



Sustainable Urban Development in Jaipur Smart City, Rajasthan

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Abstract

The 17 Sustainable Development Goals (SDGs) of the 2030 Sustainable development Agenda, were unanimously accepted by world leaders in September 2015. Goal 11 sustainable cities are focused on overall urban development and reducing inequalities in the urban cities. Smart cities, on the other hand, are generally understood to make extensive use of information and communication technology (ICT) to help cities build their comparative advantages (Yigitcanlar and Baum 2008; Caragliu et al. 2011), or to be a conceptual model in which urban development is achieved through the use of human, collective, and technological capital (Yigitcanlar and Baum 2008; Caragliu et al. 2011; Angelidou 2014). As a result, the phrase "smart city" refers to a collection of sub-themes such as smart urbanism, smart economics, sustainable and smart environment, smart technology, smart energy, smart transportation, smart health, and so on (Gudes et al. 2010; Cocchia 2014; Lara et al. 2016). As per Deakin and Al Waer (2012) and Townsend (2013), Smart cities emerge as a result of the intelligent use of digital information, for example in the fields such as Human health, transportation, energy usage, education, knowledge transfer, and city government are just a few examples. Jaipur is a smart city under the Smart City Mission of India. Smart cities are a relatively recent notion that may be considered as a successor to information cities, digital cities, and sustainable cities (Yigitcanlar 2006). This paper aims to analyze the parameters of sustainable development in the smart city Jaipur.

Keywords: Sustainable Development Goals, Sustainability, Urbanisation, Smart City.

Introduction

Rajasthan is located in northwest India, and Jaipur is its capital. It lies about midway between Alwar (northeast) and Ajmer (southeast) in the state's east-central area (southwest). It is the most populated city in Rajasthan. The city was constructed in 1727 by Maharaja Sawai Jai Singh to replace neighboring Amber (now Amer, a component of Jaipur) as the capital of the princely state of Jaipur. It is a walled town surrounded (save to the south) by hills (founded by the Rajputs in the 12th century CE). In the late twentieth and early twenty-first centuries, Jaipur exploded in

population, more than tripling from 1991 to 2011. It has a mixed Hindu-Muslim population. The city was the site of numerous bombing attacks in the early 21st century, with mosques and Hindu temples being targets.

To the east and south, the city is bordered by lush alluvial plains, while to the north and west, hill ranges and desert lands. The main crops farmed in the region are bajra (pearl millet), barley, gramme (chickpeas), pulses, and cotton. The reserves of iron ore, beryllium, mica, feldspar, marble, copper, and garnet are all mined. Other close attractions include Sariska National Park, which is located to the northeast of Amer.

Population: 2,322,575 in 2001; 3,046,163 in 2011.

The city is noted for its beauty, and its straight-line layout is unusual. It is known as the "pink city" because of its mostly rose-colored structures. The City Palace, which houses part of the royal family of Jaipur; Jantar Mantar, an 18th-century open-air observatory that was named a UNESCO World Heritage site in 2010; Hawa Mahal (Hall of Winds); Ram Bagh palace; and Nahargarh, the Tiger Fort are among the most notable structures. Other public buildings include a museum and a library. The University of Rajasthan, which was founded in 1947, is based in Jaipur.

Objective

To analyze the Sustainable Urban Development and progress of the smart city mission in Jaipur Smart City.

Study Area

Jaipur city is popularly known as "Pink City" and is one of the best architecturally designed cities of India. The Jaipur city is surrounded by the Aravali hills from three sides which safeguard it from the desert and is located at a height of 1417 feet above sea level. It is surrounded by Tonk district, in the east by Alwar, Dausa and Sawai Madhopur districts in the south, and in the west by Nagaur and Ajmer districts. Jaipur border is shared with Sikar and Mahendragarh districts in the north.

Jaipur district is spread over 180 km in east to west, while the length from north to south is about 110 km. Rivers are the main sources of water for the district like the Banganga and Sabi river. Ramgarh Dam on the Banganga River is the main source of drinking water. Approximately 28.65 million cubic msssss of groundwater

resources are available in the capital city of the state.

Research Methodology

The study was done on the basis using both qualitative and quantitative methods. Both primary and secondary data were used for the survey. To conduct the primary survey questionnaire was prepared on the basis of a pilot survey. Firstly, the general idea was taken from residents of the city like what kind of changes has been observed by them before and after the smart city project in the city. Changes were observed by respondents in the context of urban growth, transportation, urban facilities, and solid waste management. After the pilot survey, questionnaire was prepared to ask the questions from residents of the cities and interviews was also taken by the concerned persons in Smart City Project. Therefore, a primary survey was conducted on 200 respondents and the detailed interview was taken of commissioner of Smart City Project and other related members of the Project.

Results and Discussions

A primary survey of 200 samples was conducted in Jaipur Smart City. On the basis of a primary survey in the city following observations were found. Of the total respondents, about 61 percent were male while about 48 were female. The education qualification of females was between 5th class to graduation, and for males' qualification was between 10th class to Post Graduation. Out of them, about 45 percent of people were engaged in secondary activities like government jobs, semi-government jobs, private jobs, and self-business while few were engaged in primary

activities. If we see their income about 12 percent said they earn in the range of 1 to 2 lakhs per annum mostly are businessman, while 64 percent said their income is in the range of 50 thousand to 80 thousand per annum and rest said below 50 thousand annually.

On the basis of the questionnaire, questions were asked from the people living in the city and found in the main city area for shopping purposes and other business. Their answers were recorded and converted into a graphical representation by pie charts and bar charts to understand the observations of respondents clearly.

In Jaipur smart city most of the respondents said they are living in the city for the past few decades they have seen how the city is growing fast and how things are changing in their surroundings. Most of the people are living for generations and others migrated to Jaipur city two or three decades before. In Jaipur city, the Authorities of the Smart City Project, JDA Authorities, and JMC Authorities were personally interviewed and their responses to the smart city project and progress were recorded. Apart from the questionnaire was filled up by visitors, shopkeepers, tourists, daily workers, and government employees. A few groups discussion was also

done with shopkeepers and fruit and vegetable vendors.

In Jaipur city, Smart City Mission has been spent to build smart roads (cement-concrete roads with demarcations for motorized, parking, and non-motorized areas), constructing underground ducts for hanging wires, setting up open-air gyms in parks, and renovating bus stops, among others. Several projects are carried out under special project vehicles (SPVs), such as Jaipur Smart City Limited, Funds are also spent on convergent projects carried out in collaboration with civic bodies; 50% of the investment has been provided by the union ministry of housing and urban development, 30% by the state government and the rest by local bodies. Nearly ₹1000 crore has been spent in Jaipur for the completed and ongoing projects and convergent ones. The projects worth Rs 200 crore have been completed and worth Rs 900 crore are in the pipeline under the mission.

The study reveals the ground truth of smart cities on the basis of respondents' observations. On the basis of a questionnaire, questions were asked and answers were formed in graphical representation by bar charts and pie charts to understand the observations of respondents clearly.

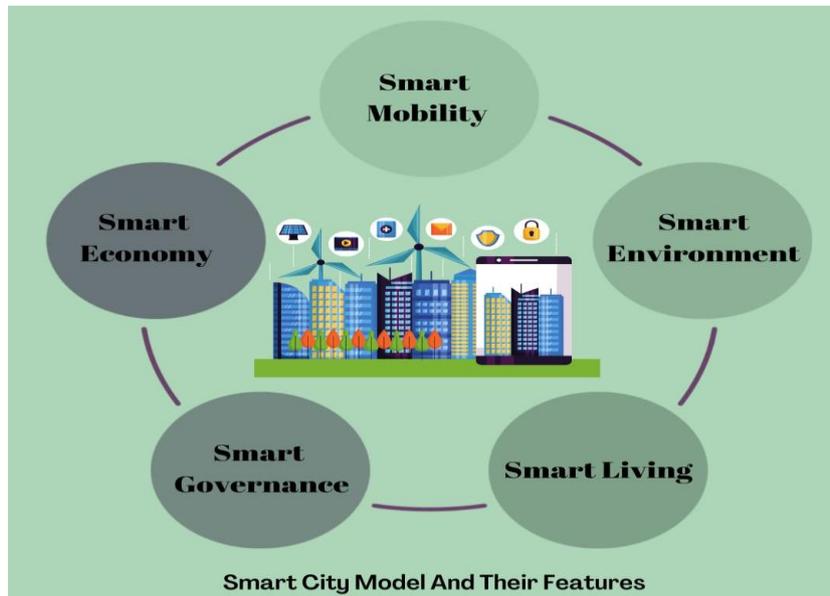


Figure 1: Features of Smart City Mission in Jaipur City, Source: Author, Primary Survey, 2022

In figure 1 respondents were asked whether they are aware of the ‘concept of smart city’ whether Jaipur is a smart city, and what are the features included in the smart city that make a city smart. On the basis of the survey, most people were aware of smart city features like good infrastructure (64%), better transportation facilities,(79%), smart health(61%), better civic utilities(81%), smart energy(65%) and overall growth and better

development of the city (77%). Only a few were who had no idea and no awareness about the smart city or sustainable development of the city. Though the exact meaning of the smart city was not known to people, the meaning was similar as they wanted more development and progress in the city, better civic facilities like power supply, water supply, better roads, and solid waste management.



Figure 2: Respondent’s requirement for Smart City Features in the Jaipur Smart City,

Source: Author, Primary Survey, 2022

In figure 2, respondents' requirement for the features in the city was observed, in this study, we found that most of the people were needed the transportation facility (72%), water supply (79%), power supply (69%), and sewerage system (64%). Daily working people were tired of dig holes, and construction on roads, they

were having problems in daily commuting to work and home. Few people were not happy with the water supply as it was not a full-time supply, allowing only an hourly basis in the city. A similar case was with the power supply and sewerage system. They all need smart solutions for the above problems.

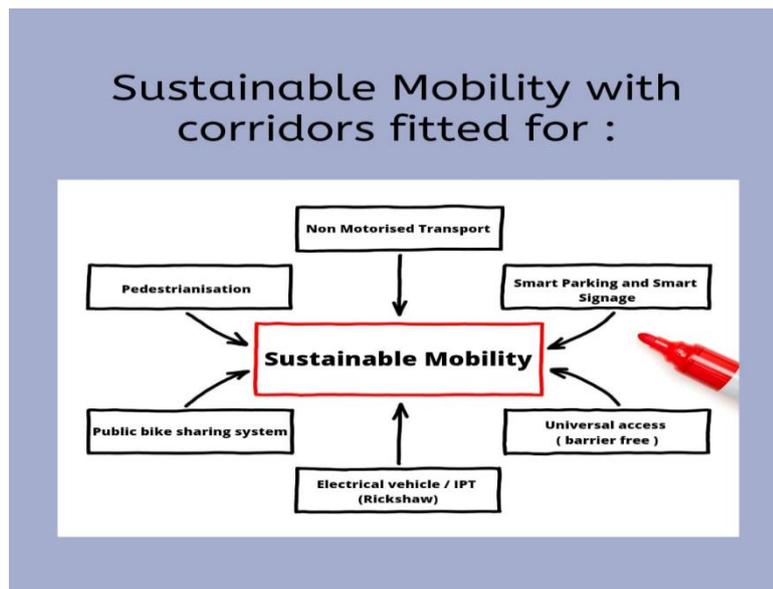


Figure 3 Respondents' Requirement for Sustainable Mobility, Source: Author, Primary Survey, 2022

Figure 3, explains the requirement of respondents in transportation, In the response to the above questions, 79 percent of respondents answered yes, in the case of the roads, 59 percent said yes to railway services, 76 percent said that the metro is a good mode of transportation but the very short distance it covers, 81 percent

said buses services are good while 74 percent were satisfied with E-Rickshaw and E-vehicle services. They found the need for smart parking, smart roads, smart pedestrians, and smart bicycle. These services are provided in Jaipur city, some works are completed and some are still in pipeline.

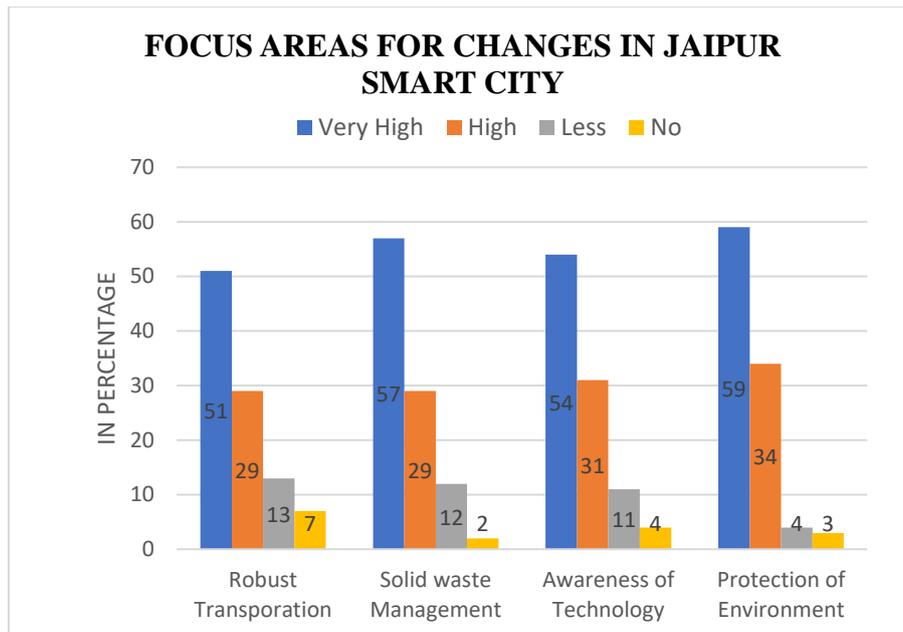


Figure 4: Focus Areas for Changes in Jaipur Smart City, Source: Author, Primary Survey, 2022

In the above figure, 4 explains that 93percent of respondents said there is a major need for environmental protection. Similarly, 85 percent said awareness of technology among people needs to be increased. Similarly, 86 percent said yes, to solid waste management, most people are tired of dirty solid waste and want a permanent solution for the disposal of waste. While 80 percent said they want better transportation facilities, widen roads, multiple lanes, better working signals on red lights, and CCTV cameras on the dark side of roads and corners, more protection for women. If we see mostly residents are very required more CCTV Cameras, E-buses, Underground Cabling, while some are satisfied with smart parking, speedometer, metro, smart signals, Kiosk but they are limited in wall city only not in the whole city. Therefore, people are not fully satisfied.

Discussion

More smart solutions were needed for encroachment and parking problems, respondents said. Therefore, encroachment is another biggest problem in the city,

which continues even after setting up smart roads in the city. As shop keeper's businesses were hit during construction, residents needed more smart solutions for managing the traffic. The projects like multi-level car parking, retrofitting and façade development in major markets are still in the work in progress while some are in the pipeline. Officials are claiming that the work in process will yield better traffic management in the city once work is completed. In the walled city of Jaipur, the night bazaar and kiosks will be set up where tourists can purchase, therefore, night bazaar is opening soon.

More focus is on to develop the tourist spots and attract more tourists in the city. The most popular and visited areas of the city are the Amber (pronounced as Amer) Fort, the city palace, Hawa Mahal, Jantar Mantar, the Albert Hall Museum and Govind Devji Temple; while Jaleb Chowk, Ram Niwas garden, Chogan Stadium and the Talkatora lake have huge potential to be developed as high tourists.

Conclusion

Even after getting the ‘smart city’ tag, Jaipur continues to have a faulty sewage network, inefficient traffic system, inadequate garbage treatment, and encroached road as per the resident’s observations, but the work related to them under projects are still going on and some are in the pipeline. Some work has been completed, though full results would be seen only after the completion of all projects in the city. Crores have been spent on Smart City Mission in Jaipur, but no major investment has been made in improving the city’s drainage system and claims that the drainage is the responsibility of the municipal corporations. But we cannot deny that the smart features like widening of roads, E- buses, CCTV cameras, WiFi, intelligent lights, environment monitoring system, multi-level parking in SMS Hospital, smart meters, speedo sensors, fire sensors, sensor-based dustbins, information display system, charging points, bins with sensors, and safe movement of pedestrians, Kiosk Centres are new features of the smart city Jaipur. Smart city ventures are also called to address issues of political coordination among different levels of administration.

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