SUSTAINABLY PLANNED SMART CITY

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Abstract- Urban performance currently depends not only on the city's donation towards hard infrastructure but also, increasingly so, on the environmental impacts, availability and quality of knowledge, communication, social Infrastructure. Sustainability is not limited to energy conservation only, but also it has been expanded to resource usage, the surrounding environment and working conditions for society. We find that the presence of a creative class, the quality of and dedicated attention to the urban environment, the level of education, multimodal accessibility, and the use of ICTs for public administration are all positively correlated with urban wealth.

The present paper aims to shed light on the often elusive definition of the concept of the 'sustainably planned smart city' by showing a small imaginary planned city plan photograph. The competition held to make 100 smart cities this paper prompts the formulation of a new strategic agenda for smart cities in India, in order to achieve sustainable &smart urban development

Keywords : - *sustainable[1], smart city[2], planned city[3],pune smart city[4], green city[5]*

Introduction

Urban performance currently depends not only on the city's donation towards hard infrastructure but also, increasingly so, on the environmental impacts, availability and quality of knowledge, communication, social Infrastructure. Sustainability is not limited to energy conservation only, but also it has been expanded to resource usage, the surrounding environment and working conditions for society. We find that the presence of a creative class, the quality of and dedicated attention to the urban environment, the level of education, multimodal accessibility, and the use of ICTs for public administration are all positively correlated with urban wealth.

The conceptualisation of Smart City varies from city to city and country to country, depending on the level of development, willingness to change and reform,

resources and aspirations of the city residents. Planning is the Basic need to build a smart & sustainable city. Building Bye-Laws are tools used to regulate and forefend excessive growth of city by controlling coverage, height, and building bulk and construction aspects of buildings so as to achieve orderly development of an area. A green city combines design, construction and operational practices to significantly reduce or eliminate the negative impact of development

on both people and the environment. The green factor an architect or town planner attempts to safeguard the Air, Water and Land By choosing eco-friendly building materials and construction factor. To make city sustainable we have to make its components sustainable. The components of Town are – residential buildings, commercial buildings, industrial buildings, institutional buildings, recreational buildings, etc.

❖ What is sustainably planned smart city?

A city which is designed to minimize negative environmental impacts & improving the lifestyle of the citizens by reducing non-renewable resource inputs and harmful waste and pollution outputs & integrate multiple information and communication technologies to critical infrastructure as well as its components.

1. Sustainable & smart planning

Each and every part of city should be designed such that public transport can be applied everywhere and there will be no any need of private vehicle. Spatial Planning is one of the important pre-requisites for smart city & it can be achieved using GIS and Remote Sensing applications. The purpose of using GIS is that maps provide an added dimension to data analysis which brings us one step closer to visualizing the complex patterns and relationships that characterize real-world planning and policy problems. Topography, geology, landscape of the land etc. should be studied before selecting the location for city. Agricultural land, forest land, water catchment areas, etc. are avoided. Natural beauties are kept intact while developing the city

2. Sustainable & smart transport

Public transport is one and only one solution to reduce the pollution & traffic problems Public transport takes the city towards sustainability. People

will automatically attract towards public transport system instead of private vehicles if we develop and design the system so that it will provide comfort, entertainment & safety to the passengers. BRT project implemented in Pune and Pimpri-Chinchwad are effective.

To overcome the problem of over speeding we can install programed electronic chips in the required zone as well as in the vehicles so that when a vehicle enters into such zone the chip in the vehicle will activate and it will automatically restrict the speed of vehicle accordingly. It will also reduce the ratio of accidents.

Various traffic models based on GIS allows estimating and visualizing traffic flow patterns and analyzing the congestion points. GPS located buses will help in prediction of timing of next bus.

The CCTV surveillance system for security as well as traffic control which can capture the photographs of vehicles which don't follow the signals and speed limits.

3. Sustainable & smart infrastructure

Materials used for the construction makes the infrastructure sustainable and smart. Sustainable building materials are materials that are ecologically responsible because their impact on environment is not as damaging as traditional building materials. Sustainable construction method can be incorporated into buildings at any stage, from design and construction to renovation and deconstruction. An architect has an ability to change entire building process with the stroke of a pen by specifying a material with low carbon dioxide emission in its fabrication.

4. Sustainable & smart energy

Energy efficiency is the concept in which the energy losses are minimized and same outputs are managed by saving the energy. Energy efficient smart equipment is needed to be used to use the energy efficiently. For example if we used sensor based lighting system then it will save the light when no one is in the room. Sustainability In the use of energy can be achieved by using the renewable energy resources. Energy management includes proper use of the generated energy or provided energy. Smart meters are useful to efficiently use the energy

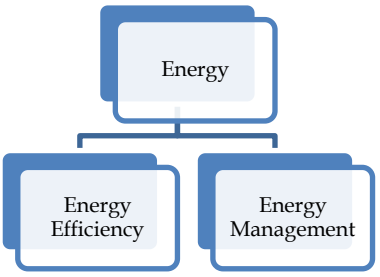

Fig.1: energy management and efficiency

5. Sustainable & smart water supply & waste water management

Leakage is the main problem of water supply scheme. To make the water supply 24 x 7 leakage removal is essential various smart tools or equipment are used to eliminate or detect leakages various smart materials are also available for the supply system. Various systems like SCADA helps in keeping records as well as proper management. The standard water supply per head is taken as 135 lit. instead of that if we are able to reduce the per capita demand then there will be saving of million litres of water.

6. Sustainable solid waste disposal

Solid waste generated in the city is also a great problem our old method is to dump it, but a huge area is needed to do such activity. Also the dumping causes land pollution, ground water pollution and it will be difficult to live nearby such area. The non-decomposable part (plastic) in solid waste is either burnt or recycled which causes huge air pollution.

We can use waste plastic, tyres, demolition waste, fly ash, etc. in construction of road. Avoiding use of plastic can also reduce the generation of waste.

Case study of PUNE : -

Area : -	479 KM2
Population : -	3,124,458
Density : -	6500/ KM2

1. Sustainable and smart transport : -

- Under smart city mission 45 KM of road is redesigned
- PMC has hired professional consultants to create the Pune bicycle plan which will include dedicated bicycle tracks, bicycle parking, signal priority for bicycles, whatever it takes to make cycling safe and attractive
- Parking is not a right but commodity. It streamlines parking supply and rates. It will get Pune closer to its goals of supporting 40% trips by public transportation and reducing use of personal vehicles, and transform at least 10% on street

parking to public spaces by year 2031 by creating a modern and effective parking management system.

- PMC has hired professional business consultants to develop a 10 years business plan to improve its operational institutional and financial structure.
- Extending the network of BRT on Solapur road, Baner road, and Nagar road
- 31 KM of metro railway tracks are proposed as Vanaz - Ramwadi & Swarget - Pimpri will be started in 2021.
- HCMRT (High Capacity Mass Transit Route) routes of 37 KM are proposed for pune.

2. Sustainable and smart energy : -
    - Upgrading of 70000 conventional street lamps with LED lamps
    - Provision of feeder pillar based SCADA system to ensure information of energy saving any failure or non-functioning street light and approach remote monitoring
    - Improvement In security by reducing the blind areas and reducing the robbery
3. Sustainable and smart water supply management
    - Smart intervention for WTP, SR's transmission & distribution system
    - 100% consumer metering
    - Accountability of water balance
    - Pressurized 24 x 7 water supply
    - High reduction in NRW/UFW
    - High service level benchmark
4. Sustainable solid waste management : -
    - To provide most cost effective solid waste collection & disposal services while providing maximum practical protection to environment for zero waste city.
    - Most advanced vehicle tracking system
    - Using of plastic waste management rules 2016

Conclusion : -

Pune city is developing at very fast rate.. Depending upon the type of city, different smart city rating systems are used to improve the lifestyle of city consistently. Some factors are being considered in rating system to improve the quality of the lifestyle. Current paper is considering general parameters which will help pune city to improve comparative stronger and smarter to its competitors

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