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WATER EFFICIENCY AND CONSERVATION IN URBAN INDIA



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3. Review of legal and institutional provisions

‘Right to Water’ is not explicitly covered in Article 21 of the Indian Constitution but under the broad rubric of ‘Right to Life’. Article 51A of our Constitution envisaged that it shall be the fundamental duty of every Indian citizen to protect and improve the natural environment, including forests, lakes, rivers and wildlife, and to have compassion for living creatures.

In order to conserve water resources, several water-related policies have been formulated. The National Water Policy (NWP) was first formulated in 1987 and updated and notified it in 2002 and in 2012, respectively. The scope of coverage widened with each notification. NWP is considered to be a comprehensive water policy that highlights NRW, water-efficient technologies, rainwater harvesting, reuse of treated water etc. It provides an overview of the water resource situation, addresses the problem because of its scarcity and suggests development with conjunctive use of surface and groundwater (refer to *Appendix 4*).¹

Subsequently, states such as Maharashtra, Rajasthan, Odisha and Himachal Pradesh also proposed their water policies with reference to NWP (refer to *Appendix 5* for the status of state water policies). Sixteen states have prescribed their water policies while six have prepared their draft water policies, which are in the public domain for feedback. Eight states have not prepared overall policies for water management. The existing national and state water policies in general have adopted a holistic approach but these act only as guiding documents with no legal standing. They cannot be enforced and remain silent towards mainstreaming urban WEC that will overcome current water issues. The NWM, launched under the National Action Plan on Climate Change (NAPCC), recommends 20 per cent water-use efficiency programmes, including water conservation and water recycling (refer to *Appendix 4*).²

The provisions and decisions within the policy and plan act as a guide to identifying priority actions to reduce water demand and augment supply to achieve sustainable water management. There are numerous policies and plans targeting different objectives of water management which, in some cases, overlap. Overall, these policies address issues such as aquifer depletion, management of waterbodies and groundwater conservation. However, while existing policies were formulated with water as a subject, they did not incorporate a holistic approach to water management. These policies also lack adjudication, administration and enforcement mechanisms to achieve stipulated goals.

Seminal articles on legal, institutional and governance provision in the country were studied to understand their inclusion of WEC. Though not explicitly mentioned, there are provisions for conservation of water resources that are overlooked (see *Appendices 4 and 6*).

There are no direct, formal and binding laws specifically framed for the protection and conservation of water resources in India. After an intensive review of various legal and institution provisions, it is concluded that there is no Act or legal provision that covers water conservation and its efficient usage at the national level. However, there are some examples such as the Andhra Pradesh Water, Land and Trees Act and Rules (2002) that legally enforce water-conservation measures.³

There are several standards, guidelines and manuals related to water-resource management that talk about decentralized wastewater reuse through dual plumbing, improving water quality of wetlands by stopping pollutants from entering into waterbodies, enhancing water supply through reduction of NRW and provision of water auditing. These documents give the present status of water management and envisage an improvement to bring it at par with that in developed nations. They are the only source of information that implementers can refer to before they take initiatives in specific directions. However, these documents don’t have the same enforcement power as legislations or formally binding laws. They focus on the issue of water management while overlooking solution details (see *Appendix 7*).

Different ministries, departments, authorities and government organizations are involved in WEC in urban areas. They work separately, with some coordination among them, to give shape to urban water management. The important aspects of water management such as groundwater management, sustainable drainage, restoration of waterbodies, reuse of treated/reclaimed water, biodiversity conservation and WEC are dealt by various institutions. Organizations like the Central Water Commission, Central Ground Water Board and Central Public Department Works, under different ministries, are involved in providing technical support, coordination and monitoring water resource.

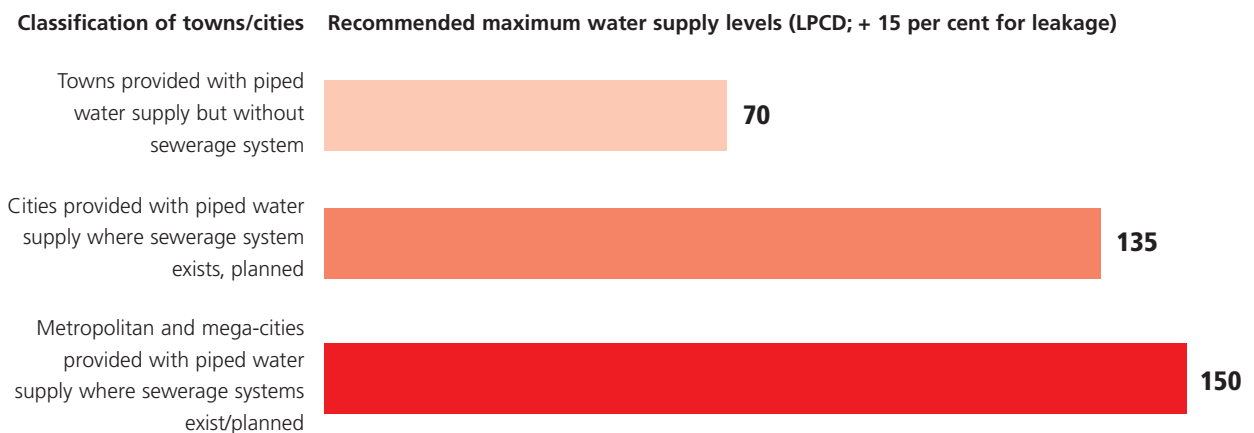
The municipal body is responsible for providing water supply in most places, while in others (mainly metropolitan cities) city-level water supply and sewerage boards have been constituted to perform this function. The common pattern in most cities is that a state-level agency, such as the Public Health Engineering Department/Division (PHED), or a state-level water supply and sewerage board does the capital work and once construction is finished it hands over the responsibility of O&M to the local government. In some cities the state-level agency does the capital work and the O&M while the revenue functions are with the local government. Out of 30 Indian states, only 15 states have PHEDs and 11 states have a water and sewerage board/Jal Nigam, an indication of the mismanagement of water resources in states (see *Appendix 5*).

Cities are expected to estimate water demand based on guidelines issued by the Central Public Health and Environmental Engineering Organization (CPHEEO), a central government agency which recommends norms for water supply based on different classes of cities. CPHEEO recommends that cities without a sewage system supply 70 litres of water per person per day; large metropolitan cities should supply 150 LPCD. In addition, a city can consider a 15 per cent distribution loss; a metro city, therefore, can supply 175 LPCD (see *Figure 7: CPHEEO standards for water supply*).^{4, 5}

Several reports indicate that every city tends to make its own rules and estimates its water demand which is called the 'official demand'. Interestingly, cities always overestimate demand, so that there is an even larger demand–supply gap. This situation is then used, invariably, to justify bigger supply schemes.

The CPHEEO manual on sewerage and sewage treatment gives recommendations on quality norms for use of treated sewage for specified activities. It gives various examples of treated sewage currently used in India and abroad. The manual also provides indepth designs of various onsite sanitation systems and suggests use of decentralized wastewater treatment systems.

Figure 7: CPHEEO standards for water supply



Source: CPHEEO, G., 1999. Manual on water supply and treatment. Ministry of Urban Development, New Delhi.

CPHEEO also envisages protection of wetlands in urban areas by reducing the flow of sewage and other polluting agents through its advisory on ‘Conservation and restoration of water bodies in urban areas’.

Apart from guidelines, the MoUD initiated an exercise to develop standardized service-level benchmarks (SLBs) with respect to basic municipal services in 2006. It was prepared with the expectation that state governments and cities would adopt this performance monitoring framework at the ULB/parastatal level, and undertake to regularly collate and analyse the performance data to improve the quality of the decision-making process in the sectors identified under the framework. SLB parameters were identified for four basic urban services: water supply, sewage; solid waste management and storm-water drainage (see *Appendix 8*).⁶

The SLB mentions the percentage of wastewater received at the treatment plant that is recycled or reused after appropriate treatment for various purposes (such as in gardens and parks, for irrigation, etc). However SLB does not focus on the scope of reuse at the decentralized level. Since the measurements are at STP inlets and outlets, the indicator is reported at city/ULB levels.

Further, assuming the setting up of 109 Smart Cities in the country, a committee has been formed under the chairmanship of MoUD to come up with standards for Smart City projects with the BIS.

The BIS has developed ‘Smart City indicators’ in 17 different sectors, with 46 core indicators considered essential for assessing the performance management of city services and quality of life. The 47 supporting indicators are given to promote best practices (see *Appendix 8*).⁷

Under these indicators, the cities would need to maintain the data online with the framework developed by the Ministry of Statistics and Programme Implementation. These indicators are applicable to any city or municipality that wishes to measure its performance.

As per the above analysis, it is evident that various government organizations efforts are making efforts on WEC. There is, however, need for a concerted effort among the organizations to crystallize ideas in one document for the practical realization of sustainable water management.

For implementing any policy, stakeholders working in different sectors need to be involved. Apart from government organizations, the efforts of NGOs and other academic institutions are also required. For example, the National Bureau of Water Use Efficiency Authority (NBWUEA) has been recommended by the IELO. The need to implement a community-based decentralized system for safe drinking water supply in India is identified—TERI has prepared an implementation strategy. The Administrative Staff College of India (ASCI) advocates high-quality continuous urban water supply and sanitation (WATSAN) services for all residents, with a 24 x 7 water supply in a well-managed distribution network, which actually costs less than intermittent (two to four hours a day) systems. WWF India and International Union for Conservation of Nature (IUCN) India have taken up the biodiversity conservation angle along with conservation of waterbodies.

There are also many international organizations (non-governmental, academic, governmental, funding, and more) working on water conservation in several countries. These organizations (World Bank, UN, SWITCH, CIRIA, Asian Development Bank, USEPA, Stockholm International Water Institute, World Water Council etc.) have made significant contributions to water conservation efforts by raising awareness, creating new standards for water efficiency, fund allocation for projects under water conservation and promoting policies and plans related to water conservation (see *Appendix 9*).

There is, however, need for a common platform in which water as a resource is the main focus. *Table 6: Water conservation initiatives* summarizes existing as well as missed opportunities of the aforementioned initiatives that overlook the bigger picture.

Appendix 4: Water policies and plans in India

Legal provisions/policies	Key points	Provision for urban WEC
National Water Policy (1987)	<ul style="list-style-type: none"> Water allocation priorities were set with drinking water as foremost Emphasis on water zoning of the country and economic activities guided and regulated in accordance with such zoning Maximize availability by bringing available water resources within the category of utilizable resources 	<ul style="list-style-type: none"> Water rates focused to cover the annual maintenance and operation charge
National Water Policy (2002)	<ul style="list-style-type: none"> Envisages that water is the part of larger ecosystem Drinking water should be provided to entire population 	<ul style="list-style-type: none"> Promotion for non-conventional methods for utilization of water, such as recharge of groundwater and rainwater harvesting, is mentioned Principle of 'polluter pays' should be followed in management of polluted water.
National Environment Policy (2006)	<ul style="list-style-type: none"> Mainstream the environmental concerns in all developmental activities Covers surface water, groundwater and wetlands 	<ul style="list-style-type: none"> Emphasis on groundwater conservation Impact on electricity tariff/diesel pricing on groundwater extraction is highlighted Promotion of efficient water use techniques by sprinklers/drip irrigation. Selecting crops that can be grown with water-efficient measures
National Water Policy (2012)	<ul style="list-style-type: none"> To treat water as an economic good which, MoWR claims, is to promote its conservation and efficient use Intended for the privatization of water-delivery services Focused on making availability of safe drinking water as preemptive needs 	<ul style="list-style-type: none"> Discusses a broad aspect of water conservation in urban, industrial and agricultural uses Measures to enhance water availability by pricing of water, recycling of grey water and watershed management, including rainwater harvesting, use of scientific techniques such as desalination is discussed. In view of autonomous working of municipality water users association should be given statutory power to decide and collect water bills which will include sewerage charges also.
National Water Mission (2008)	<ul style="list-style-type: none"> Recommends water-use efficiency programmes, including water conservation, water recycling 	<ul style="list-style-type: none"> Promotion of citizens and state actions for water conservation, augmentation and preservation Increasing water use efficiency by 20 per cent by 2017
12th Five Year Plan (2012–17)	<ul style="list-style-type: none"> Focuses on the need to invest in water and wastewater management that is both sustainable and affordable. Covers recommendation for new institutions, groundwater laws. Protection and use of local water sources before planning for the long-distance transportation of water projects. Repair, renovation and restoration of waterbodies guidelines 	<ul style="list-style-type: none"> Comprehensive water audit plans to offer cost-effective water-efficient technologies. Mainly for industries Provision to create forum that provides gateways on water conservation (RWH/recycling and reuse/ water conservation devices)
National Mission on Sustainable Habitat	<ul style="list-style-type: none"> One of the eight core missions under NAPCC to make cities sustainable through improvements in energy efficiency of buildings, water supply and water management. 	<ul style="list-style-type: none"> Wastewater reuse, storm-water management including rainwater harvesting, wherever possible

Source: Compiled by CSE, 2016

Appendix 5: Status of policies, departments and boards in Indian states

S. no.	State	State water policy	PHED	Water and sewerage board
1	Andhra Pradesh	Andhra Pradesh State Water Policy (2008)	√	Hyderabad Metropolitan Water Supply and Sewerage Board
2	Arunachal Pradesh	X	√	X
3	Assam	Assam State Water Policy (2007)	√	Assam Urban Water Supply and Sewerage Board
4	Bihar	Draft State Water Policy (2010)	√	Bihar Rajya Jal Parishad, (BISWAS Board.)
5	Chhattisgarh	X	√	X
6	National Capital Territory of Delhi	Delhi Water Policy (2016)	X	Delhi Jal Board
7	Goa	Goa State Water Policy (2000)	X	X
8	Gujarat	Draft State Water Policy	X	Gujarat Water Supply and Sewerage Board
9	Haryana	Haryana State Urban Water Policy (2012)	X	X
10	Himachal Pradesh	Himachal Pradesh State Water Policy (2013)	√	X
11	Jammu and Kashmir	Draft State Water Policy	√	X
12	Jharkhand	Jharkhand State Water Policy 2011	X	X
13	Karnataka	Karnataka State Water Policy (2002)	X	Bangalore Water Supply and Sewerage Board
14	Kerala	Kerala State Water Policy (2008)	X	X
15	Madhya Pradesh	Madhya Pradesh State Water Policy (2003)	√	X
16	Maharashtra	Maharashtra State Water Policy (2003)	X	Maharashtra Water Supply and Sewerage Board
17	Manipur	Draft State Water Policy, 2015	√	X
18	Meghalaya	Draft State Water Policy, 2015	√	X
19	Mizoram	X	√	X
20	Nagaland	Draft State Water Policy	√	X
21	Odisha	Orissa State Water Policy (2007)	X	X
22	Punjab	Punjab State Water Policy (2008)	X	Punjab Water Supply and Sewerage Board
23	Rajasthan	Rajasthan State Water Policy (2010)	√	X
24	Sikkim	X	√	X
25	Tamil Nadu	Tamil Nadu State Water Policy (1994)	X	Tamil Nadu Water Supply And Drainage Board /Chennai Metropolitan Water Supply and Sewerage Board
26	Telangana	X	X	X
27	Tripura	X	X	X
28	Uttar Pradesh	Uttar Pradesh State Water Policy (1999)	X	Uttar Pradesh Jal Nigam
29	Uttarakhand	X	X	Uttarakhand Peyjal Nigam
30	West Bengal	X	√	X

Source: Compiled by CSE, 2016

Appendix 6: Water acts in India

Acts	Key points	Provision for urban WEC
Pre-Independence		
The Easement Act (1882)	<ul style="list-style-type: none"> All rivers and lakes under absolute right of the state and No individuals right or claim can be made over it 	<ul style="list-style-type: none"> To control water use for the larger public good, the northern India Canal and Drainage Act was brought to the forefront
Land Acquisition Act (1894)	<ul style="list-style-type: none"> Land owner's right over the groundwater under the consideration of easement connected to dominant heritage i.e. Land 	-
Post- Independence		
7 th Schedule—Entry 17	<ul style="list-style-type: none"> States will have jurisdiction over water within their boundaries 	-
Union List—Entry 56	<ul style="list-style-type: none"> In the public interest, state are subject to Entry 56 in the Union List that allows the Central government to regulate and develop the interstate river and river valleys 	-
River Board Act (1956)/ Interstate Water Dispute Act (1956)	<ul style="list-style-type: none"> Centre to advise state government on regulation and development of interstate river development projects. This Act has not been used in practice 	<ul style="list-style-type: none"> Guide government on conservation and optimum utilization of water resources Conservation is mainly at catchment level
Water (Prevention and Control of Pollution) Act (1974)	<ul style="list-style-type: none"> To prevent and control water pollution and restoring of wholesomeness of water Establishment of Central and State Pollution Control Boards (CPCB/SPCB) 	<ul style="list-style-type: none"> Emphasis on dealing with industrial pollution Poor enforcement with respect urban waterbodies conservation
Water (Prevention and Control of Pollution) Cess Act (1977)	<ul style="list-style-type: none"> To levy and collect cess on water consumed by industries and local authorities. Prescribes the maximum quantum of water to be used by different industries 	<ul style="list-style-type: none"> Mandatory for local authorities and industries to affix water meters Act provide opportunity to mandate on water use efficiency for different users Rebate on protecting water from being polluted and also on water saving from over exploitation
Environmental Protection Act (EPA) (1986)	<ul style="list-style-type: none"> Water is defined as component of Environment. Central Ground Water Authority formed under EPA 	<ul style="list-style-type: none"> Authorize the Central government to protect and improve water quality
Andhra Pradesh Water, Land and Trees Act and Rules (2002)	<ul style="list-style-type: none"> Component of groundwater protection with registration of wells Gives provision to formulate guidelines to recycle and reuse waste water by various sectors including ULB 	<ul style="list-style-type: none"> The only Act enacted by any state in India that covers a matter related to water conservation
Maharashtra Water Resource Regulatory Authority Act (2005)	<ul style="list-style-type: none"> Promote efficient use of water and to minimize the wastage of water and to fix reasonable use criteria for each category of use. 	<ul style="list-style-type: none"> Promote water harvesting for surface water availability for areas where groundwater availability is poor Review and revise the water charges Augmentation of water resources through recycles and reuse especially for industries
Town and Country Planning Acts of various states	<ul style="list-style-type: none"> Himachal Pradesh, Bihar, Kerala, Gujarat, Tamil Nadu formulated TCPA 	<ul style="list-style-type: none"> Cover developmental aspects related to water (supply and sewerage). Suggest preparation of Master plans which indicate conservation of existing water bodies in cities

<p>74th Constitutional Amendment (1992) 12th Schedule</p>	<ul style="list-style-type: none"> • Devolution of powers to ULBs for governance • 18 tasks listed for ULB 	<ul style="list-style-type: none"> • Task 6 deals with water supply for domestic, industrial and commercial usage • Task 8 deals with the protection of environment and promotion of ecological aspects
<p>Draft National Water Framework Act proposed in 2011</p>	<ul style="list-style-type: none"> • An Act to provide a broad overarching national legal framework of general principles on water as a vital and stressed natural resource • An umbrella statement of general principles governing the exercise of legislative and/or executive (or devolved) powers by the states and the local governing bodies 	<ul style="list-style-type: none"> • Includes differential water pricing with full cost recovery to be made for high and medium income group • Water market should be regulated in the interests of equity, social justice, resource conservation and the protection of the aquifer

Source: Compiled by CSE, 2016

Appendix 7: Water guidelines and manuals in India

Guidelines and manuals	Key points	Provision for urban WEC
Guidelines and benchmarks for green large area development	<ul style="list-style-type: none"> Focuses on preservation of surface water and water quality, protecting and enhancing on-site water resources, reusing and recycling wastewater and sustainable storm-water management for large-area development 	<ul style="list-style-type: none"> Promotion of dual plumbing/dual water distribution system to recycle and reuse treated wastewater Encouraging decentralized wastewater systems and safe disposal of generated sludge in all large development
EIA	<ul style="list-style-type: none"> Tool for imposing restrictions and prohibitions on new projects or activities, or on the expansion or modernization of existing projects or activities based on their potential environmental impacts on water and other natural resources 	<ul style="list-style-type: none"> The risks of contamination of water from pollutants that affect drainage and runoff
Advisory on Conservation and Restoration of Water Bodies in Urban Areas by CPHEEO	<ul style="list-style-type: none"> Reflects the environmental and social impact of lake restoration and also suggested steps in Lake Conservation, additional support by the Government of India for the water conservation is discussed. 	<ul style="list-style-type: none"> This document gives only management, not technical, support
BIS Standards	<ul style="list-style-type: none"> Sets acceptable limits and the permissible limits for water 	<ul style="list-style-type: none"> Assessing the quality of water resources, and to check the effectiveness of water treatment and supply by the concerned authorities.
CPHEEO Manual	<ul style="list-style-type: none"> Summarizes legal and policy matter related to water quality monitoring and management 	<ul style="list-style-type: none"> Useful for formulation of action plan to restore water quality. In-spite there is no consideration for storm water which largely affects water quality.
General Guidelines for Water Audit & Water Conservation by CWC	<ul style="list-style-type: none"> Discusses action plans for water conservation and describes steps for water audit 	<ul style="list-style-type: none"> Water audit—studying and reducing NRW—proved to be an effective tool to minimize water wastage and increase revenue for municipality Focuses on surface water as well as groundwater, rainwater harvesting, improving water quality, and cleaning up polluted rivers and lakes etc.
NRW reduction tool kit by JnNURM	<ul style="list-style-type: none"> Provides the idea of auditing water supply and calculating losses at various stages 	<ul style="list-style-type: none"> Helps enhance efficiency of transmission and distribution network
Conservation and management of lakes by MoEFCC	<ul style="list-style-type: none"> Describes legal and regulatory framework and technologies involved in lake restoration 	<ul style="list-style-type: none"> Removing the nutrients from the lakes, control of organic load, control of the nutrient input are helpful in restoration of lakes. Catchment based initiatives along with policy initiatives for protection of lakes is discussed.

Source: Compiled by CSE, 2016

Appendix 8: Water and sanitation: Service-level benchmarks

Benchmarks at a glance

Water supply services		
S. No.	Proposed Indicator	Benchmark
1	Coverage of water supply connections	100%
2	Per capita supply of water	135 lpcd
3	Extent of metering of water connections	100%
4	Extent of non-revenue water (NRW)	20%
5	Continuity of water supply	24 hours
6	Quality of water supplied	100%
7	Efficiency in redressal of customer complaints	80%
8	Cost recovery in water supply services	100%
9	Efficiency in collection of water supply-related charges	90%
Sewage management (sewerage and sanitation)		
1	Coverage of toilets	100%
2	Coverage of sewage network services	100%
3	Collection efficiency of the sewage network	100%
4	Adequacy of sewage treatment capacity	100%
5	Quality of sewage treatment	100%
6	Extent of reuse and recycling of sewage	20%
7	Efficiency in redressal of customer complaints	80%
8	Extent of cost recovery in sewage management	100%
9	Efficiency in collection of sewage charges	90%
Solid waste management		
1	Household-level coverage of solid waste management services	100%
2	Efficiency of collection of municipal solid waste	100%
3	Extent of segregation of municipal solid waste	100%
4	Extent of municipal solid waste recovered	80%
5	Extent of scientific disposal of municipal solid waste	100%
6	Efficiency in redressal of customer complaints	80%
7	Extent of cost recovery in SWM services	100%
8	Efficiency in collection of SWM charges	90%
Storm-water drainage		
1	Coverage of storm-water drainage network	100%
2	Incidence of water logging/flooding	0%

Source: Handbook of Service Level Benchmark 2008, Ministry of Urban Development, Government of India