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Original Article

Cities, Communities, and Sustainability: An Economic Study of Gujarat

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Abstract: *This article analyses the economic dimensions of sustainable communities around the idea of Sustainable Development Goal 11 -"Sustainable Cities and Communities." Examining the important themes, infrastructure, public safety, and social justice, we take a theory-practice based approach and draw in a select amount of secondary data from government agencies such as NCRB & MOSPI along with some existing literature. While this paper is not heavily data-driven, we discuss the developments that have occurred in Gujarat within the emerging idea of sustainability in everyday human life. A very important aspect of development is to keep pace with other domains of life such as equity, environmental balance and quality of life, which often lag behind the economic quantitative parameters of development. This paper attempts to build on providing insights & offer reflections on how Gujarat's development story relates to more global sustainability ambitions.*

Keywords: *Sustainable Development, Urbanization, Housing & Transport*

I. INTRODUCTION

Urbanization is moving faster than ever. Currently, over half of the planet's population lives in urban areas and projections suggest that number could rise to nearly 70% by 2050. (UN, 2023) The studies also point to the fact that urban areas are driving the economic engines of the global economy contributing to more than three-quarters of the GDP, an economy driven by consumption, higher productivity, and therefore greater economic potential. But urbanization comes with its own set of negative aspects. As cities expand and people move across from rural areas, in hopes of jobs, the primary issue that has to be fulfilled becomes that of employment and housing. Rapid migration into towns, and clustering of cities, though has increased the potential for markets to expand and be more accessible, but has also opened up a plethora of challenges for the administration to encounter. Environmental issues such as pollution, traffic control, law & order, sanitation & maintenance of public goods are some of them. These problems can produce negative consequences that affect both economic and social stability of the city. As the density of people increases with rapid population growth & migration from rural segments, there needs to be a just and equally rapid economic activity that can compensate for the growing demand for facilities such as affordable housing. As urban centers rise, deliberate sustainable urban development becomes more crucial. Unchecked urbanization can lead to inefficiencies in the economy and slow down the progress of the nation.

According to UN SDG progress reports, a billion residents are said to be living in slum areas (UN SDG, 2020). Almost an equivalent number of people lack access to all weather roads, crippling the access to markets & transportation. The dashboard also suggests that only 50% of urban residents have access to public transportation.

Urban areas, when well-planned and managed, can become dynamic hubs of innovation and key drivers of sustainable development. Sustainable urban growth offers clear economic advantages, such as healthier population, cleaner environment, better output efficiency, improved markets, and better access through enhanced transport systems. An enhanced investment in this sector creates major economic opportunities for businesses involved in planning, construction, and delivery of urban services across sectors like energy, transport, waste, and recreation. Aligned with SDG 11, sustainable approaches can also give rise to new industries, particularly in as areas such as renewable energy, sustainable construction materials and electric vehicles are on rise. As transport becomes accessible, affordable & cleaner, urban mobility will increase, and pollution decline thereby creating a more favourable climate for economic growth.

Using a framework such as SDG 11 to respond to the urbanization challenges is key to maximizing the economic potential of the nation. With the expansion of the Indian economy, and Gujarat being an important contributor to economic growth, one

important element of urbanization is the continued movement of the population to urban areas and states for better opportunities. These migrations place a high pressure on available urban resources and infrastructure.

One of the most ambitious plans of the government was the Smart City project. An aim to transform the India's selected top cities to best urban 'smart' hubs, capable of innovative practices, and high-quality living. Gujarat's urban population accounts for roughly one-third of the state's total population, with several cities—such as Ahmedabad, Surat, Rajkot, Vadodara, Gandhinagar, Bhavnagar, Bhuj, and Ankleshwar—emerging as prominent urban centers. Key infrastructure projects like Infocity, GIFT City, and Dholera serve as major urban development highlights. Under the Smart Cities Mission, six cities from Gujarat, including Ahmedabad, Surat, Vadodara, Rajkot, Gandhinagar, and Dahod, have been selected for development. Notably, private sector participation has been most active in areas such as slum rehabilitation, affordable housing, smart parking solutions, and integrated payment systems. (Sagra, 2018)

In order to manage this growth in urban areas and support continued economic growth, sustainable urban planning, as recognized in SDG 11, is essential to avoid reinforcing existing inequalities or environmental challenges. This paper outlines aspects, progress and some insights gathered from the state of Gujarat.

II. LITERATURE REVIEW

A two-phase methodology was adopted in a study (Narayanan, Jenamani, & Mahanty, 2021) to explore the key drivers of sustainability and prosperity in Indian cities. The first phase involved constructing a city prosperity index, while the second focused on developing a sustainability index and identifying their underlying determinants. The findings indicate that income levels, access to public services, and housing positively influence urban sustainability, whereas natural amenity limitations and higher crime rates have adverse effects. The study also highlights a strong positive correlation between a city's prosperity and its sustainability outcomes. In research (Bhate & Samuel, 2023) on outcomes of the (PMAY) Pradhan Mantri Awas Yojana – Housing for All scheme, the study highlights the need for effective beneficiary outreach through detailed information sharing and active community engagement. It recommends that designated authorities should promote discussions, and empower grassroots volunteering to bridge awareness gaps among people about the scheme. It focuses on the role NGOs can fulfil, as a local player, in helping beneficiaries navigate the scheme. Despite the scheme's potential as a collaborative housing model, the study points out that only 38% of approved houses were constructed over a five-year period. The study concludes with recommendations such as identifying beneficiaries & ensuring accessible, well-linked support systems.

According to an assessment of India's road infrastructure (Mohapatra, et al., 2023), it has found a set of unique issues in urban and rural zones. Specifically, urban roads tend to need better drainage and stronger construction materials, while rural road access on its own didn't offer sufficient access. The study also pinpointed specific women's safety issues in terms of transit, elaborating on how a lack of transport security can affect opportunities for women to obtain work. The paper recommends future infrastructure policy should allow for the consideration of these factors regarding gender-sensitive concerns for inclusive mobility.

A technical study on fleet electrification at the Mundra depot (Prajapati & Desai, 2024) explores the feasibility of replacing diesel-powered vehicles with electric alternatives. While the analysis is primarily scientific, it underscores the broader economic implications of transitioning to sustainable transport systems—such as reduced fuel costs, long-term operational savings, and alignment with green infrastructure goals.

Gujarat is among the most urbanized states in India, primarily due to strong migration-driven pull factors. However, this urban growth is concentrated in key centers like Ahmedabad, Surat, Rajkot, Vadodara, Bhavnagar, and Jamnagar. The study (Roy & Saha, 2023) notes that Central Gujarat, Saurashtra, and South Gujarat have seen faster urbanization, majorly due to industrial migration. It emphasizes that sustaining future urban growth will require a careful focus on selecting economically viable and environmentally sustainable industries.

III. OBJECTIVES OF STUDY

The objectives of the study include:

- To analyze the performance of Gujarat in target indicators relevant to Sustainable Development Goal 11 (SDG-11)
- To discuss the insights so gathered from (i) above and offer suggestions as relevant to achieving the SDG-11 goal by the State.

IV. METHODOLOGY

The paper employs a secondary data research approach to analyze the various components of SDG-11 indicators as listed under target indicators by the UN-SDG. The paper draws upon published data and reports from credible sources, including the Ministry of Statistics and Programme Implementation (MoSPI), NCRB, State Urban Development Reports, and relevant publications from government and other research articles. (Data points obtained for relevant target sub indicators for Gujarat from MoSPI also includes data from Union Territory of Daman & Diu)

Disclaimer: One needs to exercise caution while interpreting crime statistics. As NCRB, 2022 puts it, "Increase in crime numbers in a State police data may in fact be on account of certain citizen centric police initiatives, like launching of e-FIR facility or women Helpdesks, etc." The assumption of rising crime reports should not be attributed to inefficiency of law & order.

The analysis references the official UN-SDG 11 target indicators, selectively focusing on those with accessible and relevant data in the Gujarat context. The indicators explored in this study include:

- The share of the urban population residing in inadequate housing or informal settlement such as slums. (Indicator 11.1)
- Proportion of population that has convenient access to public transport (Indicator 11.2)
- Amount spent on conservation of culture & nature heritage ecosystems (Indicator 11.4)
- Human impact of disasters, measured in terms of casualties & economic losses (Indicator 11.5)
- Proportion of municipal solid waste collected and managed in controlled facilities (Indicator 11.6)
- Average levels of urban air pollution, (e.g. PM2.5 and PM10) in cities (Indicator 11.6)
- Reported cases of victims of harassment (children) (Indicator 11.7)

The treatment of each indicator takes different form of depth depending on the database for the values available, while the study uses both quantitative data and qualitative understanding to extract economic implications. The paper remains almost entirely theory-based without substantial empirical analysis, and to promote policy-level thinking about sustainable urban development in Gujarat.

V. DISCUSSION

Slums are typically informal settlements lacking proper physical and social infrastructure. These areas are often marked by overcrowded living conditions, poorly constructed housing, and inadequate access to essential services such as sanitation, clean water, and electricity. The structural instability and unhygienic environment also pose serious risks to human health and safety.

According to the Performance Assessment System (PAS) portal (PAS, 2011), valuable insights have been gathered regarding the condition of slums in Gujarat. The National Sample Survey Office (NSSO) defines slums as areas comprising at least 20 households living in dilapidated tenement-like conditions, typically under unhygienic surroundings. Similarly, the Census of 2011 defines slums as compact settlements with a population of 300 or more living in congested structures with poor civic amenities. The PAS study on Gujarat's slums involved initial stakeholder consultations, site visits, and first-hand interviews with residents to develop a grounded understanding of the living conditions.

The results showed that about three-fifths of slums had tap connections, close to 45% had toilets, and 49% had door-to-door waste collection. Although this data pertains to an older time frame, it offers a base estimate drawn from the 2011 Census. With the Swachh Bharat Mission in place, several states, including Gujarat, have claimed near 100% toilet coverage across households. The data also (at the time) reflected that about 20% of the nearly two-fifths urban population lived in slums. Areas like Godhra, Jetpur, Surendranagar, Porbandar, and Vapi reported above-average slum proportions. The study concludes with suggestions such as building greater community awareness about schemes, encouraging willingness to contribute, and addressing key supply-side challenges.

According to Census 2011 data, 103 towns in Gujarat were officially reported as having slum areas, accounting for approximately 3.94% of the total towns in the state. The average household size within these settlements was around 4.9 persons. Overall, slum dwellers made up about 6.53% of the total urban population in Gujarat. (Ramudu, Lakhsmi, & C. Balakotaiah, 2023)

One of the initiatives under action is the 'The Pradhan Mantri Awas Yojana' – Housing for All (Urban) Mission, launched for implementation between 2015 and 2022, aimed to extend central support to state governments and union territories for facilitating housing for all eligible urban households by the year 2022. The scheme envisions housing units with a carpet area of

up to 30 square meters, along with access to basic civic infrastructure. However, states and union territories are granted discretion to decide the specific size and additional features of the housing units based on local needs and conditions. (Ministry of Housing & Urban Poverty Alleviation, 2015) Expedited tracking on these scheme implementations can ensure that indicated goals (11.1) are achieved as early as possible.

The following data is extracted & tabulated with reference to Indicator 11.2 for Gujarat for selected years.

Table 1: People Killed/Injured In Accidents in Road Accidents (Per 1 Lakh Population)

Year	Cases	Injured	Died	Mid-year projected Population (in lakhs)	Death Rate	Injuries Rate
2019	18414	17619	8040	682.5	11.78	25.82
2017	18631	17955	7663	637.7	12.02	28.16
2015	23362	21505	8245	623.3	13.23	34.50

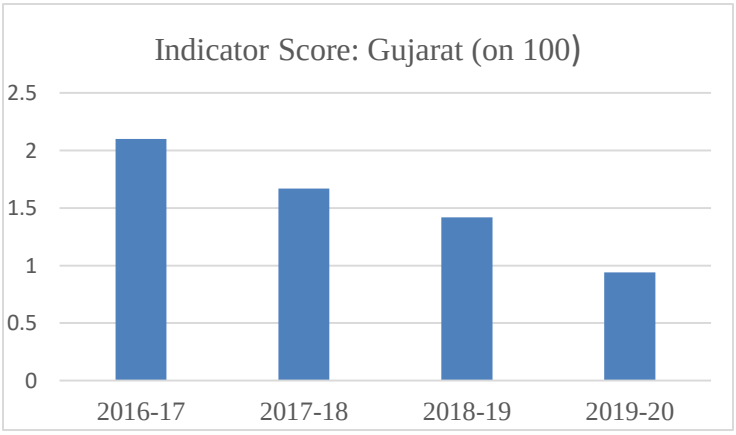
Source: MOSPI

Gujarat's data on traffic incidents shows the fatalities and injuries on the road. The number of deaths per 1 lakh population during 2015, 2017, and 2019 ranged from 11.78 to 13.23, while the injury ratios ranged from 25.82 to 34.50. There seems to be a reduction in both treatment ratios by 2019. However, given the high absolute number, it is imperative to ensure the infrastructure be upgraded & monitored. The access to transport is not merely about physical connectivity but must be integrated with safety. Urban transport planning must account for traffic discipline, enforcement and dedicated passage for vehicular movements. Achieving SDG 11.2 in spirit would thus require interventions that bring down accident rates while improving the overall safety & passenger journey experience.

As per available statistical figure on the MoSPI dashboard (MoSPI, 2022-23), only about 41.6% of the urban population has access to high-capacity public transport systems close to their place of residence (defined here as less than 1 km). Gujarat has several UNESCO heritage sites, ancient towns and ecologically sensitive areas that all need sustaining investment over time. These regions not only are culturally important but also serve as hub of tourism & hospitality.

Gujarat's per capita expenditure score on preservation of cultural and natural heritage on a scale of 100, has declined continuously, from 2.1 in 2016–17 to just 0.94 in 2019–20. This decline implies that the financial commitment to heritage conservation has decreased, as evidenced from spend-amounts from MoSPI database. Also, with increasing population and larger denominator base, the per-capita spend index has shown a more accelerated fall. The state needs to re-align its spent towards priority heritage sites, or provide them with necessary facilities and/or institutional support.

Figure 1: Total per Capita Expenditure Relevant To Indicator 11.4 (On Scale Of 100)



Source: MoSPI

The data on waste processing shows a sudden uptick in the year 2019. The percentage of waste processed dropped from 28% in 2016 to 23% in 2018, slightly uneven fluctuation, before the percentage jumps to 87% in 2020. This could be due to better policy implementation or better compliances.

Table 2: Percentage Trends of Indicator 11.6 (Gujarat)

Target/Year	2016	2017	2018	2019	2020
Waste Processed	28	28	23	74	87
Door-to Door collection (wards)	95	97	100	100	100

*Source: MoSPI (*Doesn't include Daman & Diu)*

With regards to number of wards reporting Door-to-Door trash collection, the state has achieved complete saturation (100%) coverage in this domain, indicative of fulfilment of this target indicator. This seems to be driven by the Swachh Bharat Mission initiative, and active work administration of the local authorities in implementing this cleanliness drive.

As per Gujarat State Disaster Management Plan Report (GSDMA, 2024-25), multiple disturbances that connect to Sustainable Development Goals (SDG) 11 occurred in the state in past few years. Cyclone Biporjoy in 2023 was a very severe cyclonic storm that impacted the coastline, particularly areas like Kutch, Devbhumi Dwarka, and Jamnagar. Certain isolated fire incidents were also observed in Bharuch and Vadodara in June 2020. The COVID-19, as a health emergency in the entire state as well as the country, created extreme stress to the existing healthcare system. Other disruptions include repeated exposure of Valsad, Vapi, and other low-lying regions to heavy rainfall and potential flooding events during cyclones, such as Cyclone Nisarga (2020) and Cyclone Vayu (2019). Evacuation events cost significant funds to the state treasury and flooding has the potential to disrupt people's livelihoods, particularly in vulnerable occupations such as fishermen. The primary focus in any disaster is always preventing casualties, and minimizing the risk of damages to wealth & property. Disruption in economic activities can dent the GSDP progress. With active involvement of the authorities, timely monitoring, and sound preparedness, the potential losses against such incidents can be minimized.Air quality in Gujarat presents the picture of particulate matter (PM) emissions. During 2018–19, PM2.5 concentrations were within permissible norms at only two monitoring stations, while 32 stations recorded levels above 60 $\mu g/m^3$. The Gujarat Pollution Control Board (GPCB) reports the reason behind suspended particulate matter to be the geographical semi-arid conditions of the state & the wind velocity due to which particles remain suspended for prolonged durations in air. (CAG, 2022) Also, during 2019–20 and 2020–21 there were no recorded PM10 concentrations above 150 $\mu g/m^3$. This improvement is possibly connected to the drop in industrial and vehicular activity from pandemic lockdowns in both years. But over a longer-term picture about certain cities as audited by the report (CAG, 2022) are less hopeful. Annual average PM10 concentrations increased at five of the seven monitoring stations (Vapi, Surat, Ankleshwar, Ahmedabad and Bhavnagar) between 2011–12 and 2020-21, which is concerning area. These PM levels can have impact on quality of life & therefore economic productivity of the region.

Table 3: Crime against Children (Regions with maximum cases in Gujarat)

Sr. No	Region	Total IPC Relevant	POSCO
1	Ahmedabad City	458	352
2	Anand	43	95
3	Bharuch	34	102
4	Dahod	93	104
5	Panchmahal	88	91
6	Surat City	297	215
7	Vadodara Rural	94	48
	Gujarat	2292	2499

Source: National Crime Records Bureau Report 2022

The above statistics points towards certain regions that require attention. High Case count (population based) for cases under Indian Penal Code (IPC) and Protection of Children from Sexual offences act (POSCO) is observed in Ahmedabad & Surat city. These regions are densely populated and therefore require stronger safety measures in place. Enhanced policing and community-level engagement to ensure safety.

With such multiple considerations – taking into account the environment and public safety, it is clear that the achievement of SDG 11 for Gujarat is still in its path to progress. It is about more than just building infrastructure or investments. It requires creating stronger, resilient, and sustainable cities that provide opportunity for everyone.

VI. CONCLUSION

This research analyzed the urban development in Gujarat through the lens of SDG 11, using this analysis to better understand the context of both the economic risks and potential opportunities for sustainable urbanization. The analysis shows that unsustainable practices such as under-investment in public transit or poor waste management could have economic costs. One can argue that these consequences can range from loss of productivity to increased public health costs. Unequal access to urban infrastructure and services also could cause economic divides, which can undermine stability and long-term investments. This could impact the progress in other SDG areas. The outcomes of this paper also highlight an optimistic possibility. To develop into a more resilient urban economy, the state needs to ramp up its investments in better & safer transports (roads), and structure employment & housing opportunities to manage the migration pressure. With the appropriate support and policy reform, it is possible that Gujarat can develop its urban centers across the region as sustainable and inclusive engines of growth.

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