सत्यमेव जयते
NITI Aayog

DEVELOPMENT MONITORING AND EVALUATION OFFICE

Urban Transformation

Sector Report

July 2021

Analysis by Ernst & Young (Lead Member) and
Athena Infonomics (Consortium Partner)
Survey Partner Lattice Solutions

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PREFACE

The Government of India (GoI) spends close to Rs. 14 lakh crores annually on development activities, through nearly 750 schemes implemented by Union Ministries. To improve the effectiveness and efficiency of public finance, and the quality of service-delivery to citizens, all schemes have been mandated to undergo third party evaluations, to provide an evidentiary foundation for scheme continuation from 2021-22 to 2025-26. In 2019, the Development Monitoring and Evaluation Office (DMEO), NITI Aayog was assigned the task of evaluating 28 Umbrella Centrally Sponsored Schemes (UCSS), which are schemes/programmes funded jointly by the Centre and the States and implemented by the States. This historic exercise, undertaken between April 2019 and February 2021, evaluated 125 Centrally Sponsored Schemes (CSS), under 10 Sectors, together covering close to 30% of the GoI's development expenditure, amounting to approximately Rs. 3 lakh crore (USD 43 billion) per annum.

In order to fulfil this mandate to the highest standard possible, to optimize both the robustness and the uptake of the evidence generated, DMEO adopted a nationally representative mixed methods evaluation methodology and a consultative review process for the reports. Through qualitative and quantitative analysis of secondary literature, analysis was done at three levels: the sector, the umbrella CSS and the scheme itself. The studies thus produced then underwent a review process involving consultations with NITI Aayog subject matter divisions, concerned Ministries and Departments, and external experts.

The present report is an outcome of this evaluation study and presents an analysis of the Urban Sector based on primary and secondary data collection. In this Report, we seek to cover the urban sector in India, identifying the intended and actual contribution of GoI schemes to sector outcomes. This includes areas for more focused effort to achieve national priorities/SDGs. It also identifies opportunities for convergence of the schemes within the sector to other developmental programmes of the Central and the State Governments as well as with private sector, international, multilateral and bilateral aid, etc.

We hope that this Report will further our understanding of the Urban Sector and help us move towards achieving the Sustainable Development Goals and the National Development Agenda, to promote the well-being of all sovereign citizens of India.

Acknowledgements

We would like to express our gratitude to Dr. Rajiv Kumar, Vice-Chairman NITI Aayog, and Shri Amitabh Kant, Chief Executive Officer, who have been the driving force, first in entrusting this important responsibility to the Development Monitoring and Evaluation Office (DMEO) and subsequently as mentors throughout the study, in providing all necessary support and guidance for the completion of the project. We also express our gratitude to the Ministry of Finance for recognizing the crucial need for evidence in the deliberations and decisions pertaining scheme budget allocations.

Our invaluable partners in this exercise have been the Ministry of Housing and Urban Affairs, with all its officials, without whose cooperation this evaluation would not have been possible. We are grateful to them for providing us access to available data, for patiently sharing their expertise through Key Informant Interviews (KIIs), and for providing their vital comments on the draft reports during various stages of the study. A detailed list of the Key Informant Interviews can be found in the annexures to this report.

In our federal structure, equally important partners in this endeavour have been the State Governments of Andhra Pradesh, Bihar, Chandigarh (UT), Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and Uttarakhand, and their Chief Secretaries. Officials across the State governments have extended their gracious cooperation to the study, for which we are deeply thankful.

Next, we must thank our external experts, Mr. Partha Mukhopadhyay, Senior Fellow, Centre for Policy Research and Mr. Srikanth Viswanathan, Chief Executive Officer, Janaagraha Centre for Citizenship and Democracy for helping refine and rationalize the report through their insightful comments, corrections, and feedback. From the fundamentals of the sector to the latest developments, they helped ensure that the report was as comprehensive, cogent, and technically robust as possible, within the short timeframes available.

M/s Ernst and Young LLP. and Athena Infonomics (consortium partner), the consultant firm, has done a remarkable job, particularly given the significant challenges of scale, time and resources presented by this project. Adding to the constraints, the global pandemic and the COVID-19 lockdown did not stop them from delivering top quality work. Particular appreciation is due to Mr. Shrinivas Kowligi, Partner and his team, Mr. GSK Chaitanya (Vice President), Ms. Anima Gupta (Manager), Mr. Srikanth Kireeti Katam (Senior Associate), Mr. Naveen CG (Associate), Mr. Abhishek Mahajan (Executive), Mr. Ankit Chatri (Associate Director), Ms. Anupama Ramaswamy (Lead Consultant), Ms. Shruti Viswanathan (Lead Consultant), Mr. Narendra Bhalla (Associate Consultant), Ms. Kun Zhang (Program Manager), Dr. Rajivan (Economist- Advisor) from the E&Y and Athena Infonomics team and the field partners – Lattice Solutions.

At NITI Aayog, this exercise would not have gotten off the ground without the consistent support of the Procurement Management Committee and Bid Evaluation Committee, particularly Late Mr. Sonjoy Saha, Adviser (PPP/PAMD), Dr. A.P Singh, Ex-Adviser (Agriculture) and Ms. Sanchita Shukla, the then Director, Internal Finance Division. Staffs at the NITI Aayog Managing Urbanization vertical, particularly Mr. K Rajeswara Rao (Additional Secretary), Mr. Parag Gupta (Ex-Adviser), Mr. Sanjay Kumar (Director), Dr. Bishwanath Bishoi (Deputy Adviser) and Mr. Dhiraj Santdasani (Young Professional) have also been

instrumental in seeing this project to fruition. The Internal Finance Division further merits special mention here for their extensive efforts.

DMEO team has been at the core of the studies - in this sector specifically, Ms. Tanvi Bramhe, Young Professional, Mr. Harish, Senior Statistical Officer, Mr. Asad Fatmi, Young Professional and Ms. Anjum Dhamija, Consultant worked on every detail of this herculean endeavour, under the guidance of Mr. S.P Srivastava, Director and Mr. Venugopal Mothkoor, Monitoring and Evaluation Specialist. Across packages, Deputy Director General Mr. Ashutosh Jain also oversaw coordination, standardization and monitoring of the study design, analysis, and implementation processes. They were supported by the Evaluations Core Team: Dr. Shweta Sharma, Mr. Anand Trivedi, Ms. Sanjana Manaktala, Ms. Vatsala Aggarwal, Mr. O.P. Thakur and Mr. Jayanta Patel. The DMEO administration and accounts officers, including Mr. D. Bandopadhyay, Mr. Munish Singhal, Mr. D.S. Sajwan, Mr. Manoj Kumar and others provided vital support on documentation, approvals, payments etc.

In accordance with the massive scope and scale of the exercise, this report owes its successful completion to the dedicated efforts of a wide variety of stakeholders.

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List of Abbreviations

A&OE	Administrative and Office Expenses
AAC	Autoclaved Aerated Concrete
AB	Ayushman Bharat
ABD	Area Based Development
ABSH	Annuity Based Subsidised Housing
ADA	Agra Development Authority
ADB	Asian Development Bank
AEGR	Annual Exponential Growth Rate
AFD	Agence Française de Développement
AGSH	Annuity cum capital Grant based Subsidized Housing
AHP	Affordable Housing in Partnership
AIF	Alternate Investment Fund
AIP	Annual Implementation Plan
ALF	Area Level Federation
AMC	Annual Maintenance Contract
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AP	Andhra Pradesh
APRPRP	Andhra Pradesh Rural Poverty Reduction Programme
APUFIDC	Andhra Pradesh Urban Finance and Development Corporation
ARC	Administrative Reforms Commission
ASHA	Accredited Social Health Activist
ASICS	Annual Survey of India's City-Systems
ATR	Action Taken Report
BCG	Boston Consulting Group
BLC	Beneficiary-led Individual house Construction
BMC	Bhubaneshwar Municipal Corporation
BMGF	Bill and Melinda Gates Foundation
BMTC	Bengaluru Metropolitan Transport Corporation
BMTPC	Building Materials and Technology Promotion Council
BoI	Bank of India
BOT	Build Operate Transfer
BPL	Below Poverty Line
BRT	Bus Rapid Transit
BSCL	Bhubaneshwar Smart City Limited
BSUP	Basic Services for Urban Poor
BUIDCO	Bihar Urban Infrastructure Development Corporation Ltd
BUMT	Build, Use, Maintain and Treat
C&D	Construction and Demolition
CA	Central Assistance
CAA	Constitutional Amendment Act
CAG	Comptroller and Auditor General of India
CAPI	Computer Assisted Personal Interviews
CASE	Commissioner as Chief Executive
CB	Capacity Building
CB&T	Capacity Building and Training
CBO	Community Based Organisation
CBUD	Capacity Building for Urban Development
CCBP	Comprehensive Capacity Building Programme

CCTV	Closed Circuit Television
CDAC	Centre for Development of Advanced Computing
CDP	City Development Plan
CDS	Community Development Societies
CE	Chief Engineer
CEO	Chief Executive Officer
CEPT	Centre for Environmental Planning and Technology
CGTMSE	Credit Guarantee Fund Trust for Micro and Small Enterprises
CIDCO	City and Industrial Development Corporation
CII	Confederation of Indian Industry
CIIF	Confederation of Indian Industry Foundation
CITIIS	City Investments to Innovate, Integrate and Sustain
CLAF	City Level Advisory Forum
CLAP	CLSS Awas Portal
CLC	City Livelihood Centre
CLF	City Level Federation
CLSS	Credit Linked Subsidy Scheme
CLTC	City Level Technical Cell
CMMU	City Mission Management Unit
CO	Community Organiser
CoE	Centres of Excellence
COVID-19	Corona Virus Disease, 2019
CPCB	Central Pollution Control Board
CPF	Community Participation Fund
CPHEEO	Central Public Health and Environmental Engineering Organisation
CPL	Community Participation Laws
CPPR	Centre for Public Policy Research
CPR	Centre for Policy Research
CPSE	Central Public Sector Enterprises
CPWD	Central Public Works Department
CREDAI	Confederation of Real Estate Developers' Association of India
CRP	Community Resource Person
CRSP	Central Rural Sanitation Programme
CSE	Centre for Science and Environment
CSMC	Central Sanctioning and Monitoring Committee
CSO	Civil Service Organisation
CSP	City Sanitation Plan
CSR	Corporate Social Responsibility
CSS	Centrally Sponsored Scheme
CSTEP	Centre for Study of Science, Technology and Policy
CT	Community Toilet
CUE	Canadian Universities Event
DAC	Development Assistance Committee
DAY-NULM	Deendayal Antyodaya Yojana - National Urban Livelihood Mission
DBT	Direct Benefit Transfer
DCC	District Consultative Committee
DEEM	Directly Elected Executive Mayor
DEWATS	Decentralised Wastewater Treatment Systems
DFID	Department for International Development
DHP	Demonstration Housing Projects
DISE	District Information System for Education

DLAMC	District Level Advisory and Monitoring Committee
DLRMC	District Level Review and Monitoring Committee
DMEO	Development Monitoring and Evaluation Office
DMICDC	Delhi–Mumbai Industrial Corridor Project
DPR	Detailed Project Report
DROH	Direct Relationship Ownership Housing
DRRH	Direct Relationship Rental Housing
EAP	Employee Assistance Program'
EBTC	European Business Technology Centre
ECBC-R	Energy Conservation Building Code for Residential
ECBC-R	External Commercial Borrowing
EDP	Entrepreneurship Development Programme
EE	Executive Engineer
EESL	Energy Efficiency Services Limited
EIB	European Investment Bank
E-MAAS	Municipality as a Service
EMI	Equated Monthly Instalment
EPC	Engineering, Procurement and Construction
EPIC	Elector's Photo Identity Card
EPR	Extended Producers Responsibility
EST&P	Employment through Skill Training and Placement
EV	Electric Vehicle
EWS	Economically Weaker Section
FAR	Floor Area Ratio
FC	Finance Commission
FFC	Fourteenth Finance Commission
FGDs	Focussed Group Discussions
FICCI	Federation of Indian Chambers of Commerce & Industry
FS	Faecal Sludge
FSI	Floor Space Index
FSSM	Faecal Sludge and Septage Management
FSTP	Faecal Sludge Treatment Plant
FT	Fast Track
FY	Financial Year
FYP	Five Year Plan
GDP	Gross Domestic Product
GFC	Garbage Free Cities
GFRG	Glass Fibre Reinforced Gypsum
GHTC	Global Housing Technology Challenge
GIS	Geographic Information Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GLSH	Government Land Based Subsidised Housing
GoI	Government of India
GPS	Global Positioning System
GST	Goods and Services Tax
GT	Grant Thornton
GUDCL	Gujarat Urban Development Company Limited
GUI	Graphical User Interface
GUMS	Green Urban Mobility Scheme
HFA	Housing for All
HFAPoA	Housing for All Plan of Action

HFCs	Housing Finance Companies
HH	Household
HLRN	Housing and Land Rights Network
HPEC	High Powered Expert Committee
HR	Human Resource
HRIDAY	Heritage City Development and Augmentation Yojana
HUDCO	Establishment of Housing and Urban Development Corporation
HUIDB	Haryana Urban Infrastructure Development Board
I&SP	Innovations and Special Projects
IAP2	International Association for Public Participation
IAS	Indian Administrative Services
IBEF	India Brand Equity Foundation
ICCC	Integrated Command and Control Centre
ICDS	Integrated Child Development Scheme
ICDS	Integrated Child Development Services
ICICI	Industrial Credit and Investment Corporation of India
ICLEI	Local Governments for Sustainability
ICT	Information and Communications Technology
IDSMT	Integrated Development of Small and Medium Towns
IEBR	Internal and Extra Budgetary Resources
IEC	Information, Education and Communication
IFD	Integrated Financial Division
IFI	International Financing Institute
IGR	Investible Grade Rating
IHHL	Individual Household Latrine
IHSDP	Integrated Housing and Slum Development Programme
IIHS	Indian Institute for Human Settlements
IIT	Indian Institute of Technology
ILO	International Labour Organisation
INR	Indian National Rupee
IoT	Internet of Things
IPC	Indian Penal Code
IPT	Intermediate Public Transit Systems
IRMA	Independent Review and Monitoring Agency
ISC	India Sanitation Coalition
ISRO	Indian Space Research Organisation
ISSR	“In-Situ” Slum Redevelopment
IT	Information Technology
IT&ITES	Information Technology and Enabled Services
ITDP	Institute for Transportation and Development Policy
ITMS	Intelligent Traffic Management System
IUT	Institute of Urban Transport
IVRS	Interactive Voice Response System
JBY	Janashree Bima Yojna
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Programme
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
JSA	Jal Shakti Abhiyan
KfW	Kreditanstalt für Wiederaufbau
KIIs	Key Informant Interviews
KUIDFC	Karnataka Urban Infrastructure Development and Finance Corporation

KURDFCL	Kerala Urban & Rural Development Finance Corporation Ltd
KWSPFT	Karnataka Water and Sanitation Pooled Fund Trust
LED	Light Emitting Diode
LGSFS	Light Gauge Steel Framed Structures
LHP	Light House Projects
LIC	Low Income Categories
LIG	Low Income Group
LSG	Local Self Government
LSWM	Liquid and Solid Waste Management
LWM	Liquid Waste Management
M/o EF&CC	Ministry of Environment, Forest, and Climate Change
M/o HUA	Ministry of Housing and Urban Affairs
MDCH	Mixed Development Cross-subsidised Housing
MDGs	Millennium Development Goals
MDWS	Ministry of Drinking Water and Sanitation
MEPMA	Mission for Elimination of Poverty in Municipal Areas
MES	Modular Employable Skills
MHM	Menstrual Hygiene Management
MIG	Middle Income Group
MIS	Management Information System
MLA	Member of Legislative Assembly
MLD	Million Litres Per Day
MMS	Mid-day Meal Scheme
MMU	Mission Management Unit
MoEF	Ministry of Environment and Forest
MoEFFC	Ministry of Environment, Forests and Climate Change
MoHFW	Ministry of Health and Family Welfare
MoHRD	Ministry of Human Resources Development
MoHUA	Ministry of Housing and Urban Affairs
MoHUPA	Ministry of Housing and Poverty Alleviation
MoJS	Ministry of Jal Shakti
MOOCs	Massive Open Online Courses
MoSJE	Ministry of Social Justice and Empowerment
MOSPI	Ministry of Statistics and Programme Implementation
MoU	Memorandum of Understanding
MoUD	Ministry of Urban Development
MoWRRFG	Ministry of Water Resources, River Development and Ganga Rejuvenation
MP	Madhya Pradesh
MP	Member of Parliament
MPUDC	Madhya Pradesh Urban Development Company Limited
MRF	Material Recovery Facility
MRSI	Market Research Society of India
MRTS	Mass Rapid Transit System
MSME	Micro, Small and Medium Enterprises
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
MTPA	Million Tonnes Per Annum
MUIDCL	Maharashtra Urban Infrastructure Development Company Limited
NAPCC	National Action Plan on Climate Change
NARC	National Advisory and Review Committee
NBA	Nirmal Bharat Abhiyan

NBC	National Building Code
NCAER	National Council of Applied Economic Research
NCE	New Climate Economy
NCR	National Capital Region
NCRB	National Crime Records Bureau
NCT	National Capital Territory
NE	North Eastern States
NFSA	National Food Security Act
NFSSM	National Faecal Sludge, and Septage Management
NGO	Non-Governmental Organization
NGT	National Green Tribunal
NHAI	National Highways Authority of India
NHB	National Housing Bank
NHHP	National Housing and Habitat Policy
NHM	National Health Mission
NHP	National Housing Policy
NIC	National Informatics Centre
NIF	National Indicator Framework
NIIF	National Investment and Infrastructure Fund
NIPFP	National Institute of Public Finance and Policy
NIT	Notice Inviting Tenders
NITI	National Institution for Transforming India
NIUA	National Institute of Urban Affairs
NMMU	National Mission Monitoring Unit
NMSH	National Mission on Sustainable Habitat
NMT	Non-Motorised Transport
NRLM	National Rural Livelihoods Mission
NRSC	National Remote Sensing Centre
NRW	Non-Revenue Water
NRY	Nehru Rojgar Yojna
NSAP	National Social Assistance Programme
NSDC	National Skill Development Corporation
NSDM	National Skill Development Mission
NSDP	Net State Domestic Product
NSQF	National Skill Qualification Framework
NSS	National Sample Survey
NSSF	National Small Savings Fund
NSSO	National Sample Survey Organisation
NUHHP	National Urban Housing and Habitat Policy
NUHM	National Urban Health Mission
NUIS	National Urban Innovation Stack
NULM	National Urban Livelihood Mission
NUPF	National Urban Policy Framework
NUSP	National Urban Sanitation Policy
O&M	Operation and Maintenance
OBC	Other Backward Class
OBPS	Online Building Permission System
OD	Open Defecation
ODF	Open Defecation Free
OECD	Organisation for Economic Co-operation and Development
ORF	Observer Research Foundation

OTP	One Time Password
OUIDF	Odisha Urban Infrastructure Development Fund
PAiSA	Portal for Affordable Credit and Interest Subvention Access
PARAS	Personalised After-training Rapid Assessment System
PDMC	Project Development and Management Consultants
PDS	Public Distribution System
PEARL	Peer Experience and Reflective Learning
PFMS	Public Financial Management System
PIB	Press Information Bureau
PLI	Primary Lending Institutions
PMAY (U)	Pradhan Mantri Awas Yojana (Urban)
PMC	Project Management Consultancy
PMEGP	Pradhan Mantri Employment Generation Programme
PMIDCL	Punjab Municipal Infrastructure Development Company
PMIUPEP	Prime Minister's Integrated Urban Poverty Eradication Programme
PMJAY	Pradhan Mantri Jan Arogya Yojana
PMJDY	Pradhan Mantri Jan-Dhan Yojana
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
PMMY	Pradhan Mantri Mudra Yojana
PMU	Project Management Unit
PMUY	Pradhan Mantri Ujjawala Yojana
POSHAN	Prime Minister's Overarching Scheme for Holistic Nutrition
PPCP	Public, Private, Community Partnership
PPP	Public Private Participation
PT	Public Toilet
PWC	Pricewaterhouse Coopers
PWD	Public Works Department
PwDs	People living with different abilities
QC	Quality Control
R&D	Research and Development
RAY	Rajiv Awas Yojana
RBI	Reserve Bank of India
RCC	Reinforced Concrete
RCUES	Regional Centre for Urban & Environmental Studies
REESI+E	Relevance, Effectiveness, Efficiency, Sustainability, Impact, and Equity
RERA	Real Estate Regulatory Authority
RF	Revolving Fund
RMC	Rajkot Municipal Corporation
RO	Resource Organisation
RRTS	Regional Rapid Transit System
RSBY	Rashtriya Swasthya Bima Yojana
RTE	Right to Education
RTP	Rapid Training Program
RUDSICO	Rajasthan Urban Drinking Water Sewerage & Infrastructure Corporation Limited
RWA	Residents Welfare Association
SAAP	State Annual Action Plan
SBI	State Bank of India
SBK	Swachh Bharat Kosh
SBM	Swachh Bharat Mission
SBM (G)	Swachh Bharat Mission (Gramin)
SBM (U)	Swachh Bharat Mission (Urban)

SC	Scheduled Caste
SCADA	Supervisory Control and Data Acquisition
SCAF	Smart City Advisory Forum
SCH	Smart Cities Hub
SCM	Smart Cities Mission
SCP	Smart City Proposal
SCSP	Scheduled Caste Sub Plan
SDG	Sustainable Development Goals
SE	Superintending Engineer
SEBI	Securities and Exchange Board of India
SECC	Socio-Economic Caste Census
SEP	Self-Employment Programme
SEP-G	Self-Employment Programme - Group
SEP-I	Self-Employment Programme - Individual
SFC	State Finance Corporation
SFD	Shit Flow Diagram
SGSY	Swarnajayanti Gram Swarojgar Yojana
SHG	Self Help Group
SHPC	State High Powered Committee
SHPSC	State High Power Steering Committee
SJSRY	Swarna Jayanti Shahari Rozgar Yojana
SLAC	State Level Appraisal Committee
SLB	Service Level Benchmarks
SLBC	State Level Bankers Committee
SLIP	Service Level Improvement Plan
SLNA	State Level Nodal Agencies
SLSMC	State Level Sanctioning and Monitoring Committee
SLTC	State Level Technical Cell
SM&ID	Social Mobilisation and Institutional Development
SMC	Shelter Management Committee
SMD	State Mission Directorate
SMMU	State Mission Management Unit
SMS	Short Message Service
SoR	Schedule of Rates
SoS	Sanitation in Schools
SPA	School of Planning and Architecture
SPARK	Systematic Progressive Analytical Real-time Ranking
SPV	Special Purpose Vehicle
SSA	Sarva Shikha Abhiyan
ST	Scheduled Tribe
STeP	Sanitation Technology Platform
STEP-UP	Skill Training for Employment Promotion amongst Urban Poor
STP	Sewage Treatment Plant
STPs	Skill Training Providers
SUH	Shelter for Urban Homeless
SUSV	Support to Urban Street Vendors
SWM	Solid Waste Management
TASC	Technical Assistance for Smart Cities
TCPO	Town and Country Planning Organisation
TDR	Transfer of Development Rights
TIF	Tax Increment Financing

TNPVS	Tamil Nadu Pudhu Vazhvu Society
TNUDF	Tamil Nadu Urban Development Fund
TNUIFSL	Tamil Nadu Urban Infrastructure Financial Services
TNWSPFT	Tamil Nadu Water and Sanitation Pooled Fund Trust
TOC	Theory of Change
TOD	Transit Oriented Development
TPD	Tonnes per day
TPQM	Total Productivity and Quality Management
TPQMA	Third Party Quality Monitoring Agencies
TSC	Total Sanitation Campaign
TSU	Technical Support Unit
TUFIDC	Telangana Urban Finance Infrastructure Development Corporation
TUFIDCO	Tamil Nadu Urban Finance and Infrastructure Development Corporation Ltd
TULIP	The Urban Learning Internship Program
TVC	Town Vending Committee
UBSP	Urban Basic Services for Poor
UC	Utilization Certificate
UCDN	Urban Community Development Network
UCHC	Urban Community Health Centre
UD	Urban Development
UGSS	Under Ground Sewerage System
UIDAI	Unique Identification Authority of India
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
UIG	Urban Infrastructure and Governance
ULB	Urban Local Body
ULCRA	Urban Land (Ceiling and Regulation) Act
UMC	Urban Management Centre
UN	United Nations
UNCRD	United Nations Centre for Regional Development
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNPFA	United Nations Population Fund
UP	Uttar Pradesh
UPHC	Urban Primary Health Centre
URDPFI	Urban and Regional Development Plan Formulation and Implementation
USD	United States Dollar
USEP	Urban Self-Employment Programme
USHA	Urban Statistics for Human Resources and Assessment
UT	Union Territory
UWEP	Urban Wage Employment Programme
UWSP	Urban Women Self-Help Programme
VAMBAY	Valmiki Ambedkar Awas Yojana
VGF	Viability Gap Funding
VMS	Variable Message Sign
VTO	Vacuum Truck Operators
WASH	Water, Sanitation and Hygiene
WB	World Bank
WBIDFC	West Bengal Infrastructure Development Finance Corporation Ltd
WCD	Women and Child Development
WEF	World Economic Forum
WHO	World Health Organisation

WO	Work Order
WSP	Water and Sanitation Program
WSPFT	Water & Sanitation Pooled Financing Trusts
WTE	Waste-to-Energy

1 Introduction

The Government of India (GoI) has assigned National Institution for Transforming India (NITI Aayog) the responsibility of conducting third party evaluation of Centrally Sponsored Schemes (CSS) for ten sectors, including the Urban sector. NITI Aayog has selected EY for undertaking the evaluation of CSS in the Urban Transformation sector.

Objectives of the Study

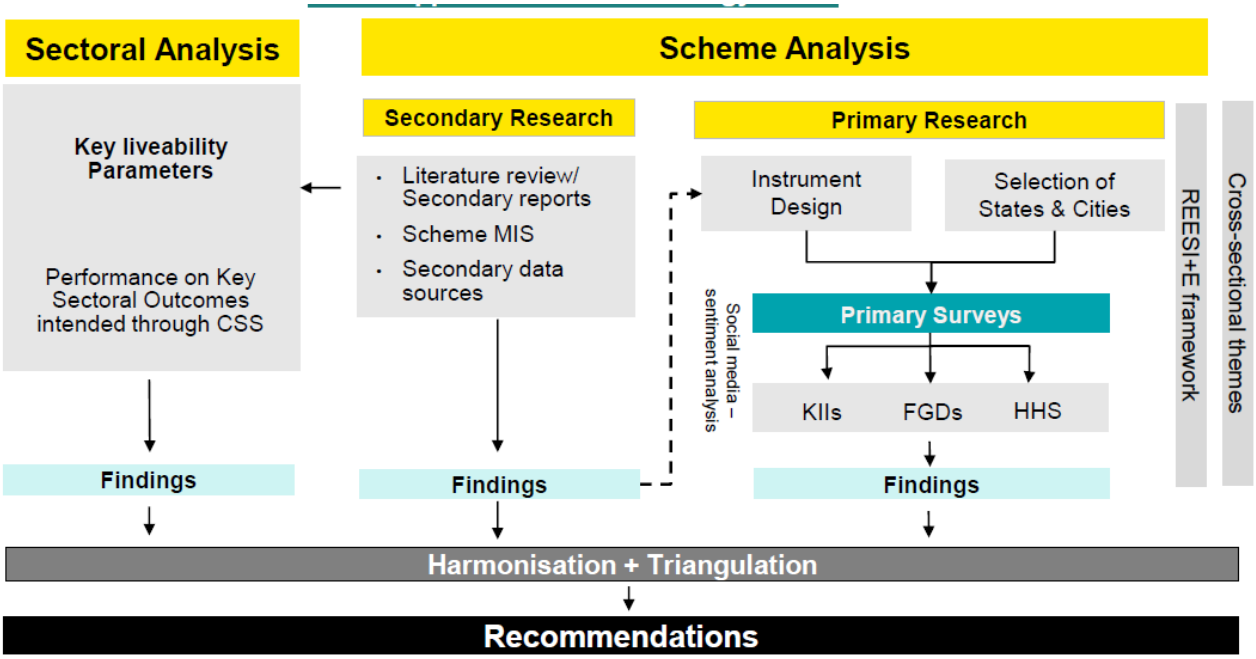
The objective of the study is to assess the performance of Urban sector in India and evaluate the five urban CSS. The findings of the evaluation study may be used by appropriate authorities for the rationalization of the schemes and also as an input for the 15th Finance Commission.

The broad objectives of the study are to:

- Undertake a detailed Urban sector analysis to understand the status of the sectoral performance and its alignment with the Global and National agenda,
- Qualitatively and quantitatively evaluate the contribution of CSS schemes against their intended outcomes and assess their impact on overall liveability of urban India,
- Assess each of the five CSS schemes - Pradhan Mantri Awas Yojana (Urban) (PMAY(U)), Smart Cities Mission (SCM), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Swachh Bharat Mission (SBM), and National Urban Livelihood Mission (NULM)) against their objectives using the REESI+E framework and cross-cutting themes,
- Identify and highlight scalable best practices and home-grown innovations, and create case studies for further dissemination, and
- Recommend on the way-forward for each of the schemes.

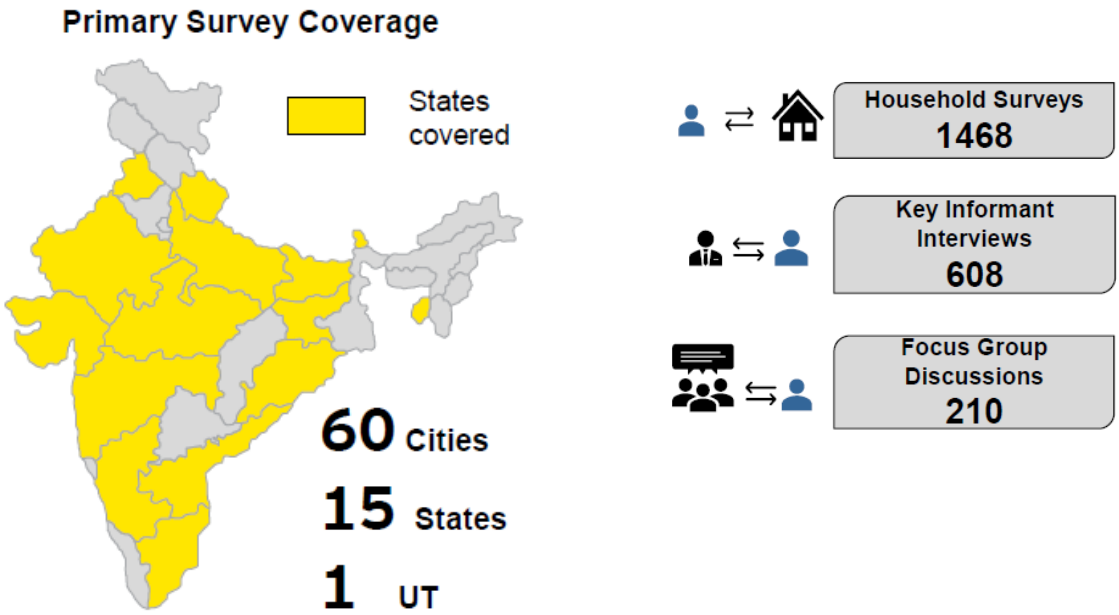
Approach & Methodology

A detailed approach and methodology framework for the study was presented and approved at the Inception Report stage and subsequent discussions. The evaluation of schemes was undertaken using the REESI+E framework. For each scheme, areas of enquiry were identified against each of the REESI+E principles. Secondary data, including data from MIS obtained from the Missions and other secondary reports has been used for assessing performance of the schemes and mapped to the areas of enquiries within the REESI+E matrix. The following chart presents a summary of the study methodology.



Primary surveys were used to validate the inferences on scheme performance arrived at during the secondary research. A detailed approach was planned for undertaking the primary surveys exercise across select States, data analyses and triangulation with the secondary research. Due to the ongoing COVID-19 pandemic

situation across the country, there were some challenges faced during the process of conducting primary surveys. However, all primary surveys were completed with some modifications.



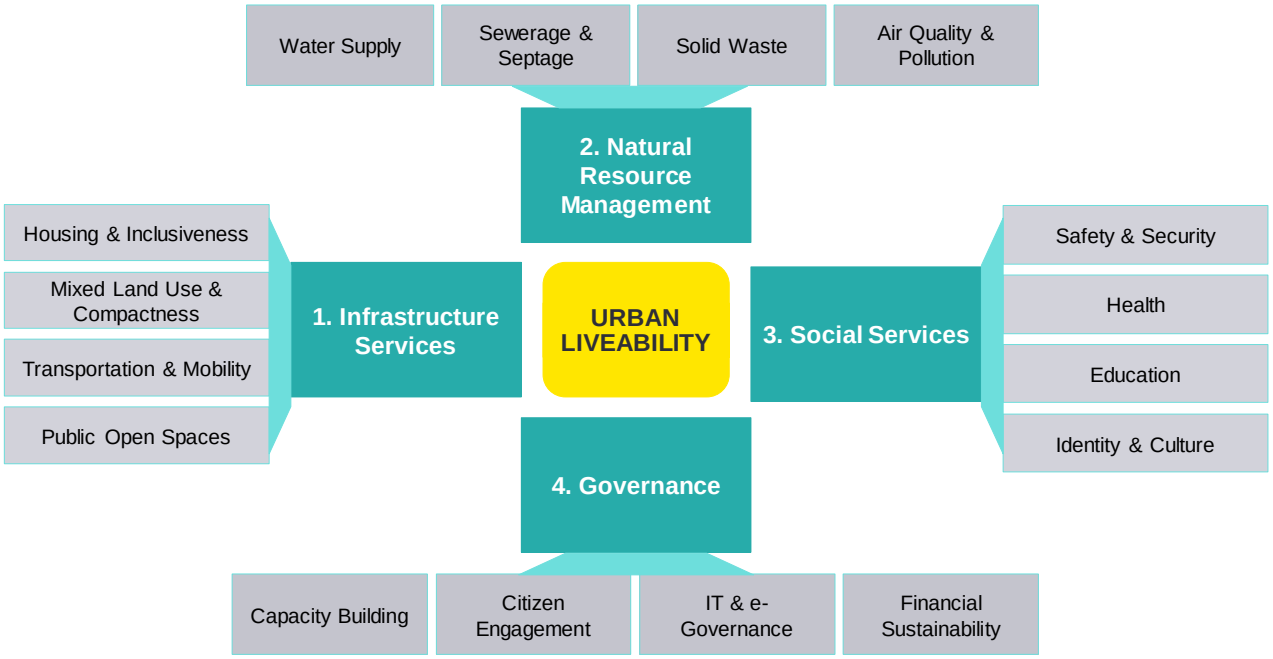
Urban Development in India and sector performance

Urbanisation in India has seen rapid growth in the last few decades. Urban population has grown from 28.61 crores in 2001 (27.82 per cent of total population) to 37.71 crores in 2011 (31.15 per cent) - which is estimated to be 48.3 crores (34.9 per cent) in 2020 (United Nations, 2018). During the same period, number of urban households living in slums has increased from 1.01 crores to 1.37 crores. However, the percentage of these urban households living in slums has reduced from 23.5 per cent (2001) to 17 per cent (2011). Urban poverty too has reduced from 25.7 per cent (2004-05) to 13.7 per cent (2011-12). Most importantly, cities contributed 60 percent of India's GDP in 2011.

The demand on urban infrastructure and urban services is continuously increasing, and it is being compounded by other related trends – a large share of young population, increasing population numbers of urban poor and their low-income levels. As per the HPEC report (2011), the urban infrastructure investment deficit is estimated at $827 billion at 2009–2010 prices (Rs 39.2 lakh crore) for the period 2012–2031. While the GoI is working towards addressing this investment requirements, it is also designing its schemes with the objective of making Indian cities more liveable - the five flagship CSS in the urban sector are working towards these objectives of the GoI.

The evolution of urban development programs has been gradual, leading to empowering the ULBs through decentralisation of decision-making, encouraging them to manage their own revenue and create infrastructure and urban services. The urban governance framework seeks to enhance the autonomy of ULBs by devolving 18 functions listed under the 12th Schedule of the Indian Constitution. However, this devolution has not been uniform across all States and has not necessarily provided cities with the autonomy that was envisaged. The five flagship urban CSSs have observed a shift in the approach of executing the schemes with ULBs and local institutions as key implementing agencies for planning, designing, implementing and managing the services, and are also contributing towards the sectoral requirements identified under each of the liveability parameters.

The study assessed performance of urban sector based on key liveability parameters comprising of four pillars – Infrastructure services, Natural resources management, Social services and Governance, which further looked into four sub-parameters each as presented in the following figure. Along with assessment of the sectoral outcomes under liveability parameters intended through urban CSS, each sub-parameters has also been analysed based on principles of access, adequacy, quality, equity, livelihood and sustainability.



Under infrastructure services, it is observed that focused interventions in housing and shelter have improved conditions in our cities with improving housing ownerships and improved quality of houses (more pucca houses and improved DU ventilation). However, it has been found that our cities' green spaces are shrinking with growing urbanisation. And, cities are unable to provide minimum green space requirements as per the international standards (UN- 30 sq. m. per capita). In context of mixed land use and compactness, it is found that Indian cities have higher population densities (Indore – 97 pph, Mumbai – 210 pph) than their counterparts (Hongkong – 67 pph, Singapore – 84 pph), but FAR/ FSI followed in Indian cities are very low compared globally, highlighting a paradox of Indian cities. With regards to transport and mobility, there has been a significant impetus on Mass rapid transit systems with very high share of investments towards it, however the bus transport capacity is currently inadequate and highlight the emerging public transit needs with a more integrated approach. These all sub-parameters put together, highlight the need to practice sustainable land management to provide access to suitable and adequate land for all uses and purposes.

Natural resource Management covers status of water supply, sanitation and waste-water management, solid waste management, and air quality and pollution. It is noted that there have been marginal improvements in access to drinking water facilities on HH premises over last few years. However, water scarcity is becoming a challenge for Indian cities. Further, access to clean and treated water is also a critical challenge that needs to be addressed to improve the current capacity that stands at 33 per cent. Sewerage, sanitation and solid waste management have been mainstreamed with focussed Missions; AMRUT and SBM (U), but these sectors require greater attention at the treatment and disposal end of their value chains to overcome the environmental degradation that our cities face. It is observed that air quality in Indian cities is an emerging cause for concern. 21 out of world's 30 most polluted cities are in India. Therefore, it is noted that our cities need to graduate towards city airshed based management for preserving and providing access to clear air just like watershed management works.

Social services encompass Safety and Security, Health, Education, and Identity and Culture. It is noted that City Government has very limited role towards these services. While access and adequacy of social infrastructure has seen significant focus through urban CSS, where in city government functions (spatial planning, land allocation etc.) have a direct bearing on access to social services; the provisions of such social services and their operations are largely a function of other State Departments and Central agencies. Thus, the need for integrated planning, formal coordination mechanisms amongst all the stakeholders for sustainable operations is imminent in creating better quality of life through social services provisions.

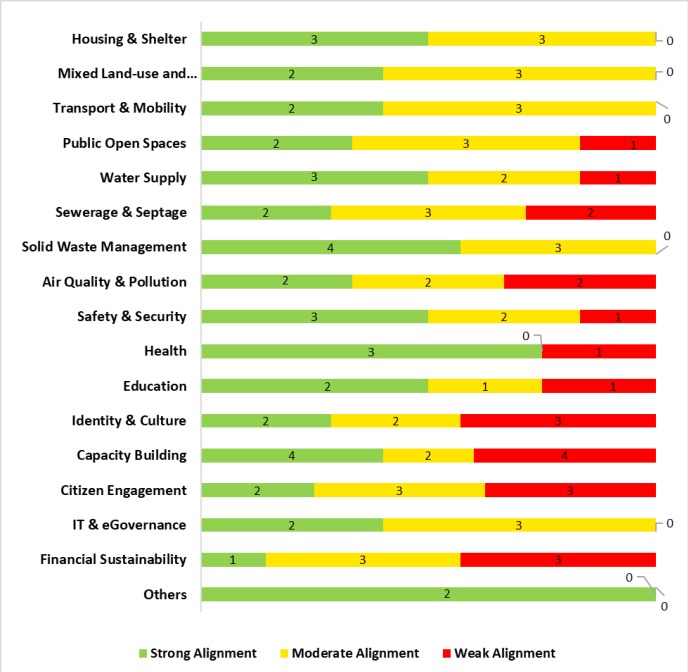
Governance covers areas of Capacity Building, Citizen participation, IT and e-Governance and Financial Sustainability. It is observed that there has been a widespread effort by all the urban Mission towards improving governance, however there is need felt to strengthen the legacy structures and institutionalise the efforts. Under citizen participation, it is noted that while urban CSS launched multiple Mission focused outreach events and platforms for greater recognition to citizens'' voice, the existing formal structures for citizen participation such as ward committees and area sabhas have remained weak. It is noted that urban CSS have broadened capacity building initiatives and use of technology/ data interventions pointing towards

Mission focused approach. But, absence of an urban sector view to capacity building and inadequacy of IT skills and data silos are limiting cities to expand IT and e-Governance beyond Mission boundaries. On the financial sustainability, it is noted that National Government has shown higher focus towards urban sector, wherein the Central expenditure has doubled in last 20 years. This expenditure push is further echoed at the State level, wherein a significant spending (60 to 80 per cent) is towards urban CSS. However, financial sustainability at the implementation level remains a key challenge. Total municipal tax revenues in India stand at 0.3 % of the GDP which is extremely low compared to other countries. On the other hand, lack of qualifying instruments for market funding, limited action by State level financial intermediaries leads to high dependency of ULBs in inter-government transfers, predominantly CSS and Finance commissions.

Based on the detailed assessment of the liveability parameters, gaps in the following three key areas were identified:

- Outcome orientation,
- Sector financing, and
- Implementation capacities.

Outcome orientation: Outcomes desired from the urban sector across the liveability parameters were identified and the key outcomes intended from the five CSS were mapped to the sector outcomes based on the strong, moderate and weak alignment, highlighting a broad trend emerging with respect to gaps in outcomes targeting.



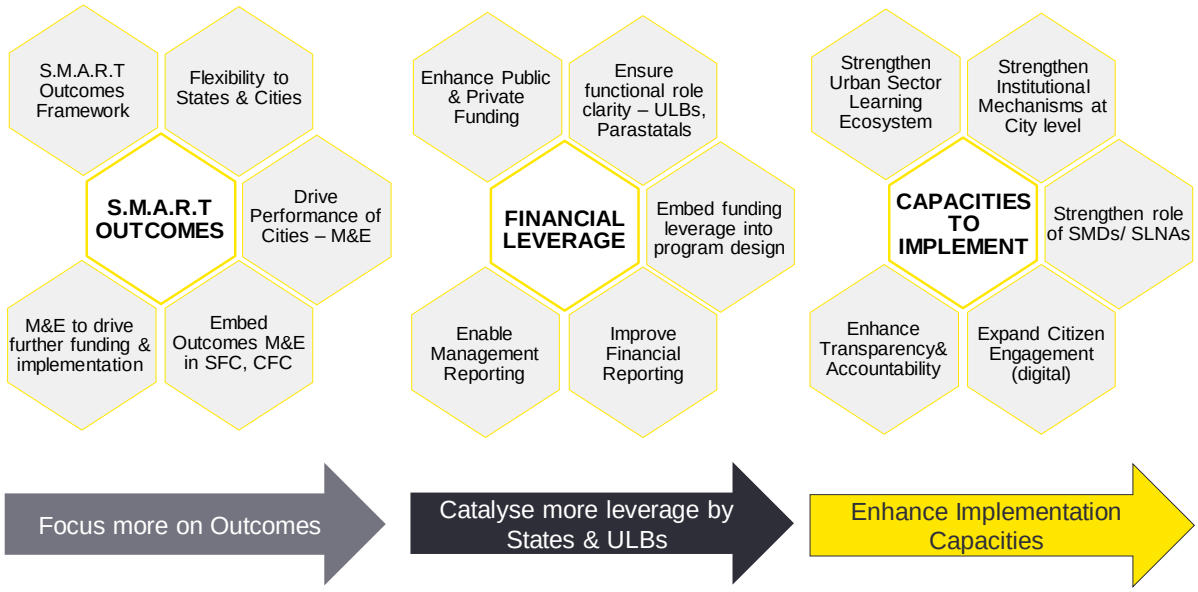
It is noted that all Missions have not been able to comprehensively address all the desired outcomes (~100) at a sector level. It is understood that National level Missions cannot undertake all the initiatives to meet the local level outcomes, but these gaps highlight the need for outcome targeting in the design of future CSS, rather than an input targeting scheme.

Sector financing: It is assessed through the study that there is an increasing gap in financing of urban infrastructure in cities (approximately Rs. 3.8 lakh crore gap exists – between 2012-18 excluding housing sector), despite significant focus of GoI through funding through budgetary resources, IEBR, EAP, PPP, FC etc. However, it is noted that weak ULB finances, limited capacities at State and City level for implementation of capital programs have led to limited contribution from these stakeholders to overall sector level financing. Hence, it is noted that one of the key areas of weakness in sector financing is financial leverage, especially in case of large multi-year investments to be undertaken by States and ULBs. This is attributable to low emphasis on access to instruments of leverage such as long-term debt, private capital, land value capture, monetisation etc. Therefore, a rational policy response could be to strengthen the institutional framework addressing aspects of stable inter-governmental fiscal flows, improved clarity in functional, spatial and financial jurisdictions.

Implementation Capacities: It is assessed that, at present, there are challenges with respect to building implementation capacities; such as, prevailing initiatives do not meet the speed and scale of the growing needs of the cities, only some States have municipal cadre, existing capacity building programmes are largely Mission driven. On the supply side, the limited number of high-quality institutions providing urban sector education and weak industry-academia link add to the overall weal implementation structures. While these supply and demand constraints exist, these challenges are further affected by the issues in functional (multiple departments, little clarity on functions etc.) and spatial jurisdictions (Asymmetry in growth of towns, peripheral expansion etc.) at State, ULB level. Therefore, it is observed that there is a tremendous opportunity to bridge this gap in building implementation capacities through an integrated and comprehensive approach.

Based on the sectoral assessment, the way forward for urban sector in India is three-pronged:

- Outcome oriented cities
- Performance based funding
- Strengthened urban sector institutions for implementation


S.M.A.R.T Outcomes Framework
Flexibility to States & Cities
S.M.A.R.T OUTCOMES
Drive Performance of Cities – M&E
M&E to drive further funding & implementation
Embed Outcomes M&E in SFC, CFC
Enhance Public & Private Funding
Ensure functional role clarity – ULBs, Parastatals
FINANCIAL LEVERAGE
Embed funding leverage into program design
Enable Management Reporting
Improve Financial Reporting
Strengthen Urban Sector Learning Ecosystem
Strengthen Institutional Mechanisms at City level
CAPACITIES TO IMPLEMENT
Strengthen role of SMDs/ SLNAs
Enhance Transparency& Accountability
Expand Citizen Engagement (digital)
Focus more on Outcomes
Catalyse more leverage by States & ULBs
Enhance Implementation Capacities

2 Sector level analysis

This chapter presents the assessment of Urban sector in India. It sets the context to the urban sector by highlighting urbanisation trends in India, urban population growth, urban poverty, and the urban economy. This is followed by the evolution of urban development programs in India with focus on the recent CSSs of the Government. The chapter presents an assessment of the performance of the urban sector aligned with global goals and national priorities and identifies broad sectoral coverage and gaps that are mapped to the key outcomes intended through the urban CSS. Further, the chapter assesses the performance of the sector based on a framework covering liveability parameters for urban areas. This is followed by examining the sector-level financing aspects from the perspective of Central, State and other institutions to highlight certain key issues and challenges.

2.1 Background of the Sector

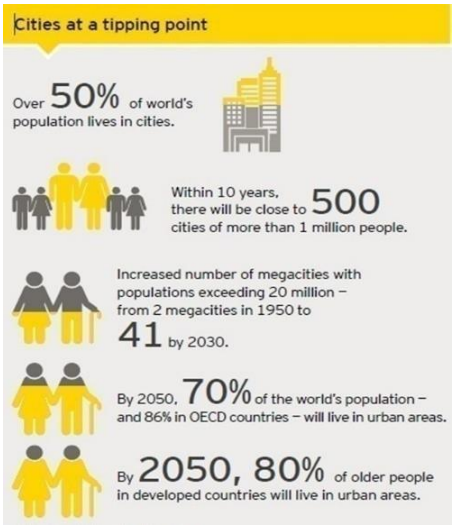
2.1.1 Urbanisation in India

India's urbanisation trends

India is witnessing rapid urbanisation, with 34.9 per cent of Indian population residing in urban areas currently and forecasted to be 1.8 times of the current urban population by 2050.

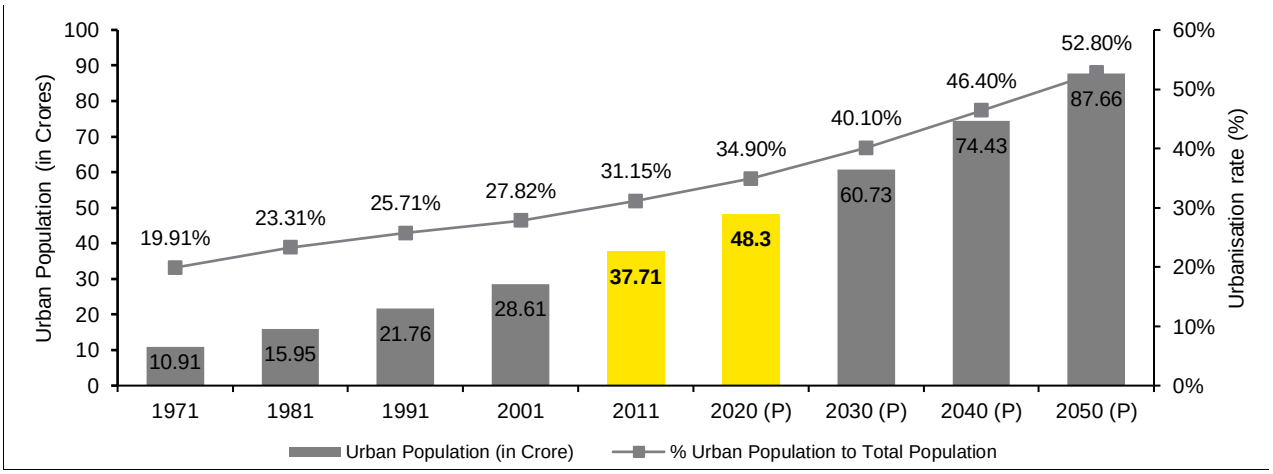
Urbanisation is one of the important realities of recent decades in India (MoHUA, India Habitat Report III - National Report, 2016). India's urban system consists of 7,933 cities and towns (statutory towns and census towns) of varying population sizes, with an urban population of 37.7 crore (GoI Census , 2011). India's urban population is estimated at 48.3 crore in the year 2020, making it the second largest country contributing towards global urban population (United Nations, 2018). Global urban trends are also reflected in India's growth story.

India's urban population accounted for 31.15 per cent (37.71 crore) of its total population (GoI Census , 2011), and is estimated to be 34.90 per cent (48.3 crore) in the year 2020. As indicated in Figure 2.1, urbanisation is expected to reach 52.80 per cent (87.66 crore) by 2050 (United Nations, 2018), which is more than double the urban population in the 2011. Between 2001 and 2011, urban population increased at compounded annual growth rate of 2.8 per cent, which is estimated to be 2.79 percent between 2011 and 2020. This is expected to reduce to between 2.32 and 1.65 over the next three decades.



Source: oecd.org/gov/cities.htm

Figure 2.1: Urbanisation trend in India



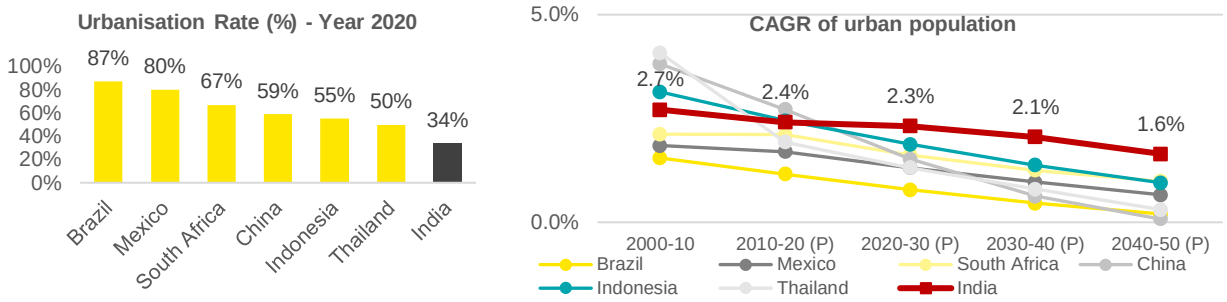
Source: Census of India, GoI (Year 1971 to 2011); UN World Urbanisation Prospects, 2018 (for Year 2020 to 2050)

Urbanisation trends: International perspective

India is envisioned to have higher urban growth rate compared to other developing countries during the next three decades.

The extent of urbanisation in India remains significantly lower compared to other major developing countries (United Nations, 2018), as indicated **Error! Not a valid bookmark self-reference.**. It is estimated that the population growth rate will be higher in India than in other countries, thereby highlighting the need for more focused approach towards the urban sector.

Figure 2.2: Urbanisation across different countries



Source: UN World Urbanization Prospects, 2018 (for Year 2000 to 2050)

Urbanisation: State variations

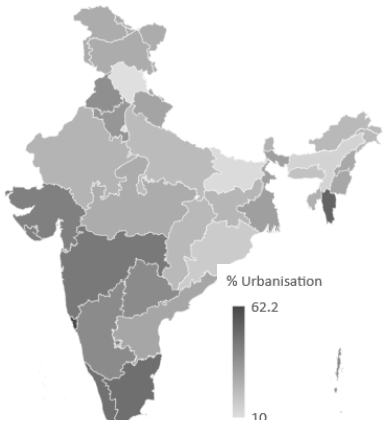
Indian States showcase large variations in urbanisation, highlighting polarised urban growth in the country.

There is high level of skewness in urbanisation across Indian regions. Western and Southern India observed higher urbanisation, whereas Eastern and Central India has low urbanisation. This highlights the different requirements of States for driving and sustaining urban and economic growth at the same time for different regions.

Urbanisation rate within the country varies from 10 per cent in Himachal Pradesh to 97.5 per cent in NCT of Delhi. In the case of larger States, urbanisation shares are higher than the national average of 31.4 per cent (2011). This includes high-income states such as Tamil Nadu (48.4 per cent), Kerala (47.7 per cent), Maharashtra (45.2 per cent), Gujarat (42.6 per cent) (Ahluwalia et al., 2019).

Along with this variation across States, cities also have evolved and urbanised with varying characteristics.

Figure 2.3: Extent of urbanisation - State-wise



Source: Census of India, 2011
Note: Delhi NCT is 97.5%, excluded in above map to restrict the index colour range

Key drivers of urbanisation in India

India's urbanisation growth story is the result of various factors including 'Indian urban definition'[1], natural growth, reclassification of cities and rural-urban migration that leads to different growth patterns. Megapolis city regions are growing at an unprecedent rate – there are five megacities currently. In addition, share of smaller towns has increased over the last decade by virtue of re-classification of rural settlements to urban areas adding to the overall urban population. This necessitates a multi-pronged approach for the Urban sector to cater to large as well as small cities.

[1] For the Census of India, the definition of urban area is as follows;

1) All places with a municipality, corporation, cantonment board or notified town area committee, etc.
2) All other places which satisfied the following criteria:
    a. A minimum population of 5,000
    b. At least 75 per cent of the male main working population engaged in non-agricultural pursuits; and
    c. A density of population of at least 400 persons per sq. km.

The first category of urban units is known as Statutory Towns. These towns are notified under law by the concerned State/ UT Government and have local bodies like municipal corporations, municipalities, municipal committees, etc., irrespective of their demographic characteristics.

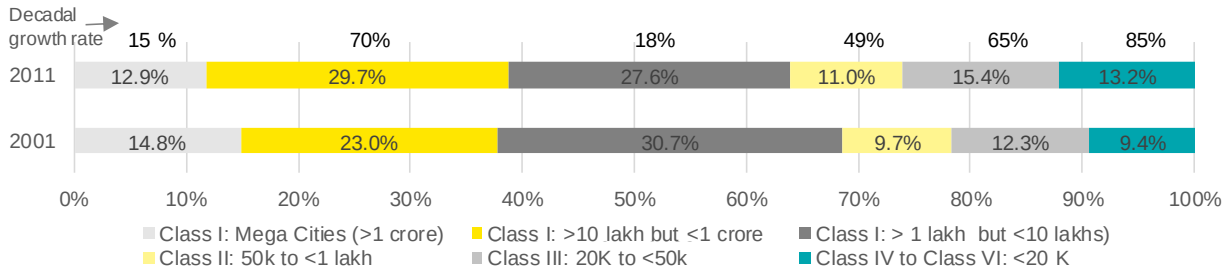
Natural growth and reclassification of cities

Urbanisation in India has observed two different spatial characteristics. First, an increasing number of metropolitan cities and a rising population in these metropolitan cities (population above 10 lakh) – the number of cities has increased from 35 in 2001 to 52 in 2011. These cities account for 42.6 per cent of the nation's total urban population, with three megalopolis cities of Mumbai, Delhi and Kolkata accounting for 12.9 per cent of the entire urban population share. Second, an unprecedented rise in the number and population of census towns, with an addition of about 2,530 towns in the last decade itself (MoHUA, India Habitat Report III - National Report, 2016) (MoHUA, URDPFI Guidelines, 2015).

It is interesting to note that the maximum decadal growth of urban population has been in lower class of cities followed by Class I cities with population between 10 lakh to 1 crore. The share of lower class of cities increased primarily by virtue of their reclassification - rural areas getting notified as urban areas or getting recorded as census towns. The urban population in census towns has increased from 2.1 crores (7.3 per cent) in 2001 to 5.86 crores (15.5 per cent) in the year 2011. It is also noted that megapolis cities have witnessed comparatively lower growth. This highlights that the increased level of urbanisation in the country from 2001 to 2011 is not only a result of acceleration in the growth rate of large, small and medium towns but also because of an increased number of census towns adding to the overall urban population (Kundu, 2015).

While based on Census definition, the three cities Mumbai, Delhi and Kolkata are mega cities based on the administrative boundary, the urban agglomeration considering the contiguous urban areas and cities without any clear delineation in built-up areas are creating large city regions. As per the UN, based on urban sprawl and populations beyond official city limits, India currently has five megacities; New Delhi (2.65 crore), Mumbai (2.14 crore), Kolkata (1.5 crore), Bengaluru (1.05 crore), and Chennai (1.02 crore). This is anticipated to reach to seven cities by 2030 (out of the total of 41 across the world) with the inclusion of Hyderabad and Ahmedabad to this mega-city list (UN, World Cities Report, 2016). Although, as presented in Figure 2.4, the share of mega cities based on the census (official administrative boundary) has reduced from 2001 to 2011, the futuristic view towards population growth in mega cities is on the higher side. As per the UN, between 2018 and 2030, the population of Delhi is projected to have additional one crore population, and hence Delhi will overtake Tokyo as the world's largest city by 2030 (UN, The World's Cities in 2018, 2018).

Figure 2.4: Share of Urban Population by type of settlement



Source: URDPFI guidelines Volume 1, Town and Country Planning Department, Government of India, 2015

If the trend highlighted in the above figure continues, it becomes necessary to have a multi-pronged approach for the Urban sector in order for it to cater to large as well as small cities. This also calls for States to leverage on the growing cities for regional development.

Rural-urban migration

One more important facet of India's urbanisation is the migration arising from social and economic reasons of its citizens. The dynamics of movement of people from rural to urban, and also urban to urban, highlights the changing need of people. There are many reasons for migration - education, marriage in the case of females, natural disasters, etc. However, the prime reason is the economic opportunity provided by cities across all the income segments of citizens - those who are largely employed by industry and services sectors. As per 2011 census, the total number of internal migrants in India has been 45.4 crore (37 per cent of the country's population), out of which 7.8 crore people moved from rural to urban areas in a decade, and many from smaller cities to larger cities and vice-versa.

With growing services industry in the cities, large number of people are migrating to urban areas in search of work. As per the study conducted by BetterPlace, it is estimated that a large share of blue-collar workers migrate from villages to cities – majority of the migrant workers hail from the states of Uttar Pradesh, Assam, Odisha, Bihar (cumulatively comprising 59 per cent of the total origin) and some other northern and north-

eastern States. The top destinations are Bengaluru, Hyderabad and Delhi (66 per cent of the total migrated population). The blue-collar workforce mainly comprises of delivery staff, people involved in home maintenance and carpentry, drivers, security staff, workers in facility management, school workers, etc. The workforce is expanding as the demand across these work-segments is increasing in urban areas. It is estimated that 92 per cent of these segments are part of the informal economy. Also, it was forecasted that in one year, 14 lakh jobs will be created in the gig economy (BetterPlace, 2019) . However, along with various pull factors in the urban areas, multiple rural push factors persist including rural poverty, inequitable land distribution, high vulnerability to natural disasters, and violent conflicts (Ellen M. Hoffmann, 2019).

However, the anticipation of growth across services as well as manufacturing economy in urban areas has witnessed a sudden setback due to the recent outbreak of a global pandemic – COVID 19, which has affected the life of all the citizens with more severe repercussions on the urban poor. Post unlocking of areas to resume work in the cities, many sectors such as industries and construction are trying to catch up on to the original pace. Other sectors in services economy/ gig economy are facing the challenges affecting the most vulnerable segments of the society. The pandemic and its aftermath have impacted four crore internal migrants, many losing their jobs (mainly informal), with the most vulnerable urban poor affected. Reasons identified are more due to inadequate access to housing/ cost of housing/ rentals, lack of basic water and sanitation facilities, health facilities, or social safety nets to help such segments of the society to survive such conditions (WB, COVID-19 Crisis through a migration lens, 2020).

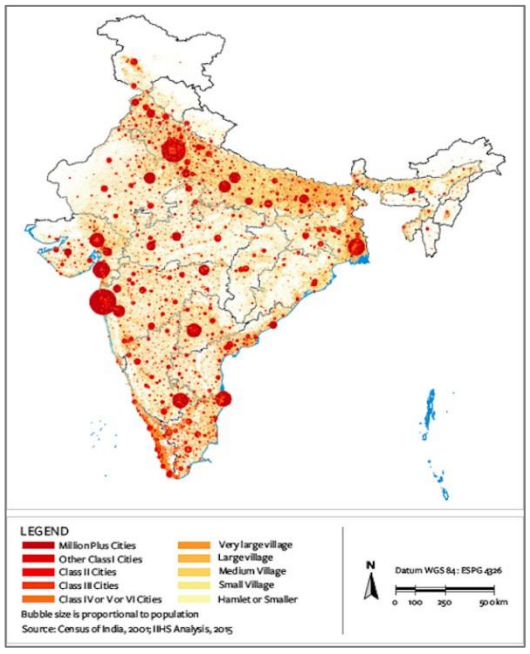
The recent initiatives aligned with the 'AtmaNirbhar program' are important to address these challenges faced by migrants not only during current times but also in the future. However, it is noted that the large cities which are contributing large shares towards Indian economy are going to face some challenges which were not anticipated previously. This may slow down the economic contribution and employment generation in cities compared to the forecasts based on the past trends as discussed in the following section.

Role of cities in India's economy and job creation

Indian cities are hubs of economic growth. Indian urban population accounts for 60% and by 2031 it will generate 75% of country's GDP. India will be home to 10 fastest growing global cities (based on YoY GDP) in the next 20 years.

Urban areas of India are engines of economic growth and the contribution of cities to the 'Wealth of Nations' is in current times an unrivalled and irrefutable fact. However, the growth inducing infrastructure in cities is facing tremendous pressure and not keeping up pace with the growing demand from citizens for better services to propel the economy. The productivity of urban economy in India is gauged by the fact that the urban population which accounts for 31 per cent of the total population, generates around 60 per cent of the country's gross domestic product (GDP), and by 2031, it is further expected to generate about 75 per cent of the GDP (MoHUA, 2016).

Figure 2.5: Top 100 Cities as per 2011 Census



Source: 2011 Census

Source: Urban India 2015: Evidence, IIHS

It is also evident by the fact that just about 16 per cent of India's population living in its 100 largest cities, covering less than 0.3 per cent of the total land area, produce over 43 per cent of the National GDP (IIHS, 2015). While India is not predicted to overtake the largest and best cities in the world by 2035, its growth story is being anticipated to be the most compelling one for the next decade. Only Mumbai and Delhi, with populations bursting above 20 million, show up in the population and GDP growth (%Y-o-Y) categories of World's top 10 cities by 2035. However, the top 10 fastest growing cities in the World will be in India (Surat, Agra, Bengaluru, Hyderabad, Nagpur, Tiruppur, Rajkot, Tiruchirappalli, Chennai and Vijayawada) and are expected to contribute nearly USD 0.9 Tn GDP by 2035 (Oxford Economics, 2018).

At the global level, the strong positive relationship between per capita income levels and urbanisation rates is well established. As per a study by IGC, the correlation coefficient between the per capita income levels

and urbanisation rates at the state level is reported to be as high as +0.9; relatively richer states including Gujarat, Maharashtra, Kerala, Tamil Nadu have urbanisation rates more than 40 per cent (Tumbe, 2016).

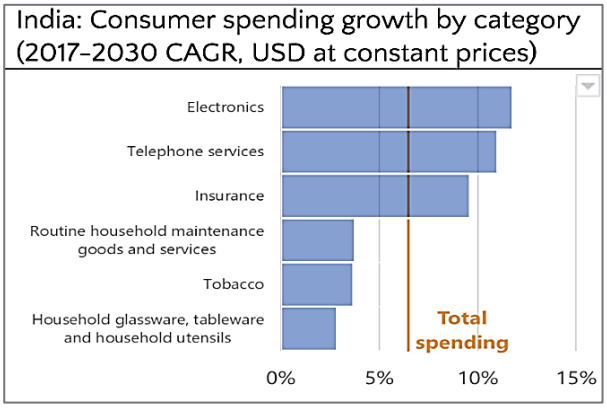
Underlying the above narrative is the fundamental equation of jobs and productivity. Both these factors are a direct function of the industry and service or tertiary sectors located in and around urban agglomerations. India's urban population has about 86 per cent literacy rate, 48 per cent labour force participation rate and 60 per cent workforce in tertiary sector (NSO, 2019). The tertiary sector alone had contributed over 56 per cent share of Gross Value Added (2018-19 current prices) to the Indian economy (MoSPI, 2020). It was expected that the services sector would generate around 70 per cent of net new jobs in urban areas by 2030 (MGI, 2010), and at the same time, the emerging digital economy of India is poised to create ~60-65 Mn jobs by 2025 (MGI, 2019).

It is expected that by 2040, every month nearly one million Indians would join the 473 million strong workforce (WEF & IDFC Institute, 2020). Approximately 40 per cent of this would be urban and with urban female worker's average monthly earning nearly 57 per cent more than their rural counterparts (NSO, 2019) – the impact on India's economy will see lesser gender consumption parity. While the total consumer spending in India stood at USD 1.4 Tn (2017), a rapidly expanding urban middle class consumer base is expected to contribute nearly USD 1 Tn more by 2030 (Visa, 2018).

Figure 2.6: India's future growth story – top 10 fastest growing cities, consumer spending growth

Top 10 fastest-growing cities in the world, 2019-35

Rank	Growth (%y/y, 2019-35)	City	GDP 2018 ($ billion, constant 2018 prices)	GDP 2035 ($ billion, constant 2018 prices)
1	9.17	Surat	28.5	126.8
2	8.58	Agra	3.9	15.6
3	8.50	Bengaluru	70.8	283.3
4	8.47	Hyderabad	50.6	201.4
5	8.41	Nagpur	12.3	48.6
6	8.36	Tiruppur	4.3	17.0
7	8.33	Rajkot	6.8	26.7
8	8.29	Tiruchirappalli	4.9	19.0
9	8.17	Chennai	36.0	136.8
10	8.16	Vijayawada	5.6	21.3



Sources: (Oxford Economics, 2018), (Visa, 2018)

Urban Poverty, inequality and infrastructure deficits

While Indian cities are witnessing rapid economic growth, concerns related to urban poverty, inequality and infrastructure deficits remain. Overall, urban poverty in terms of income levels has declined, but the inequality in terms of built development, access to infrastructure has persisted with existence of slums across the cities. With increasing urbanisation, India is also facing increasing deficit in infrastructure which affects the urban quality of life.

India is witnessing urban transformation with presence of one of the largest share of young population across the world, and about 75 per cent of urban inhabitants live in the lower income segments, earning an average of Rs. 80 a day (McKinsey Global Institute, 2010). This adds to the pressing need for inclusive development for the overall growth of the country. While urban poverty levels have declined substantially, from 25.7 per cent in 2004–05 to about 13.7 per cent in 2011–12 (NITI Aayog). As per the Census of India, urban households living in slums have reduced from 23.5 per cent to 17 per cent from the year 2001 to 2011 - the unequal income divide persists in Indian cities. It is also noticed that although the share of slums in urban population has reduced, the absolute number of households living in slums has increased from 1.01 crores in 2001 to 1.37 crores in 2011. The mega cities of Mumbai, Delhi NCR and Kolkata have large share of about 42 to 55 per cent of their population in slums, whereas the proportion of slum dwellers in the million-plus cities is around 35 per cent (MoHUA, India Habitat Report III - National Report, 2016). These urban centres are home to migrants and add to the urban poverty due to various factors.

According to Global Multi-dimensional poverty index (MPI) 2020, India is 62nd among 107 countries with an MPI score of 0.123 and 27.91 per cent headcount ratio, based on the NFHS 4 (2015/16) data. Ranks of other neighbouring countries are Sri Lanka (25th), Bhutan (68th), Nepal (65th), Bangladesh (58th), China (30th), Myanmar (69th) and Pakistan (73rd). The latest NFHS 5 (2019/20) is set to see improvement over NFHS 4 brought about by focused schemes and interventions in these parameters, especially in sanitation, cooking

fuel, housing, drinking water and electricity. The survey has been paused due to the COVID-19 pandemic (PIB, NITI Aayog, 2020).

To overcome these inequalities and alleviate urban poverty, various urban programmes focused on urban infrastructure development have been launched over the decades. However, infrastructure creation has always been a capital and resource intensive business. India's ambitious USD 5 Tn economy goal is, hence, being propelled by about USD 1.4 Tn investment in infrastructure in the next five years (Ministry of Finance, 2020). In contrast to the infrastructure narrative, the story for urban infrastructure has been different, at least until the introduction of the recent large-scale urban funding programs in the country. The total central assistance allocated under the five centrally sponsored urban schemes i.e. SCM, AMRUT, PMAY(U), SBM(U) and NULM to the tune of over Rs. 2.68 lakh crore is definitively a critical driver in urban sector development and job creation. In this regard, the CSSs in urban sector have clearly laid the necessary path and contributed in stimulating economic activity.

With this trend of increasing urbanisation, and even after impetus provided by GoI through CSS, India is facing increasing deficit in infrastructure which has slowed down the pace of improvement in the urban quality of life. With rising importance of urban areas as significant contributors of economic development, the need for improving urban infrastructure is paramount. India must leverage its urbanisation despite the fact that a majority of the cities are deficient in basic services and are financially weak and lacking the capacity required to plan and implement the required change. The capacity of infrastructure and services supply is not matching with the urban growth and inadequate measures for environmental and natural resource management are affecting the quality of life of urban residents (NIUA, 2015).

To overcome this large amount of capacity gap, the urban infrastructure investment deficit was estimated at Rs. 39.2 lakh crore at 2009–2010 prices for the period 2012–2031 by (Ahluwalia, 2011) to replenish deficit accumulated over the years for achieving urban service delivery and also to meet the future needs of cities. This is a colossal amount for making Indian cities more liveable. GoI has taken several measures to address these growing demands to improve quality of life of its citizens over the years, and this is reflected in the programmes and schemes launched by the Central government from time to time. The following section presents the evolution of urban development programmes in India and the prevailing governance framework.

2.1.2 Evolution of Urban Development Programmes in India

Post-independence, during the early years of development planning in India, the priority of GoI was on developing villages. Over the last few decades, with India experiencing an urban transformation, GoI's legacy approach has seen the emphasis shift towards urban sector (Batra, 2009). With the enactment of 74th Constitutional Amendment Act (CAA), 1992, the municipal government received a constitutional recognition for the first time since independence (Sharma, 2014), and it became a defining moment in India's urban history, empowering the third tier of government i.e., urban local bodies (ULB) through devolution of finances, functions and functionaries.

In India's federal structure, urban development is a State subject. State governments define State-specific urban development policies, establish institutions including local governments for executing the urban policy agenda, design and implement urban development programmes and projects. The role of the Central government is to be an advisor and is to define an overall approach to urban development, compatible with macroeconomic parameters at the national level. As cities are increasingly contributing towards the country's economy, the Central government has introduced numerous initiatives in partnership with the State and local governments, making urban development a shared responsibility (MoHUA, 2016).

Various policy guidance's, programmes and initiatives have been taken up from time to time, to meet the growing need of urbanisation. These include national level policies, setting up of different committees and their recommendations, national programmes and schemes for urban infrastructure creation, institutional constitution to deliver certain specific requirements. The Planning Commission was set-up by GoI to formulate Five Year Plans (FYPs) for effective and balanced utilisation of resources and determining the key priority sectors for Nation's development (Kundu et al., 2018).

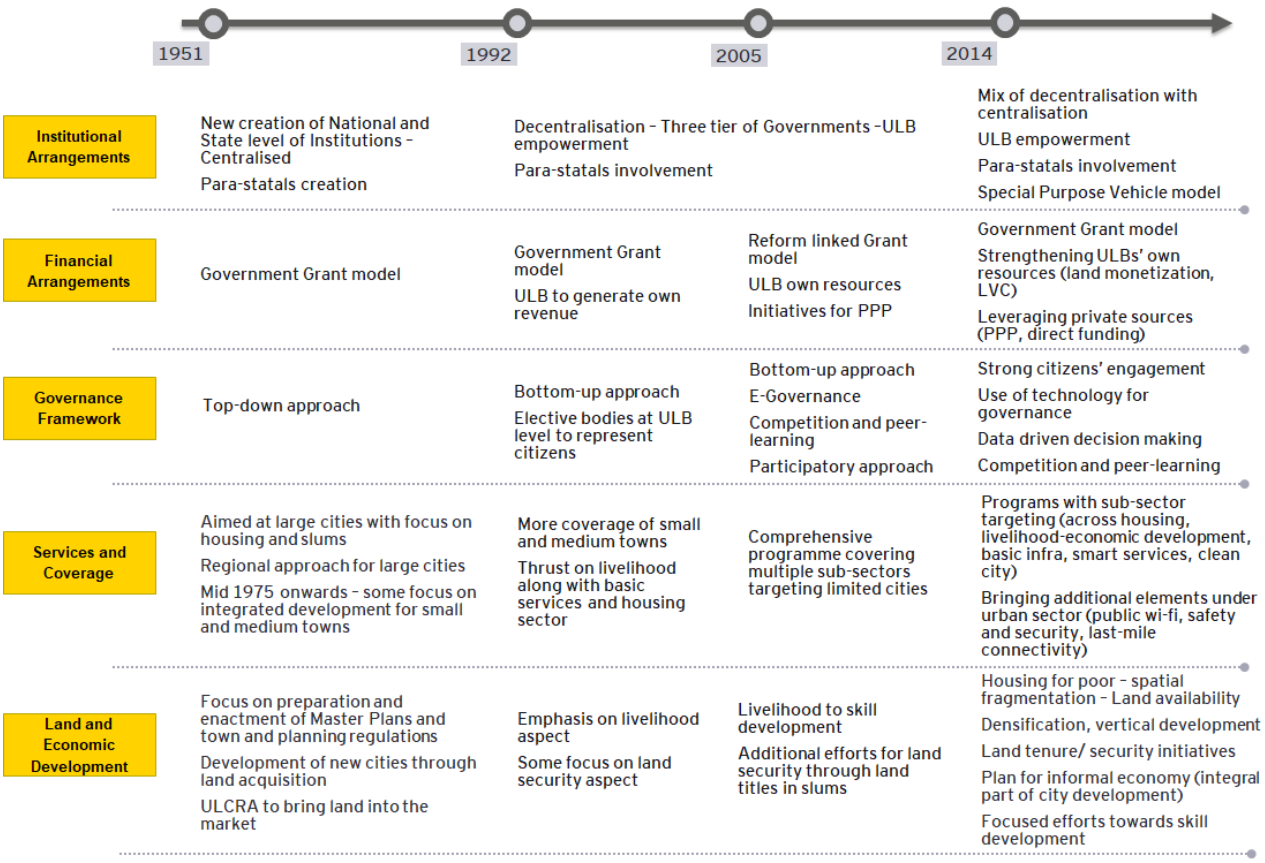
In 2005, JnNURM was launched as the first large-scale urban development programme that established the foundation for large central assistance programs in the urban sector to address the challenges in infrastructure, service delivery and policy reforms. It followed a comprehensive urban sector approach for 65 cities along with certain initiatives for non-Mission cities. It laid the agenda for urban reforms to address the challenges faced across different dimensions of governance, finance, policy and regulatory. However, as mentioned in the HPEC Report, most of the State Governments did not undertake the implementation of

these reforms seriously, and it became an exercise to draw funds from GoI than meeting the actual agenda. While JnNURM increased focus and attention of the government towards urban challenges and problems, various assessments have highlighted that the capacity constraints at local level, project selection and limited stakeholder consultations have been the key reasons for its partial success .

Figure 2.7 below presents the broad evolution of urban sector, since the launch of first FYP by the Planning Commission in 1951, across five different dimensions viz. institutional arrangements, financial arrangements, governance framework, services and coverage, and land and economic development. The urban sector in India evolved with multiple interventions such as national-level programs, policies, and institutional development. A table presenting various national level programmes, policies, their coverage, institution formations, since 1951, i.e. the launch of FYPs is presented in Appendix 1.1. The Figure 2.8 showcases that the institutional arrangements have evolved from a more centralised approach during 1951 to 1992, to a more decentralised approach starting 1992, which has further been re-imagined through focus on creation of Special Purpose Vehicles (SPV) bringing in both city and State mix for local governance and service delivery. Similarly, under financial arrangements, the city level infrastructure development was solely through government grants initially. However, in the 1990's, the focus shifted towards increasing local level revenues and empowering ULBs to generate, manage and spend public money in infrastructure creation followed by focus on ULB finances and private sector participation. In the initial FYPs prepared by the Planning Commission, the government programs were fragmented in nature, concentrating on limited sub-sectors and on large cities, which gradually shifted towards small and medium towns, followed by a comprehensive approach.

In 2005, JnNURM was launched as the first large-scale urban development programme that established the foundation for large central assistance programs in the urban sector to address the challenges in infrastructure, service delivery and policy reforms (WB, 2013). It followed a comprehensive urban sector approach for 65 cities along with certain initiatives for non-Mission cities. It laid the agenda for urban reforms to address the challenges faced across different dimensions of governance, finance, policy and regulatory. However, as mentioned in the HPEC Report, most of the State Governments did not undertake the implementation of these reforms seriously, and it became an exercise to draw funds from GoI than meeting the actual agenda (Ahluwalia, 2011). While JnNURM increased focus and attention of the government towards urban challenges and problems, various assessments have highlighted that the capacity constraints at local level, project selection and limited stakeholder consultations have been the key reasons for its partial success (Ahluwalia, 2011) (CAG, 2012) (WB, 2013).

Figure 2.7: Evolution of urban sector across five dimensions

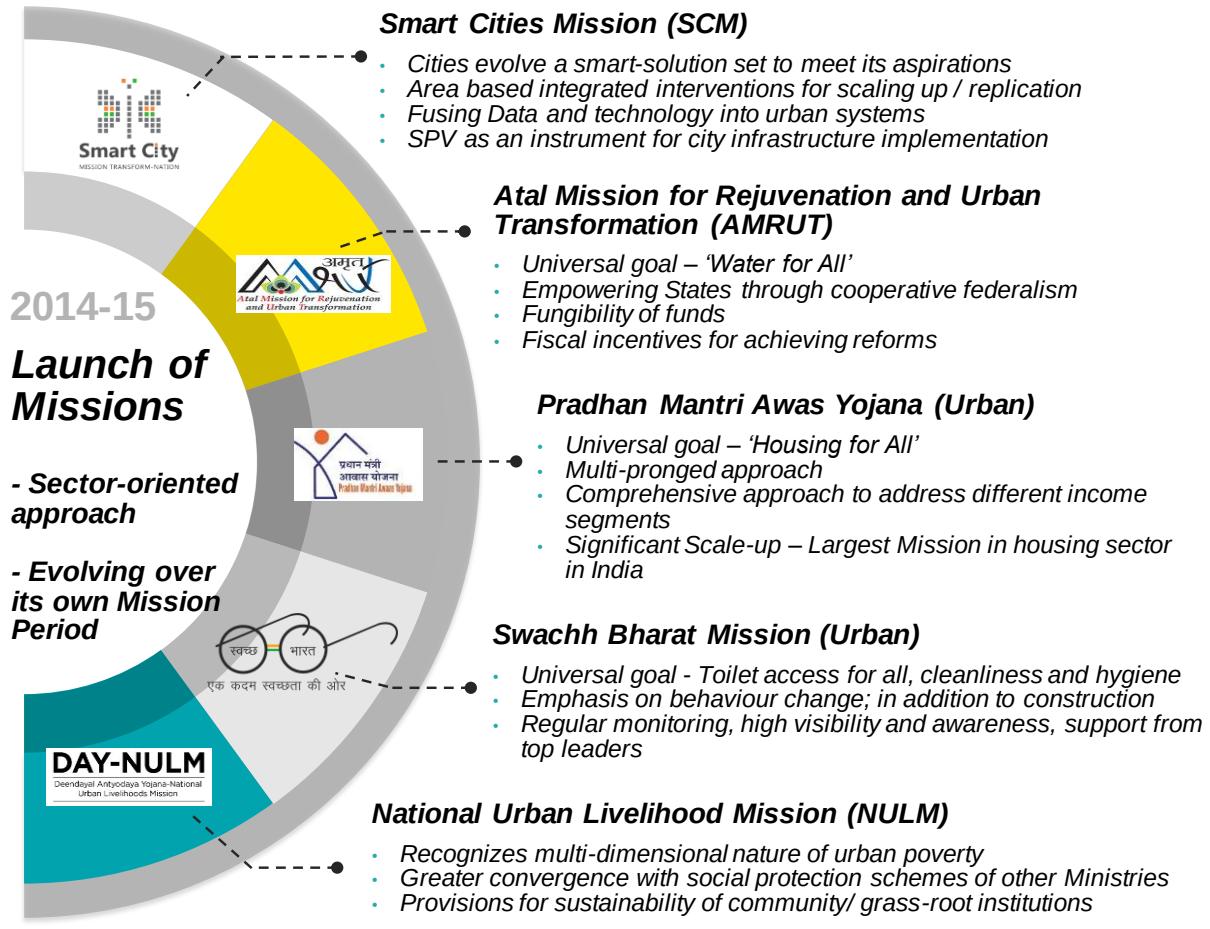


Source: Compiled from Kundu et al. (2018); Bhagat (2014); Sharma (2014); and various five-year plans of India

Post JnNURM, the Central government focused on various sub-sectors and launched multiple schemes for improving the quality of life of citizens. To sustain the rapid urbanisation India is witnessing, since 2014 GoI has launched aspiring schemes, focused on creating clean, liveable, economically vibrant and inclusive cities with the provision of basic services and housing to the citizens in a cost-effective and sustainable manner across all the statutory towns/ cities, with an aim to leave no one behind.

Urban Missions focussed on sector-oriented approach with the vision for achieving national priorities such as universal access to water under AMRUT, 'Housing for All' under PMAY (U), clean cities under SBM (U), which has been identified as one of the distinctions between earlier programmes, especially JnNURM. Along with the focus of Missions on the achievement of targets, many more interventions and initiatives have been undertaken to address the challenges at sectoral level, due to which Missions have also witnessed evolution since their inception. To meet the aspirations of all the stakeholders, the Missions have witnessed evolution at multiple levels during last five years including their vision, operating models, targeting beneficiaries, and implementation boundaries. For example, in case of 'Housing for All', beyond provisioning of funding and supply of houses to the beneficiaries, it also focused on formulation of tenancy laws, development of regulatory mechanism for real estate sector, etc., creating a conducive environment for the projects under the Mission as well as for the urban sector.

Figure 2.8: Urban CSS – Key features and distinctions



Source: EY-Athena Analysis

With continuous emphasis on urban development, the current Missions have expanded and broadened to incorporate data, innovative and technological developments, along with more participatory approach for provisioning and functioning of infrastructure. These Missions have emphasised on creation of dedicated institutional structures and generate competitive spirit amongst States, along with provision of greater flexibility to States for decision making in respect to project selection and implementation.

Recently, NITI Aayog under its 'Three Year Action Agenda (2017-18 to 2019-20)', identified initiatives and actions for the urban sector, focusing on affordable housing, clean cities, and urban transportation. Some of these initiatives include reducing inflated land prices by bringing land price down through lowering of stamp duty, controlling the flow of illicit money into real estate, replacing the current rent control act with tenancy law; dormitory housing for migrant workers; rental voucher scheme for the urban poor in 100 Smart Cities; establishment of a central authority to spread the use of waste to energy plants; to draw up national design standards and contracting standards for city roads; amongst others (NITI Aayog, 2017).

The following section highlights the performance of the Urban sector.

2.2 Performance of the Sector

This section explores India's urban sector performance on key outcomes intended through the CSS. To assess the comprehensive sector scenario, first the alignment of urban sector Missions is assessed the goals and targets set against Sustainable Development Goals (SDG). Further, key liveability parameters have been assessed across the key principles of access, adequacy, quality, equity, livelihood, and sustainability, with an objective to identify the gaps in the broad sectoral outcomes against the key outcomes intended through urban CSSs. In addition, this section also explores the sector level financing aspects from Central, State and other institutional perspectives to highlight key issues and challenges.

2.2.1 Assessment of sector based on global goals and national priorities

The SDGs are a universal plan for all the countries to end poverty, protect the planet and ensure prosperity for all. There are a set of 17 goals which include 169 targets. India is committed to achieve SDGs, and for this purpose, India's developmental schemes and programmes have been aligned to the global goals.

Multiple SDGs cut across the urban sector landscape. The targets under three important goals of SDGs 1, 6 and 11 have been presented in Appendix 1.2 – Global goals and national priorities.

The SDGs set the agenda for the nation to achieve global benchmarks, and the NUPF[2] (draft) sets an integrated and coherent approach towards future urban planning and development. The draft NUPF is one of the first such directional documents at a national level that provides a framework for the States to create more holistic and comprehensive policies considering their local contexts. It is structured along two broad areas; the ten 'sutras' – philosophical principles that are the core of draft NUPF, and these sutras are applied to ten functional areas of urban space and management. The outlines of the sutras and functional areas of the NUPF are presented in Appendix 1.2 – Global goals and national priorities.

These global and national priorities set a framework for the overall assessment at the urban sector level. Figure 2.9 presents the mapping and understanding of the broad coverage and gaps at the urban sector level by studying the contribution of GoIs urban CSSs towards the SDGs.

Overall, it has been observed that there are many strong linkages between CSS and global goals and national priorities. Although SDGs were launched after the launch of CSSs, many components of CSSs are aligned towards these global goals. Specifically, SCM is contributing towards majority of the targets of the SDGs 1, 6 and 11, however its coverage is in limited cities. Similarly, these CSSs are aligning with draft NUPF's agenda and contributing towards its attainment.

At the national level, NITI Aayog is monitoring the progress of the targets set in the SDGs (aggregate data at the national level is available for limited indicators). Goal 11 has 10 targets and 11 indicators, Goal 6 has 8 targets and 11 indicators, and Goal 1 has 7 targets and 14 indicators. The table highlighting targets and achievements of SDGs which are being monitored currently by NITI Aayog are presented in the Appendix 1.2 – Global goals and national priorities.

[2] There can be more philosophies which can be explored and delved into to formulate more implementable policies at State and local levels. However, in the context of this evaluation study, the current draft of NUPF has been considered for assessment at sectoral level.

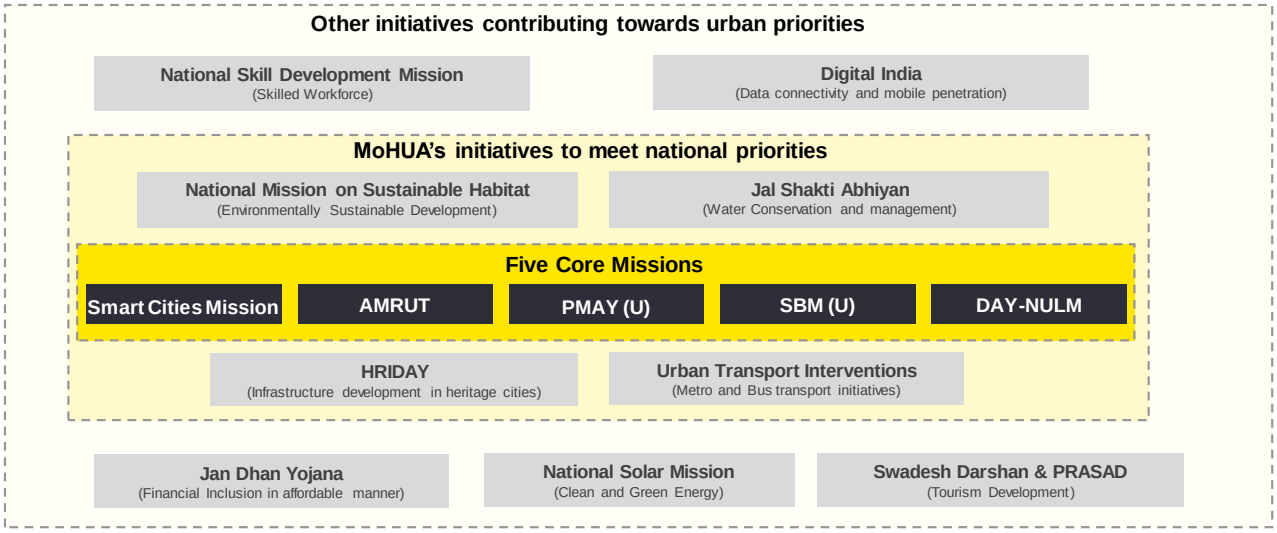
Figure 2.9: Linkages between CSS and global goals and national priorities

Source: EY and Athena Analysis

The detailed alignment of each scheme with different goals and targets has further been detailed out in the subsequent chapters under scheme-wise analysis.

Apart from these key CSS under this evaluation study, there are many other initiatives of the MoHUA and other Central Government Ministries which contribute directly and indirectly to achieve global development goals and national priorities.

Figure 2.10: Linkages of various schemes with five urban CSS contributing towards SDGs achievement



Source: EY and Athena Analysis

The detailed information of different Missions and initiatives contributing towards the urban sectoral requirements has been presented in Appendix 1.3.

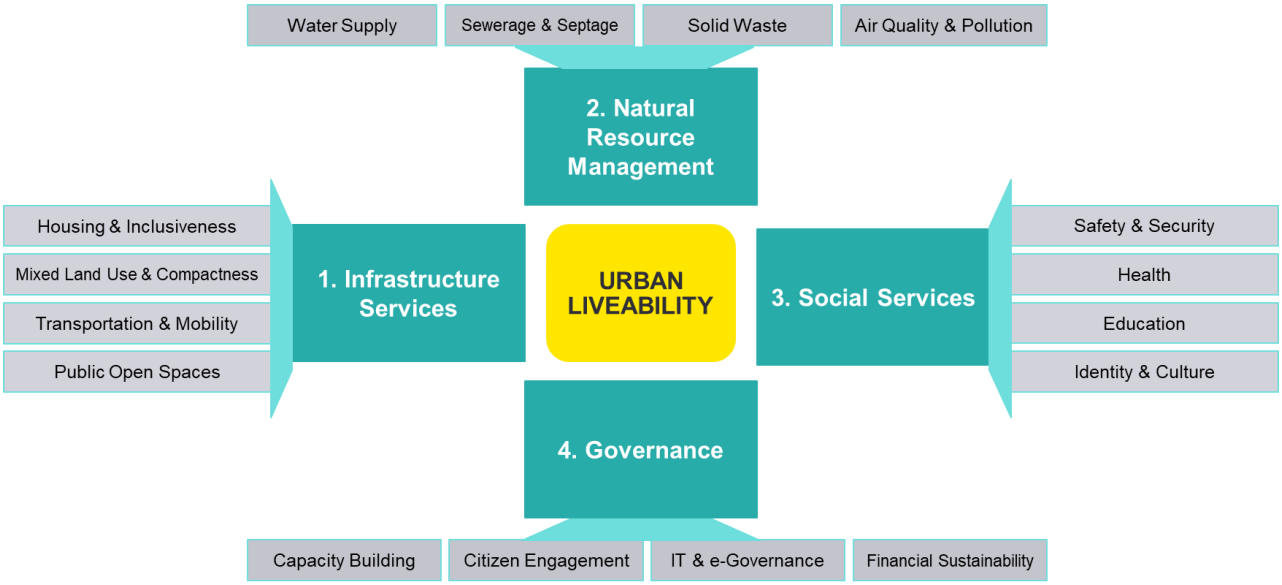
To meet the global agenda, actions are required at multiple fronts, and the Ministry will need to identify ways to expand the ambit of the Missions by mobilising resources wherever possible or help incentivise the cities to take ownership of the goals. Some States and cities are stepping-up their efforts and undertaking such initiatives which present their interest on the ownership for achieving the global agenda. For example, Community Systems Foundation – Open Cities Institute (OCI) in 2018 under the Local Data Action Solutions Initiative (LAD-SI), carried out a study to address the implementation of SDGs at the sub-national and city level. OCI worked with the ULB of Patiala, Punjab to create city-level SDG data system that includes a model indicator list and data dashboard and provides a one-stop visualisation tool to aid the city's decision making and planning efforts (Varma, 2019).

Along with these global goals, it is apparent that the alignment between the draft NUPF and the CSS has been very strong, which may be attributed to the fact that the draft NUPF has been formulated post the launch of these Missions, and the MoHUA is aspiring to achieve the urban agenda through the learnings of these Missions. At the same time, GoIs 'National Infrastructure Pipeline' for the period of 2020 to 2025 has a vision to create 'Infrastructure services that raise the quality of life and ease of living in India to global standards'. This infrastructure pipeline is well aligned with the aspirations of 'housing and water supply for all' along with creation of sustainable and smart cities.

2.2.2 Assessment of urban sector based on the Key Liveability Parameters

The objective of urban development initiatives is to achieve balanced development across all aspects of life of an urban resident that includes physical, social and economic aspects in a comprehensive manner (Sharma, 2014). The following figure presents the framework for assessing the urban sector. The framework is categorised into four major components – infrastructure services, natural resource management, social services, and governance under the key liveability parameters. These have been assessed across six principles i.e. access, adequacy, quality, equity, livelihood, and sustainability, based on the scope defined for the study.

Figure 2.11: Framework for performance assessment of urban sector



Source: EY-Athena analysis based on the scope for the evaluation study

The evaluation team, in order to elucidate the mutual contributions between the Urban Sector and the Urban CSS, has evolved a two-pronged approach to assess the performance of the sector. While the Top-Down approach, as indicated in the previous section, has been to assess the urban sector's alignment with Global and National priorities. The Bottom-up approach, through the liveability framework analysis, has been undertaken to assess the alignment of the urban CSS to the sectoral goals. The latter approach has been evolved based on the scheme wise analysis that was undertaken to analyse the contributions being made by the schemes through various interventions.

An attempt has been made to identify the desired outcomes of the urban sector based on national and global outcome frameworks (wherever applicable) for different liveability parameters under each of the four key pillars. Broadly the outcome indictors through global frameworks were compiled from sources such as – the UN SDGs, UNDP, UNESCO, WHO, Multilaterals (WB, ADB) and renowned scholars through literature review. Similarly, the outcome indicators through national goals/priorities were compiled from sources such as – CSS guidelines, other Ministry level program and policy documents (EOL, NUHM, URDPFI, NEP etc.,), Outcome Budget (2020-21), Planning Commission, Finance Commission reports, renowned think tanks (CRDF, NIUA) etc.,

The key outcomes intended through urban CSS have been mapped against the desired outcomes of the sector to understand and analyse how the schemes have intended to align with the overall sectoral liveability goals. The alignment of Scheme level intended outcomes to Desired Urban Sector outcomes has been based on below matrix:

Table 2-1: Alignment matrix for mapping Scheme level intended outcomes

Strong Alignment	Directly intended by Schemes (mission guidelines, advisories, etc.)
Moderate Alignment	Indirectly intended by Schemes (mission guidelines, advisories, etc.)
Weak Alignment	Not directly intended by the Mission(s), and weak attributability of outcomes to the Mission

Source: EY and Athena analysis

The following section provides detailed analyses of each liveability parameter under the four key pillars, capturing the bottom-up alignment of outcome indicators. Further, the report consolidates this alignment analysis across all liveability parameters to build an aggregate view and discuss the implications of such an aggregate view in Section 2.2.3.1.

2.2.2.1 Infrastructure Services

Housing and Inclusiveness

Housing is considered fundamental to the health and well-being of people and adds to the economic growth. Yet, globally, urban dwellers are struggling to meet the needs of affordable housing (MGI, 2014). Its role is multi-faceted in the upliftment of the household - along with providing a shelter, it affects the access to infrastructure, employment, health, education, poverty level and many other indicators (Gopalan & Venkataraman, 2015). In India, Right to Shelter is a fundamental right, guaranteed under Article 21 of the Constitution of India, thus highlighting the significance of this sector for 'quality of life' of citizens.

Sectoral outcomes for Housing and Shelter

Housing sector is a critical area of policy, governance and service delivery for the National and State Governments. On account of its inherent dependence on land and urban planning which are both State subjects, the role of State Governments is significant in provision of housing.

GoI has undertaken several measures on policy, programs, institutional development and financing to address the needs and challenges of the sector since Independence. The focus of these initiatives has evolved over time, with India's economic growth and changing needs. Initially, GoI emphasised on institution building and housing for weaker sections of society, government employees and industrial workers. This was followed by creation of the Housing and Urban Development Corporation (HUDCO) to provide affordable housing finance along with attention towards infrastructure development. Subsequently, Government's focus shifted towards creation of strong financial market for housing, along with a robust policy framework, resulting in constitution of National Housing Bank (NHB) and first National Housing Policy (NHP) in 1988. During this era, many State Housing Boards and Development Authorities were constituted which focused on planned housing development across cities. During 1990s and early 21st century, various new programmes focused on slums, integrated development, provision of basic services, interest subsidy schemes, amongst others were introduced (MoHUA, India Habitat Report III - National Report, 2016). Along with this, focused policy framework for urban housing was launched in 2007 - the 'National Urban Housing and Habitat Policy' that aimed at a comprehensive strategy to housing by encompassing finance, technology, land, materials, and targeted poverty alleviation. In 2005, JnNURM was launched. It included two focused components on housing - Basic Services for Urban Poor (BSUP) and Integrated Housing and Slum Development Programme (IHSDP). This was followed by the launch of Rajiv Awas Yojana (RAY) in 2011 with an objective of slum-free India. Based on the learnings from the long historical growth of housing programmes and to overcome the ever-increasing housing sector challenges, a mammoth initiative was rolled out by GoI in 2015 for providing affordable housing to the urban poor, through the launch of PMAY (U).

In addition to the launch of PMAY (U), GoI has been progressively introducing reforms to stimulate the sector. Some of the reforms include; Infrastructure status to affordable housing; GST rationalisation for affordable housing segment; launching of Real Estate (Regulation and Development) Act, 2016 and RERA rules to formulate Real Estate Regulatory Authority in every State; guidelines on affordable housing on PPP; and Model Tenancy Law for improving rental housing market.

Overall, PMAY (U) has a strong focus on improvement in this sector across multiple liveability related principles through multiple components as well complimentary initiatives undertaken as part of the Mission. NULM also focuses on access to shelter to the bottom end of the income pyramid. AMRUT and SBM (U) provide for basic services thus enabling overall habitat development and hence improving the quality of the living. In recent times, there has been a specific focus to shift towards the outcome approach, which can be observed through alignment with SDGs, Ease of Living Index, and Draft Urban Policy Framework. The following sub-section attempts to map the key outcomes intended through the Urban CCS vis-à-vis the desired outcomes for affordable housing sector, on the basis of national and international outcome frameworks in relation to housing, studied for this purpose. The following table summarises the same.

Table 2-2: Sectoral outcome coverage and gaps - Housing and shelter

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Availability of adequate, safe, and affordable housing (ownership/ rental/ temporary for homeless) with basic services for all (slum/ EWS/ and other income segments)	PMAY (U), ARHC; NULM - SUH component; AMRUT, SBM (U), SCM	Access, Adequacy, Quality, Equity
Security of tenure and ownership and control over land, property	PMAY (U)	Access, Equity

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Access to affordable housing finance, to enable housing ownership for all segments	PMAY (U) – CLSS	Access, Equity
Rehabilitate slums and/ or upgrade basic infrastructure in slums	PMAY (U), AMRUT, SBM (U) [3]	Access, Equity
Skill Development of the people involved in housing construction sector	PMAY (U) – GHTC	Livelihood
Adoption and Mainstreaming of modern, innovative and green technologies and building material for faster and quality construction of houses.	PMAY (U) – TSM; PMAY (U) - GHTC	Sustainability

Note: The desired outcomes have been drawn based on the literature review including; PMAY (U) OOMF and guidelines; NULM OOMF and guidelines; ARHC Operation guidelines; Urban Indicators Guidelines - Monitoring the Habitat Agenda and the MDGs, 2004; SDG-11, Ease of Living Index, 2019; Ease of Living Index, 2018; GHTC – Concept Note

Based on the coverage of sectoral outcomes, the following section presents an overview of the progress that has been made in the housing sector across the six principles.

Access: Access to housing refers to availability of affordable housing and shelter, having access to security of tenure and land, and equal access to credit/ finance to purchase/ build house. Access to housing for everyone is essential whether it is for a short or a longer period.

PMAY (U) intends to bridge this gap by enabling ownership housing. Recent launch of 'Affordable Rental Housing Complexes' (ARHC) seeks to provide rental options for urban poor. NSS shows that share of households with self-owned dwelling unit have improved from 61.1 per cent to 63.8 per cent in six years from 2012 to 2018 (NSSO, 2018). A large part of this improvement can be attributed to PMAY (U), under which 33.5 lakh houses have been completed according to Mission MIS. Achievement of target of 112 lakh houses is then expected to create substantive increase in share of self-owned dwelling units in India's cities. NSS data shows that the urban households under lowest income quintile class on MPCE has the highest owned dwelling unit at 77.1 per cent, whereas highest income quintile only accounts for 54 per cent as owned housing. This could be attributed to high mobility amongst higher income groups with changing jobs and transitioning from owning to sharing concepts (FICCI and JLL, 2019). Across social groups, scheduled tribe have the lowest share of owned dwelling unit at 54.1 per cent, with other/ general category having the highest owned dwelling unit at 67 per cent (NSSO, 2018). On the other hand, share of rented houses has decreased from 35.4 percent to 32.8 percent from 2012 to 2018 (NSSO, 2018). This may be attributed to the historical context of housing policies and programmes that emphasised home ownership, resulting in higher demand and supply towards the same, with limited focus on needs of tenants and migrants (D'Souza, 2019). The private market is responding to the niche areas of temporary housing in urban India, such as Aarusha Homes, Oxford Caps, among others. However, these private sector initiatives are mainly focussed on student housing and formal sector employees/ transient workers.

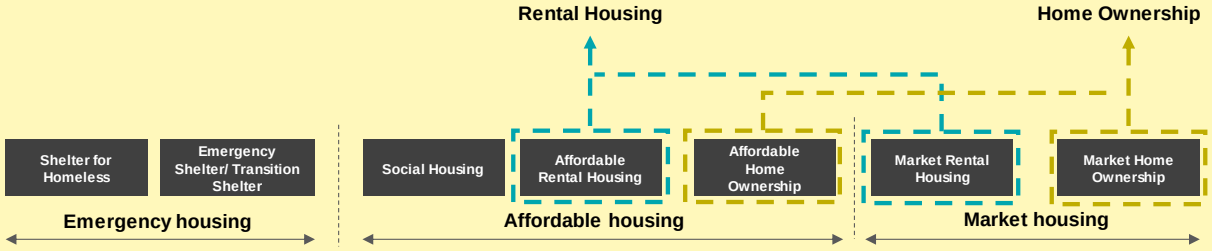
Launch of ARHC under PMAY (U) is a novel step towards creation of rental options for the urban poor including short-term migrants to have better access to housing. This initiative coupled with the envisaged launch of 'Model Tenancy Law' (MTA) is expected to create a better market for rental housing, especially for States with higher shares of rented houses like Tamil Nadu (40 per cent), Andhra Pradesh (44 per cent), and Karnataka (46 per cent). However, it is noted that Indian rental housing is largely informal. As per NSS, 70 per cent of the rented houses are without any formal contracts (NSSO, 2018). While it could be due to informal status of the houses itself, the prevalent Rent Control Acts in various States have also acted as deterrent to the formalisation of rent agreements between the lessee and lessor (Knight Frank, 2019). PMAY (U)'s increasing focused approach towards both ownership and rental options through multiple development models and regulatory mechanisms, takes a big step forward towards enabling access to housing for all.

[3] PMAY (U) focuses on 'Housing for All' including slum dwellers which can be rehabilitated under all the components of the scheme; however, slum upgradation is addressed through different Missions but is not a focused approach under urban CSS.

Figure 2.12 Concept of 'Housing Continuum'

'Housing Continuum' Concept

This term is used broadly in housing strategies across the globe. This concept highlights the broad range of responses available for different types of households based on their need and suitability. It enables policy makers to move away from a one-size-fits-all strategy of providing public housing towards a diverse range of housing options – from homelessness to house ownership.



Source: Adapted from – UN, 2017, Housing for Migrants: Challenges and Practices in the ECE Region', Economic and Social Council; Rosenfield, O., 2018, EU Urban Agenda Housing Partnership links with international commitments; Australian Housing and Urban Research Institute (AHURi) - https://www.ahuri.edu.au/research/ahuri-briefs/understanding-the-housing-continuum

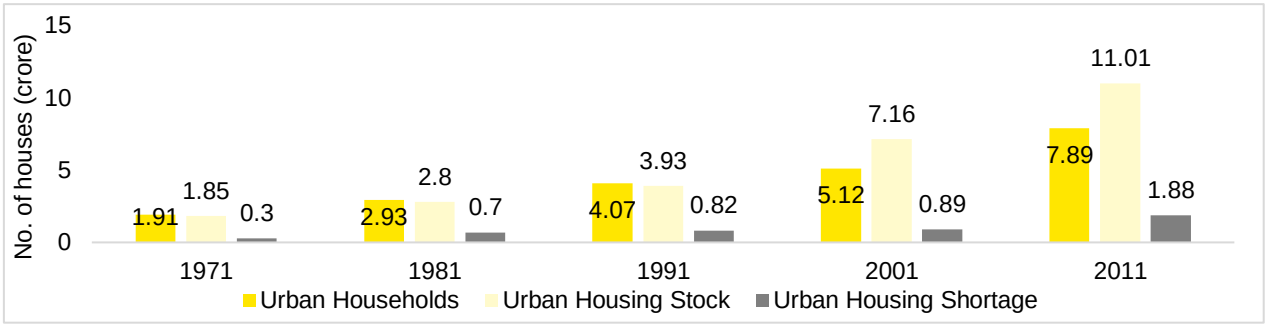
According to Census 2011, homeless population in urban areas was 9.4 lakhs, which contributed marginally to the overall estimated housing shortage. However, as per Housing and Land Rights Network (HLRN), these numbers are underestimated and may have increased over the years. NULM – Scheme on 'Shelter for homeless' provides for this section of society. Currently 1,545 home shelters have been developed under the NULM with additional capacity of 82,209 people, beyond the non-Mission shelters. While NULM has performed well and provides for bottom-most of the income pyramid, who are typically left out by other Missions, the need to meet such shelter requirements is extremely critical with increasing urbanisation. Access to affordable land is critical for creating affordable housing along with provision of tenure security to the households. Increasing land values put pressure on availability of land for development of affordable housing. Limited access to land and formal rental market for urban poor affects their dwelling unit choices, resulting in development of houses on vulnerable land parcels and government land, translating into poor quality of housing stock and creation of slums. Although all the households residing within slums may not require new houses, they may require upgradation or redevelopment to improve the quality of life of the citizens. It is to be noted that the absolute number of households living in slums has increased from 1.01 crores in 2001 to 1.37 crores in 2011, that is equivalent to 17.4 per cent of the total urban population. PMAY (U) has focused on 'Housing for All' including slum dwellers. Houses sanctioned so far in PMAY(U) include 26 lakh slum households under different components of the Mission.

Another critical factor involves the access to credit and finance to build/ purchase houses. Traditionally, banks and housing finance companies (HFCs) focused on high-income and middle-income formal sector employees for providing loans (FSG, 2018). However, with focused approach under CLSS component of PMAY (U) and NHB's initiatives in relation to involvement of different types of financial institutions, the housing finance market has observed large coverage of EWS and LIG segments which were hitherto addressed only partially. As per RBI, the affordable housing segment has been one of the key factors for home loan growth. Even when deceleration was observed in 2016-17 in cases of total home loans, the lower slab of home loans (up to Rs. 10 lakh) observed robust growth (RBI, 2018), which can be attributed to the CLSS component and awareness created by PLIs amongst the consumers. As PMAY (U) covers all the statutory towns and notified planning areas/ development areas in the country, targeted interventions and resources for affordable housing finance have helped the sector move forward on the access parameter.

Adequacy: It refers to sufficient numbers of houses and their adequacy in respect to the housing context and habitat.

Housing shortage has been increasing in absolute numbers over the years as presented in Figure 2.13. According to a report (MoHUPA, TG-12, 2012), India's urban housing shortage was estimated to be 1.8 crores in 2012 with ~95 per cent housing shortage in EWS and LIG category. The housing shortage was estimated based on multiple factors; viz. non-serviceable houses, obsolescence factor, congestion within the dwelling unit and homelessness, wherein the congestion factor has the highest contribution towards the housing need. It is noted that, over the years, despite the existence of housing stock being more than the number of households, the housing shortage remains. This is largely due to different levels of housing supply in different market segments resulting in many vacant houses.

Figure 2.13: Urban Households, Housing Stock, and Housing Shortages in India, 1971-2011 (in crores)



Source: Tiwari, P. and Rao, J., 2016, Housing Markets and Housing Policies in India, ADBI Working Paper Series, ADB Institute

The 'Global Strategy for Shelter to the Year 2000' declared by the United Nations, defined "adequate housing" as "adequate privacy, adequate space, adequate security, adequate lighting and ventilation, adequate basic infrastructure and adequate location with regard to work and basic facilities - all at a reasonable cost." Thus, just meeting the demand numbers does not address adequacy, and there is a need for comprehensive habitat development.

Access to basic amenities like drinking water, electricity, septic tank are major determinants of quality of life. As per NSS, 90.9 per cent of the households had access to safe drinking water, 99.1 per cent households had access to electricity, 96.2 per cent had access to safe sanitation and 75.3 per cent of the households had access to separate kitchens (NSSO, 2018). GoI is taking multiple initiatives to provide adequate housing to the weaker section, including provision of financial assistance for construction of houses equipped with basic amenities. Such amenities include - electricity through Saubhagya scheme (NITI Aayog, 2019), toilet construction under Swachh Bharat Mission (SBM), health coverage through Ayushman Bharat, LPG gas connections through Ujjwala Yojana, amongst others under Angikaar Campaign (MoHUA, PMAY(U) Angikaar Presentations, 2019), and water connections under AMRUT.

PMAY (U) guidelines prescribed a set of norms for dwelling unit carpet area for different categories of income segments as presented in the following table. Mission also revised the upper limit for the dwelling unit carpet areas for MIG I and MIG II under CLSS component to address the increasing need of dwelling unit space requirements of the households. In addition, many States to enhance the liveability and address the need based on the local context have suggested to develop larger houses for EWS and LIG segments. For example, Tamil Nadu State proposed to develop 400 sq. ft. houses for EWS segment.

Table 2-3: Norms for dwelling unit carpet areas under PMAY (U)

	EWS	LIG	MIG I	MIG II
Carpet Area of DU	Up to 30 sq. mt.	Up to 60 sq. mt.	90 sq. mt. Revised to 160 sq. mt.	110 sq. mt. Revised to 200 sq. mt.

Source: PMAY(U) Guidelines (Revised), 2016; Ministry of Housing & Urban Poverty Alleviation, 2017, Pradhan Mantri Awas Yojana (Urban) – Credit Linked Subsidy Scheme for Middle Income Group (CLSS for MIG) – Operational Guidelines;

Limited availability of land to provide affordable housing at the right location to address the lower income segments' social and economic requirements remains a challenge. In this context, initiatives such as unlocking of Government land for provision of affordable housing (i.e. land parcels held by Central Government and CPSEs), and through PPPs is a much needed approach for housing development in the cities (PIB, Policy aims at tapping private and public lands for affordable housing under 8 PPP options., 2017) (PIB , 2019). In addition, earmarking of land as affordable housing zone under Master Plans[4] as an initiative under PMAY (U) and affordable housing zone under the pilot LAP/ TPS under AMRUT will have a potential to move the sector forward on the issue of access to land for affordable housing.

[4] Access to land is captured through a reform under PMAY (U) - Earmarking of affordable housing in Master Plan

Impact of Relocation Programs

Benefits of relocation of slum residents to subsidized suburban housing may not always outweigh costs of moving away from economically and socially well-connected urban slum areas. Cheaper housing does not automatically improve financial well-being, and valuable social networks may not be as easily replicated in new, less-dense communities. A study in Ahmedabad found that a slum relocation program had low take-up and no significant impact on incomes of families or educational attainment of children. There was also a sharp disparity in social capital between urban slums and suburban government housing.

However, in a different context, relocation from low income neighbourhoods to less distressed communities through housing vouchers improved physical and mental health of adults but had little to no effect on economic well-being or learning outcomes. Long term follow-up studies showed that the housing lottery succeeded in helping families live in lower-poverty, safer neighbourhoods, with some modest declines in neighbourhood racial segregation as well.

Source: Bernhardt,S., Field, E., Pande, R. 2016, Moving to opportunity or isolation? Network effects of a slum relocation program in India, American Economic Journal: Applied Economics, 9 (1), 1-32.

Quality: It refers to meeting the standards of construction in respect to structure of the house, ventilation and spacing/ overcrowding. Along with dwelling unit areas, States have also developed certain layout designs / typologies and possible material specifications that can be used by BLC beneficiaries. In case of AHP, ISSR and CLSS, State agencies and private developers need to get the layout plans approved in adherence to State bye-laws and national building codes. According to NSS, the structure of the houses has improved from 93.6 per cent to 96 per cent from 2012 to 2018 (NSSO, 2018). While the aspect of ventilation within houses has improved during the same time period, it stands low at 53.8 per cent. Further, as mentioned in the TG-12 report, largest factor for housing shortage has been overcrowding/ congestion factor within the dwelling unit, which is also resonated through the NSS in 2018. It shows that in households with resident married couples, only 72.4 per cent have separate rooms (NSSO, 2018). As mentioned in the adequacy section, PMAY (U) addresses the space requirements to improve the household living quality. Further, BLC component of PMAY (U) enables incremental development of a house, thus enabling households to construct additional room, toilet, kitchen etc. as needs of the family grow over time.

Equity: It refers to the ability of low-income households, slum dwellers as well as women, to have access to an appropriate house and related services. As per TG-12, the largest gap was estimated in EWS and LIG category that accounted for ~95 per cent. PMAY (U) addresses this need and as of March 2020, has been able to approve ~90 lakh houses for EWS segment. Further, as the demand assessment exercises of HFAPoA have covered slums, PMAY (U) provides the option to slum dwellers to opt for a house under other components of the Mission. Mission focuses on women empowerment by creating a provision for mandatory registration of houses in the name of the woman of the household.

The approach to address the issue of affordability along different segments of the housing continuum creates the opportunity for a household to move up the 'housing ladder'[5] from temporary housing to home ownership or informal to formal market or smaller to larger dwelling unit. PMAY (U) targeted interventions across income spectrum, it also helps in creating an integrated housing market which potentially helps in addressing the trickledown effect, which is otherwise observed in case there is inadequate supply or shortage in any of the sub-segments (variety of options for different income segments).

Livelihood: It refers to opportunities created under this sector and the skill development it needs and can generate for the overall construction sector. Real estate sector is the second largest employment generator after agriculture sector, and the residential segment contributes about 80 per cent of the real estate sector employment (IBEF, 2019). As per the study carried out by National Institute of Public Finance and Policy (NIPFP, 2019), the total estimated number of jobs (direct and indirect) generated by the PMAY(U) Mission were 61.49 lakhs during the period from June 2015 to February 2019. This data was published when the Central Government had sanctioned 72.81 lakh houses under PMAY (U). This presents significant contribution of the scheme on the housing sector employment. Further, MoHUA has estimated generation of 46 lakh direct and 104 lakh indirect employment up to March 2020 under PMAY (U), which contributes to a very large quantum of total employment in urban areas.

[5] Housing Ladder – It is the process wherein a household progresses across the different affordability levels.

Sustainability: It includes environmental sustainability at the construction level and investigates social and financial sustainability at an individual person level. Housing policy measures in India, which earlier focused on provision of houses by constructing them directly, have shifted towards creating an enabling eco-system, improving access to credit and encouraging participation from multiple stakeholders in housing development. Further, the recent initiatives focus on sustainability, to reduce the effects of climate change and social inclusion of all the possible stakeholders (MoHUA, India Habitat Report III - National Report, 2016). However, to bridge the housing gap as per the current demand and further develop affordable housing for future generation will have severe consequences on the environment. As per the report by (Nagrath, K., & Gilbert, A., 2014), in a business-as-usual scenario of construction of housing, provisioning of the large social housing demand will accelerate climate change, environmental degradation and the depletion of natural resources. With each dwelling unit size varying from 30 - 60 sq. m, the additional building footprint in urban area by 2022 will be at least 360 million sq. m, further impacting the energy consumption and carbon emissions. (Shakti Foundation, 2018). Various policy initiatives have been considered for optimising energy use in buildings, including the National Building Code (NBC), 2016; the Energy Conservation Building Code for Residential (ECBC-R), 2018; the Model Building Bye-Laws, 2016; various green building ratings; National Urban Housing and Habitat Policy (NUHHP), 2007.

Under the PMAY(U) Mission, a Technology Sub-Mission (TSM) has been set up to facilitate adoption of modern, innovative and green technologies, and choice of building materials for faster and quality construction of houses. TSM facilitates preparation and adoption of layout designs and building plans suitable for various geo-climatic zones. It also assists States/ cities in deploying disaster resilient and environment friendly technologies (MoHUA, India Habitat Report III - National Report, 2016). Under TSM, a compendium of 54 alternate and innovative housing construction technologies have been identified, and CPWD has issued SoRs on 29 new construction technologies. The recently held Global Housing Technology Challenge (GHTC) was one such initiative to incubate innovative and green technology ideas for affordable housing. These technologies include; Formwork systems, Precast sandwich panel systems, Steel structural systems, precast concrete construction systems with some of the futuristic technologies such as 3D pre-cast volumetric or 3D monolithic modular casting. These technologies reduce construction time, provide flexibility to create different building options with same dwelling unit design, reduce on-site material wastage, and increases safety and security of workers. Many of these technologies require controlled conditions with same material and fixed design codes and standards, reducing any possibility of discrepancy on the site. All LHP cities have selected the above-mentioned latest technologies. LHP at Ranchi has selected 3D pre-cast volumetric technology. Its faster implementation and dissemination to States will help in quicker replication across new mass housing projects.

Further from a social sustainability perspective, it is important to build cohesive communities to sustain the houses and O&M of the assets created. PMAY (U) launched the ‘Angikaar’ campaign that intended to infuse social behavioural change to adapt to new housing and additional features such as lifts, common areas, play areas for children etc. Such social cohesion efforts need to be addressed in a continual manner to sustain the development across communities.

Mixed Land use and compactness

The land use pattern in a city is a juxtaposition of natural and socio-economic factors along with human interactions in space and time, and this relationship between different uses is built through master planning processes. With increasing urbanisation, the land demand is increasing as well, creating pressure on both horizontal and vertical development. Hence, it may be stated that compact development with mixed-land use is imperative to overcome land pressures and increasing environmental degradation due to sprawling of the cities. New Climate Economy (NCE) looked into the relationship between urban form and economic performance, and found an evidence that more compact Indian cities have performed well economically than more sprawled cities during 2002 to 2012 period (Tewari, M., & Godfrey, N., 2016). This highlights the agglomeration economies kicking-in when more dense development starts taking place and more focused approach towards compact development is carried out. The NCE suggests that a “poorly planned, ‘sprawled’, private-vehicle dependent model of urban growth can have significant economic, social, and environmental costs which undermine prosperity. On the other hand, more appropriately compact, connected, and coordinated cities can be more productive, socially inclusive, resilient, cleaner, and safer” (Tewari, M., & Godfrey, N., 2016). In last three to four decades, mixed use has emerged as important planning concept across the world. This has been a reaction to the non-vitality of fixed, mono-functional and segregated land uses of the early 20th century tools followed largely due to industrialisation (Mahajan, M., 2018).

Mixed use is interpreted in vast variety of ways across the world and by stakeholders. Mixed use implies a combination or mixing of commercial, residential and industrial land uses as opposed to segregation of residential land uses from non-residential uses (Aurand,A., 2010). Grant defines features of mixed-land use development to be; increased intensity of land uses, increased diversity if uses, and integrating segregated uses (Grant,J., 2002).

Sectoral outcomes for Mixed land use and compactness

Indian cities are witnessing sprawl and along with segregation of land uses, low focus on densification and limited emphasis on compact development have been observed to be the key reasons for expanding cities. However, it is noted that traditional Indian cites were mix-use developments with more fine compact development, along with street-based living, production and trading. But, with modern planning movement in India, the emphasis lied on the segregated zoning development. While, Indian cities propagated zoning regulations, mixed-use activities have proliferated even in strict land-use zones of the cities, as a market response to people's requirements (Mahajan, M., 2018).

The GoI has been undertaking several policies, regulatory, and programmatic measures to address the need of the increasing land pressure in urban areas and enhancing multi-functional use of the land to improve liveability. URDPFI, 2015 calls out for provision of mixed land use under zoning regulations and highlights that its implementation results in reduction in urban sprawl, by providing higher densities and relaxing development norms without affecting the quality of life. URDPFI guideline highlights that 'Mixed-use development' is the practice of allowing more than one type of use in a building or set of buildings which can be combination of residential, commercial, industrial, office, institutional or other land uses. It is presumed that mixed land uses yield socio-economic benefits and therefore has a positive effect on housing and commercial values' (URDPFI, 2015). And with this, few cities like Delhi, Bengaluru, Mumbai etc. introduced mixed land use provisions under their master plans. It is noted that GoI has recognised its importance and sought to address it through SCM. SCM seeks to promote mixed land use in area-based developments (ABD) containing a range of compatible activities and land uses close to one another in order to make development and land use more efficient. Beside this, other factors supporting inclusive neighbourhoods and compact development like TOD, NMT, vibrant street development etc. have also been addressed under SCM. AMRUT also focuses on densification and transit provisioning to improve liveability with all amenities developed within a compact form. The following sub-section attempts to map the key outcomes intended through the urban CSS against the sectoral desired outcomes identified based on the national and international outcome frameworks. Mixed-use and compact cities should lead to sustainable and efficient land use and enhance the liveability of its citizens. The following table summarises the desired sectoral outcomes and its mapping with existing urban CSS/ interventions.

Table 2-4: Sectoral outcome coverage and gaps: Mixed use and compactness

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Sustainable land development and efficient land use	SCM – ABD redevelopment component; AMRUT – LAP/ TPS	Adequacy, Sustainability
Enhanced walkability and reduction in commuting time	SCM, AMRUT	Access, Adequacy, Sustainability
Promotion of vibrant street life	NULM – SUSV component; SCM, AMRUT	Access, Equity, Livelihood
Inclusive neighbourhoods	AMRUT - NMT, SCM – urban transport	Access, Equity
Increase in Transit-Oriented Developments (TOD) in Cities	SCM	Access, Adequacy

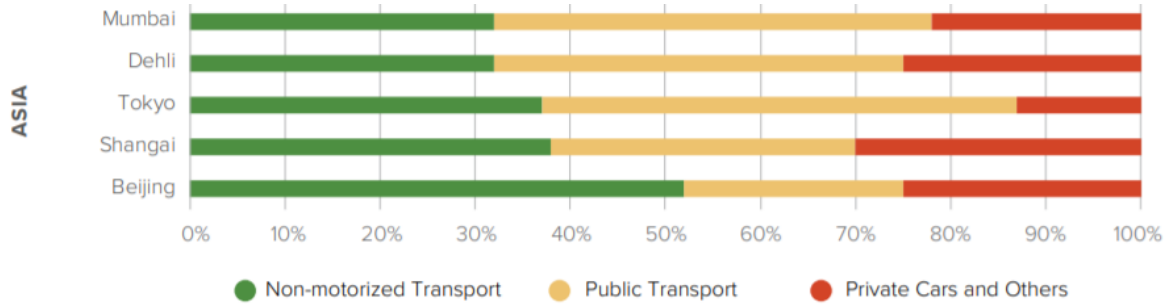
Note: The desired outcomes have been drawn based on the literature review including; SCM guidelines, NULM OOMF and guidelines; URDPFI, 2015, UN-Habitat, 2011, A new strategy of sustainable neighbourhood planning: five principles; ADB, 2018, Enabling Smart urban redevelopment in India through floor area ratio incentives

Based on the coverage of sectoral outcomes, the following section presents an overview of the progress that has been made across 'mixed use and compactness parameter' across the six principles.

Access: It refers to the access to the infrastructure related to social, commercial, transits, and daily needs that helps in building an inclusive neighbourhood. It shall target to provide vibrant life, easy movement of people with low dependency on private cars, easy access to schools, health facilities and other basic daily needs. Currently, in India beside introduction of mixed-use provision in master pans of some of te cities, it is largely promoted across the cities through two policy/ program measures; transit-oriented development (TOD), and SCM. As SCM has limited scope across ABD in 100 cities, the TOD policy becomes more important mechanism for dense and mixed-use development.

While many cities have launched TOD policies as discussed in next sub-section, TOD has witnessed little progress on the ground in some select cities, such as Delhi, Ahmedabad etc. Along with this, the availability of social infrastructure within the neighbourhood, especially in case of primary education shows that more than 90 per cent of urban children have access to primary schools within one kilometre from their residence. Along with these services, the availability and access to pedestrian facilities and NMT infrastructure is key to enhance walkability and improve last-mile connectivity for better neighbourhoods. Modal share across Asian cities highlight that a large number of urban residents walk or use cycle/ cycle rickshaws (NCE, 2018). The following figure presents the modal share across NMT, public transport and privatised motorised options across different cities. While the modal share split is available for certain cities in India, and the available data highlights the higher share of NMT compared to American and some European cities, the infrastructure to create walkability more convenient, safe and enjoyable is very limited.

Figure 2.14: Modal share for largest cities in Asia



Source: NCE, 2018, Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in urgent times

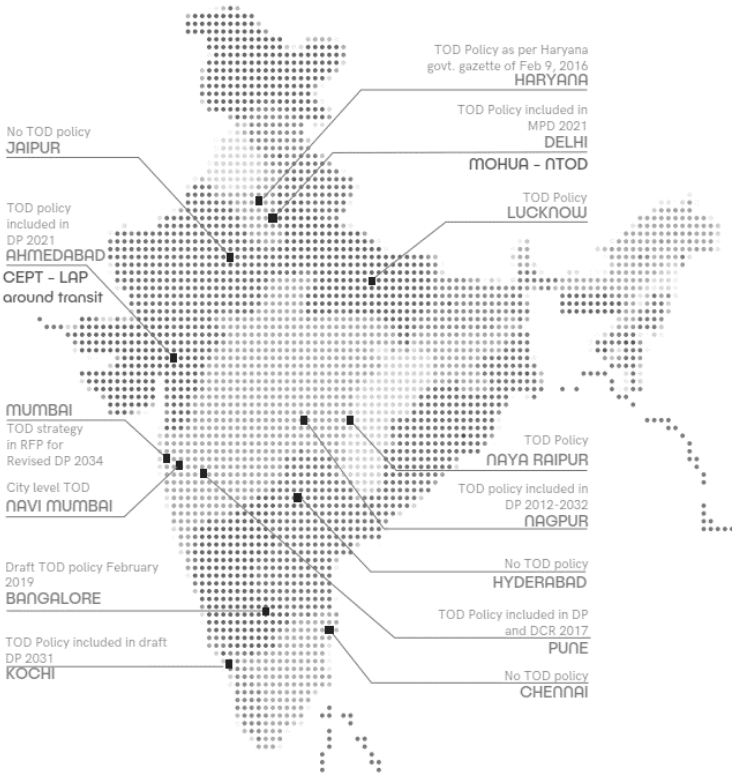
In Indian cities, the NMT infrastructure requirement across cities and actual implementation in terms of service level benchmarking is not measured or recorded. However, with increasing focus on such modes, both SCM and AMRUT have focused towards implementation of such infrastructure to create more inclusive areas; wherein under SCM, 41 projects have been completed in 23 cities with the total investment of Rs. 264 crore and under AMRUT around 110 projects with central assistance of Rs. 137 crore have been completed. While there are many factors that collectively contribute towards mixed-use and compact development, including development regulations, relaxed norms on densities, FAR, and heights, the involvement of local stakeholders and their willingness to undertake such transformation is also very important.

Adequacy: It looks into the sufficiency of the policy and regulatory measures that aids in helping implement mixed land uses and compact urban forms along with the current status of the policy implementation. GoI has recognised the need for such development and hence, one of the philosophical principles of the draft NUPF emphasises on 'Building for Density' and one of the function areas focusses on 'City Planning'. These two aspects together will pave the path for the mixed land use and compact city development.

Increasing need for the compact development and mixed land use can be attributed to the increasing burden on land, land's limited availability, and increasing environmental pressure. Urban land use is governed by Master Plans prepared in line with the Urban Development Plan Formulation and Implementation (URDPFI) guidelines, and density is governed by development control regulations that are locally revised at city/ State level from time to time (Abbu, 2015). Recognising the need for compact development and mixed land-use, GoI launched 'National Transit Oriented Development Policy'. Cities such as New Delhi and Ahmedabad amongst many others have implemented policies that integrate urban planning strategies such as TOD, for achieving dense and compact urban form along transport corridors promote walkable, mixed-use neighbourhoods, and reduce use of motorized vehicles by providing FAR/ FSI incentives (Shenvi, A. and Slangen, R.H., 2018).

Although, a number of schemes and initiatives of the government (both at central and State level) have been contributing towards the concept of mixed use and compact development, they have not addressed it in its entirety. SCM emphasised on 'area-based development' with an objective to transform existing urban areas by promoting mixed-use, walkable, and transit-accessible inclusive neighbourhoods, with open spaces and cultural amenities that uses urban land efficiently and improve the overall quality of life. AMRUT also launched Local Area Planning (LAP) and Town Planning Scheme (TPS) in 2019, to use land efficiently and address the liveability concerns of the citizens. While there have been efforts undertaken by the cities under these Missions, they are applicable to only certain select cities.

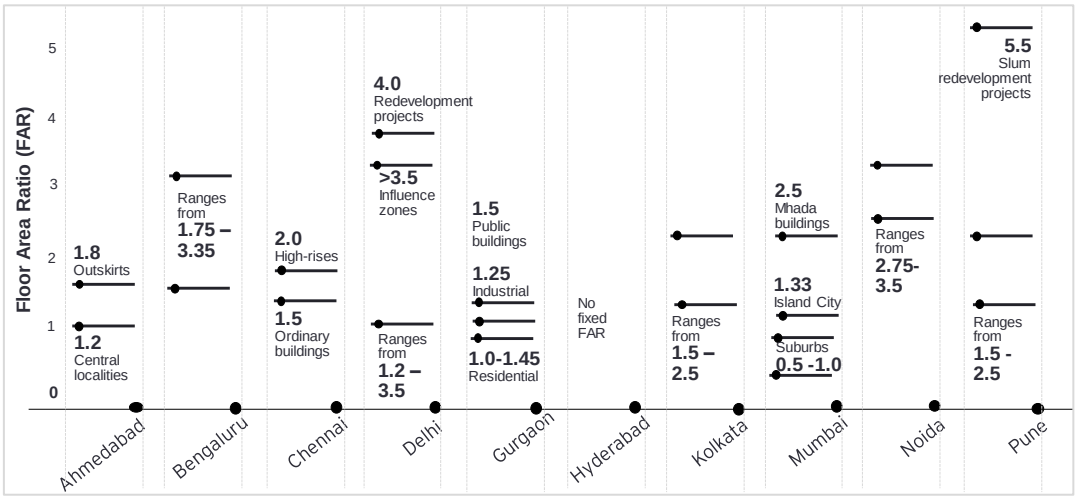
Figure 2.15: Status of TOD policies in India



Source: MoHUA and CEPT, 2020, LAP for Transit: Illustrated handbook for Indian Cities

While, there have been progress on policy front towards TOD and LAP, very low progress has been witnessed on the ground. Preparation of TOD plans through development plans or standalone local area plans has been limited, with certain progress achieved in Delhi, Ahmedabad and Bengaluru (CEPT and Shakti Foundation, 2020). Globally, to create high-density, mixed-use neighbourhoods that are serviced by public transport, FAR incentives and 'density bonuses' are provided to encourage such kind of development. US and Brazil have followed these approaches (Shenvi, A. and Slangen, R.H., 2018). Recognising this need, SCM was launched with the objective of upgrading urban infrastructure in existing Indian cities, using smart technology, and governance strategies, promoting high-density, mixed use, area-based development that is inclusive and sustainable (Shenvi, A. and Slangen, R.H., 2018). The mission guidelines recommend the use of higher FSI and higher ground coverage (MoHUA, Smart Cities Mission Guidelines, 2015). However, FAR/ FSI varies a lot across the Indian cities and is generally very low compared to global counterparts. In India, it largely is around 1.5 to 3 FAR across cities with some recent exceptions and updates in some of the cities witnessing FAR of 5 and above. However, globally the FARs of large cities varies from 5 to 15. Some of the average FARs of international cities are; Shanghai – 8, Chicago – 12, Hong kong – 13, New York – 15, and Tokyo up to 20.

Figure 2.16: Permissible Floor Area Ratio (FAR) in India's Top 10 cities



Source: https://www.proptiger.com/guide/post/fsi-in-10-cities-of-india

While FARs in Indian cities are low, the population density show a different story, as presented in the following sub-section.

Quality: In India, many cities experience dense development, and suffer from overcrowding, congestion, inefficient urban services, poor pedestrian facilities and cycling conditions, and inefficient public transport services (Tewari, M., & Godfrey, N., 2016). While the central areas of many Indian cities are among the most densely populated along with mixed use in the world (Hyderabad – 184 pph, Indore – 97 pph, Hongkong – 67 pph, Singapore – 84 pph) current land and development regulations lead to a low density of built-up floor space. Real estate prices are also very high, thus pricing out urban poor from the city-centre to either reside in the over-crowded areas, extremely vulnerable locations or move into suburbs to seek for cheaper land. (Tewari, M., & Godfrey, N., 2016). ITDP highlights that "The best way to manage urban growth is for cities to grow vertically (densify) instead of horizontally (sprawl). With good planning, higher densities make sustainable transit less expensive and more effective, and help create walkable, liveable neighbourhoods with an active, mixed-use environment" (ITDP, n.d.). In this line, Project Tender SURE was launched in 2011, that mandates the integration of physical infrastructure with prioritised comfort and safety of pedestrians and cyclists and recognised the need of the vendors and hawkers. It can be highlighted that; such concepts have been developed as 'Smart road' and 'Smart street' projects under SCM that enhance the quality of living in the neighbourhoods.

Millions of people around the world enjoy the experience of dense and diverse urban environment. Some of the most prosperous and prestigious neighbourhoods are among the densest of cities such as Tokyo, Seoul, Barcelona, New York, Rio de Janeiro, and San Francisco. However, to maintain the quality of life, the density needs to be balanced well with the infrastructure creation, sufficient services, right spaces for open areas, and preservation of historical and cultural places (ITDP, n.d.). In case of Indian cities, the deficit in access to basic services in low to medium dense areas is also evident (Tewari, M., & Godfrey, N., 2016), hence the potential to develop highly-dense neighbourhoods addressing the liveability aspects seems difficult for most of the cities due to lack of urban planning in terms of master planning, infrastructure creation and weak coordination between various service delivery institutions.

Livelihood: As mentioned earlier, NCE looked into the relationship between urban form and economic performance, and found an evidence that more compact Indian cities have performed well economically than more sprawled cities during 2002 to 2012 period (Tewari, M., & Godfrey, N., 2016). However, at micro level enhanced space for street vendors on the streets designed in mixed land use and compact cities are functionally very important to reduce the commuting time for citizens to access their daily needs and also help in enhancing the livelihood opportunities for the vendors. TOD Policy focuses on the inclusion of the vendors on the streets. Many cities have also come out with 'Street Design Guidelines' like Pune, Delhi, Chennai etc. specially after projects implemented under SCM, which also mentions regarding the earmarking of dedicated street vending spaces to improve their livelihood and also create vibrant streets to add to the safety measures as well.

Equity: As mentioned earlier, TOD aims at inclusive development wherein all users of the system are benefited, including last-mile connectivity providers, street vendors etc. thus creating equitable spaces for different segments of the society.

Sustainability: This refers to the sustainable and efficient land use development, which is significantly critical for enhancing quality of life of the people. In last few decades, Indian cities have grown vastly in geographic size to meet the increasing urbanisation requirements. Sprawling cities have increased the dependence on automobiles resulting into higher traffic congestion, air pollution, rising greenhouse gas emissions, and poor public health (WRI Blogs, 2014).

The concept of 'mixed use and compact development' has been under discussion and is also recognised as a significant factor for sustainable development and further reducing ill-effects of sprawling cities. Higher compactness correlates with lower carbon emissions. As per NCE, densification is more carbon efficient and resilient to climate change and disasters; with global examples from Barcelona's car-lite superblocks and Singapore's green canopies, which are estimated to build resilience by reducing local peak temperatures by five degree Celsius and further reducing costs associated with air conditioning (NCE, 2018). While it is being addressed many cities across the globe, there have been very few efforts to measure the compactness and sprawl of Indian cities (Verma, 2019), and hence limited initiatives in its actual impact on Indian cities.

As per our traditional approaches of planning, the density and public transport have played a minimal role for taking the decision for mixed land use. City plans have been mainly developed based on the land availability. With rapid urbanisation, cities are more and more focusing on compact urban development as a key strategy for climate protection. Further, it is believed that the long-term solution is to develop urban areas in a way

that reduces the need for people to commute for longer durations through personal modes (Nallathiga, 2010). In this context, cities need to strengthen urban planning with focused approach towards compact development to create inclusive and sustainable cities.

Transportation and Mobility

This sub-sector plays an important role in the urban context and impacts all citizens. The GoI has taken various initiatives to address this sector's requirement over time. This sub-sector in conjunction with efficient land use can address sustainable development in urban areas. Urban land limitations and development controls are pricing out people and commercial areas to far-off locations and on the outskirts of the cities, thus urban transport becomes increasingly important for people to commute for their work and other purposes. Good transport systems provide an opportunity to citizens to make trade-off between the housing type and the distance travelled for work. However, if such urban transport is insufficient and inefficient, other challenges in relation to land market get aggravated (World Bank, 2013). Indian Government has been recognising these aspects and launching initiatives to address these problems.

Sectoral outcomes for Transportation and Mobility

The unplanned growth of India cities with increasing sprawl has added to crisis in terms of urban mobility, resulting in congestion, vehicular pollution, and road accidents. Coupled with inadequate transportation systems, the affect is severe on the poor who use these modes to access their jobs, education etc. (Abhishek, V., 2020). To overcome these challenges and meet the sustainable development requirements, GoI has been undertaking several policies, regulatory, and programmatic measures to address the need of the increasing pressure in urban areas in relation traffic, transport, mobility and its resultant effects like congestion, pollution, etc.

Overall, SCM has a strong focus on enhancing the accessibility, adequacy, quality, equity and sustainability of the sub-sector. AMRUT emphasises on environment friendly NMT development to address mobility problems. The following sub-section attempts to map the key outcomes intended through the Urban CSS against the sectoral desired outcomes identified based on the national and international frameworks. Transport and mobility sector should be able to provide access to multiple options with seamless, safe and convenient commute to every citizen to enhance their quality of life. The following table summarises the desired sectoral outcomes and its mapping with existing urban CSS/ interventions.

Table 2-5 Sectoral outcome coverage and gaps - transportation and mobility

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Availability of adequate and safe road infrastructure i	AMRUT and SCM	Access, Adequacy, Equity
Enhanced use of NMT, public transport and improved last mile connectivity	AMRUT and SCM	Access, Adequacy, Quality, Sustainability
Availability of adequate Parking Infrastructure in Public areas	SCM, AMRUT	Access, Adequacy, quality
Promotion of Environment friendly and sustainable mode of public transport and IPT	SCM - FAME	Sustainability
Financially sustainable Public Transport Infrastructure and Services	SCM	Sustainability

Source: The desired outcomes have been drawn based on the literature review including; Ease of Living Index, 2019; AMRUT OOMF and guidelines; SCM OOMF and guidelines; SDGs

Based on the coverage of sectoral outcomes, the following section presents an overview of the progress that has been made in the transport sector across the six principles.

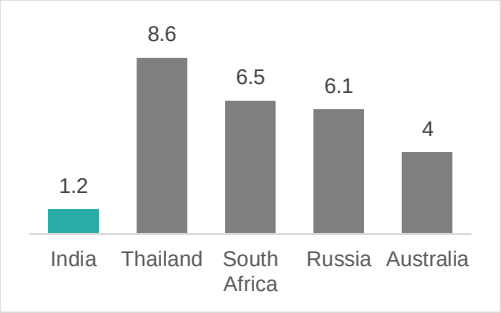
Access and Adequacy: In case of transport and mobility there are various aspects which are inter-related, thus, this sub-sector is assessed through these two principles together. Access principle refers to access to road infrastructure and various mobility options including pedestrian facilities, NMT, IPT and public transport. Adequacy refers to sufficiency of the public transport available in context to the population residing in the area/ city to provide adequate and good quality services.

With growing urban population, India is also witnessing rapid motorisation. The growth in registered urban vehicles has increased at a very rapid rate from 1951 to 2011. The total number of registered motor vehicles in India increased from about 3 lakhs in 1951 to 54 lakhs in 1981 and to nearly 21 crores in 2015, a 40-fold increase (O P Agarwal, & Rathi, S., 2014) (IIHS, Urban Transport Paper in India: Challenges and Recommendations, 2018). This is an increase of 7.7 per cent per annum as against a population increase of 3.8 per cent per annum during the period of 1951 to 2011. The growth of registration of motor vehicles, was even faster at 10 per cent per annum during 2001-2011. This increase was further accompanied by change in transport mode composition with the share of buses declining from 11.1 percent in 1951 to mere 1 per cent in 2011 in India (O P Agarwal, & Rathi, S., 2014). This large growth, in the absence of a widespread public transport system, has caused a rapid increase of private car ownership in India. Five Indian metro cities are witnessing a very grave situation, having vehicle registration rates in excess of 500 per 1,000 people, accounting for 54 per cent of the total vehicles in all the metropolitan cities as of 2011 (Sarma, K. Sen et al., 2011).

Indian cities observe a great heterogeneity in the mode of transport on the road – pedestrians, bicycles, cycle, rickshaws, auto-rickshaws, taxis, motorbikes, two-wheelers, cars, and buses. In smaller cities, even animal carts compete for the same road space. Thus, vehicles on Indian roads tend to have lower journey speeds compared to other global cities (O P Agarwal, & Rathi, S., 2014). Many experts feel that the present motorisation levels are relatively sustainable, but the high motorisation rate is certainly unsustainable and, therefore, the thrust on better balancing demand across the different transport modes is critical (Ahluwalia, 2011).

Public transport in India mainly comprises of bus services and is unable to meet the overall requirement of cities. As against the need of 3.4 lakh buses for public transport, only one lakh buses are available currently (NITI Aayog & BCG, 2018), and India lags in per capita bus fleet in comparison to comparing countries.

Figure 2.17: Availability of buses per 1000 persons



Source: NITI Aayog and BCG, 2018, Transforming India's mobility: A perspective

Intermediate Public Transit (IPT) forms a vital share of the modal share in the cities, ranging from 3 to 8 percent of the total modal shares. Their role as a feeder to existing public transport systems, providing the last mile connectivity helps increase the coverage of the main public transit systems. Due to their informal and unorganised nature, issues of planning, safety and efficiency need to be addressed, to improve these systems for effectively addressing the travel needs of the people in the cities. (O P Agarwal, & Rathi, S., 2014).

Besides bus and IPT, which are mainly local/ State/ private sector driven, GoI has contributed largely for Metro and RRTS projects. During last 5 years, GoI has approved an investment of Rs. 1.81 lakh crore, and for smaller cities, Ministry issued standard specifications for Light Urban Rail Transit System. During last five years, around 700 kms of new Metro rail lines have been made operational in 18 cities (MoHUA, Standing Committee on Urban Development – Second Report (2019-2020), Seventeenth Lok Sabha, 2020), and around 450 kms of BRTS has been made operational in 11 cities (PIB, 2020).

While GoI is investing across different modes of mobility and transport infrastructure, the existing gap between the need and current status would need a mammoth amount of investment and effort. Recognising this, GoI identified transport and mobility as one of the core areas under SCM and NMT under AMRUT. While, these Missions are adding to this infrastructure, the approach to provide has been very fragmented and limited to Mission cities only. There is need to develop a city-wide mobility plans and urban transport infrastructure plans to overcome these wide gaps.

Quality: It delves into quality of the transport infrastructure and hence the safety it provides for the public. As per the study carried out by CSTEP in 2014, the urban road length went up by 3.35 times from 1981 to 2011, whereas the number of motor vehicles went up 26 times during the same period, thereby reducing the road space per vehicle (from 0.18 km per vehicle to 0.01 km per vehicle) drastically and leading to increased congestion. Major Indian cities are now constantly ranked amongst the most congested cities in the world. Many cities in India are facing the challenge of reduced journey speeds; average speed for vehicles in major cities in India is reported around 17 km/h. Further, the off-peak speed for 13 arterial roads in Delhi has been recorded at 27 km/h, 50 to 60 per cent lower than their design speeds.

According to 2020 version of the TomTom traffic index which provides insights on road congestion levels across the globe, 4 Indian cities namely Bengaluru, Mumbai, Pune and Delhi, find themselves on the list of 10 most traffic congested cities across the globe, with Bengaluru topping the chart of over 400 cities, with drivers expecting to spend an average of 71 per cent extra travel time stuck in traffic (TomTom, 2020). Further, it is estimated that the cost of traffic congestion in India is over USD 20 billion annually across just four metro cities of India (NITI Aayog & BCG, 2018).

As per a CSTEP and IUT study, performance of city bus services varies across large cities. Bengaluru Metropolitan Transport Corporation (BMTC) has been one of the few agencies generating operating profits, whereas other transport corporations in the country have faced losses. As this study states "although riding a bus, walking and cycling constitute the main modes of transport for the urban poor, these modes do not receive adequate attention in mobility planning by the government. For example, when it comes to improving bus services, the focus is more on improving the quality of services, often resulting in higher costs. However, the CSTEP study found that fares were too high and unaffordable for large share of the people surveyed under its study.

It was also found that low frequency, absence of shelters, travel time, inadequate seat reservation and harassment were some of the major concerns in using public transport. Pedestrians and cyclists on the other hand considered inadequate street lighting, absence of cycle parking, poor roads, hygiene, road repairs, walker-unfriendly footpaths, unsegregated traffic and unsafe crossings to be matters of prime importance." (O P Agarwal, & Rathi, S., 2014). On similar lines, the World bank study conducted in 2013 highlights that public transport in India is least affordable among global counterparts based on public transport affordability index (World Bank, 2013).

Various initiatives of Central and State Governments like Smart Cities, AMRUT, metro rails, projects to augment public transport and road infrastructure, etc. have been implemented to create a positive impact on the urban mobility scenario in Indian cities. These interventions, with a clear policy and legal framework, and a well-defined roadmap across all urban areas, can substantially augment commuter experience in the country.

Equity: It refers to ability of different sections of the society to safely commute in affordable manner. India's urban transport sector is generally planned with minimal interventions in relation to female passengers, senior citizens, children, physically disadvantaged people. Women and girls almost comprise half of the urban population and 84 per cent of female trips are by public, intermediate public and nonmotorized modes of transport (GoI Census , 2011). Since women are mostly informal workers, their work destination is generally dispersed across the city area. A study of a low-income settlement in Delhi by (Anand, A. & Tiwari, G., 2006) showed a gender dimension to the linkages across shelter, transport and livelihood.

It is showcased in the study that women are more affected than men when access to employment, education or basic services are located far away from their residences. For example, relocation of squatter settlements to the periphery of Delhi led to an increase in female unemployment by 27 per cent compared to 5 per cent for men (Anand, A. & Tiwari, G., 2006). In India, women's concerns in cities especially urban transport came to the forefront mainly through the safety dimension. Hence, "Women and girls fear using public transport because of violence and the fear of violence. Crowded public transport is often the location where women face sexual harassment, because the crowd offers anonymity" (Khosla, P. & Dhar, S., 2013). SCM is focusing on creating safe environment through ITS, CCTV and early response systems, however it needs to be enforced fully and expanded across the cities of India to observe its result in future.

Livelihood: It refers to opportunities created under this sector and the skill development it needs and can generate for the overall transport sub-sector. This sector has a strong employment base, however the number of people employed in urban transport is not known as it has a mix of different transport modes and operated by both government and private sector.

Sustainability: It includes environmental sustainability that should be at the core of this sub-sector to address the increasing challenges of air pollution. The lack of integrated mobility planning has resulted in making Indian cities amongst the most polluted and congested ones globally (IIHS, Urban Transport Paper in India: Challenges and Recommendations, 2018). According to NITI Aayog, India's cities are under substantial risk due to air pollution. As per a WHO study, thirteen out of the top fifteen most polluted cities in the world belong to India (WHO, 2018). Urban pollution in India is about 40 per cent above the safe limits across major Indian cities measure at PM2.5 level.

Further it is alarming to see that the PM2.5 levels are also increasing, when mostly other countries have stabilized their pollution levels at the safe levels. The large share of contribution to air pollutions that is 70 to

80 percent of PM2.5 is contributed by vehicular pollution, domestic activity, construction activity, road dust and industrial activity (NITI Aayog & BCG, 2018). To overcome such problem, Faster Adoption and Manufacturing of Hybrid & Electric Vehicles (FAME) scheme was launched by GoI in 2015 and introduced incentives for electric buses. SCM has converged with this scheme to launch these EVs in the smart cities. Also with reference to vehicular pollution the steps taken include introduction of cleaner / alternate fuels like gaseous fuel (CNG, LPG etc.), ethanol blending, universalization of BS-IV by 2017; leapfrogging from BS-IV to BS-VI fuel standards by 1st April, 2020; ongoing promotion of public transport network of metro, buses, e-rickshaws and promotion of carpooling etc. Electric vehicles (EV) are in key focus highest leadership of India, which intends to manufacture EVs, build support infrastructure like charging kiosks and provide support ot people to purchase cleaner vehicles. Further, to address the growing need for environment friendly mobility options, SCM has recently launched Cycles4Change Challenge in 2020.

In terms of institutional framework, existence of multiple agencies handling different urban transport functions is common in Indian cities. This fragmented institutional framework with isolated functioning leads to limited coordination, conflicting agendas and limited accountability. To address this, the National Urban Transport Policy 2006, suggested to constitute Unified Metropolitan Transport Authority (UMTA) for all million plus population cities, to maintain better coordination amongst all the transport related agencies within a city. UMTA is supposed to rationalize existing functions (remove overlaps and address gaps). As per Census 2011, there are 52 cities with million plus population, however, only a limited number of cities have been able to constitute UMTA by far, such as Hyderabad, Chennai, Delhi, Pune, etc. (MoUD, Final operations document for UMTA, 2016). Indian cities need to immediately act on these issues to address them and create more sustainable institutions to provide more integrated and financially sustainable public transport to citizens.

Public Open Spaces

"Public spaces are an important part of cities as they contribute to improvements in liveability, environmental quality and sustainability. Despite these benefits, conditions of public spaces in cities in developing countries like India are far from desirable in terms of quantity as well as their quality" (Praliya & Garg, 2019). Further, the ecological importance of urban green spaces is rarely taken into cognizance, which is further continuing the decline in the urban open spaces with the rapid rate of urbanisation (Jafri, S. & Rajaullah, M., 2018).

Sectoral outcomes for public open spaces

The following sub-section attempts to map the key outcomes intended through the Urban CCS against the sectoral desired outcomes identified based on the national and international frameworks. Transport and mobility sector should be able to provide access to multiple options with seamless, safe and convenient commute to every citizen to enhance their quality of life. The following table summarises the desired sectoral outcomes and its mapping with existing urban CSS/ interventions.

Table 2-6: Sectoral outcome coverage and gaps: Public open spaces

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Universal access to safe, inclusive green and public spaces	SCM and AMRUT	Access, Equity
Adequate open and green spaces in cities	-	Adequacy
Availability of public recreational spaces, more vibrant community life	SCM	Access, Adequacy
Improved quality of waterfront spaces for citizens to use for recreation and physical activities	SCM, AMRUT	Access, quality
Enhanced quality of public open spaces	SCM, AMRUT, SBM, NULM	Quality
Sustainable O&M of Public open spaces	SCM, AMRUT	Sustainability

Source: The desired outcomes have been drawn based on the literature review including; Ease of Living Index, 2019; ii – AMRUT OOMF and guidelines; iii – SCM OOMF and guidelines; iv – SDGs

Overall, SCM and AMRUT has a strong focus on enhancing the accessibility, adequacy, quality and equity in respect to public open spaces. The sustainability is not directly captured under these Missions. Both SCM and AMRUT schemes, provide for development and improvement of open spaces, however it is noted that

the focus is mainly on improving the parks and installing new facilities in existing parks and not the creation of new parks. This approach of improving existing parks effectively improves the quality of existing green spaces thus improving access and quality for the people to use it however it does not improve the per capita green/ open spaces and thus does not fully contribute towards adequacy and accessibility principles against the standards as described in the following sections.

Based on the coverage of sectoral outcomes, the following section presents an overview of the progress that has been made in the housing sector across the principles.

Access and Adequacy: In case of this sub-sector due to inter-relation of various aspects, this sub-sector is assessed through these two principles together. As per the findings by a team of faculty members at the Indian Institute of Science (IISc) Bengaluru, it was revealed that many cities are facing a decline in the urban green (Jafri, S. & Rajaullah, M., 2018). The following figure broadly presents the declining greens in major cities as per the study.

Figure 2.18: Break-up of land use in major cities highlighting decreasing urban greens

Source: Jafri, Shoeb and Rajaullah, Mohammad, 2018

For a healthy living, the World Health Organisation (WHO) has set a minimum limit for the per capita green space in urban areas as 9 sq. m. The minimum limit per capita green space has also been identified by the United Nations (UN) as 30 sq. m. per person, but no specific limit for per capita public open spaces has been identified by any agency (Shahfahad et al., 2019). According to the Urban and Regional Development Plan Formulation and Implementation (URDPFI) guidelines for India, the green space shall be 10 to 12 sq. m. per capita. On the other hand, access to open space/ green space should be within 250 m of residential areas and 100 per cent local/ native plants should be used in landscaping in these green spaces as it leads to reduced water consumption while improving urban biodiversity (Dhanpal, G. & Pradeep Chaudhary, 2012).

New Delhi is the greenest metropolitan city of India with about 22 per cent green cover, and the per capita green space is about 20 sq. m. and open space is about 30 sq. m., which is higher compared to the other metropolitan cities like Mumbai and Chennai which have less than 10 per cent green cover. The per capita green space in Mumbai is 1.28 sq. m., and Chennai has 0.46 sq. m. Other large cities like Gandhinagar and Chandigarh have higher green spaces, i.e. 160 sq. m. and 55 sq. m. per capita respectively (Shahfahad et al., 2019).

As is evident, many cities have failed to provide for basic minimum open space requirements. (Praliya & Garg, 2019), state that “the lack of these spaces is not due to lack of land availability but is mainly due to the apathy and minimal importance given by government authorities to recreational needs of citizens”. Additionally, (Jafri, S. & Rajaullah, M., 2018) have “identified lack of public recreational open space, inadequate playgrounds, maintenance of parks, broken and inadequate equipment in park as common problems in relation to green open spaces in urban centres”.

While both SCM and AMRUT provide for development of parks/ green spaces, open spaces and water-front development for recreational purposes and better quality of life, the approach has been very fragmented in nature with focus on number of parks rather than meeting the per capita requirements as per Indian or global norms. Additionally, these initiatives have also been limited across the Mission cities. This deprives smaller

cities from such special funding for open spaces and highly depends upon State level investments or ULB funding. SCM and AMRUT together have invested Rs. 1050 crore to improve and develop green spaces.

Quality: "Public spaces are an important part of cities as they contribute to improvements in liveability, environmental quality and sustainability. Despite these benefits, conditions of public spaces in cities in developing countries like India are far from desirable in terms of quantity as well as their quality" (Praliya & Garg, 2019). Further, the ecological importance of urban green spaces is rarely taken into cognizance, which is further continuing the decline in the urban open spaces with the rapid rate of urbanisation (Jafri, S. & Rajaullah, M., 2018).

Equity: It refers to ability of different sections of the society to safely access and use public open spaces. The gender equitable, safe and inclusive cities is one of the urban agendas. As observed, there are multiple factors that affect women's perception of safety in open spaces – improper lighting, quality of public spaces such as broken sidewalks, blocked streetlights, empty/ dilapidated areas etc. which results in low usage of these open spaces by women (Mahadevia, D. & Saumya, L., 2019). SCM is trying to address the universal access and safety concerns for different segments across parks, streets, open spaces etc. but it is limited to select areas of smart cities. This needs to be enhanced and expanded to new areas to make our cities more equitable.

Based on the literature review, various challenges and the possible broad way forward has been identified and summarised in the following table.

Table 2-7: Key challenges and way forward – Infrastructure services

Liveability Parameter	Key Issues & Challenges	Broad way forward
Housing and Shelter	• Land related: Unavailability of low-cost land, unclear/ weak land titles, land cost, limited land monetisation • Finance related: High cost of construction, limited access to organized finance for weaker section, limited private sector participation in affordable housing schemes • Formation of informal housing: slums, homelessness, evictions, large informal rental housing • Many statutory approvals/ clearances, limited skilled labour	• Sustainable land management to ensure access to suitable and adequate land for all critical uses under infrastructure services • Efficient integrated urban planning at different levels (regional planning, city planning and local area planning) to create adequate access to housing, transport, economic hubs and open spaces • Scale up LAP/ TPS models across the cities to provide an opportunity for land amalgamation, TOD, land monetization, value capture financing to address the land and financing requirements for urban development • Build competencies at ULB level and other city level institutions to plan and enforce master plans, to manage land, and to deliver and maintain the infrastructure developed
Mixed use and compactness	• Indian FSIs are generally very low compared with cities - Shanghai, Hong Kong, New York, and Tokyo leading to more expansion/ sprawl. However, current FAR/ FSI practices in India also have significant socio-economic implications. It is essential to address these by establishing safeguards before replicating this approach in other cities to ensure that redevelopment is inclusive and sustainable. • High prices of land within the city leads to low-income housing/ large commercial spaces to develop at suburbs, sprawling the city. • Compact cities require very high technical expertise to address the higher densities and corresponding infrastructure, hence limited technical expertise at city level to develop compact cities in sustainable manner is a critical challenge. • Lack of urban planning and limited coordination between infrastructure creation and service delivery institutions lead to sprawled development or inefficient dense development.	

Liveability Parameter	Key Issues & Challenges	Broad way forward
Transport and Mobility	• Inadequate and inefficient public transport infrastructure, road congestion, and parking spaces • Informal and unorganised nature of IPT leading to issues of planning, safety and efficiency • High transport emissions resulting into bad air quality and various factors leading to declining road safety • Limited implementation of intelligent transport systems leading to low enforcement and less efficiency in the urban transport systems • Fragmented institutional frameworks, human resource challenges, especially to meet new and innovative transport system requirements	
Public open spaces	• Increased scarcity of land within city area leading to low green spaces • Minimal importance given to these spaces for the citizens by the Government • Green Spaces – shrinking as Cities grow • Cities are unable to provide minimum open space requirements	

2.2.2.2 Natural Resource Management

Water Supply

Water is a natural and economic resource, that is irreplaceable in nature. It is unevenly distributed on Earth; wherein with ~ 17 per cent of the world's population, India has 4.5 per cent of freshwater resource (WaterAid, 2018). Clean and adequate water supply is critical for health and quality of life of citizens. The water supply service chain broadly follows the steps of sourcing, treatment, transmission/ distribution, and household water supply in the last mile. However, many models exist within this overall value chain. From an end user's perspective, households may obtain their water from multiple sources.

The most desirable one would be assured piped water supply on premise, which involves a water treatment plant that extracts raw water from surface or groundwater, treat it, and transmits and distributes the treated water through a piped network to households. The water supplied may be used for various purposes to meet basic demands from domestic chores, personal hygiene, to drinking/ cooking. However, many households in low income areas without access to tap water rely on alternative sources such as tankers, standpipes, hand pumps, protected or unprotected springs and wells, etc. Hence, clean and sufficient water supply is imperative to achieve the prosperity.

Sectoral Outcomes for Water Supply

In India, the 'Right to water' has been protected as a fundamental human right by Supreme Court as part of the 'Right to life' under Article 21 of the Constitution. Although water supply is primarily a State subject, both centre and State play a crucial role in managing water resources and funding water supply.

Recognising the importance of water sector and its supply to every household, the GoI has undertaken several measures on policy, programs, institutional creation to address the challenges and problems of the sector since Independence. The first central level effort to provide drinking water in cities and towns were undertaken through the Integrated Development for Small and Medium Towns (IDSMT, 1979), followed by Accelerated Urban Water Supply Programme (AUWSP, 1992). The landmark initiative of JnNURM brought water supply projects on the fore-front with a large-scale central assistance under UIG and UIDSSMT component. In 2015, GoI launched AMRUT with an objective of universal coverage of water supply as a priority sector under the Mission.

Overall, AMRUT is directly aligned with the overall access aspect of the sector. AMRUT's objective is to achieve 100 per cent water connections to all the HHs. Since the launch of the scheme, it has provided

77,64,458 tap connections. In addition to AMRUT, SCM has undertaken water supply projects mainly in convergence with AMRUT with the project cost of around Rs. 2000 crores (completed projects).

The following sub-section attempts to map the key outcomes intended through the Urban CCS with the sectoral desired outcomes. Based on the national and international outcome frameworks with respect to water supply sector have been studied for this purpose. The following table summarises a set of overall outcomes desirable for the sector and its mapping through the outcomes intended under the urban CSSs.

Table 2-8: Sectoral outcome coverage and gaps - Water Supply

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Universal and adequate access to safe drinking water for all (individuals, communities and public)	SCM, AMRUT	Access, Quality, Equity
Availability of 24X7 water supply	-	Adequacy, Sustainability, Equity
Adequate treatment & distribution capacity of drinking water	AMRUT	Adequacy
Equitable water charges for different users	AMRUT	Equity
Financially sustainable drinking water infrastructure and services	AMRUT	Sustainability
Sustainability of drinking water resources	JJM, AMRUT	Quality, Sustainability

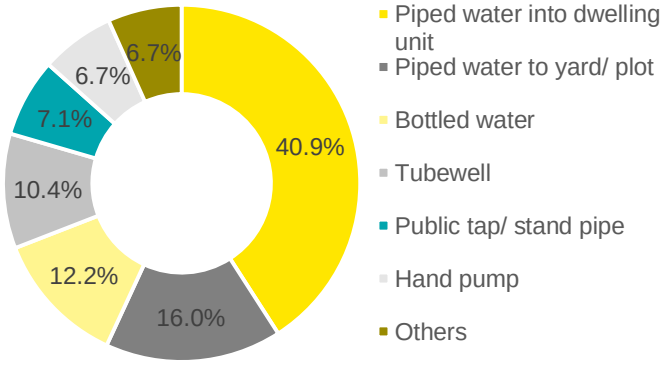
Note: The desired outcomes have been drawn based on the literature review including; AMRUT OOMF and guidelines; SCM guidelines; SDG-6, Ease of Living Index, 2019

Based on the coverage of sectoral outcomes, the following section presents an overview of the progress that has been made in the water supply sector across the six principles.

Access: Access to safe drinking water is an important measure of the socio-economic status of the citizens and it is imperative for health of the family members. In India, the main sources of water are categorised across primary sources and secondary sources. Primary sources include; river, pond/ lake/ tanks, rainwater, glacier melts, groundwater/ handpump/ borewell/ tubewell/ covered and uncovered wells, sea water, and atmospheric water. Secondary sources include; canals, dam reservoirs, bottled water, tanker supplies, tap water from treated source, and tap water from untreated source (WaterAid, 2018).

In 2018, largely piped water into the dwelling unit (40.9 per cent) was the principal source of drinking water followed by piped water to yard/ plot (16 per cent). Beside this, bottled water, tubewell, public tap/ standpipe and hand pump also have a substantial share as a primary source for drinking water (NSSO, 76th Round, 2018) as presented in the adjacent figure. However, these primary sources are within premise and off premise which highlights the status of accessibility to drinking water at household level.

Figure 2.19: Percentage distribution of households by principal source of drinking



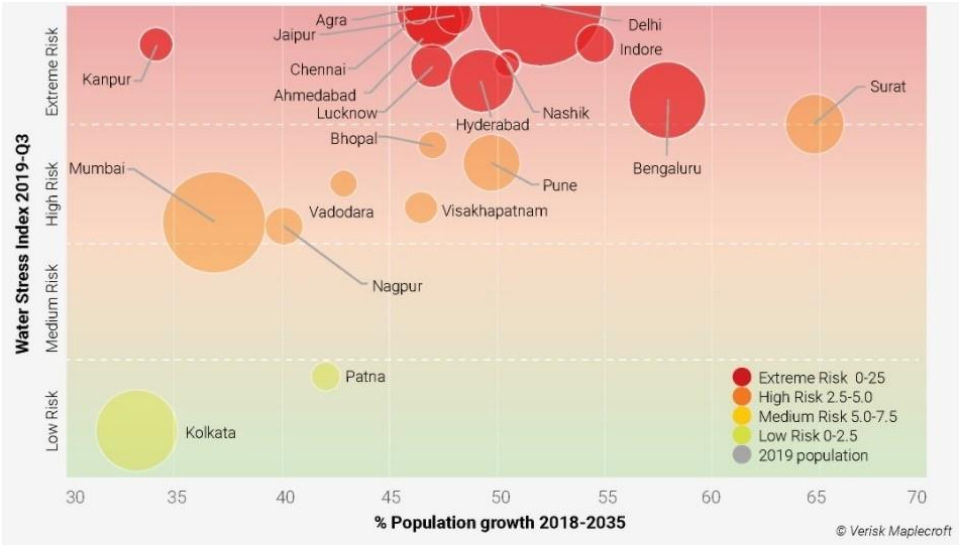
Source: NSSO, 2018

In 2012, urban households with drinking water facilities on premise stood at 76.8 percent (NSSO, 2012), and saw only a mild increase to 80.7 per cent in 2018 (NSSO, 76th Round, 2018). The remaining 20 per cent of urban households still need to travel each day to obtain their basic supply of drinking water, wherein 13.8 per cent have to travel up to 0.2 kms, 3.2 per cent up to half a km and 2.3 per cent have to travel beyond half a kilometre to fetch water for drinking purposes. However, it is noted that households having exclusive access to principal source of drinking water has improved from 46.8 per cent in 2012 to 57.5 per cent in 2018 (NSSO, 76th Round, 2018), share of which can be attributed to AMRUT's focused approach on universal access to water. Although individual connections have improved over the years, it is lower compared to coverage at 91 per cent in China and 86 per cent in South Africa.

Adequacy: It refers to sufficiency of water at HH level and the current shortage scenario. Water supply system needs to have adequacy at every step of the value chain to meet the overall objective of supply of safe drinking water. Water scarcity is a key concern which is affecting urban life. Cities are witnessing water shortages and such scenarios are expected to increase in the future, which can affect the economic development anticipated from urban growth. As per Versik Maplecroft, India is ranked at 46th position across the world based on the Water Stress Index, however, when one delves into the city level status, it highlights that 11 of India's 20 largest cities are at extreme risk, wherein the consumption is closer to the available resources (Verisk Maplecroft, 2019).

Further, it is estimated that the demand-supply gap for the domestic sector will stand at ~ 50 BCM by 2030 (McKinsey and WRG, 2009). These increasing gaps and day zero for the cities reflect the dismal condition for our cities. GoI recognises this and has introduced multiple initiatives to address the water management, water conservation and water preservation, which needs full attention to reduce this water scarcity.

Figure 2.20: Indian Cities facing the water shortage



Source: Verisk Maplecroft, 2019, Chennai is the tip of the iceberg of India's water stressed cities

As per WSP, the per capita availability of water ranges from 90 to 120 lpcd (WSP, 2014). As of 2014, no major city in India supplied 24x7 water to its entire urban population. Three pilots were carried out in three cities of Karnataka – Hubli-Dharwad, Belgaum, and Gulbarga that have shown good results (World Bank, 2014). In Indian cities, largely the duration of water supply ranges from one hour to six hours compared to 24 hours in Brazil and China and 22 hours in Vietnam (WaterAid, 2018), highlighting a large gap prevalent in this sector.

The incomplete coverage and inadequate infrastructure, distribution losses including non-revenue water (NRW), and prevalence of informal supply chains remains a challenge in India cities (IIHS, 2014). More than 40 per cent of water produced in many Indian cities does not earn any revenue, be it loss of water or water consumption not getting billed, hence leading to poor cost recovery and eventually poor service quality leading to inadequacy of the water (WaterAid, 2018). While demand supply gap remains a concern, the water supply infrastructure including treatment and distribution has been a focused approach under AMRUT with an objective to provide universal and adequate access to safe drinking water for all. Mission has implemented many projects to overcome these gaps (details of the number of projects and its investments have been presented in the AMRUT scheme evaluation section).

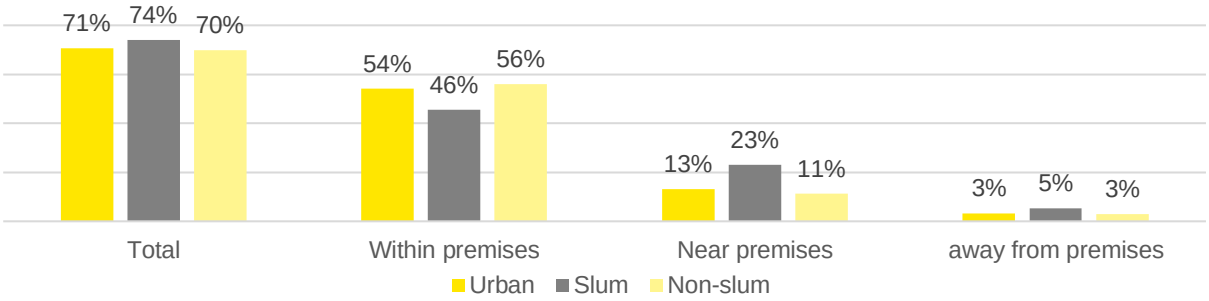
Quality: It refers to meeting standards of water quality which is safe for human consumption. As per IS-10500 of Bureau of Indian Standards (BIS), water is declared safe if it is free from biological contamination (guinea worm, cholera, typhoid etc.) and within permissible limits of chemical contamination (excess fluoride, brackishness, iron, arsenic, nitrates, etc.). This helps in checking quality of the water resources as well as treated water supply. Central Pollution Control Board (CPCB), the apex body for quality monitoring shared that river pollution increased in five years, wherein the number of polluted rivers increased from 121 to 275 in five years (CPCB, 2015). On the other hand, at the national level, urban water treatment capacity stands at only 33 per cent (NITI Aayog, 2018). This highlights the poor quality of water that is being sourced for supply water to urban population. In 2019, BIS carried out water quality tests of the tap water across 15 major cities of India. Out of this, all the samples of nine cities failed meaning that the quality of water supplied across the cities is largely poor (PIB, Water Quality Report for State Capitals & Delhi as analysed by BIS, 2019). As per Desai, 2019, the quality of water produced at filtration plants or water treatment plants pass through various networks and it worsens once travels through trunk lines, distribution systems etc. Poorly maintained pipeline networks, intermittent supply of water in the pipeline having proximity to municipal sewers etc. are main contributors for poor quality of water (Desai, 2019). This highlights the relationship between water and

waste-water management and requirement of an integrated solution to address both the problems. Beside surface water, ground water – an important source of water is vastly fluoride and arsenic affected due to agricultural run-offs carrying fertilizers and pesticides (WaterAid, 2018).

Equity: It refers to the ability of low-income/ poor households to access the same water services with same quality and adequacy. It also refers to the equitable water charges for different users.

In case of slums, Census of India, 2011 data shows that, slum households (74 per cent) have better access to tap water for drinking than the non-slum population (69.9 per cent). However, slum dwellers have lower access to tap water within the premise.

Figure 2.21: Households using tap water (in per cent)



Source: WaterAid, 2018, State of Urban Water Supply in India

AMRUT with an objective of universal access to water has played a very pivotal role in providing tap connections across the income segments. Mission has catered to around 16 slum households over last five years.

Sustainability: It includes the sustainability of the resources, financial recovery, and instructional frameworks for the water supply parameter.

Both surface and ground water resources are facing challenges in context of its capacity and its quality. Along with this, one of the biggest concerns in this context is the drawing water for the cities from a very distant source. The following table presents the distance of the water sources of select cities.

Table 2-9: Select cities and distance from their water source

Name of the city	Water Source	Distance between city and source
Delhi	Tehri Dam	320 km
Mumbai	Middle Vaitarna	120 km
Chennai	Krishna	200 km
Bengaluru	Cauvery	100 km
Hyderabad	Krishna	100 km

Source: IIHS, 2014, Urban Water Supply and Sanitation in India, IIHS RF Paper on Water Supply and Sanitation

In addition to this, ground water is depleting due to excessive extraction of water through formal and informal sources for multiple uses. And this dependence on ground water is attributed to its nature of affordability compared to water tankers supplied by authorities or private players (IIHS, 2014). Hence another main issue that cuts across the water supply service chain is the conservation of water sources, which has recently been highlighted by the Jal Shakti Abhiyan (JSA) under AMRUT.

The water SLB indicators in case of O& M cost recovery stood at an average of only 39 per cent and collection efficiency was at 58.7 per cent (MoUD, 2012). Basis this low collection rates, the Fourteenth Finance Commission (2015-2020) recognized drinking water as public service of national importance and defined the sustainable drinking water supply systems as 'those being operated under a formal management model, have 100 per cent household meters installed and whose net revenues from water tariffs and subsidies are sufficient to cover at least the O&M costs of the system'. However, water pricing remains a challenge across urban India with inappropriate tariff structures, user charge waivers and limited metred connections. This eventually leads to low cost recovery eventually affecting the service quality.

In context of institutional framework, involvement of multiple Government departments such as water resources, public health engineering, urban development, groundwater, rural development, rural water supply & sanitation, etc. involved in water sector leads to coordination challenges. Especially since the water resources are common for all the uses and urban and rural areas, its consumption across regions falling under different jurisdictions ask for higher coordination mechanisms. Also, the presence of limited capacity at ULB levels especially in case of smaller cities is a key concern for efficient water supply systems. AMRUT focuses on capacity development of ULB officials to deliver the projects and sustain the service delivery, however Mission's limited purview for up to 500 cities, limits other cities to avail benefit under the Mission. Many State initiatives are undertaken to address this gap, however there is till need for large scale capacity augmentation of officials to address the increasing challenges in water sector.

Sanitation and Wastewater Management

Adequate sanitation and wastewater management is crucial to the health and living environment of a city's residents. Wastewater as a concept includes both blackwater (from toilets) and greywater (from other household activities such as dishwashing, shower, etc); sanitation specifically deals with blackwater. For households connected to sewers (offsite sanitation), blackwater and greywater are generally mixed and captured together by the sewer network; in this case, sanitation and wastewater management are synonymous. For households relying on onsite sanitation, in most cases only the blackwater is captured in the onsite containment system while the greywater is disposed through drainage systems. This section focuses on the wastewater from sewered sanitation and the septage and faecal sludge from onsite sanitation, which have the most significant environmental, health and economic implications.[6]

It is estimated that 1,20,000 tonnes of human waste is generated in India per day (Luthra, 2015). Untreated human waste on open ground or directly discharged into waterbodies can contaminate the soil and drinking water sources, posing tremendous health risks. Numerous studies have established connections between inadequate sanitation/ wastewater management and incidences of vector and water-borne diseases, such as diarrhoea. Diarrhoea is also among the biggest causes of mortality for children under five years of age. According to UNICEF, close to 90% of child deaths from diarrhoeal diseases are directly linked to contaminated water, lack of sanitation, or inadequate hygiene. (UNICEF, 2013).

In addition, severe and constant diarrhoea could lead to malnutrition, child stunting, and loss of school years. However, diarrhoea incidence can be reduced by around 30% with sewerage systems, or up to 60% in places with very poor initial sanitation conditions as found by a meta-analysis of 25 studies examining the correlation between sewerage and enteric diseases (Norman, Pedley, & Takkouche, 2010). These health-related impacts linked to improper liquid waste management costs India approximately Rs. 1.75 lakh crore, or 71.6% of the total impacts of inadequate sanitation according to a World Bank report (WSP, 2010). The report estimates that inadequate sanitation causes India economic losses of Rs. 2.4 lakh crore, or 6.4% of India's GDP in 2006. This also includes productive time lost to access sanitation facilities or sites for defecation, which accounts for another 20% of the overall economic impact. Further, the consequences of inadequate sanitation are disproportionately born by children and the poor households living in densely populated urban slums.

Recognizing the importance of adequate sanitation, the central and state governments in India have long been devoting attention and efforts to sanitation as a priority area. The first five-year plan in India (1954) provided for a rural sanitation programme. This was followed by national programmes in 1986 (Central Rural Sanitation Programme), 1999 (Total Sanitation Campaign) and 2012 (Nirmal Bharat Abhiyan). In 2014, the GoI launched the SBM, a flagship programme to eliminate open defecation and improve solid waste management across the country. SBM(U) has a clear mandate to improve access to sanitation in urban areas, through the construction of Individual Household Latrines (IHHL), Community Toilets (CT) and Public Toilets (PT) among other complementary interventions such as awareness creation for toilet usage.

Meanwhile, AMRUT has a component on expanding sewer connections, targeting a different segment of the sanitation service chain. Given the complexity of stakeholder roles and incentives in different segments of the sanitation service chain, addressing India's sanitation challenge requires interventions across the chain to achieve safely managed sanitation. This covers from toilet construction and sewer network expansion, to safe and affordable desludging options, to proper treatment and disposal of human waste. Further, continued

[6] As there is no reliable data on greywater management at the national scale, it is excluded from evaluation in this section.

sanitation service provision cannot be possible without sustainable Operations & Maintenance (O&M) models, perspectives of a circular economy from reuse of treated waste by-products, and seamless coordination among stakeholders along the sanitation service chain.

Overview of the Sanitation Service Chain

Sanitation service delivery is usually achieved through two main models—offsite/ sewered sanitation and onsite/ non-sewered sanitation. Traditionally, sewered sanitation involves the construction of Under Ground Sewerage System (UGSS) with extensive sewer pipelines and a Sewage Treatment Plant (STP) to receive and treat the wastewater generated from the end consumers connected to the sewer network. The implication is both very high capital investments and high recurring Operations & Maintenance (O&M) costs. Given the high cost of constructing, operating, and maintaining UGSS and STPs, sewer system is mostly only seen in big cities with dense population and sufficient financial resources. The 12th five-year plan found that the majority of sewage treatment facilities were in metropolitan cities.

On the other hand, onsite sanitation relies on individual households to construct their own septic tanks or pit latrines to contain the human waste generated, which is then supposed to be emptied by cesspool trucks and transported to a treatment plant. This model is much less costly to municipalities and it is common for smaller cities to rely entirely on non-sewered sanitation. Even in big cities with sewers, households that are located farther away from the central sewer pipelines and especially in low income settlements often still need to rely on onsite sanitation, as sewer networks may not have been extended to their neighbourhoods.

While onsite sanitation requires relatively fewer financial resources from municipalities, it can be a significant cost for households to construct their own containment unit (i.e. septic tank or pit latrine) connected to the toilet. Households without the financial means or space to construct proper containment units often end up with poorly built tanks or pits that do not meet safety standards and that leak faecal sludge (see Text Box 1 for explanation of term) into the environment, or connecting the toilet directly to open drains.

Further, containment units need to be desludged frequently as the pits/tanks become full. In reality, however, many households do not desludge for reasons ranging from awareness to inhibitive costs, allowing pits and tanks to overflow and contaminate the environment. Even when desludging does happen, private desludging operators often illegally empty the FS collected directly into the nearby waterbody or dump on the roadside instead of traveling farther to transport it to the treatment plant. The complexity of stakeholder roles and incentives along the chain places tremendous responsibility on municipalities to create awareness and strengthen regulation and monitoring for onsite sanitation.

Besides traditional sewers and onsite sanitation systems, there are also other systems such as condominio/ shallow sewers and decentralised wastewater treatment systems (DEWATS) but are far less common and mostly piloted at small scale.

The Basics of Faecal Sludge (FS)?

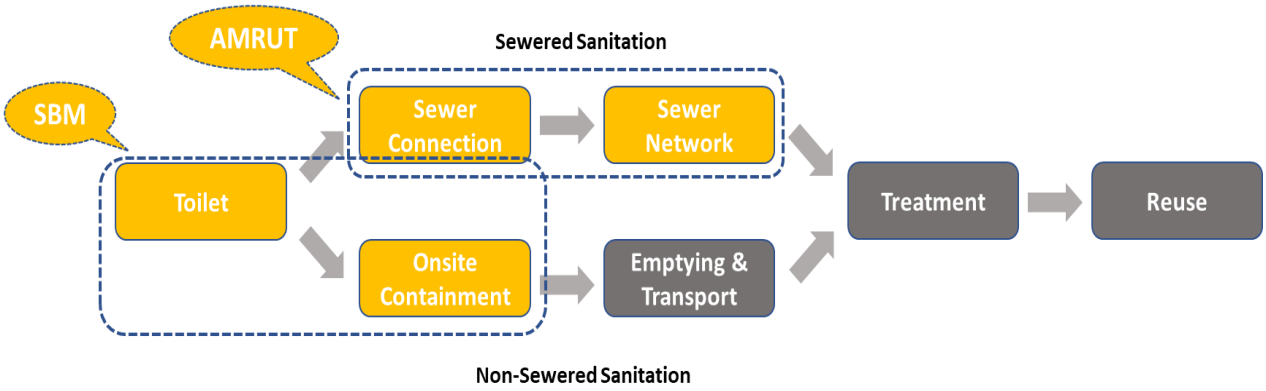
FS comes from onsite sanitation systems/technologies and has not been transported through sewer. It is raw or partially digested, a slurry or semi solid, and results from the collection, storage or treatment of combinations of excreta and black water with or without grey water. Some of the examples of onsite sanitation systems are pit latrines, unsewered public ablution blocks, septic tanks, aqua privies and dry toilets. Faecal sludge is highly variable in its consistency, quantity, and concentration.

Internationally, the term faecal sludge is commonly used as a generic term to refer to the content from all types of onsite systems. In the Indian context, FS is sometimes used for only the content of pit latrines, while that of septic tanks is sometimes specified as ‘septage’.

Source: Adapted from DownToEarth.org.

Following figure illustrates the sanitation service chain for both onsite (non-sewered) and offsite (sewered) sanitation. As issues and challenges in sanitation service delivery differ across the components of the service chain and are closely linked to the stakeholder roles and responsibilities in each part, the analysis of sectoral performance below follows a service chain approach.

Figure 2.22: The Sanitation Service Chain



Linkage of Sanitation and Wastewater Management with SBM and AMRUT

Out of the five CSS, AMRUT has a clear focus on sewerage network expansion, whereas SBM's implicit focus is Faecal Sludge and Septage Management (FSSM), with a focus on user interface/ toilets. Along the sanitation service chain, while toilet coverage and sewer networks are the most visible parts of the schemes, safe management of faecal sludge and septage generated from onsite systems has major implications for health and environmental outcomes. The table below outlines scheme coverage and gaps along the sanitation service chain as mapped by the six liveability domains of access, adequacy, quality, equity, livelihood, and sustainability.

Table 2-10: Sectoral outcome coverage and gaps – sanitation and wastewater management

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Universal and adequate access to individual and public sanitation facilities	SBM Guidelines (2017)	Access, Adequacy
Universal design principles and sanitation standards	SBM Guidelines (2017)	Access, quality, Equity
Access to sewer connection or affordable and safe management of faecel sludge	AMRUT, SBM(U); CPHEEO Advisory on Public and Community Toilets (2018)	Access, equity
Adequate treatment capacity of greywater and blackwater	AMRUT, SBM(U); CPHEEO Manual (2013); Advisory on Public and Community Toilets (2018)	Adequacy
Promotion of reuse/recycle of wastewater and principles of circular economy	-	Sustainability
Sustainable O&M of Sewerage & Sanitation facilities	SBM Guidelines (2017); AMRUT	Sustainability
Decent work, health and occupational safety of sanitation workers	-	Livelihood

Note: The outcome areas are drawn based on literature review including SDG 6, CRDF 2019, ADB (2001), CGIAR (2016).

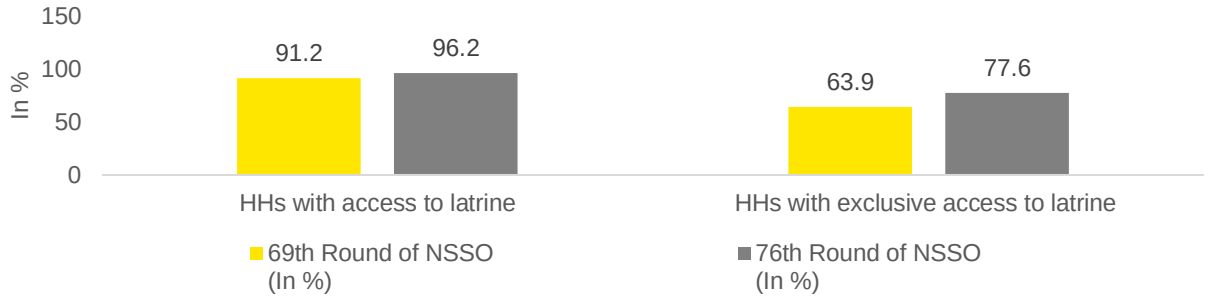
This section presents an overview of the progress that has been made in the sanitation sector along the service chain in each of the six liveability domains. Greater detail on sanitation indicators is available in the scheme level analysis.

Access: Access to sanitation refers to availability of both toilet infrastructure and safe emptying and transport options, including sewer connections and affordable safe desludging services for households relying on onsite sanitation.

At the toilet infrastructure level, access includes through a combination of IHHL, CT and PT. NSS reports show that access has improved by 5% over the period of 2012 to 2018, from 91.2% to 96.2% (NSSO, 2018). A large part of this increase can be attributed to SBM, under which over 61 lakh IHHLs and nearly 6 lakh

CT/PT blocks have been constructed, according to the mission MIS. Among the various types of access, IHHL access has increased substantially by 13.7% from 2012 to 2018, rendering fewer households reliant on CT/PT. While a more recent breakdown by access type is not available, overall access rate across urban India is now close to 100%, as all ULBs in the country except for 52 ULBs in West Bengal have achieved ODF status in 2019 under the Mission.

Figure 2.23: Percentage of HHs with Access and Exclusive Access to Latrine in Urban India



Source: NSSO, 76th Round, 2018.

Besides overall availability of toilet blocks, access to CT/PT is further characterized by key parameters such as the toilet distance and universal design, which determine whether certain population groups will be able to use the toilet. Long distance from the household to the toilet block would require a significant amount of travel time and often deters women and girls from accessing the toilet at night due to safety concerns. While little data is available for average toilet distance before 2014, SBM has made it mandatory for CT to be within a radius of 500 meters of all dependent households, and PT within one kilometer of public spaces to which it caters. As this distance requirement is one of the criteria for ODF certification, all ULBs certified as ODF should have met the threshold.

Universal design refers to the CT/PT having design features that cater to the needs of different population groups. For example, a gender friendly toilet design would have, among other features, separate entrances for men and women to allow women sufficient privacy as they enter and exit (CPHEEO, 2018). Similarly, CPHEEO advises CT/PT blocks to have ramps and railings for wheelchair accessibility, and child-friendly toilet seats. However, states often have their own guidelines that are much less extensive than prescribed by CPHEEO, and data on gender friendly and universal design is not well tracked across the country. More data is needed on CT/PT blocks' adherence to CPHEEO prescribed standards to understand whether vulnerable population groups might have been left out in certain states or cities.

While toilet access is not restricted by the type of sanitation adopted (sewered or non-sewered), emptying and transport options are distinct for these two types of sanitation. AMRUT and SBM each addresses the emptying and transport issue in one of the two predominant sanitation types.

At the time of the 2011 Census, only 32.7% of households were connected to sewage lines (Census of India, 2011). AMRUT directly addresses this through providing sewer connections for households and has invested nearly 32,500 crores on sewerage. Of the targeted 145 lakh sewer connections, 45 lakh connections (31%) have been achieved as on 1st April 2020. Dividing this by the 8.08 crore urban households reported in the 2011 Census yields around 5.5% of all urban households having gained sewer access under AMRUT. Achieving AMRUT's target of 145 lakh total sewer connections would increase this percentage to about 18%.

Considering that India's urban population has been growing and that average household size has also been decreasing, the actual percentage of households that could be covered by AMRUT's sewer component would be less than 18%. This means that even when AMRUT's mission target for sewer connections is achieved, over half of urban households would still need to rely on onsite sanitation. In addition, AMRUT targets only 500 large cities, leaving the smaller cities outside the ambit of the programme with limited financing for sewage networks and treatment infrastructure.

These data points imply that urban India, especially the smaller cities, will continue to rely predominantly on onsite sanitation in the foreseeable future. This highlights the importance of ensuring access to safe desludging options for septic tanks and pit latrines. However, this had traditionally been receiving little attention until recent. In 2018 during its 76th round, National Sample Survey (NSS) for the first time included indicators on latrine emptying. Results show that while 86.1% of households have bathroom and latrine within premise, only 15.4% of all urban households have ever emptied their latrines.

Moreover, among the households that have desludged, about half desludged only once in five years or even longer—27.7% emptied their tanks/ pits once in five years, 21.9% once in ten years. By comparison, CPHEEO recommends containment units to be emptied at least once in three years. Content from pits and tanks that have not been emptied in a long time could overflow and pose environmental risks, or gradually solidify and make it more difficult to desludge. Lack of desludging by households could be associated with multiple reasons, a major cause among which is prohibitive costs. In NSS 76th round, average amount paid for the last desludging activity was found to be Rs. 1941, a substantial amount for low income households.

While SBM does mention the need for FSSM in the scheme guideline and policy documents, little financial resources have been devoted to provision of safe and regular desludging for onsite sanitation systems thus far, nor have targeted interventions been designed and implemented at scale. Nevertheless, the scheme identifies FSSM to be a focus area for its next phase starting 2020. To improve access to safe affordable desludging services, the mission can consider a menu of options including but not limited to formalisation and regulation of private emptiers, vouchers as subsidy for low income households, and scheduled desludging which is being piloted in a few towns in India.

In the city of Wai in Maharashtra, for example, scheduled desludging is being provided to all households once in three years at an affordable cost of Rs. 60 per year, in the form of a sanitation tax charged to all households and collected along with property tax (Mehta, *et al*., 2019). As SBM covers all ULBs across the country, targeted interventions and resources for safe affordable desludging have the potential to move the sector another big step forward on access, in addition to what has already been achieved on toilet access.

Adequacy: Adequacy refers to sufficient numbers of toilet facilities (applicable to CT/PT), sewer connections, and treatment plants relative to the size of the population. Sufficient desludging capacity is excluded from discussion here, as it is predominantly a private market with relatively low entry bars and can be scaled up quickly.

The 2014 SBM guideline has prescribed a set of norms for CTs as shown in Table 1. Based on this set of norms and other requirements mentioned in the guideline document, states and ULBs have been asked to conduct assessments to determine the number and location of PT/CT blocks to fill in the gap. As the target for PT/CT has been achieved over and above what was initially set based on the gap assessment, toilet facilities can be considered adequate to meet the demand of the population.

Table 2-11: Norms for Community Toilet as per SBM Guidelines

Toilet Seats	Bath Units	Urinal Units	Clothes Washing Area
One seat for 35 men	One unit per 50 users	One unit per 200-300 users	4 to 5 sq. meters per 10 toilet seats; Min. 1.5 m ×1.2 m
One seat for 25 women			

Source: Guidelines on Swachh Bharat Mission-Urban, GoI, 2014.

On the other hand, adequacy of sewer connections and treatment capacity falls under the purview of AMRUT. The Parliamentary standing committee in its 2018 report concluded that “the number of sewerage connections provided under AMRUT was inadequate with respect to the number of households, State-wise, which did not have sewerage connection at the beginning of the Mission”.

Meanwhile for treatment infrastructure, according to CPCB’s 2015 inventorization of STPs, there are a total of 816 STPs having capacity of 23,277 MLD in India. However, only 522 are operational, while 79 are non-operational, 145 are under construction and 70 are proposed for construction. This leaves only 18,883 MLD of operational capacity, compared to a total sewage generation of 61,754 MLD. This means that even if all functional treatment plants operate at full capacity, still only around 30% of the total wastewater is treated. As per the AMRUT MIS dated 1st April 2020, the total capacity of sewerage treatment envisaged by construction of new STPs and augmentation of existing STPs is 8,456 MLD. This will add about 13.7% more sewage being treated when all planned construction is completed, still leaving a huge gap of more than 50% untreated sewage. Large amount of untreated sewage is entering waterbodies and polluting drinking water sources, making it unfit for human consumption, said the National Green Tribunal (PTI New Delhi, 2019).

Across the sanitation service chain, therefore, only toilet infrastructure is adequate to meet the demand of the population, whereas both sewer connection and treatment capacity have a long way to go.

Quality: Quality of sanitation refers to meeting standards for toilet infrastructure, desludging, and discharge of treated biosolids and effluent.

On toilet infrastructure, SBM guidelines and CPHEEO guidance documents have provided detailed prescriptions for both the features that PT/CT should have and design standards of the containment unit for IHHL as well as for PT/CT. The 2013 CPHEEO Manual provides the dimensions of septic tanks based on the number of users. Both SBM and CPHEEO documents require PT/CT to be properly maintained and clean, well-lit especially at night, equipped with sufficient and reliable water supply, and have provisions for Menstrual Hygiene Management (MHM), such as napkin vending machines in public places with high footfall and waste bins for napkin disposal.

A 2019 study on community and public toilets in urban India found that most public and community toilets are contracted to local or regional nongovernmental organizations (NGOs). Due to the fragmentation of the market, there is significant variation in the quality of CT/PT (STeP, 2019). Meanwhile, community participation in planning has been found to lead to improved CT/PT quality (Cardone et, al., 2018). These pieces of evidence suggest that the quality of shared sanitation services provided varies depending on the private contractor engaged for the service, inputs from the community and the level of engagement of the city planning officials. However, there is limited data to systematically track the quality of toilets constructed at a national level.

Similarly, quality of desludging services varies widely as a function of the level of mechanisation of the service, skill level of vacuum truck operators, and regulation and monitoring of the operators. While very little data is available for a systematic assessment, anecdotal evidence suggests that more often than not, service is improperly carried out without protective equipment and necessary safety precautions, resulting in spillage of faecal sludge on the premise and coming in direct contact with humans. These are some of the main challenges for urban households to access safe sanitation. To address these issues, India needs a sanitation market in which ULBs can actively train and engage desludging operators in formal employment to provide residents with high quality services (MoHUA, India Habitat Report III - National Report, 2016).

Whereas adherence to a clear set of standards vary for toilets and desludging, treatment standards itself has been under debate. In a set of orders from 2018 to 2019, the National Green Tribunal (NGT) has directed the Central Pollution Control Board (CPCB) to revise its standards for sewage treatment and discharge in line with a more stringent set of parameters. If this set of revised parameters is followed, most STPs in the country will not be able to meet the quality standards. Even under the more lenient CPCB standards, almost 50% of all STPs assessed (56 out of 114) by CPCB in 2013 failed to meet the effluent discharge standards (CPCB, 2013). Regardless of the standards that will be used, however, treatment quality has not been much of a focus of any CSS. While AMRUT has dedicated resources for treatment infrastructure development, emphasis is mostly placed on treatment capacity, and the scheme does not track data on treatment quality. In all three of the service chain areas, data is insufficient for a systematic analysis of the quality of sanitation. It is hence recommended that relevant missions include service quality indicators in their MIS moving forward, to capture useful data for tracking progress on service quality and adjust interventions.

Equity: Equity refers to the ability of low-income households to access the same sanitation services, including toilets and sewer connection or desludging services.

Poor communities report the lowest access to toilets and to sewerage networks. The 2011 Census estimated that nearly 34% of households in urban slums did not have access to a latrine on premises, and more than half of those without a latrine on premises did not have access to a public latrine. SBM has operated as a universal scheme, providing incentives for the construction of toilets to all households that do not have one. Additionally, the scheme has constructed public and community toilets for those households that lack the space and economic means to construct an IHHL. As ULBs across the country are being certified as ODF, this also means that these slum households are obtaining close to universal access. Thus, it can be stated that equity concerns around sanitation is covered under SBM. On the other hand, costs of sewerage and desludging services are not among the main focus areas of AMRUT or SBM. More data and understanding of equity concerns in access to, and pricing of, sewerage and desludging services is also currently unavailable. Detailed equity concerns and measures are explored in the scheme level analysis.

Livelihood: Livelihood refers to decent work opportunities and conditions for those working in the sanitation sector, especially at the lower end of the skill spectrum.

SBM, in alignment with the abolition of manual scavenging law, bans the use of manual scavengers and advocates for self-emptying, and mechanised methods of desludging. The Socio-Economic Caste Census (SECC) 2011 reported that over one lakh families were involved in some form of manual scavenging. In 2019, the Ministry of Social Justice and Empowerment reported 54,130 manual scavengers nationally. A 2017 study reports limited understanding of, and access to, rehabilitation schemes and skill development (Dalberg,

2017). Under the SBM, there is limited data collected on the state of manual scavenging and the conditions of sanitation workers. While the scheme advocates for self-emptying or mechanised options for desludging, effort on rehabilitation and integrating them into the formal sector is primarily carried out by the Ministry of Social Justice and Empowerment.

Sustainability: Sustainability includes the sustainability of the environment, resources, infrastructure, finance, as well as social sustainability.

On toilets, SBM encourages the participation of private sector and community-based organisations in O&M of the CT/PT constructed, which is conducive to institutional and financial sustainability. Meanwhile, awareness generation campaigns are carried out under the scheme to sensitize citizens on toilet usage and aim to ensure long term social sustainability of ODF. Data on the outcomes of these efforts is however not well captured. A crucial step along the service chain of safe sanitation is the safe transport of faecal sludge collected from containment systems to the treatment plant. The national policy on FSSM recognises illegal dumping as a key challenge, as it is a common practice for desludging operators to empty their trucks into open fields, storm water drains and even flooded roads (Prasad, 2018). A study of urban Uttar Pradesh found that overflow from septic tanks 'of 50 per cent of the population is discharged in open drains, of which, 2% is treated by tapping of nullahs and drains' (CSE, 2019). Only 27% of faecal sludge was 'safely managed'. Thus, there are large sustainability gaps in the emptying and transport part along the sanitation service chain.

Detailed project reports (DPRs) are mandated under SBM and AMRUT. DPRs not only outline the implementation plan and allow space for feedback, they also test the financial and institutional sustainability of the project proposed under the schemes. Details on the capital and operational expenditure of the projects are sought, and the ULB must assess its ability to generate revenue streams for the project. However, no data on the indicators to measure financial sustainability and performance of different projects is currently available. Another area at a very incipient stage is the reuse of FS by-products. This is barely covered in the scheme guidelines and policy documents and remains an area largely unexplored in urban India.

Treated biosolids can be sold as manure, fertilizer, and fuel briquets, while effluent can be used for agricultural irrigation. Moreover, treatment plants around the world have been using the biogas generated from FS to power the plants themselves and save on electricity. As per CPCB estimates, current utilisation of treated wastewater is less than 2% (NGT, 2019). Across the world, however, the sale of treated wastewater has demonstrated an average potential of around 40% recovery of total treatment cost, and up to 100% in some cases (World Bank, 2015). The large amount of FS generation in the country thus represents not just a treatment burden but also a huge potential for a circular economy that urban India should consider for its future.

Solid Waste Management

Better management of municipal solid waste improves the liveability and sustainability of cities. It results in clean streets, improves the functioning of other civic infrastructure like sewerage and storm water drainage system, improves public and environmental health and safer streets (World Bank, 2015). The demand for solid waste management (SWM) services like other municipal services such as water supply, sanitation etc. increases with increase in urbanisation and economic development, among other factors. The adverse impact of poor and unscientific waste management on human and environmental health is well documented. Further, ULBs in India spend a significant amount of their municipal budgets on SWM and the estimated financial requirements for effective and sustainable SWM is much higher.

As per the latest available figures, India generates about 65 million tonnes of solid waste annually; of which 45-50 per cent is organic/ wet waste, 20-25 per cent recyclable and 30-35 per cent is inert waste (Standing Committee on Urban Development, 2019). This has increased by about 33 per cent since 2011 when the total waste generation was estimated to be ~ 46.5 million tonnes. Without any effective waste reduction strategies, the total waste generation is likely to increase by 2.5 times to 165 MTPA in 2031 and by seven times to 436 MTPA in the year 2050. India's plastic generation is about 9.4 MTPA of which 3.4 MTPA (~40%) remains untreated (MoHUA., 2019).

While data on the exact quantum of Construction & Demolition waste is not available, studies suggest that C&D waste is likely to grow rapidly with increase in construction activity in the country (Ahluwalia U. P., 2018). CSE's estimated C&D waste generation in India in 2013 at 530 MTPA – 44 times higher than the then official estimates (CSE, 2014). Estimates by BMTPC suggest ~100 MTPA of C&D waste generation in the country (BMTPC, 2018). A study by the Niti Aayog stated that management of C&D waste has been historically dismal

in the country with bulk of such waste disposed of illegally causing serious environmental problems (Niti Aayog, 2018).

Like many other urban services, demand for solid waste management is positively correlated to urbanisation and growth in urban population. As cities expand, municipal solid waste management services are required to be extended to the new growth or outgrowth areas. The total number of cities / towns in India has increased from 5161 in the year 2001 to 7935 in 2011 and further to 8000+ in recent years. Waste is a growing issue which is directly linked to society's production and consumption patterns. Further, waste generation has an overall positive relationship with economic development (World Bank, 2018).

It is worth mentioning here that India continues to be one of the fastest growing economy in the World and the country lifted 271 million people out of poverty between the period 2005-06 and 2015-16. As per the World Bank's classification of countries by income level, India falls under the low-middle income ($1026 - $4035) category and the per capita waste generation is about ranges between 0.2 kg to 0.6 kg per day (*ibid.*). As India sets itself to become a 5 trillion economy in the years to come, the per capita consumption is set to rise along with a change in consumption pattern of its citizens. In low-and middle-income countries, food and green waste comprise more than 50 per cent of the total waste whereas in high-income countries it is about 32 per cent (*ibid.*).

Management of MSW continues to be one of the major challenges faced by ULBs across the country due to sustained increase in the quantum of waste generation, aesthetic, public health, and environmental concerns. The adverse human, environmental and economic impacts of uncollected and poorly disposed waste are well-documented. As per the United States' Public Health Services, there could be at least 22 diseases that are directly or indirectly caused due to improper solid waste management. Further, a study on the status of SWM in South Asia by McKinsey in 2016 estimated the economic cost of uncollected household waste that is not safely disposed to the tune of USD 375 per tonne. A report by Chintan reported that 3-4 per cent of India's Greenhouse Gases originate due to poor management of solid waste (Chintan, Failing the Grade, 2011).

Management of municipal solid waste entails a large expenditure by ULBs accounting for nearly 20 per cent of municipal budgets in low-income countries; for ULBs in India it ranges from 10-15 per cent and budgets can be as high as 50 per cent in some cases (World Bank, 2008). As per the Parliamentary Committee Report on Urban Development, ULBs in India spend about 60-70 per cent of their total waste management expenditure on street sweeping, 20-30 per cent on transportation and less than 5 per cent on disposal of waste (Standing Committee on UD 2018-19, 2019). The MSWM Manual prepared by CPHEEO states that the associated cost of processing and disposing one tonne of waste is about Rs. 1000 and approximately Rs. 10.7 crore per day for the country.[i]

Apart from the financial investment, as much as 30 per cent to 50 per cent of the municipal personnel in a typical ULB are involved in management of municipal waste. The overall cost of managing waste is likely to increase in the future due to increase in population and geographical spread of cities, among other factors. The High-Powered Expert Committee (HPEC) on Urban Infrastructure and Services in 2011 had estimated that urban India would require ~Rs. 48,582 crores towards capital expenditure and Rs. 2.7 lakh crores for O&M for solid waste management in the country. A report by CPR in 2015 further estimated that to deliver the SWM services in the country over the next ten years, Rs. 1.36 lakh crores would be required (Dasgupta S, *et al.*, 2015).

There is a significant mismatch between the resources currently spent by ULBs in solid waste management and estimated resource requirements. This is true particularly for the processing and disposal of solid waste as several ULBs do not have the processing units and sanitary landfill in place yet. The Integrated Solid Waste Management hierarchy mentions 'sanitary landfills' as the least preferred option for safe disposal of inert residual waste. A study by NEERI in 2005 on the waste composition found that about 25 per cent of the total waste generated in Indian cities happens to be 'inert' waste.

The MSWM Manual 2016 suggests that residue from processing plant should not exceed 15 per cent of the waste delivered at processing facility and further to be reduced to less than 5% in the stipulated time (CPHEEO, 2016). The quantum of inert waste depends on the quality of source segregation and choice and type of processing technology adopted by ULBs. Further, the MSWM suggests sanitary landfill as 'necessary' for certain waste types that includes – non-biodegradable & inert waste, commingled waste, pre-processing, and post-processing rejects from waste processing plants and non-hazardous waste not being processed / recycled. The SWM Rules, 2016 provides comprehensive regulations on the location, design, and operational modalities of sanitary landfills.

Construction and O&M of sanitary landfill sites is expensive. As per the World Bank estimates, in low-income countries, the cost of a sanitary landfill could by USD 40 / Rs. 3000 per tonne (World Bank, 2018). A report by CPR estimates that landfill capacity for about 42,000 TPD would be needed by 2019 (Dasgupta, 2015). The report also estimates capital expenditure for landfills to be about Rs. 1,838 crores (till 2019) and O&M expenditure for landfills to be about Rs. 4,578 crores for the next ten years (*ibid.*).

Sectoral Outcomes for Solid Waste Management

The GoI has taken several measures on policy, projects, and awareness generation to address the challenges discussed above and to bring a change in the way India manages its municipal waste. Some of the notable initiatives include launch of the JNNURM programme in 2005, setting up the Technical Advisory Group and setting up the Inter-Ministerial Task Force on Integrated Plant and Nutrient Management using city compost in 2005, formulation of the Municipal Solid Waste (Management and Handling) Rules 2000 by M/o EF&CC, preparation of MSW Management Manual 2000 by M/o UD and CPHEEO, formulation of the National Urban Sanitation Policy (NUSP) in 2008, launch of Swachh Bharat Mission in 2014, Smart Cities Mission in 2015, Plastic Waste Management Rules 2011 & revised in 2016, the revised Solid Waste Management Rules 2016, the SWM Manual in 2016, and the draft National Urban Policy Framework 2018.

There has been a specific focus towards shift towards outcomes and impacts of SWM interventions through *Swachh Survekshan*, Garbage Free Cities, Ease of Living Index, and the Municipal Performance Index and the National Urban Policy Framework. The following sub-section attempts to map a set of outcome areas based on national and global outcome frameworks (wherever applicable) for waste management in the country. Broadly, management of waste should result in protection of public health, environment and resource value (UNEP 2015); and enhancing the liveability condition of Indian cities. The table below summarises a set of overall outcomes desirable for the sector.

Table 2-12: Sectoral outcome coverage and gaps – solid waste management

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Regular collection service to all waste generators	SBM Guidelines 2017	Access, Adequacy
Cleaner neighbourhood and cities	SBM My Swachh Neighbourhood Guideline 2017	Access, Quality
Modern and scientific management of waste	SBM Guidelines 2017; Objective 2.1.3; SCM Guidelines 2015	Quality, Sustainability
Transition towards circular economy including EPR system and integration with industry and academia	SBM (U) – Plastic Waste Management 2019; SBM Guidebook 2016	Livelihood and Sustainability
Formalizing and providing safe, healthy working conditions to informal sector workers	SBM(U), NULM	Livelihood
Increase in public awareness and behaviour change	SBM Guidebook 2016	Sustainability
Sustainable O&M of SWM infrastructure	SBM (U) Guidelines	Sustainability

Note: (i) United Nations Human Settlement Programme 2004; (ii) UN SDG 2015 (SDG 11.6); (iii) UN Habitat 2018 (iv) World Bank 2018, UN Habitat 2018; (v) NUSP 2018; (vi) UN Habitat 2018; (vii) NUSP 2018; (viii) UNHSP 2004, UN Habitat 2018; (ix) WHO.

Overall, SBM(U) has a strong focus on improving access, adequacy, equity, and environmental sustainability whereas SCM has a strong focus on quality, adequacy, and sustainability. Desirable outcomes related to collection service, cleaner neighbourhood & cities modern & scientific waste management, enhanced public awareness and behaviour change are well targeted through SBM and SCM. National strategies for effective SWM are adopting concepts of circular economy, waste reduction, EPR and formalisation of workers in waste sector. Two outcome areas namely reduction in diseases (water borne, Malaria and air pollution etc.) and greater integration of the SWM sector with industry and academia need to be addressed. Performance of the SWM sub-sector on the six liveability principles is discussed in the subsequent section.

Access: Regular waste collection service and to cleaner neighbourhood, cities are the two desirable outcomes areas linked to this liveability principle. SBM (U) is the only CSS that addressed these outcomes. SBM's target of providing 100% door to door waste collection service is aimed at ensuring universal access of solid waste management (SWM) services in all urban areas of the country. The service covers all household categories – general and slum households. The Supreme Court Committee in 1999 on SWM stated that no system of primary collection of waste at the doorstep existed. Previous national programmes such as JNNURM did not focus on universal coverage of door-to-door service. Even in individual cities that attempted such provision, the door-to-door solid waste collection service was partial. A Planning Commission report of 2014 indicated HH coverage of waste collection was less than 50 per cent and ~30 per cent of HHs had coverage of door-to-door waste collection services.

A Performance Audit on Management of Waste in India carried out by the CAG in 2008 found waste collection in 56 ULBs across 20 states to be irregular and ineffective (CAG 2008). The HPEC Report in 2011 stated the waste collection efficiency in major metropolitan cities ranged between 70-90 per cent and it was found to be much lower – 50 per cent in smaller cities. The HPEC Report further reported that less than 30 per cent of the waste was segregated. As reported by the SBM Urban Dashboard, till date, 81535 or 96.5 per cent of the total wards in the urban India are being covered by 100 per cent door-to-door collection service and about 77 per cent of the total wards are reported to practice 100 per cent source segregation. These figures indicate that access to SWM services has improved in recent years. SBM (U) released guidelines on "My Swachh Neighbourhood" in 2017 that serves as a ready reckoner for engaging all stakeholders in improving cleanliness standards of neighbourhoods and enhance the sustainability of the cleanliness drives.

Adequacy: Frequency of waste collection, resources (financial and technical) and infrastructure systems need to be adequate for effective management of waste. This requires due consideration for optimum collection frequency for different waste streams such as wet waste, dry waste, domestic hazardous waste etc. This includes the availability and carrying capacity of waste transport vehicles, number of SWM staff and equipment (including personal protective equipment for sanitary workers) total capacity of solid waste processing plants and sanitary landfill for inert waste etc. SBM(U) and SCM focus on modern and scientific management of waste. SBM Guidebooks outline the need for punctuality of waste collection especially daily collection of biodegradable wet waste. The HPEC in 2011 reported waste collection efficiency to be between 70-90 per cent in large cities and ~50 per cent in smaller cities. The Standing Committee on Urban Development stated processing / treatment capacity to be about 18 per cent in 2014. As per the SBM MIS, nearly 142 million tonnes of legacy waste are left unattended in the country with Delhi, Maharashtra and Gujarat accounting for 48 per cent of such waste. The SBM and SCM have given a strong push to developing the waste processing infrastructure along with collection efficiency. The emphasis of SBM on source segregation is aimed at improving the efficiency and quality of processing. Source segregation allows ULBs to select the most suitable and cost-effective processing technologies like composting, setting up material recovery facility for dry waste or waste-to-energy plants.

The adequacy of processing capacity for SWM has witnessed improvements since the decade of 2000s when the service backlogs ranged between 88 per cent (major cities) to 100 per cent (smaller cities). Currently, a total of 1531 functional centralised compost plants with a processing capacity of 38.9 MTPA exists; another 566 compost plants with processing capacity of ~23 MTPA is under construction. In addition, there are 4 functional RDF plants and 37 bio-gas plants with a processing capacity of 1.27 MTPA. Further, 26 waste-to-energy plants with an input capacity of 8.22 MTPA is under construction. Together, a total processing capacity of 71.39 MTPA will be available post completion of on-going plants which appears adequate to cover the current waste generation of ~66 MTPA. This is significant compared to the installed capacity of 1 MTPA and ~1.6 per cent of compost production in 2014 (Standing Committee on C&F, 2017). However, the functional capacity of these plants will determine the actual capacity available for processing. With respect to C&D waste, the processing infrastructure appears to be significantly inadequate with only six functional C&D plants in the country (MoHUA., 2020).

This suggests very low rate of recycling capacity compared to international scenario where countries like Netherlands, France recycle 80-90 per cent of their C&D waste.[ii] With respect to e-waste, the E-Waste Management Rules of 2016, the primary responsibility of disposal of such waste rests with the producers and recyclers; the role of the ULB is to ensure that e-waste doesn't enter municipal waste and to channelize orphan e-waste to authorised dismantler or recycler. As per Global W-Waste Monitor, India generates about 2 MTPA of e-waste that also includes imports; 80 per cent of which is recycled informally (Balde C., 2017). At present there are 178 authorised recycler and dismantlers in India. Of the total hospital waste, bio-medical waste constitutes about 15-20 per cent. Compared to the 4000+ ULBs in the country, there are only 2000 Common Bio-Medical Waste Treatment Facilities in operation (Standing Committee on UD 2018-19, 2019).

Quality: Quality in the context of SWM refers to the overall level of SWM services across its value chain. It includes citizen centric service delivery, regular and timely provision of waste collection services to all waste generators, efficient redressal of SWM related complaints, high quality of processed waste products like compost or refuse derived fuel (RDF) and reliability of the technology. The GoI has undertaken several initiatives towards a citizen centric service delivery. These include shift from an input / process/ output-based projects towards an outcome and impact-based project / programme design. Some of these initiatives include Right to Public Service enactments, National e-governance plan, public disclosure laws, release of service level benchmarks, among others. The SLBs for SWM launched in 2010 by MoUD were aimed at shifting the focus from infrastructure creation to delivery of service outcomes. There is very little evidence on the quality of SWM services provided by the ULBs or ULB appointed contractors in the country.

The HPEC Report of 2011 had reported that the collection of the garbage from dumpsites was infrequent and transfer of waste from roadside dustbins to transfer stations was done by ULBs with varying degree of efficiency. The *Swachhata* Status Report based on a rapid survey found that dumping places – street and community bins were cleaned daily in about 48 per cent of the wards and weekly in about 38 per cent of the wards (MOSPI 2016). At present about 66% of the solid waste generated in the country is processed through various technologies with bulk of it composted. Of the 9.4 MTPA of plastic waste generated in the country, ~60 per cent is recycled largely by the informal sector. Though India's plastic recycling rate of 60 per cent is higher than the global average i.e., 20 per cent, still 3.4 MTPA of plastic waste is either landfilled or results in environmental pollution. (MoHUA, 2019).

With respect to the quality of products from processed waste, the quality of compost is linked to segregation of waste at source. Compost made from waste segregated from mixed waste are not observed to fit for end-use due to contamination and high mineral content. The CPCB in its report on "Characterisation of MSW Compost and its Application in Agriculture" that studied select compost plants in the country found evidence of heavy metal contamination in some samples of compost made from MSW. The study further reported and lacked the required nutrient content resulting in lower sale price (CPCB, 2006). Another study undertaken in 2010 that assessed the quality of compost in Indian cities, most of the compost samples did not conform to the to the quality control guideline of 'The Fertilizer (Control) Order 1985" (Saha, 2010). A Report on Water and Sanitation Service Levels in Cities of India by CEPT University in 2013 stated the average efficiency in redressal of SWM related complaints by 1200 ULBs in the country to be ~69 per cent (CEPT, 2013). The SBM has made substantial improvements in addressing complaints and grievances related to SWM and cleanliness in general by ULBs. SBM has developed a *Swachhata* App and a *Swachhata* Platform that has two interfaces – City Dashboard and Engineer Dashboard. The City Dashboard tracks and presents the city level complaint resolution rates and the Engineer Dashboard presents the complaint resolution by ULB engineer thereby recognising the best performing city and engineer and ushering in a spirit of competition.

The *Swachhata* app has ~1383 cities and 8,583 ULB engineers onboard. Once the complaint is registered, it the concerned municipal body gets notified post which it an action needs to be taken within 24 hours. The *Swachhata* app has more than 1.7 crore urban users across the country (PIB, 2020). The data on the total number of SWM related complaints till date is currently not available. However, as per the data available for 2018, every month about 2.3 lakh complaints were registered on the *Swachhata* App of which 2.1 lakh complaints were redressed indicating a grievance redressal rate of 91 per cent - the corresponding service level benchmark is 80 per cent). The quality of complaint redressal has improved since the launch of the SBM and the role played by *Swachh Survekshan*. The Government has included the usage and response to citizens' complaint registered via the App an important element of the scoring criteria in *Swachh Survekshan*. This has incentivised cities to popularise the usage of the app among its citizens.

Equity: Equity in the context of SWM refers to provision of SWM services like door-to-door collection, community, and street bins uniformly to all residents in a city. The cost of the SWM service should be affordable to all. It also includes ensuring safe habitat around the location of the physical infrastructure established for SWM. Equity and access are also inter-linked as lack of access to SWM services to waste generators would also mean lack of equity in service provisioning. As discussed earlier, access to waste collection services was low in the decade of 2000s with door-to-door waste collection service practiced by select cities and in urban wards. Slum areas have traditionally been served through community bins. As per the NSSO survey of 2002, about 31 per cent of the slum households did not have any arrangement for garbage disposal and about 7 per cent of the slum households disposed garbage on their own.

The situation improved by 2009 and the 65th Round of NSS reported that in 65 per cent of the slums, ULBs provided garbage disposal arrangement and the per centage of slums without any waste disposal arrangement reduced to 16.5 per cent. The 69th Round of NSS reported ULBs made garbage disposal arrangements in about 62 per cent of all slums. The percentage of slums without any garbage disposal

arrangements decreased further to 27 per cent of all slums. However, the system did not include door-to-door collection of waste from the households. Under SBM, about 95.5 per cent of all urban wards in the country is served through door-to-door collection service of waste and the Ministry is working towards achieving its target of 100 per cent in this regard.

Livelihood: The principle of 'livelihood' in the context of SWM refers to promotion of livelihood opportunities in the SWM sector with safe working conditions and decent work standards for SWM workers of the ULBs. It also includes protection of livelihood of the informal workers involved in SWM activities in the urban areas. Livelihood conditions of SWM workers are unsafe and unhealthy. Data on the number of sanitary workers including those involved in solid waste activities is not reliable. However, as per a report by WaterAid, there are about 50 lakh sanitation workers in the country (WaterAid, 2019). A Chintan Report of 2018 reported that there are about 15 lakh people who make their living by recovering, sorting, and selling recyclable materials (Chintan, 2018). Though hard data on SWM workers' working condition is limited, there are qualitative aspects captured in various studies. A World Bank study in 2008 noted that in many cities across the country, deployment of SWM workers is often done without adherence to specified norms (World Bank, 2008).

The study found that in some states, four workers are engaged per 1000 population whereas in some states, one SWM worker is tasked with cleaning 500 meters of road length. The same study also stated that collected waste is transported in open trucks that involve manual loading and it results in loss of productivity and increased health risks of SWM workers. Apart from the SWM workers, the informal workers including the rag-pickers play a signification role in waste management. Due to their engagement, the actual amount of waste required to be collected by ULB is lower compared to total waste generation in the city. However, as ULBs improve their waste management system – either through their own efforts or by engaging a private contractor, the livelihood of informal workers and rag-pickers will be affected in the absence of measures to rehabilitate them. However, under SBM, ULBs are carrying out enumerator of rag-pickers and integrating them into their SWM systems like door-to-door collection service or in processing units. A total of 83626 workers from the informal waste sector have been formally integrated by about 2044 ULBs across the country (MoHUA, 2020). Further, 5.56 lakh sanitation workers have been linked with social welfare schemes of the Government (*ibid.*).

Sustainability: Sustainability in the context of SWM is multi-dimensional. It includes social sustainability i.e., continuity of people's engagement in SWM planning and service delivery, financial sustainability i.e., cost recovery of SWM operations, private sector participation and market-based financing and environmental sustainability i.e., application of the principles of 3R in SWM planning and operations. In the urban sector in India, there is a remarkable shift towards outcomes and service delivery. This is particularly evident for the SWM sector in the country. Recent government programmes and schemes have explicitly defined goals and outcomes. For instance, the SBM (U) identified '100 per cent door-to-door collection of solid waste' as one of its target outcomes. Such a target for the ULBs translates into better service quality for citizens and in turn improves cost recovery. Studies have found that low cost recovery is often associated with poor service delivery (Ahluwalia, 2011). As per the MoHUA, the SLB for cost recovery in SWM operations is 100 per cent.

Cost recovery of SWM operations is critical for the ULBs as on average ULBs spend between 10-20 per cent of their annual municipal budget on SWM – it is even 50 per cent in some cases. The HPEC Report of 2011 stated that the average cost recovery in select ULBs ranged from 7.8 per cent (Amravati) to 55 per cent (*Palakkad*). The Report further stated that on average user charges contribute less than 50 per cent of the O&M cost of basic infrastructure services in India. The PAS Report based on SLB data for 2012-13 covering 1300 ULBs in the country reported the national average cost recovery of SWM operations at about 27 per cent (PAS, 2014). With the focus on improving service delivery outcomes under SBM, several ULBs such as Trichy Municipal Corporation, *Bruh*at Bangalore *Mahanagara Palike*, Indore Municipal Corporation, Agra Nagar Nigam, Trivandrum Municipal Corporation etc. have introduced user charges to cover the cost of SWM operations (NDTV 2017). Data is not available on actual collection or recovery. About 1280 ULBs report undertaking initiatives that encourage adoption of 3R principles and 141 ULBs have received star rating though only 6 ULBs have received a 5-star rating.

The sector is also witnessing emergency of several start-up that is connecting households with waste recyclers, ULBs and other stakeholders in the system which is encouraging (Lok Sabha 2019). These trends are likely to improve the financial sustainability of SWM operations in the ULBs. The environmental sustainability of the SWM sector has improved with ULBs clearing the service backlogs across the SWM value chain. HPEC Report of 2011 had reported that only 9 per cent of the waste was processed and 1 per cent disposed. As of 2020, the country is processing 66 per cent of the waste and collection efficiency in terms of door-to-door collection has reached 96 per cent of the total urban wards in the country; 480 ULBs

process at least 80 per cent of their collected wet waste (MoHUA, 2020). Further, remediation plans of 2221 dumping sites have been approved of which remediation is complete with respect to 390 plants.

SWM received programmatic attention since JNNURM that included solid waste as an eligible project component. About 100 SWM projects were approved with a total project cost of INR 2,400 crore (UIG – 3.3 per cent & UIDSSMT – 2.4 per cent of total funds); 23 projects developed through PPPs at a total cost of Rs. 657 crore (MoUD, 2013). SBM (U) builds upon the learning from JNNURM and continues programmatic support for SWM along with a significant thrust on a 360-degree stakeholder involvement with a focus on citizens. Significant progress has been made on increasing coverage of service, segregation, processing and awareness generation. There is also a growing importance of management of solid waste at the ULB level spearheaded by the *Swachh Survekshan* ranking.

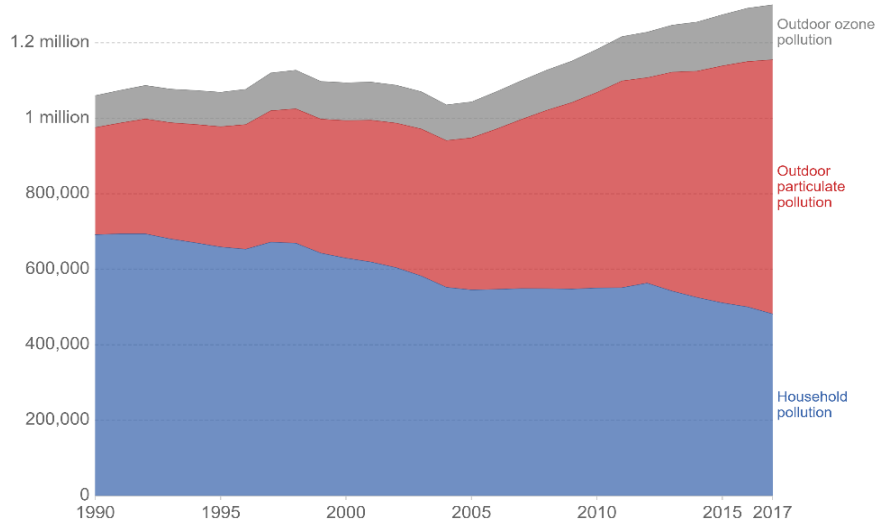
Air Quality & Pollution

The Stockholm Declaration (1972) has been a global milestone in anchoring the need to protect natural resources – Land, Water, Air ecosystems included, for the wellbeing and dignified lives of the present and future generations. As a member signatory to this UN Declaration, India's Air (Prevention & Control of Pollution) Act, 1981 has been instrumentalized for enforcing regulations across the country through National and State Pollution Control Boards. Urban Air Quality refers to how "clean" the ambient air is inside of cities with a density, population, and level of activity that generally are recognized as urban (Goodsite M.E., Hertel O., 2012). Air Pollution has been defined as presence in atmosphere any air pollutant (solid, liquid or gaseous substance, including noise) in such concentrations as may be or tend to be injurious to human beings or other living creatures or plants or property or environment (MoEFCC, 1981).

Breathing clean air is a human right. The fact that our health is strongly influenced by the air we breathe is reflected by the growing number of fatalities globally due to air pollution. Since the first global environmental awareness initiative in 1974 (World Environment Day), the emphasis on clean air has been a continuous and ongoing effort. The 2019 theme of World Environment Day was 'Air Pollution', as it had been costing millions of lives each year globally and had become a pressing environmental concern (WHO, 2019). India has the second highest fatalities due to air pollution (outdoor ozone, outdoor particulate & household), after China. During the three decades between 1997 – 2017, India had lost over 1 million lives annually due to air pollution (IHME, 2019).

The WHO refers to urban outdoor air pollution (also referred commonly as Ambient Air Pollution – AAP) as air pollution experienced by populations living in and around urban areas (i.e. cities), while indoor air pollution (commonly referred to as Household Air Pollution – HAP) refers to the pollutants found in indoors. While ambient air pollution accounts for an estimated 4.2 million deaths per year due to stroke, heart disease, lung cancer and chronic respiratory diseases, household air pollution i.e., predominantly exposure to smoke from cooking fires causes 3.8 million premature deaths each year, mostly in low- and middle-income countries, including (WHO, 2020). In India, until 2013 the fatalities due to Indoor air pollution were higher than outdoor, since then deaths due to outdoor air pollution have increased.

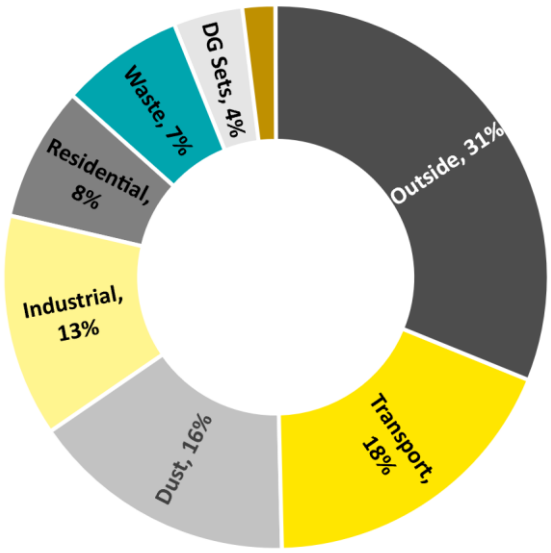
Figure 2.24: Number of Deaths due to Air Pollution in India (1990-2017)



Source: (IHME, 2019)

The main cause of indoor air pollution is inefficient fuel combustion from rudimentary technologies used for cooking, heating and lighting. There are also natural indoor air pollutants, like radon, and chemical pollutants from building materials and cleaning products that also impact the health. Predominant sources of ambient air pollution are fossil fuel combustion, fumes from VOC, emissions from waste (solid & liquid), controlled burn practices (agriculture, forestry), fertilization among others. In urban areas, vehicular emissions, crop burning, generation of dust- particularly from construction sites, depleting tree covers and poor waste management – all contribute towards the declining air quality (ORF, 2019). Vehicle emissions produce over 90 percent of air pollution in urban areas in developing countries (Contreras and Ferri, 2016), whereas in India urban air pollutant sources are diverse where the top pollutant source (of PM2.5) was from outside the city airshed areas followed by transport and dust (Urban Emissions, 2019).

Figure 2.25: Annual average source contributions (PM2.5) in 30 Cities



Air pollution in Indian cities is a symptom of inadequate urban planning and a by-product of industrial activity. Unless there is a sustained effort to address the causes of air pollution at its source, the problem will only exacerbate over time.

- APnA City Programme (2019)

Outside the City = contribution of pollution originating outside the designated city airshed; Transport = Transport emissions from road, rail, aviation, and shipping (for coastal cities); Dust = Dust emissions from road re-suspension and construction activities; Industrial = Industrial emissions from small, medium, and heavy industries (including power generation); Residential = Residential emissions from cooking, heating, and lighting activities; Waste = Open waste burning emissions; DG sets = Diesel generator set emissions; Bricks = Brick kiln emissions (not included in the industrial emissions);

Source: (Urban Emissions, 2019)

While urban air pollution in India has been increasing with rapid urbanization, infrastructure and industrial expansion et.al., the tackling the urban air quality & pollution issue requires a more regional approach where peri-urban and adjoining rural areas also play a significant role (see Figure 2.25 above). Within the City jurisdictions, efforts towards sustainable planning & design, waste and green-cover management have critical role in improving air quality.

There have been numerous efforts, since the Air (Prevention & Control of Pollution) Act, 1981, undertaken by National, State and Local governments in tackling air quality and pollution. However, the steering committee on Air Pollution and Health related issues (MoHFW, 2015) broke new ground in its approach to understanding and managing health impacts of air pollution. A shift from conventional approach to air quality management, in alignment with the resolution of the World Health Assembly (2015), the Steering Committee had explicitly focussed on issues of air pollution form Health perspective and on integrated exposure of the population to all sources of air pollution. Among its recommendations, the committee had specifically laid out emphasis on coordinated framework and action plan across ministries/ tiers of government. Following recommendations were made to the Ministry of Urban Development with regard to addressing health impacts of air pollution:

Table 2-13: Recommendations of the Steering Committee on Health-related issues & Air pollution to the MoUD

Recommendation	Aligned Urban CSS
Formulate/revise urban transport policy which reduces vehicular pollution (Include Health Promoting city guidelines in the "100 Smart Cities")	Smart Cities, AMRUT, Metro/ MRTS
Develop and implement policies to reduce indoor air pollution (like disincentivizing diesel gensets and promoting clean cooking fuels thus '*making available clean and making clean available*')	PMAY(U)
Enforcement of ban on burning garbage or biomass (especially during winter months)	SBM(U)

Recommendation	Aligned Urban CSS
Help cities develop air pollution alerts & emergency plans based on the Air Quality Index or CPCB continuous air monitoring data	SCM

Source: (MoHFW, 2015)

Notable National level initiatives undertaken by Government of India on Air Pollution Mitigation are presented below:

Initiatives on Air Pollution Mitigation:

- National Ambient Air Quality Standards (NAAQS) envisaging 12 pollutants have been notified under EPA, 1986 and 115 emission/effluent standards for 104 different sectors of industries, besides 32 general standards for ambient air have also been notified.
- Executing a nation-wide programme of ambient air quality monitoring known as National Air Quality Monitoring Programme (NAMP). The network consists of Six hundred and Ninety-One (691) manual operating stations covering Three Hundred and three (303) cities/towns in twenty-nine (29) states and four (6) Union Territories of the country. In addition, there are 86 real-time Continuous Ambient Air Quality Monitoring stations (CAAQMS) in 57 cities. Delhi has 10 Manual Stations and 18 CAAQMS. 20 additional CAAQMS are at various stages of installation in Delhi.
- With reference to Vehicular pollution the steps taken include introduction of cleaner / alternate fuels like gaseous fuel (CNG, LPG etc.), ethanol blending, universalization of BS-IV by 2017; leapfrogging from BS-IV to BS-VI fuel standards by 1st April, 2020; ongoing promotion of public transport network of metro, buses, e-rickshaws and promotion of carpooling, streamlining granting of Pollution Under Control Certificate, lane discipline, vehicle maintenance etc.
- National Air Quality index (AQI) was launched by the Prime Minister in April, 2015 starting with 14 cities and now extended to 34 cities.
- A Graded Response Action Plan for control of air pollution in Delhi and NCR region has been notified. This plan specifies actions required for controlling particulate matter (PM emissions from various sources and prevent PM10 and PM2.5 levels to go beyond 'moderate' national Air Quality Index (AQI) category. The measures are cumulative. Emergency and Severe levels include cumulatively all other measures listed in the lower levels of AQI including Very Poor, Poor and Moderate. Actions listed in the Poor to Moderate category need to be implemented though out the year.
- Central Pollution Control Board (CPCB) has issued a comprehensive set of directions under section 18 (1) (b) of Air (Prevention and Control of Pollution) Act, 1986 for implementation of 42 measures to mitigate air pollution in major cities including Delhi and NCR comprising of action points to counter air pollution in major cities which include control and mitigation measures related to vehicular emissions, re-suspension of road dust and other fugitive emissions, bio-mass/municipal solid waste burning, industrial pollution, construction and demolition activities, and other general steps.
- In order to involve people in the effort, Government had launched a campaign called '*Harit Diwali and Swasth Diwali*' during September 2017 involving over 2000 schools in Delhi and over two lakh schools in the country. The Government had also organized a Mini Marathon for '*Swachh Hawa for Swachh and Swasth Bharat*' on 15th October 2017 at India Gate in which nearly 15,000 school children had participated.
- Regular co-ordination meetings are being held in the Ministry at official and ministerial level with Delhi and other State Governments to avoid the emergency situation.
- Focussed efforts on National Capital Region have also been undertaken.

Source: (MoEF&CC, 2020)

The National Clean Air Programme (NCAP) was launched in 2019 to achieve a 20-30 per cent reduction in PM2.5 and PM10 concentration by 2024 (tentative national level target, with 2017 as base year) (MOEFCC, 2019). It had identified 102 Non-attainment cities, which had the target to reach the NAAQS as per CPCB with respect to their ambient air quality data (2011-15) and the WHO air quality database (2018). The table below outlines scheme coverage and gaps with respect to the desired outcomes at urban sector level:

Table 2-14: Sectoral outcome coverage and gaps – air quality & pollution

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Achievement of National Ambient Air Quality Standards	SCM, SBM(U), NCAP	Quality

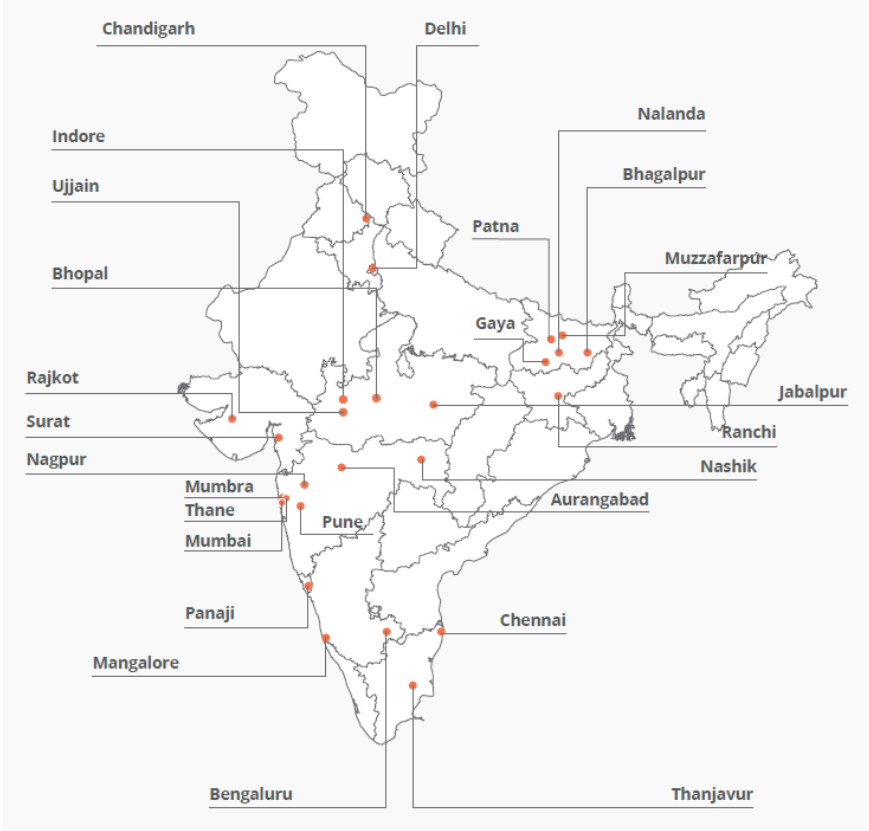
Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Reduction in number of NCD deaths (Non-Communicable Diseases) due to air pollution	NCAP	
Reduction of environmental impact in cities due to air pollution	SCM, SBM(U)	Sustainability
Improved adoption of renewable natural resources to reduce GHG emissions	-	Sustainability
Reduction of impact of pollution on vulnerable population of cities	-	Equity
Sustainable O&M of Air Quality Measurement infrastructure	SCM	Sustainability

Note: The outcome areas are drawn based on literature review including UN SDG 2015; WHO; GoI - NCAP

Among the Five Urban CSS – Smart Cities Mission and SBM(U) have intended and supported cities in implementing projects and initiatives targeting NAAQS for reduction of environmental impact in mission cities due to pollution (including air). The SBM(U) had accelerated ODF infrastructure and services among mission cities and had also created significant awareness among citizens of cleanliness among others. It had also initiated concerted efforts for creation of SWM infrastructure, which has been a critical area of concern for many cities in achieving Ambient Air Quality standards. By creation of the sanitation and SWM infrastructure and building awareness among stakeholders, SBM(U) had supported in reduction on harmful emissions into urban environs.

The Smart Cities Mission, through various projects across mission cities along with ClimateSmart Cities Assessment Framework (CSCF) had directly intended to improve city liveability standards including Air Quality. The CSCF is a first of its kind cities assessment framework on climate relevant parameters, including those of the NCAP. Several mission cities had undertaken projects under NMT/eVehicles, energy & green buildings, urban planning & green cover, water resources management, waste management and city operations (ICCCs) bearing capabilities directly impacting the ambient as well as indoor air quality standards (GIZ-NIUA, 2020).

Figure 2.26: Some Cities from SCM targeting Climate Smart initiatives



Source: (GIZ-NIUA, 2020)

Based on the literature review, various challenges and the possible broad way forward has been identified and summarised in the following table.

Table 2-15 Key challenges and way forward - Natural Resource Management

Liveability Parameter	Key Issues & Challenges	Broad way forward
Water Supply	• Gap in access to drinking water facility on the premise has reduced, but 'exclusive' access through piped water stands at 40.9 per cent • Increasing scarcity due to depletion of the water resources • High distributional losses and high non-revenue water • Wastewater and septage contaminating surface and ground water • Low O&M cost recovery and collection efficiency	• Protection of water resources (surface as well as ground water) • A strong focus on urban regional water planning can help mitigate water risks in urban settlements. • Funding infrastructure creation and promoting institutional improvements to meet the requirements in all small, medium and large cities • Reduction on non-revenue water and improvement in cost recovery by service providers • Focus on water conservation and preservation through rain-water harvesting • Moving towards 24X7 water supply model – cities need to demarcate district metered areas (DMAs) to initiate 24X7 pilots.
Sanitation & Wastewater Management	• Gap in toilet access has been bridged (96.2%) but 'exclusive' access to toilet' is ~77.6% • Wastewater treatment capacity has increased but actual treatment varies across states (33-50 per cent) • Wastewater treatment projects not integrated with water supply projects • Low utilisation of treated wastewater (<2 per cent)	• Revision of city sanitation plans along with focus on preparation of shit-flow diagrams • Need for effective regulation of FSM by ULBs • Provide funding support for sanitation and wastewater infrastructure i.e., STPs, FSTPs etc. • Encourage ULBs to integrate water supply projects with wastewater management projects • Explore innovative service delivery models such as clustering /hub-and-spoke for sanitation services along with greater application of digital tools like IOT • Ensure role clarity and greater coordination among concerned departments at the city level
Solid Waste Management	• Need for large scale investments in solid waste management; ULBs can manage the front-end services like collection & transportation but lack resources for capital investments in treatment and disposal • Data on leveraging PPPs in SWM is limited; lack of congruence between financial instruments and asset creation in large cities • Limited number of private sector players to support the demand	• Provide funding support for capital intensive processing and disposal infrastructure • Leverage PPPs for special category waste such as plastic waste, C&D waste • Formulate strategies and provide handholding support to ULBs for leveraging EPR

Liveability Parameter	Key Issues & Challenges	Broad way forward
	• Sustaining of existing practices like source segregation, processing etc. • Limited technical (institutional and human resource capacity) at all levels – national, state and ULB for long-term SWM planning	

2.2.2.3 Social Services

City Government functions include land-use planning, allocation of appropriate land (quantum & location) and provision of basic infrastructure that has direct bearing on social services amenities and hence Quality of Living of Citizens. However, the service provision and O&M are largely functions of other State and Central level Institutions – a major factor for any disparity in overall service delivery.

Taking cognizance of the above Institutional arrangement, the evaluation team undertook assessment of social services as relevant to the Urban Sector context and have presented the key connected issues.

Safety and Security

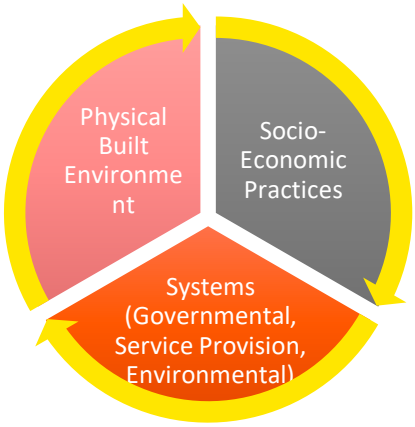
The Asia Foundation's Urban Safety Project (Jayde Roberts, 2018) refers Urban Safety to the extent to which a city's inhabitants are able to live, work and participate in urban life without fear of bodily harm or intimidation. It should be viewed as a complex set of ever-changing and interconnected problems related to – Physical-Built, Socio-Economic and Systems factors.

The above definition is coalescent with the commitment 39 under the New Urban Agenda (UN Habitat III, 2017). Further, the UN-Habitat Safer Cities programme has three building blocks; i) building urban safety through urban vulnerabilities reduction; ii) building urban safety through urban planning, management and governance; and iii) improving the governance of safety.

The National Disaster Management Act, 2005 had been a steppingstone in India's effort and focus on institutionalizing Disaster Management (both Natural and Man-made) at all levels. The National Disaster Management Policy (2009) further emphasized the need of detailed Hazard Risk and Vulnerability analysis to be part of the Disaster Management Plans.

The following table presents broad coverage of the urban CSS across the desired sectoral outcomes under this parameter of Safety and Security.

Figure 2.27: Urban Safety Net, illustration



Source: Illustration based on Urban Safety Project (Jayde Roberts, 2018)

Table 2-16: Sectoral outcome coverage and gaps – Safety and Security

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Improved emergency response time through integrated city safety & security systems	SCM	Access, Adequacy, Quality
Ease of access to safety & security services to all citizens at all times	SCM	Access
Reduced urban transport related violations, accidents and fatalities	SCM, AMRUT	Access, Adequacy, Quality

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Reduced socio-economic and human losses due to disasters (natural/human) including flooding	SCM, AMRUT, SBM (U)	Sustainability
Reduction in incidences of crime against vulnerable population esp. in public spaces	-	Equity, Adequacy
Sustainable O&M of all safety & security infrastructure	SCM	Sustainability

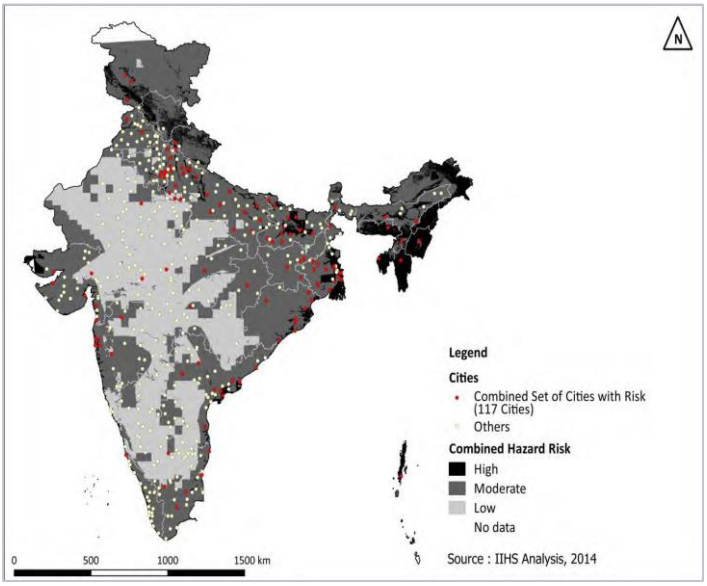
Note: *Desired Outcomes based on Output-Outcome Framework* (Ministry of Finance, 2020-21)*; aspects of scheme coverage and principles of liveability assessment based on scheme guidelines and evaluation team's analysis.*

India's estimated average annual economic loss of $9.8 Bn, of which ~$7 Bn is due to Floods (UNISDR, 2015), is a recurring phenomenon across several States in the Country. These are exclusive of the drought and agricultural losses, that are increasingly being affected by climate change. One of the key drivers behind such increasing economic losses is lack of knowledge about hazards and access to risk information, which is essential to undertake any risk reduction action (NIDM, 2019). Progressing and leveraging from the many lessons learnt under the *Hyogo Framework* for Action (2005-15), the *Sendai Framework* for Disaster Risk Reduction (2015-30) shifted global focus from Managing Disasters to Managing Disaster Risks through better understanding and calibration of Risks so as to effectively prevent future losses.

Garima Jain et.al., (IIHS, Urban Risks and Resilience in India, 2016) have analysed that in India, about 76 per cent of the population is exposed to high-to-medium multi-hazard risks, of which nearly 30% live in the million-plus cities and many small and medium-sized towns, primarily owing to a higher concentration of people and capital investments, increasing socio-economic and physical vulnerabilities, and limited capacities to cope.

Some of the recent natural disasters in urban areas such as Floods in Chennai (2015), Srinagar (2014), Kochi (2018), HudHud cyclone in Visakhapatnam (2014) have severely impacted the cities both in terms of economic and social losses. Chennai and Visakhapatnam events combined had and estimated loss of Rs. 10,000 crore (IIHS, Study for the XV Finance Commission on Urban Infrastructure and Resilience, 2020). Further, in its Post-disaster audit reports of Chennai (CAG, Report No.4, 2017) and Srinagar (CAG, Report No.4, 2016), the CAG had pointed out to the poor capacities of ULBs in India on Emergency Preparedness and Resilience building.

Figure 2.28: Combined set of Most Risk Prone Cities in India (117)



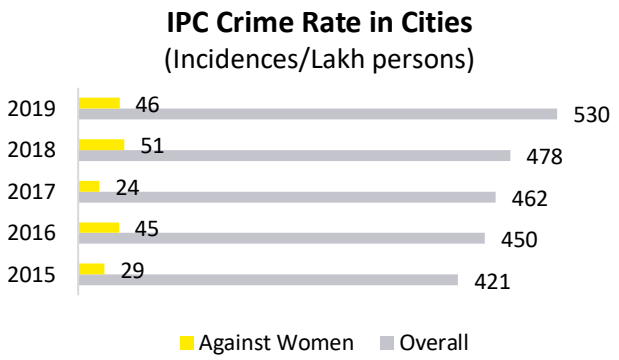
Source: Garima Jain et.al, IIHS (2016)

The NDMA vulnerability profile of India indicates 58.6 per cent of its landmass is prone to Earthquakes (moderate to very high intensity), 12 per cent of its land is prone to floods and river erosion, 76 per cent of its coastline is prone to cyclones and tsunamis, 68% of cultivable area is vulnerable to droughts and hilly areas are at risk of landslides and avalanches (NDMA, n.d.). BMTPC's Vulnerability Atlas of India (BMTPC, n.d.) has categorized high to very high risk of ~1.12 crore urban houses vulnerable to earthquakes, ~2 crore urban houses vulnerable to Winds and ~0.66 crore urban houses vulnerable to Floods in India.

The Earthquake Disaster Risk Index (NMDA, 2019), has categorized 13 out of 50 Cities analysed are in high level risk – Srinagar, Aizwal, Pithoragarh, Bhagalpur, Panipat, Shimla, Solan, Ratnagiri, Gangtok, Moradabad, Uttarkashi, Nainital and Vijayawada. The report while highlighting that such alarming scenario needs immediate attention, has also pointed out that there is very less attention paid on securing basic infrastructure that is being planned and implemented through various Government programs and providing safety to the city residents.

Many risks arise from natural hazards but many other arise due to local crimes. National Crime Records Bureau (NCRB, 2016-20) publishes crime statistics for India. For urban crime rates, it covered 19 largest metropolitan cities.

Figure 2.29: Crime rates in 19 largest metropolitan cities of India



Source: (NCRB, Crime in India, 2016-18, Statistics, 2016-

We commit ourselves to promoting a safe, healthy, inclusive and secure environment in cities and human settlements enabling all to live, work and participate in urban life without fear of violence and intimidation, taking into consideration that women and girls, children and youth, and persons in vulnerable situations are often particularly affected.

We will also work towards the elimination of harmful practices against women and girls, including child, early and forced marriage and female genital mutilation.

Commitment No.39 (UN Habitat III, 2017)

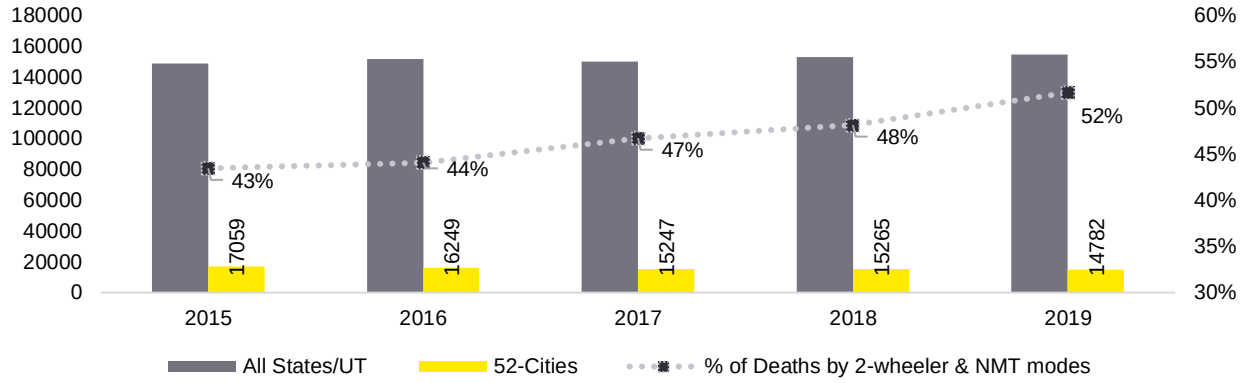
As per the analysis carried out by Jha in the year 2019, Delhi's rate of IPC crimes is 1,306 (per lakh population) that is far above any other urban agglomeration covered by NCRB. Other cities like Kochi, Patna, Jaipur and Lucknow have crime rates of 809, 751, 683, and 600 respectively. The lowest crime rates with regard to IPC crimes are in Kolkata, Coimbatore, Hyderabad, Mumbai and Chennai 141, 144, 187, 212 and 221 respectively (Jha, 2019). However, IDFC's SATARC survey in four metros (Delhi, Mumbai, Chennai & Bengaluru - 2017) found that only 6-8% of victims of theft have lodged a FIR with the police.

Proclivity of Cities to Crime is one of the significant concerns for society. Charu Nangia et.al (Charu Nangia, 2019) study clearly established that presence of augmented built environment factors supported neighbourhoods achieve very low crime incidents against women. Thus, criminal behaviour can be controlled and minimized by espousing ameliorate built environment e.g., using CPTED Strategies, in urban neighbourhoods. While the operational responsibility of safety & security lies with Home or other Departments (State/Centre), the urban sector agencies/ schemes along with other National and State level agencies/ schemes, are also contributing to improve 'safety and security' in the urban areas.

There are various factors affecting the safety and security concerns, such as; Public transport – availability, waiting time, transit station spacing; Infrastructure – lighting, footpaths/ walkways, open streets; Security – police personnel density, CCTV availability, women police personnel (SafeTiPin, Delhi: A Safety Assessment, 2019) (Kaur et al., 2019). SafeTiPin created an index in 2019 and provided a safety score of 2.5 out of 5 to Delhi, Gwalior; 2.6 to Jodhpur and 2.9 out of 5 to Bhopal. These scores reflect the perception of women respondents during safety audits at multiple locations from a point of perception of safety at that particular location. An important finding of these studies is that, 95% of respondents have cited using public transport as most unsafe while 84% have cited that waiting for public transport (at bus stops) as most unsafe places in Cities (SafeTiPin, Women and Mobility - a case study of Bhopal, Gwalior and Jodhpur, 2019).

Weak policy, no separate regulation for urban roads and letting Car dictate city design, have been cited as predominant factors contributing to the absence of universal safety to urban road users in India (ICLEI, 2014). Despite the presence of a National Road Safety Policy (which has been adopted by all States, MORTH) the increasing number of deaths (2015-19) due to Road Accidents highlights the weakness in enforcement. It is also important to note that, while data shows an increasing trend in deaths by 2-Wheeler and NMT modes, more than 50% of overall deaths due to road accidents have been by 2-wheelers and NMT modes. However, the trend in overall deaths due to road accidents in 52 cities has been decreasing during the same period (NCRB, Accidental Deaths and Suicides in India, 2015-19). This improvement could be attributed partly to the awareness among urbanites on Road Safety and also interventions brought in through various Urban CSS.

Figure 2.30: Deaths due to Road Accidents in India



Source: (NCRB, Accidental Deaths and Suicides in India, 2015-19)

The Smart Cities Mission focused on creating a more safe and secure environment and has identified multiple interventions under this segment like ICCC, Smart Street poles, Surveillance, Open Spaces etc., for improving Access, Adequacy and Quality of Urban Safety & Security. AMRUT has also contributed in certain aspects of improving Urban Safety & Security through interventions such as provisioning of energy efficient street lighting, creation of footpaths/ walkways, improved parks etc.,

IIHS in its draft report to the 15th FC has indicated that while AMRUT, SCM and PMAY(U) have partly addressed Disaster Risk and Vulnerability aspects related to Built-Environment, SBM(U) and HRIDAY need to highlight and incorporate relevant standards (e.g., Hazard Risk Vulnerability Assessment, Disaster Management Plans) into their guidelines. Gender responsive Urban Mobility still remains a challenge, especially in India, due to lack of policy and implementation focus towards the mobility issues of Urban Women & Girls caused by their varying socio-cultural needs, patterns of travel and poverty (Heather Allen, 2018).

Health

Universal access to healthcare is a well-articulated goal for both global institutions and national governments. India's National Health Policy, 2017 envisions the goal of attaining highest possible level of health and well-being for all, for all ages, through a preventive and promotive health care orientation in all developmental policies, and universal access to good quality health care services without financial hardship to the citizens.

The following table presents broad coverage of the Urban CSS across the desired sectoral outcomes under this parameter.

Table 2-17 Sectoral outcome coverage and gaps – Health

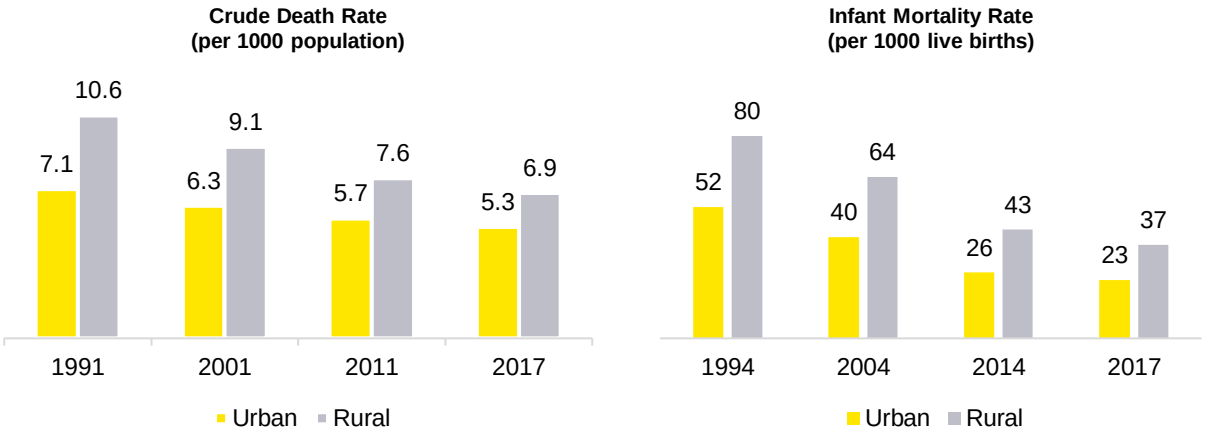
Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Universal access to affordable & good quality healthcare in cities	NUHM	Access, Adequacy, Quality, Equity
Reduction in Socio-economic and human losses due to vector borne diseases & NCD	SCM, AMRUT, SBM(U)	Access, Adequacy, Quality
Participation of Community based Organizations, Development Partners, NGOs, SHGs and facilities to achieve cleanliness and hygiene in communities	SBM (U), NULM	Equity, Livelihood, Sustainability
Sustainable O&M of all infrastructure supporting health	-	Sustainability

Note: *Desired Outcomes based on Output-Outcome Framework* (Ministry of Finance, 2020-21)*,* (NUHM, 2017)*; aspects of scheme coverage and principles of liveability assessment based on scheme guidelines and evaluation team's analysis.*

The health condition of urban population is better than that of people living in rural areas as presented in the table below. This has been improving over the years, but rapid urbanisation with limited growth in

infrastructure provisioning to meet the changing needs is resulting in health hazards due to over-crowding and increasing air, water, and land pollution (Usmani & Ahmed, 2018).

Figure 2.31 Health conditions in urban and rural India



Source: (MoHFW, National Health Profile, 2019)

The health system in urban India is highly diverse, comprising of private health care services, public health care facilities and services and traditional healers such as Ayurveda and homeopathy. However, it is noted that the private health sector has gained importance over the recent years and has grown quickly compared to its counterparts in public sector (Butsch et al., 2012). As per ADB's report on urban health (ADB, 2015), private health facilities provide about 80 per cent of patient care in urban areas and it further highlights that the urban primary health care system needs to be significantly strengthened to achieve its health indicators.

The existing primary health facilities in urban India are limited in number, are underutilised, do not match the standards and norms and do not meet the quality parameters. Further, they have limited scope of services that includes provisioning of basic primary care and they have very limited focus on community outreach and health promotion. Additionally, even if the residents have proximity to private health facilities, many urban residents cannot afford such services due to very high prices charged by private facilities (ADB, 2015).

In urban areas there are total of 3,772 hospitals with 431,173 beds (MoHFW, National Health Profile 2018, 13th Issue., 2018). Further, urban poor is one of the most vulnerable section in reference to the health indicators in urban India. They have low access to healthcare facilities for immunisation, access to health professionals, amongst other problems (Usmani & Ahmed, 2018).

The National Urban Health Mission (NUHM) aims to meet the healthcare needs of urban population, especially the urban poor. The Mission aims to increase, for the urban population, their access to primary health services and reduce their out of pocket expenses, through strengthening the health system, proper targeting and convergence with related schemes. One of the components of the NUHM is the creation of health services in urban areas in the form of Urban-primary health centre (U-PHC) and Urban – community health centre (U-CHC). The status of infrastructure under NUHM is as follows:

Table 2-18: Public health facility status in urban areas

Facility	Status (number)
1 U-PHC per 50,000 population	768
1 U-CHC per population > 5 lakhs	69

Source: (MOHFW, 2018-19)

It has also been found that, there has been shortage of human resources across these facilities leading to low availability of health services to urban population (NUHM, 2017). Urban health is deteriorating with increasing pollution and other factors.

SCM has tried to capture health-related service offerings as one of the parameters and to some extent, contributed towards creation of healthcare facilities in Cities. AMRUT mission, through provision of water, wastewater infrastructure at city level, has made direct contribution to reduction of communicable vector borne diseases in urban areas. NULM and SBM(U) Missions, have not only supported in improving overall

health outcomes of citizens through provision of basic infrastructure but also, through convergence with various Health CSS, have enhanced the access and adequacy of Health related services through SHGs, Community Based Organizations to urban poor and diverse urban citizenry.

Health is the core function of the Health departments at State and Central levels. City governments can at best enhance physical access (which can indirectly help enhance adequacy and equity), demarcate land/location for health facilities, also build and upgrade public health infrastructure. However, the actual service delivery (including O&M) of such facilities ultimately falls under either Government agencies or private sector/ trusts. The challenges pertaining to universal and equitable access, affordability and sustainable O&M of Health Infrastructure/Services in Cities, predominantly surround the Functional fragmentation between agencies.

Education

India has the largest educational system in the world, with over two crore children going to schools. Education system in India is a mix of government-led and private-led schools. School education comprises of primary, secondary and senior secondary levels (Care, 2018).

The following table presents broad coverage of the Urban CSS across the sectoral outcomes (which have been limited through lens of urban sector, as compared to broader set) under this parameter.

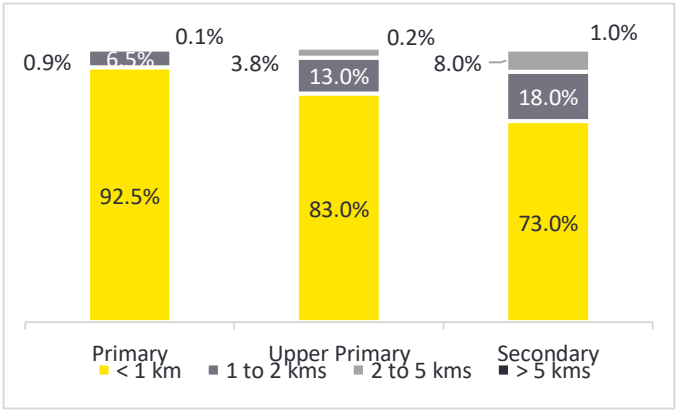
Table 2-19: Sectoral outcome coverage and gaps – Education

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Universal access to affordable & good quality education in cities	MHRD Schemes, SCM	Access, Adequacy, Quality, Equity
Enhancing retention, transition of pupils by providing infrastructure and other facilities to educational establishments	SCM, AMRUT, SBM(U)	Adequacy, Quality, Sustainability
Ensure facilities that are child, disabled and gender sensitive to provide safe, inclusive and effective learning environment	SCM, AMRUT, SBM (U)	Equity, Quality
Sustainable O&M of all infrastructure supporting education	-	Sustainability

Note: *Desired Outcomes based on Output-Outcome Framework (Ministry of Finance, 2020-21), National Development Agenda , SGDs and the National Education Policy (MHRD, 2020); aspects of scheme coverage and principles of liveability assessment based on scheme guidelines and evaluation team's analysis.*

The literacy rate in urban areas is pegged at 79.5 per cent, with male and female literacy rate at 83.7% and 74.8% respectively (Ministry of Statistics and Programme Implementation, 2014). According to NSSO, 2014, a large proportion of children have access to schools within a distance of one km from their houses. However, the access to these schools reduces from primary level to secondary level of education.

Figure 2.32: Access to educational facilities in urban India

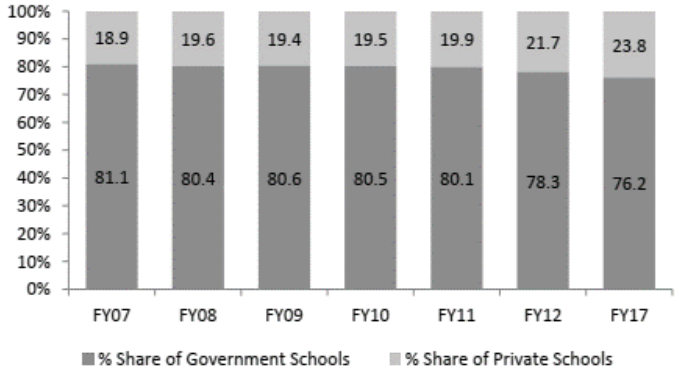


Source: ***Invalid source specified.***

In light of the restrictions applied, by the GoI, on private K-12 institutions to be established as 'not-for-profit' and to be run only by trusts/ societies, only 3.5 lakh schools (~23.8 per cent of the total schools in India, FY2017) are observed to be run by private trusts, political, religious/ charitable organisations. And nearly 11.2 lakh schools (~76.2 per cent of the total schools in India, FY2017) are run by Government (Care, 2018).

As per the Right to Education (RTE) Act, 2009, "private schools providing elementary education are required to admit 25 percent of the students from the weaker sections and disadvantaged groups and provide them free education". Further, Sarva Shiksha Abhiyan has also helped in improving the participation of under-privileged children. However, as per the study carried out by James in 2019, "over 96 per cent of primary-school-age children are enrolled in school, but less than 40 percent of these children are able to read at a second-grade level", showcases the not so good outcome of the efforts put by the Government.

Figure 2.33: Percentage share of government and private schools (FY07 - 17)



Source: DISE

SCM has tried to provide for the school education facilities through interventions such as Smart Classrooms, improved access to Schools (pedestrian, bicycle), provision of basic utility and sanitation infrastructure especially for girls and specially abled children. AMRUT and SBM(U) have also contributed to enhanced access and equity of Educational facilities (and thereby indirectly education administration and learning outcomes), through provision of Water and Sanitation infrastructure.

Like Health, Education is also a core function of the Education Departments at State and Central level. City governments functions at best are limited to provision of basic infrastructure facilities, which indirectly contribute to enhanced access and adequacy of Education facilities to citizens. Also, the local authorities, through their role of providing adequate land at appropriate locations for social infrastructure (URDPFI guidelines), have a bearing on Equitable access to Education facilities. The actual service delivery (including O&M) though, would still vest with the Government, Private operators.

Identity & Culture

Identity can manifest its attribution both specifically – to life forms including people, places including cities, other physical things such as food, jewellery, toys etc., and abstractly – to ideas, philosophies and traditions among others. In the urban context, Shubhi Sonal (Shubhi Sonal, 2014) illustrates, the sense of urban Identity - often termed as *urbanity* by modern urban scientists - can be understood as a juxtaposition of the physical, visual, social, economic, cultural and political realms. Each of them affecting and inter-connectedly responding to each other.

Throughout the history, world over, Cities have been melting pots of cultures and identities through various forms of expression – physical, ideological, economic, political, social and creative. India's rich historical heritage has bestowed its diverse population and places with immeasurable wealth of time transcendental culture and identity. Many of its cities today stand testimony to their magnanimous identities and dynamic socio-cultural manifestations. The following table presents broad coverage of the Urban CSS across the sectoral requirements under this parameter.

Table 2-20: Sectoral outcome coverage and gaps – Identity & Culture

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Enhance liveability of cities and safeguard their identities	HRIDAY, SCM	Quality, Sustainability
Ensure social inclusion in cities through culture	-	Equity
Foster human-scale and mixed-use cities by drawing on lessons learnt from urban conservation practices	HRIDAY, SCM	Access, Adequacy, Quality
Enhance the quality of public spaces through culture	SCM	Quality
Build on identity & culture as a sustainable resource for inclusive economic and social development	HRIDAY, MoC Schemes, SCM	Livelihood, Sustainability
Regenerating cities and urban-rural linkages by integrating identity & culture at the core of urban planning	-	Access, Equity
Promote participatory process through culture and enhance the role of communities in local governance	-	Equity

Note: *Desired Outcomes based on Global Report on Culture & Sustainable Urban Development (UNESCO, Global Report on Culture & Sustainable Urban Development, 2016); aspects of scheme coverage and principles of liveability assessment based on scheme guidelines and evaluation team's analysis.*

Figure 2.34: Bollywood Theme Park, Mumbai

Source: newindiaexpress.com, 2018

While Culture is integral to human development and is the fabric for the dynamic construction of individual and collective identities, Urban Culture is a culmination of collective human memories transcending time and space through generational interactions. The city, as referred to by Italian architect Aldo Rossi, is 'the locus of collective memory' (Rossi, 1966), the historical accretion of human action, and a dynamic, living environment whose past influences not only the present but also the future. Culture has provided cities with the dynamic wellspring by which to exchange, challenge, innovate and evolve.

The intertwined nature of Urban Identity and Culture have long been prevalent in the Development of Societies and Nations, however in the last three decades global marked shift towards new urbanism and principles of sustainability have brought these into the main foray. Based on the Hangzhou Outcomes (UNESCO, Hangzhou Outcomes, 2015), the UNESCO global report on culture for sustainable urban development (UNESCO, Global Report on Culture & Sustainable Urban Development, 2016) has provided three strategic guiding principles for the outcomes under the New Urban Agenda:

- People Centred Cities are culture-centred spaces
- Quality urban environments are shaped by culture
- Sustainable cities need integrated policy making that builds on culture

Figure 2.35: Paranthe Wali Gali, Delhi (left); Dance & Music Festival, Chennai (right)

Sources: @Lodhidelhi Twitterati, 2017; tamilnadutourism.com, 2020

India's significant cultural capital includes: 37 world heritage sites; two thriving film industries and many smaller ones as well; and a diversely vibrant cultural heritage. While the art & culture sector globally has contributed to ~$2,250 Bn revenues and employment of nearly 30 million people (CII, Transforming Urban India: Art and Culture's Pivotal Role, 2019), India's creative goods industry including arts, crafts, cultural and gaming/vfx had registered ~$20 Bn (UNCTAD, 2018) exports, most of which is contributed by Cities. An interesting point to note is that the burgeoning young population in the country (standing at ~350 Mn) has become a significant consumer base in Urban India for the $8.4 Bn animation/gaming/vfx, ~$3 Bn movie and $1.3 Bn food service industries (UNCTAD, 2018).

While conservation and preservation of culture, heritage and identity of Urban landscapes/ places has been steadily growing, creating new identity and socio-cultural heritage to cities has also begun to take mainstage in Indian cities. Urban placemaking, heritage conservation and creating iconic culture infused landmarks across cities in India (metros and non-metros alike) have not only been receiving accolades from critics but also have gained public appreciation. Dilli Haat, NCPA Mumbai, Shilparamam Hyderabad, Indore Haat bazaar, among many others, have both attracted diverse urban patrons and created a pragmatic urban-rural linkage.

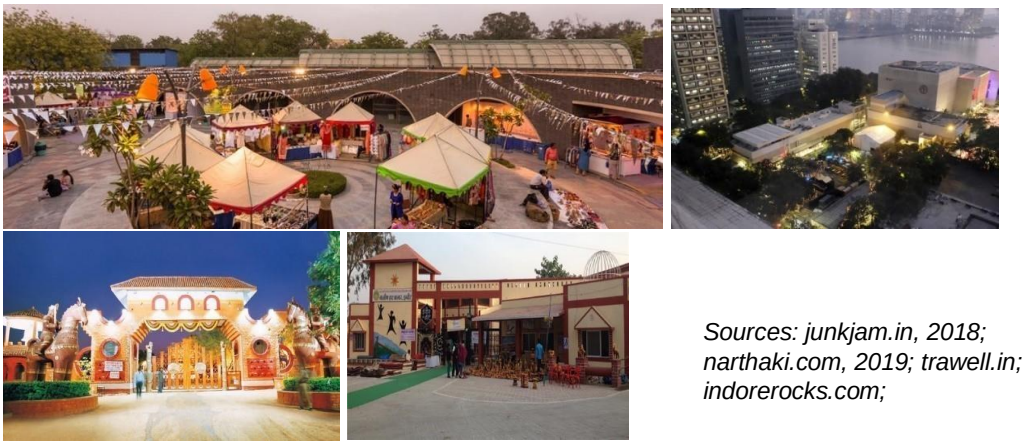
Figure 2.36: Amaravati greenfield city's architectural impression reflecting local identity & culture

Source: APCRDA, 2018

A study of three cities - Ahmedabad, Varanasi & Pune - by ORF (Niranjan Sahoo, 2016) has analysed the effects of socio-cultural dynamics and processes of urban

exclusion. The report further highlighted the growing trend in residential segregation by socio-cultural and economic characteristics (incl. migration), the identity of neighbourhoods does exert an influence on the extent of access to municipal services despite being located in denser parts of the cities. Shreya Urvashi (Shreya Urvashi, 2018) has also emphasised the intricate and sublime nature of socio-cultural discrimination being experienced by India's urban dwellers – especially on ethnic, class, caste and religious grounds.

Figure 2.37: Views of Dilli Haat, NCPA Mumbai, Shilparamam Hyderabad, Indore Haat bazaar



Sources: junkjam.in, 2018; narthaki.com, 2019; trawell.in; indorerocks.com;

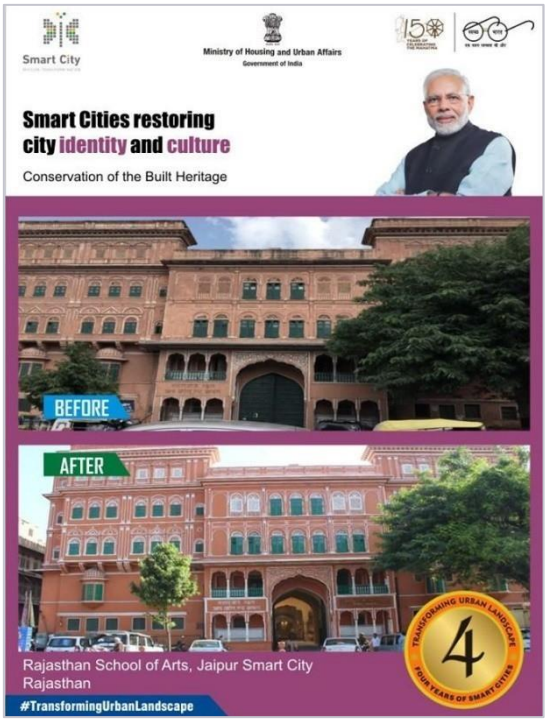
CII (CII, Transforming Urban India: Art and Culture to play a pivotal role, 2018) outlined some of the key challenges in India's art & culture sector as – lack of comprehensive policy for developing cultural infrastructure, declining use of art in cities, lack of integrated approach to building city identity, insufficient funding and low utilization, institutional constraints to upskill artists/artisans, low potential to attract private investments and art forgery. Kiruthiga et.al (Kiruthiga, 2018) argued that built heritage settings of temple towns, which could have been passed down for generations as the most valuable memories of a city, is being relentlessly torn down due to its conflict with the pressure of urbanization.

Government of India, through various centrally sponsored programs under various ministries, has been actively promoting and cultivating city cultural identities. Tourism and Culture ministries have their flagship programs for curating distinct city/location identities (our culture-our identity, Swadesh Darshan, PRASAD etc.,), while the Urban CSS under MoHUA – SCM and HRIDAY have also been augmenting India's efforts for creating vibrant, resilient and culturally inclusive cities.

HRIDAY is Govt. of India's flagship program focusing on development of four types of infrastructure – physical, institutional, economic and social – in an effort to revitalize heritage cities and places which contribute to strengthening urban identity and culture viz. sustainable societies.While Smart Cities Mission has both planned and implemented place making projects under Culture and Identity Theme of ABD areas. It has also encouraged cities to actively engage with citizenry and develop unique branding i.e., logos, taglines etc.

The **Rajasthan School of Arts**, located at Kishanpol Bazaar in the walled city of Jaipur and just about 100m from the Ajmer Gate, is the oldest institution in the State to promote art and culture. JSCL had undertaken the restoration of this building for adaptive reuse as a '**Museum of Legacies**'. The building has been developed as an inclusive space for citizens and tourists alike, to serve as not just a museum of indigenous art from across India but also to host workshops, events, live performances and cultural events. It was completed in Sep'2017 and opened to public in Dec'2017. Opened with 5 primary galleries, each named after a renowned individual in the art & culture scene of India, the museum hopes to be a microcosm of the best Indian artistic practice.

Figure 2.38: Restoration and Adaptive reuse of Rajasthan School of Arts



Source: MoHUA, 2019

However, due to the intricate nature of Urban Identity and Culture predominantly with respect to people and places – a number of sector level desired outcomes, especially pertaining to Equity, Livelihood and Sustainability are still unaddressed by any of the CSS.

In summary, while Social Services play an important and long-term role in improving Urban Liveability, the diversified nature of functional responsibilities currently in Cities – both for Infrastructure and Service provision, creates the gap in achieving the desired outcomes. It can also be observed that functional fragmentation does not only impact the implementation capacities of agencies responsible for Social Services but also impacts the overall sustainability of Cities (Physical, Socio-Cultural, Financial, Environmental and Economic).

Table 2-21 Key challenges and way forward – Social Services

Liveability Parameter	Key Issues & Challenges	Broad way forward
Safety & Security	• Despite increased efforts in disaster planning and mitigation, cities continue to face significant socio-economic losses annually. • While access to safety & security (infrastructure/ services) has improved, there is an urgent need to adequately cover vulnerable population esp. at public spaces • Inactive plans and/or services, unmaintained assets risk the sustainability of urban safety & security	• City plans need to capture adequate social services requirements and ensure equitable access • Adoption of innovative design practices e.g., Climate Resilience, CPTED should be made mandatory in city planning process • Safety & Security, Identity & Culture related aspects could be coordinated at ULB level with relevant departments through a dedicated nodal cell mechanism and periodic review/approval of municipal councils • Health & Education related aspects, where-ever cities don't have direct jurisdiction, should be elevated to District level authority for ensuring effective planning and efficient implementation. • At least 50% of asset maintenance costs should be recovered through private means, balance through Govt. funding • Build community ownership for facilities and services planned / provided to ensure equitable and inclusive local self-governance
Health	• City masterplans had limited or no focus on adequate equitable provisioning for health & education infrastructure – resulting in adhoc demand driven provisions • Most ULBs currently do not have a formal coordination mechanism to address city level health & education outcomes i.e., beyond missions • Inactive plans and/or services, unmaintained assets risk the sustainability of urban health and education	
Education		
Identity & Culture	• Although city identities have gained awareness and traction in recent times, ensuring socio-economically inclusive and environmentally sustainable identities remains a key unaddressed area • Leveraging identity & culture to promote equitable and inclusive societies either through events or places is still a key issue in many cities • There is a strong need in cities to anchor urban-rural linkages and enhance participatory local governance through culture – either through institutional mechanisms or processes • Inactive plans and/or services, unmaintained assets risk the deterioration of urban identity & culture	

2.2.2.4 Governance

Governance as per the liveability framework covers four important dimensions – capacity building, citizen participation, leveraging IT & e-governance and financial sustainability. This section discusses each of these four dimensions on the six principles of access, adequacy, quality, livelihood, sustainability and equity.

Capacity Building

Urban development is a multi-faceted challenge. Provision of urban infrastructure and services requires integration and coordination with other line Departments, including the State Planning Department, State Finance Department. Hence, the urban departments at the state level require adequate institutional and human resource capacities to meet democratic accountability. States are also expected to build capacities of its urban development department and urban local bodies in terms of establishment/ strengthening of a dedicated training institute, staffing and preparation of state-level capacity building plans (MoHUA, n.d). As State Government progress towards empowering the ULBs with more functions, the role of ULBs is likely to transform from being one of the service providers at the city level to 'the service provider' in the future.

The Report on the Mid-term Appraisal of the 11th Five Year Plan (2010) stated that emphasis should be given on proactive assistance to cities and states to build their soft infrastructure (Government of India, 2011). The Report identified governance, financing, planning, the professionalisation of service delivery and accelerating the development of local capacity and knowledge as key buildings blocks to strengthen the urban sector reforms process and improve capacities for management and local governance (*ibid.*). The Administrative Reforms Commission had also proposed an urban governance capacity building programme to address capacity gaps in urban local bodies (MoHUA, n.d).

Habitat III Policy Paper on Urban Governance, Capacity and Institutional Development highlight the need for greater capacity at all levels of governance and for all involved actors. It outlines the importance of setting up a well-resourced capacity building programme, local partnerships, systematic approach and mobilisation of different modalities of education & training, and innovative strategies to manage urbanisation (United Nations, 2017). A qualitative study undertaken by NIUA and sponsored by the Niti Aayog in 2015 identified a set of recommendations to build the comprehensive capacity of ULBs (NIUA, 2015).

Most of the Urban CSS include a component of capacity building that targeted different stakeholders, thematic areas and included different approached for training and capacity augmentation. The table below maps a set of desirable outcome areas for capacity building based on literature review and maps the alignment of the urban CSS against them.

Table 2-22: Sectoral outcome coverage and gaps - Capacity Building

Outcome Area	Urban CSS Mapping	Principles
Result based demand-responsive training initiatives	-	Access, Quality
Continuous training opportunities for all stakeholders (Officials, Elected Representatives, Citizens etc.) and timely, quality assured training	SCM (TULIP), (SBM) E-Learn, (NULM) U-Learn	Access, Livelihood
Enhance informed decision making and better prioritisation of local needs / policies	-	Quality, Sustainability, Equity
Adoption of integrated, adaptive, practical learning and leverage existing institutional mechanisms	CBUD; SCM (TULIP); (SBM) E-Learn; U-Learn (NULM);	Access, Quality
Systematic knowledge management, greater partnerships and institutionalisation of capacity created	PMAY(U) Gurukul, SCM (Smartnet), SBM, AMRUT	Sustainability
Availability of adequate Municipal Cadre	SCM Guidelines 10.6 & 13.3; NULM, PMAY, SBM, AMRUT	Quality, Sustainability
Ensure availability of adequate staff with requisite skill sets; creation of enabling framework for professional hiring	SCM, AMRUT, PMAY(U), SBM(U), NULM	Adequacy, Quality

Outcome Area	Urban CSS Mapping	Principles
Enhanced institutional mechanism for integrated planning and sustainable development of Cities	SCM, AMRUT	Sustainability
Recognition of training in career progress		Sustainability, Livelihood
Financial sustainability of capacity building initiatives	-	Sustainability

Note: (i) Planning Commission (2011); (ii-a) to (iv) Habitat III Policy Paper 4; (ii-b) Planning Commission (2011); (v) Capacity Building Framework for Strengthening Implementation of NUHM, 2017, (vi) to (xi) NIUA 2015. (x) Planning Commission (2011)

One of the notable features of the five urban CSS is the provision of dedicated capacity building budgets to ensure availability of professional technical and managerial support for effective implementation of the Missions. SCM, SBM and NULM have leveraged digital platforms to provide an array of self-learning-based training options to officials. CBUD, SCM and NULM have integrated training courses; CBUD launched a new integrated capacity building framework covering all five Missions, SCM introduced peer-to-peer learning under its 20-20 programme and NULM's U-learn courses target officials of both SBM and NULM.

The issues of lack of staff and professional talent is addressed by all Missions with SCM providing for hiring professional talent at leadership level in the SPVs. SCM, AMRUT, SBM and PMAY have encouraged partnership with the industry (e.g., IUDX) and academia (IITs, IISC, CEPT etc.). Some of the critical outcome areas financial sustainability of training initiatives, recognition of training in vertical mobility, increase in investments in systematic knowledge creation to manage institutional memory and building the negotiation / bargaining power of the public sector especially the ULBs, remain largely unaddressed. The following sub-section discusses the six liveability principles related to capacity building.

Access: The Habitat III Policy Paper 4 suggests that the new urban governance will have to be digital era governance and that the role of governments should be to facilitate, stimulate and offer room for technological and social innovation. The Report of the Working Group on Capacity Building for the 12th FYP had also recommended use of ICT in capacity building on urban management and robust information systems (Planning Commission, 2011). India's urban sector has witnessed greater adoption of ICT platforms for various purposes including 'citizen centric' service delivery, digital access to information and capacity building, among others. As digital penetration and literacy improves over time, application of ICT enabled platforms and modes are only going to increase for cost-effective and at scale engagements. Urban CSS have used both conventional classroom-based training delivery models and ICT-based training platforms for training with a greater emphasis on the latter. Further, the Missions have intensified and widened the outreach of the training programmes to participants other than the government such as elected representatives and citizens. For instance, SBM's E-Learning platform has seven training modules for citizen training.

Till now ~4.12 lakh ULB staff have registered on the E-Learning platform and more than 3.63 lakh certifications (including multiple learning-cum-certifications) awarded. SCM's Fellowship Programme and the newly launched 'The Urban Learning Internship Program (TULIP)' is a platform that connects urban governments with fresh graduates. TULIP targets to provide 25000 successful internships by 2021 and about 8000 postings have been made under the program so far. NULM's U-Learn initiative helps in the training of functionaries of both SBM(U) and NULM at the grassroot level and the training courses can be attended by community resource persons, SHG members and other beneficiaries. As the delivery of training is ICT-enabled, it facilitates round-the-clock learning and flexibility to participants. AMRUT trained more than 52760 functionaries and elected representatives against a target of 45,000 whereas under PMAY (U), ~5288 trainings / workshops were conducted.

Adequacy: While access to training has enhanced due to ICT-enabled platforms and extension of such training to beyond Mission functionaries, these training programmes were largely undertaken to support Mission implementation and were largely process driven and introductory in nature.[7] Capacity building programmes that are designed based on sector specific training need assessment (TNA) and/or post training participant feedback help in assessment of adequacy and quality of training for continuous refinement. However, sector specific training gap or need assessment were not undertaken prior to the launch of the

[7] For an overview of the courses under the new Integrated Capacity Building Framework please refer to the Office Memorandum dated 18th September 2017 accessed at http://smartcities.gov.in/upload/oms/59c0f2f89f6cfIntegrated_CapacityBuilding_MOHUA.pdf

Missions. The CBUD TNA undertaken in 2014 was based on a sample of 11 ULBs and covering general areas such as financial management, urban planning, service delivery and governance. However, the Urban CSS Missions planned in 2014 were sector specific in nature and required several new skills and knowledge in the area of smart solutions, sanitation planning, transit-oriented development, GIS-based master plan development, urban livelihood, innovative technologies for low-cost construction, PPPs, land-value capture etc.

Further, the Training Need Assessment for Smart Cities Mission commenced only in 2018, i.e., three years into the Mission implementation. Further, at the institutional level, some of the Missions such as SCM, SBM and NULM have limited or no technical support. Several states have PHED, PWD or parastatals experienced in handling water supply, sewerage, housing & general infrastructure development. But similar support for urban livelihood, solid waste management, IT based solutions etc are not available. Even at the national level, CPHEEO has a small team that supports the Mission mostly in day-to-day operations.[iii] Hence, institutional level support for capacity building has remained inadequate. The need for creating technical / professional cadres that has been highlighted in several national level reports and committees remain unaddressed. Further, availability of credible supply side institutions at regional and local level to support decentralised delivery of training remain inadequate. There is a need for expanding partnerships beyond Government institutions to private, academic & research organisations, corporate and other non-governmental organisations to widen the network of support institutions for capacity building (Ramanath Jha, 2018).

Urban Planning Education – Need for improving capacities in this sector

India has ~5000 urban planners i.e., one urban planner for every 75000 urban population and covering its ~8000 urban areas (Economic-Times, 2015). According to a report of the Expert Committee in Town Planning and Architecture (2011) set up by the MoHRD India would need about 3 lakh town and country planners by the year 2031 (Times-of-India., 2019). India has about 26 institutes that offer urban planning programmes and the country produces about 400 urban and regional planning graduates annually (Ramanathan, N.d.). Just two institutes namely School of Planning and Architecture, New Delhi and CEPT account for 60 per cent of these graduates. While the private sector absorbs most of the fresh graduates, only 15 per cent of the fresh graduates take up Government jobs with narrowly defined job descriptions (ibid.). While the ratio of urban planner to population ratio is lower compared to developed economies such as Canada and USA (one urban planner per 5000 urban population), the larger concern is about the depth and breadth of specialisation offered by urban planning institutions in the country. For instance, in India only the SPA Delhi and Bhopal and CEPT have a comprehensive urban transportation programmes whereas in Canada 16 colleges offer public transportation programmes. Indian cities need not only an increase in the quantity of urban planner but also planning professional with specialisation in areas such as development control, conservation and preservation, social planning, urban design etc. which is currently done by limited institutes.

The reforms in urban planning and management are imminent. The Government of India has set up an Advisory Committee to explore the need to advance the existing urban planning education system in terms of multi-disciplinary curriculum, supply of qualified urban planning professionals and their staffing in states and ULBs to oversee effective planning and implementation. Urban planning being multi-faceted requires availability of both specialised, multi-disciplinary and short-duration professional courses (for continuous learning) to urban planning students and professionals. Some suggestions to reform the existing urban planning ecosystem in terms of the demand, supply and linkages with the job market especially in government systems include the following:

- Creating demand for urban planning skills and knowledge at the local level; initiatives such as LAP, CITIIS, SCM, HRIDAY etc. that encourage application of urban planning principles for social and physical inclusion etc. need to be scaled
- The National Urban Innovation Hub that seeks to establish a network of 5 hubs and 100 plus spokes could impart leadership skills (through hubs), knowledge and technical skills (through spokes) related to urban planning and management at the national and local level. The leadership skills to officials from the Central and State Administrative Services could be imparted by national (E.g., LBSNAA) and state level nodal training institutions
- Strengthen mechanisms for absorption of urban planning graduates by the government bodies by addressing entry barriers, realigning job-description to leverage the multi-disciplinary knowledge and skills of urban planners and developing career plans.
- The TULIP programme could focus on linking urban planners with ULBs that could be a win-win for both the urban planning graduates and ULBs
- Attracting international planners for design and development of prestigious / signature urban projects through International Competitive Bidding. However, such invitations should ensure availability of

domestic urban planners in the teams to maintain Indian context. For example, The Shanghai Urban Planning Bureau invited international firms from the USA, UK and France to participate in its projects involving rail network, development of Huangpo Riverbank, Suzhou Creek Landscaping etc. recognising its lack of planning resources.

Quality: The Planning Commission had identified 'quality' of training materials and trainers along with data on capacity requirement for achieving service delivery norms as a major lacuna in the urban capacity building ecosystem at the state and city level (Planning Commission, 2011). It also highlighted the need for timely, relevant and quality assured information related to urban issues to urban managers based on the learning from the JNNURM regarding supply-side deficiencies. Hence, it was recommended that capacity building interventions should preferably precede programme implementation. However, the training programmes under the Urban CSS are observed to run in parallel to the Mission implementation period along with significant lags at the State and ULB level thereby likely to affect planning and execution of Mission activities – 58 per cent of the total trainings undertaken under PMAY (U) was in 2019-20. Further, integration of capacity building programme for all the five Missions was initiated in 2017 i.e., after 2-3 years of launch of Missions. Though greater number of training / certifications have been imparted through ICT platforms, the nature of training courses varies from videos to case studies to classroom-based intending to strike a balance between theoretical constructs and application of practical use-cases. There is a need for going beyond conventional class-room trainings to experiential learning, exposure visits, long-term training.

Even conventional class-room training should be designed on the principles of adult-learning and techniques like Harvard Case Study Method that allow learning by doing. The MoHUA under the SNUSP II had designed and implemented a country wide capacity building programmes on the new SWM Rules of 2016 and the MSWM Manual 2016 targeting national and regional training institutes along similar lines. Such innovative capacity building elements need to be replicated in other programmes and initiatives. Further, as discussed under the adequacy principle, it is observed that the focus of the recent training workshops under the Urban CSSs appear to be process driven and aimed at supporting smooth implementation of the Missions; these trainings need to be supported with specialised training on sector and cross-cutting areas. There is also a need for a post-training completion feedback mechanism along with a follow up training on areas that need new training or retraining.

Livelihood: One of the notable features of the capacity building initiatives taken under the recent Urban CSSs is the creation of platforms and avenues for the young professionals in the sector. The Smart Cities Fellowship Programme and the TULIP allow experiential learning experience to the largely home-grown young professionals from various fields – engineering, urban planning, statistics etc. Capacity building programmes across various government arms and levels have suffered due to incorrect targeting and consistency (Planning Commission, 2011). Lack of demand for training is coupled with two factors – reluctance of institutions to allow municipal staff to attend training (Ramanath Jha, 2018) and absence of incentives for the municipal staff to attend such training; completion of training courses are generally not linked to career growth. The Planning Commission recommended that State Governments could consider linking successful completion of training courses to career prospects and promotions. However, this has not been adopted in the urban sector in the country.

Sustainability: The knowledge and skill imparted under any training programme are prone to obsolesce. Innovations, systems, technologies require constant update and make capacity building an on-going process. Comprehensive Capacity building programmes target all stakeholders including the government functionaries at all levels, the elected representatives and the citizens who are the ultimate end users of urban infrastructure and services. While many of the government employees at the municipal level have extended career horizon, the elected representatives change with completion of their political tenure. As the elected representatives – Mayor-in-Council review and approve (as the case may be) administrative proposals, they need orientation about their functions, statues, processes and sectoral overview etc. Another element under sustainability is the need to keep the existing institutions adequately engaged, informed and utilised as per their area of specialisation and comparative strength. This would assist in systematic knowledge management and institutionalisation of the capacity that has already been created. Lastly, creating adequate funding arrangements to sustain the training initiatives over the longer run is essential. Greater devolution of functions and financial powers as envisioned under the 74th CAA will help augment the financial capacity of ULBs.

Among the five Urban CSSs, only AMRUT has an urban reform agenda though the performance of states on it is delinked to the reform incentives. The status of devolution of 74th CAA functions varies across states and across ULBs within state (MOHUA., 2020). Barring large municipal corporations, ULBs in general are not

able to provision for capacity building programmes (Ramanath Jha, 2018). The Urban CSSs have utilised the existing state level institutions for capacity building thereby building institutional capacities and targeted elected representatives and citizens thereby contributing to overall sustainability. Financial sustainability of the capacity building beyond the Mission period remains a concern and there is need to explore alternative mechanism to fund such programmes in the future. The SCM TNA 2018 found that there is willingness to pay for high-quality training programmes among many ULBs which can trigger and create a demonstration effect among other institutions through a results-based training programme.

Equity: The capacity building initiatives under the Urban CSSs have targeted many stakeholders including the grassroot level functionaries and citizens. Though a large number of training programmes were self-learning and ICT based, traditional classroom-based training was also continued thereby allowing flexibility to those who aren't comfortable using digital platforms. Further, Mission set aside dedicated budget for capacity building for greater outreach. Mandatory training under SBM(U) that ensured access to training for all ULB staff.

Citizen Participation

Need for Citizen Participation

People or citizens are the ultimate client or beneficiaries of any intervention by the government, development organisations, private sector organisations, including non-governmental organisations and think tanks. Cities are meant to be built for people - people of all age, gender, communities and abilities. Participatory governance involves the sharing of the power by the government with citizens and private sector (Sejal Patel, 2016). Citizen engagement or participation is one of the most important drivers for governance improvement (Simon O'Meally, 2017).

Citizen Participation in Indian Context

Being the world's largest democracy, participatory and decentralised governance has always been at the centre-stage of India's democracy – more in the rural context than in the urban. Formal structures for citizens' participation in urban local governance or participatory governance were mandated through the 74th CAA in 1992. The Ministry of Urban Development in 2005 introduced a model Community Participation Law that aimed at providing a three-tier governance structure i.e., City - Ward Committee – Area *Sabha* in Indian cities. The Ward Committees recommended under the 74th CAA was envisaged as a participatory space that allowed citizens, councillors and administrative officials to work together. *Area Sabhas* as per the CPL primer comprise all registered voters in a polling area.

Both Ward Committees and *Area Sabhas* are aimed at increasing the proximity between citizens and their elected representatives and city administration by serving as neighbourhood level formal platforms. In recent times, few additional formal structures such as the Standing Committee (Subject Matter) Town Vending Committee, Shelter Management Committee are available at the local level that involve citizens in matters of local governance. The urban CSSs have accorded greater emphasis on enhancing "citizens' voice" on different aspects of urban liveability and services provided by government agencies (ULBs and parastatals) at the local level. Initiatives such as *Swachh Survekshan*, *Swachh Manch*, *Shehari Sahbhagita Manch*, Smart City Advisory Forum, Ease of Living Index etc. rely significantly on citizens' feedback and perceptions about urban service delivery and provide alternative channels to citizens to voice their opinions.

Role of Urban CSS in Citizen Participation including desired outcome areas

International agencies like the World Bank and the United Nations view citizen participation as a critical element of 'good governance' (Guarneros-Meza, 2010). UN-Habitat proposes transparency and accountability and civic engagement and citizenship as core principles of good governance (UN-HABITAT, n.a.). A review of the literature highlights several impacts of citizen engagement on outcome areas such as service delivery, public financial management and governance. Waddington *et al.* (2019) found that interventions that stimulate direct engagement between citizens and service providers have a positive impact in terms of realising improvements in access to services and quality of service provision (Waddington, 2019). Increased transparency, enhanced citizen trust in the government and improvement in the quality of governmental responses are positive outcomes identified in several research studies.

OECD reported improved utilisation of public resources and quality of policy outcomes as a positive outcome of citizen engagement (OECD, 2009). Inclusive budget process and greater citizen engagement can result in more pro-poor fiscal policies. Moynihan (2003) discussed how citizen input could help public officials to improve allocative efficiency through better resource allocation choices which in turns leads to improvement

of the process of public service provision. It would be expected that urban CSSs further drive the citizen engagement agenda like JNNURM by incentivising the states and ULBs. While the broader objective of citizen participation is improved governance, there are other desired outcomes such as greater proximity between the government and citizens, improvement in service delivery, greater citizen satisfaction, enhanced resilience and advancing a right to the city – ensuring equity in urban societies, among others. The table below lists a set of seven desired outcome areas emanating from citizen engagement and the urban CSSs that are targeting these outcomes.

Table 2-23: Sectoral outcome coverage and gaps - Citizen Engagement

Sectoral Desired Outcomes*	Urban CSS Mapping	Principles
Enhanced decision-making power to citizens	NULM, SCM, PMAY	Access, Adequacy
Improvement in access, effectiveness and efficiency of public service delivery and social security schemes	SCM, SBM, AMRUT, NULM, PMAY	Access, Adequacy, Quality, Sustainability, Equity
Improvement in citizen satisfaction of public infrastructure and service delivery	SCM, SBM, AMRUT, NULM, PMAY	Quality
Improvement in public control and citizens' access to public data	SCM, SBM, NULM, AMRUT, PMAY	Access, Adequacy
Enhance accountability to citizens	SCM	Quality
Advancing a right to the city – ensuring equity in urban societies	-	Access, Equity
Enhanced resilience of citizens and communities	-	Sustainability

*Note: (i) UNDP 2016; Pierre and Peters 2000; (ii) World Bank 2014 and UNDP 2016; (iii) & (iv) Waddington 2019; (v) Habitat III Policy Paper 4; (vi) UNDP 2016; (vii) & (vii) Habitat III Policy Paper 4; *Indicative*

Out of the seven outcome areas presented in the table above, outcomes pertaining to "improvement in efficiency and effectiveness of service delivery," "improvement in citizens' satisfaction" and "improvement in citizens' access to public data" are largely aligned with all the five Urban CSS Missions. While the involvement of ULBs planning, implementation and monitoring of implementation varies across Missions, AMRUT has a greater alignment with 'enhancing accountability' due to its push to the urban reform agenda. Some of the other critical outcome areas – role of citizens in decision making (and hence more efficient and effectiveness of service delivery), ensuring greater equity to vulnerable groups like the urban poor, women, PWDs etc and enhanced resilience of citizens and communities by way of greater engagement in service delivery planning are largely not addressed by the Missions. The following sub-section discusses the status of citizen participation along the six liveability principles.

Assessment on Liveability Parameters

Access: Opportunities for citizens in local governance can be through formal and informal structures. Formal structures include District Planning Committees, Ward Committees, *Area Sabhas* and other Standing Committees formed by the ULBs that have legal or administrative backing. As per the 74th CAA, all ULBs with a population more than three lakhs are required for form Ward Committees. The Community Participation Law introduced by the Ministry of Urban Development in 2005 expected ULBs to form *Area Sabhas* comprising register voters at the level of polling booths. Informal mechanisms include citizen surveys, need based project or programme level consultations etc.

Figure 2.39 Status of formal mechanisms for citizen participation in India

Access to formal mechanisms remain limited in the country. The JNNURM attempted to institutionalise citizen participation at city, ward and area levels by embedding several reforms measures (Government of India, n.d). The reforms include:

Enactment of Community Participation Law to establish ULB accountability	Enable constitution of Area / Ward Sabhas within Municipal Wards	Enact a Public Disclosure Law mandating ULBs to disclose information to its citizens periodically	Developing City Development Plans are prepared in consultations with stakeholders at the grassroots level	Set up the Community Participation Fund (CPF) is established to catalyse the process of community participation

As per the HPEC Report, 12 States had enacted/formulated Community Participation Laws (CPL), Acts and Rules and 19 states have enacted/formulated Public Disclosure Laws, Acts and Rules (HPEC, 2011). Another 11 States had enacted the CPL by June 2012. (CAG, 2013). At present, all the state Municipal Acts have provision for Ward Committees, but their constitution and functional status is limited. The table below presents a snapshot of the status of Ward Committees and *Area Sabhas* in the country.

Table 2-24: Status of Ward Committees and Area *Sabhas*

Enabling Legislations for Ward Committees	Constitution of Ward Committees	Enabling Legislations for Area / Ward Sabhas	Formation of Area / Ward Sabhas
• Provision for Ward Committees exists in Municipal Acts of most states • Kerala has made provisions for setting up Ward Committees in all ULBs > 1 lakh population	• However, Ward Committees are not constituted in all cities • There are geographical variations in formation of WCs – some cities form WCs at a zonal level • Metropolitan cities such as Delhi, Chennai and Mumbai allow	• Provisions for Area / Ward Sabhas do not exist in 15 states • Provisions for community participation do not conform to the Model Nagar Raj Bill in states that have enacted	• Area / Ward Sabhas are functional only in few cities such as Dharamshala, Kochi, Aizawl and Gangtok • Norms for formation of Area / Ward Sabhas vary across states. E.g., 15 Area Sabhas per ward in Chennai and between

Enabling Legislations for Ward Committees	Constitution of Ward Committees	Enabling Legislations for Area / Ward Sabhas	Formation of Area / Ward Sabhas
	formation of one WC for 10 or more wards • Representation of civil society members varies across states • Non-voters are not part of the WCs	Community Participation Law	2 to 4 Area Sabhas per ward in Guwahati • In Agartala, though Ward Committee meetings take place monthly but citizen participation is not allowed in these meetings

Source: Compiled from various sources including: TERI 2009, Kuruvilla et al., 2013, Praja 2019, 2020, Guwahati Municipal Corporation Website accessed on 20.07.2020.

Key findings from Urban Governance Study by Praja

Praja undertook a study in 2020 to understand the implementation of 74th CAA and challenges faced by city government. The study covers 27 states, NCT and 21 cities in the country.

- Only eight out of the 21 participating ULBs have constituted Ward Committees. Further, only six of the eight constituted Ward Committees were found to be functional
- There is no provision for *Area Sabhas* in Municipal Corporation Acts of seven states
- District Planning Committees (DPCs) are constituted in 17 ULBs but are active in only nine ULBs

Apart from Ward, Committees, Area Sabhas and District Planning Committee, there are a few additional formal mechanisms available to citizens now that allow their participation in local governance. These include the formation of Town Vending Committees as per the National Street Vending Act of 2014, Shelter Management Committee under the NULM and City Level Advisory Form (CLAF) of the Smart Cities Mission.

All the Urban CSS focussed on creating avenues for citizen participation albeit in different forms. For instance, the SCM Guidelines for preparation of Smart City Proposal (SCP) clearly signalled the intent for a strong citizen engagement. The SCP Guidelines stated the following: "*The Proposal development will lead to the creation of a smart citizenry. The proposal will be citizen-driven from the beginning, achieved through citizen consultations, including active participation of groups of people, such as Residents Welfare Associations, Tax-Payers Associations, Senior Citizens and Slum Dwellers Associations. During consultations, issues, needs and priorities of citizens and groups of people will be identified and citizen-driven solutions generated*" (Ministry of Urban Development, 2015).

About 15.2 million citizens participated in the preparation of plans at various stages, accounting for about 12 per cent of the total population of the proposed participating cities (M Ramachandran, 2019). The Mission also has approved projects that use ICT solutions for citizen engagement as part of the cities' plans in the Smart City Proposal. These include initiatives for Public/ Passenger Information System, Grievances Redressal, Electronic Service Delivery, e-Governance, Platform for Citizen engagement including City Dashboard, Traffic mobile app, Parking mobile app, Mobile app-based SWM and cleanliness monitoring. The SBM through its annual Swachh Survekshan exercise covers a larger and wider number of stakeholders at the neighbourhood level. SBM gives considerable weightage to citizens' perception on various aspects of sanitation. The fifth edition (2020) of the *Swachh Survekshan* witnessed participation of 19 million people from 4242 ULBs in the country.

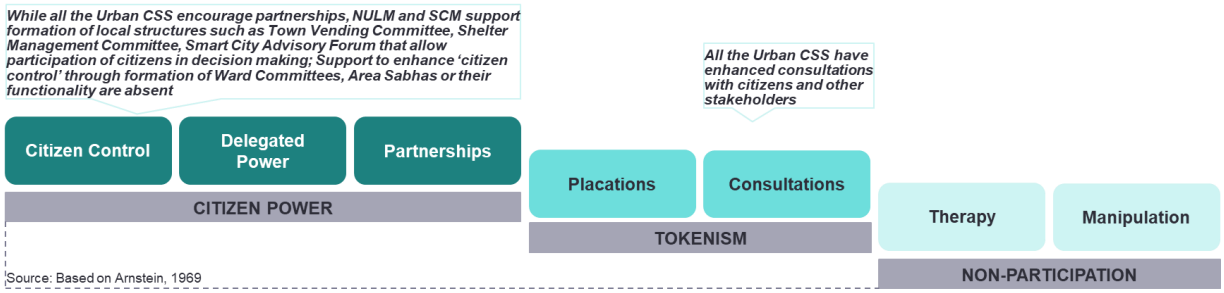
Overall, there is improvement in the access of citizens to Government Programmes and Schemes and government has leveraged ICT tools and platforms at large scale to connect with the citizens. There is a clean signal of intent to engage with citizens in the very early stages of the project (e.g., identification of projects in SCPs) to institutionalisation of citizens' role in project monitoring (e.g., CLAF and *Swachh Survekshan*). While the trust on ICT is encouraging as it also allows to reach and engage the younger

generation those without access or interest in digital platforms could be left out. Hence maintaining a balance in the outreach platforms could improve the coverage.

Adequacy: Citizen engagement often takes several forms – through formation of community development committees, collecting feedback through citizen satisfaction surveys, undertaking public consultations, participatory planning, budget consultations and social audits (UNDP Global Centre for Public Service Delivery, 2016). The policy landscape in India provided platforms for citizen participation on a wide range of areas. These include preparation of developmental plans, master plans, participatory budgeting and prioritisation of civic infrastructure and services, among others. The nature, intensity and scale of involvement of citizens in these areas have been limited in the past due to several reasons such as lack of legal frameworks, programme or project design, level of awareness among citizens and level of translation of feedback provided by citizens into actual intervention design.

Sherry Arnstein published a seminal paper in 1969 that described how citizens are involved in the planning and regeneration programmes (Arnstein, 1969). A conceptual ladder with seven rungs corresponding to the extent of citizens' power in determining the end-product, this heuristic device is widely used to identify people's participation in government-led initiatives across the globe. Urban CSS have largely encouraged consultations with citizens and other stakeholders – their role in strengthening citizen power in terms of delegation of power and citizen control has been limited. The Figure below presents the seven rungs of the conceptual ladder:

Figure 2.40: Conceptual ladder for citizen engagement



Adequacy of engagement with citizens varies across sectors and programmes. While SCM sought citizen participation early on during the project conceptualisation stage and ensured continued citizen participation through the SCAF, AMRUT guidelines required the cities to consult citizens during the preparation of the Service Level Improvement Plans, appraisal on best practices, user charges etc., project prioritisation and citizen centric innovation. The Urban CSS Missions have also attempted crowdsourcing of solutions from the citizens – PMAY through the Global Housing Technology Challenge, SCM through Smart Cities Proposals, AMRUT through adoption of 'citizen-generated innovation' – solutions for cleaning of sewerage systems and septic tanks etc.

Arnstien identified partnerships, delegation of power and citizen control as the most ideal form of engaging citizens and communities. There are efforts to empower the Ward Committees across cities that would allow a greater say of citizens in urban planning and service delivery and activating established Ward Committees would contribute to that. *Jan Andolan* has sustained the engagement of citizens from all groups and its social reform impact has result in greater demand among citizens for participation. However, these are no substitute to formal mechanisms recommended under the 74th CAA and require push from all stakeholders.

Quality: Absence of formal platforms for meaningful and responsible citizen participation across ULBs limit the potential of citizen participation. Barring few ULBs, like Pune, Nagpur, Dharamshala etc. representation of citizens in ULB committees is absent. There are some good examples of participatory governance such as the urban planning in Chhattisgarh, street vending plan in Mumbai, plans for slums in Ahmedabad and Kerala's urban ward planning (Sanskriti, 2019) but these are limited in number. Another participatory method – Participatory Budgeting which has had success in reducing structural inequities globally is implemented in few Indian cities – e.g., Pune. Citizen participation in urban sector is recent times is witnessing an increasing number of 'public outreach' based events largely related to Mission goals and awareness generation. These include *Shahari Samridhi Utsav* and *Shahari Sahbhagita Manch*[iv] of NULM, *Angikaar* campaign[v] of PMAY and demand surveys conducted under SBM, PMAY etc. While these events serve the Missions' purposes, they do not promote or serve as recommended platforms for citizen participation.

Sustainability: To institutionalise and sustain citizen engagement, the SCM guidelines provide for constitution of an Advisory forum at the city level. The City Level Advisory Forum (CLAF) include the District Collector, MP, MLA, Mayor, CEO of SPV, local youths, technical experts and members representing Residents Welfare Association (RWA), Tax Payers Association, Slum-Level Federations and Non-Governmental Organisations (Ministry of Urban Development, 2015). CALFs have been constituted in all of the 100 smart cities (Ministry of Finance, 2020). SBM(U) is the most extensive behaviour change campaign that aims to make India a clean nation. While there have been other sanitation programmes in past, the 'citizen-centric approach' of SBM-Urban is its key differentiator.

Since its launch, the Mission has developed and adopted various engagement models for proactive citizen outreach and participation which resulted in transforming the Mission into '*Jan Andolan'* with an active citizenry. These include:

- ***Swachh Survekshan***: Swachh Survekshan aims to rank the cities annually based on their cleanliness status, fostering a spirit of healthy competition among cities. The survey also encourages large -scale citizen participation and uses Citizen Feedback as one of its key data sources. Between 2016-2020, a total of 4.8 crore citizens have participated in the *Swacch Survekshan* surveys
- ***Swachh Manch*****:** The *Swachh Manch* is a web citizen engagement platform that allows a) stakeholders to create/invite/participate in volunteering opportunities; b) uploads photographs as evidence of citizens and organisations participating in the initiatives and c) record the number of hours volunteered as an acknowledgement of citizens'/organisations' efforts and contributions to the cause of 'swachhata' (Press Information Bureau, 2019). A total of 2.94 lakh events have been posted on the portal, 1.86 lakh citizens have signed up as volunteers who have contributed a total of 46.55 lakh volunteering hours to the Mission (MoHUA, Swachh Manch, 2020). Furthermore, a total of 1.52 lakh *Swachhata Hi Seva* 2019 events have been posted with total participation from 4.15 crore participants (*ibid.*).
- **Awareness campaigns:** The Mission also used Audio-visual messages, thematic drives, collaborations with comic book publishers, newsletters, etc. to create awareness regarding 'swachhata' (cleanliness)

These initiatives have contributed to enhanced flow of information to the citizens and increased their awareness levels about government programmes and services. There is greater recognition to "citizens' voice" in identification of service level gaps at the city level.

Equity: While the formal structures recommended under the 74th CAA and the CPL provide platforms for citizen participation they limit such participation to only voting citizens thereby excluding the migrant population. Availability of new platforms such as Town Vending Committee, Shelter Management Committee and Smart City Advisory Forums have not only enhanced access to local governments but also provide an opportunity for inclusion of the urban poor in local governance and service delivery. The TVCs and SMC primarily target urban poor including the street vendors and homeless.

Today, the representation of women in urban local bodies in the country is ~37 per cent which is higher than the mandated 33 per cent (Murugan, 2017).Several states have increased the quota for representation of women in their ULBs from 33% to 50%; these include Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tripura and Telangana (Economic Times, 2018). Increasing participation of women in ULB affairs has led to greater attention to gender issues that impact women (Jha., 2020).

IT & e-Governance

With many focused initiatives in the digital area, transformational changes have been observed in the last few years. With the implementation of the CSS schemes, a large amount of data is being created and collated. Data ranges from characteristics of citizens to project features and progress of project implementation and the processes involved. The following table presents broad coverage of the urban CSS across the sectoral requirements under this parameter.

Table 2-25: Sectoral outcome coverage and gaps – IT & e-Governance

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Availability and universal coverage of e-services in cities	SCM, AMRUT	Access, Equity
Adequate e-services, availability of applications through different modes – mobile applications, kiosks, electronic-offices/service providers	All schemes	Adequacy
Improved responsiveness and quality of services offered through the digital portals/interfaces	All schemes	Quality
Improved efficiency and transparency of public services	All schemes	Sustainability
Drive citizen and private innovation in public service delivery	SCM	Access, Sustainability

Note: Sectoral Desired Outcomes, aspects of scheme coverage and principles of liveability assessment based on scheme guidelines and evaluation team's analysis.

The roots of e-Governance in India can be traced back to the launch of National Information Centre (NIC-NET) project in 1987. This project has evolved into a more robust and transformational program – the Digital India initiative, with a vision to transform India into a digitally empowered society and knowledge economy (MeITY, 2015). The JNNURM program has been a notable contributor to the urban digital transformation, through its mandatory reform for the participating 65 ULBs. The various modules under 'e-Governance' reform of JnNURM Scheme were:

a. e-Procurement
b. Municipal accounting system
c. Property tax and user charge collection
d. Registration of birth and death
e. Public grievance redressal
f. Offsite real time monitoring system
g. Citizen service centres
h. Building permit allocation
i. Double entry accrual accounting system
j. Council management system
k. Health programme management and
l. Personnel information system

Source: (DeITY, 2015)

Between 2006 and 2012, several centrally sponsored schemes and initiatives were undertaken by GoI to further the e-Governance and Digital agenda propounded by the UN as part of MDGs. Following is a brief snippet of four important initiatives undertaken in the Urban sector:

Table 2-26: Overview of various Urban eGovernance initiatives (2006-12)

Name	Authority, Year	Objectives
Information and Services Need Assessment (ISNA)	JnNURM, 2006	Developing a National Architecture for E-governance in Municipalities
National Urban Information System (NUIS)	TCPO, 2006	Establish a comprehensive information system (GIS and Urban Indicators) at ULB level for planning, management and de-centralized governance in the context of implementation of the 74th CAA.
Basic Statistics for Local Level Development (BSLLD) - Urban	Central Statistics Office (CSO), 2011	Provide information for local planning, effective implementation and monitoring of various social and economic development programmes at ULB level
National Urban Database System (NUDS)	NIUA, 2012	Proposal to establish a centralized urban database system where standardized data would be made available in a user-friendly format

Source: (MoUD, 2012)

While the NUIS (2006) had evolved from the UN program for Global Urban Observatories and has majorly focussed on high resolution spatial database in selected cities, there had been limited access and coverage for the database so created. The Bhuvan application, developed by ISRO/NRSC, has hosted the spatial data prepared by the Survey of India and predominantly serves Government departments/agencies (ISRO-NRSC, 2019). BSLLD was initially developed for Rural areas but later in 2013-14 was taken up for Urban areas also on a pilot basis covering 1198 wards from 82 towns in 26 States/UT (MoSPI, 2020).

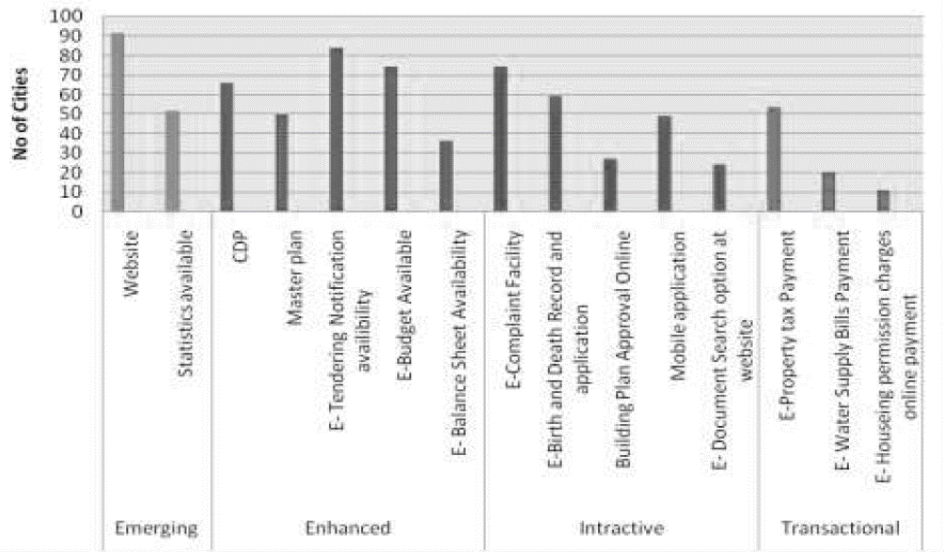
The 2012 Performance Audit Report of JnNURM for the period 2005-11 (CAG, 2012), has pointed that out of only 27 out of 62 Cities (less than 45 per cent) committing to implement e-governance by 2010-11, have achieved this reform. It has also been observed that larger cities (2 Mn+ population) were placed better with capacities to implement eGovernance reforms as against the smaller cities (<0.5 Mn population) (S Praharaj et.al., 2018). The NIUA in its PEARL study (NIUA, 2015) has observed that the no.of users accessing eGovernance services in Rajkot Municipal Corporation (RMC) have doubled (from 2 to 4 lakh) between 2006-11, highlighting the need and acceptance of digital civic services in ULBs.

Underpinning the twin challenges of Urban India i.e., growing inability of ULBs to provide citizen services smoothly and disproportionate focus of government on Rural development – in 2003 the eGov Foundation (not-for-profit Trust) has evolved to help city administrators use digital solutions to enhance productivity and improve services (eGov, 2018). As one of the major private sector initiatives, eGov has been contributing to Urban eGovernance in India from its DIGIT solution for Bengaluru (2004) to currently onboarding ~1000+ ULBs, redressing ~3 Mn complaints and issuing 4.7 Mn certificates (eGov, 2020).

All five Urban CSS, under the evaluation study, have intended and undertaken eGovernance based management of schemes – websites, MIS, PFMS, eOffice etc., They have also provided for citizen centric platforms for accessing scheme level services – Online registration of beneficiaries, Social Media/Online citizen engagement, Aadhaar enabled DBT etc., While a significant portion of these Missions focused on development and/or rejuvenation of urban infrastructure, some were also designed to promote certain e-Governance solutions to cities namely the eGovernance reforms in AMRUT and implementation of ICT based solutions in Smart Cities (ICCCs, WiFi, Digital Classrooms etc.,).

During the initial stages of the Smart Cities Mission – cities have activated their online presence majorly for general information and tender updates (Tripathy et al., 2016), however leveraging their online presence for scaling up citizen transparency and/or civic services has still been under progress (S Praharaj et.al., 2018).

Figure 2.41: e-Governance performance of Smart Cities in India (as on Feb-2016)

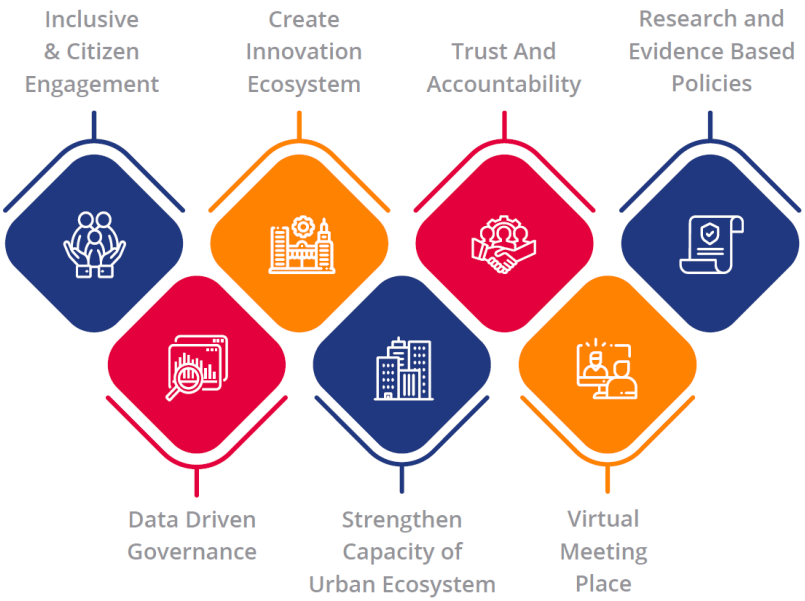


Source: (Tripathy et al., 2016)

Government of India, through the Smart Cities Mission, has envisaged to catalyse transformative collaboration in the urban ecosystem through establishing shared digital and physical infrastructure platforms i.e., National Urban Innovation Hub (NIUH) and National Urban Innovation Stack (NUIS). While NIUH is being established as a foundational institution for managing the nation-wide innovation activities to be carried out through a 'hub-and-spoke' model of intervention, a polycentric network of 100 'lighthouse' cities of SCM. The

NUIS is intended as the digital backbone, to strengthen the capacity of the urban ecosystem to solve complex programs at speed and scale by unlocking the power of urban data, build capacity among all stakeholders and enabling responsive and data driven governance (MoHUA-SCM-NIUA, 2018).

Figure 2.42: NIUH Impact priorities and key components



Physical Infrastructure
- Community Labs
- National Campus
- Regional Hubs
- City Leadership Academy
- Centre for Innovation Ecosystems
- Ministry support services

Digital Infrastructure
- IUDX | NULP
- Urban Apps Marketplace
- Expertise certification & search
- Citizen service platforms
- Local ecosystem curation tools

Source: (MoHUA-SCM-NIUA, 2018)

The NUIS has been designed to provide stakeholders with the digital tools and platforms, standards, specifications and certifications, and enable greater coordination and integration amongst them. It is supporting several key programs including the India Urban Data Exchange (**IUDX**), India Urban Connect, SmartProcure, Research and Innovation for Urban India, National Urban Learning Platform (**NULP**), SmartCode and Smart Governance to name a few.

The National Urban Databank & Indicators (NUDB&I) initiative (TCPO, 2006) had envisaged to capture various data points and derive indicators for National Urban Observatory (NUO) for monitoring the health of urban settlements in India. That exercise has now evolved, to align with SDGs, into much broader and deeper levels through the introduction of National Indicator Framework (MoSPI, 2018), Ease of Living Index (MoHUA, 2018), Municipal Performance Index (MoHUA, 2019) and India Urban Observatory (MoHUA, 2019). These data repositories and annual indices, compliant with global open data standards, have the potential to transition Urban India from its traditional silo Static eGovernance model towards more integrated and data viz. performance driven (near real-time) Dynamic eGovernance model.

Financial Sustainability

This section presents the overall investment scenario in India's urban sector from three levels i.e., National Government, State Government and External Funding Agencies. It also broadly lays out the financial scenario of ULBs and State-level Financial Intermediaries.

- **Investments in Urban Sector at National Level:** Government of India has significantly enhanced its Urban Sector spending during the evaluation period (2014-20), directly driven by the roll-out of large centrally sponsored schemes. With about Rs. 3.15 lakh crore central expenditure on the Urban Sector through budgetary, IEBR, and the 14th Finance Commission Grants, the overall accessibility, adequacy, equity and sustainability of Urban Sector spending at National level has been significant.
- **Investments in Urban Sector at State Level:** For the purpose of evaluation, four States have been selected (each from a different zone) – Andhra Pradesh, Gujarat, Jharkhand and Uttar Pradesh. The overall performance of these four States with respect to both CSS funding and State level financing has been looked at. At the aggregate level among the four States, the total Urban department expenditure during the period (2015-20) has been ~Rs. 48,000 crores. An important point to note is that the share of Urban Department budgets in the Four States towards CSS (Central and State Assistance combined) ranges between 60-80 per cent.
- **Investments in Urban Sector by External Funding Agencies:** About seven different external funding agencies (Multi-lateral /Bi-Lateral) have provided funding to Urban Sector projects across the country during the period (2014-20). Nearly Rs. 46,000 crore worth of funds have been disbursed for

implementation of projects under various sub-sectors, namely Metro rail/ MRTS, WASH, urban development, urban transport and smart cities. The funding was received by 18 States and the north eastern region. Due to the nature of this type of funding, only selective and well performing cities/ULBs have been able to access this funding route. Despite the significant push by these external funding agencies for innovative and sustainable financing of projects, all major urban infrastructure projects (other than Metro/MRTS) need further improvement in adopting sustainable project financing options both for both capacity augmentation and O&M perspectives.

The summary of evaluation based on secondary data analysis for the Investments in Urban Sector from the above three sources across the six principles of inquiry is presented below:

Table 2-27: Sectoral outcome coverage and gaps - Financial sustainability

Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Access & adequacy of various funding options at Central, State & City level	All schemes	Access, Adequacy
Enhanced leverage of Municipal Finances - enabled by borrowing framework	-	Adequacy
Robust Own Source Revenue (OSR) in ULBs	15 FC	Adequacy
Rational predictable assigned sources (SFCs, CFCs)	15 FC	Sustainability
Availability of funding sources and options to all ULBs	PMAY(U), SBM(U), NULM	Equity
Gender based budgeting, funding arrangements	-	Equity
Adoption of outcome-based funding models	-	Sustainability

Note: Sectoral Desired Outcomes, aspects of scheme coverage and principles of liveability assessment based on scheme guidelines and evaluation team's analysis.

Based on analysis from secondary data, the overall funding by Central Government in Urban Sector has mixed performance across all measurable principles. While the Government has made significant strides in overall funding accessibility and adequacy, the scenario of funds availability, accessibility or even O&M sustainability has not seen much improvement at the State or ULB/ Implementation Agency level.

Further, States also showcase mixed performance across the measurable principles in the overall funding by States in Urban Sector. A large portion of State Urban Department Budgets have been observed to be towards CSS (CA+SA). States have also contributed to own initiatives in Urban Sector other than CSS.

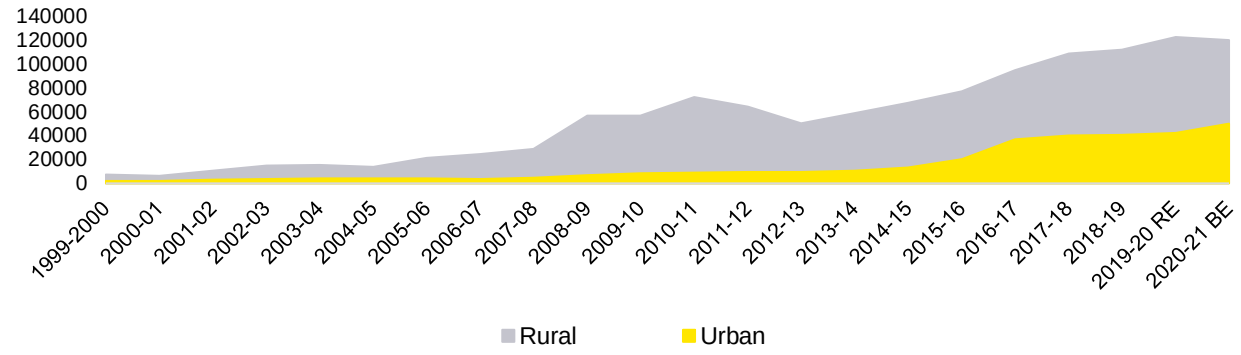
Based on the secondary data, it is observed that the overall funding from external agencies has performed well across all measurable principles. However, the extent of funding through external agencies to the ULBs will be explored through stakeholder discussions.

2.2.2.5 Investments in urban sector at National level

Based on the analysis of secondary data, the overall funding by Central Government in Urban Sector has mixed performance across all the measurable principles. While the Government has made significant strides in overall funding accessibility and adequacy, the scenario of funds availability, accessibility or sustainability has not seen much improvement at the ULB/ implementation agency level.

The intriguing case of fiscal stimulus paradox between the urban and rural sectors needs a careful examination. A glance into the expenditure scenario, over the two decades between 1999-2019, for the rural and urban sectors shows that the average overall central expenditure on urban sector is about 23 per cent that of rural sector. The period under consideration for the performance evaluation (2014-20) shows a significant improvement though, with about 32 per cent spending on urban sector (in proportion to that of rural).

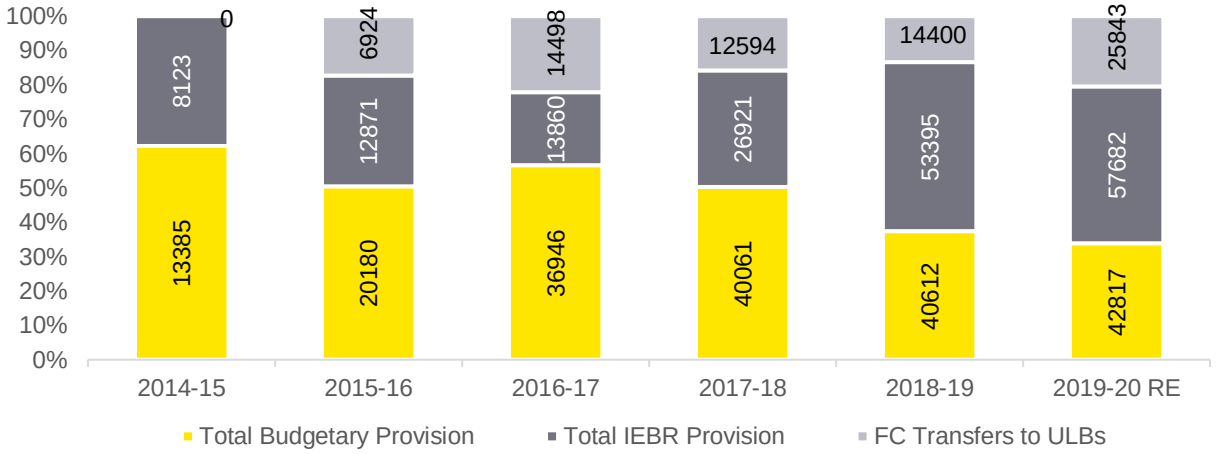
Figure 2.43: Trend in total expenditure across urban and rural Ministry/ Department (Rs. Cr)



Source: (Ministry of Finance, 1996-2020)

The total urban Sector spending by the central government during the period 2014-20, under budgetary, internal, extra budgetary and constitutional provisions, stood at over **Rs. 3.15 lakh crore**. It is important to note that both budgetary and IEBR provisions account for 85 per cent of the total provision and the 14th Finance Commission transfers to ULBs (2015-20) for about 15 per cent.

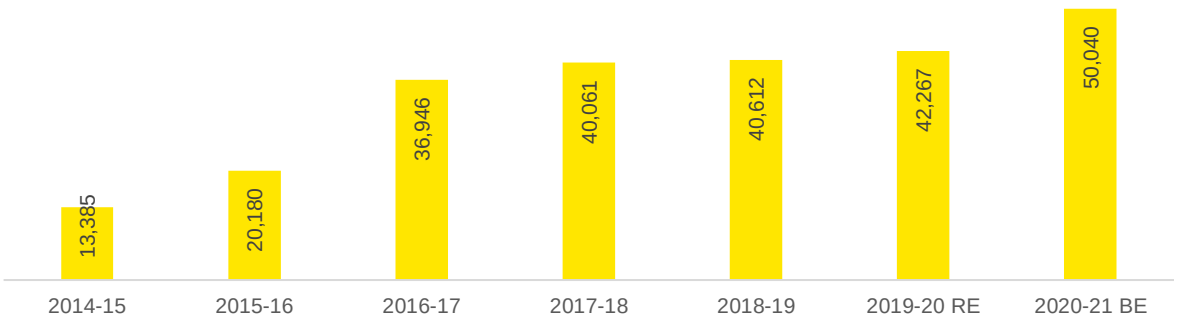
Figure 2.44: Total Central expenditure portfolio under MoHUA (Rs. Cr)



Source: (Ministry of Finance, 2014-20)

Budgetary Resources: To a large extent, the shift in Government spending on the Urban Sector has been observed due to the impetus laid in the beginning of year 2014, on improving urban living conditions through various Centrally Sponsored and Sector Schemes. With an average annual increment of ~ 36 per cent, the total budgetary expenditure in Urban Sector between 2014-20, was over **Rs. 1.51 lakh crore**.

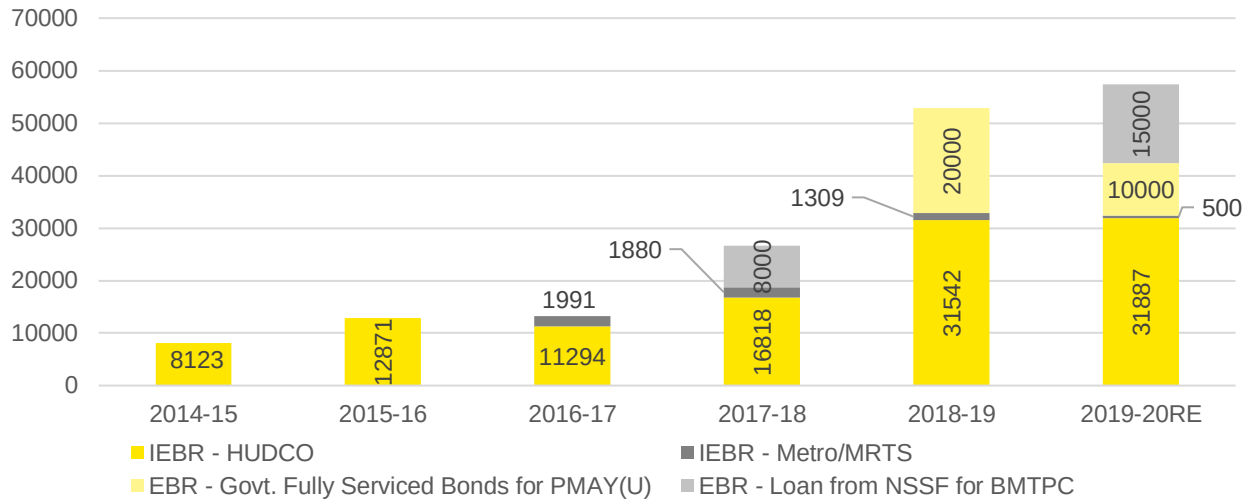
Figure 2.45: Trend of budgetary provision by MoHUA (Rs. Cr)



Source: (Ministry of Finance, 2014-20)

Internal & Extra Budgetary Resources (IEBR): Two sub-sectors, housing and urban MRTS, have leveraged more than **Rs. 1.1 lakh crore** during the period 2014-20. While HUDCO's contribution for housing and urban infrastructure projects accounted for over 70% of the IEBR provisions, the National Small Savings Fund (NSSF) loan for Building Materials & Technology Promotion Council (BMPTC) along with the Government fully serviced bonds for PMAY (U) mobilised during 2018 and 2019 respectively, amounted to a total of Rs. 28,000 crore (excl. RE 2019-20).

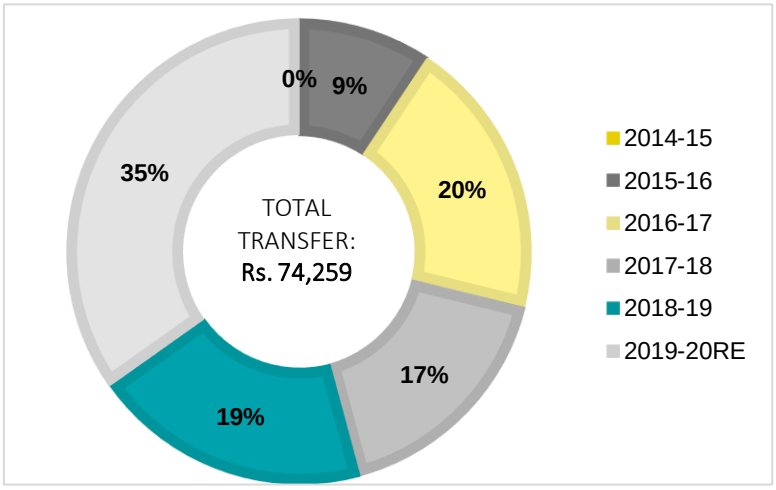
Figure 2.46: IEBR provision by MoHUA (Rs. Cr)



Source: GoI Budget Documents, 2014-20

Finance Commission Grants to ULBs: The 14th Finance Commission, set-up for the period 2015-20, has provided recommendations on devolution grants to the ULBs, While the overall grant structure was of two parts – basic and performance, the overall recommended devolution was to the tune of Rs. 87,144 crore. Between the period 2014-20, the total 14th FC grants disbursed by the Ministry have been about Rs. 48,416 crore (only 55 per cent of the overall devolution recommended).

Figure 2.47: 14th FC transfers to ULBs



Source: GoI Budget Documents, 2014-20

**Note: 2019-20 release data is unavailable*

Urban Centrally Sponsored Schemes

The overall financial outlay envisaged under the five urban CSS is ~Rs. 9.5 lakh crore, of which nearly one third is the Central Government's share and the remaining is expected to be through matching State share, ULB, private sector and beneficiary contributions. Following table presents a summary of the funding outlay covering the Central Assistance (CA) under these schemes.

Table 2-28: Funding status across the five CSS through Central Assistance of MoHUA, GoI

Scheme/ amount in Rs. Crore	Approved project cost**	CA Sanctioned	CA Released	CA Utilized Funds	% sanctioned funds released	% of released fund utilized
SCM	2,23,371	50,000	19,085	12,235	38%	64%
PMAY(U)	6,20,000	1,65,061	69,178	46,882	42%	68%
AMRUT	85,802	35,990	18,826	14,668	52%	78%
NULM	8,441*	6,405	3,041	NA	47%	NA
SBM(U)	62,009	14,623	10,453	8,119	71%	78%
Total	**9,99,623**	**2,72,079**	**1,20,583**	**81,904**	**44%**	**68%**

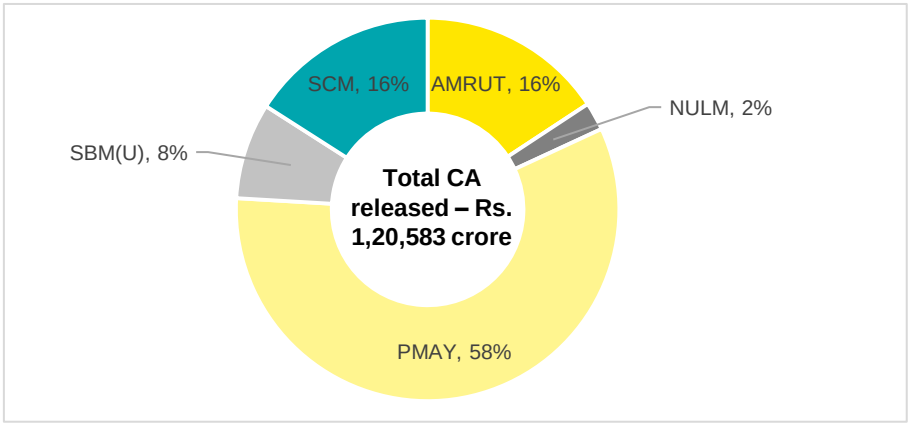
Source: Schemes' respective MIS databases and other data received from MoHUA; upto March 2020

**Data is from 2014-2015 onwards. Total budget outlay sanctioned by the Expenditure Finance Committee at the start of the Mission, includes Rs. 6,404.90 crore as the Centre's share and Rs. 2035.78 crore as the States' share.*

*** Stakeholders include Central Government, State Government, ULB, private investment, beneficiary contribution*

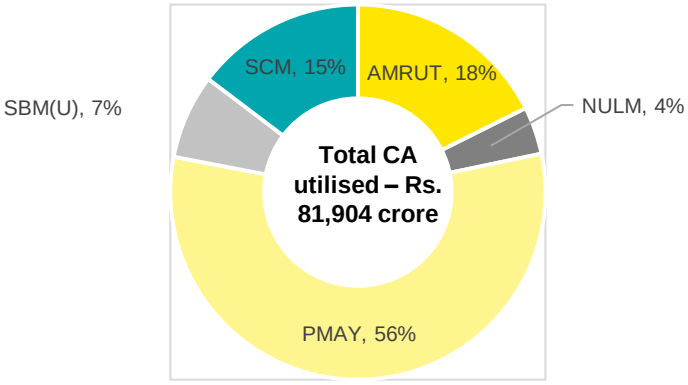
Following charts present the distribution of funding across the five schemes.

Figure 2.48: Scheme-wise share of total CA released amount across all the CSS



Source: Schemes' respective MIS databases and other data received from MoHUA

Figure 2.49: Scheme-wise share of total CA utilised amount across all the CSS



Source: Schemes' respective MIS databases and other data received from MoHUA

2.2.2.6 Investments in urban sector at State level

For the purpose of **State wise budget expenditure**[8] assessment, four states i.e. Andhra Pradesh, Gujarat, Jharkhand and Uttar Pradesh have been selected for review. For this assessment, CSS contribution to the

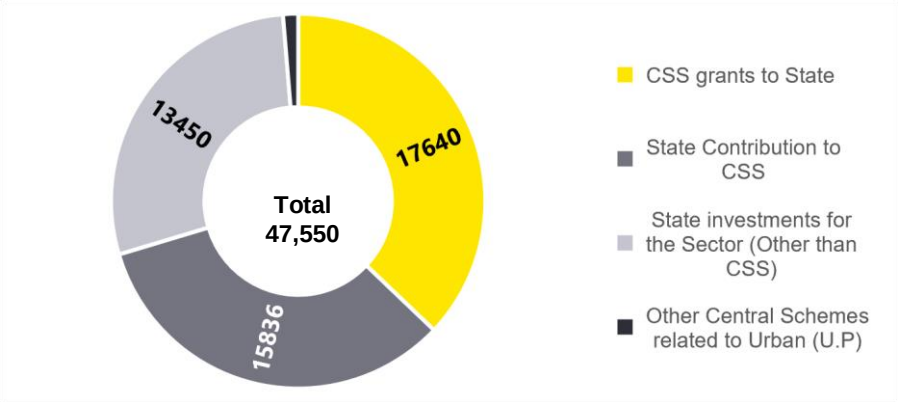
[8] It must be noted that the budget expenditure numbers provided in this section are taken from the Budget books of the four States. Due to the different budgeting practices, delay in utilisation & carry over of unutilised funds, the year wise fund release by the Centre for

States, States' contribution to the CSS schemes and States' own initiatives/ schemes for development of Urban Sector have been considered. The details are as follows:

i. **CSS grants to the States** – corresponds to GoI share of grants for 5 schemes under the study i.e. AMRUT, SCM, PMAY(U), SBM(U) & NULM.
ii. **State contribution to CSS** – corresponds to the State Government and ULBs contribution to the Scheme expenditure during the year.
iii. **State investments for the Sector** - corresponds to the expenditure incurred by the State for development of projects and interventions which are similar in nature to the Urban CSS schemes.
iv. **Other Central Schemes related to Urban (Uttar Pradesh only)** - is the expenditure incurred by the State of U.P on Urban Schemes sponsored by GoI (projects under Ganga River Basin) other than the five urban CSS. This amounted to a total of Rs. 624 crore during the period 2015-20.

The overall Urban Sector spending among the four States assessed for the period between 2015 to 2020, amounted to over **Rs 47,550 Crores**. While 38% of the funding has been the share of CSS Central Grants to the State, ~34% had been the States' Contribution to CSS and 29% has been the States' own initiatives in the Urban department expenditures. At an aggregate level, in these four States, the contribution ratio of Centre to State for the five CSS has been 53:47.

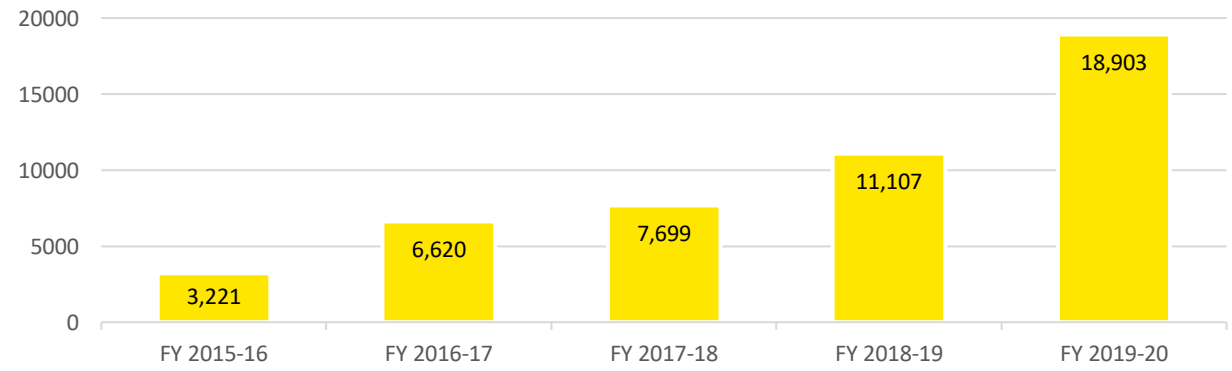
Figure 2.50: Portfolio of overall urban department expenditures in four States (Rs. Cr)



Source: State-wise Budget Documents of Andhra Pradesh, Gujarat, Jharkhand and Uttar Pradesh, 2014-20

While the overall annual urban sector expenditure, among the four States combined, has grown by over 140 per cent every two years between 2015 and 2020. The highest total urban department expenditure for the four States combined, has been observed in the FY 2019-20 at nearly 40 per cent of the overall expenditure. This was also the year, in which the States' contribution to CSS was higher than that of the Central contribution.

Figure 2.51: Overall annual Urban department expenditure among four States (Rs. Cr)

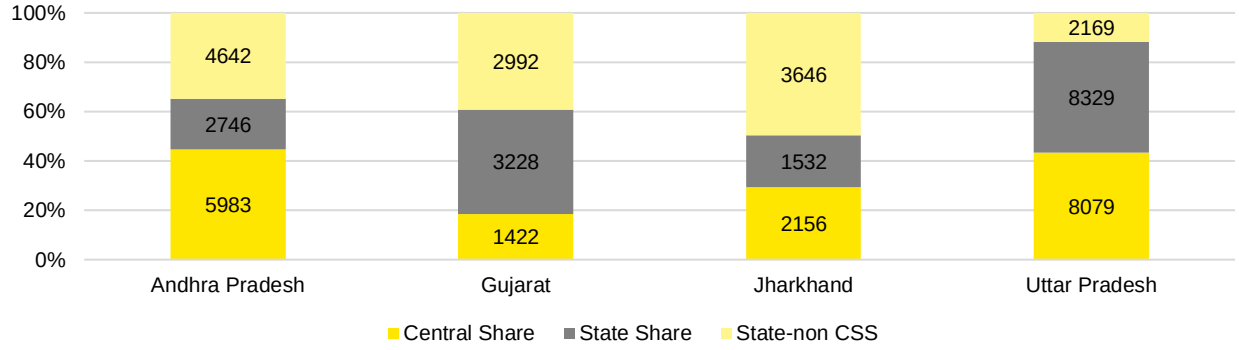


Source: (State Govt. Budgets, 2015-20)

different schemes may not actually match with the budget expenditure provided. There was also no provision in the budget books about scheme wise Central Funds unutilised by States and hence has not been part of this assessment.

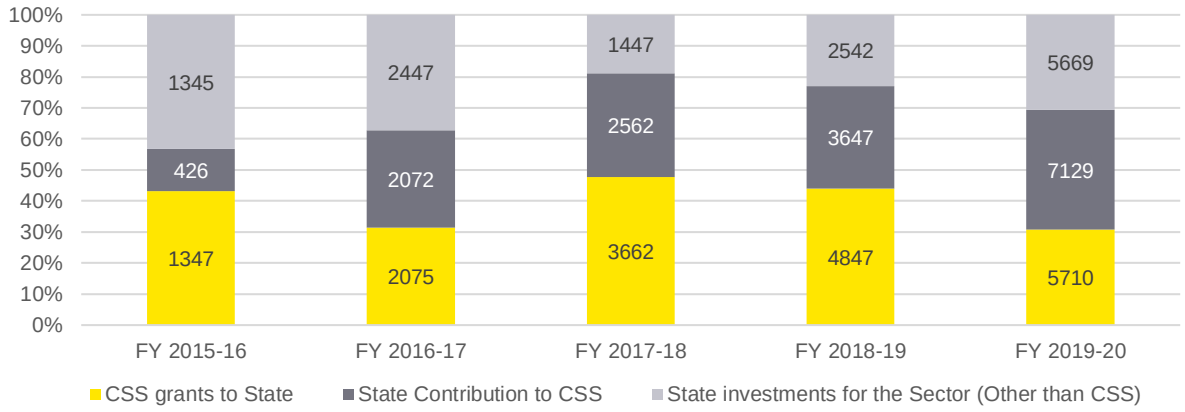
In terms of States' flexibility to spend on the Urban Sector, the proportion of expenditure between CSS and non-CSS initiatives at State level has been influenced by the Central grant inflow to the States. Except for the FY 2019-20, the State's own Initiatives have proportionately contracted as the total CSS funding expanded in the State expenditure portfolio as observed from the chart below.

Figure 2.52: State-wise urban department expenditure based on funding sources (Rs. Cr)



Source: (State Govt. Budgets, 2015-20)

Figure 2.53: Year-wise overall urban department expenditure portfolio among four States (Rs. Cr)



Source: (State Govt. Budgets, 2015-20)

State wise assessment of the four States during the period between 2015-20 is as follows:

i. **Andhra Pradesh:** For the schemes under consideration, the State had a budget expenditure of over Rs. 13,370 crores, with a breakup of 45 per cent Central share of CSS, 21 per cent State share of CSS and 35 per cent expenditure for its own State level initiatives in Urban Sector other than CSS.
   - Andhra Pradesh has contributed about 55 per cent share towards urban development schemes including CSS. The State has initiated its own Smart Cities scheme to develop additional cities similar to SCM cities. Similarly, additional interventions have also been undertaken for the urban housing and infrastructure projects such as water supply and sewerage projects, Metro Rail etc.,

ii. **Gujarat:** For the schemes under consideration, the State had a budget expenditure of over Rs. 7,640 crores, with a breakup of 19 per cent Central share of CSS, 42 per cent State share of CSS and 39 per cent expenditure for its own State level initiatives in Urban Sector other than CSS.
   - Among the four States assessed, Gujarat had the highest contribution of nearly 81 per cent as the States share towards urban development schemes including its contribution to the five CSS. The State has initiated projects under water supply & sewerage other than projects sanctioned under AMRUT.

iii. **Jharkhand:** For the schemes under consideration, the State had a budget expenditure of over Rs. 7,335 crores, with a breakup of 29 per cent Central share of CSS, 21 per cent State Share of CSS and 50 per cent expenditure for its own State level initiatives in Urban Sector other than CSS.

iv. **Uttar Pradesh:** For the schemes under consideration, the State had a budget expenditure of over Rs. 18,570 crores, with a breakup of 43 per cent Central share of CSS, 45 per cent State share of CSS and 12 per cent expenditure for its own State level initiatives in Urban Sector other than CSS.

- UP had also made a total contribution of Rs. 624 crore towards various projects under the Govt. of India's Ganga Rejuvenation program.

Figure 2.54: State-wise annual urban department expenditure details (Rs. Cr)

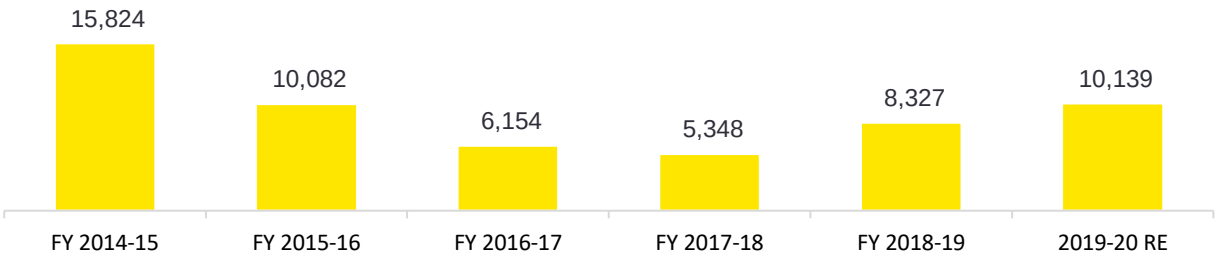
Source: (State Govt. Budgets, 2015-20)

The details of State-wise total urban department expenditures, State-wise CSS wise funding, and State level schemes and initiatives are presented at Appendix 1.4.

2.2.2.7 Investments in urban sector by external agencies

Financial support from external funding agencies, through Multi-lateral and Bi-Lateral Co-operation, provides not only the access and availability of funding but also the crucial elements of financial prudence. During the period between 2014-20, urban sector in India has received nearly **Rs. 46,000 crores** from seven different external agencies – JICA, ADB, WB, AFD, EIB, DFID and KfW.

Figure 2.55: Annual funding in Urban Sector by external agencies (Rs. Cr)

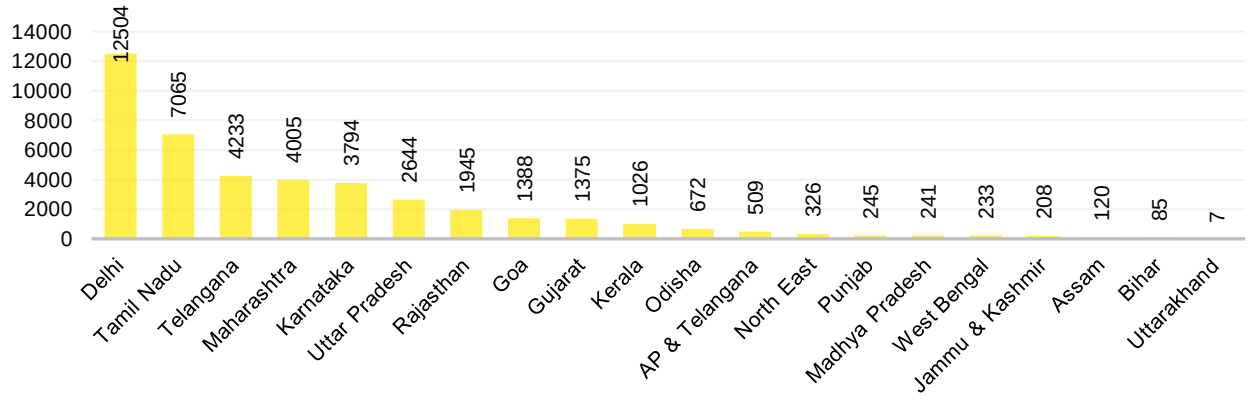


Source: (Ministry of Finance, 2014-20)

Eighteen states and the North East region have been provided access to external aided funding for various urban sector programs. While Delhi, Tamil Nadu and Telangana are the top three receivers of EAP funding,

Assam, Bihar and Uttarakhand are the bottom three in terms of overall EAP funding during the period between 2014 and 2019.

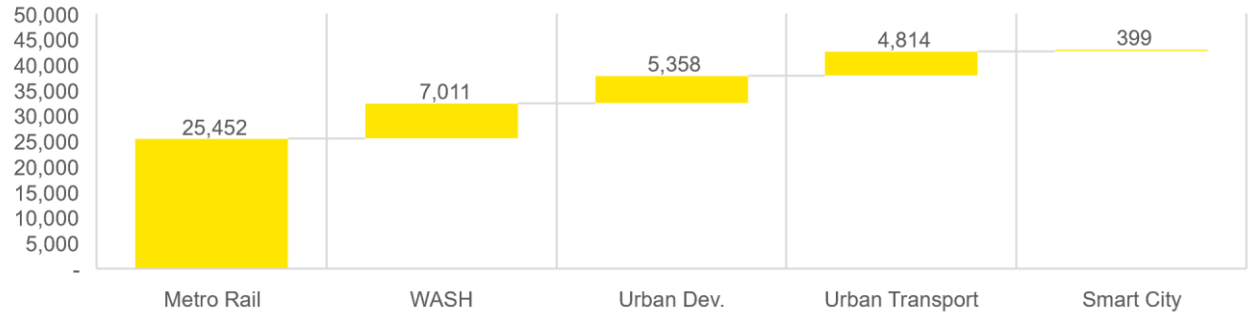
Figure 2.56: State-wise funding in Urban Sector by External Agencies (Rs. Cr)



Source: (Ministry of Finance, 2014-20)

Among the sub-sectors which have received funding from external agencies, Metro/MRTS projects have dominated the space with nearly 60 per cent of the overall urban sector funding. WASH (water, sewerage, SWM) and urban transport have also found their place in the EAP funding during the period 2014-19. Urban development, urban services improvement, capacity building has also been part of the EAP funding (majorly dominated by ADB). While SCM EAP funding of nearly Rs. 400 Cr from AFD is reflected in GoI books, it had also attracted TA and other investments interests from across the globe (e.g., USTDA, WB, ADB)

Figure 2.57: Urban sub-sector wise funding by external agencies (Rs. Cr)

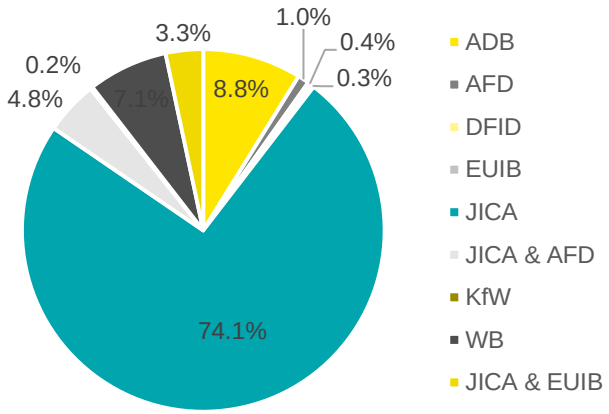


Source: (Ministry of Finance, 2014-20)

While there have been joint funding participations between Japanese and European agencies, JICA has been dominant with its presence in urban sector funding of about 74 per cent. JICA along with AFD and EUIB have extensively funded Metro rail projects across India with a total funding outlay of over Rs. 24,700 crores. JICA has also led its participation in WASH and urban transportation sub-sectors.

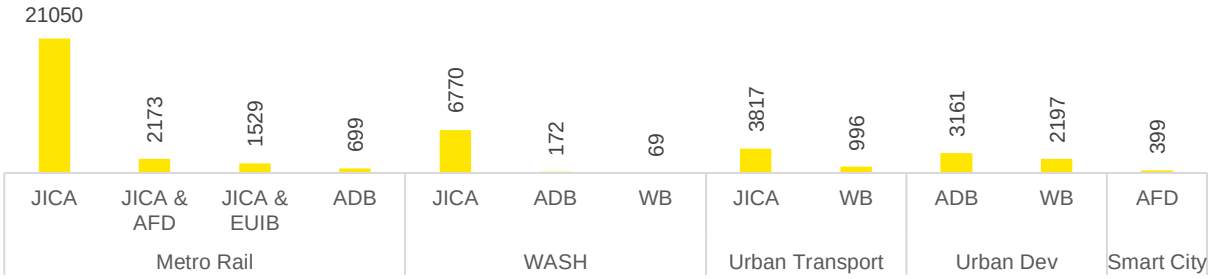
ADB has led the urban development space, along with participation in WASH and Metro Rail sub-sectors with a total funding outlay of nearly Rs. 4,000 Crores. WB had its presence in urban development, urban transport and WASH sub-sectors with a total funding outlay of more than Rs. 3,200 Crore. AFD, while leading in joint participation with JICA in Metro Rail projects, has also participated in Smart City program.

Figure 2.58: Agency wise urban sector funding (Rs. 45, 734 Cr)



Source: GoI Budget Documents, 2014-20

Figure 2.59: Agency-wise sub-sector funding (Rs. Cr)



Source: GoI Budget Documents, 2014-20

The detailed list of EAPs is enclosed in Appendix 1.4.

In summary, during the evaluation period (2015-20):

- Central and State governments were able to mobilize funds from various sources including budgetary provisions
- Due to varied focus and priorities, EAP and State Govt. own funding of Urban Sector projects have predominantly had limited sub-sector focus
- Due to large share of CSS funding in the Urban Dept. budgets, as observed among four States, flexibility of States and ULBs towards own funded programs/projects is affected.
- Availability of Funds at ULB level, both from receipt as well as utilization perspectives remain a key issue (predominantly due to scale and efficiency of operations)
- O&M sustainability of projects at ULB level, irrespective of funding sources, remains a major challenge to be focussed

2.2.2.8 Financial Scenario of ULBs and State-level Financial Intermediaries

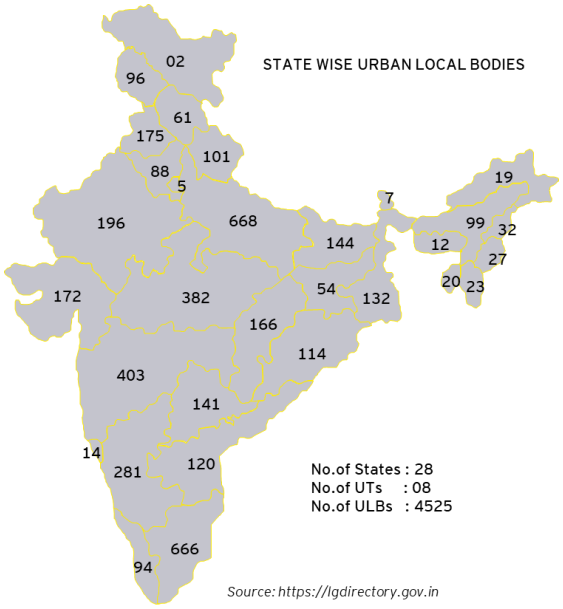
The 74th Constitutional Amendment Act, 1992 stipulates that the principles which should govern, and measures needed to improve financial position of the municipalities be referred to the State Finance Commission (SFCs) to be set up in each State.

There are 4,525 Urban Local Bodies spread across 28 States and 8 Union Territories of India (MoPR, 2020). While these ULBs were provided with 18 functions to carry out on their own, assignment of revenue sources to ULBs has been left to the provisions in respective State level laws and recommendations of SFCs.

Taxes related to properties or holdings, on entertainment shows and practice of professions are generally assigned to ULBs. However, there are wide variations in the powers, assignments and basis for rates applicable across States.

ULBs are bereft of any taxes / levies that directly relate to consumption, hence buoyancy in the main source, viz. Property tax is driven by increase in property valuation and expansion of built environment in cities.

Figure 2.60: State-wise ULBs in India



Source: (MoPR, 2020)

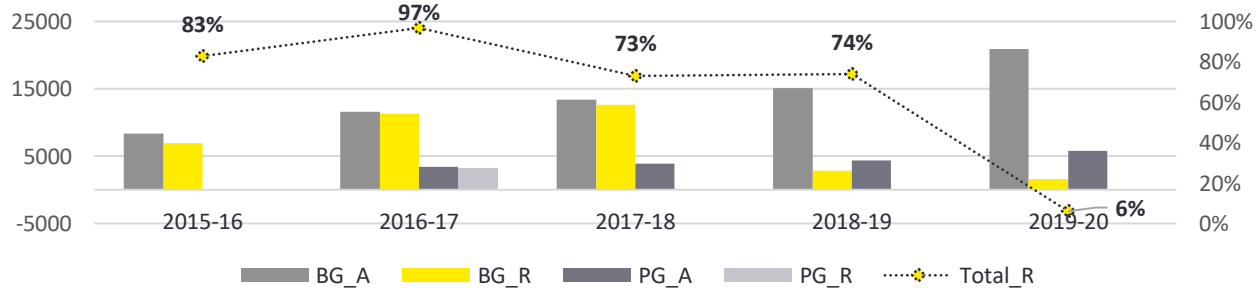
Some important observations made by the 13th and 14th Finance Commissions regarding persistent lacunae in urban fiscal governance are:

The 13th Finance Commission (2010-15)	The 14th Finance Commission (2015-20)
"The experience of SFCs has not been found to be successful for a number of reasons. SFCs themselves are hampered by lack of data. Limited capacity and poor ownership by State Governments compounds this problem." (13th Finance Commission of India, 2010-15)	*"It is inconceivable, and certainly not desirable, that local bodies seek an ever-increasing share of public moneys and yet continue to keep themselves beyond the ambit of accountability and responsibility for the public money placed with them."* (14th Finance Commission of India, 2015-20)

The 13th FC report has highlighted the long-time taken by the SFCs to submit their report as an attribute of lack of requisite expertise and insufficient staff. Further, it also had observed that the State Governments generally take a long time to accept and act on the SFC recommendations. The NIPFP working paper (Manish Gupta et.al, 2019) analysis had revealed that the average time taken by the SFCs to submit their reports is around 32 months and the average time taken by States to table the ATRs is around 11 months. This effectively meant that these delays are impinging on the fundamental need of steady and predictable flow of funds to the ULBs thereby adversely impacting basic service delivery.

The 14th Finance Commission had recommended a total devolution of about Rs. 87,144 crores to the ULBs for the period 2015-20. However, less than 60 per cent of the allocated funds have been released to the States till 2019-20 (Ministry of Finance, 2015-20).

Figure 2.61: Status of 14th FC Grants (Allocated Vs Released, Rs. Cr.)



Note: BG-Basic Grant, PG-Performance Grant; A-Allocated; R-Released Source: (Ministry of Finance, 2015-20)*
*[*Note: FY2019-20 data is based on twitter feed of O/o FinMin (Ministry of Finance, 2020)]*

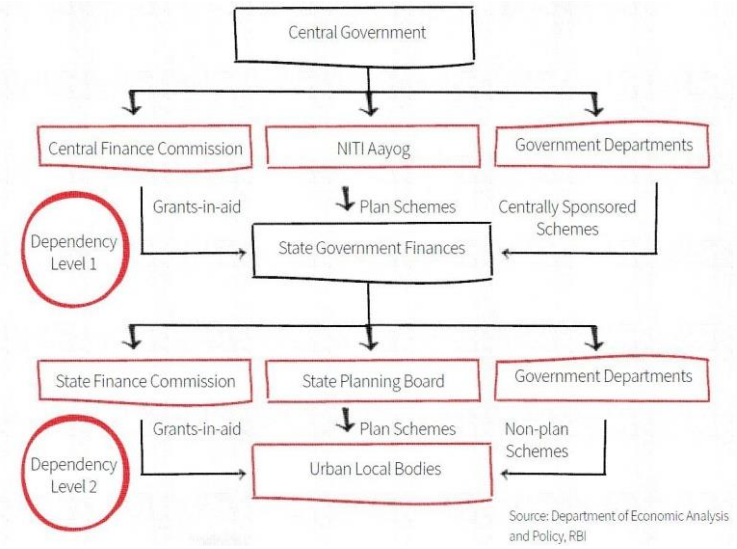
Under the JnNURM scheme (2005-06), it was expected inter alia that (i) modern and transparent budgeting, accounting, financial management systems, designed and adopted for all urban service and governance functions; and (ii) ULBs as financially self-sustaining entities for urban governance and service delivery will be established, through reforms to major revenue instruments. However, as observed above by the 14th FC, reliable fiscal practices in ULBs has remained a critical challenge. While democratization of financial resources helped ULBs to independently plan and implement service delivery, fiscal dependency of the States on the Centre and of the ULBs on the State hasn't helped these institutions in a steady progression.

Certain key institutional challenges inter alia, as indicated by Isher Ahluwalia (Isher J Ahluwalia, 2017) of Urban Governance in India, happen to be that –

State finance commissions did not meet the standards set by the Central Finance Commission. They have not challenged the state level political resistance to devolve and urban local governments have remained hamstrung by the lack of funds and are having to function with unfunded mandates. And that - *the disempowerment has reached levels such that for several states, staff salaries of the urban local governments are being paid by the state governments*.

Laying critical emphasis on Financial Accountability and Sustenance, the 14th FC had recommended a performance grant of Rs. 17,428.76 crore for the period 2015-20, to address the following issues:

Figure 2.62: Illustration of Fiscal Dependency- Centre, State & ULBs

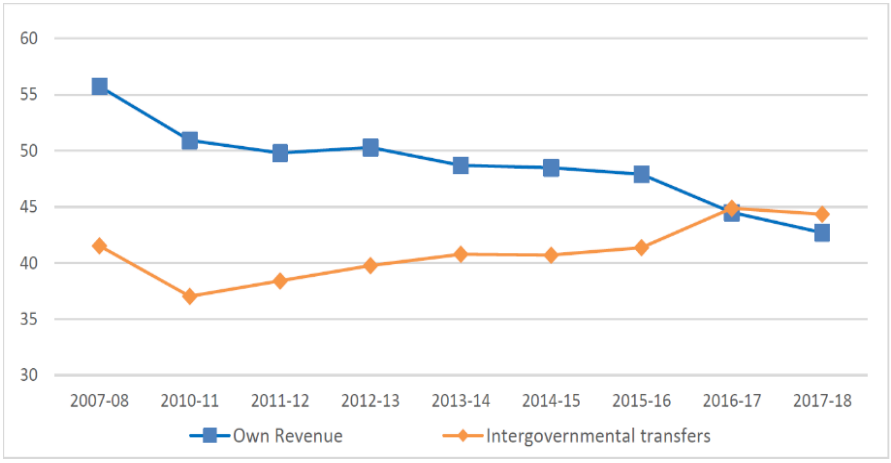


Source: (JLL, 2019)

i) Making available reliable data on local bodies receipt and expenditure through audited accounts; and
ii) Improvement in own revenues

Despite continuous efforts through Central and State programs, the ULBs have remained largely dependent on devolutions from the Centre and State Governements. As observed evidently in ICRIER's report to the 15th FC (ICRIER, 2019), the proportion of Municipal Own Revenues Vs. Intergovernmental Transfers (as a % of Total Municipal Revenue) have been consistently declining over the last decade.

Figure 2.63: Trend of Municipal Own Revenue Vs. Inter-Govt. Transfers



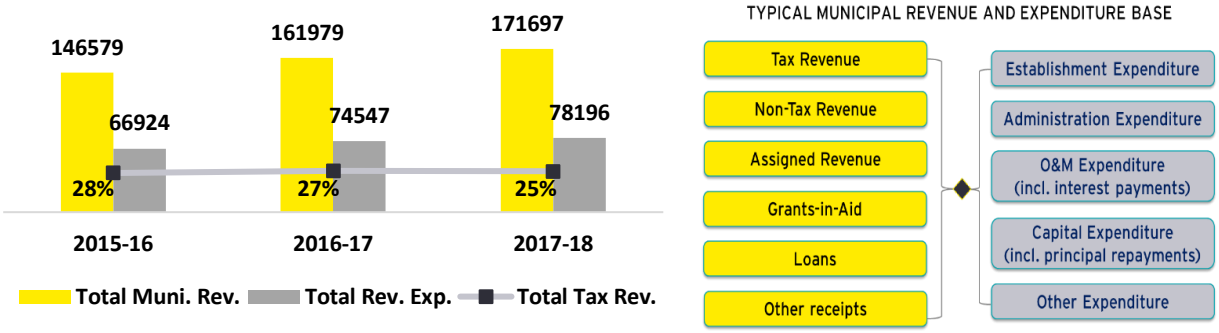
Source: (ICRIER, 2019)

MoHUA shall be supporting States and ULBs through **PRAPTI -** Policy and Reforms for Augmentation of Property Tax in India – for **doubling property tax collections by 2024** (MoHUA, 2020)

If own revenues are taken as a measure of decentralization, as the international literature suggests, then, India has moved backwards in implementing the objectives embodied in the 74th CAA, 1992 (MoUD & NIUA, 2013).As per the report (ICRIER, 2019), while the total municipal revenues have grown annually, their

proportion to the National GDP have remained below 1% and the total tax revenues have hovered only at 60% in proportion to total revenue expenditure of the ULBs. This increasing trend in ULBs dependency on Inter-Governmental transfers had limited effect on (i) improving ULB own revenues and (ii) enabling Annual Reporting.

Figure 2.64: Municipal Revenues scenario in India (Rs. Cr.)



Source: (ICRIER, 2019)

The 15th Finance Commission has mandated (2020-21) for undertaking reforms to property tax as an entry condition for grants, and GOI's '*Atma Nirbhar Bharat Abhiyan*' has provisioned additional borrowing limit (0.25 per cent of GSDP) tied up to property tax reforms. In this backdrop, the Property Tax Reforms Toolkit introduced by MoHUA is an important initiative for supporting the States and Cities to achieve the goal of doubling property tax collections – from current ~Rs. 20,000 to Rs. 40,000 crore - in India by 2024 (MoHUA, 2020).

Government of India's initiatives for Urban Sector through Guaranteed lending, State Pooled Financing, Urban Development Funds, Bonds, Term Loans and PPPs have a history of over two decades now. However, commercial financing for Urban Infrastructure in India is still considered to be in its nascent stages, with only a few countable success cases to refer to. Till 2014, 23 Municipal Bonds had been issued for a total resource mobilisation of Rs. 1,353 crore (~US$300 million).

Some States have been successful on this front - Tamil Nadu and Karnataka have raised finance for small/medium ULBs through pooled bond financing i.e., via their respective Water & Sanitation Pooled Financing Trusts (WSPFT).

TAMIL NADU WATER & SANITATION POOLED FUND TRUST (TNWSPFT)

- Fund Manager : TNUIFSL
- Bond Issues : 06
- Period : 2002 - 2017
- Amount Raised : Rs. 302 cr
- Tenure range : 10 -15 years
- Interest rates : 7.25% - 10.60%
- Ratings : AA - AAA (SO)
- Repayments : Tied up to Budgetary allocation by State Govt.
- Other borrowings : Loans from TNUDF and HUDCO

KARNATAKA WATER & SANITATION POOLED FUND TRUST (KWSPFT)

- Fund Manager : KUIDFC
- Bond Issues : 01
- Period : 2005
- Amount raised : Rs. 100 cr
- Tenure range : 15 years
- Interest rates : 5.95%
- Ratings : AA (SO)
- Repayments : Escrow of SFC Devolutions to ULBs
- Other borrowings : Loans from commercial banks (BOI, SBI, Axis, Syndicate Bank, Vijaya, Yes Bank & ICICI

After the new regulations introduced by SEBI in 2015, there have been 7 Municipal Bond issues with an overall value of Rs. 4,110 crore (~US$588 million). While raising bonds has been a successful phenomenon for most of these cities, implementation of projects through bond financing have been facing challenges atypical to municipal infrastructure projects.

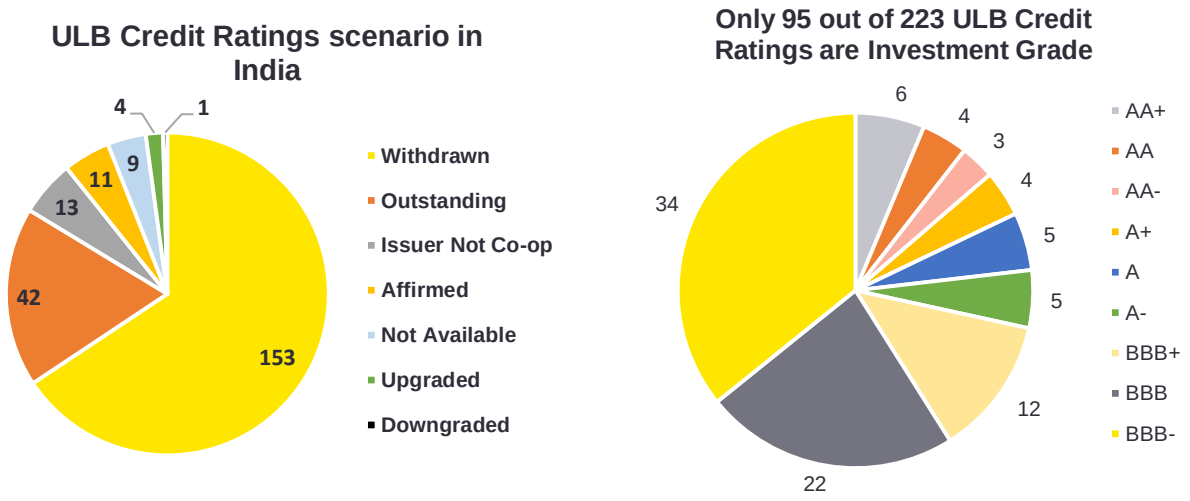
Table 2-29: Implementation level challenges of recent Municipal Bond financed projects (2015-20)

Year	City	Amount (Rs. Cr)	Rating	Purpose	Challenges/Issues
2017	Pune	200	AA+	Water metering project	Project bids cancelled and delayed
2018	Hyderabad	195	AA	Strategic road development project	Budgetary support and Land acquisition constraints
2018	Indore	140	AA	AMRUT projects	-
2018	Amaravati	2000	BWR AA-	Development of State's new capital	Project halted after change in Govt.
2018	Bhopal	175	BWR AA	AMRUT projects	Change in State Govt. has slowed down the project progress
2019	Ahmedabad	200	AA+	AMRUT projects	-
2019	Visakhapatnam	80	AA	Strategic road development project	Budgetary support and Land acquisition constraints
2019	Surat	200	AA+	AMRUT projects	-

Source: EY Analysis, (MoHUA, Cityfinance.in, 2020)

Despite attempts to improve credit worthiness of cities, developing a qualifying instrument that underpins the attractiveness and sustainability of market funding has been a challenge for cities. Only 95 out of 223 ULBs have got Investment Grade credit rating (BBB- and above) and only 16 out of 223 credit ratings are active, as per the recent data available (MoHUA, Cityfinance.in, 2020).

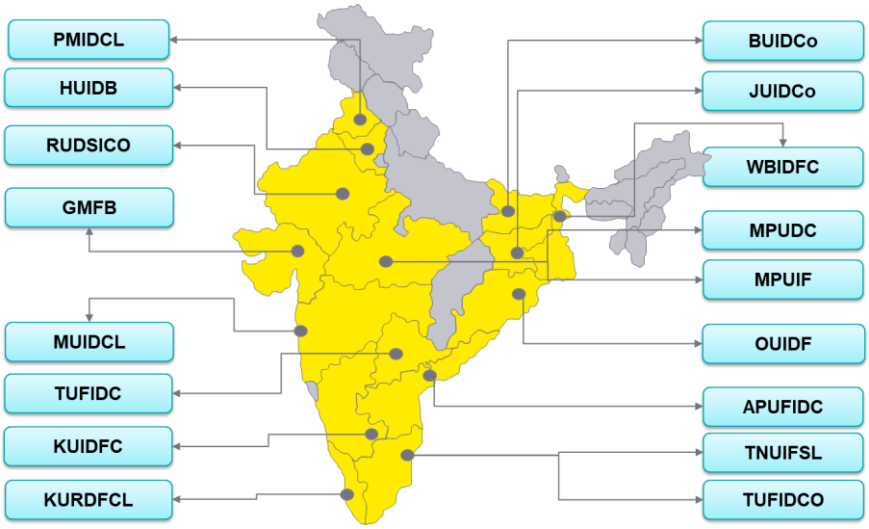
Figure 2.65: ULB Credit worthiness scenario in India



Source: EY Analysis, (MoHUA, Cityfinance.in, 2020)

Efforts on creation of State Level Financial Intermediaries for Urban Development, since JnNURM, had largely found traction and has been supporting major Central and State Sponsored Urban Programs across India. Several States have incorporated Urban Financing institutions to take up Guaranteed and Non-Guaranteed financing of urban sector projects. While most of these organizations have been created to channelize Central and State funds for implementation of various schemes, some of them have created own pool of Funds (Urban Development Funds, Trust Funds etc.).

Figure 2.66: Snapshot of State-level Urban Financing Intermediaries in India



Guaranteed Financing:

- MPUIF, BUIDCo, GUDCL, TUFIDC, OUIDF, APUFIDC, TNUIFSL

Non-Guaranteed Financing:

- WBIDFC, KURDFCL, KUIDFC, TUFIDCO, PMIDCL

NBFCs: WBIDFC, KURDFCL, TUFIDCO

Source: EY and Athena Analysis

Some States have adopted innovative structures for resource mobilization

- **KUIDFC**: Utilizes SFC devolutions along with credit rated program structures and Govt. comfort letters, to borrow from commercial banks. Also utilizes Blended financing i.e., market borrowings blended with own corpus funds, to provide subsidized lending for ULBs.
- **PMIDCL & HUIDB**: Punjab and Haryana have created development funds (PMIDF, HUIDF) with legislative acts, which securitize certain Taxes, Fees and Charges to be credited into the Fund as annual corpus. These are then leveraged to fund basic municipal infrastructure projects across ULBs
- **KURDFCL**: Despite a small corpus, of Rs. 35 cr, KURDFCL has been successfully funding revenue generating projects across ULBs that have supported in 100% loan repayments.

Despite their existence, across States, State level Urban Financing intermediaries have not been fully leveraged to undertake multi-source financing, financial economies of scale, seamless/ integrated planning and program implementation (between Centre, States and ULBs). There has been limited pooled financing activity undertaken during 2015-20 and only four States i.e., Telangana, Karnataka, Tamil Nadu and West Bengal have been observed to access market borrowings (term loans).

In essence:

- The Centrally Sponsored Schemes constitute a large share of capital investment support directed to ULBs from Central and State Governments, funded through budgetary and extra-budgetary resources.
- Over the last few years, dependency of ULBs on devolution and capital grants from higher tiers of Government have increased.
- Market borrowings to finance urban infrastructure have been muted and limited to efforts from few States.
- State level financial intermediaries must evolve to being urban financing institutions taking on differentiated approach for large and smaller cities and move beyond redirecting Central and State capital grants.
- The challenge at the ground level continues to lie in structuring viable projects, with project revenue streams secured to service debt.
- These challenges will be critical to achieve the desired scalability for raising capital to bridge the gaps in financing urban infrastructure.

Table 2-30: Key challenges and way forward - Governance

Liveability Parameter	Key Challenges	Broad way forward
Capacity Building	• Felt need for a comprehensive sector specific training need assessment early on – to design and build capacities beyond Mission period • Existing capacity building initiatives largely support implementation of Mission activities • Emphasis on tech-enabled self-learning through self-assessment and best practices (NULP) • Gaps persist in creating in-house capacities on core areas such as urban planning and management, public health, cadre systems etc. Hence, increasing dependence on external agencies • Financial sustainability for capacity building initiatives (barring large ULBs) remains a challenge	• Undertake an urban sector training need assessment at the national, state and ULB level to assess the technical training requirements • Design and implement an integrated multi-level, multi-disciplinary continuous capacity building programme covering different sectors and cross cutting areas. These could include programmes of (i) basic courses for higher learning, (ii) advanced courses for specialized learning and (iii) advance level practitioners' courses for project implementation officials • Build urban competency in state administrative cadres - encourage / incentivise states and ULBs to establish professional teams specialized in core areas (urban planning, finance, public health, social and economic services) and emerging areas (data science, ICT, climate change and resilience, communication, etc.). States should consider provision of greater flexibility to larger cities to manage their human resource and skill requirements • Increase investments in capacity building programmes in line with the HPEC recommendations • Leverage the infrastructure and capacities being built under the National Urban Innovation Hub to strengthen the service delivery capacity of ULBs
Citizen Participation	• Formal mechanisms such as Community Participation Law, Ward Committee, Area Sabhas, District Planning Committees, ULB Standing Committees that enable citizen participation continue to remain unutilized • Lack of flexible mechanisms for representation of non-voting residents (migrants, street vendors,) in local governance • Sub-optimal targeting under existing citizen participation initiatives	• Incentivise states and ULBs to form and activate Ward Committees and Area Sabhas along with substantial transfer of powers to the Ward Committees. Municipal Performance Index could consider significant weightages towards these aspects. • Support formation of citizen forum at a city level which is delinked to voting rights • Encourage involvement of elected representatives in the planning, regulation, slum development, water supply and sanitation functions, among others • Incentivise ULBs to adopt / pilot participatory budgeting • Prepare city wide Citizen Engagement Plan for effective targeting and engagement of different citizen groups for various urban governance activities

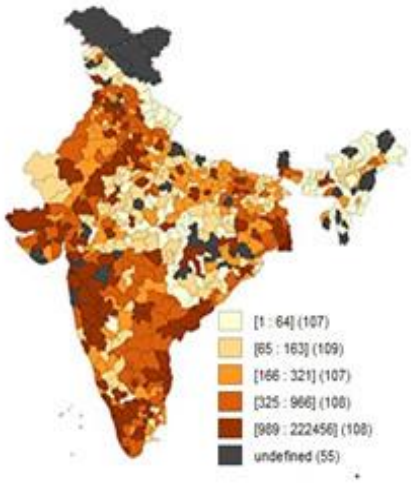
Liveability Parameter	Key Challenges	Broad way forward
		• Leverage ICT-based technologies for enhancing citizen participation
IT & eGovernance	• Beyond schemes or missions, the Cities have not been able to widen and/or deepen their digital operations, services (footprint) which are critical foundations for service delivery, transparency and accountability • Institutional silos and resistance to data sharing remain significant barriers to drive performance/ results driven investments, atleast in cities with >1Mn population.	• CAG audits of States & ULBs could include, along with accountability & transparency, the dimension of digital footprint of cities (information, services and internal operations) • • Urban Data Exchanges enabled by mandatory Open Data policy should be institutionalized for all cities with population of >1 Mn
Financial Sustainability	• Access to rational and predictable sources of funding, for small & medium cities, continues to be a critical challenge • Despite continued efforts, cities largely have not been able to imbibe either project recourse-based funding or debt culture • While limited capacities to implement projects has been a barrier, atleast for small & medium cities, the role of State level financial (& nodal) intermediaries has not been effectively managed	• States should be strongly incentivized to drive urban sector funding – as representatives of ULBs at Center and as facilitators of development at State levels • • Beyond the performance driven and/or outcomes driven mission funding, the Central Government could look at providing attractive incentives to States for managing urban finances – through RBI/ HUDCO sponsored credit programs, CFC performance grants to States, Institutional Fund of Funds

2.2.3 Sectoral Issues and Challenges

The contribution of Cities to the 'Wealth of Nations', whether the Western or Eastern way, is in our time an unrivalled and irrefutable fact. Close to two decades of post-liberalisation, India's economic outlook for the next leap phase has now been anchored on '*Strengthening the Market Economy and Building Trust to support it*' (Ministry of Finance, 2020). Proliferation of Entrepreneurship at grassroots and Export oriented Jobs among other policy level interventions, are being posited as the critical instruments of Wealth Creation for India's next economic leap.

Underlying that rhetoric is the impeccable position and performance of Urban Centres towards the contribution in Market Economy. It has been found that, *for every 10% rise in new firms there is 1% rise in District Domestic Product* (Ministry of Finance, 2020). Thus, whether for exploiting Global Value Chains for networked products or for raising Entrepreneurial value addition, clearly India's Urban Centres will need to undergo large scale consolidation and exploitation in the process.

Figure 2.67: Distribution of New Firms across Districts



Source: (Ministry of Finance, 2020)

Municipalities in India are not bound by any performance standards either in respect of revenue-raising or delivery of services. The economy - wide costs of the absence of any form of performance standards are phenomenally large (MoUD & NIUA, 2013). There is an urgent need to undertake structural shift in the way Cities' performance – physical, fiscal and functional - is managed. As we stand at this critical juncture, and

also amidst a global pandemic that has completely questioned our traditional systems, India needs to reorient its thinking on ***Building Better Working Cities*** to achieve its ambitious economic leap in the next 5-10 years.

In the preceding section 2.2.2, the evaluation team has presented a bottom-up approach analyses of the urban sector through the liveability framework. In the context of broad trends in the urban sector on various parameters impacting liveability and the scope and achievements of the flagship urban CSS; three broad critical issues that cut-across all of these are identified that need to be focussed upon. These broad issues are:

1	Gaps in Outcomes alignment	2	Gaps in Sector Financing	3	Gaps in Implementation Capacities
Sector level desired outcomes **Vs** CSS level intended outcomes		Overall national level investments required **Vs** actual expended, leverage and instruments of leverage		Dearth of adequate personnel with skills and capacities, at both State and ULB levels, to match investments being made in urban sector	

The following sub-sections delve into the details of these gaps.

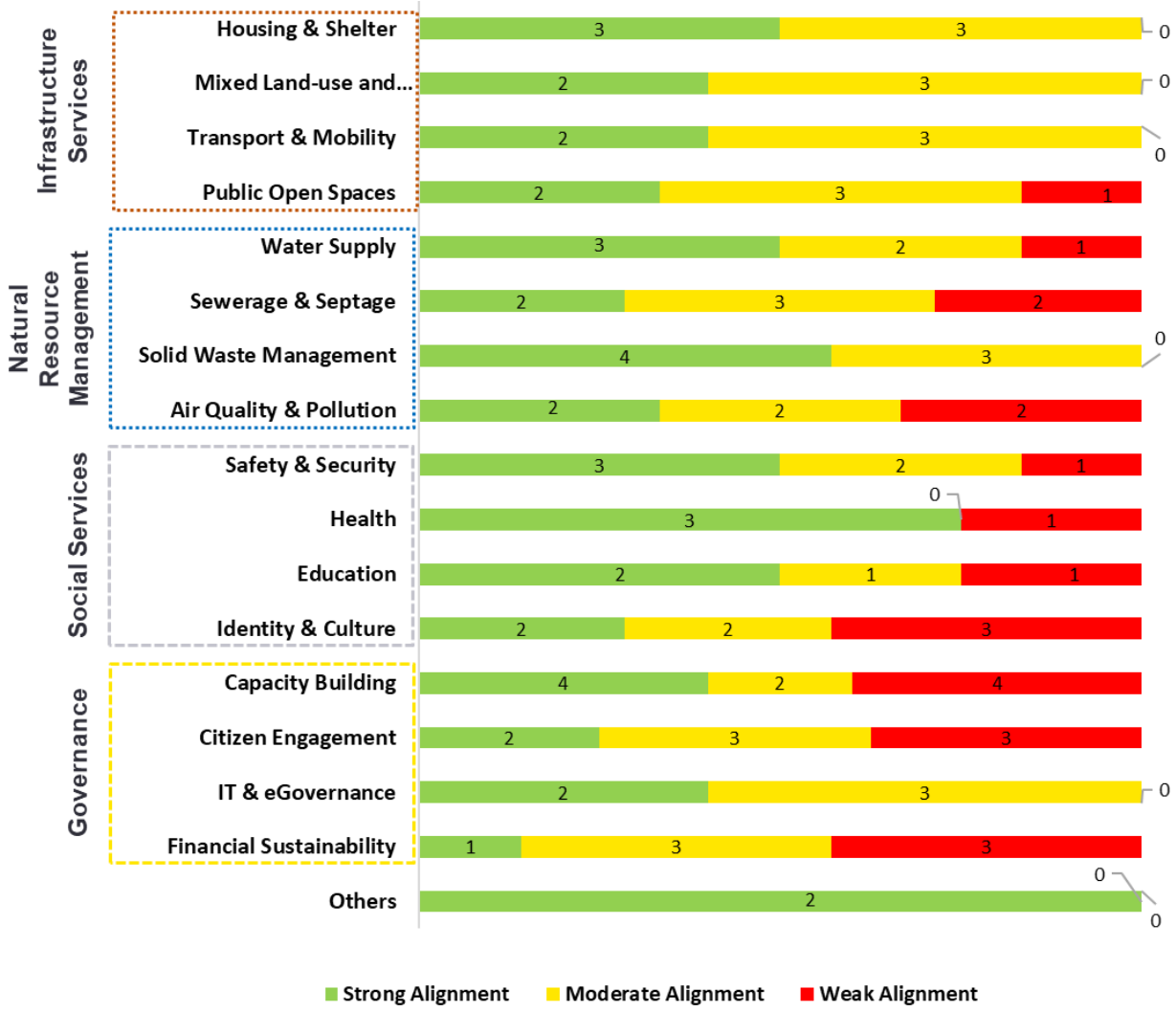
2.2.3.1 Gaps in Outcomes alignment

Central to the evaluation study and also to the sustainable growth of cities, ***Urban Liveability*** has been the focus of assessing the performance of the 5 Urban CSS vis-à-vis needs of the Cities. Urban Infrastructure remains a key element impacting liveability in Cities, and there is an increasing trend of adopting Output and Outcome oriented development goals in Cities (e.g., SGDs, New Urban Agenda, EoL, MPI etc.).

The evaluation team has consolidated the liveability parameter level outcome alignment analysis, to generate an overall sector level view, as presented in Figure 2.68. This aggregate view highlights the overall extent to which the Urban flagship CSS taken together align with the desired outcomes of the urban sector to achieve higher levels of liveability. The key observations from such a view are:

- Nearly **20 per cent** of the desired outcomes **remain weakly aligned to** any urban sector initiatives undertaken in the CSS, while ~40 per cent of desired outcomes are each strongly and moderately aligned with the 5 flagship CSS combined
- **Social Services** & **Governance** pillars make up most of the unaddressed outcomes, predominantly due to **weak alignment** with any scheme level intended outcomes
    - Within Social Services, Identity & Culture has the greatest number of unaddressed desired outcomes as this was not significantly intended by any of the CSS
    - And under Governance, only IT & eGovernance outcomes have been focussed well by all the Schemes while Capacity Building, Citizen Engagement and Financial Sustainability outcomes need more focus
- In **Infrastructure Services and NRM,** CSSs have focussed on specific key issues, and indirectly address related issues thus leading to a combination of strong and moderate alignment with liveability outcomes.
    - Water and sanitation, waste management, mobility and housing have been the core areas targeted by the CSS in a significant way. However, due to the complex and evolving nature of urban liveability there are areas within Infrastructure Services and NRM that are only moderately addressed by the CSS.

Figure 2.68: Aggregated map of outcomes gap at Sector level



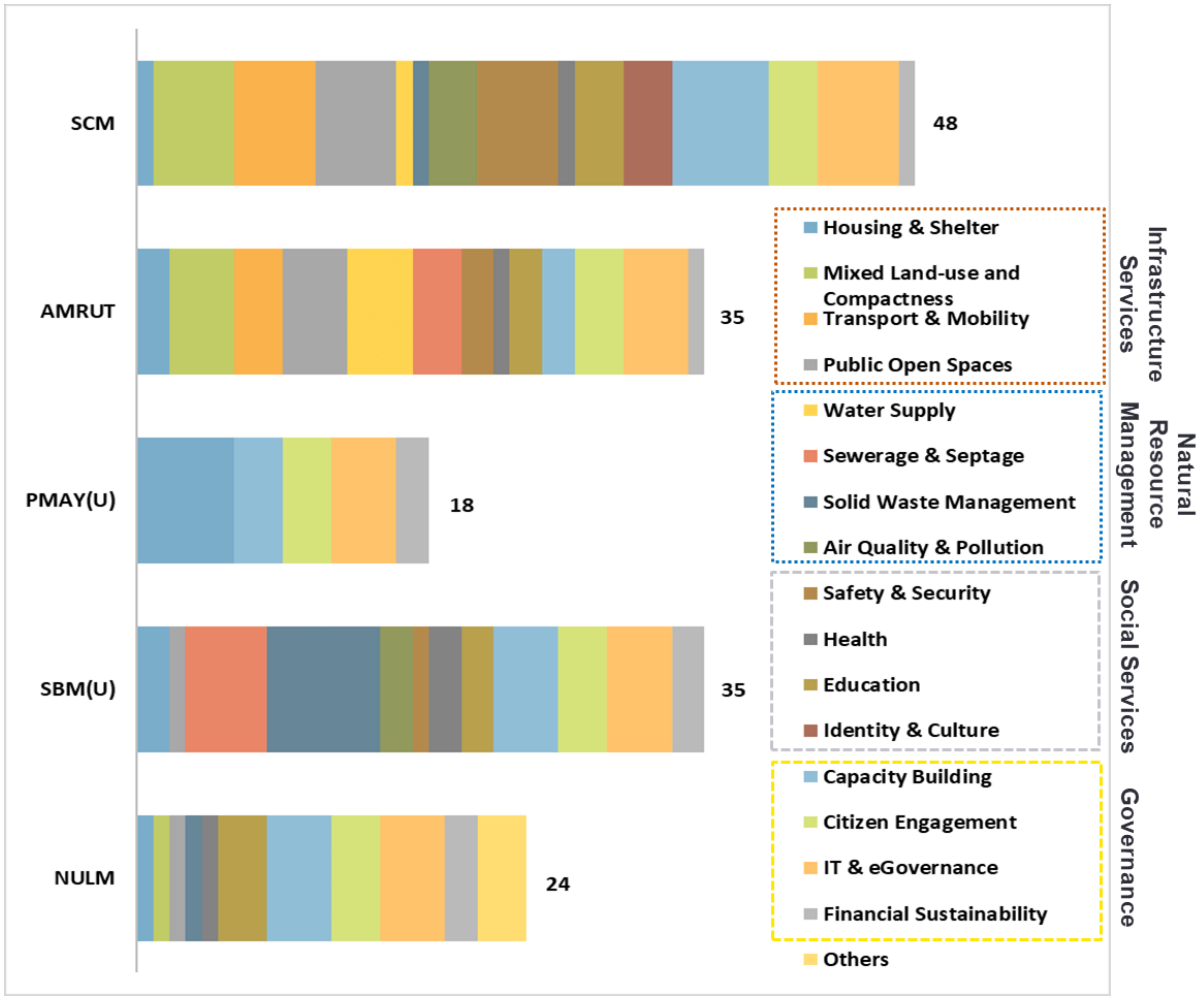
Source: EY and Athena analysis

Liveability in Cities vis-à-vis Quality of Life is emphasized, time and again, as a critical foundation of Sustainable Urban Development and Growth. The outcomes mapping analysis clearly brought out the limited extent to which Urban CSS were able to address desired sectoral outcomes. This leads us to the inquiry of, as to what role have the 5 CSS played or have intended to play in Urban Liveability.

Scheme-wise mapping of intended outcomes to Sectoral desired outcomes has broadly indicated the below:

- Leaving out the unaddressed desired outcomes, among the 5 Urban CSS – SCM had intended to achieve a broad range of sectoral outcomes across four pillars of liveability
- Whereas other schemes had sharper focus on specific parameters i.e., PMAY(U) [Housing & Shelter], SBM(U) [Sanitation & SWM]
- All schemes have more or less equally intended for Governance Outcomes
- Among all the urban liveability parameters, while Capacity Building has the highest no. of outcomes desired (10); Financial Sustainability has the highest proportion of unaddressed outcomes (71 per cent)

Figure 2.69: Aggregated map of intended outcomes at Scheme level



Source: EY and Athena analysis

To contextualize '*what do the above observations mean*' at a City level, the evaluation team highlights that the performance of the cities – physical, fiscal and functional - are intertwined with aspects of both vertical and horizontal institutional arrangements. The 3-tier urban governance structure (vertical) predominantly being regulatory in nature and hence prescriptive, while the inter-departmental / inter-agency collaboration efforts (horizontal) predominantly being reactive to the vertical governance culminate in achievement or non-achievement of the set outcome targets.

As observed above, Infrastructure Services and Natural Resource Management have relatively specific and hence strong, cohesive nature of vertical and horizontal institutional responses, as provision of these services are mostly embedded into regular functions of the city governments and parastatal agencies. On the other hand, Social Services and Governance require broader and hence diverse nature of vertical and horizontal institutional responses. Departments like Education, Health, Safety & Security, Culture etc., operate well beyond the realm of City Government mandates. These operational paradigms highlight the complexities in the ecosystem of urban liveability – that would need a reorientation towards 'Building Better Working Cities'.

The aggregated mapping table of liveability parameters w.r.t sectoral desired outcomes and scheme level intended outcomes is presented at Appendix-1.5.

Given this scenario, **two key questions** emerge – for the future of the schemes from a design stand-point:

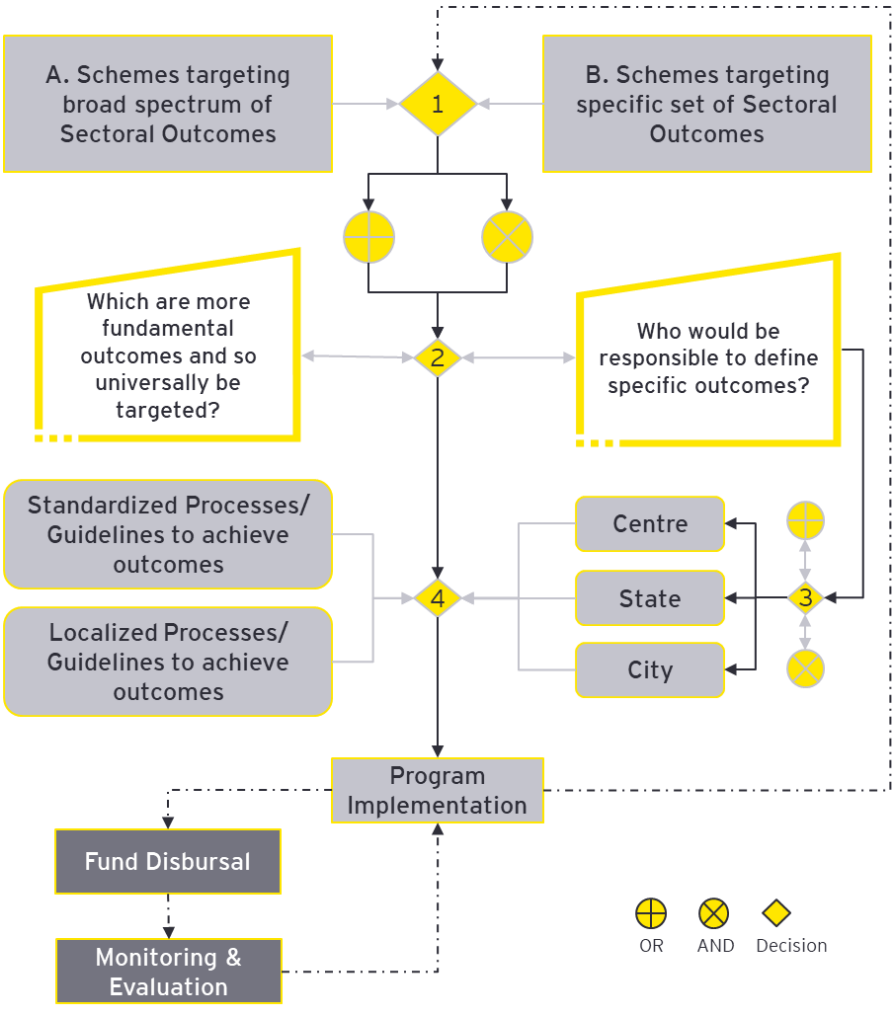
A. Should there be schemes **targeting broad spectrum** of sectoral outcomes and leave it to the **cities/ States to choose from**, as per their needs?

OR

B. Should there be schemes **targeting specific** set of outcomes and bring in **sharper focus** on achieving the set goals

The evaluation team has analysed the above questions through a scenario-based schematic. There are four important decision points which would broadly guide the future scheme design and implementation:

Figure 2.70: Scenario schematic for Future Schemes design



Source: EY and Athena analysis

1. To decide on the schemes design for addressing broad and/or specific set of outcomes
    a. There is possibility of schemes to co-exist, as is the current case with the 5 CSS, targeting both broad set of outcomes as well as specific set of outcomes
    b. However, in either case there would be a need to look at overall outcomes that are to be achieved by Urban India

2. To decide on which would be more fundamental outcomes and which would be specific ones
    a. Once the outcome requirements for the proposed schemes are finalized, it would become important to delineate from the overall set of targeted outcomes – which would be the fundamental ones that need to be achieved by all Cities (i.e., National Priorities)

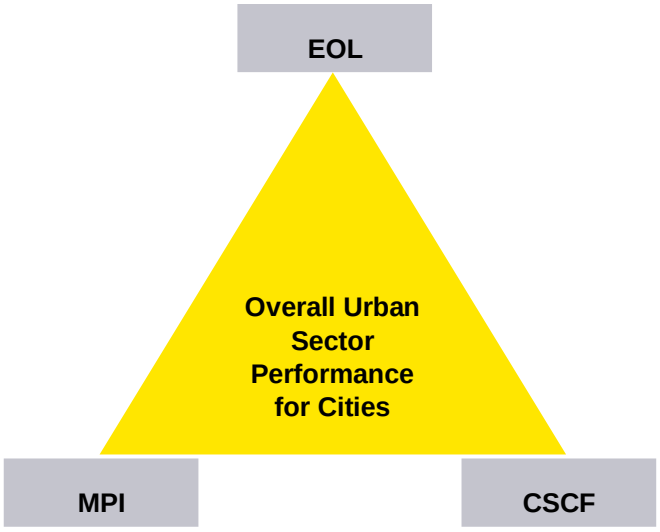
3. To decide on who takes the onus of defining the fundamental and/or specific set of outcomes
    a. Delineation of Fundamental and Specific outcomes from the overall set would bridge the inclusive and exclusive needs of all 3-tiers of Government
    b. However, while the fundamental outcomes could be prioritized and defined by the Central Govt., the specific set of outcomes would need inter-governmental consultations
    c. States, by the power vested with them, could drive the consultation process between Cities and Centre to equitably address the needs and hence actively support in Scheme design

4. To decide on standardized and/or localized set of processes / guidelines to achieve the identified set of outcomes
    a. Since the outcome definitions and targeting would possibly be attempted by all 3-tiers of Government, the imperative would be on processes that guide the implementation and achievement of these outcomes (essentially at city level)
    b. Here again, it would befall upon States to mediate appropriately in designing the standard and local set of processes/guidelines that would anchor the inclusive and exclusive needs of all 3-tiers of Government

These decision points would then feed into the Program Implementation including Funding, Monitoring and Evaluation mechanisms – leading further to next set of CSS. This analysis has also clearly pointed out that Sectoral Financing and Capacities to Implement programs/projects will be undisputedly critical for Sustainable Urban Development.

In summation, the aggregate view of outcome alignments between the Urban sector and flagship CSS points to the need for a reconciliation of outcome setting and pursuit. The diversity of target outcomes across the 5 flagship schemes presents a case for developing an integrated view of the transformation in the urban sector at the city level.

A valid response to such an opportunity would be to undertake a comprehensive compilation of urban sector outcomes that can be pursued by cities. MoHUA through the initiative of launching the triad of Ease of Living Index (EOL), Municipal Performance Index (MPI) and ClimateSmart Cities Assessment Framework (CSCF) has thus already laid the foundation for comprehensively assessing outcomes across indicators that represent Quality of Life, Municipal governance and performance, Sustainability and resilience.



Hence, we suggest that the triad of these three frameworks together be institutionalized at multiple levels, viz.

- National level through policies for cities
- MoHUA level through policies and programs for urban development
- State level for guidelines, programs and performance management of cities and
- City level for planning, implementation and monitoring

2.2.3.2 Gaps in Sector Financing

Since the 1990's, actions that enhance the powers of cities to improve its own revenue sources (OSR), rationalize intergovernmental transfers (IGFT) and provide the regulations for a borrowing framework (BF) – often called as the three pillars of municipal finance -that can attract long-term capital, have been a part of municipal reforms in most developed and developing countries, including India. As can be seen by desk study, leverage in India is much lower than developed countries ($3 Trillion), China ($187 billion), France (€36 billion) and even lower than developing countries such South Africa ($3 billion) and Columbia ($2 billion) (FMDV, 2015). It is also internationally recognized that while larger cities can access markets directly, smaller ones would need pooled structures on account of need to minimize transaction costs. India has been at forefront of multilateral consensus, such as the Addis declarations on local financing (UN, 2015).

Traditional Financing: State guarantee backed (1950-1990)

During the period (1950-90), the sources of municipal debt have been usually limited to State Governments or institutions such as LIC, HUDCO on the basis of guarantees issued by the state. For example, in Tamil Nadu, up until 2003, municipal debt raised on this basis would constitute roughly 75% or INR 700 crores ($300 million). Two key institutional features of this kind of financing are; first, the lack of clarity at the municipal level - on the size, terms of the loan and the repayments which such borrowings entail, and second, the assets being created by parastatals with no involvement of the municipality and with no parastatal responsibilities other than construction. This ad hoc method of financing has led to several water and sanitation schemes – which were used in a suboptimal manner and with periodic write offs of the debt. This guarantee method of financing continues to be the dominant mode in India today especially in the environment investments.

There are several reasons as to why this kind of financing is unsustainable, unknown contingent liabilities on the State Governments, lack of ownership of the municipality in the construction and maintenance of the asset etc. From an institutional perspective the lack of clarity on the assignment of responsibilities over mobilizing finance, asset creation and repayment is best suited to a situation where municipalities were bureaucratically administered as indifferent service providers of the state instead of proactive creators of infrastructure. It is dysfunctional after the 74th CA which provides for elected leadership of municipal governments. However, while the 74th has changed the political basis of municipal governance, it is having not been accompanied by financial reform.

A quick assessment of the 74th from our perspective, namely the rules for mobilizing finance shows that it has not achieved much, nor could it be expected to do so. After all, national constitutions are not expected to write down rules for financing. In the US, the Wastewater Act 1970 specified standards, and the Pooled financing rules were separate enactments to facilitate investments. In South Africa, while the IGFR specifies responsibilities for fiscal transfers the MFMA is a separate enactment for municipal financing. So it is but natural that if municipalities were to be politically empowered and held responsible for investments as specified in schedule 12, there would have to be enabling policy for financing. The 74th CA, did mandate a SFC – to ensure rational and stable fiscal transfers – and there is little tracking of this performance at the national level. So there is a policy vacuum on financing which has been filled by programs such as JnNURM and now by SCP and AMRUT.

Modern Financing: Leverage and Links with Markets (Post 1990)

While the dominant source of finance for urban infrastructure, especially environmental – has been the guarantee backed, there have been significant attempts at a micro level, to move to more rational mobilization strategy at the level of cities and states. Mirroring global trends, in India too, especially since the 1990's, larger cities such as Ahmedabad, Hyderabad Nagpur and Bangalore have raised debt for municipal infrastructure by accessing capital markets based on credit ratings through issuing debt instruments of varying tenure on a non-guarantee mode. And after a long hiatus, Pune and Indore and Hyderabad with total issuance amounting to ~ Rs. 7500 million since 2017.

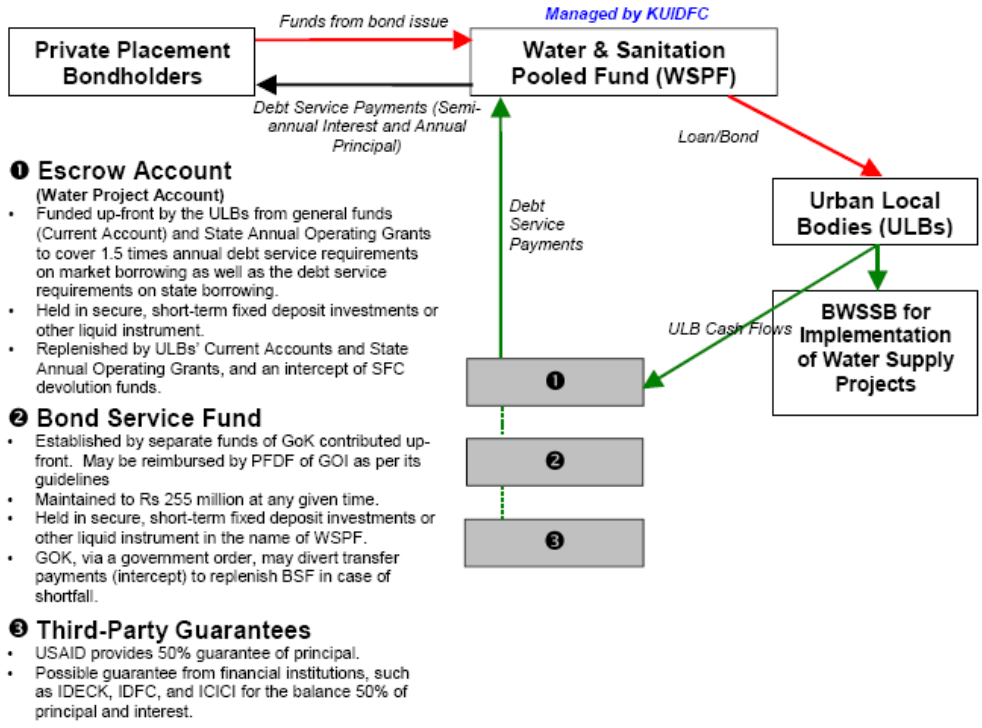
Table 2-31: List of some Municipal Bond issuances between 1997-2018

City	Amount (Rs. Mn)	Guarantee	Annual Interest	Escrow	Purpose	Rating
Bangalore Municipal Corporation (1997)	1,250	State Govt.	13%	State Government grants and property tax	City roads/street drains	A- (SO)
Ahmadabad Municipal Corporation (1998)	1,000	No	14%	Octroi from 10 octroi collection points	WS&S project	AA- (SO)

City	Amount (Rs. Mn)	Guarantee	Annual Interest	Escrow	Purpose	Rating
Ludhiana Municipal Corporation (1999)	100	No	13.5% to 14%	Water & Sewerage taxes and charges	WS&S Project	LAA- (SO)
Nasik Municipal Corporation (1999)	1,000	No	14.75%	Octroi from four collection points	WS&S project	AA- (SO)
Indore Municipal Corporation (2000)	100	State Govt	13.0%	Grants/property tax	Improvement of city roads	A (SO)
Nagpur Municipal Corporation (2001)	500	No	13%	Property tax and water charges	WS project	LAA- (SO)
Madurai Municipal Corporation (2001)	300	No	12.25%	Toll tax collection	City road project	LA+(SO)
Visakhapatnam Municipal Corporation (2004)	200	No	7.75%	Property tax	Water supply project	AA-(SO)
Pune Municipal Corporation (2017)	2000	No	7.59%	Property tax and user charges	SMART city	AA+(SO)
Indore Municipal Corporation (2018)	1400	No	9.25%	Property tax and user charges	AMRUT	AA(SO)
Greater Hyderabad Municipal Corporation (2018)	3950 across 2 tranches	No	8.90% & 9.38%	Property tax and user charges	Road development	AA

Further still, smaller municipalities have used pooled financing structures to a more sustainable method of financing. Clearly in states such as Tamil Nadu and Karnataka, where demand side reforms have tended to be better – rational and predictable transfers, improved empowerment for municipal governments have found it easier to raise market finance at low costs on non-guarantee mode and where the borrower- lender relationship is well defined.

Figure 2.71: Pooled Financing Structure – KWSPF (Karnataka)

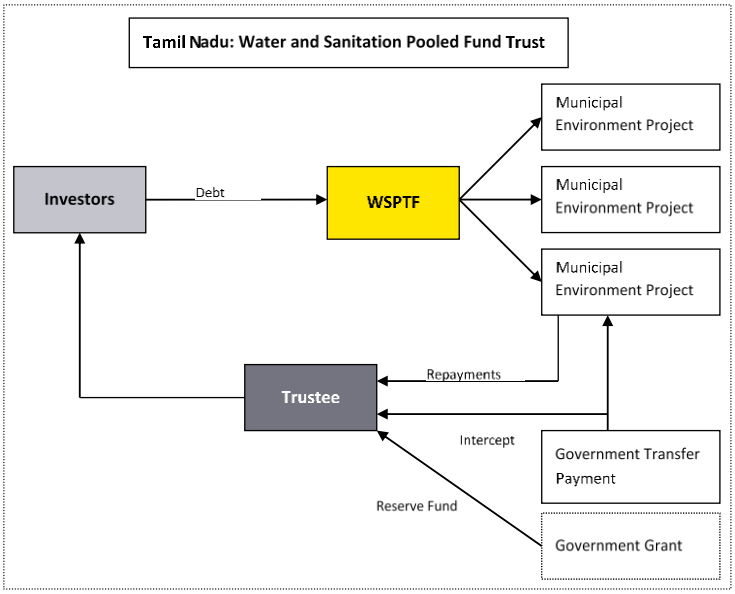


The project promoted by Bangalore Water Supply and Sewerage Board, KUIDFC and USAID's FIRE project supported the Board in pooling the demands of local bodies and enabled them raise resources from the Market. The fund manager is KUIDFC, a State Level financial intermediary and the security arrangements consist of an Escrow, Bond Services fund and guarantee by USAID. The total cost of the project is INR 3400 Mn and the sources of funds include:

Citizen Contribution-35% | Government Grants-22% | Municipal Bonds-30% | Subordinated Loans-13%

In Tamil Nadu, based on the recognition to lower costs for environmental projects, especially in small and medium towns, the state government set up Water and Sanitation Pooled Fund, as a trust with limited equity, and eliminating dividend expectations. This trust, with little recourse to the capital, relied on credit enhancements of a debt service reserve fund and repayment from borrower's taxes and fees. The average size of projects was $1 million (drinking water connections, pumping stations etc) and by aggregating these demands into a pool, raised $10 million through a bond issue (rated as AA at a spread of about 70 bps over state government borrowing cost).

Figure 2.72: Pooled Financing Structure – TNWSPF (Tamil Nadu)



A study of the bond issue of WSP shows that domestic private debt can finance environment infrastructure at low costs, if sufficient attention is given to the design of the intermediaries' capital structure, and security packages. And the depth of Indian markets in that a secondary market emerged with long term pension funds as investors.

Table 2-32: List of Secondary Investors in WSPF Bonds

List of Secondary Investors in WSPF Bonds
1) The Karnataka Bank Ltd 2) The Tata Engineering And Locomotive Company Ltd Superannuation Fund 3) The Tata Engineering And Locomotive Company Ltd Provident Fund 4) Credit Capital Investment Trust Company Ltd Trustees Taurus Mutual Fund A/C Libra Bond Fund 5) The Tata Engineering And Locomotive Co. Ltd Employees Pension Fund 6) The Baghat Urban Co Operative Bank Limited 7) The Indian Hotels Co. Ltd Employees Provident Fund 8) Trust Capital Services (India) Pvt. Ltd. 9) Digital Globalsoft Limited Provident Fund Trust 10) Staff Provident Fund of Nicholas Piramal India Ltd 11) City Union Bank Limited - Mount Branch 12) Gujarat Industries Power Co. Ltd. Provident Fund Trust 13) Metlife India Employees Provident Fund Trust 14) Advanta India Management Staff Provident Fund

Based on the Tamil Nadu and Karnataka experience the national government set up a Pooled Finance Development Fund, and initiative which promised much but delivered little. There are probably several reasons as to why PFDF has never taken off despite it being operated by the same Central Ministry.

- First, it coincided with the JnNURM program which placed an emphasis on equity PPP's and a set of reforms which do not address fundamental constraints for revenue streams of municipalities to improve. JNURM's reform agenda – reduction of stamp duties, elimination of rent controls and urban land ceiling – are based on the model that rapid growth in housing which these reforms were expected to generate would somehow get infrastructure financed. Needless to say this has not happened – nor is it likely to. Rent control is a fact of life at best in a few cities – in Chennai it covers less than 2% of housing stock – and the expectation that this elimination would improve the financial status of cities is a bit farfetched.

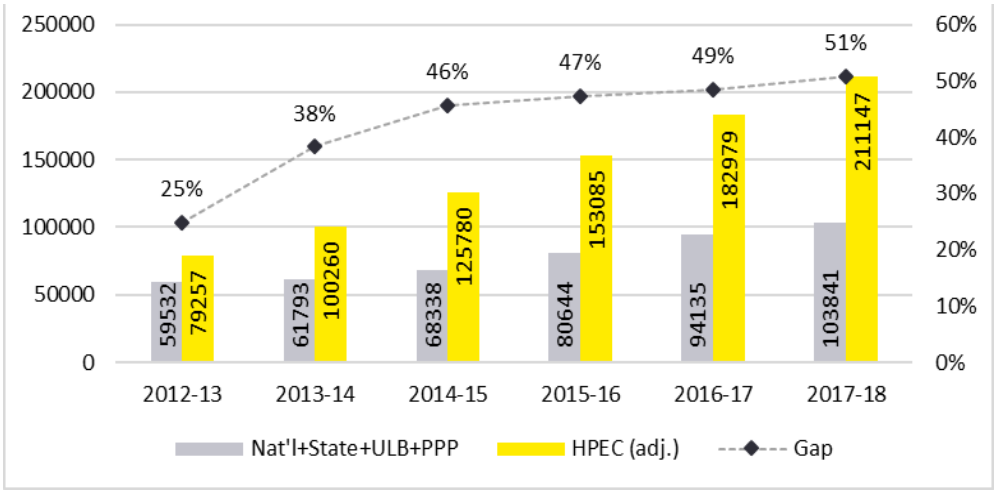
- Second, CSS (JnNURM, Smart Cities and Amrut) have definitely improved the flows of grant finance on an unprecedented scale. Prior to JUNRM, a plethora of GOI schemes were either restricted in geography (Mega Cities Program) or thinly spread such as the AUWSS, neither of which had much impact. Therefore, the pressure to search for finance was quite intense, JnNURM has successfully removed the pressure and at the same time eroded the incentives to leverage. Neither SCP nor Amrut have linked flows to leverage as is done in other national grant programs in other counties.
- Third and more difficult to document is the prevailing policy preference for equity PPP's driven both by national policy. It is suggested that this is myopic, for equity PPP's to function, municipal revenue streams need to be robust. And a distinction between project financing and a system that finance projects needs to be made and the latter is usually a national responsibility.

The HPEC (HPEC, 2011) has recommended **~₹39.1 Lakh crore** investment for Urban Infrastructure over a 20-year period [2011-12 to 2031-32]. The evaluation team has undertaken a broad assessment, subject to availability of data, of Actual Expenditures at all three tiers of Government for the Urban Infrastructure sub-sectors (excl. Housing) during the period [2012-18]. The assessment has revealed that:

Based on the analysis of National, State and Municipal CapEx provisions – a total of ~**₹3.8 Lakh Crore gap exists** (~45%) for the period [2012-18]

- Total estimated investment[1] - ~₹8.5 Lakh Cr
- Total investment actually made[2] - ~₹4.7 Lakh Cr[3]

Figure 2.73: Financing Gap in Urban Infrastructure (2012-18) based on HPEC estimates (Rs. Cr)



Source: EY and Athena analysis

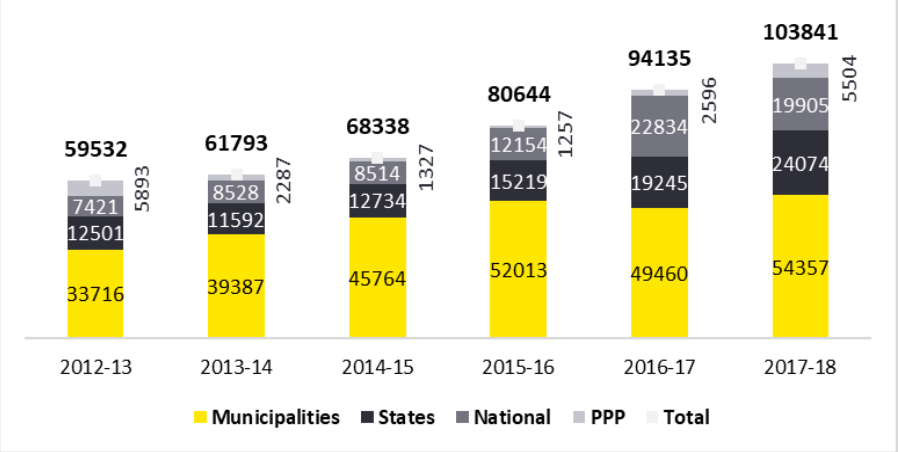
Notes:

1. *HPEC annual estimates have been projected using phasing plan provided (@pg. 81) and then adjusted from 2009-10 to current prices of respective years using Cost Inflation Index (FinMin, 2019)*
2. *ULBs record Central and State Grants (Schemes, FC, others) in their Capital Account. States record Scheme & FC grants in their Revenue Account. Avoiding any double counting issue, the Nat'l Metro/MRTS CapEx, State Capital Outlays (UD, WS&S), ULB CapEx and PPPs have been considered to reflect actual expenditures incurred for Urban Infrastructure Development from all 3 tiers of Govt.*
3. *The State Capital Outlays on Housing has been ignored, UD has been fully considered. Provisions among States for Urban WS&S CapEx were varying between 15-50% of the total WS&S (U+R) CapEx, hence an avg. of 30% of total WS&S (U+R) has been considered under Urban.*

Sources: *Municipal CapEx – ICRIER report to 15FC (2019); State CapEx – RBI Study of State Finances (2019); National MRTS CapEx – GoI budget docs; PPP – WB PPI Database; Cost Inflation Index – FinMin, 2019 [https://www.incometaxindia.gov.in/Charts%20%20Tables/Cost-Inflation-Index.htm]*

An important issue to note is that the gap during 2012-18 is increasing (25% to 51%), reflecting the consistent underspending at all 3-tiers of Government with respect to the required investment to meet benchmark service levels.

Figure 2.74: Annual Urban Infrastructure CapEx by all 3-tiers of Govt. (2012-18) (Rs. Cr)



Source: EY + Athena analysis

- While Central Govt. had access to multiple sources of funds (budgetary, IEBR, EAP, PPP, FC), the States and ULBs have leveraged limited options (Budgetary, IGFT, FC, Market)
- It is also observed that ULBs Revenue Expenditures (**RE**) on an avg. [2012-18] are **~98 per cent** of their **Own Revenues**, leaving no room for any Capital Expenditure (**CE**). RE have also grown beyond 100% of CE since 2016-17, infringing upon other revenue sources.
- Also, Revenue Exp. (incl. program funding) forms **~60 per cent of the Total Expenditures** in ULBs – pointing to limited institutional capacities available for implementation of Capital Programs.

Table 2-33: Aggregated Municipal Income & Expenditure figures (2012-18) (Rs. Cr)

ULB Finances	Total Own Revenue	Total Central Tr	Total State Tr	Market Borrowings	Other Source Rev.	Total Rev. Exp	Total Cap. Exp
2012-13	52,543.20	8,068.00	33,484.20	2,209.00	8,171.70	48,985.80	33,716.10
2013-14	58,248.90	9,878.10	38,908.50	3,466.10	9,118.50	53,910.90	39,386.70
2014-15	63,417.80	9,698.10	43,531.80	3,501.00	10,645.30	61,153.10	45,763.60
2015-16	70,223.20	13,306.10	47,335.50	4,178.50	11,535.20	66,924.30	52,013.40
2016-17	72,066.80	19,819.20	52,872.50	4,420.80	12,799.80	74,547.40	49,459.50
2017-18	73,331.30	20,569.40	55,573.90	3,794.20	18,428.30	78,195.50	54,357.10

Source: (ICRIER, 2019)

The above investment gap analysis highlights that, there is a strong **need to transition** from past and current National (**Co-operative**) approach towards Urban Sector financing to a more State-led and City owned financing format (**Competitive-Cooperative**). This encourages the States to lead, cities to own and Centre to facilitate Sector level financing initiatives vis-à-vis Scheme Programming.

However, it would be illogical to assume for that transition to occur without enabling and radically improving the abilities of **States and Cities to Leverage** their thinly spread resources.

Leverage – issues at States and ULB level

International experience suggests that coordinated action between different levels of government is needed if cities are to be provided access to systemic financing. Given the underlying asymmetry of information between lenders and borrowers, a potential market failure situation, leading to moral hazard and adverse selection is likely to, and has most probably, emerged. For a significant debt market, the need for a regulatory framework for municipal debt, specifying transparent rating criteria, removal of fiscal distortions and deepening of the capital markets, by encouraging tradability, are actions to be taken by the Central Government. At the State level, municipal reform, by way of specified cost recovery mechanisms and benchmarks for permissions to borrow are necessary steps in developing a market where private capital flows can finance public infrastructure.

J-Pal's study on impact of urban infrastructure investments in LatAM showed that:

Infrastructure investments can positively impact access to infrastructure, property values and private investment in marginalized urban areas.

- A randomized evaluation of a large infrastructure investment program in Mexico found that providing roads, sewage, lighting and sidewalks as well as community centers improved access to infrastructure. Residents responded to the program by investing in their homes which increased property values and reduced moving rates (J-Pal, 2018).
- Paving residential non-arterial streets in low income neighbourhoods in Mexico similarly increased property values. The increase in property wealth made residents more comfortable taking out larger loans to finance vehicles, home appliances and home improvements. Further, the road construction costs were equal to the increases in property values (J-Pal, 2016).

And in a country of India's size there is bound to be variety in the pace of both urbanization as well as institutional responses. For example, the framework for own source revenues vary significantly, in some states there is considerable freedom to vary these at the city level, whereas in others (Shillong) several parts of the city properties are outside the jurisdiction of the city government. A similar situation prevails with reference to user charges – in Chennai, part of the water charges is collected by the local government while some is collected by the Utility Company. Further still, there is considerable variation at the state level on the stability and reliability of fiscal transfers.

These major institutional issues are the most significant determinants of the capacity to attract private capital – debt or equity. Unless private capital can predict future revenue streams with some confidence the flow of finance will obviously be limited. Policies which strengthen the demand side are clearly needed. It would have been logical for a national program such as JnNURM, SCP and AMRUT to target major institutional reforms on the demand side – rational transfers, authority to raise finances and define jurisdictions than another CSS that ends up tracking disbursements rather than financial and institutional capacity.

Indian experience has shown where municipalities are trusted, and given powers to create, design, finance and pay for its use over time have shown remarkable powers to deal with institutional infirmities. The Alandur example in the environment sector and the Madurai road in the transport sector demonstrate the value of investing in local government, and the setting up of the PFDF by GOI was a policy movement in this appropriate direction of keeping the faith in local government. However, PFDF has not taken off and the policy direction has been more towards the equity PPF's especially after the JNURM launch. Equity PPP's are perceived as requiring fewer tough institutional choices – especially as risks are diffused through the system, whereas debt PPP's require strong policies for devolution which is always more difficult given the status quo.

In this regard, the SCM needs greater clarity on both financial as well as institutional aspects. Under this program, states and ULB invest equity in a special purpose vehicle (SPV) that was supposed to attract debt. With no guaranteed revenue streams, it is no surprise that these SPVs have so far been unsuccessful in leveraging private sources of finance. More troubling is the fact that the assets created by the SPVs would further fragment city assets that would reduce the size of the balance sheet and hence financing.

From an institutional standpoint, transferring city level assets and responsibilities back to the states implies a reversal of the 74th CA and decentralization principles. This is surprising as GOI has long recognised that functional and geographic fragmentation is inimical to both financing and governance. Added is the fact the central government is involved in approving the CEO's of the SPV's! If as it seems to be the case in most situations, the assets are not transferred, and the SPVs are only pass throughs, it is not clear if State Government equity is needed for a project implementation company.

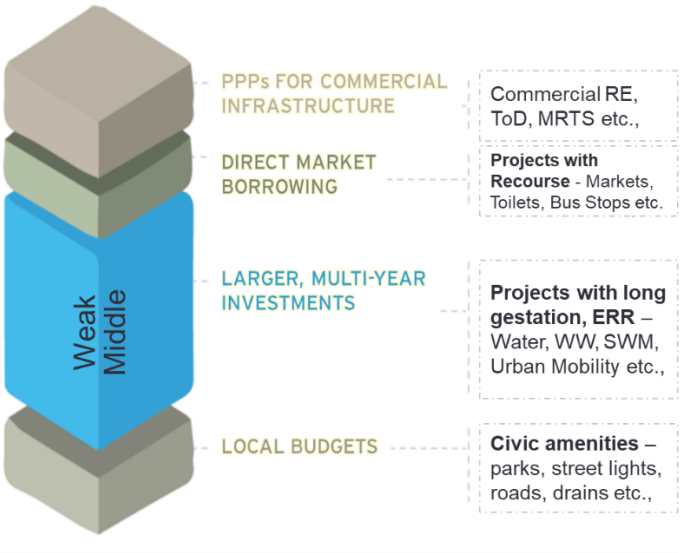
Assets to be financed

From a financing perspective, urban infrastructure investments can be divided into three categories:

i) investments that are more in the nature of public goods – parks, city roads etc and hence would need recourse to taxes to service debt
ii) investments that are more private in nature but still need capital subsidies - for example, water and wastewater, solid waste – where user charges and taxes can be used to service debt, and
iii) pure revenue projects like toll roads where the recourse is directly to user charges to service debt and equity.

The financing challenge would appear to be higher in the second category, named as the "weak middle" where private capital needs to be supported by public funds.

Figure 2.75: Weak Middle of Urban Infrastructure Finance



Source: (World Bank, 2017)

Instruments of Leverage - Debt

Most urban infrastructure investments, especially environmental ones, are capital intensive, long gestation investments that generate externalities across municipal boundaries. Their long life implies that benefits accrue over at least a generation and hence the costs should be similarly inter-generationally spread in the form of long-term debt. For example, water and sewer mains get replaced once in thirty years. Additionally, in many cases, public good characteristics (non-excludability in consumption) imply that user charges by themselves can rarely be expected to cover capital costs, maintenance and replacement. Subventions are either needed as grants in the capital financing, or subsidized interest rates.

Further, in smaller cities (which limit the economies of scale) and in lower income countries, the potential for full user charges are further constrained. For example, a wastewater system, at best, takes three years to build and involves construction and connection risks with little or no cash flows during this period. This implies the need for initial repayment moratoriums and also perhaps the need to complement debt with grants, especially if low-income populations constrain the ability to pay. Further in small towns, the low volume of connections would keep the user charges needed for debt service high.

These facts suggest the appropriateness of long tenor debt finance which allows user charges to grow gradually over time (as water and wastewater connections increase), as the high capital costs can be amortized in smaller repayment streams, and hence allow for affordability. Further, debt for municipal infrastructure would need to be denominated in local currency since most of these assets do not earn foreign currency revenues, and exchange rate volatility could pose major shocks for financial viability.

Instruments of Leverage - Equity

Equity is a preferred instrument if urban infrastructure investments can generate robust third-party sales (as is in the case of telecom and power) with users paying for products/services. This is also possible in inter-city toll roads, and commercial investments such as municipal shopping markets. On the other hand, for the first two category of investments identified above, the prospects for mobilizing equity appear limited without substantial subsidies.

Institutionally, there would have to be a process guidance in place for choice of the concessionaire, (unsolicited offers versus competitive bidding), rules for handling multiple ownership (a city water concession may depend on adequate flows from a source owned by the state), and security for the lenders (step in rights etc). Thus, equity investments in urban infrastructure are limited internationally (in developed and developing countries) and have usually not worked as per expectations.

Instruments of Leverage - Land Based Financing (VCF, Monetization)

Land value capture has been recommended as a cost recovery tool, especially when the investment triggers an increase in land values. Apart from transport investments (new roads) it possible for regulatory decisions, such as change in land use or FAR to directly affect property values. Land value captures (LVC), typically, institute a process to share this land value increment by capturing part or all of the change; and use LVC

proceeds to finance infrastructure investments (e.g., investments in transit and TOD), any other improvements required to offset impacts.

There are two main categories of LVC: development-based LVC and tax- or fee-based LVC. Development-based LVC can be facilitated through direct transaction of properties whose values have been increased by public regulatory decisions or infrastructure investment. Tax- or fee-based LVC is facilitated through indirect methods, such as extracting surplus from property owners, through various tax or fee instruments (e.g., property taxes, betterment charges, special assessments, etc.)

It has been argued that LVC is useful for capturing the benefits for urban transit systems in developed and developing countries (Suzuki et.al, WB, 2015) and (Smith & Gihring, 2014). It is claimed that the Hong Kong transit system has been financed using land value capture techniques. National governments have issued guidelines on methods of using LVC especially in the transport sector (MoUD, VCF Framework, 2017). Systems such as enhanced property taxes, impact fees exist in several legislations and practice, and it is not clear the extent to which this is a new financing tool. LVC as a policy tool, is perhaps optimally used to ensure that external benefits are recovered through these impact fees.

Some recent steps include the AMRUT reforms. Actions to provide financial guidance include the updates for 94 cities in 14 states of India, and 233 receiving credit ratings. Further and more concretely, the Pune Municipal Corporation raised Rs. 200 crores by issuing 10-year municipal bonds. CARE estimates that of Rs. 1,000- Rs. 1,500. Cr. per annum over the next five years would be raised by way of Municipal bonds is an indication of the expected growth in the market in the years to come (MoHUA, Cityfinance.in, 2020). While these estimates are encouraging, they would need reforms before financing can reach the scale necessary to lift cities in India from the current low-level equilibrium trap, and the policy satisfaction with project level achievements rather than systemic ones (NITI Aayog, 2018). Apart from financial sustainability, such an approach would encourage accountability by making municipalities responsible for designing, financing and paying for infrastructure over time. Given interstate variations in a typology based on the three essential pillars of municipal finance would be a useful starting point.

Most independent observers would agree that **Tamil Nadu & Karnataka** performance in opening up access for environmental infrastructure was on account of three enabling factors; first, the major reforms which allowed local governments to borrow, rationalization of revenue transfers, second, the deepening of the Indian debt market, which enabled longer term finance from insurance and pension companies to invest, and third, the availability of IBRD credit which facilitated blending with local finance. Of these, the critical catalyst was the **institutional reform** since the mid 1990's.

These major urban sector reforms, provided for **greater powers for local governments** to design, finance and create infrastructure. A major aspect of the reforms was to rationalise fiscal decentralization ensuring that revenue streams of local governments were more stable and predictable. On the supply side, it was recognised that along with enhanced powers and responsibilities local governments needed a sustainable financing mechanism which could raise resources from domestic markets. A key first step towards this objective was to **enable the intermediaries to pool** these demands so as to enable them to access long term debt finance.

2.2.3.3 Gaps in Implementation Capacities

There is no second opinion about the dearth of implementation capacities at City and State-levels for planning, designing, financing, implementing, operating & monitoring basic infrastructure services in rapidly urbanizing India. Globally as well, cities with the greatest infrastructure needs often lack the capacity and knowledge to develop bankable projects. It is a totally different rhetoric as to how many of the current bankable projects have been able to realize the value of investments or are mere examples of *privatization of profits and 'publification' of expenses* (Joan Clos, 2016).

Although, one of the fundamental objects of the 74th CAA (1992) has been to empower and make ULBs more resourceful/self-reliant. However, improvement of institutional capacities and resources at ULBs has not been proportional to urbanization. Since the time of JnNURM (2005), the inadequacy of persons with skills and capacity to execute urban infrastructure projects in a sustainable manner has continued to be a challenge (HPEC, 2011), the 12th Plan Steering Committee report (Planning Commission, 2012), the performance audit report on JnNURM (CAG, 2012), the CBUD project (NIUA, 2014), the qualitative assessment report on Capacity Building needs of ULBs (NITI-NIUA, 2015), the TA Report on Strengthening Institutional Capacity in Tamil Nadu (ADB, 2018), the performance audit of implementation of 74th CAA in Karnataka (CAG, 2020)].

It is also evident that functional and geographic fragmentation have further created complexities in implementation capacities to meet the needs of rapid urbanization. Lack of clarity in functions between ULBs and parastatals / state line departments – majority of the States in India have yet to fully devolve functions and functionaries to the ULBs to become self-reliant. Prevalent SPV structure, under SCM, further aggravates functional fragmentation of roles at the local level. Also, the ULBs are not empowered to coordinate and control the roles and functions of parastatals / state departments with respect provision of basic urban infrastructure and services. While, Urban planning processes lack integration of top-down and bottom-up plans – the absence of DPCs, MPCs and the same being managed through DTCP and/or UDAs is a set-back for ULBs in taking ownership of visioning vis-à-vis planned development. Structures and platforms for participatory planning are available in only few cities.

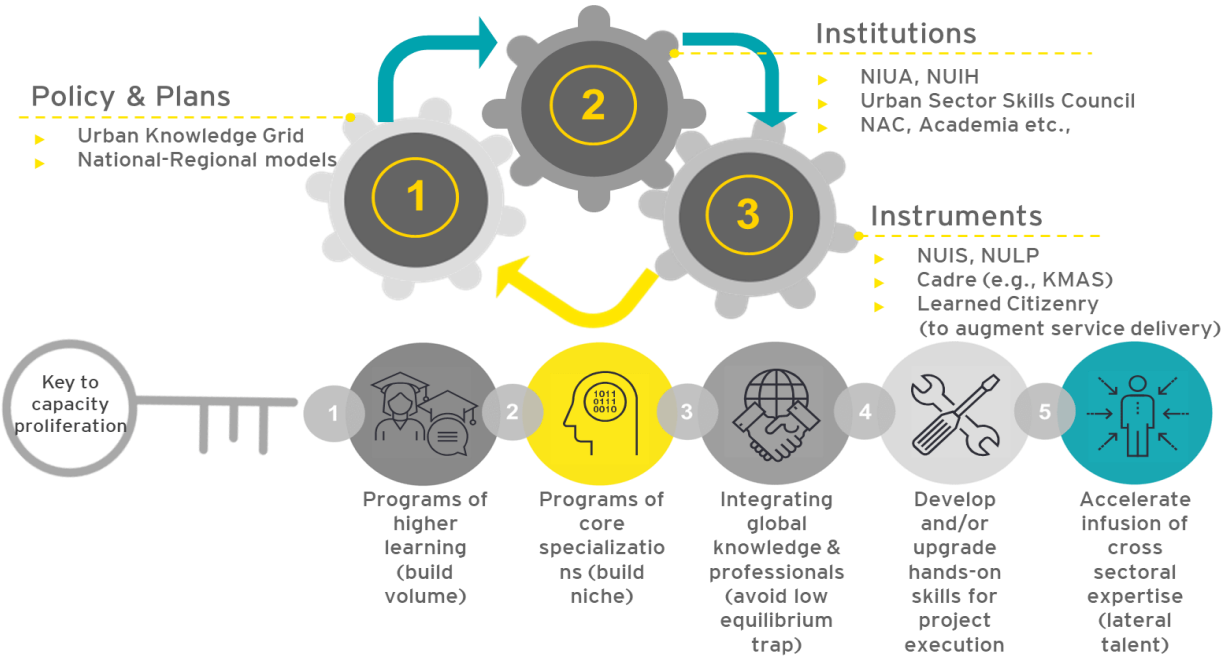
Non-standardisation of norms for classification of ULBs has caused asymmetry in growth of census towns and statutory towns. Also, the political economy constraints keep fostering anti-urban bias in the political regime and disincentivizing rural local governments to go urban due to apprehensions of losing large amounts of funds and be controlled by urban regulations (Isher J Ahluwalia, 2017). In addition, the Urban peripheral expansion among Class-I cities is ever increasing and adding to spatial fragmentation. The prevalent ABD model, under SCM, has sort of created new spatial units of implementation – adding to further geographical fragmentation of urban areas. The limited tenure and lack of powers for city mayors impacts accountability to citizens, while statutory / formal structures for citizen participation in local decision making are largely non-functional. The new non-formal mechanisms for citizen participation are being entirely Mission driven, pointing to sustainability issues.

The evaluation team observes that, despite attempts made through the 5 CSS for development and/or augmentation of implementation capacities, there are still certain critical areas of complexity to be resolved:

- Insufficient capacity and capability at the ULB and State level - accorded low priority;
    - National level institutions have not evolved to cater to growing needs of the Cities.
- Existing capacity building programmes largely drive Missions' priorities viz. limited funding, are not demand responsive and not continuous.
- Supply side constraints in terms of a) credible high-quality institutions b) industry-academia linkages
- Only some states have municipal cadre, however lack of systemic mobility of urban sector officials (both vertical and horizontal) is a barrier to scaling up good practices and/or re-inventing the wheel viz. limiting the recurrence of mistakes

The learning and skills ecosystem for Urban India needs a greater systemic impetus and institutional proliferation to achieve the required capacity levels for transitioning from current status. An ecosystem view below depicts the broad contours of the key to such proliferation:

Figure 2.76: Urban Knowledge ecosystem perspective



Source: EY and Athena analysis

Cities in India are suffering with insufficient personnel with skills and capabilities to meet the increasing demand of sustainable urban development. Functional and Financial autonomy of ULBs is observed to be hampered due to several reasons, majorly political economy constraints et.al., Mission linked capacity enhancements and/or citizen participation will only affect temporarily but would not serve the ULBs in achieving the much-needed effective decentralization for sustainable urban development.

2.3 Key Findings and Way Forward

The present situation is one of – increasing physical and financial gaps, weak demand conditions in ULBs leading to unstable revenue streams which do not allow private debt or equity supply into the sector. This is coupled with functional and geographic fragmentation – increasing the counterparty risks. The rational policy response is to strengthen the institutional framework – stable intergovernmental fiscal flows, improved definition of municipal responsibilities, powers and thereby reducing functional and geographic fragmentation.

The evaluation team strongly believes that any forthcoming Centrally Sponsored Schemes for the Urban Sector should reorient themselves to address the following three critical aspects.

India's 10 fastest growing ***Cities*** and the new ***Urban Middle Class*** are expected to add nearly **$2 Tn** to its GDP, by **2035** (Oxford Economics, 2019).

Will Building Better Working Cities be the answer to India's $5 Tn Economic Leap by 2025?

S.M.A.R.T OUTCOMES	**Focus more on Outcomes** ▪ Design and Implement a **S**pecific, **M**easurable, **A**chievable, **R**elevant and **T**ime-bound Outcomes Framework ▪ Provide flexibility to States, Cities – while ensuring some fundamentals are applied universally ▪ Drive performance of Cities through standardized, periodic monitoring & evaluation ▪ Embed annual Outcomes Evaluation into SFC and CFC reports, ensuring equity & performance criteria in devolutions
LEVERAGE	**Catalyse more Leverage at State & ULB levels** ▪ Enable Public and/or Private Financing to comprehensively meet the demands of City Infrastructure ▪ Ensure clear allocation of Functions and sub-sectors between Cities & Parastatals – to achieve Balance Sheet risk clarity, for lenders ▪ Enable improved financial & management reporting (e.g. integrated reporting) by ULBs. This could be done with the support of State Urban Finance Intermediaries, which are anyway SLNAs for resource augmentation
IMPLEMENTATION CAPACITY	**Widen Urban Knowledge systems and enhance Implementation Capacities** ▪ Strengthen urban sector learning ecosystem – leadership, managerial & skills ▪ Encourage Cities to adopt Institutional Mechanisms (e.g., SPV) focused only on Capital Programs ▪ Strengthen the role of State level Intermediaries (e.g., KUIDFC, RUDSICO, OUIDF etc.,) in supporting Small & Medium Towns (<1 Lakh population) through market-based human resource augmentation ▪ Expand Citizen Engagement, on a widespread basis through digital means, into Planning and Implementation stages to achieve more transparent, accountable & efficient program implementation

Appendix

Sectoral level Analysis

Appendix 1.1 - Highlights of evolution of urban development programmes and initiatives in India

Period	Programmes and Initiatives
1951-61 (1st and 2nd FYP)	• Institutional set-up for the management of urban areas such as creation of Ministry of Work, Housing and Supply (1952); the National Building Organisation (1954), Regional and Town Planning Department in Indian Institute of Technology, Kharagpur (1952) • Establishment of School of Planning and Architecture (1959); and Delhi Development Authority (1957) • Integrated Subsidised Housing Scheme (1952) for industrial workers and economically weaker sections • Low Income Group Housing Scheme (1956)
1961-74 (3rd and 4th FYP)	• Establishment of Town and Country Planning Organisation (1962) • Establishment of Housing and Urban Development Corporation (HUDCO) (1970) to finance housing and urban development projects • Establishment of Calcutta Metropolitan region • Development plans for 72 urban centres • Regional studies in respect of metropolitan regions around Delhi, Greater Bombay and Kolkata were initiated • Environmental Improvement of Urban Slums (1972) – Provision of a minimum level of basic services in slum areas of 11 cities with a population of eight lakhs and above • Development of New State Capitals such as Chandigarh, Gandhinagar, Bhopal and Bhubaneswar
1974-90 (5th, 6th and 7th FYP and Rolling Plan)	• Establishment of Mumbai Metropolitan Regional Development Authority (1975) • National Commission on Urbanisation (1986) submitted its report in August 1988 and bill known as 65th Constitution Amendment which was introduced in Lok Sabha in 1989. • Formation of Ministry of Urban Development (MoUD) • Urban Land (Ceiling and Regulation) Act, 1976 – Putting a ceiling on the ownership of vacant land in UAs and thereby bringing more land into the markets • Coverage of Environmental Improvement of Urban Slum programme was extended to all cities • Integrated urban development programme (1974-79) in Metropolitan cities and areas of national importance • Integrated Development of Small and Medium Towns (IDSMT) (1979) – aimed at 200 small and medium towns • Urban Basic Services for Poor (UBSP)
1992 – 2005 (8th, 9th and 10th FYP	• 74th CAA to grant constitutional status to urban local bodies • Mega City Scheme (1992-97) – Mumbai, Kolkata, Chennai, Bengaluru and Hyderabad • Accelerated Urban Water Supply Programme (1994) • Swarna Jayanti Shahari Rozgar Yojana (1997) subsuming Nehru Rojgar Yojana, UBSP, Prime Minister's Integrated Urban Poverty Eradication Programme (PMIUPEP) • National Slum Development Programme (1997) • Integrated Development of Small and Medium Towns Scheme extended to 904 towns (revamped and dovetailed for boosting employment generation)

Period	Programmes and Initiatives
	• Valmiki Ambedkar Awas Yojana (VAMBAY) (2001) for the provision of shelter and upgrading the shelter of the people below poverty line
2005 – 12 (10th and 11th FYP)	• Launch of Jawaharlal Nehru Urban Renewal Mission – for integrated urban development of urban infrastructure and services in select 65 mission cities. Earlier programmes such as Mega City, IDSMT, NSDP and VAMBAY were subsumed under this programme • Rajiv Awas Yojana – to support State and city governments to upgrade slums and assign title to the slum dwellers and make Indian cities slum free • SJSRY was reemphasised with major emphasis on skill development, self-help groups and micro finance for self-employment
2012-present (12th FYP)	• National Urban Livelihood Mission (NULM) (2013) – aimed at all the cities to build capacities and skills in sectors that have growing employment opportunities with an aim to benefit the urban poor. • Swachh Bharat Mission (Urban) (2014) – focused on waste management and sanitation in all statutory towns • Smart Cities Mission (2015) – aimed at developing smart solutions for selected urban areas in 100 cities • The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) – focusing on waters supply and sewerage improvement in all class 1 cities • Pradhan Mantri Awas Yojana - Urban (PMAY-U) for provision of housing to all by 2022 • Heritage City Development and Augmentation Yojana (HRIDAY) – to address the development of 12 heritage cities

Source: Compiled from Kundu et.al. (2018); Bhagat (2014); Sharma (2014); and various five-year plans of India; India Habitat III, National Report, 2016, MoHUA, GoI; Schemes/ programmes guidelines

Appendix 1.2 - Global goals and national priorities

Sustainable Developments Goals relevant for Urban Sector

SDG-11: Sustainable Cities and Communities

The targets are:

11.1	By 2030, ensure access for all to **adequate, safe and affordable housing and basic services and upgrade slums**
11.2	By 2030, provide **access to safe, affordable, accessible and sustainable transport systems**
11.3	By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, **integrated and sustainable human settlement planning and management**
11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage
11.5	By 2030, significantly **reduce the number of deaths and other losses caused by disasters, including water-related disasters**
11.6	By 2030, **reduce the adverse per capita environmental impact of cities**
11.7	By 2030, provide **universal access to safe, inclusive and accessible, green and public spaces**
11.a	Strengthening national and regional development planning
11.b	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
11.c	Building sustainable and resilient buildings utilising local materials

SDG-6: Clean Water and Sanitation

The targets are:

6.1	By 2030, achieve **universal and equitable access to safe and affordable drinking water**
6.2	By 2030, achieve **access to adequate and equitable sanitation and hygiene** for all and end open defecation
6.3	By 2030, **improve water quality**, **halving the proportion of untreated wastewater** and substantially increasing **recycling and safe reuse** globally.
6.4	By 2030, substantially **increase water-use efficiency** across all sectors
6.b	Support and **strengthen the participation of local communities in improving water and sanitation management.**

SDG-1: No Poverty

The targets are

1.1	By 2030, **eradicate extreme poverty for all people everywhere**, currently measured as people living on less than USD 1.25 a day
1.2	By 2030, **reduce at least by half the proportion of men, women and children of all ages living in poverty** in all its dimensions according to national definitions
1.3	Implement nationally appropriate **social protection systems and measures for all**, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable
1.4	By 2030, **ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources**, **as well as access to basic services, ownership and control over land and other forms of property**, inheritance, natural resources, appropriate new technology and financial services, including microfinance
1.a	Ensure significant **mobilization of resources** from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, **to implement programmes and policies to end poverty** in all its dimensions
1.b	Create sound **policy frameworks** at the national, regional and international levels, based on **pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions**

Source: https://sustainabledevelopment.un.org/ accessed on 15th January and 10th April 2020

Outline of draft National Urban Policy Framework

	Ten Sutras – philosophical principles		Ten Functional Areas
1	Cities are cluster of Human Capital	1	City Planning
2	Cities require a 'Sense of Place'	2	Urban Economy
3	Not static Master Plans but evolving Ecosystems	3	Physical Infrastructure
4	Build for Density	4	Social Infrastructure
5	Public Spaces that encourage Social Interaction	5	Housing and Affordability
6	Multi-modal Public Transport Backbone	6	Transportation and Mobility
7	Environmental Sustainability	7	Urban Finance
8	Financially Self-Reliant	8	Urban Governance
9	Cities require Clear, Unified Leadership	9	Urban Information Systems
10	Cities as Engines of Regional Growth	10	Environment and Sustainability

Source: Draft National Urban Policy Framework, 2018

Status of Urban Sector related targets in reference to SDGs: Indian Overview

Sustainable Development Goal	Target Value (%) for 2030	Status (%)
Goal 11: Sustainable Cities and Communities		
Houses completed under PMAY (U) as a percentage of net demand assessment for houses	100	32
Urban households living in slums	0	5.41
Wards with 100 per cent door to door waste collection	100	90.99
Waste processed	100	56.00
Installed sewage treatment capacity as a proportion of sewage generated in urban areas	100	38.00
Goal 6: Clean Water and Sanitation		
Urban households with individual household toilet	100	97.22
Goal 1: No Poverty		
Population living below National Poverty line	10.95	21.92
Households living in kutcha houses (rural + urban)	0	4.2

Source: SDG Index, NITI Aayog, 2019

Appendix 1.3 - Linkages of various schemes with urban CSS contributing towards SDGs achievement

Besides these key CSS under this evaluation study, there are many more initiatives undertaken by MoHUA and other Central Government Ministries which contribute directly and indirectly to achieve global development goals and national priorities.

There are many key indicators that contribute towards the goal of clear water and sanitation. As these CSSs are evolving and expanding, they are further addressing additional indicators under these goals. Recently in the year 2019, GoI launched 'Jal Shakti Abhiyan' (JSA) as a response to escalating water crisis, that strongly targets SDG 6 for water conservation and water efficiency. JSA was launched as a water conservation campaign by creating citizens as the key resource for its implementation. It was a short duration campaign, which ran through two phases in the last half year of 2019. The focus of the campaign was on water stressed districts across the country which encompassed 756 ULBs as well. In the short-term the campaign's focus has been on integrated demand and supply side management of water at local level with thrust on rainwater harvesting (RWH), reuse of treated waste-water, rejuvenation of water bodies, and plantation of trees.

ULBs are responsible to carry out the projects and the funding is to be routed through AMRUT in case of the cities under this mission. In case of cities which are not under AMRUT's ambit, need to utilise the State funds, grants available under CFC and SFC, and other external sources. The AMRUT guidelines were amended to provide for utilisation of State A&OE funds for mass awareness campaign the respective States (MoHUA, Guidelines for Urban water conservation Jal Shakti Abhiyan, 2019). The JSA witnessed 9.15 lakhs events and 3.4 crore people's participation with around 2.4 lakh RWH structures installed, new 31 thousand establishments using waste water, and 1470 water bodies have been taken up for rejuvenation (MoHUA, AMRUT, 2020). Along with this increasing focus of AMRUT and SBM (U) towards resource efficiency will help in achieving certain indicators such as ambient water quality in water bodies, water use efficiency, level of water stress etc. in future years.

Similarly, there are certain initiatives especially in case of urban transport which are fragmented and spread across multiple missions and interventions. During JNNURM, the Mission provided for development of projects for public transport, city roads, parking projects etc. The new Missions, SCM and AMRUT, both has strong linkages with urban transport especially capturing non-motorised transport (NMT), energy efficient public transport, pedestrian facilities, multi-level car parking (MLCP), smart roads amongst many others.

Beside these initiatives, MoHUA's urban transport wing also looks after the interventions such as Bus Rapid Transit System (BRTS), urban transit infrastructure or financing of metro rail projects across the country (MoHUA, Urban Transport, 2020). Although, large investments are carried out by MoHUA towards urban transport, due to its fragmented approach, the indicators under global goals may have not been measured. This also highlights that may be there is a need to have a separate Mission for urban transport which addresses the physical infrastructure and mobility systems (both public and private) with an objective for universal access towards urban transport for every person in the country.

In addition, MoHUA launched 'National Heritage City Development and Augmentation Yojana (HRIDAY), a central sector scheme of the GoI in January 2015. Its overall aim has been to bring together urban planning, economic growth and heritage conservation in an integrated, inclusive and sustainable manner. This contributed towards protecting cultural heritage. Under this scheme, twelve cities were identified, and the mission period ended in March 2019. The scheme focussed on planning, development and implementation of core heritage linked infrastructure including revitalisation of urban infrastructure for areas around heritage, religious, cultural and tourism assets of the cities. This included implementation and enhancement of basic services with focus on water supply, sanitation, drainage, waste management, approach roads, streetlights, public conveniences and such services. Broadly, this Mission has observed linkages with SCM, AMRUT and SBM (U) (NIUA, HRIDAY Guidelines, 2015).

Further, there are certain indicators under SDGs which are difficult to measure and hence MoHUA along with other organisations will have to formulate systems to measure and monitor them. For example, urban air quality or disaster resilience. To overcome increasing challenges due to environmental degradation and climate change, in 2010, Central Government launched 'National Mission on Sustainable Habitat' (NMSH) to build urban resilience. This was launched along with other seven Missions under the first 'National Action Plan on Climate Change (NAPCC). It was approved with an outlay of Rs. 54,200 crore, however due to no specific targets, only Rs. 950 crores was allocated for the Mission in the 12th FYP (2012-17) (Centre for Science and Environment, 2018)

The focus of the Mission has been to promote understanding of climate change, its adaptation and mitigation, energy efficiency and natural resource conservation. The Mission sought to promote:

- Improvements in energy efficiency in buildings through extension of the existing Energy Conservation Building Code;
- Better urban planning and modal shift to public
- Improved management of solid and liquid waste
- Improved ability of habitats to adapt to climate change by improving resilience of infrastructure, community-based disaster management, and measures for improving advance warning systems for extreme weather events; and
- Conservation through appropriate changes in legal and regulatory framework.

The key deliverables of the Mission included:

- Development of sustainable habitat standards that lead to robust development strategies while simultaneously addressing climate change related concerns;
- Preparation of city development plans that comprehensively address adaptation and mitigation concerns;
- Preparation of comprehensive mobility plans that enable cities to undertake long-term, energy efficient and cost-effective transport planning; and
- Capacity building for undertaking activities relevant to the Mission.

(MoUD, National Mission on Sustainable Habitat, 2010)

Technical divisions such as the Central Public Works Department (CPWD), Central Public Health and Environmental Engineering Organisation (CPHEEO), Town and Country Planning Organisation (TCPO) and the Institute of Urban Transport (IUT) were the key institutions for the NMSH's sector-wise agenda. These sectors encompassed; energy efficiency in the residential and commercial building sectors, urban transport, water supply and sewerage, urban planning, urban storm-water drainage, and municipal waste[9] (Centre for Science and Environment, 2018).

All the urban Missions' underlined focus has been on reducing environmental degradation and build urban resilience, but it needs more pragmatic approach to create more sustainable, climate and disaster resilient cities. For example, poor air quality is a recent phenomenon which has led to degradation of human health which has been partially addressed across the Missions. SCM is trying to monitor the air quality, and SCM and AMRUT are contributing towards building upon energy efficient and non-motorised transport. But to overcome this problem, there will be a need for comprehensive planning and development of urban infrastructure with defined outcomes.

Although, NMSH paved the way for macro-level objectives for climate and disaster resilience, MoHUA needs to create more outcome-based interventions for sustainable habitat. SDG 11 focuses on creating 'resilience' especially towards natural disasters. India faces numerous natural disasters including earthquakes, urban flooding, cyclones etc. and the frequency and adversity of such disasters is increasing over the time. SCM and AMRUT with focused approach towards storm water management and PMAY (U)'s increasing focus towards resilient building development highlight MoHUA's emphasis on these aspects. Indian cities are densely populated, and many buildings are seismically vulnerable which draws an attention towards the requirement of earthquake resistant infrastructure. Thus, 'seismic sustainability/ resilience', is a key step to reduce the human and material losses due to natural disasters (Jha, R. 2020), especially when India has recently witnessed earthquakes at increasing frequency. This not only calls for resilient planning at building level but also at a city level with a comprehensive approach by infusing disaster resilient and climate resilient principles in urban planning.

There are numerous other Centrally sponsored and Central Sector Scheme of GoI which are contributing towards the overall urban development agenda in some indirect manner, like National Skill Development Mission (NSDM) – creating skilled workforce for urban centres, Digital India – penetrating the IT infrastructure

[9] As per (Centre for Science and Environment, 2018), the NMSH was highly advisory in nature. JNNURM was identified as the main channel for implementation and routing of funds for NMSH. But till the year 2014, the Mission was able to create only advisory documents and sub-committee reports on different sectors to create more climate change responsive infrastructure. With the launch of new Missions by Central Government, including SCM, AMRUT, SBM, HRIDAY etc. which focussed more on vast coverage and specific sectors the focus shifted towards these new schemes which had clear outlay and targets. Since there was some overlapping of the objectives in the new schemes and NMSH, it was believed that the fundamentals of the NMSH will be reflected in the new schemes. CPHEEO reflects that there are no specific funds that have been allocated for NMSH, which is now being implemented through flagship missions of MoHUA i.e. AMRUT, SBM (U) and SCM.

for creating conducive environment for smart solutions across the schemes etc. These all efforts are in some way contributing towards the achievement of SDGs and priorities defined under draft NUPF.

Appendix 1.4 – Details of Investments in Urban Sector

State wise funding assessment for the Urban Sector in AP, Gujarat, Jharkhand & UP (Amount in Rs. Crores)

State	Scheme	2015-16	2016-17	2017-18	2018-19	2019-20	Total Investments (2015-20)	% share against State Total
		A	B	C	D	E	F=A+B+C+D+E	
1. Andhra Pradesh[1]	CSS grants to State	1,111.54	506.18	1,285.09	1,990.33	1,090.12	5,983.26	45%
	State Contribution to CSS	137.48	475.18	430.38	595.62	1,107.17	2,745.83	21%
	State investments for the Sector (Other than CSS)	217.33	663.85	545.84	1,520.14	1,695.00	4,642.16	35%
	Sub-Total	***1,466.35***	***1,645.21***	***2,261.31***	***4,106.09***	***3,892.29***	***13,371.25***	***100%***
2. Gujarat	CSS grants to State	-	588.00	429.24	404.57	-	1,421.81	19%
	State Contribution to CSS	-	862.59	309.79	480.96	1,574.62	3,227.96	42%
	State investments for the Sector (Other than CSS)	-	-	-	-	2,992.44	2,992.44	39%
	Sub-Total	**0.00**	**1,450.59**	**739.03**	**885.53**	**4,567.06**	**7,642.21**	***100%***
3. Jharkhand[2]	CSS grants to State	113.73	470.83	639.14	445.00	487.00	2,155.70	29%
	State Contribution to CSS	71.74	130.74	419.01	442.50	468.50	1,532.49	21%
	State investments for the Sector (Other than CSS)	557.17	1,046.68	700.86	688.45	653.00	3,646.16	50%
	Sub-Total	**742.64**	**1,648.25**	**1,759.01**	**1,575.95**	**1,608.50**	**7,334.35**	***100%***
4. Uttar Pradesh	CSS grants to State	121.38	509.62	1,308.33	2,006.81	4,132.81	8,078.95	43%
	State Contribution to CSS	216.85	603.85	1,402.90	2,127.44	3,978.37	8,329.41	45%
	State investments for the Sector (Other than CSS)	570.61	736.89	200.12	333.37	328.29	2,169.28	12%
	Other Central Schemes related to Urban (State contribution)	102.77	26.03	27.89	72.00	395.24	623.93	-
	Sub-Total	**908.84**	**1,850.36**	**2,911.35**	**4,467.62**	**8,439.47**	**18,577.64**	***100%***
Total for Sample 4 States	CSS grants to State	1,346.65	2,074.63	3,661.80	4,846.71	5,709.93	17,639.72	38%
	State Contribution to CSS	426.07	2,072.36	2,562.08	3,646.52	7,128.66	15,835.69	34%
	State investments for the Sector (Other than CSS)	1,345.11	2,447.42	1,446.82	2,541.96	5,668.73	13,450.04	29%
	Other Central Schemes related to Urban (State contribution)	102.77	26.03	27.89	72.00	395.24	623.93	-
	TOTAL	**3,220.59**	**6,620.46**	**7,698.59**	**11,107.19**	**18,902.56**	**47,549.38**	**100%**

[1] For Andhra Pradesh - revised estimates for the year 2018-19 & budgeted estimates for the year 2019-20 have been considered.
[2] For Jharkhand - revised estimates for the year 2018-19 & budgeted Estimates for the year 2019-20 have been considered.

Scheme wise funding assessment for the Urban Sector in AP, Gujarat, Jharkhand & UP (Amount in Rs. Crores)

Scheme	State	CSS grants to State- 2015/16-2019/20	State contribution to CSS - 2015/16-2019/20	Sub-total CSS - 2015/16-2019/20	State investments for the sector (Other than CSS) -2015/16 -2019/20	Sub-total State contributions for the Sector-2015/16-2019/20	Total investments in the Sector 015/16-2019/20	Share of Central Contribution for Scheme – Total spending	Share of State Contribution for CSS scheme &State Scheme – Total spending
		A	B	C=A+B	D	E=D+B	F=C+D	C/F	E/F
AMRUT	Andhra Pradesh	1,055.24	311.00	1,366.25	1,722.49	2,033.49	3,088.74	34%	66%
	Gujarat	281.20	1,530.97	1,812.17	2,956.44	4,487.41	4,768.61	6%	94%
	Jharkhand	372.29	290.92	663.20	3,612.68	3,903.60	4,275.89	9%	91%
	Uttar Pradesh	1,793.97	2,604.29	4,398.25	1,761.75	4,366.04	6,160.00	29%	71%
	Sub-total AMRUT	**3,502.69**	**4,737.18**	**8,239.87**	**10,053.36**	**14,790.54**	**18,293.23**	**19%**	**81%**
Smart Cities Mission	Andhra Pradesh	844.00	508.00	1,352.00	398.00	906.00	1,750.00	48%	52%
	Gujarat	751.50	496.00	1,247.50	-	496.00	1,247.50	60%	40%
	Jharkhand	396.00	302.00	698.00	-	302.00	698.00	57%	43%
	Uttar Pradesh	1,825.00	1,825.00	3,650.00	150.50	1,975.50	3,800.50	48%	52%
	Sub-total SCM	**3,816.50**	**3,131.00**	**6,947.50**	**548.50**	**3,679.50**	**7,496.00**	**51%**	**49%**
PMAY	Andhra Pradesh	3,719.00	1,457.75	5,176.76	2,058.31	3,516.06	7,235.07	51%	49%
	Gujarat	279.53	829.69	1,109.22	36.00	865.69	1,145.22	24%	76%
	Jharkhand	941.35	702.96	1,644.31	-	702.96	1,644.31	57%	43%
	Uttar Pradesh	2,749.88	1,833.25	4,583.13	880.96	2,714.21	5,464.09	50%	50%
	Sub-total PMAY	**7,689.76**	**4,823.65**	**12,513.41**	**2,975.27**	**7,798.93**	**15,488.69**	**50%**	**50%**
SBM	Andhra Pradesh	128.59	363.90	492.49	463.36	827.26	955.85	13%	87%
	Gujarat	109.10	328.39	437.49	-	328.39	437.49	25%	75%
	Jharkhand	281.21	153.68	434.88	-	153.68	434.88	65%	35%
	Uttar Pradesh	1,446.97	1,891.44	3,338.41	-	1,891.44	3,338.41	43%	57%
	Sub-total SBM	**1,965.86**	**2,737.42**	**4,703.28**	**463.36**	**3,200.78**	**5,166.64**	**38%**	**62%**
NULM	Andhra Pradesh	236.42	105.16	341.58	-	105.16	341.58	69%	31%

Scheme	State	CSS grants to State- 2015/16-2019/20	State contribution to CSS - 2015/16-2019/20	Sub-total CSS - 2015/16-2019/20	State investments for the sector (Other than CSS) -2015/16 -2019/20	Sub-total State contributions for the Sector-2015/16-2019/20	Total investments in the Sector 015/16-2019/20	Share of Central Contribution for Scheme – Total spending	Share of State Contribution for CSS scheme &State Scheme – Total spending
	Gujarat	0.48	42.91	43.39	-	42.91	43.39	1%	99%
	Jharkhand	164.86	82.93	247.79	33.47	116.40	281.27	59%	41%
	Uttar Pradesh	263.15	175.43	438.58	-	175.43	438.58	60%	40%
	Sub-total NULM	**664.91**	**406.43**	**1,071.34**	**33.47**	**439.91**	**1,104.82**	**60%**	**40%**
Total for all schemes	Andhra Pradesh	5,983.26	2,745.82	8,729.08	4,642.16	7,387.98	13,371.24	45%	55%
	Gujarat	1,421.81	3,227.96	4,649.77	2,992.44	6,220.40	7,642.21	19%	81%
	Jharkhand	2,155.70	1,532.48	3,688.19	3,646.16	5,178.64	7,334.35	29%	71%
	Uttar Pradesh	8,078.96	8,329.41	16,408.37	2,793.21	11,122.62	19,201.58	42%	58%
	Total	**17,639.73**	**15,835.68**	**33,475.41**	**14,073.97**	**29,909.65**	**47,549.38**	**37%**	**63%**

The following table provides an overview of some of the State Level Schemes and initiatives undertaken in AP and Gujarat.

State	State Initiatives
Andhra Pradesh	**<u>Water Supply & Sewerage Projects</u>** • Infrastructure Facilities in Grade-III Municipalities (Budgeted Rs 44.52 crores for 2019-20) • Infrastructure Facilities in Nagarapanchayats under DMA (Budgeted Rs 40.00 crores for 2019-20) • Loans to Nellore Municipal Corporation for Comprehensive Water Supply and Under Ground Drainage (Revised budget of Rs 152.39 crores for 2018-19) • Assistance to Andhra Pradesh Urban Greening and Beautification Corporation (Budgeted Rs. 13.50 Crores for 2019-20) • AIIB loan for Andhra Pradesh Urban Water Supply & Septage Management Improvement Project (APUWSSMIP) (Loan of Rs. 3,214 crores for 50 ULBs) – Sanctioned in 2018-19 • AIIB loan - Andhra Pradesh Urban Water Supply & Septage Management Improvement Project (APUWSSMIP) (Loan of Rs. 63 crores for Pilot Septage Management Project) – Sanctioned in 2018-19 **<u>Smart cities</u>** • Implementation of Smart Cities of State Scheme for - Anantapur, Eluru, Kurnool, Nellore, Ongole and Srikakulam • Visakhapatnam Smart City – Support through VCCICDP – ADB - Distribution Network improvements for NRW reduction and 24x7 water supply in North –West sector of GVMC area- Project cost Rs.424.92 Crores • Visakhapatnam Smart City - Development of Sewerage System in Gajuwaka and Malkapuram area and Wastewater Treatment System for Supply of Recycled Water to various industries in the peripherals of Visakhapatnam Package 1 with a project cost of Rs.412.00 Crores. A financial assistance of Rs.150 Crore in the form of Equity and/or Equity equivalents proposed to be provided by GVMC to GVSCCL, and the balance amount of Rs. 262 Crore to be arranged by APUIAML as Term Loans. • Visakhapatnam Smart City - Development of Sewerage System in Gajuwaka and Malkapuram area and Wastewater Treatment System for Supply of Recycled Water to various industries in the peripherals of Visakhapatnam Package 2 with a cost of Rs. 530 Crores. GVMC to contribute Rs. 350 Cr towards the sewage collection network and conveyance component for package 2 project by means of grants from the Government/Municipal Bonds/Loans/ internal revenue sources of GVMC etc. and the balance amount of Rs.180 crores will be arranged by the Andhra Pradesh Urban Infrastructure Asset Management Limited, Vijayawada as term loan equivalent to funding. **<u>Housing</u>** • YSR Urban Housing (Budgeted Rs 1,000 crores for 2019-20) • Loans to Andhra Pradesh Township & Infrastructure Development Corporation Ltd., (APTIDCO) for Housing (Actual Expenditure of Rs. 60.00 crores for 2017-18)
Gujarat	**<u>Water Supply & Sewerage Projects</u>** • Nal se Jal scheme - Safe drinking water for every household by providing tap drinking water - Rs 4,500 Cr (FY 2019-20) • Assistance to Municipal Corporations/ Municipalities – Rs 449.48 Cr (FY 2019-20) • Capital support to Gujarat urban development Company - Rs 10 Cr (FY 2018-19) • Assistance through Swarna Jayanti Mukhyamantri Shaheri Vikas Yojana - To provide civic infrastructure in urban areas - Rs 4,540 crore (FY 2018-19)

State	State Initiatives
	• Improvement in water supply and drainage system - Rs 1,264 crore (FY 2018-19) • Infrastructure creation - Rs 2,912 crore (FY 2018-19) • A provision for functioning STP under water supply and underground sewage project - Rs.1264 Cr (FY 2018-19) • Assistance for AMC to operate STP in 105 municipalities – Rs 71.44 Cr (FY 2018-19) • Assistance for newly formed 6 municipalities – Rs 50 Cr (FY 2015-16) **Housing** • Assistance for Urban Housing (UDA's, Housing Boards & ULB's) – Rs 992.90 Cr (FY 2019-20) • Assistance to Gujarat Housing Board under Mukhya Mantri Gruha Yojna & other amenities – Rs 10 Cr (FY 2019-20) & Rs 70.28 Cr (FY 2017-18) to Ahmedabad Urban Development Authority

List of External Assisted Projects

Details of Project Wise EAP Funding in Urban Sector

EAP - where inflows are >100Cr			2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
ADB	DoNER	North Eastern Region Urban Development Program	120.58	-	-	-	-
ADB	DoNER	North Eastern Region Capital Cities Development Investment Program	-	73.85	86.55	44.95	-
AFD	MoHUA	Smart City Projects	-	-	-	-	399.21
AFD	Pune	Pune Metro Rail	-	-	-	-	-
JICA	Delhi	Delhi Metro Rail	1723.13	2688.76	3106.85	3140.4	1844.48
JICA	Chennai	Chennai Metro Rail	980.06	1703.82	213.73	29.2	308.49
JICA	Mumbai	Mumbai Metro Rail	0	106.64	911.5	-	2492.15
JICA	Kochi	Kochi Metro Rail	161.79	264.64	-	-	-
JICA	Ahmedabad	Ahmedabad Metro Rail	-	-	151.69	394.48	828.64
JICA	Kolkata	Kolkata East-West Metro Project (II)	-	-	-	-	-
JICA	Delhi	Delhi - Water Supply Improvement Program	-	-	-	-	-
JICA & AFD	Bengaluru	Bengaluru Metro Rail	598.39	707.06	282.44	150.94	-
JICA & AFD	Nagpur	Nagpur Metro Rail	-	-	-	204.26	230.25
JICA & EUIB	Lucknow	Lucknow Metro Rail	-	-	730.72	-	798.55
WB	MoHUA	Capacity Building for Urban Development Project	-	11.12	-	-	-
Major EAP under State Plan							
ADB	Kerala	Kerala Sustainable Urban Development Project	600.03	-	-	-	-
ADB	Karnataka	North Karnataka Urban Sector Investment Program Project	361.03	58.15	-	-	-
ADB	Jaipur	Jaipur Metro Rail Line 1 - Phase B	82.13	222.09	119.72	127.27	148.1
ADB	Rajasthan	Rajasthan Urban Sector Development Investment Program Project-2	-	851.94	66.04	143.53	184.13

EAP - where inflows are >100Cr			2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
ADB	Jammu & Kashmir	Jammu & Kashmir Urban Sector Development Investment Program Project-2	-	207.84	-	-	-
ADB	Assam	Assam Urban Infrastructure Investment Program Project-1	-	-	36.56	-	-
ADB	Karnataka	Karnataka Integrated Urban Water Management Investment Program-Project-1	-	-	34.08	96.78	41.31
ADB	Madhya Pradesh	Madhya Pradesh Urban Services Improvement Project	-	-	-	45.15	195.77
ADB	Bihar	Bihar Urban Development Investment Program-Project 1	-	-	-	16.25	69.12
JICA	Bengaluru	Bengaluru Water Supply and Sewerage Project	1244.81	-	-	-	-
JICA	Hyderabad	Hussain Sagar Lake and Catchment Area Improvement Project	415.88	-	-	-	-
JICA	Kolkata	Kolkata Solid Waste Management Improvement Project	232.71	-	-	-	-
JICA	Agra	Agra Water Supply Project	656.86	-	40.98	416.62	-
JICA	Amritsar	Amritsar Sewerage Project	244.65	-	-	-	-
JICA	Odisha	Orissa Integrated Sanitation Improvement Project	478.16	-	-	-	193.38
JICA	Goa	Goa Water Supply and Sewerage Project	1388.23	-	-	-	-
JICA	Hogenakkal	Hogenakkal Water Supply and Fluorosis Mitigation Project	1374.14	-	-	-	-
JICA	Guwahati	Guwahati Water Supply Project	-	-	34.51	49.14	-
JICA	Hyderabad	Hyderabad Outer Ring Road	3652.32	-	160.85	4.31	-
WB	Maharashtra	Maharashtra Water Sector Improvement Project	60.09	-	-	-	-
WB	Tamil Nadu	Tamil Nadu Urban Development Project - 3	228.27	88.97	175.73	484.53	481.73
WB	Karnataka	Karnataka Municipal Reforms Project	217.66	-	-	-	-
WB	Andhra Pradesh & Telangana	Andhra Pradesh and Telangana Municipal Development Project	6.83	398	-	-	104.14
WB	Tamil Nadu	Mumbai Urban Transport Project-2A	996.07	-	-	-	-
WB	Karnataka	Karnataka Urban Water Supply Modernization Project	-	-	1.67	-	-
WB	Uttarakhand	Uttarakhand Water Supply Program for Peri- Urban Areas	-	-	-	-	7.09
EAP - where inflows are <100Cr							
KfW	-N.A-	-N.A-	-	101.88	-	-	-
EUIB	-N.A-	-N.A-	-	115.78	-	-	-
JICA	-N.A-	-N.A-	-	2258.97	-	-	-
AFD	-N.A-	-N.A-	-	60.56	-	-	-
DFID	-N.A-	-N.A-	-	161.93	-	-	-

Source: GoI Budget Documents, 2014-20

Details of Agency Wise EAP Funding in Urban Sector

	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	Total
ADB	1163.77	1413.87	342.95	473.93	638.43	4032.95

	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	Total
AFD	-	60.56	-	-	399.21	459.77
DFID	-	161.93	-	-	-	161.93
EUIB	-	115.78	-	-	-	115.78
JICA	12552.74	7022.83	4620.11	4034.15	5667.14	33896.97
JICA & AFD	598.39	707.06	282.44	355.2	230.25	2173.34
KfW	-	101.88	-	-	-	101.88
WB	1508.92	498.09	177.4	484.53	592.96	3261.9
JICA & EUIB	-	-	730.72	-	798.55	1529.27
Total	**15823.82**	**10246.73**	**6153.62**	**5347.81**	**8326.54**	**45898.52**

Source: GoI Budget Documents, 2014-20

Appendix 1.5 – Sectoral outcome coverage and gaps – aggregated view

Liveability Parameter	Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Housing & Shelter	Availability of adequate, safe, and affordable housing (ownership/ rental/ temporary for homeless) with basic services for all (slum/ EWS/ and other income segments)	PMAY (U), ARHC; NULM - SUH component; AMRUT, SBM, SCM	Access, Adequacy, Quality, Equity
Housing & Shelter	Security of tenure and ownership and control over land, property	PMAY (U)	Access, Equity
Housing & Shelter	Access to affordable housing finance, to enable housing ownership for all segments	PMAY (U) – CLSS	Access, Equity
Housing & Shelter	Rehabilitate slums and/ or upgrade basic infrastructure in slums	PMAY (U), AMRUT, SBM (U) [1]	Access, Equity
Housing & Shelter	Skill Development of the people involved in housing construction sector	PMAY (U) – GHTC	Livelihood
Housing & Shelter	Adoption and Mainstreaming of modern, innovative and green technologies and building material for faster and quality construction of houses.	PMAY (U) – TSM; PMAY (U) - GHTC	Sustainability
Mixed Land-use & Compactness	Sustainable land development and efficient land use	SCM – ABD redevelopment component; AMRUT – LAP/ TPS	Adequacy, Sustainability
Mixed Land-use & Compactness	Enhanced walkability and reduction in commuting time	SCM, AMRUT	Access, Adequacy, Sustainability
Mixed Land-use & Compactness	Promotion of vibrant street life	NULM – SUSV component; SCM, AMRUT	Access, Equity, Livelihood
Mixed Land-use & Compactness	Inclusive neighbourhoods	AMRUT - NMT, SCM – urban transport	Access, Equity
Mixed Land-use & Compactness	Increase in Transit-Oriented Developments (TOD) in Cities	SCM	Access, Adequacy
Transport & Mobility	Availability of adequate and safe road infrastructure i	AMRUT and SCM	Access, Adequacy, Equity
Transport & Mobility	Enhanced use of NMT, public transport and improved last mile connectivity iii	AMRUT and SCM	Access, Adequacy, Quality, Sustainability
Transport & Mobility	Availability of adequate Parking Infrastructure in Public areas	SCM, AMRUT	Access, Adequacy, quality
Transport & Mobility	Promotion of Environment friendly and sustainable mode of public transport and IPT iii	SCM - FAME	Sustainability
Transport & Mobility	Financially sustainable Public Transport Infrastructure and Services	SCM	Sustainability
Public Open Spaces	Universal access to safe, inclusive green and public spaces	SCM and AMRUT	Access, Equity

Liveability Parameter	Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Public Open Spaces	Adequate open and green spaces in cities	--	Adequacy
Public Open Spaces	Availability of public recreational spaces, more vibrant community life	SCM	Access, Adequacy
Public Open Spaces	Improved quality of waterfront spaces for citizens to use for recreation and physical activities	SCM, AMRUT	Access, quality
Public Open Spaces	Enhanced quality of public open spaces	SCM, AMRUT, SBM, NULM	Quality
Public Open Spaces	Sustainable O&M of Public open spaces	SCM, AMRUT	Sustainability
Water Supply	Universal and adequate access to safe drinking water for all (individuals, communities and public)	SCM, AMRUT	Access, Quality, Equity
Water Supply	Availability of 24X7 water supply	--	Adequacy, Sustainability, Equity
Water Supply	Adequate treatment & distribution capacity of drinking water	AMRUT	Adequacy
Water Supply	Equitable water charges for different users	AMRUT	Equity
Water Supply	Financially sustainable drinking water infrastructure and services	AMRUT	Sustainability
Water Supply	Sustainability of drinking water resources	JJM, AMRUT	Quality, Sustainability
Sanitation & WW Management	Universal and adequate access to individual and public sanitation facilities	SBM Guidelines (2017)	Access, Adequacy
Sanitation & WW Management	Universal design principles and sanitation standards	SBM Guidelines (2017)	Access, quality, Equity
Sanitation & WW Management	Access to sewer connection or affordable and safe management of faecel sludge	AMRUT, SBM(U); CPHEEO Advisory on Public and Community Toilets (2018)	Access, equity
Sanitation & WW Management	Adequate treatment capacity of greywater and blackwater	AMRUT, SBM(U); CPHEEO Manual (2013); Advisory on Public and Community Toilets (2018)	Adequacy
Sanitation & WW Management	Promotion of reuse/recycle of wastewater and principles of circular economy	--	Sustainability
Sanitation & WW Management	Sustainable O&M of Sewerage & Sanitation facilities	SBM Guidelines (2017); AMRUT	Sustainability
Sanitation & WW Management	Decent work, health and occupational safety of sanitation workers	--	Livelihood
Solid Waste Management	Regular collection service to all waste generators(i)	SBM Guidelines 2017	Access, Adequacy
Solid Waste Management	Cleaner neighbourhood and cities	SBM My Swachh Neighbourhood Guideline 2017	Access, Quality

Liveability Parameter	Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Solid Waste Management	Modern and scientific management of waste(ii)	SBM Guidelines 2017; Objective 2.1.3; SCM Guidelines 2015	Quality, Sustainability
Solid Waste Management	Transition towards circular economy including EPR system and integration with industry and academia	SBM (U) – Plastic Waste Management 2019; SBM Guidebook 2016	Livelihood and Sustainability
Solid Waste Management	Formalizing and providing safe, healthy working conditions to informal sector workers	SBM(U), NULM	Livelihood
Solid Waste Management	Increase in public awareness and behaviour change (ix)	SBM Guidebook 2016	Sustainability
Solid Waste Management	Sustainable O&M of SWM infrastructure	SBM (U) Guidelines	Sustainability
Air Quality & Pollution	Achievement of National Ambient Air Quality Standards	SCM, SBM, NCAP	Quality
Air Quality & Pollution	Reduction in number of Non Communicable Diseases (NCD) deaths due to air pollution	NCAP	
Air Quality & Pollution	Reduction of environmental impact in cities due to air pollution	SCM, SBM	Sustainability
Air Quality & Pollution	Improved adoption of renewable natural resources to reduce GHG emmissions	-	Sustainability
Air Quality & Pollution	Reduction of impact of pollution on vulnerable population of cities	-	Equity
Air Quality & Pollution	Sustainable O&M of Air Quality Measurement infrastructure	SCM	Sustainability
Safety & Security	Improved emergency response time through integrated city safety & security systems	SCM	Access, Adequacy, Quality
Safety & Security	Ease of access to safety & security services to all citizens at all times	SCM	Access
Safety & Security	Reduced urban transport related violations, accidents and fatalities	SCM, AMRUT	Access, Adequacy, Quality
Safety & Security	Reduced socio-economic and human losses due to disasters (natural/human) including flooding	SCM, AMRUT, SBM (U)	Sustainability
Safety & Security	Reduction in incidences of crime against vulnerable population esp. in public spaces	-	Equity, Adequacy
Safety & Security	Sustainable O&M of all safety & security infrastructure	SCM	Sustainability
Health	Universal access to affordable & good quality healthcare infrastructure in cities	NUHM	Access, Adequacy, Quality, Equity
Health	Reduction in Socio-economic and human losses due to infrastructure/services addressing vector borne & NCD	SCM, AMRUT, SBM(U)	Access, Adequacy, Quality
Health	Participation of Community based Organizations, Development Partners, NGOs, SHGs and facilities to achieve	SBM (U), NULM	Equity, Livelihood, Sustainability

Liveability Parameter	Sectoral Desired Outcomes	Urban CSS Mapping	Principles
	cleanliness and hygiene in communities		
Health	Sustainable O&M of all infrastructure supporting health	-	Sustainability
Education	Universal access to affordable & good quality education infrastructure in cities	MHRD schemes, SCM	Access, Adequacy, Quality, Equity
Education	Enhancing retention, transition by providing infrastructure and other facilities to educational establishments	SCM, AMRUT, SBM(U)	Adequacy, Quality, Sustainability
Education	Ensure facilities that are child, disabled and gender sensitive to provide safe, inclusive and effective learning environment	SCM, AMRUT, SBM (U)	Equity, Quality
Education	Sustainable O&M of all infrastructure supporting education	-	Sustainability
Identity & Culture	Enhance liveability of cities and safeguard their identities	SCM, HRIDAY	Quality, Sustainability
Identity & Culture	Ensure social inclusion in cities through culture	-	Equity
Identity & Culture	Foster human-scale and mixed-use cities by drawing on lessons learnt from urban conservation practices	SCM, HRIDAY	Access, Adequacy, Quality
Identity & Culture	Enhance the quality of public spaces through culture	SCM	Quality
Identity & Culture	Build on identity & culture as a sustainable resource for inclusive economic and social development	HRIDAY, SCM, MoC schemes	Livelihood, Sustainability
Identity & Culture	Regenerating cities and urban-rural linkages by integrating identity & culture at the core of urban planning	-	Access, Equity
Identity & Culture	Promote participatory process through culture and enhance the role of communities in local governance	-	Equity
Capacity Building	Result based demand-responsive training initiatives (i)	-	Access, Quality
Capacity Building	Continuous training opportunities for all stakeholders (Officials, Elected Representatives, Citizens etc.) (ii-a) and timely, quality assured training (ii-b)	SCM (TULIP), (SBM) E-Learn, (NULM) U-Learn	Access, Livelihood
Capacity Building	Enhance informed decision making and better prioritisation of local needs / policies(v)	-	Quality, Sustainability, Equity
Capacity Building	Adoption of integrated, adaptive, practical learning and leveraging existing institutional mechanisms(vi)	CBUD; SCM (TULIP); (SBM) E-Learn; U-Learn (NULM);	Access, Quality
Capacity Building	Systematic knowledge management, encourage partnerships, and institutionalisation of capacity created(vii)	PMAY(U) Gurukul, SCM (Smartnet), SBM, AMRUT	Sustainability

Liveability Parameter	Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Capacity Building	Availability of adequate Municipal Cadre	SCM Guidelines 10.6 & 13.3; NULM, PMAY, SBM, AMRUT	Adequacy, Sustainability
Capacity Building	Ensure availability of adequate staff with requisite skill sets; creation of enabling framework for professional hiring(vii)	SCM, AMRUT, PMAY(U), SBM(U), NULM	Adequacy, Quality
Capacity Building	Recognition of training in career progress(x)	-	Sustainability, Livelihood
Capacity Building	Financial sustainability of capacity building initiatives(xi)	-	Sustainability
Capacity Building	Enhanced institutional mechanism for integrated planning and sustainable development of Cities	SCM, AMRUT	Adequacy, Sustainability
Citizen Engagement	Enhanced decision-making power to citizens(i)	NULM, SCM, PMAY	Access, Adequacy
Citizen Engagement	Improvement in access, effectiveness and efficiency of public service delivery(ii) and social security schemes	SCM, SBM, AMRUT, NULM, PMAY	Access, Adequacy, Quality, Sustainability, Equity
Citizen Engagement	Improvement in citizen satisfaction of public infrastructure and service delivery	SCM, SBM, AMRUT, NULM, PMAY	Quality
Citizen Engagement	Improvement in public control and citizens' access to public data(v)	SCM, SBM, NULM, AMRUT, PMAY	Access, Adequacy
Citizen Engagement	Enhanced accountability to citizens(vi)	SCM	Sustainability
Citizen Engagement	Advancing a right to the city – ensuring equity in urban societies(vii)	-	Access, Equity
Citizen Engagement	Enhanced resilience of citizens and communities(viii)	-	Sustainability
IT & eGovernance	Availability and universal coverage of e-services in cities	SCM, AMRUT	Access, Equity
IT & eGovernance	Adequate e-services, availability of applications through different modes – mobile applications, kiosks, electronic-offices/service providers	All schemes	Adequacy
IT & eGovernance	Improved responsiveness and quality of services offered through the digital portals/interfaces	All schemes	Quality
IT & eGovernance	Improved efficiency and transparency of public services	All schemes	Sustainability
IT & eGovernance	Drive citizen and private innovation in public service delivery	SCM	Access, Sustainability
Financial Sustainability	Access & adequacy of various funding options at Central, State & City level	All schemes	Access, Adequacy
Financial Sustainability	Enhanced leverage of Municipal Finances - enabled by borrowing framework	-	Adequacy
Financial Sustainability	Robust Own Source Revenue (OSR) in ULBs	15FC	Adequacy
Financial Sustainability	Rational predictable assigned sources (SFCs, CFCs)	15FC	Sustainability

Liveability Parameter	Sectoral Desired Outcomes	Urban CSS Mapping	Principles
Financial Sustainability	Availability of funding sources and options to all ULBs	PMAY, SBM(U), NULM	Equity
Financial Sustainability	Gender based budgeting, funding arrangements	-	Equity
Financial Sustainability	Adoption of outcome based funding models	-	Sustainability
Others	Improved Livelihoods of Urban Poor	NULM	Livelihood
Others	Enhanced access to gainful self-employment and/or skilled employment opportunities in cities	NULM	Livelihood

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