

## INTRODUCTION

*The long term Perspective Plan for Bhubaneswar–Cuttack Urban Complex prepared by the Department of Architecture and Regional Planning, Indian Institute of Technology Kharagpur (IIT Kharagpur), provided vision to the anticipated development for the target year 2030. Comprehensive Development Plan (CDP) for Bhubaneswar Development Plan Area (BDPA) is a statutory requirement. It translates the broad level strategies prescribed into Perspective Plan document into implementable medium term planning proposals. Main objectives of CDP are to prepare up-to-date existing urban land use map as well as physical development plan to regulate and guide the urban growth in the region.*

*The CDP envisages a major boost in the image of this region, terms of quality of life, equity and eco sensitive planning, allocation of land resource for future population, employment growth and transportation is directed in such a manner that provides most efficient use of abundant land resource yet ensuring protection of its natural resources and preservation of diverse historical and cultural heritage.*

*With supportive government policies, BDPA is emerging as a centre for all high-tech employment and acting as a magnet for new immigrants, However, this has also resulted in low density urban sprawl replacing farmland, marshy land and forest, unauthorized encroachment and traffic congestions, water scarcity, inefficient sewerage system, housing back log and inadequate social infrastructure.*

*A distinct north south divide is evident, with northern, affluent part of BDPA in total contrast with slow-growing low dense south and south-west area of BDPA Rural and Khurda-Jatani. The contrast is also evident in planned township and unplanned parts of the BDPA region. This indicates problem of unbalanced growth. Moreover farming community in the intervening agricultural spaces is under tremendous pressure from real estate developers. If left unchecked, the pattern of development in this region will permanently affect its environmental assets. The challenges of unequal or imbalanced growth of BDPA are to be resolved. The goals, the CDP should address are improved mobility, accessibility and transportation alternatives, promotion of a strong, sustainable economy, provision of quality housing and adequate community facilities, services and utilities. Moreover, provision of flexibility in development design and control guidelines, availability of developable land and adequate infra-structure, efficient and effective use of governmental and non-governmental resources are prime considerations.*

According to the Orissa Development Authority Act, 1982, Comprehensive Development Plan shall define the various zones, indicate the manner in which the land in each zone is proposed to be used and phasing of development. Various aspects to be covered are physical and socio-economic aspects, functional plans on various sectors, financial aspect, administrative structures, zoning regulation with specific emphasis on natural hazard prone zone areas, investment plan and action plan, proposed land use plan translated over revenue map in GIS format.

The Planning Process involved updating the maps and information through discussion, research and public hearing. Through an iteration process, all interested stakeholders have been involved and all sectors of development were addressed.

The preparation of the Comprehensive Development Plan has been based on assessment of the existing conditions and accounting for the potential resources and constraints, status analysis and consideration of the prime issues. Six stages of the plan preparation are - Stage-1: delineation of BDPA into 14 planning zones, Stage-2: The study of existing land use, Stage-3: subsequent identification of vacant land as well as plot wise ownership (Public & Private) of the planning zone, Stage-4: The allocation of types, quantum and distribution of land uses and central functions, Stage-5: implementation mechanism, Stage-6: the future land use plan and their zone wise distribution based on zoning regulations for the 14 planning zones as per the ODA ACT. Development cost of the CDP is organised through estimated investment plan.

### **STUDY AREA AND ITS CHARECTERISITCS**

In-depth understanding of the study area covers various natural and man-made features, development trend and distribution based on exhaustive survey and data compilation (the Socio-Economic Survey Report and the Status Report of the BCUC planning area). Bhubaneswar Development Plan Area (BDPA) has been formed by a process of amalgamation and annexation of BMC, BDPA Rural, Khurda and Jatani (**Map-1**). The planning area is transforming towards a new identity as a major centre for information technology, educational and research organisation.

*Physical characteristics - topography, soil condition, river system, natural drains, reserve and protected forests have influenced the settlement pattern. BDPA has emerged as a linear conurbation from north to south, mainly because of restricted growth in the flood plains of eastern part and reserve forests in the north western part.*

*Socio economic survey revealed that majority of families in BDPA belong to nuclear family (52%), about 75% household own their residences, and a huge majority reside in single storied houses (69%). There are some 193 slum pockets in BDPA.*

*Tertiary Sector activities are the major economic activities within the region- primarily trade and commerce as well as service sector activities. The low level of socio-economic development in rural parts of BDPA is alarming and calls for immediate intervention.*

*BDPA region enjoys excellent connectivity with other adjoining regions of strategic importance. However, the passenger transit option needs improvement for greater interaction.*

*The existing water supply and sewerage system needs major augmentation. The drainage facilities demands management that would take advantage of natural slope and address the recurrent problems of flooding, illegal encroachments, need of periodic maintenance, and provisions of adequate land for future reconstruction and augmentation activity.*

*The planning area is endowed with varied historical and cultural resources from different historical periods. Bhubaneswar, often referred to as a “City of Temples” is truly a cultural paradise and any tourist’s delight, with magnificent temples and temple complexes like the Mukteswar and Lingaraj, and ancient caves as found at Udayagiri, Ekamra Kshetra - is a place of unique ‘living heritage’. Of the innumerable historical structures and precincts in BDPA, mainly six areas - Dhauli, Udayagiri and Khandagiri , Ekamra Kshetra , Khurda Fort and the Colonial and cultural heritage at Jatani can be identified as areas of significant historical and cultural values and deserve special attention. With appropriate policy guidelines and heritage management, the cultural resources of BDPA can not only promote tourism and boost local economy but also be able to play a crucial and meaningful role in projecting Bhubaneswar’s cultural identity. This will also contribute a great sense of pride amongst the residents of BDPA and become a touchstone for future development.*

## LAND USE AND LAND OWNERSHIP

Present Land use of BMC, Khurda Municipality, Jatani Municipality and BDPA Rural have been analysed in detail. It reveals that in spite of all past efforts of Master Plan/ Interim Development Plan/ Comprehensive Development, this planning region of BDPA has remained largely rural, surrounded by vast agricultural hinterland, forest land, waste land and water body as well as incompatible land use in parts (**Map-2**). The structure of the capital city is predominated by gridiron pattern and has lost its control. Mixed land uses are seen in most parts of the planning area. Areas with sparse developed residential areas and encroachment of non-residential activities can be utilized for wise use in future.

Land ownership is based on five different categories namely Government Land, Temple/ Trustee, Government Reserved, Government forest and Private. The compilation of the ownership data and their analysis shows the land ownership in various zones. This has enabled the planning to identify the land availability or capacity of each zone.

## CONCEPTUAL PLAN

Based on a multi-criteria analysis, The BDPA is divided into four broad categories - **Extensive Development Zone, Intensive Development Zone, Sensitive Development Zone, and Restrictive Development Zone (Map-3)**.

Conceptual Plan is based on 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 the issue of sporadic and haphazard growth.

The Comprehensive Development Plan of BDPA is based on a vision to create a world class city that will not only have high end activities and centers of excellence, but also will have a distinct identity based on its rich cultural background and natural resources.

Some of the Salient features of the CDP are:

- Strong connectivity through a system of Ring Road/bypass encircling the entire BDPA, North South metro corridors and transverse connection in east-west direction.

- *Availability of land - public land and uncultivated or less fertile land has primarily been identified for locating new activity centers.*
- *Two distinct traits of development - western belt of High End activities and an eastern belt of Cultural Landscape*
- *New location of Airport and its impact on revitalisation of Khurda and Jatani with proposed high tech corridors and industrial hubs on the south eastern parts.*
- *Special housing zones and new townships*

*The vast stretch of low lying flood prone areas along the eastern periphery at Sribantapur and Sisupalagarh has been identified as an ecologically sensitive zone with limited development mainly for recreation, tourism and cultural activities, as well as, agro-based industries. In between the two major spines of development, the Capital complex along with high end institutional and technical hubs, diplomatic enclave, housing condominiums and townships forms a Central zone serving the entire BDPA. On the northern western periphery, Nandankanan forms a nucleus of high end world class recreation and cultural activities like golf courses, festival grounds, nature trails, camping sites (Map-4).*

*The spatial structure thus evolved will hopefully be the basis of an urban area that will be able to ensure a better quality of life for its entire people and put BDPA as a livable, enviable and a unique city of future.*

### **DEMOGRAPHIC & ECONOMIC PERSPECTIVE**

*The future population distribution is more than a mere projection of the past trends or the past behavior of the demographic variables. Population allocation for the 14 Planning Zones was done considering the homogeneity of the geo-physical environment, the functionally integrated areas (here, revenue villages) and the development potential of the individual areas.*

*The three urban centers and adjoining rural hinterland comprising the BDPA are at present varying in terms of levels of development. The vision is to uplift the BDPA as well as the entire BCUC region to the status of a State Capital Region and place it in the fast track of economic development, through a planned and investment friendly atmosphere for achieving a better quality of life. The effect of planned interventions on*

population growth has also been considered and growth rate and future proposed population density have been used to project the future population of administrative areas in BDPA along with its 14 individual zones. The estimated population in 2030 will be around 20,00,000; 1,50,000; 1,30,000 and 7, 20,000 (approx) in Bhubaneswar Municipal Corporation (BMC), Khurda Municipality, Jatani Municipality and BDPA Rural respectively. The future gross density would be enhanced to a figure of 29-30 persons per acre in the year 2030 from the existing 13-15 persons per acre. The East Kuakhai and Tamando regions are estimated to have the highest growth rate (around 600%) followed by the Gangapara (around 273%) and Aigania regions (around 253%). Tamando shall accommodate an additional population of (4,49,300), followed by Aigania (2,30,000), Chandrasekharapur (221500) and East Kuakhai (2,00,000). This will address the need of a balanced growth between the north and the south portion of BDPA. It is also expected that BDPA region would be experiencing a paradigm shift in its economic and real estate scenario. Bhubaneswar, characterised by low real estate costs, availability of land for development, untapped manpower pool and rising quality of life is a preferred option for most IT companies. Positive economic growth has also translated in rising disposable incomes and growing aspiration levels amongst new generation youth. This has been further fuelled by the increase in size of 25-55 age group of earning population and the emergence of double income, nuclear families. Furthermore, Bhubaneswar region would certainly invite more migratory young population mainly due to change in occupation, transfer of services and also for better social infrastructure facilities. At the same time to correct the imbalance in the present sex ratio and percentage of child population active role of NGO's need to be stressed in the right forum.

The local economy of BDPA is passing through a major transformation mostly from agrarian and traditional industry oriented economy to high-tech service economy. The relative share of primary sector activities to 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.

Among primary sector activities, there will be larger stress on high value farming, horticulture, floriculture, animal husbandry and livestock farming.



*Several food processing activities can also flourish based on these activities to meet the local consumption demand.*

*A decline in manufacturing activities is observed within BDPA region. Many of the industries have either stopped their operation or became sick. Many of the industrial estates have failed to attract expected level of industrial investment despite providing adequate infrastructure. There has been a conscious effort to keep the polluting at bay from the BCUC regions especially from the Bhubaneswar area and it is expected to remain so in future. Huge expansion is contemplated in the industrial sector primarily concentrating on the non-polluting sector i.e. electronics and hardware manufacturing, auto components manufacturing and assembly, engineering goods and allied industries, building materials and components etc.*

*Knowledge based service sector will acquire the status of economic mainstay. Growth of this sector will not only provide direct employment opportunities but also create a huge scope for vast array of ancillary services and associated indirect employment.*

*In the years to come, BCUC is expected to emerge as the regional provider of health and educational services catering to the demand of the Orissa and also to the neighboring states. Several facilities i.e. super specialty health services along with medical college, national level educational campuses, regional level sports education and training campus etc. has been proposed in BDPA.*

*The phenomenal rise in IT, ITES and other service sector employment will induce huge demand for residential floor spaces (group housing and service apartments) followed by commercial floor spaces and institutional spaces. Escalation of land prices has been astronomical in some of the places mostly due to speculation – leading to a ‘real estate bubble’. Though it’s very natural to experience a boom in real estate activities for an upcoming urban center like Bhubaneswar, there is a need to deflate the ‘real estate bubble’ which might otherwise lead to a slump in real estate activities. This issue has been addressed by preparing a blueprint to control and direct the speculative forces as desirable locations through increase in supply of developed land with commensurate physical and social infrastructure.*

*Trade and commerce functions will proliferate with increasing income and spending pattern – mostly towards organised formal sector. Rise in trading functions and rising affluence will also lead to growth of banking and financial services.*

*Huge influx of domestic and international tourists owing to the rich historical and cultural heritage of the region is expected to rise steadily in coming years. This will lead to rapid expansion of tourism and enabling service sectors - having multiplier effect on other urban activities such as retail trade and commerce, hospitality services, transport services as well as banking and financial services. In addition to this, proper development of the hospitality sector will boost the rising business tourism activities.*

### **TRAFFIC AND TRANSPORTATION**

*Excessive reliance on private transit options has been observed for intra-urban travel which will turn out to be the single most important influencing factor in future. This will not only stress the capacity of the road network and pull down the level of service but will also strain the parking infrastructure and the local environment. Moreover, it will lead to further deterioration of public/para transit infrastructure and reduced mobility for the sections of people who cannot afford private transit modes. Planning for mass transit facilities is the key step toward addressing these issues and correct the existing distortion in the urban transit sector. Based on the recommendations of the RITES Ltd., an alignment has been proposed connecting all important urban centers within BDPA as well as BCUC. Apart from this, it has also been observed that the existing transit terminal facilities (both rail and bus) are inadequate to cater to the anticipated demand. Augmentation of existing rail passenger terminal and new regional level bus terminal facilities have been proposed near Nandankanan to address these future needs (**Map-5**).*

*Looking at the air travel demand, it is anticipated that the present airport will not be able to cater to the growing need for larger runway as well as accommodating ancillary facilities. It has been suggested to find an alternative location for a new airport just outside BCUC to address these emerging issues keeping in view the proposed spatial allocation of activities of regional importance within and outside BCUC.*

*Lack of connectivity between some parts of the BDPA with the Bhubaneswar town has posed constraints to growth. The proposed road structure with hierarchy of roads has aimed at providing connectivity to the existing as well as the future growth nodes. Certain bypasses and ring roads have been proposed to reduce interference between regional and mixed traffic.*



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

*The traffic volume within the Bhubaneswar 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.*

### **HOUSING AND SLUMS**

*The BDPA constitutes around 58% of the BCUC area. It extends over 419.10 sq km against 721.9 sq km of the BCUC area.*

*The existing population of BDPA of around 13.7 lakh will reach 30 lakh by the period 2030. This will mean an addition of around 16.3 lakh people. With an average household size of 4.5 this implies an addition of 3.6 lakh dwelling units. In addition there is a current backlog of around 15,000 dwelling units. If the qualitative shortage and obsolescence factors are added to that, the total housing requirement for BDPA in 2030 is around 4.4 lakh dwelling units.*

*This illustrates the significance of this area as well as the magnitude of the housing requirement that BDPA is likely to encounter, for which adequate planning has to be done.*

*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.*

*The planning units Chandrasekharpur, East Kuakhai, Aigania, Tamando and Gangapada, earmarked for extensive development, will account for almost 73% of the total quantitative housing shortage of BDPA.*

*It is felt that BDPA should have a compact development instead of a very low-density spread-out type of development. This would be economical from the infrastructure and high land value points of view. The future density in the additional areas has been assumed to lie between 40 dwelling units per acre to 60 dwelling units per acre. Consequently, the future housing area requirement is computed to be around 9200 acres.*

*It is expected that the BDPA will continue to see the growth of nuclear families. An increased demand for rental housing in this area is envisaged. Several measures will have to be taken to make rental housing an acceptable proposition and also to make rental housing affordable.*

*The joint and extended families in the Khurda and Jatani areas are likely to split into nuclear families. Many of the members will move out within and outside the region for employment. New activities proposed in these areas will also attract in-migration to these areas.*

*The CDP assumes new roles to the BDPA rural areas. This will generate a new scenario with a drastic increase in the pucca houses. 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 BDPA will generate a significant demand for housing in the 750-1200 sq ft range, owing to the growth in IT and ITES sectors.*

*Khurda and Jatani are likely to maintain their low-rise built up character, while the high escalation of land prices will see growth of multi storied apartments and some condominiums in the Chandrasekharpur, Aigania, Pokhariput and East Kuakhai areas. The BMC area falling in Stratum 2, and identified as intensive development zone in the Vision 2030 will probably see a rise in walk up type (G+4) dwelling units with heights up to 15m. Part of this will be through new construction activity while re-densification by addition of extra floors to existing dwelling units will also rise significantly. It is also anticipated that smaller plots in the range of 500 sq. m will get amalgamated to accommodate new dwelling units in the range of G+ 8 category.*

### **Slums**

*The total number of slums in BDPA is 193. There are 47 wards in BMC with 62 authorized slums and 131 unauthorized slums.*

*The future slum development policies would include:*

- 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.*

*The strategy to achieve this would include the following, among others:*

- i. Inclusive Approach to Definition of Slum/Informal Settlement*
- ii. Comprehensive Listing of Slums/Informal Settlements*
- iii. Registration of Slum Dwellers*
- iv. Identity Card provision*
- v. De-listing those settlements already provided with a certain level of services.*
- vi. Classification of Land Status / Tenability*
- vii. Granting of tenure mainly on government land and negotiated compensation on slums on private land.*
- viii. Resettlement and rehabilitation package*
- ix. Environmental improvement*
- x. Improving access to social services*
- xi. Economic empowerment*

### **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 BDPA. 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 hour supply system with adequate pressure in the distribution system even at the tail ends. In BMC, raw water intake systems be designed and installed to have an enhanced water supply of 88 MGD. Suitable modifications are to be done to enhance the capacity of the intake channels so as to provide the additional supply of 25 MGD.*

*The drinking water demand in Khurda, Jatani, and Rural areas of BDPA in 2030 will be 200 MLD. It appears that in the absence of a centralised 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 future water demand of the municipalities Khurda and Jatani together with the Rural BDPA could be met by River Mahanadi, River Daya, River Kuakhai and ground water. There is an urgent need of master plan for water supply and its implementation. The tentative cost of proposed water supply system for BDPA is Rs. 1125 crores.

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 future wastewater.

Since it is necessary to provide sewage treatment facilities for 480 MLD of wastewater, a decentralised wastewater treatment system would be more appropriate. The centralised 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 BDPA is around 1246 crores.

The natural drains in most of the BDPA 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 lead to diminish the carrying capacity of drains which cause flooding in many areas and deserve immediate 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 organised 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 urban area be made permanent and also the natural drainage system be improved. Hence, the BDPA demands a full fledged drainage system.

The drainage facilities provided are very poor in Jatani, Khurda and Rural areas of BDPA. It is recommended that a drainage master plan for the entire BDPA area should be prepared. Strict implementation of the master drainage plan for these areas appears much essential. The

tentative cost of the proposed drainage system of BDPA is around 402 crores.

It has been felt that the solid waste management in BDPA is not in tune with the rapid development of the area. The Municipal solid waste management remains neglected. The total solid waste generation expected in BDPA would be 1500 MT/day as on 2030. It is always advisable to have decentralised 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. The solid waste generation expected in BDPA is very high, 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 BDPA is around 109 crores.

### **SOCIAL INFRASTRUCTURE**

BDPA, being the most important capital region of Orissa state, will have to provide education, health care and other social amenities for a population of 30 lakhs in 2030. Data and studies indicate that social infrastructure in BDPA has scope of improvement, both quantitatively and qualitatively. The Government of Orissa has its own departments for education and health, who prepare and execute plans for these services for the entire state including areas covered by BDPA. Spatial allocation and space requirements for education, healthcare, recreation and other such social infrastructural facilities is a critical aspect wherein the participation and involvement of the local administration is inevitable.

Higher level of growth is generally driven by innovation, level of education and aspects of social infrastructure. Although the average literacy rate in BDPA is higher than that of the other districts of Orissa, the educational facilities in rural BDPA are to be improved significantly. A total of 591 additional facilities, 560.8 hectares of land and a capital of rupees 1123 crores are estimated to be required for the overall development of educational facilities in BDPA region by 2030. The Government should work very closely with the private and public sector to form an advisory committee comprising representatives from all concerned for adoption of city's municipal schools to reduce dropout rates and form up-to-date

courses to ensure that its education and training system would meet the tertiary needs, now and in future.

Adequate health infrastructure is a prerequisite for a progressive, healthy society. The present number of beds is sufficient compared to the standards, but an additional 31 hospitals and 25 nursing homes with a total investment of 1300 crores would be necessary to match the demand in 2030. 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 Government health services. Moreover, these facilities urgently need to be augmented with more sophisticated medical equipments, implementing waste disposal autoclave, etc. NGOs and CBOs should be given more responsibility in conducting various camps, issuing medical cards and arrangement for bringing more workers under medical insurance coverage. Increased public-private partnership in the creation of diagnostic centers, improvement of medical equipments to provide services to people at more affordable prices is required. New trend of computerisation of all hospitals should be actively encouraged in BDPA. The investment for health care facilities, will amount to an estimated 1300 crores rupees.

Other infrastructural amenities like Telecommunication, Postal Service, Power, Fire Service, Commercial/Cooperative Bank, Recreational Hall (Cinema/Auditorium), Parks and Playground Community hall and Library, Music, dance and drama Center are all estimated to add up to rupees 887 crores.

It is estimated that around 1334 MVA would be required to cater to the energy demands of all households by 2030. In BDPA, there is huge potential for power generation from the renewable energy sources, such as wind, biomass and solar energy with special emphasis on generation of grid quality power from them. Further, the use of renewable sources of energy must be promoted through demonstration projects and awareness programmes.

### **CULTURE, RECREATION AND TOURISM**

Presenting immense scope for Religious, Culture/Heritage, Educational, and Adventure based Tourism, as well as Eco-tourism, the BDPA has tremendous possibilities to grow into an important cultural, recreational and tourist destination. For this, a holistic approach focusing on the preservation and propagation of culture, widening the spectrum of



*recreational offering and strengthening the places of potential tourist interest is necessary.*

*Conservation and Development of Daya River and other historical water bodies for Historical or Heritage Interpretation, activities like landscaped sculpture gardens, peace park, light and sound programme, which would generate an awareness towards historical importance of the place among the local mass and tourists along with providing outdoor recreation must be undertaken. Rural Representational Centers or Tribal Art and Handicrafts centers can be developed for covering both the interest of rural tribal folk and tourists.*

*For Educational Tourism, youth hostels, log huts, eco-trails, camping sites, trailer parks may be developed in comparative remote locations amidst natural surroundings with basic infrastructural facilities. Picturesque, picnic/ outdoor recreational area with mountaineering, sky diving facilities, camping sites, etc. can be developed at Barunei hills, near Barunei temple and at Garh Khurda for Adventure Tourism.*

*Adaptive reuse of abandoned stone quarries and low-lying areas can be planned for recreational development with creative landscape design (both trees and shrubbery), water bodies as catchments reserves, natural exposed rock strata along with minimum park accessories (like benches, lighting etc.).*

*Sustainable approaches that are economically viable and socio-psychologically acceptable characterize Eco-tourism and result in integrated and holistic product development and capacity building in host communities. Ecotourism also lends a sense and uniqueness of place and exemplifies the commitment to the greening of the tourism industry. Thus, development of low-lying areas in the southern eastern side of BDPA area can be used for development of eco sensitive activities such as Heritage Parks, theme parks, orchards, Herbal Gardens, Yoga centers, low density tourist resorts etc. can promote Eco-tourism in the region.*

*An Urban Parkway System connecting various parks with landscaped structures along major circulation corridors at Bhubaneswar will add to the beauty of this Koenigsberger planned city.*

*BDPA is surrounded by many potential places of tourist interest which are proposed to be grouped into inter-zonal and intra-zonal Tourist Circuits with supportive facilities like mode of travel, infrastructure, facilities and services.etc, These shall be either Religious Tourism based,*

*Monument and Culture based, Buddhist circuit, Art and Craft, Tribal/ village tourism based, Wildlife, Ecotourism and Adventure or Weekend and scenic area based.*

*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. Thus “Good Host Training” to encourage friendliness, increase awareness of Tourism and foster attitude of Oriya Hospitality Culture in frontline people is essential. The whole setup must draw inspiration from the National Tourism Policy 2002 in terms of **Swagat (Hospitality, Soochana (Information), Suvidha (Comfort), Suraksha (Security), Sahyog (Co-operation) and Sanrachna (Infrastructure)***

*In BDPA, scope of Private sector participation has to be encouraged for the augmentation and development of facilities and services 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. Thus a ‘new model’ can be derived to ensure optimum utilization of rich tourism resources for creating new employment especially in rural or suburban areas. This is to strengthen the already existing market for the rich and varied Orissan handicrafts and to preserve and accelerate the contribution of tourism in the socio-economic development of the BDPA. About 316 hectares of land is required under tourism activities to cater for an estimated 30 lakhs annual tourists and for an approx. investment of Rs. 580 Crores.*

### **HERITAGE AND CONSERVATION**

*BDPA area is endowed with varied historical and cultural resources from different historical periods. Of the innumerable historical structures and precincts, mainly six areas emerge as most outstanding and deserve special attention - 1) Ekamra Kshetra, a living heritage city, 2) Dhauli, 3) Udayagiri and Khandagiri - the twin hill of renowned cave temples, 4) Sisupalagarh, the ancient palace of capital of Kalinga, 5) Khurda, the last independent fort of India and 6) Jatani - an example cultural and colonial heritage.*

*All these heritage sites are sensitive development areas and very much a part of larger urban agglomeration of BDPA which is emerging as a major capital complex with a global vision. However, the growth and development of BDPA should neither stifle the great cultural heritage nor evade its rich cultural legacy. It is also important to clearly establish the future role of these diverse cultural and heritage resources in the emerging and envisaged development scenario of BDPA. Moreover, protection of heritage should not end up in converting a living heritage in a 'museum city'. Management of such heritage resources thus is challenged by conflicting demands of conservation, economic development and social equity.*

*A systematic understanding of the present status of these heritage areas 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 BDPA. With an aim of 'living with heritage', conservation policies prescribed in CDP, have addressed dynamic interaction between cultural heritage, society and the natural environment and is based on a unifying process of value based heritage management.*

*It is suggested that following areas are declared as Special Heritage Areas*

*Ekamra Kshetra (Zone 18), Sisupalagarh and its surroundings as Aitihāsik Kshetra (Zone 16), Dhāuli and its surroundings as Sanskritik Kshetra (Zone 19), Udayagiri and Khandagiri (Zone 20), Khurda Fort and Barunei (Zone 24), Cultural and Colonial Heritage at Jatani (Zone 25).*

*For each of the identified Heritage Areas, a Special Area Action plan is needed so as to maximise the maintenance of significance through 'management of change'. It is recommended that 1) identified Heritage Areas are to be declared as important cultural sites of BDPA and protected and preserved as Special Areas, 2) A detailed zonal development plan must be carried out for each one of the identified Heritage Areas . 3) It is necessary to prepare an inventory of all built, cultural and natural heritage resources of the special area. The inventory must include both protected and unprotected resources.*

*The special heritage areas have been classified as per conservation measures, viz. preservation, rehabilitation, revitalization, infill or new development areas, areas that need to retain and/or enhance townscape qualities. Recommendations for the identified Special Heritage Zones have been integrated with policies prescribed for tourism and recreation with a focus on various activities like conservation interventions, visitor*

management, infrastructure development and interpretations. Zone wise detail recommendations in terms of permitted activities, movement pattern, and broad regulations have been prescribed in CDP. Detail plans must be prepared by respective development Authorities and Municipalities.

The major cluster of proposed heritage areas along with the earmarked Special Heritage Zones within the - Ekamra Kshetra (Old Town, Bhubaneswar) Aitihāsik Kshetra (Sisupalagarh and its surroundings) and the Sanskritik Kshetra (Dhauri) along with the areas (along Daya canal) has been proposed to be developed as the 'Cultural Hub' for the entire BCUC area. Lands in Kukudakhai and Nuagaon, have been specifically earmarked for new developments for tourists and pilgrims in close proximity to the proposed Cultural Hub and act as a 'Gateway to the Cultural Hub'.

To ensure proper accessibility and connectivity to the heritage areas, Heritage Circuits and Heritage Trails have been proposed. Development of necessary facilities for tourists and visitors along these routes at appropriate locations need to be encouraged.

With appropriate policy guidelines and heritage management, the cultural resources of BDPA can not only promote tourism and boost local economy but also be able to play crucial and meaningful role in projecting Bhubaneswar's cultural identity. This will also contribute a great sense of pride amongst the residents of BDPA and become a touchstone for future development.

### **ENVIRONMENTAL MANAGEMENT**

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 require treatment before supply. The water quality in Kuakhai, Bhargavi and Daya rivers show a decreasing trend with lower quality levels at some points. Since the waste loads from drainage channels ultimately finds its way to these rivers, 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 slum to solve these problems. A detailed air quality analysis of the entire BDPA is to be done to identify the most polluting and hazardous industrial units including the source apportionment study for key pollutants, especially particulate pollutants and NOx. 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. Green belt development and afforestation should be encouraged which may act as sink for air pollutants. 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. The control on industrial pollution and conservation of water resources of the area are equally critical in imparting the desired quality to human life.

Major natural disasters which Bhubaneswar Development Plan Area is prone to are cyclones (Very High Damage Risk Zone-B, Vulnerability Atlas of India 1997), earthquakes (Moderate Damage Risk Zone - MSK VII of Earthquake) and flood. Lack of awareness of vulnerability and risk is a major factor for enhancement of vulnerability in the region. Therefore it is necessary to reduce the consequences of natural disasters by Planning, Preventing and Preparing the major urban communities so that the local capacity is strengthened and they are prepared to respond to natural disasters.

Vulnerability to earthquake and fire has been aggravated by the haphazard growth of the urban areas. Parts of the city, especially the old town area is highly vulnerable to cyclones due to weak housing and poor quality of infrastructure. In recent years due to regular deforestation and heavy increase in the traffic of Bhubaneswar, the city has also been experiencing increased pollution and higher temperatures. Overcrowding of the city has led to traffic congestion, at times aggravated by encroachments on both sides of the roads. Blockage of natural drains through land reclamation has led to the stagnation of sewer water at various places, causing the spread of water borne diseases. Further, open dump yards, lack of any proper drainage and covered sewerage system and the use of old, unclean water tanks for bathing purposes all add to the health hazards of the region.

*Although corrective steps can be undertaken to decrease the effects of pollution and traffic congestion, natural disasters cannot be prevented. Therefore, appropriate mitigation measures need to be taken to reduce the extent of damage, destruction and human suffering. Building byelaws must be suitably modified as per the guidelines of the National Disaster Management Authority to mitigate earthquakes. High-rise buildings must comply with standards set in the NBC. Creating an urban inventory, thematic maps and queries will also help identify BDPA's most vulnerable areas and "what-if" scenarios and help in planning mitigation measures such as retrofitting and relocation. Extensive redensification of urban landscape (green belts, strip plantations etc.) afforestation and restoration of forest land must be undertaken immediately to curb pollution, decrease the impact of cyclones, and mitigate floods. Development of a Disaster-Proof Living Zones with firebreaks, improved roads, etc. must be undertaken. Various structural measures such as dams, reservoirs, and embankments, and non-structural measures (like mandatory submission of geotechnical soil report along with structural design for all building proposals for sanction) may also be adopted for flood mitigation.*

### **DEVELOPMENT MANAGEMENT AND FINANCE**

*The plan proposals are statements of intention, or at best, a guiding framework. The right kind of organisational arrangement and necessary finances need to be put in place for successful implementation of the all relevant and useful plans. Thus the intents need to be translated into a set of implementable projects, which can be done in stages of prioritization, suitable packaging and the phasing of implementation determined. The proposed initiatives from project conception, formulation, financing, execution and operation and maintenance through the project lives are to be conceived or visualized, and the organisation/institution would need to work in a coordinated manner.*

*The concerned agencies in the Bhubaneswar Development Plan Area (BDPA) will be Bhubaneswar Development Authority (BDA), Bhubaneswar Municipal Corporation (BMC), Municipalities of Khurda, Jatani and BDPA Rural i.e. Panchayat Samitis. The task of implementation of a dynamic plan demands a wide range of technical, financial and management skills to be successful. Some of the relevant issues concerning urban management are inter-agency coordination, creation of a single coordinated body (BCUC Metro Authority),*



*establishment of a special purpose company (SPC) to implement the plan and the involvement of private sectors*

*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. A right structure of governance needs to be created with concerned agencies accountable for instituting target setting and streamlining of the key processes. Also the evolutionary process of development needs have been reflected in the new legislation and amendments of existing legislation with necessary consideration of the acts and rules in operation.*

*The land use policy has evolved by adhering to the requisites of environment and has been formulated 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. Four types of development zones have been identified for the preparation of Perspective Plan for BDPA namely extensive, intensive, restricted and sensitive development zones.*

*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. 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.*

*The concept of Special Economic Zone is an innovative option of resource mobilisation. Some of the areas can be brought under 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.*

*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. It is thus imperative to find out means for enhanced revenue mobilisation by the concerned*

infrastructure development agencies. Infrastructure financing agencies insist on the cardinal principles of appropriate and innovative user-pay instruments (beneficiary to pay) to ensure economic, financial and technological sustainability.

Property tax, being the single largest source of revenue, adequate efforts needs to be provided on this score. Special Development Districts (SDD) should be created to make major investment 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 Bhubaneswar Development Plan Area (BDPA), for shaping its future towards vision 2030. It sets out the spatial strategy for 14 planning subzones as identified in the perspective Plan to address the different needs of each area.

While analysing the innumerable complex variables involved in the dynamic process of urban development, two interesting observations have been made. Firstly, a unique and interesting phenomenon of planning corridors has evolved and has been proposed as a series of corridors BDPA namely Residential Corridor, Institutional Corridor, Commercial Corridor, Industrial Corridor, Garland Lake System, Transportation Corridor and Green Corridor (**Map-6**).

Secondly, the assessment of the allocation of the quantum of activity distribution in the various zones has led to the creation of numerous 'Hubs' which have been proposed in compatibility to the existing and proposed land uses in the various zones. Some of these unique concepts are 'Eco City' in Bharatpur, 'Knowledge City' in Chandrasekharpur, 'Heritage City' in Old BBSR, 'Film City' in Aigania and 'Satellite City', 'Health City', 'Science City', 'Diplomatic Enclave', 'IT City' and 'Central Park' in Tamando (**Map-7**). It has been observed that the various special activities are proposed mainly due to the availability of large chunks of government land, uninterrupted vacant land and landforms.

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 BDPA shows Residential land use as 33.7%, Commercial land use as 2.94%, Industrial land use

as 4.18%, Public and Semi-Public land use as 12.65%, Utilities and Services land use as 1.05%, Recreational land use as 8.74%, Transportation land use as 14.58%, Agriculture land use as 14.05%, Water Bodies use as 5.18% and Special Area use as 2.93% of the total 419.10 Sq. km of land area of BDPA (**Map-8**).

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.

In the Bhubaneswar Development Plan Area (BDPA), various use zones viz. Residential, Retail Commercial and business, Wholesale Commercial, Industrial, Public and Semi-Public, Utilities and Services, Open space, Transportation, Agricultural and forest, Water bodies, Special Heritage Zones and Environmentally Sensitive Zones having their location as indicated in the Comprehensive Development Plan shall be regulated and guided. Thus a detailed list has been provided for the 'Activities Permitted', 'Activities Permissible on application to Competent Authority (with conditions)' and 'Activities Prohibited' for each of the land use zones mentioned in the proposed CDP of BDPA.

Following the submission of the Draft Comprehensive Development Plan as per the statutory requirements Objections & Suggestions on the draft CDP were invited from various stake holders & a 'Board of Inquiry' was formulated by the BDA authorities to review the same. Reviewing the feedback received from the Board of Inquiry rationally the planning consultants have finalised the Comprehensive Development Plan.

### **INVESTMENT PLAN**

The different sectoral plans 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.*

*A summary of sector-wise investment plan for all the sectors covering traffic and transportation, housing, physical infrastructure, social infrastructure, tourism and heritage has been estimated. It is observed by adding the sectoral plans through gross estimate the BDPA Comprehensive Development Plan will require a total public and private sector investment of around Rs.29560 crores during next 25 years.*

*However, of this total tentative capital investment amount for all sectors, an approximate amount of Rs.15000 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, Capital finance through devolution of fund, User Charges, increased and Reformed Tax base and improved Collection.*