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Smart Cities And Smart Villages: Holistic Approaches To Urban-Rural Transformation

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Abstract

A holistic approach to urban and rural transformation through smart cities and smart villages focuses on improving level of peoples, quality of life, economic growth, and harnessing technology for sustainable development. Generally smart cities aim to improve urban areas through efficient services and infrastructure, while smart villages address rural challenges by leveraging technology for community development and economic opportunities. Over recent decades, peoples (urban and rural) communities are facing numerous economic and social changes and challenges. Some of these challenges have been increasingly addressed through the lenses of technology and digitalization. Smart villages apply technology to address rural challenges, promoting sustainable development, community resilience, and economic opportunities. In this review, we have focus on existing implementations of the smart village concept and the importance of digital/urban facilities for rural area. Basically, education, health, information connectivity, sanitation, electrification, establishment of cottage and small-scale industry etc. are the dimensions of smart villages. The main goal of this paper is to discuss many smart villages' initiative and technologies to improve the rural area.

Keywords: Smart Cities, Urbanization, Migration, Infrastructure, Education, Health Development of Smart Villages

Introduction

India's urban population, which makes up over 35% of the country's total population, increased from 79.9 million in 1960 to 487.70 million in 2020. 600 million people, or 40% of India's population, are expected to live in urban areas by 2036, producing close to 70% of the country's GDP, according to a World Bank Group analysis from 2024. The way India handles this urbanization will be crucial to achieving its goal of being a developed nation by 2047, the 100th anniversary of independence. Developing nations frequently see fast

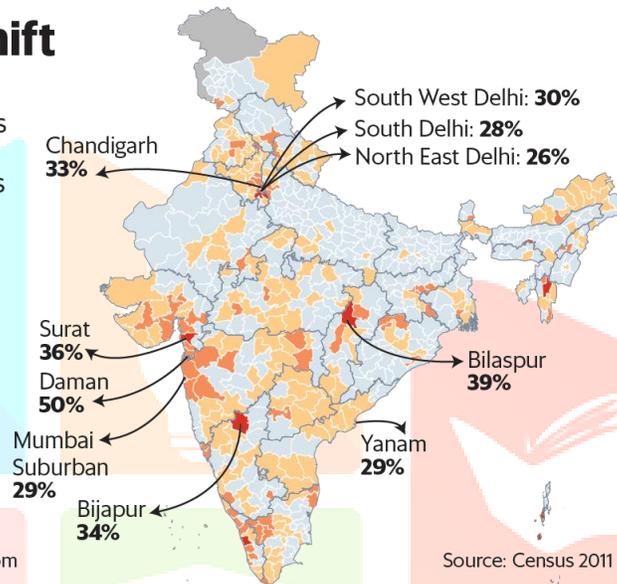
urbanization as a result of population expansion, economic possibilities in cities, and rural-urban movement. China, for example, has a large urban population, and forecasts suggest that this trend will continue.

Smart Cities

India's transition to a developed economy will be fuelled by its cities, which are growth engines. In order to foster large-scale planned urbanization and create an environment that supports faster growth and development, the government launched the Smart Cities Mission. India sets out on this quest to build a growth engine that will propel the nation's progress (Pai 2016). Good governance, sufficient energy availability and efficient energy use, smart buildings, necessary infrastructure services with a good road network and integrated public transport systems, strong technological connectivity, reasonably priced and high-quality healthcare, and a sustainable and healthy environment are the eight main characteristics that define smart cities (Suresh & Ramachandran 2016).

The urban shift

Daman and Bilaspur lead the top 10 districts in terms of share of rural-to-urban migrants in their population.



Compiled by howindialives.com

Source: Census 2011

Picture showing the urban shift across India (downloaded from <https://www.livemint.com/>)

India's urban population increased from 286 million in 2001 to 377 million in 2011, and this growth would continue at an exponential rate by 2030, according to the Census of India Report. The Indian economy's agricultural model is quickly becoming reliant on industrialisation, and a large number of rural residents are migrating to tier-II and tier-III cities as well as state capitals and other economic hubs (Suresh & Ramachandran 2016).

Some Essential Features of a Smart Cities

According to the Ministry of Urban Development's guidelines, the model needs to have the following elements. A sufficient water supply and a guaranteed electrical supply, with at least 10% of the city's energy coming from solar, are essential components of a smart city.

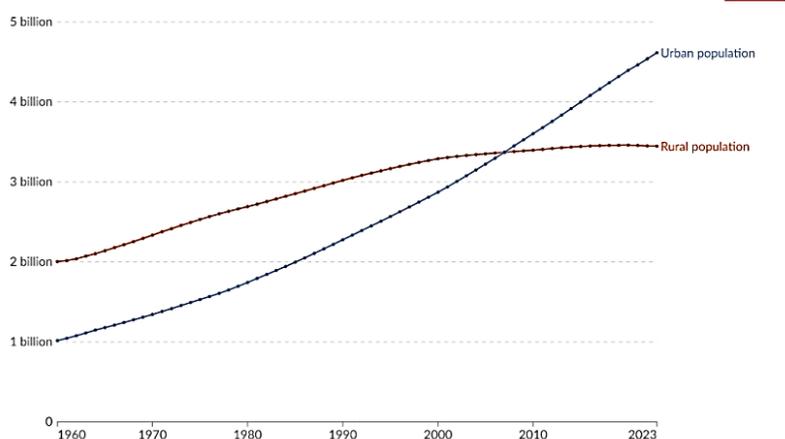
Recycling of waste water and storm water, sanitation (including solid waste management), rainwater harvesting, smart metering, strong IT connectivity and digitization, pedestrian-friendly pathways, promotion of non-motorized transportation (such as walking and bicycling), intelligent traffic management, non-vehicle streets and zones, smart parking, energy-efficient street lighting, creative use of open spaces, and noticeable improvements to the area (such as replacing overhead electric wiring Redevelopment and Greenfield models of smart cities require that at least 80% of the structures be green and energy-efficient, and that at least 15% of the housing offered in Greenfield developments be classified as affordable (Suresh & Ramachandran 2016) The below mentioned are the requirements for being smart:

- Population Stability
- Environmental Conditions
- Green space
- Stable air and water quality/pollution
- Cleanliness
- Smart governance
- Smart transportation/connectivity
- Advanced technology
- Standard living of people
- Education
- Health care
- Perception of people (Khurana & Raj 2021)

One of the largest issues facing our generation is unemployment. Numerous issues are primarily caused by it. Therefore, poverty that results from unemployment makes living extremely challenging. Having a huge workforce and a low job supply is one of the consequences of unemployment. Workers' pay drops to extremely low levels under these situations, and they are compelled to work without insurance or job security. Migration considerations may include such circumstances and people's aspirations for a higher standard of living. The issue of migration continues to hold its position on the agenda with each passing day. International migration is sustained by experienced demographic, social, political, economic, and environmental events (Telsac & Telsac 2022).

Human migration continues to produce unavoidably large-scale human movements. These individuals require significant financial and moral help because a significant portion of migration nowadays occurs as a result of forced migration. It is crucial to have a thorough grasp of the factors that lead to migration in order to address the issue at its root. Reducing the sources of an issue before it arises is the best way to solve it (Telsac & Telsac 2022). Only the receiving city in the nation may experience issues as a result of village migration. There should be a team effort to find a solution.

Number of people living in urban and rural areas, World



Data source: World Bank based on data from the UN Population Division (2025) OurWorldInData.org/urbanization | CC BY
 Note: Because the estimates of city and metropolitan areas are based on national definitions of what constitutes a city or metropolitan area, cross-country comparisons should be made with caution.

Picture showing number of people living in urban and rural areas (downloaded from <https://ourworldindata.org/>)

Government Initiatives for smart cities

- Smart Cities Mission: Launched in 2015, this initiative aimed to develop 100 smart cities. As of early 2025, 7,479 out of 8,058 tendered projects were completed, with an investment of ₹150,002 crore.
- AMRUT (Atal Mission for Rejuvenation and Urban Transformation): Focused on providing basic infrastructure services in cities. Projects worth ₹78,910 crore have been grounded under this mission.
- Pradhan Mantri Gram Sadak Yojana (PMGSY): This scheme aims to provide all-weather road connectivity to unconnected villages, enhancing rural accessibility and reducing migration pressures.
- Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS): Provides 100 days of wage employment to rural households, aiming to reduce distress migration by offering local employment opportunities.

Smart Villages

Intelligent Village Mahatma Gandhi's ideas of Adarsh Gramme (model village) and Gramme Swaraj (village self-rule/independence) serve as the cornerstone of India. As the main undertaking following India's independence in 1947, Gandhi advocates for integrated rural development to benefit the majority of the population in two texts, Hind Swaraj and Gramme (Village) Swaraj. The idea of a "Smart Village" was started by the Eco Needs Foundation. By providing things like internal roads, safe drinking water, tree planting, sanitation, and water conservation, the foundation is embracing villages and working towards sustainable development.

The idea of creating a "smart village" is to build a community to the point where it can supply services on its own. When discussing smart villages, we prefer to create a situation where the village begins to generate revenue for itself in addition to concentrating on creating or sustaining the village environment for significant use (Mohanty et al. 2020).

A lot of reasons drive people to go to cities in search of a pleasant life with lots of opportunities. Urban locations typically offer more social and cultural facilities, more job opportunities, and other human services like education than rural places. The reasons behind mass migration from rural to urban are due to some of the following factors:

1. Search for jobs in urban areas where opportunities of employment are high due to high industrialization in these areas.
2. Low prices for agricultural products that lower the income for people living in rural areas since agriculture is their major source of income.
3. Nature of the education system i.e., institutions of higher learning are located in cities, forcing many of the youth to migrate to cities.
4. Lack of security in some rural areas since mechanisms and institutions for security are concentrated in cities.
5. Better healthcare facilities in urban areas.
6. Wage gap between rural and urban areas; since many jobs in urban areas pay more than the same jobs in rural areas, people move to urban areas in search of higher wages.
7. Less opportunity for banking and (Automated Teller Machines) ATMs (Mohanty et al. 2020).

Requirement of Smart Villages

In the era of India's industrialization, villages are getting uninformed. 69% of Indians reside in villages; if this fact is disregarded, it will impede the nation's economic development. To improve villages' social and economic, the smart village concept, as envisioned by the great Mahatma Gandhi, has been introduced. Villages are the foundation of our nation's economic development because they house the majority of primary sector operations. The nation's growth will undoubtedly be aided by investigating fresh avenues and aspects for the rural populace in various fields. In that regard, the Smart Village concept is an introduction to the idea of urbanization (Ramesh, 2018).

- Energy conservation
- Water conservation
- Good health facility
- Good transport system
- Good education facility
- Grievance redresser
- Strengthening CBOs
- Functional bank account
- Facilities regarding to the agriculture
- Latest & affordable medical facility
- E-governance
- Use of modern technologies for improvement of locality
- Improvement on women empowerment
- Smart security
- Efficient public transportation system
- Improving sanitation conditions
- Solid and liquid waste management
- Rain harvesting /Rain water drainage system
- Safe drinking water facilities
- Use of renewable energy

The idea of a "smart village" is to build a community to the point where it can supply services on its own by becoming self-sufficient. Developing or sustaining the village environment for significant use is simply one aspect of smart villages; another is creating a situation where the community begins to generate revenue on its own. UNESCO (United Nations Educational, Scientific Cultural Organization), UNICEF (United Nations Children's Fund), USAID (United States Agency for International Development), FASAF (Family and Schooling in Africa), UAPS (Union for African Population Study), and many other non-profit and developmental organizations are working hard to improve living conditions in rural areas today. Smart villages could be one way to do this.

Although migration to cities may be seen as an indication of progress, modernisation, and globalization, the question that remains is what will happen if a sizable portion of the population leaves the villages? Natural resources and skills abound in rural places, but they require technology assistance to be improved. These are nature's fundamental resources that are still not being fully utilized.

A sustainable living would result from technological interventions for rural development. Investments in infrastructure, business development, human capital, capacity, and community building are all crucial, as is technology. The development of e-literacy skills, access to e-health and other essential services, creative solutions for environmental issues, the application of the circular economy to agricultural waste, the promotion

of locally produced goods aided by technology and information and communication technology (ICT), etc. are typical goals of a smart village.

The advantages of tourism, cultural events, and smart specialisation agro-food initiatives were also mentioned by Mohanty et al. In addition to discussing potential application areas like agriculture, health, infrastructure planning, and lifestyle, this review aims to give a technical overview of smart village efforts and implementation aspects.

Some of the managerial concerns and technology requirements that are critical to the creation of prosperous smart villages are also covered in this chapter. There is a wealth of literature on smart cities (Green B 2019, Kar et al. 2017, Karvonen 2019, Manika 2018, Townsend 2013), but little is known about the general concept of smart village efforts and contemporary trends (Mohanty et al. 2020).

Conclusion

Not only is it an ambitious goal, but it is also crucial for India's equitable growth to close the gap between smart cities and smart villages. Even while urbanization is vital, India's rural areas, where the majority still live, must not be overlooked for their needs and possibilities. Implementing the ideas of smart cities and smart villages as complementary tactics inside a single policy framework is necessary. Putting money into smart villages will balance demographic pressures, lessen distressed migration, and unlock underutilized rural resources. Smart cities have the potential to boost economic growth and innovation at the same time. A more robust and inclusive future can be built in India by promoting technological integration, infrastructure development, and community empowerment in both environments. Uttar Pradesh serves as a microcosm of this national issue due to its twin identities as a predominantly rural and rapidly urbanizing state. Policy and practice elsewhere in India can be guided by the lessons learnt from this state's development trajectory. In the end, overcoming the urban-rural divide calls for political will, multi-sector cooperation, vision, and above all community involvement. The country is closer to reaching its objective of having a prosperous and independent economy by 2047 when cities and villages develop in tandem.

References:

1. Green B (2019) *The smart enough city: putting technology in its place to reclaim our urban future*. MIT Press, Cambridge, MA
2. Green B 2019, Kar et al. 2017, Karvonen 2019, Manika 2018, Townsend 2013
3. Kar AK, Gupta MP, Ilavarasan PV, Dwivedi YK (eds) (2017) *Advances in smart cities: smarter people, governance, and solutions*. CRC Press, Boca Raton, Florida
4. Karvonen A, Cugurullo F, Caprotti F (eds) (2019) *Inside smart cities: place, politics and urban innovation*. Routledge, New York.
5. Khurana N & Raj M. (2021). Smart villages and smart cities: a sustainable need of emerging India: case study analysis. IJCRT. Volume 9, Issue 5 pp: 530-540.
6. Manika A (2018) *Smart world cities in the 21st century: knowledge and information*. De Gruyter Saur, Boston
7. Mohanty, S., Mohanta, B., Nanda, P., Sen, S., & Patnaik, S. (2020). Smart village initiatives: an overview. *Smart village technology: concepts and developments*, 3-24.
8. Pai. M (2016) *What will it take to create smart cities in India?* Retrieved from <http://wri-india.org/blog/what-will-it-take-to-create-smart-cities-india>
9. Ramesh, B. (2018). Concept of Smart Village and its Impact on Rurbanization. *International Journal of Trend in Scientific Research and Development*, 2(03), 1948-1950.
10. Suresh, P., & Ramachandran, S. (2016). Development of Smart Cities in India—Dream to Reality. *Scholedge International Journal of Business Policy & Governance*, 3(6).

11. Telsaç, C., & Telsaç, Ö. Y. (2022, March). Causes of migration and its effects. In *2nd International Symposium "Global Migration Phenomenon" With its Security, Economic, Social, Political and Cultural Dimensions, Ankara*.
12. Townsend AM (2013) *Smart cities: big data, civic hackers, and the quest for a New Utopia*. W.W. Norton, New York.

