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Design a Smart Township near Nasik City

Krishna S. Deokule[1], Priti P. Patil[2]

[1]Department of Civil Engineering, S.S.V.P.S's B.S.Deore C.O.E. Deopur, Dhule, MS., India

[2]Asst. Prof. S.S.V.P.S's B.S.Deore C.O.E. Deopur, Dhule, MS., India

Abstract: ***The townships are planned with "walk to work" concept, built up with public private partnership, integrated in nature can be the future of the cities developing in India. They will be self sufficient, self managed and self governed units, with well defined and well designed residential, commercial, retail and recreational areas; self owned and created infrastructure, integrated waste management systems, energy efficient management systems, water resource management systems, and other amenities in place thus reducing the pressure on the local governing bodies and the city resources. The main aim of this project is to develop Energy Efficient management Framework for Infrastructure Facilities. This framework will form the basis of workable and flexible sets of comprehensive procedures able to be amended with regard to specifications, design, standards, human resources and legislation as well as accommodating the cost of whole-life values. The land use planning and design principles for new towns as embodied in Housing and Development Board structural model. This has lead to the efficient use of land resources to house people and activities, efficient movement of people, goods and services, adequate provision of facilities, and a harmonious spatial pattern of land uses. Asset management techniques able to take account of the full range of factors in less stable environments require to link contributory variables including population analyses life-cycle analysis, national design specifications, building codes, procurement routes, and project management tools towards re-build and retro-fitting.***

Keywords: Township; Modern Facilities

1. Introduction

A smart township isn't only about a set of buildings, but also about how it interacts with nature, about availability of social amenities like healthcare, education and sanitation. Also, it must be frugal in the way it consumes natural resources, given their scarcity.

Keeping India's context in mind, if we only talk about information and communication technology as a major component of a smart city, it will be a little misleading. We have to think in terms of what smartness means to us and our people rather than focus on what smartness means in the Western world. This is particularly important keeping in mind the government's vision to develop 100 smart cities that would touch a significant portion of the urban Indian landscape.

Due to rapid urbanization, people are getting attracted towards the city and urban areas where they are hoped to get more and more facilities and amenities to survive in better living conditions. As a result of this trend the limits of the city increases day by day.

Due to this, more development happens and need to fulfill their demand for every sectors and planning like housing, commercial and employment facilities as well as institutions and the health facilities. Increase in demand and Development are dispersing and sprawling everywhere and which are not seen to be properly managed. So have Thesis for proper planning and proper management in urban areas. Based on this concept neighborhood planning is Coming as a new trend now days. As well as satellite towns, special townships communities living are upcoming need of present and future generations. This concept is originally American concept based on the principle that one is planning for a society and not for an aggregate of house.

Hence the goal is to evaluate the guidelines for eco-friendly Special Township analyze it and do some changes or certain additions to develop a self-sustainable township. Second stage will be the introduction of the parameters which are applicable for making an eco-friendly development in urban areas and third stage will be implementation in the form of design demonstration through designing an eco-friendly special township up to master planning stage. Final conclusion is in for of suggested modified addition a guideline for sustainable Special Township in accordance With suggested guideline.

1.1 Overview Of Project

Since more & more people are turning their focus on increasing their standard of living, metropolitan cities of India are suffering from overcrowding. More and more people shifting to urban areas create difficulty in distribution of resources. Day by day cities are expanding in population and size without undergoing much infrastructural growth. This result in major problems like over-crowding, water cut-offs, load-shedding, etc.

1.2 Objectives Of Project

With development of Smart Township that we hope that this will change the way they operate for the benefit of future generations, ensuring that they do not put a strain on resources which will cause such resources to vanish before future generations have an opportunity to benefit from them.

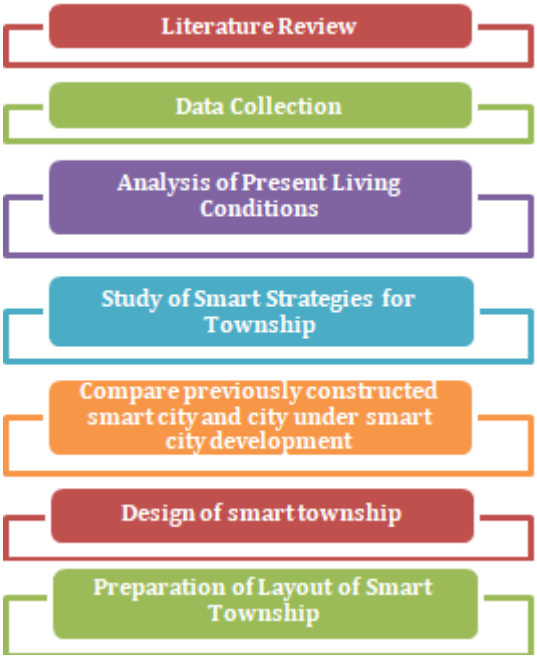
Smart Township will reduce needs and reliance on surrounding areas. In addition to being environmentally sustainable, this can also be economically beneficial, and may allow a city to be more secure in the event of a natural or civil emergency. Reduction of reliance on surrounding areas includes growing food in a city, reducing water needs and reusing water as much as possible, and generating

energy inside the city. The city may become independent of the surrounding area, reducing strain on outlying communities.

The main objectives of the project are as follows:

1) To identify the current social state & problems faced by the citizens in daily life
2) To suggest better approaches to overcome the hurdles in routine of the occupants.
3) Study of Smart Strategies to make a smart township
4) To divide the township into different zones
5) To design a road network for the township.
6) To prepare layout of smart city.
7) To analyze the transportation facilities and type of structures.
8) To select a site and give a proposal for township.
9) To maintain functionality and comfort of the space.
10) Planning of township by using modern infrastructural facilities.
11) To suggest energy efficiency techniques through solar panel and lightning arrestors to develop the selected location by improving the infrastructure facilities.
12) To enhance the quality of life for the people.
13) To adopt energy efficiency techniques in the building, thereby reducing the cost.

1.3 Methodology



2. Case Studies

The adoption of environmental best practices is seen as a phenomenon that will happen in the lifetime of this process of development of project, but the initiation of best practices shall be visible in master planning stage. Therefore, the projects identified for study have been in different stages of development of conceptual planning, master planning, construction, or operational stages. The case study approach helps in reviewing the practical manifestations and their own interpretations towards development. A reiterative process of selection has been taken up for township case studies and after the initial screening of the townships chosen as case studies, a field study has been undertaken for a select few township sites to understand the present status, context and implementation of some of the important initiatives proposed in the master plan.

2.1 Defining Large Scale Townships

This research defines large scale townships as projects covering a total contiguous land area of 100 acres or more for development and involve land use transformation and new construction on either brown or green field. The implementation of these projects may take many years and may involve one or multiple developers, promoters or construction companies. The proposed plan should have an integrated land use and constitute at least residential, commercial and institutional components on the project site. This research takes into consideration the fact that these townships are not covered in the macro level city planning and neither can be completely covered under micro level building design. Therefore, the understanding of planning and design of these township projects is at a meso-level.

2.2 Township Case Study Profiles

Large-scale township projects that fulfill the criteria of having a total project area of more than 100 acres and having mixed use developments, and after a brief review of the promotional material and proposals 10 township projects were selected based on their assertion for environmental sustainability. These cases show inclination towards environmental sustainability strategies though the extent to which such practices are adopted shall be clear only in long term, the planned project profile of the studied townships in given in Table 1.

Table 1: Township case studies: project details

Sr. No.	Project Name and Location	Total Project Area	Project Period	Development type	Key sustainability features
1	Lavasa Hill City, Near Pune	25,000 acres	2008-2021	Green field, Low density, Mixed use residential township development, 300,000 residents and 2,000,000 tourists	Natural resource conservation and Eco-friendly housing
2	Magarpatta City, Pune	400 acres	2006-2012	Green field, Mixed use, medium density township development, 90,000 Population	Eco-friendly township development
3	Marg Swarnbhoomi, Near Chennai	1000 acres SEZ, 172 acres township	2009-2016	Green field, Medium densityresidential township, Special Economic Zone, 150,000	Pilot project for platinum rating by IGBC GTRS
4	GIFT City, Ahmedabad	550 acres	2008-2017	Green field, High density high rise, Financial district Flagship development (only 23% residential land use), 300,000 residents	Technology based smart city concept

				and 2,000,000 tourists	
5	Esencia Green township, Gurgaon	112 acres	2012-2015	Green field, Residential township	Pilot project for GRIHA green township rating
6	Amanora Park, Pune	400 acres	2008-2020	Green field, Residential township	Award winning eco-township
7	Mahindra World City, Chennai	1550 acres total, 325 acres residential	2002-onwards	Green field, Mixed use township with a major component of Industrial, apparel and IT SEZ, 30,000 residents, 35,000 direct	First IGBC gold rated township integrated with IGBC gold rated SEZ
8	Wave City, Ghaziabad, NCR	4500 acres (1671 acres in phase 1)	2010-onwards	Green field, Integrated Mixed use Residential township	Smart growth principles and IGBC rating targeted
9	Nanded City, Pune	700 acres	2010-onwards	Green field, Mixed use Residential township	Eco-friendly township development
10	Palava City, Mumbai	2780 acres	2011-onwards	Green field, Integrated Residential township, Approx. 500,000 people and 350,000 jobs	Promoted as Smart City

3. Design Concept of Smart Township

Any township made up of one or more neighborhood sector. And this neighborhood concept was originally comes from America. Township is the place where not only residential facilities are provided but also recreational facilities, commercial educational and health facilities are accommodated within a walking distance in a single campus. In urban cities like Pune, over population is increasing , its side effects are increasing like geography of city boundary line depending on requirement of land. And hence surrounding infrastructure also increased like road networking, amenities etc. A concept of a special township was developed by urban developers which include consultation with planners, architects, and developers were held and the Govt. of Maharashtra finally approved this concept in 2004 as special township scheme 2004. The main objective of this scheme is to promote private investment in housing sector to facilitate affordable housing and create a hassle free atmosphere for owner.

3.1 Objective of Smart Township

Convenience is the main objective in the form of economic, social and living amenities to be given to the people within Smart Township. To provide all infrastructure and residential amenities to the people which they required for living purpose.

3.2 UDPFI Planning Guidelines

These are the guidelines are reference guidelines generally used in India for planning, it consists of following things:

A. Area Requirement

1) Site should having area access of minimum road width 18 m wide
2) Site should be continuous, unbroken and uninterrupted in any case having area minimum 100 acres or 40 hectors.
3) Site area shall not include any natural feature like river , forest , dams etc within a 500 M range
4) Site area should be min 200 M away from the historic places, national parks, eco sensitive zones, catchment areas etc.
5) Site should not include defense area, ports, notified Area of SEZ, quarry sites.

B. Infrastructure Facilities

The entire onsite infrastructure i.e. roads, approach road, street lights, water supply, drainage systems and amenities.

C. Water Supply

Storage capacity shall be 1.5 times of actual requirement. The daily water requirement of minimum 140 liters per capita per exclusive of requirement of water for fire fighting and gardening. The developer must develop the rain water harvesting, ground water recharge and waste water recycling project on site.

D. Drainage and Garbage Disposal

The developer shall make arrangement for disposal of sewage and solid waste as per requirement of M.P.C.B.

E. Power Supply

Developer may draw existing power source or may go for alternative arrangement of power supply but it should be continuous and good quality.

3.3 Norms For Land Use Plan

A. Residential

Should be cluster, neighborhood or plotted in proper grid pattern .60% area out of total built up area of special township is pure for residential sector. 10 % built for residential tenements having area up to 40 sq.m.

B. Commercial

It should be convenient for shopping and community center.

C. Education

Comprehensive education system from primary and secondary education should not provide at one place only and should provide according to planning standards. Area for playground must be provided.

D. Amenity Spaces

Area of amenities like market, recreational centres, and town halls should not be less than 5 of gross area and should be evenly placed.

E. Health facilities

Minimum primary health facilities should be provided in required place according to planning standards.

F. Parks , Gardens And Play Grounds

These areas should excluding statutory open spaces and should be distributed in all residential clusters. Minimum 20% area should provide as open space and allow general public also.

G. Public Utilities

1) Appropriate area should provide for public utilities.
2) Transport and communication
3) Main 18 to 24 m wide road. Internal road=9m
4) Service industries
5) Area provided within township be predominated land use would be residential use.

3.4 Sustainibility Indicators

Indicators provide evidence of conditions or problems. Indicators may be qualitative (a canary suffocating in a mine shaft offers good evidence that toxic gases are near) or quantitative. There are also limits to how useful indicators may be. Indicators offer a snapshot or a glimpse of a larger situation, but don't offer absolute understanding. In a neighborhood context, indicators help evaluate whether local actions are having the effects desired. A neighborhood can use indicators to help determine what conditions exist and whether the direction the neighborhood is headed is consistent with community goals. Indicators can allow a group to hold itself, its public officials, its funders and supporting institutions accountable to neighborhood goals. Finally, indicators can also be used as a reporting tool that can help build consensus for an action strategy.

The indicators here considered for general analysis of case study are:

A. Environmental indicators.
B. Social indicators.
C. Economical indicators

A. Environmental Indicators

Environmental indicators include the factors which are responsible to define the environmental conditions of that township. The environmental indicators includes,

1) Rain water harvesting
2) Waste management
3) Use of Passive technologies for energy generation.
4) Use of eco-friendly materials in building constructions.
5) Gardens and open spaces
6) Provision of local farm lands
7) Reduction in pollution/ No pollution of Air/water/soil/Noise etc.
8) Reduction in building footprints.

B. Social Indicators

Social indicators include the factors which are responsible to define the social l conditions of township. The social indicators include,

1) Social interaction space provisions in township
2) Provision of temple , worship areas
3) Provision of a community gathering area
4) Community hall , community centers
5) Provision of recreational areas like malls, multiplex, shopping centers in the same premises for peoples of different income groups.
6) Organization of Common activities like tree plantation, seminars, workshop in day to day life.
7) Senior citizen meeting places.
8) Exhibition areas for cultural development etc.
9) Safety measures for the residents inside the township like Safety from accidents, safety from fire, provision of hospitals within a short distance, schools etc.

C. Social Indicators

Social indicators include the factors which are responsible to define the economic conditions of township. The economic indicators includes,

1) Provision of hosing for different income group
2) Affordable housing for each income group.
3) Cost reducing construction technologies for LIG and MIG people.
4) Use of passive technologies in planning to reduce the overall energy consumption and ultimately the cost.
5) Local market places and local farming for generating the economy within a township itself etc.

4. Conclusions

1) The various aspects of the planning of a self sustainable town have been studied and some of the conclusions have stated.
2) The population our country is increasing tremendously, that to in urban areas and the load of human activities like increasing vehicles, increasing waste, increasing pollution etc. Therefore there is a need of reducing this load on cities; self sustainable townships may be one of the solutions.
3) There is a big problem of disposal of household waste, biomedical waste, industrial solid waste etc. in Pune as well as in many metropolitan cities in India. This problem may be solved on large scale by developing the self sustainable townships in such cities.
4) Energy is the integral part of the survival of the human being. Due to the ever increasing pollution, energy sources are getting depleted. Hence there is a demand for non-conventional energy sources which can be effectively implemented in the development of such artificial self sustainable townships.
5) Reuse of water is also effectively implemented by constructing water treatment plants. Public facilities like hospitals, schools and colleges, gardens, function halls, malls, sports complex etc. can be made available for the people living in township under one roof.

5. Further Research

This research is a part of a broader research goal that emphasizes on the indicators in the form of planning strategies, initiatives as well as best practices adopted by township developments in India and to propose for a useful generalized decision making framework for similar developments to follow in future.

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