

Sustainable Development Goals and Their Incorporation in Urban Planning

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Abstract— Over the years, the world's population living in cities or urban centres has been rising steadily. As the world is rapidly urbanizing, urbanization is becoming an unstoppable phenomenon in India too. At the same time, urbanization is perceived to be correlated with pollution, congestion and inferior quality of life. Also, within the context of unplanned or poorly governed urbanization, cities are often characterized by stark socioeconomic inequalities, social exclusion, extreme poverty, high unemployment, slums, unaffordable and inadequate housing, and poor environment situations as well as unsustainable environmental footprints. Urban centres will be increasingly crucial for accomplishing all sustainable development goals (SDGs) and incorporating the social, economic and environmental goals set forth in the 2030 Agenda. The accordance on an independent goal in SDGs on cities and human settlements was colossal and reflects the growing attention on “urban” as a development theme at the global level. The study discusses the progress of individual states, union territories and the country made under SDG 11. Further the progress of policies, programmes, schemes, rules and regulations that have been introduced and implemented by government of India supported with case studies is highlighted. All these initiatives in the form of policies, programmes etc. comes under the purview of urban planning measures and are also helping and contributing towards achieving the targets under SDG 11 in the country significantly. India has existing national urban policies, programmes and schemes like AMRUT, PMAY, HRIDAY etc. and has shown commitment to development of national urban policies and schemes that are needed to guide urban growth that is line with the aim of the SDGs. In order to achieve the 2030 agenda, there is still the need of formulation and implementation of more policies and schemes addressing other targets under SDG 11.

Index Terms— Affordable Housing, Sustainable, Sustainable Development Goals, Disaster Management, Universal Accessibility, Urbanization, Urban Planning.



1 INTRODUCTION

Indian urban system consists of 7933 cities and towns of different population sizes, and a population of 377.16 million (Census 2011) which is the second largest in the world. The urban system has registered a notable growth in its base over the 2001-11 decade, and this drift is expected to continue. Approximately 180 million rural people live next to India's 70 largest urban centres, a number that will rise to about 210 million by 2030 [1].

Cities are essential centres for the exchange of ideas, trade and commerce, cultural amalgamation, promotion of scientific temper, social and industrial productivity and much more. Urban areas across the globe currently house four billion people who make up 54 per cent of the world population. This is expected to rise to 5 billion by 2030. Rapid urbanization, especially in developing countries, calls for significant changes in the way in which urban development is designed and managed, as well as substantial increases of public and private investments in urban infrastructure and services. Given this context, efficient urban planning and management practices must be put in place to deal with the existing and upcoming challenges brought about by urbanization.

Urbanization has provided new jobs and opportunities to millions of people and has contributed to poverty reduction. At the same time, expeditious urbanization puts pressure to the resource base and raises demand for energy, water, and sanitation, as well as for public services, education and health care. Urban areas are continually evolving as a result of people's mobility, natural population growth, socio-economic development, environmental changes, and local and national policies.

2 ABOUT AGENDA 2030

The 2030 Agenda for Sustainable Development will be at the core of international and transnational cooperation for the next 15 years. It combines economic, social and environmental aspects and defines global values for sustainable development. Thus, the agenda is a tool to achieve global mobilization for the common good, manage global challenges and increase accountability for actions. It formulates classic underlying principles of development policy (the policy field of development cooperation), but also emphasizes the indivisibility and universality of the Sustainable Development Goals (SDGs) and the pledge to “leave no one behind”.

The SDGs are a compilation of 17 global goals outlined to be a ‘plan to attain a better and more sustainable future for all’. The SDGs set in 2015 by the United Nations General Assembly and expected to be achieved by the year 2030 are part of UN Resolution 70/1, the 2030 Agenda. The goals are broad based and interrelated. The 17 SDGs consists of a list of targets which are computed with indicators, Fig. 1. Shows the 17 SDGs [2]. The SDGs and its targets will encourage action in the following decisively significant areas: poverty, hunger, education, health and well-being, education, gender equality, water and sanitation, energy, economic growth and decent work, infrastructure, industry and innovation, reducing inequalities, sustainable cities, consumption and production, climate action, ecosystems, peace and justice, and partnerships. Goal 11 aims to foster inclusiveness and sustainable urbanization so that the cities can be productive, accessible places that draws talent, encourage innovation and generates economic growth. It lays down a framework to ensure capacity building for better governance.

2.1 Goals and Targets of SDGs including Indicators

The SDGs have cemented their role as the world community’s answer to development challenges. SDGs break down the social, economic, and environmental themes into 17 goals and 169 targets, thereby enabling policymakers and implementors around the world to design effective and timely policies and initiatives. Sets of indicators suggested for the SDG targets provide critical data, but more data is often required to understand why progress is or is not being made. In particular, more data are often required on direct programme performance using coverage indicators and related quality-of-care measures.

2.2 Dimensions of Sustainable Development

Sustainable development has been elucidated as development that meets the needs of the present without compromising the ability of future generations to meet their own needs [3]. For sustainable development to be achieved, it is essential to unify three core elements: economic growth, social inclusion and environmental protection.

2.3 Pillars of Sustainable Development Goals

The current 5P initiative aims to leverage the strength of governments, the technical and financial advantages of the private sector and the socio – economic development interest of communities. The five pillars of SDGs are People, Planet, Prosperity, Peace and Partnership. Table 1 shows the pillars of SDGs [4].

TABLE 1
PILLARS OF SUSTAINABLE DEVELOPMENT GOALS

P's of Sustainable Development	Aim	Related Goals
People	End of poverty and hunger in all forms and ensure dignity and equality.	Goals 1, 2, 3,4,5,6.
Planet	Protect our planet’s natural resources and climate for future generations.	Goals 11, 12,13,14,15.
Prosperity	Ensure prosperous and fulfilling lives in harmony with nature.	Goals 7,8,9,10
Peace	Foster peaceful, just and inclusive societies.	Goal 16
Partnership	Foster peaceful, just and inclusive societies.	Goal 17

Fig. 1. Sustainable Development Goals



3 SDG AND URBAN PLANNING

SDG 11, urban planning development has become a prominent task of the Agenda 2030. SDG 11 is anticipated to set the foundation for urban-planning techniques and policies for the future. It is certain that for the practical implementation of sustainability policies related to SDG 11 (and the NUA), these policies will have to be executed directly through urban-planning interventions. These interventions are predicted to alter the intangibility of policies into physical manifestations. The targeted implementation of SDGs in cities thus has the potential to support the integration of sustainability into urban planning. In the subsequent sections, the status of SDG 11 in India, the states which are front runners, performers are listed and further the policies, programmes, schemes, rules and regulations that have been implemented and its current progress is given. All these policies, programmes etc. are the urban planning interventions but are also helping and contributing to achieve the targets under SDG 11 considerably.

3.1 SDG 11: Sustainable Cities and Communities

The accordance on an independent goal in SDGs on cities and human settlements was colossal and reflects the growing attention on “urban” as a development theme at the global level. Goal 11 is not the only goal in the 2030 Agenda where urban or human settlements issues are addressed. Goals such as Goal 1 (poverty and security of tenure), Goal 3 (Health), Goal 6 (water and sanitation), Goal 7 (Clean energy), SDG 12 (sustainable consumption and production, etc. cover targets addressing human settlements and urbanization challenges.

Targets under goal 11 that is making cities and human settlements inclusive, safe, resilient and sustainable are as follows:

1. By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.
2. By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
3. By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.
4. Strengthen efforts to protect and safeguard the world’s cultural and natural heritage.
5. By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water related disasters, with a focus on protecting the poor and people in vulnerable situations.

6. By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
7. By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.
 - 7.1 Support positive economic, social and environmental links between urban, peri urban and rural areas by strengthening national and regional development planning.
 - 7.2 By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.
 - 7.3 Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials [5].

1. To benchmark progress against targets and performance amongst States
2. To devise / reorient strategies to achieve the SDGs by 2030.
3. To identify priority areas which need investment and improvement.
4. To identify and address data gaps.

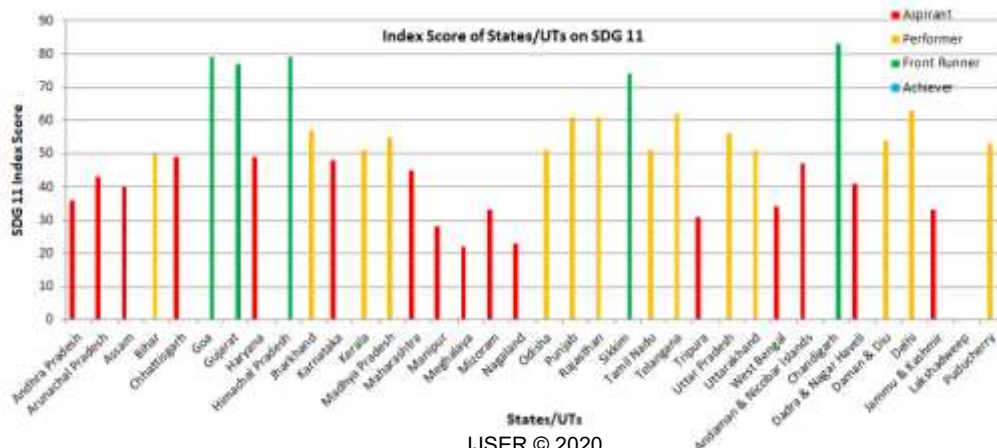
Fig. 2. Indian States achievement in SDG 11



4 INDIA AND SDG 11

The NITI Aayog brought out an SDG Index for India and States during 2018 and a ranking of the States on the progress made on SDGs. It also provides an aggregate assessment of the performance of all the States and UTs to the leadership and policy makers to evaluate their performance on SDG Goals and associated targets. The index gives a comparative position of States on selected performance indicators and assists State Governments in evolving targeted policy interventions. This effort is likely to continue yearly with greater involvement and participation of ministry of statistics and program implementation with acceptable modification in the methodology and incorporating more indicators based on the availability of more data [6]. The Index also allows States/UTs in following:

Fig. 3. Index Score of SDG 11 in different States of India.



4.1 Calculation of SDG 11 Index in India

Five national-level indicators have been identified, to measure India's performance towards the Sustainable Cities and Communities, which capture two out of the ten SDG targets for 2030 outlined under this Goal. These indicators have been selected based on the availability of data at the sub-national level and to ensure comparability across States and UTs.

The subsequent section presents the composite scores of the States and UTs on this Goal. It also shows a breakdown of the States and UTs by indicator.

TABLE 2
INDIAN STATES SCORE IN DIFFERENT TARGET OF SDG 11

Sr. No.	States/UTs	Houses completed under Pradhan Mantri Awas Yojana (PMAY) as a percentage of net demand assessment for houses	Percentage of urban households living in slums	Percentage of wards with 100% door to door waste collection	Percentage of waste processed	Installed sewage treatment capacity as a proportion of sewage generated in urban areas	SDG 11 Index Score
Index Score							
1	Andhra Pradesh	22	0	100	48	9	36
2	Arunachal Pradesh	24	91	100	0	0	43
3	Assam	16	95	50	41	0	40
4	Bihar	19	90	84	51	7	50
5	Chhattisgarh	22	38	100	84	0	49
6	Goa	91	85	100	68	51	79
7	Gujarat	57	77	100	79	74	77
8	Haryana	3	46	89	47	60	49
9	Himachal Pradesh	28	96	97	76	100	79
10	Jharkhand	33	91	97	56	9	57
11	Karnataka	24	55	85	41	35	48
12	Kerala	40	95	81	32	6	51
13	Madhya Pradesh	39	35	100	84	15	58
14	Maharashtra	20	12	76	55	63	45
15	Manipur	4	0	59	50	0	28
16	Meghalaya	20	84	0	4	1	22
17	Mizoram	2	41	74	35	11	33
18	Nagaland	10	65	27	14	0	23
19	Odisha	36	69	88	25	34	51
20	Punjab	26	56	97	53	75	61
21	Rajasthan	33	75	100	68	32	61
22	Sikkim	43	57	100	70	100	74
23	Tamil Nadu	36	33	92	60	32	51
24	Telangana	37	0	94	78	41	62
25	Tripura	44	68	4	40	0	31
26	Uttar Pradesh	23	74	88	58	37	56
27	Uttarakhand	28	60	94	42	31	51
28	West Bengal	39	42	72	9	9	34
29	Andaman & Nicobar Islands	0	69	100	65	0	47
30	Chandigarh	100	25	100	89	100	83
31	Dadra & Nagar Haveli	39	0	100	25	0	41
32	Daman & Diu	41	0	100	75	0	54
33	Delhi	100	12	82	55	65	64
34	Jammu & Kashmir	12	56	36	10	48	33
35	Lakshadweep	0	0	0	0	0	0
36	Puducherry	19	4	100	90	50	53
	India	29	55	88	56	38	53
	Target	100	100	100	100	100	100

4.2 Analysis of Indian Scenario

The composite score for each State/ UT was computed by aggregating their performance across the goals, by taking the arithmetic mean of individual goal scores.

The composite score ranges from 0 to 100 and denotes the overall achievement of the State/ UT in achieving the targets under the goals. A score of 100 implies that the State/ UT has achieved the targets set for 2030; a score of 0 implies that the particular State/ UT is at the bottom of the table.

SDG Index Score for Goal 11 ranges between 22 and 79 for States and between 33 and 83 for UTs. Himachal Pradesh, Goa and Chandigarh are the top performers among States and UTs, respectively. Four States and one UT bagged position in the category of Front Runners (with Index score higher than/equal to 65).

However, thirteen States and three UTs fell behind in the Aspirants category (with Index score less than 50). Table 2 and Fig. 3. shows the analysis of state indices [7].

5. STUDY OF THE INITIATIVES TAKEN THROUGH POLICY, SCHEME, PROGRAM'S AND GUIDELINES RELATED TO URBAN PLANNING UNDER SDG 11 IN INDIA

In this study, initiatives taken by government of India to achieve target of SDG 11 through Policy, Guideline and Norms related to urban planning has been studied. Different Scheme has divided into target of SDG. Implementation of SDG 11 is shown by certain case study related to target.

5.1 Initiatives Under Target 1

In India urbanization has become an inevitable and irreversible phenomenon, and it is a crucial facet of economic growth and poverty reduction. Smart Cities Mission, Housing for All, and Clean India Mission, and development of RURBAN clusters provide a fresh impetus to the urban sector. The Indian approach in this area mainly consists of the following efforts.

1. Reforms in the Real Estate Sector

The Real Estate (Regulation and Development) Act, 2016 (RERA) is transformative legislation aimed to ensure regulation and promote real estate sector efficiently and transparently and to protect the interest of home buyers. Rules under RERA have been notified by 30 States/UTs and 28 States/UTs. North Eastern States (Arunachal Pradesh, Meghalaya, Nagaland and Sikkim) are under process to apprise the rules under RERA [5].

2. Urban Transformation and Housing for All Under the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), basic civic amenities (water supply, sewerage, urban transport, parks, among others) are provided to all, with a focus on the poor and disadvantaged, in 500 cities including all those with a population over 100,000. To ensure adequate, safe and affordable housing and basic services for all and upgrade slums by 2022, the

Government of India has launched Pradhan Mantri Awas Yojana- Housing for all in urban areas. PMAY covers 4318 cities, including 472 class 1 cities. By August 2019, a total of more than 26 lakh houses have been completed, which includes incomplete houses of the earlier scheme of National Urban Renewal Mission. Further, to develop and promote effective means of sustainable transport, the government is taking crucial steps towards promoting electric mobility which includes the newly launched National Mission on Transformative Mobility and Battery Storage and the FAME-II Scheme [8].

3. Sustainable Urbanization

The Smart Cities Mission (SCM), launched in 2015, aims at building up sustainable and inclusive cities that provide core infrastructure, a clean and sustainable environment and a decent quality of life to its citizens. The strategic components of the Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development) with Smart Solutions applied in service delivery and governance. The 100 cities under the Mission have proposed to execute 5,151 projects worth INR 2050 billion in 5 years from their respective dates of selection [8].

Houses completed under PMAY: As of 2019, 31.01 per cent of houses were completed under Pradhan Mantri Awas Yojana (Urban) as against the total number of houses sanctioned for construction. Goa has met 91.11 percent of its housing demand whereas the completion rate of houses is the lowest in the UT of Andaman & Nicobar Islands at 3.27 per cent.

Slum households: As per the 2011 Census, 5.41 per cent of the urban households in India live in slums. Among the States, Andhra Pradesh had the highest percentage of its urban population living in slums (12.04 per cent). Among the UTs, Puducherry had the highest figure, with 11.58 per cent of its urban households living in slums. The State closest to the target is Kerala.

Door to door waste collection: Proper and established waste management is an essential criterion for sustainable cities. Seven States and five UTs have achieved the target of 100 per cent door to door waste collection whereas Rajasthan is very close to achieving the target at 99.81 per cent. Across India, 90.99 per cent of the wards have 100 per cent from door to door collection.

Waste processed: As of June 2019, only 56 per cent of the total waste generated gets processed. The best performers among the States are Chhattisgarh and Madhya Pradesh with 84 per cent of its waste getting processed each, followed by Gujarat at 79 per cent. Among the UTs, Puducherry leads with processing 90 per cent of its waste, followed by Chandigarh at 89 per cent.

Installed Sewage Treatment Capacity: The installed sewage treatment capacity as a proportion of sewage generated in urban India is 37.58 per cent as of March 2015. Himachal

Pradesh, Sikkim, and the UT of Chandigarh have a much higher sewage treatment capacity as compared to the sewage being generated.

5.2 Initiatives Under Target 2

1. Atal Mission for Rejuvenation and Urban Transformation (AMRUT). This programme envisages five thrust areas of which urban transport is one focusing on sidewalks, foot over bridges, non-motorized transport, buses, BRTS, multilevel parking, waterways and ferry vessels.
2. Service Level Benchmarks (SLB) for Urban Transport (UT) In order to improve transport services, MoUD has come up with a handbook which provides common framework for monitoring and reporting on SLBs for UT services.
3. Non-Motorized Transport Policy Chennai is the first Indian city to adopt a Non-Motorized Transport (NMT) Policy initiative to create a quality and dignified environment where citizens are encouraged to walk and cycle. The policy also talks about equitable allocation of public space and infrastructure; and access to opportunities and mobility.
4. Transit-Oriented Development along BRTS corridors Pimpri-Chinchwad, a thriving industrial city in the state of Maharashtra, has proposed Transit-Oriented Development (TOD) along the BRTS corridors. The Municipal Corporation of Pimpri-Chinchwad (PCMC) envisions a three-phase metro system.
5. Initiatives Towards Transit-Oriented Development in Indore, in an attempt at a more compact development in the Master Plan, recognizing that there is higher demand around these nodes, the Floor-Area-Ratio (FAR) along the Bus Rapid Transit System (BRTS) corridor has been increased from 1.25 to 3. There are similar proposals for increasing FARs along other BRTS corridors in the state. Gujarat has also been moving towards a pliable FSI regime and FSI pricing, and zone changes are being decided according to a specified set of rules and regulations. The development of Outer Ring Road (169 km long, 8 lane expressways) in the Hyderabad metropolitan region is another example of ensuring sustainable urban planning and design. A stretch of 1 km each on the two sides of the Outer Ring Road is selected as a Growth Corridor and is classified as mixed-use zone. Satellite townships are planned at major transportation nodes along the corridor, with provision for a green belt and metro in the growth corridor. A special impact fee will be levied on any development taking place inside the corridor, to be collected at the time of granting building permissions. The city has also

recognized the need for radial road construction, to balance the centripetal forces that will be unleashed by the new Outer Ring Road, enabling development to extend outwards from the core city to the Outer Ring Road (ideally in a phased manner). This development is expected to radically reshape the city's structure over the next 20 years, operating in conjunction with other economic drivers, particularly the rise of the ICT sector [1].

5.3 Initiatives Under Target 3

Case Study of the Master Plan of Delhi (MPD), 2021

The Master Plan of Delhi (MPD), 2021 stipulates that the Land Pooling Policy would be based on the optimum utilization of available resources in land assembly, development/redevelopment and housing. Delhi Development Authority (DDA), the concerned Land Pooling Agency, envisions assembling around 20,000 hectares of land from 89 villages located on the periphery of Delhi. It aims to construct around 2.5 million housing units within a span of six to eight years to meet the housing shortage spelt out in MPD 2021. It is believed that the policy would help develop housing and infrastructure without acquiring land, which is a cumbersome and lengthy process. The Ministry of Urban Development approved the Land Pooling Policy in September 2013. The policy aims to avert selling of land without the owner's consent. Under this policy, landowners can capitulate their landholding into the central pool, and be stakeholders to the development proposed on their land. Once the land is pooled, the landowner would get back 40 - 60 percent of the total land surrendered, as developable land. The 40-60per cent of land that DDA would retain with them would be utilized for creation of infrastructure as well as monetize it against specific purpose (Delhi Development Authority, 2013). [1]

Case Study of Town planning scheme, Gujarat

To develop urban land on the fringes of cities, the State of Gujarat has been using Town Planning Schemes (TPS), a form of land readjustment system roughly similar in principle to the ones that had been used in South Korea, Taiwan, and Germany, whereby irregular plots of land are pooled together, serviced and reconstituted into systematic plots before returning a proportion of improved land to the land owners. The legal framework for the TPS of Gujarat is originally based on the Gujarat Town Planning and Urban Development Act of 1976. Eventually, as of 2009, the TPS became fully operational. The implementation process, from initiation to final approval of a TPS, on average requires less than one year. Since 1999, the Ahmedabad Urban Development Authority (AUDA) has managed to develop on average about 700 hectares of land a year using the TPS. The average area developed each year is roughly equivalent to about 3.2 per cent of the current built-up area of the Municipality of Ahmedabad. The TPS of Gujarat have demonstrated that they are an efficient way of developing suburban infrastructure in India.

5.4 Initiatives Under Target 4

Heritage City Development and Augmentation Yojana (HRIDAY)

It is a central sector scheme of GOI. Launched on 21st January, 2015 and in order to bring together urban planning, economic growth and heritage conservation in an inclusive way and also with the objective of preserving the heritage character of the city. Under this, twelve cities namely, Ajmer, Amritsar, Amaravati, Badami, Dwarka, Gaya, Kanchipuram, Mathura, Puri, Varanasi Velankanni, Warangal have been identified for development. On 31st March, 2019, the mission period of HRIDAY scheme ended.

The development of core heritage linked civic infrastructure project including revitalization of urban infrastructure for areas around heritage, religious, cultural and tourism assets of the cities has been supported by the scheme. The development of water supply, sanitation, drainage, waste management, approach roads, footpaths, street lights, tourist conveniences, electricity wiring, landscaping and such citizen services are the initiatives under the civic infrastructure project.

Case study of Heritage City Development and Augmentation Yojana (HRIDAY) Dwarka, Gujarat

Under this scheme, a city HRIDAY plan (CHP) is prepared for Dwarka, Gujarat. The purpose of this plan is to create a sustainable Civic Infrastructure Development Plan (CIDP) for areas around tangible heritage assets (identified/ approved by the Ministry of Culture, Government of India and State Governments) by identifying gaps through infrastructure need assessment for physical infrastructure as per locally applicable standards/norms/bye-laws. MoUD appointed Urban Management Centre (UMC) in association with Urban Management Consulting Pvt. Ltd. as the HRIDAY City Anchor (HCA) for Dwarka, Gujarat. Not only Dwarka, Bet Dwarka - an island around 30 km away is also taken under study due to its heritage, religious and socio-cultural significance. An assessment of the existing scenario in both Dwarka and Bet Dwarka is done by the UMC as per the guidelines of HRIDAY and the agreed terms of reference for the HCA. On the basis of analysis, overall vision for development has been developed in consultation with various stakeholders and a shelf of projects has also been created for implementation purposes. Shelf of projects consisted of the priority assets identified on the basis of historic, architectural and socio - cultural importance. The tourism facilities and infrastructure development of these areas shall be prepared on priority than the remaining assets. The study area is divided in five heritage zones based on the existing spatial analysis of tourism sites. The plan also provides the estimates investment requirements and the roles of different stakeholders. Lastly, the suitable operation and maintenance mechanisms is suggested [9].

5.5 Initiatives Under Target 5

India is susceptible to a horde of natural disasters. Almost 60 % of the landmass is having seismic vulnerability, 12 % is

vulnerable to floods and river erosion, as much as 76 % of its digressive coastline line of more than 7500 km is exposed to cyclones and tsunamis, above two-thirds of its cultivable area is vulnerable to droughts influencing the vulnerable communities and poor excessively.

As mandated under the Disaster Management Act 2005, the National Policy on Disaster Management (2009) is in place, which calls for proactive prevention, mitigation and preparedness-driven approach and marks a paradigm shift from the earlier relief-centric strategy. The National Disaster Management Plan (NDMP) emphasizes on disaster resilience and integrates the Sendai Framework for Disaster Risk Reduction as well as the SDGs.

Multiple programmes are implemented to improve natural disaster resilience, such as the National Cyclone Risk Mitigation Project, Schemes for strengthening State and District Disaster Management Authorities, Strengthening disaster response force etc. India has newly launched the International Coalition for Disaster-Resilient Infrastructure (CDRI) through a joint initiative involving 12 partner countries to improve protective infrastructure across the world. As far as the policy and capacity building interventions are concerned, the country is moving in the right direction [8].

Case Study of Jammu and Kashmir Floods, 2014

The state is a multi-hazard susceptible region with natural disasters like earthquakes, floods, landslides, avalanches, high velocity winds, snow storms, besides manmade disasters including road accidents and fires etc. Low-lying areas of the Kashmir Valley, are prone to floods that occur due to heavy rainfall in upper catchment areas. On September 2014, the heavy rainfall in the upper catchment areas caused devastating floods in the low lying areas of Kashmir valley claiming at least 280 lives and stranded of thousands of residents.

Jammu and Kashmir State Disaster Management Plan foresees the precise assessment of risk and vulnerability to disasters in the State of Jammu and Kashmir. The plan suggests to attain its stated goals by strengthening capacities and designing preparedness measures that are embedded in socio-cultural, economic, ecological and technological aspects of risks and unpredictability, affecting diverse populations of the State. The plan demarcates strategies for proper coordination and allocation of roles and responsibilities of each government department and other stakeholders involved. The plan also has provisions of reviewing and updating plan annually [10].

5.6 Initiatives Under Target 6

The Intergovernmental Panel on Climate Change (IPCC) reveals that India, one of the most vulnerable countries in the world to global warming, will face the challenge of climate change in the coming years. The report states that agricultural economies such as India will be adversely affected due to the ramifications of global warming—including intense heatwaves, floods and droughts, water stress, and reduced food production.

Integrating Climate Action in Policies, Strategies and Planning

Way back in 2008, India had adopted the National Action Plan on Climate Change (NAPCC), which outlines a comprehensive strategy to deal with climate change-related problems and issues while building on solutions based on advanced technologies.⁷⁵ As many as 32 States/UTs have a State Action Plan for Climate Change (SAPCC). States are increasingly coming up with climate-related policy instruments (e.g. there are currently 19 wind and 15 solar policies) to fight climate change.

On the global front, India plays a leadership role in climate action. India is an active participant in the United Nations Framework Convention on Climate Change (UNFCCC) and provides technical expertise and assists in the analysis and review of climate change information and the implementation of the Kyoto mechanism.⁷⁷ India strongly supported the Paris Agreement in 2015 and proclaimed its bold nationally determined contributions (NDCs) to achieve by 2030 reduced emissions intensity of GDP by 33-35 per cent from 2005 level; about 40 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources; and an additional carbon sink of 2.5 to 3 billion tonnes of carbon dioxide amounting through additional forest and tree cover [8].

Clean Energy

A target of 175 GW of renewable energy generation capacity by 2022 (100 GW from solar, 60 GW from wind, 10 GW from biomass and 5 GW from small hydropower) has been set, which has recently been increased to 228 GW. India's Renewable Energy installed capacity has grown from 38.9 GW on 31st March 2015 to 82.58 GW on 30th September 2019 [8].

Emission Intensity

The National Electricity Policy finalized in 2018 forecasts a decline in fossil fuel capacity from 218 GW or 67 per cent of installed capacity in 2017 to 264 GW or 43 per cent of total installed capacity by 2027. Solar installed capacity in India has increased by about 12 times from 2.63 Gigawatt (GW) to 31.1 GW between March 2014 and September 2019. The share of non-fossil sources in installed capacity of electricity generation increased from 30.5 per cent in March 2015 to 35.22 per cent in September 2019. Supercritical thermal power units have increased from 40 (27.48 GW in 2015) to 66 (45.55 GW in 2018) with avoided emissions amounting to 7 MtCO₂ in 2016-17. A total of 170 old thermal generation units having a higher heat rate and a cumulative capacity of 10.64 GW have been emeritus till March 2018. India has been able to bring the emissions intensity of GDP down by 21 per cent below 2005 levels by 2014 [8].

Solid Waste Management Rules, 2016

Earlier the Municipal Solid Waste Rules, 2000 was based on centralized system of waste management in which the community participation was meager and also unsustainable. On the hand, the rules of 2016 focused on decentralized approach promoting the mantra of handle your own filth. Centralized system fostered the landfill site method. The landfill site pollutes the environment contaminating the groundwater, emitting toxic gases etc. The latter approach

reduced the pressure of dumping the waste on landfill site due to treatment of waste on site composting or Biomethanation methods. For recyclable wastes, the rules require setting up of a material recovery facility and setting up of waste to energy plants. It also states that the societies having area more than 5000 sq. mt. are responsible for their own waste management. This would reduce the waste load to the landfill site significantly. The new rules if followed and implemented would transform the waste management system in the country.

5.7 Initiatives Under Target 7

Various studies indicate a direct correlation between how much land cities allocate to streets, in the form of public spaces, and its level of prosperity. In order to secure the provision of public space and creating more livable cities, the integration of public space in local, regional and national policies and framework is essential and also promotes sustainability. Public spaces are linked to other goals such as SDG 3, SDG 5, SDG 8 and SDG 13 and are key for the achievement of the goals. Public spaces should be the part of local and municipal plans. Citywide policies and strategies should ensure planning, as well as design and management of public spaces at different scales. Without a clear policy, it is difficult for local governments to prioritize, spend and plan resources and to show how much public space is valued. Also the accessibility infrastructure provisions to public spaces is of utmost importance for people with disabilities allowing them for an independent living and equal participation and to enjoy their civic, cultural, political, social and economic rights and entitlements. The following case study of India demonstrates the approach to create an all-inclusive environment for all the sections of society.

Case Study of an Example of India's Approach to Disability Regulations

In India, discrete accessibility standards and guidelines are available for roads, buildings, highways, buses, etc. Some ministries have mandated their incorporation, especially in new projects and retrofitting. To build a hospital, theatre, stadium or any other public building in Delhi, consent with the National Building Code (NBC) is mandatory. For Delhi's city roads and street design, one must assent with the UTTIPEC (2010) Street Design Guidelines. Road-based public transport vehicles, such as buses, should accede with Urban Bus Specifications (UBS) I & II (IUT, undated). The accessibility of government websites in India should follow National Informatics Centre (NIC) regulations. NIC's website is accessible to all users irrespective of the device used (computer, mobile phone, etc.), its technology or the ability of the user. For example, a user with a visual disability can access this website using adaptive technologies, such as screen readers and magnifiers [11].

CONCLUSION

Urban issues are an entry agenda and are cross-cutting for many other SDGs and targets. This calls for policy coherence and the need to build vertical and horizontal systems of collaboration and monitoring. Enhancing political, legal and institutional frameworks, coordination mechanisms as well as financial support at the local levels is also needed. Urban local bodies can link local urban stakeholders and actors and promote coordination among them in ways that facilitate engagement in the policy and institutional frameworks that are useful for the achievement of SDGs at the local levels. To leave no one behind, governments and urban managers need to invest in smart and green integrated transport systems that are inclusive, safe, accessible and affordable. SDG target 11.2 provides an entry point to monitor urban transport systems for the first time at the global level. Efficient transport and mobility systems are at the core of poverty and exclusion policies.

Access to adequate housing contributes to various economic, social and cultural aspects of development for individuals, households and communities, making this new indicator a strong predictor of the right to housing. Efficient land use is paramount for the sustainable development of cities. Effective urban planning relies on up-to-date data and the participation of all urban stakeholders. Today, no place is immune to disasters, necessitating the need to consider disaster risk reduction and resilience strategies into the urban development process. The interconnected nature of SDG 11 and the Sendai Framework offer a unique opportunity for collective local and global action towards risk reduction and enhanced resilience. However, governments must localize disaster risk reduction strategies, including the development of frameworks that support generation of disaster related data close to real time to allow informed decisions on risk exposure.

SDG 11 targets and indicators require new partnerships at the local, national and global levels to succeed. All the targets and indicators of SDG 11 require sufficient planning and informed strategies, which are largely articulated in the need to have well-informed national urban policies. India has existing national urban policies and has shown commitment to development of national urban policies that are needed to guide urban growth that is line with the aims of the SDGs 2030. All these targets and indicators should not be examined in isolation. They are fundamentally integrated and interdependent, as the overall agenda for sustainable development. Understanding better the range of positive and negative interactions among them is key to unlocking their full potential. Connecting land to housing, transport, air quality, public space, participatory planning will permit to develop synergetic interactions with long-lasting results, a key ingredient for ensuring the success of sustainable urban development.

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