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Role of National Missions Towards Achieving Sustainable Management of Urban Water for All

S. Indupriya[1], Prof. Dr. S. Kumar[2] and Dr. K.V. Ganesh Babu[3]

[1]S.Indupriya, Ph.D, Research Scholar, SPA, JNAFAU University, Hyderabad,
[2]Prof.Dr.S. Kumar, SPA, JNAFAU University, Hyderabad.
[3]Dr.K.V.Ganesh Babu , Head Infrastructure planning & Design, ADCL-AP

Abstract:- As per census 2011, Nearly 31.16% of present India's population lives in 7935 towns. Number of metropolitan cities are increasing, Increase in further urbanization and expanding urban areas in India, will generate great pressure on Infrastructure creation and Management.

Only 70.6% of urban Households have access to individual water connections and only 21 per cent of the waste water generated is treated Present paper discusses challenges faced by Urban Local Bodies in water supply Management. Improving service delivery in slums and peri urban areas / extended areas is an urgent priority need to be addressed by authorities. The Paper also highlights ongoing Missions (framework, measures and indicators) which are implementing in India which helps in achieving Sustainable Development Goals.

Keywords: Sustainable Development Goals, Urbanization, Urban Local bodies, Access to water, Service Delivery

1. INTRODUCTION

India urban population will be 590 million by 2030 which would be about 40 percent of the total population of the country and further estimates that by 2030, the number of million plus cities will increase to 68 of which 13 cities will have more than 4 million and six cities will have more than 10 million persons. (Micknensy, April 2010)

Ongoing increase in the number of metropolises, that is, cities whose population exceeds one million inhabitants is tremendous. In India not only the size of metropolitan cities has increased dramatically but also their number. The number of metropolitan cities (+1 million) has risen sharply from 35 to 53 during 2001-11 (Kumar, September 2015).

Table1: Classification of Towns and Cities (Census 2001 & 2011)

	2001 census	2011 census		
City Type	**Number**	**Number**	**Population in Million**	**Population Share (%)**
10 million+	3	3	48.83	13
5 to 10 million	5	5	36.2	10
1-5 million	27	45	73.35	19
Other Class I cities	406	415	105.59	28
Small and medium towns	4720	7467	113.13	30
Total	**5161**	**7935**	**377.1**	**100**

Source: Census 2001, 2011

As per 2011 census, there are 53 million plus urban agglomerations/cities. The population concentration in large urban centres results in migration, pressure on infrastructure and resources, Growth of slums. Increase in further urbanization and expanding urban agglomeration in India, will generate great pressure on delivery and management of Infrastructure.

2. ANALYSIS OF ACCESS OF HOUSEHOLDS TO DRINKING WATER IN URBAN INDIA

Access of urban Households to water supply in various states of India as per census 2011, are highlighted in the following section.

2.1 Main source of drinking water: As regards water supply availability at households, only 70.6% of households are using Tap water, 6.2% access to well water, 20.8% access to Hand pump/Tube well water as the main source of drinking water.

***T*able 2: Percentage of Households by main source of Drinking water**

	Total	Urban	Rural
Access to Tap water	43.5	70.6	30.8
Access to well Water	11	6.2	13.3
Access to Hand pump/ Tube well water	42	20.8	51.9
Other Sources (Tanker supply & Bottled water)	3.5	2.5	4

Source: Census 2011

2.2 Availability of Drinking Water

Only 71.2% of Urban Households have source of water within the premises while 20.7% of households have to fetch water from a source located within 100meters in urban areas and 8% still fetch drinking water from a source located more than 100meters in urban area.

2.3 Analysis of water supply situation in Urban areas in various states

States having the highest percentage of urban households having access to tap water are A & N Islands (97.9%), Chandigarh (96.8%), Himachal Pradesh (95.5%), Puducherry (95.4) and Sikkim (92.1%) and States having the lowest percentage of urban households having access to tap water are Lakshadweep (16.9 %), Bihar (20%), Assam (30.2%), Kerala (34.9%) and Nagaland (35.7%).

Table3: Distribution of states by percentage of Urban households having access to Tap water (Treated and Un Treated source)

Percentage Range	No. of States	Name of States
Below 30	2	Lakshadweep (16.9%), Bihar (20%)
30 - 40	3	Assam (30.2%), Kerala (34.9%) Nagaland (35.7%)
40 - 50	2	Jharkhand(41.6%) ,Odisha (48%)
50 - 60	5	D&N Haveli (50.3%), Uttar Pradesh (51.5%), Tripura (54%), West Bengal(55.6%), Manipur (56.3%)
60-70	2	Madhya Pradesh (62.2%), Chhattisgarh (62.5%)
70-80	6	Daman&Diu(72.6%),Punjab(76.4%),Haryana(77.5%),Mizoram(74.4%), Meghalaya(77.6%),Uttarakhand(78.4%),
80-90	9	NCT (81.9%),J& K (87.9%), Rajasthan(82.6%),Arunachal Pradesh(84.2%),Gujarat (85.6%), Maharashtra (89.1%),Andhra Pradesh *(83.5%),Karnataka (80.4%),Tamilnadu(80.3%),
Above 90	6	Goa(90.2%),Sikkim(92.1%),Puducherry(95.4%),HimachalPradesh(95.5%), Chandigarh (96.8%),A&N Island(97.9%)

Source: Census 2011

3. CHALLENGES OF WATER MANGEMENT IN INDIA

Following section highlight Major challenges facing by Urban Local bodies in Water Management

3.1 Water Resource

India is facing the challenge to serve 17% of the world population with 4% of the world's freshwater resources. Presently designated as a water stressed nation, India stores less than one-tenth of annual rainfall. Furthermore, disproportionate use of water for agricultural use, excessive ground water pumping and deficient monsoon in the last couple of years make the demand-supply balance more critical. As per NITI Aayog, India is facing water crisis with around 50% population experiencing high-to-extreme water shortage (NITIAayog, 2019).

3.1.1 Water pollution

Urbanization results in reduction in Number of water bodies and pollution of water bodies. According to the National Urban Sanitation Policy (NUSP) of Ministry of Urban Development (MoUD), Government of India (GoI), inadequate discharge of untreated domestic /municipal wastewater has resulted in contamination of 75 percent of surface water sources across India leading to spread of water-borne diseases in urban areas. Inadequate sanitation is also a cause for contamination of groundwater aquifers. Untreated sewage also remains the single biggest land-based source of pollution for coastal areas of India (Central Pollution Control Board).

3.1.2 Depletion of ground water level.

India has extensive groundwater resources and it is the largest user of ground water. The Dynamic Ground Water Resources of India, 2017 report of Central Ground Water Board (CGWB) showed that out of total No of assessed Units 6881 (blocks/mandals/ taluks), 4310 (62%) are safe, 972 (14%) are semi-critical, 313 (4.5%) are critical, 1186 (17) % are over exploited and 100 (1.45%) are saline. This report highlights need for immediate attention required on Ground Water extraction in India.

Twenty one Indian cities–including Delhi, Bengaluru, Chennai and Hyderabad–will run out of groundwater by 2020. (NITIAayog, 2019)

3.1.3 Water Quality

Provision of safe drinking water is essential to promote public health and ensure prevention and control of water borne diseases. Despite an increased access to clean drinking water in urban areas of India in the past few decades, the quality of water supplied has remained an area of concern, no of samples conducted and Frequency of tests are not adequate

3.1 Service Delivery

- The current performance of all service sectors fall far below basic service standards. If current trends continue, it estimates that with the projected urbanization, the demand and supply gap in all basic services sector will be huge (3.5 times in water supply).
- Only 64 per cent of urban population are covered by individual water connections and stand posts in India. Duration of water supply ranges from 1 hour to 6 hours and Per capita supply of water in Indian cities ranges from 37 lpcd to 298 lpcd .
- Non-revenue water (NRW) accounts for 50 per cent of water production, compared with 5 per cent in Singapore. (TheHighPoweredExpertCommittee, March 2011)

3.2 Institutional Setup

Fragmented institutional set up- The multiplicity of agencies with overlapping jurisdictions and fragmented roles and responsibilities has been a major factor in the poor delivery of urban services. In some states, statutory agencies of state governments (parastatals) are assigned the responsibility for delivering urban services, e.g. water and sewerage. The board of the parastatal has representatives from different departments of the state government that are involved in organising the delivery of the service in question to areas under the jurisdiction of a number of ULBs (TheHighPoweredExpertCommittee, March 2011)

3.3 Capacity constraints

Municipal administration has typically suffered from overstaffing of untrained, unskilled manpower on the one hand and shortage of qualified technical staff and managerial supervisors on the other. It is not surprising then that ULBs have not been in a position to deliver current demand for urban services, let alone plan for the growing needs of cities (TheHighPoweredExpertCommittee, March 2011).

3.4 Inadequate investments in urban infrastructure

Municipal budgets in India have been heavily dependent on fiscal transfers from the higher tiers of government, Urban India will require huge investments for present and future demand.

The investment estimates for the eight sectors of urban infrastructure for the 20-year period from 2012 to 2031 amount to Rs 31 lakh crore at 2009-10 prices, water supply sector constitute the 10.6 per cent of the total urban infrastructure investment.

Average Per Capita Investment Cost for Water Supply sector at 2009-10 prices is Rs 5099 and Average Per Capita Operations & Maintenance Cost at 2009-10 prices is Rs.501. (TheHighPoweredExpertCommittee, March 2011).

3.5 Coverage of network & Disparities in water supply

As the cities expand to surrounding villages, expansion of water supply network coverage remains a challenging issue. As Demand for water Increases, ULBs depend on faraway sources which leads to greater transmission losses and suffering huge energy charges. Improving service delivery in slums and peri urban areas / extended areas is an priority requisite to be addressed immediately for sustainable management of water for all by 2030 and achieve Sustainable Development Goal.

4. SUSTAINABLE DEVELOPMENT GOALS (SDGs)

The United Nations, has set in motion a historic plan – 17 Sustainable Development Goals – that aims to build a more prosperous, more equal, and more secure world by the year 2030.The 17 SDGs and 169 targets are part of the 2030 Agenda for Sustainable Development. Building on the principle of "leaving no one behind", the new Agenda emphasizes a holistic approach to achieving sustainable development for all(UNDP), Sustainable development Goal 6 targets to towards achieving water to all

Table 4: Sustainable Development Goals 6, Targets and Indicators- Ensure availability and sustainable management of water and sanitation for all (UNDP)

Target	Indicators
6.1: Universal and equitable access to safe and affordable drinking water for all	6.1.1Proportion of population using safely managed drinking water services
6.2: Adequate and equitable sanitation and hygiene for all, and end open defecation	6.2.1Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water
6.3: Improve water quality by reducing pollution, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1Proportion of wastewater safely treated 6.3.2Proportion of bodies of water with good ambient water quality
6.4: Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals of freshwater to address water scarcity	6.4.1 Change in water-use efficiency over time 6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1 Degree of integrated water resources management implementation (0-100) 6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time
6.A By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	6.A.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan
6.B Support and strengthen the participation of local communities in improving water and sanitation management	6.B.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

Water connects every aspect of life. Access to safe water and sanitation can quickly turn problems into potential – empowering people with time for school and work, and contributing to improved health for women, children, and families around the world. Today, 785 million people – 1 in 9 – lack access to safe water.

4.1 Significances of Lack of Access

It is estimated that by 2050, more than half of the world's population will live in water stressed regions, as per researchers at MIT. More than two and a half billion people have gained access to improved drinking water sources since 1990, but 666 million people are still without.

4.1.1 Health Concerns

The water crisis is a health crisis. Nearly 1 million people die each year from water, sanitation and hygiene-related diseases which could be reduced with access to safe water or sanitation. Every 2 minutes a child dies from a water-related disease. Access to safe water and sanitation contributes to improved health and helps prevent the spread of infectious disease.

4.1.2 Social concerns

Children are often responsible for collecting water for their families. This takes time away from school and play. Access to safe water and sanitation changes this. Reductions in time spent collecting water have been found to increase school attendance, especially for girls. Access to safe water gives children time to play and opportunity for a bright future.

1) 4.1.3 Economic Concerns

Time spent gathering water or seeking safe sanitation accounts for billions in lost economic opportunities. $260 billion is lost globally each year due to lack of basic water and sanitation. Access to safe water and sanitation at home turns time spent into time saved, giving families more time to pursue education and work opportunities that will help them break the cycle of poverty. Universal access to basic water and sanitation would result in $18.5 billion in economic benefits each year from avoided deaths alone. (water.org)

5. ONGOING POLICIES & PROGRAMMES IMPLEMENTED IN INDIA TOWARDS ACHIEVING SDGs (6)

In order to achieve Sustainable Development Goals 6 and Ensure availability and sustainable management of water and sanitation for all, several Missions and schemes with focus on water sector are implemented at centre, state and local level *which are highlighted in the following section:*

5.1 The Comprehensive Water Management Index (CWMI)

The Comprehensive Water Management Index (CWMI) 2019 measures the performance of States on a comprehensive set of water indicators. The CWMI is the country's first comprehensive and integrated national dataset for water and is a massive achievement in the context of India's water management. The Index can reinforce the principle of 'competitive & cooperative federalism' in the country and enable innovation in the water ecosystem. (NITIAayog, 2019)

- The nine sectors cover 28 indicators, with the weights equally divided across a sector's indicators
- Focus on groundwater, irrigation, and policy action—highlighting the growing groundwater crisis, India's low irrigation utilization, and the importance of effective policy frameworks

Table 5: Indicator themes and weights (NITIAayog, 2019)

	Themes	Weights
1	Source augmentation and restoration of water bodies	5
2	Source augmentation (Groundwater)	15
3	Major and medium irrigation—Supply side management	15
4	Watershed development—Supply side management	10
5	Participatory irrigation practices—Demand side management	10
6	Sustainable on-farm water use practices—Demand side management	10
7	Rural drinking water	10
8	Urban water supply and sanitation	10
9	Policy and governance	15
	Total	100

5.2 Jal Shakti Abhiyan (JSA)

In order to address water scarcity, it is important to undertake efforts for conservation, restoration, recharge and reuse of water. In this pursuit, Ministry of Jal Shakti (MoJS), Government of India is launching Jal Shakti Abhiyan (JSA) from 1st July, 2019. Ministry of Housing and Urban Affairs (MoHUA) is participating actively in the Jal Shakti Abhiyan (JSA) along with States/UTs/ Urban Local Bodies (ULBs) to make water conservation measures a Jan Andolan. (Ministry of Housing and Urban Affairs, 2019)

Table 6: Thrust areas and Highlights of Jal Shakti Abhiyan are as follows

Rain Water Harvesting (RWH)	▪ Establishment of Rain Water Harvesting Cell ▪ Urban public spaces such as road side footpaths and walkways in parks are being concretized. These measures have adverse effect on natural water percolation. ULBs should undertake de-concretizing of pavements
Reuse of Treated Waste Water	▪ National Urban Sanitation Policy 2008 mandates reuse of at least 20% of treated waste water. ▪ Provision of dual piping under Building Bye-Laws should be checked in all government (Central/State/UT/ULB) buildings
Rejuvenation of Water Bodies	▪ Every city must initiate action to revive at least one water body during Jal Shakti Abhiyan. ULBs should identify all the water bodies in the city and select one for rejuvenation through public consultations. ▪ Creation of public spaces may be taken up to ensure public eye and vigilance to protect from encroachment or throwing garbage. ▪ Street vendor zones may be developed close to the water body, in convergence with National Urban Livelihood Mission (DAY-NULM).
Plantation	▪ ULBs should undertake plantation near water bodies, public spaces, parks and on roadside to improve green cover and water cycle.

Coverage

Ministry of Jal Shakti (MoJS) has identified 255 Districts and 1,597 Blocks across the country as water stressed. From the information made available by MoJS, total 756 ULBs have been identified as water stressed.

5.3 Liveability Standards in Cities

The Ministry of Urban Development (MoUD) has developed a set of 'Liveability Standards in Cities' to generate a Liveability Index and rate cities. The source of the Liveability Standards are the 24 features contained in the Smart City Proposals (SCPs), which have been grouped into 15 categories. These categories are part of the four pillars of comprehensive development of cities

A total of 79 Indicators (57 Core Indicators and 22 Supporting Indicators) have been prescribed. While the Core Indicators are considered an essential measure of liveability of cities, the Supporting Indicators supplement the Core Indicators by adding value to them. These are organized in 15 'Categories' given earlier (Ministry of Urban Development)

Table 7: Categories of Indicators of Liveability Index

INSTITUTIONAL	SOCIAL	ECONOMIC	PHYSICAL
1.Governance Index- (8 Indicators)	2.Identity and Culture Index-(5 Indicators) 3. Education Index -(6 Indicators) 4. Health Index -(5 Indicators) 5.Safety and security Index -(4 Indicators)	6.Economy and Employment -(5 Indicators)	7.Housing and Inclusiveness (2 Indicators) 8.Public Open Spaces (2 Indicators) 9.Mixed Land Use and Compactness (2 Indicators) 10.Power Supply (9 Indicators) 11.Transport and mobility (12 Indicators) 12.Assured Water Supply (6 Indicators) 13. Waste Water Management 5 Indicators) 14.Solid Waste Management (3Indicators) 15. Reduced Pollution (5 Indicators)

5.4 SDG India Index

NITI Aayog has constructed the SDG India Index spanning across 13 out of 17 SDGs. The SDG India Index is intended to provide a holistic view on the social, economic and environmental status. Sixty-two priority indicators were selected for computation of the SDG India Index.SDG Index Score for the Goal 6of Clean Water and Sanitation ranges between 31 and 100 for States and between 45 and 100 for UTs. Among the States, Gujarat has achieved a full score of 100. The same score is shared by Chandigarh, Dadra and Nagar Haveli, and Lakshadweep, while 8 states &UTs have score less than 50.

5.5 Atal Mission for Rejuvenation and Urban Transformation

AMRUT was launched in June 2015 at the same time as the 100 Smart City Mission. The scope of AMRUT is to provide basic urban services to households (e.g. Water supply, sewerage and urban transportation) and build amenities in cities to improve the quality of life. AMRUT builds on results and learnings from the previous JnNURM, AMRUT is financed by a centrally sponsored scheme, but administratively it draws heavily on State involvement, thus exemplifying the shift towards State-led initiatives. AMRUT follows a project-based approach.

5.6 Service level benchmarking for Management of Water supply

Service level performance parameters have been identified for four basic urban services: Water Supply; Sewage; Solid Waste Management (SWM); and Storm Water Drainage. These parameters have been defined primarily from a utility manager's/planner's perspective.

The Central Finance Commission included service level benchmarking as one of the conditions to be met by State governments to avail performance grants. (Handbook on Service Level Benchmarking, 2010)

Table 8 : Service Level Benchmarking- Water Supply Indicators

Water Supply	Benchmarks
Coverage of water supply	100%
Per capita Supply	135 lpcd
Extent of metering	100%
Extent of non-revenue water	20%
Continuity of Water Supply	24 X 7
Quality	100%
Efficiency in redressal of complaints	80%
Cost recovery	100%
Efficiency in collection	90%

6. CONLUSIONS

Despite the fact that reforms in the water sector were initiated more than a decade ago, quite a significant number of Households especially in the peri urban areas and slums are lack of access to water supply due to various reasons. understand these factors affecting to access to water supply and address issues is one of the major challenge of the Urban Local bodies.

To address water scarcity, it is important to undertake efforts for conservation, restoration, recharge and reuse of water.

However, these Indexes, service level benchmarking marks a noteworthy platform in strengthening data collection and analysis of data in India. Also these index helps in benchmarking performance and monitor progress across ULBs. There is necessity to understand the importance of disaggregated data at ULB level, Spatial data/Ward level data will help in prioritization of investments and helps in achieving target towards "water for all".

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