

Sustainable Integrated Industrial Township

Gandhi Zarana Hitesh¹, Himanshu J. Padhya²

¹Post Graduate Student, ²Associate prof. & Head in CED
Civil Engineering Department,
Sarvajanik College of Engineering and Technology, Surat, India
Zaranagandhi07@gmail.com

Abstract — Now a days the rate of urbanization increases. Due to the increase rate of urbanization many problems are arises. To overcome the challenges of urbanization by proposing housing facility with employment opportunity. Integrated township through the concept of sustainability is the solution to overcome these challenges. Sustainability is the approach to develop city by taking consideration of environmental aspects. The basic working principle is to integrate the ecological, social and economic aspects of sustainability in all sectors and enables its residents to live a good quality of life. Therefore, in search of better living environment and housing at affordable prices there is a large demand for development of self-contained integrated township projects in the fringe area around the large cities.

Index Terms— Integrated industrial Township, Sustainability and Sustainable Development, Case study

I. INTRODUCTION

Now a days all cities of world facing the problem of urbanization. Developing countries like India is also facing this problem of urbanization. Large cities are getting over-crowded under the urbanization. An estimated 160 million people have moved to India's cities in the last two decades, and another 230 million are projected to move there within the next 20 years. The exponential rise in the number of city dwellers is leading to an ever-increasing demand for housing and urban infrastructure. At the same time, the massive arrival of people has strained India's urban system to the point of breaking down, creating massive slums with inadequate housing, sanitation, basic services and security.

To ease the pressure on big cities and improve the quality of urban living, town planners and policy makers are encouraging the setting up of integrated township as an effective development tool for building infrastructure in the newly marked spaces beyond traditional city boundaries. Setting up of self-contained integrated township in decentralized manner offers a sensible solution of providing a more holistic living environment and preventing the production of unplanned urban villages. In fact, integrated townships bring a number of value propositions such as affordability, convenience and relaxing lifestyle in one very attractive package to modern urban planning and development.

If the integrated township is planed with the concept of sustainability, then people get better lifestyle with economic opportunities and healthier environment. Sustainable integrate township is the great opportunity for the people to live in healthy environment, to work in healthy environment with all infrastructure and good quality of life.

II. CONCEPT OF INTEGRATED INDUSTRIAL TOWNSHIP

The integrated township are clusters of housing and commercial business with associated infrastructure such as roads, schools, hospitals, convenience shopping, water treatment plants, and drainage and sewage facilities. With urban areas getting more crowded and increasingly short on future development potential, integrated township have been correctly identified as a potential solution.

Integrated township are rather complex with lower FAR (Floor Area Ratio), more open areas, and an emphasis on creating a sustainable living ecosystem with residential and commercial spaces supported by an infrastructure backbone of power, roads, water, drainage and sewage – a virtual living and breathing city.

With the challenges of overburdened population, land prices, Transport & traffic congestion, unplanned development, lack of basic services, the metropolitan cities are failed to provide the infrastructure needs in the large cities due to lack of funds on one hand and the urban market failure to supply Affordable Housing on the other hand. Therefore, in search of better living environment and housing at affordable prices there is a large demand for development of self-contained integrated township projects in the fringe area around the large cities.

III. OBJECTIVE OF INTEGRATED INDUSTRIAL TOWNSHIP

The integrated township is the best solution urbanization. Convenience is the main objective in terms of economic, social aspects. Integrated Industrial Township is the combination of living and employment opportunity at one place. Residential, infrastructure and basic amenities with employment opportunities are provided at one place.

IV. CONCEPT OF SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT

The first definition of sustainable development is given by Brundtland Commission appeared in 1987 which states “development that meets the needs of the present without compromising the ability of future generation to meet their own needs.” The Commission’s report also states that “in essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional changes are all in harmony and enhance both current and future potential to meet human needs and aspirations. Applied to the context of planning and development, the most fundamental elements of sustainability are the utilization of natural resources in a city region most effectively, most equitably across sections of society and in such a manner that the resources are conserved and renewed for future generation to meet their needs and aspirations.

V. PARAMETERS OF SUSTAINABLE DEVELOPMENT

Sustainable habitat development means achieving a balance between the economic and social development of human habitat together with the protection of environment, equity in employment, shelter, basic services, social infrastructure and transportation. To bring sustainability in urban areas, it is important to integrate sustainability in urban development and can be achieved by considering sustainability parameters in urban planning. Some of these parameters which can be considered in planning and development are:

1. Regional planning:

Master plans/development plans /comprehensive development plans for town and cities are prepared under relevant provisions of enabling legislation for a horizon year and delineate the proposed urbanisable limits in both spatial and demographic terms. Outside these limits i.e. in the peri-urban areas there is lack of control in terms of assignment of land uses and development control leading to growing unplanned and un-organized growth along with little or no integration between land use and transport resulting in unsustainable development. A regional planning framework effectively addresses these issues in terms of a proposed hierarchy of settlement and assignment of regional resources/land uses and development control. It is therefore imperative to incorporate provisions for preparing a regional plan so that all master plans are formulated within a regional planning framework leading to sustainable development of both the region and the town/city concerned.

2. High Density Development:

The National Sustainable Habitat Mission (NSHM) recommends Low Rise and Higher Density Development to improve overall energy efficiency of the area; such forms are less expensive and reduce pressure on travel demand. Therefore for planning for high density development it is necessary to carryout capacity analysis. For increase in FAR in existing built up area, rationality for the increase in FAR should be worked out apart from carrying capacity analysis for the area.

3. Re – development / re – densification:

Approaches shall be developed for Re – development / re – densification of existing urban habitat. Mixed land use, integrated and shared social space and multiple transport option can be considered and implemented, further reducing trip generation and creating efficient transport system.

4. Open Spaces:

Emphasis should be given on vegetation/green belt in urban areas to reduce “heat island” effects.

VI. CASE STUDY – GREATOR NOIDA

DMIC are proposed to be self-sustained industrial townships with world-class infrastructure, road and rail connectivity for freight movement to and from ports and logistics hubs, served by domestic/ international air connectivity, reliable power and other quality social infrastructure, and provide a globally competitive environment conducive for setting up businesses. Of the various Investment Regions (IRs) identified under DMIC project one of the key investment regions is that of the Dadri-Noida-Ghaziabad Investment Region (DNGIR) in Uttar Pradesh (UP) sub-region of DMIC owing to its proximity to the National Capital of Delhi. This investment region has been conceived as a model industrial corridor of international standards, with emphasis on expanding the manufacturing and services base and of developing as a ‘Global Manufacturing and Trading Hub’.

The site for the proposed Integrated Industrial Township is part of the delineated site for Delhi-Noida-Ghaziabad Investment Region (DNGIR), planned within the notified Greater Noida Master Plan-2021 area. It has a total site area of 302.5 Ha (747.5 acres). The proposed township is planned adjacent to the already developed sectors of Greater Noida and hence enjoys the availability of existing and proposed transportation networks and physical infrastructure.

Based upon historical and existing trends, inherent advantages of India and UP, existing status of the industry in the State, government policies, view of industry experts and potential investors, the Integrated Industrial Township is proposed with new age industry sectors such as Bio-technology, Hi-tech electronics industry, and Research and Development (R&D).

The project is proposed to act as a catalyst for fuelling the growth of industrial development of the region by attracting skilled human resource at the industrial township and generating direct industrial employment for about 58,000 workers. With a total investment of around Rs. 33,031.4 crores.

Objectives:

- Catalyst for fuelling the growth of industrial development of the Investment Region by attracting skilled human resource at the Integrated Industrial Township;

- b) Strengthening the status of Greater Noida and Noida as a manufacturing destination;
- c) Encouraging creation and growth of new businesses by fostering collaboration and innovation, along with enhancing the development, transfer, and commercialization of technology;
- d) Fostering collaboration between industries and existing/proposed educational institutes; and
- e) Promoting new industries with value addition to existing industries.

Key Design Principles:

- The Integrated Industrial Township is to be developed adopting the Sustainable City Model to facilitate the creation of a sustainable township with quality infrastructure and living environment promoting a live-work-learn-play environment within the proposed development.
- Following are the key planning and infrastructure strategies that constitute the sustainable city model, along with other sustainable practices:
 - a) Integrated sustainable site infrastructure.
 - o Energy generation and management.
 - o Water collection management.
 - o Waste management.
 - b) Urban culture and public space – sustainable, livable solutions to improve quality of life.
 - c) Sustainable planning, engineering, architecture, landscape solutions.
 - d) Sustainable building materials.
 - e) Transport planning & mobility management.
- The concept master plan focuses to create a new model planned Integrated Industrial Township with all supporting amenities (including residential, education, research, commercial, recreation, offices & administration uses) which would form part of the mixed “community” proposed within the Integrated Industrial Township. The land use plan provides an opportunity to cater to varied needs and demands of individual units/ businesses/ housing requirements. Utilities have been integrated into the plan in order to provide for reliable and continuous infrastructure for the industrial units and residing population.

The land use for the development program summarizes the major distribution of activities within the available site area of 302.5 ha. Approximately 51 percent of the total land is allocated for revenue generating industrial use. Of the remaining, a maximum of 32 percent has been used for transportation, utilities and green/ open spaces.

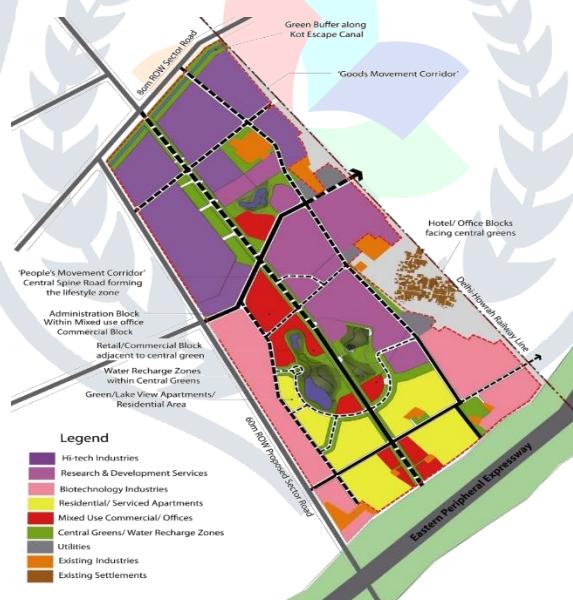


Fig. 1 Land use plan

(Source: Integrated Industrial Township at Greater Noida by Delhi Mumbai Industrial Corridor Development Corporation Limited)

Table - Development program summary

Land use	Area (Sq. m.)	Area (ha)	%	F S I
Industry	1,537,217	153.7	50.8%	
Hi-tech Industries	638,113	63.8	21.1%	2.25
Bio-tech Industries	414,718	41.5	13.7%	2.25
R &D	484,386	48.4	16.0%	2.25
Commercial Mixed Use	190,441	19.0	6.3%	4
Residential	336,170	33.6	11.1%	5

Utilities	46,434	4.6	1.5%	0.85
Greens & Water Bodies	403,567	40.4	13.4%	-
Roads	471,168	47.1	15.6%	-
Existing Structures	39,924	4.0	1.3%	-
Total Area (Sq. m.)	3,024,921	302.5	100%	

(Source: Integrated Industrial Township at Greater Noida by Delhi Mumbai Industrial Corridor Development Corporation Limited)

CONCLUSION

From above theory it is conclude that, the integrated industrial township is the best solution for the problem of urbanization. If the integrated industrial township is provide with sustainability concept then it is best option for healthy living condition with healthy environment. Sustainable Integrated Industrial Township is the township with residential, employment opportunity with healthy leaving condition and healthy environment.

VII. ACKNOWLEDGEMENT

I would like to express my deep gratitude to Himanshu J. Padhy, Associate Professor & Head in Civil Engineering Department, Sarvajanik College of Engineering and Technology

I am also very thankful to Naresh B. Rokad, lecturer in Civil Engineering Department, Sarvajanik College of Engineering and Technology.

REFERENCE

- [1] Dipali J. Chavan and Ravindra H. Sarnaik "Self-sustainable Township" International Journal of Innovation in Engineering and Technology, Vol. 2, Issue 1, February 2013.
- [2] AGENDA 21 United Nations Conference on Environment & Development Rio De Janerio, Brazil, 3 to 14 June 1992.
- [3] Green Township guideline— 2010, Indian Green Building Council.
- [4] Gujarat Integrated Township Policy, 2007, Urban Development and Urban Housing Department, Government of Gujarat.