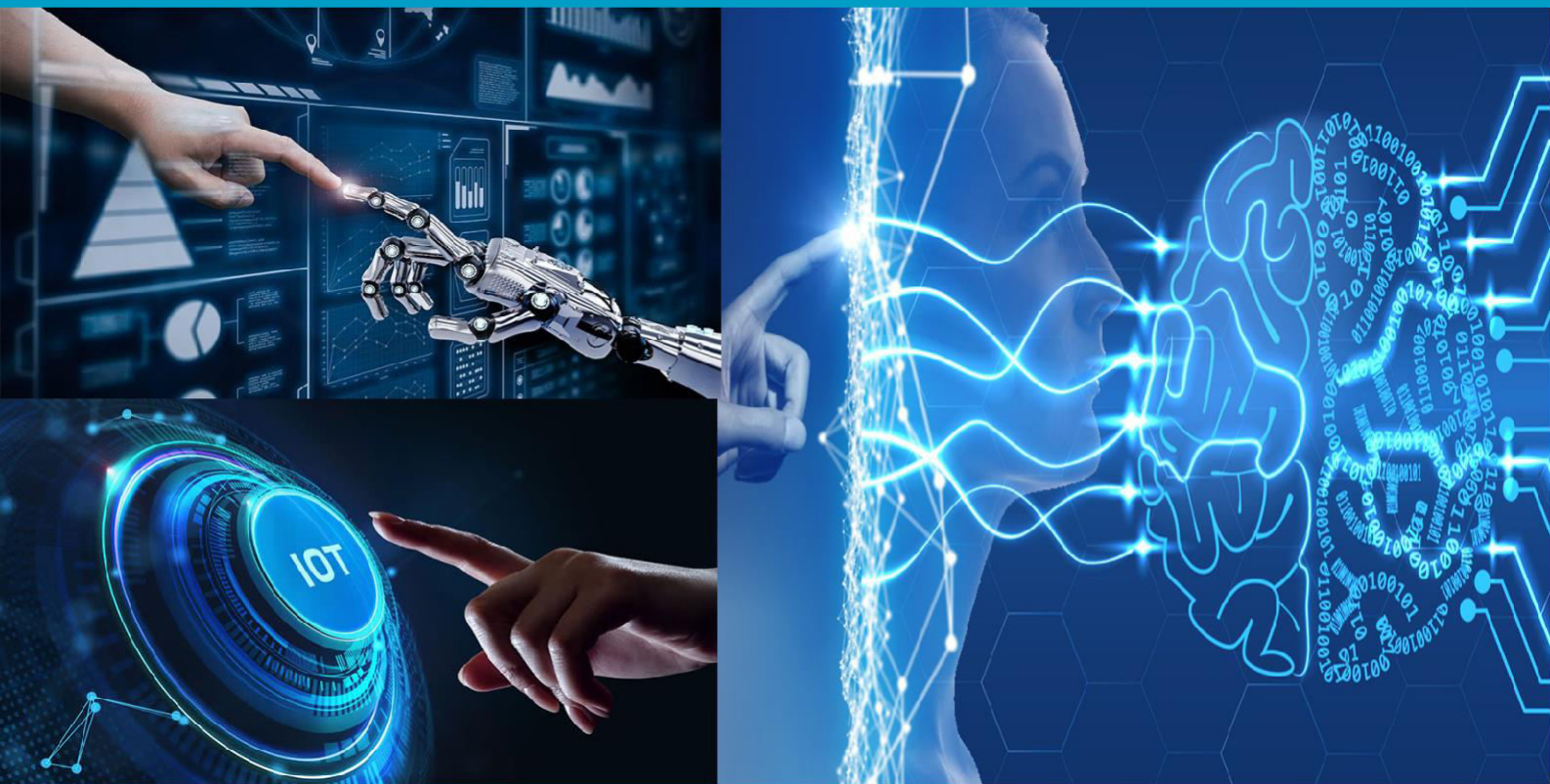




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Ecological Balance in Emerging Smart Cities of Rajasthan: A Special Case Study on Jaipur

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ABSTRACT: Ecological balance has been defined by various online dictionaries as "a state of dynamic equilibrium within a community of organisms in which genetic, species and ecosystem diversity remain relatively stable, subject to gradual changes through natural succession." and "A stable balance in the numbers of each species. Four cities of Rajasthan namely Jaipur, Udaipur, Kota & Ajmer have been selected under Smart Cities Mission.

— Total investment plan approved by MoHUA: Rs 7025 Cr

Jaipur - Rs 2401 Cr Ajmer - Rs 1947 Cr

Udaipur - Rs 1221 Cr Kota - Rs 1456 Cr

— Contribution of Smart City is Rs 4000 Cr and Convergence is Rs 3025 Cr.

With increasing population and limited resources and more demanding people, The smart cities are emerge as the solution of current scenario of civilization, where more and more people are turning to urbanization. Smart cities have various advantages over conventional cities. Jaipur is one of renowned city of India which has been developing as Smart city. Known for its architectural beauty and vibrant culture, the 18th century city of Jaipur is moving towards syncing its historic magnificence with modernity, as projects under the Centre's Smart City Mission gain momentum. The ancient walled city has been chosen for Area-Based Development under the Smart City Mission where a blend of heritage with modernity is taking shape through projects like improvement and beautification of facades, restoration of heritage buildings and 'smart roads'. Overall, its progress has been uneven, with many cities yet to achieve the desired levels of transformation. This report evaluates the first five years of the Mission, and draws lessons from its successes and failures. It discusses the physical and financial status of the projects taken up so far, and identifies the most crucial challenges—administrative, financial, and technology-related—that impede progress.

KEYWORDS: smart cities, Jaipur, Rajasthan, ecological, balance, mission, progress, ecosystem, beauty

I. INTRODUCTION

The Smart Cities Mission (SCM), launched on 25 June 2015, is a joint effort of the Ministry of Housing and Urban Affairs (MoHUA), and all state and union territory (UT) governments. It initially aimed to be completed by 2019-20, but has since been extended. One hundred cities and towns in different states and UTs [1,2] of India have been selected under the SCM—they are home to more than one-third of the country's population. The Mission aims "to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to smart outcomes," [1] and ensure that these cities are "liveable, inclusive, sustainable, (and) have thriving economies that offer multiple opportunities to people to pursue their diverse interests." [2] In other words, according to MoHUA, "smart cities are cities that work for the people." [3,4] The selection process began by identifying a large number of cities on the basis of the urban population of the state/UT, as well as the number of statutory towns in them. A two-stage competition was organised, first among cities in each state, and subsequently for the winners in each round, at the national level. Finally chosen were those which scored the highest on existing service levels, institutional capacities, self-financing, past track record and reforms, as well as on the quality of the smart city proposal they presented.

In the first round of the competition in January 2016, 20 cities were chosen; this was followed by another 13 in a fast-track round in May 2016. In September 2016, during the second round, 27 more cities were selected; in the



third, in June 2017, another 30; in the fourth in January 2018, another nine. Meghalaya's capital, Shillong,[5,6] was included as the 100th city in June 2018.

There is no universal definition of a Smart City. Each city has its own requirements based on which they can be defined as a Smart City. It is basically related to the infrastructure and use of technology to improve the living standard of the citizens.[7,8]

A city which incorporates the information and communication technologies (ICT) to reduce costs and resource consumption and at the same time engage more effectively and actively with its citizens with the use of high tech communication technology.

Some prominent features of a smart city are:

- The application of a huge variety of high end digital and electronic technologies to the city and its communities
- The application of ICT to uplift the living standard and working environments in the area
- Embedding the ICT within government systems and plans
- The regionalization of the practices that bring the ICT and the people together to promote innovation and advance the knowledge that they offer.[9,10]

A smart city is an urban region with modern technological infrastructure that benefits every section of the society – the residents, business personnel, and the government.

The smart cities are considered as the driving force behind the economic growth of the country because the huge population in such cities is the biggest market in world.[11,12]

II. DISCUSSION

Ecological balance in smart cities will be maintained :-

1. To promote use of mixed land in area-based developments – planning for infrastructure development in the areas of unused landmass with compatible activities that make land use more efficient.
2. To expand housing opportunities for all.
3. To create walkable localities by reducing congestion, air pollution and resource depletion, boosting local economy, promoting interactions, and ensuring security. The road network must be rebuilt or revamped for not just vehicles and public transport, but also for cyclists and pedestrians. Necessary administrative services need to be offered within the walking distance.[13,14]
4. To preserve and develop open spaces like parks, playgrounds, and recreational spaces to promote ecological balance, reduce the urban heat effects and enhance the quality of life of the citizens.
5. To enhance transportation services like public transport, last mile para-transport connectivity and transit-oriented development (TOD).
6. To make governance citizen-friendly and cost-effective – online services bring accountability and transparency and the same time it reduces cost of services as the citizens can avail the government services on their mobile devices without having to go to municipal offices. Creation of online groups to listen to the citizens' voice and feedback and monitoring the welfare programs and activities online will bring the government closer to the ground level.[15,16]
7. To give an identity to the city based upon the various economic activities like cuisine, health, education, arts and craft, culture, furniture, textile etc.
8. To apply smart solutions to infrastructure and services to develop the area in a better way. For example, using technology to make the areas less prone to disasters, decreasing resource consumption, providing less expensive services



Open data is crucial to create an ecosystem for innovation. Public sector can be reluctant to share the data with people, but if they do, it will cost them far less to deal with certain issues with the people's opinion and ideas.

You cannot resolve a concern completely without reaching the grass root level to identify the source and reason of the concern. Common people, if given opportunity can contribute a lot more to the society as a whole, as they are the most affected ones.[17,18]

Jaipur Smart City Limited (JSCL) has completed around nine major projects till now spending Rs 142 crore while 15 major projects are still underway for which around Rs 277 crore will be spent.

III. RESULTS

The first thing that you read once you visit the official site of Jaipur Smart City is – “The #SmartCity vision for Jaipur envisages a balance of heritage with modernism - we can be #smart while we keep our heritage protected.”

And, it is not just the hashtags in this statement that prove the city is adopting modernity, it is also the many plans to turn the city smart.

In a recent development, Ravi Jain, CEO of the Jaipur Smart City Ltd and commissioner of Jaipur Municipal Corporation in a PTI report said that projects worth Rs 200 crore have been completed and worth Rs 900 crore are in the pipeline under the mission.

Jaipur was selected for Area-Based Development under the Smart City Mission where the modernity will blend with heritage of the city through projects such as improvement and beautification of facades, restoration of heritage buildings and smart roads with integrated traffic management system, among others. These projects are divided under two – area-based development projects and PAN-city projects.[19,20]

PropGuide lists various projects taken up to turn Jaipur into a smart heritage city:
Area-based development

The walled city of Jaipur will have an area selected that will see some of the first smart projects being laid. Under this, a compact area of the city will be taken and will witness sustainable and inclusive development. This will then become a model ecosystem to be followed in pan-city projects.

The area selected, according to the Jaipur Smart City website comes under ward No 74, 84 and part portion of ward No 57. Spread in an area of 600 acres, this will include two chowkries, on either side of the axis between Badi Chauper and Choti Chauper. It will further be extended to Albert Museum, Ram Niwas Bagh, and entire east west axis, extending up to Zurawar Singh Gate. The selected areas have the most number of heritage buildings, tourist spots and shopping arcades. Three key projects will be taken up under area-based development – smart heritage and tourism precinct, smart mobility and smart and sustainable civic infrastructure.

*Smart heritage and tourism precinct: With over 11 projects under this, the focus will be to restore and redevelop tourism at the heritage centres of the city. The projects include redevelopment of Govind Dev Ji temple, Talkatora lake and Ram Niwas Bagh. Restoration of the Rajasthan School of Arts, established in 1857, will also be taken up and it will be turned into a city museum.[18,19]

There will be smart information displaying kiosks, smart heritage walks and eco-friendly corridors.

*Smart mobility: Seven projects will be developed to ease the ongoing menace of congestion across key areas of the city. Smart signaling, smart parking, smart roads equipped with CCTV and multi-modal two Metro stations will be developed. Public bicycle sharing will also be introduced.



*Smart and sustainable civic infrastructure: A gamut of projects will be taken up under this. This will include air-quality monitors, online water quality systems, upgrading to solar power and LED lighting across various key areas and structures, and a mobile app to let citizens report of street problems.[17,18]

As a part of the infrastructure, the detailed project report of the development of four underpasses – two between the Sanganeri Gate and the Jorawar Singh Gate for the passage of traffic, and two for parking areas under Johri bazaar – will be completed soon, Jain informed.

Pan-city development

These solutions will implemented all across the walled city of Jaipur. These projects, including multi modal mobility and smart solid waste management are expected to change the way Jaipur and its citizens are operating at present.[19]

*Smart multi modal mobility: Under this, the multiple modes of public transport will be integrated using technology. This will include unified ticketing and payment system across the city. With this even the non-motorised transport connectivity will be integrated. To ensure smooth functioning, transit operation centres will be set up to monitor the situations in real time.

*Smart solid waste management: With this project, the government aims to turn Jaipur into a zero-waste city. Some of the developments here would include segregation of waste at source, increased recyclability, operational discipline through monitoring, and enhancing the service standards. Smart solutions will be created to achieve this along with increasing capacity of sewerage treatment plants. The government also plans door-to-door collection of waste and registering of recyclers and rag-pickers.[15,16]

IV. CONCLUSIONS

A key factor in defining and understanding smart cities is related to the different types of cities. Each city has specific characteristics in terms of size, built environment, fiscal resources and many other features. Such differences affect the capacity of cities to manage smart technologies and attract smart city investment. Different physical characteristics may also affect the degree of applicability of specific digital technologies. Among the various approaches that have been used to classify smart cities into groups, the OECD has identified five main approaches based respectively on: i) the level of economic growth and status of a city; ii) urban growth lifecycle; iii) smart urban innovations dimensions; iv) goals; and v) spatial cluster analysis

Smart cities offer many opportunities for more efficient service delivery, digital inclusion, inclusive service delivery, and new forms of participation in the decision-making process. Data-driven innovation can promote the integration of urban systems into a more efficient, sustainable and resilient “system of systems”, for example by linking up real-time data on transport flows, energy, and water and waste systems. Smart meters and dynamic pricing on electricity have the potential to drastically change the energy consumption patterns of firms and households. Electrically powered cars, bicycles and scooters could considerably reduce air and noise pollution. Digital innovation can also enhance the circular economy, a concept that aims to improve economic and resource efficiency, through more accurate management of consumption and production processes. Early warning systems for floods and other types of natural disasters could improve preparedness, response and recovery. Digital technologies can promote a more agile and flexible model of city governance through e-government services and civic technology to facilitate access to information and voicing opinions through online platforms, citizen monitoring and public innovation labs.[19] Innovative participatory budgeting can enable citizens to have a say on how public funds are spent, in particular for programmes and infrastructure projects pursuing inclusive objectives. Digitalisation also provides cities with an opportunity to enhance their organisational and administrative capacity to overcome common challenges such as red tape, risk averse human resource management practices, a silo approach to policy development, hierarchical structures, and the lack of a talented and motivated workforce. In an era of intersecting, persistent policy challenges, coupled with a need to deliver more tailored public services in an increasingly constrained fiscal context, many local governments are rethinking how to best leverage capacity in terms of human, financial, institutional, physical and community resources to better serve residents Hence smart cities will be digitally as well as ecologically smart.[20]



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