SOUTH SOUTH CITY LEADERS FORUM

Challenges towards Clean Cities: An Indian Perspective

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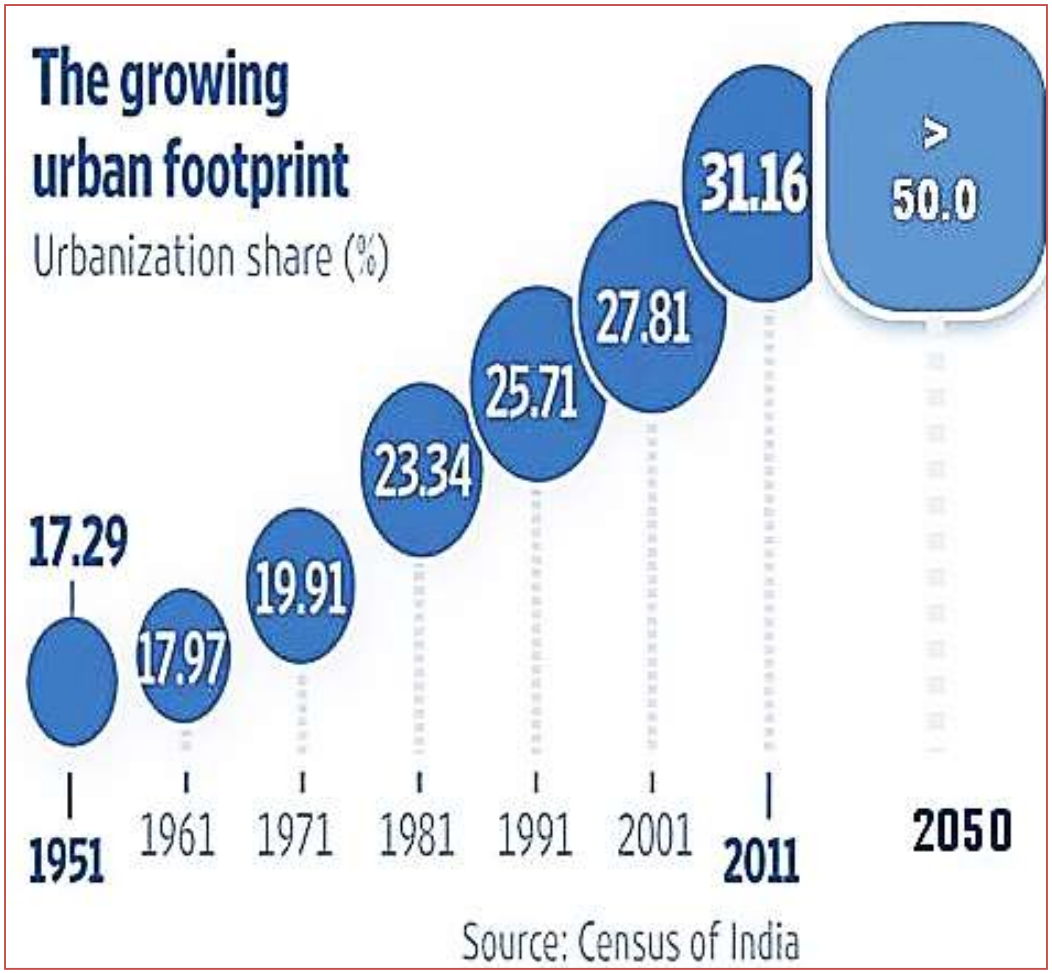
Urbanization Scenario in India

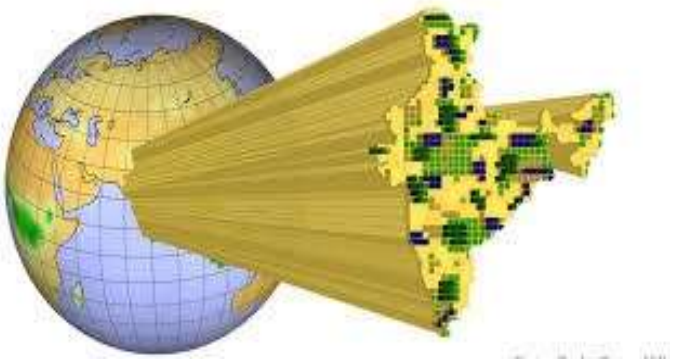
India's urban population has grown from
290 million in 2001 to
377 million in 2011

31.75% of the country's total population

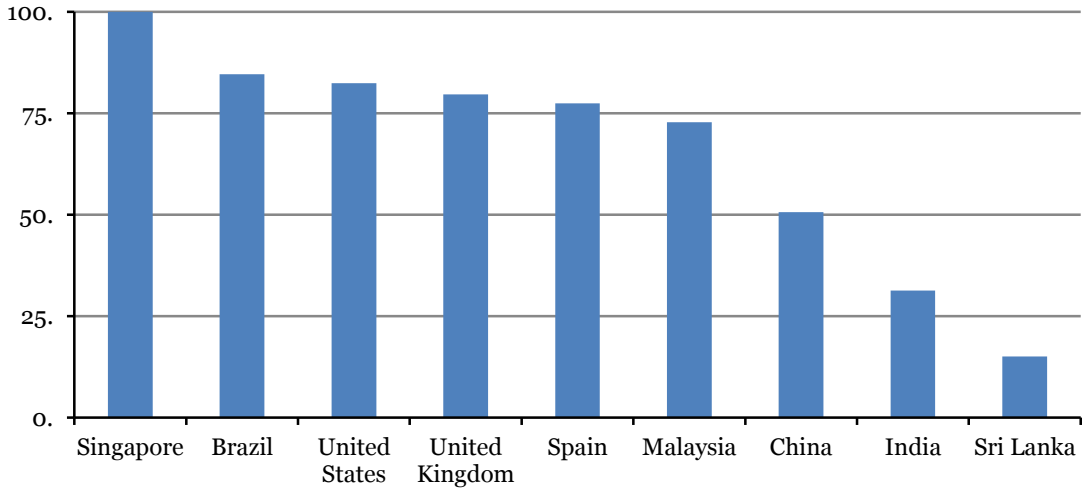


Urbanization Scenario in India

India is one of the fastest growing economies in the world today

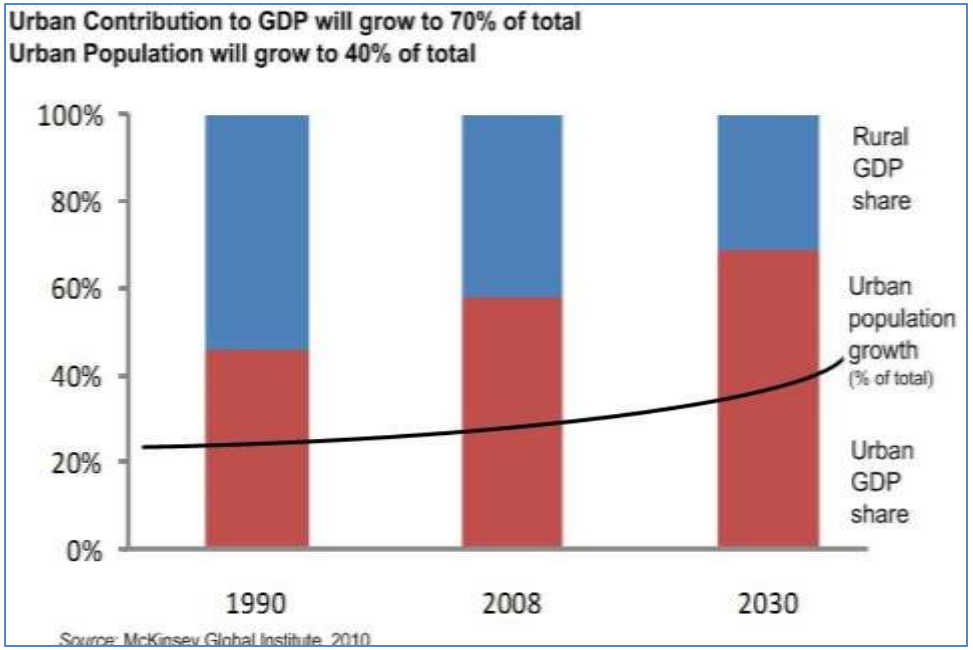


India's **urban population** is larger than the total population of United States and is second to China



Urbanization Scenario in India

Approximately **60%** of GDP of the country is derived from the Indian urban economy



Larger cities are enhancing their participation in the global economy

Smaller cities are absorbing most of the rural-urban migration and strengthening linkages to the rural economy

Strength of Indian Cities

Strong democratic institutions;

Growing middle class and enhanced paying capacity;

High density of mobile phone users leading to a high potential of m-governance;

8-10% overall growth of economy in last decade: Cities leading;

Untapped but huge potential of partnerships with private sector; and

Friendly governmental policies on FDI, JV, PPP, Technology transfer, Twinning of cities.

Urban Issues/Challenges

- **Revenue base of Urban Local Bodies**
- **Infrastructure and Service Delivery Gaps**
- **Urban and Regional planning: Sanitation, Transport, Heritage**
- **Use of ICT in governance**
- **Capacity gaps; and**
- **Sustainable development.**

Urban Development in India

Overall Growth Rate

S.No	1991-2001	2001-2011	Difference
India	*21.5*	*17.6*	*-3.9*
Rural	*18.1*	*12.2*	*-5.9*
Urban	*31.5*	*31.8*	*+0.3*

S. No	1991-2001	2001-2011	Difference
India	*102.9*	*121.0*	*18.1*
Rural	*74.3*	*83.3*	*9.0*
Urban	*28.6*	*37.7*	*9.1*

No of UAs/Towns

S.No	Particulars	2001 census	2011 census
1	*Statutory Towns*	*3799*	*4041*
2	*Census Towns*	*1362*	*3894*
3	*Urban Agglomerations*	*384*	*475*

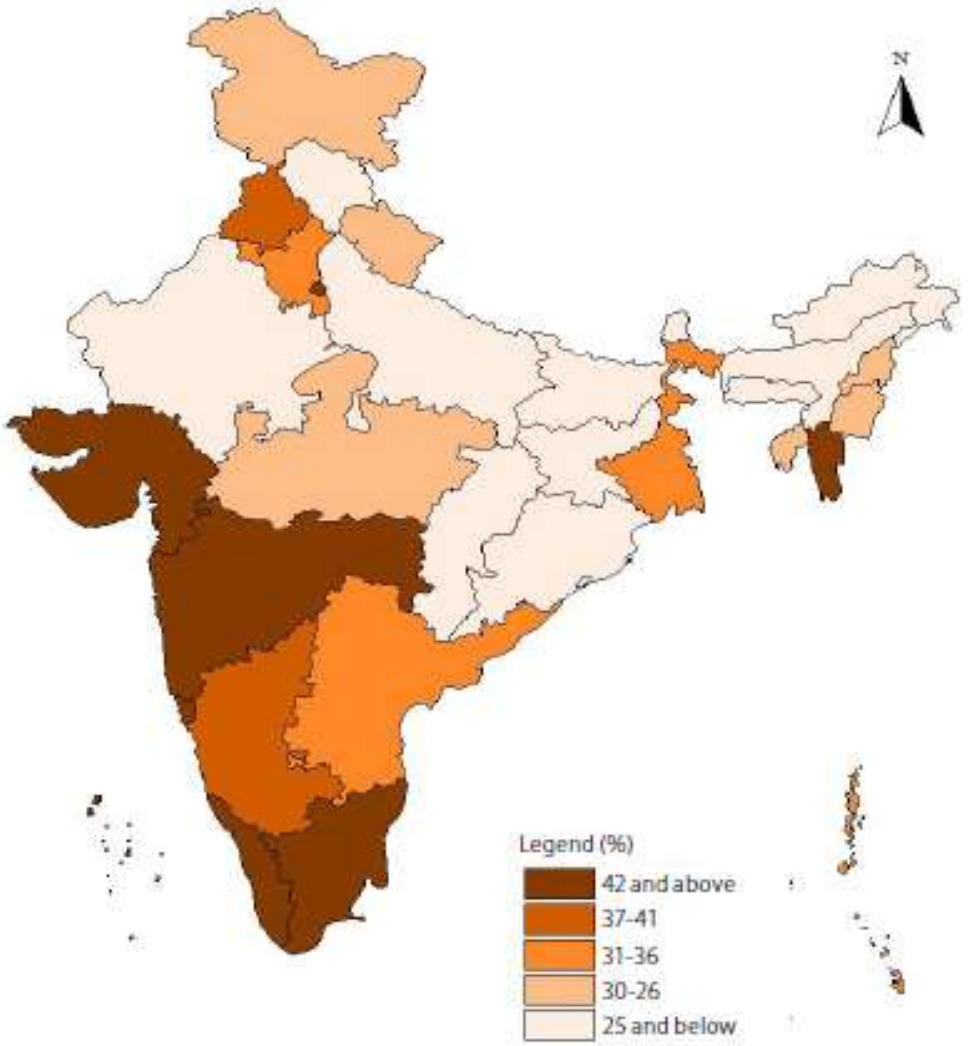
India's Urbanization

Table 1: Trends in Urbanisation in India (1961-2011)

Census Year	Urban Population (in million)	Percentage Urban	Annual Exponential Urban Growth Rate (%)
1961	78.94	17.97	-
1971	109.11	19.91	3.23
1981	159.46	23.34	3.79
1991	217.18	25.72	3.09
2001	286.12	27.86	2.75
2011	377.10	31.16	2.76

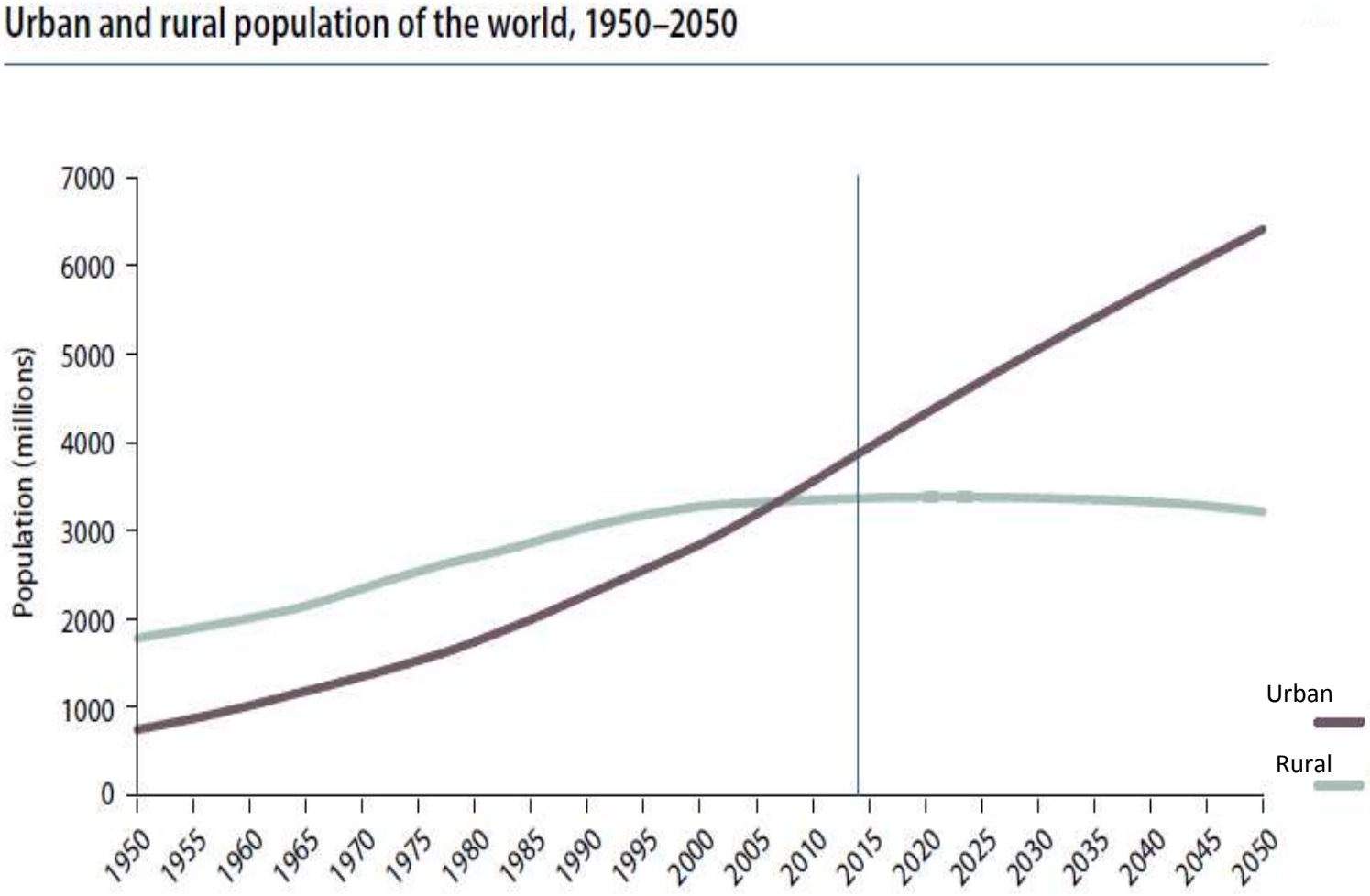
Table 2: Urban-Rural Population Growth Differentials (1971-2011)

Decade	Rural	Urban	Urban-Rural Growth Differentials (Annual Exponential Growth Rate, in %)
1971-81	1.76	3.79	2.03
1981-91	1.80	3.09	1.29
1991-2001	1.69	2.75	1.06
2001-2011	1.15	2.76	1.61



Source: Census of India, various years

World is more urban now !!



Source: United Nations, Department of Economic and Social Affairs, Population Division (2014) World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER.A/352).

India’s urban opportunity - 2030

- GDP will multiply by 5 TIMES
- 590 MILLION PEOPLE will live in cities
- 70% of new employment will be generated in cities
- 91 MILLION households will be “middle class”
- 68 CITIES will have population of 1 million plus

Source: India's urban awakening - McKinsey & Company

Government of India's new flagship programs for urban areas

1. Swachha Bharat Mission
2. National Urban Development Mission
3. Heritage Cities Programme
4. Smart Cities Programme
5. Urban Mobility Programme

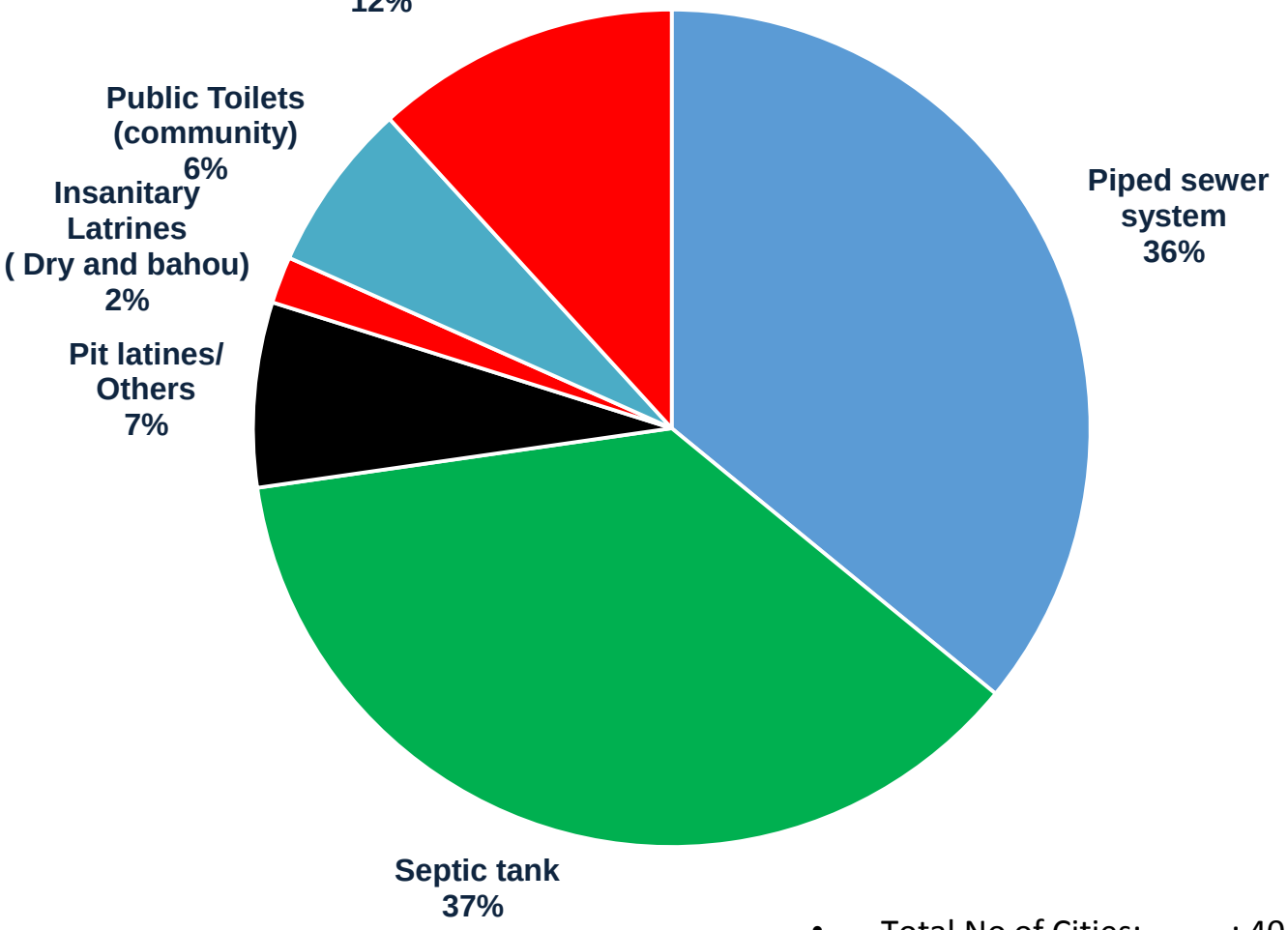
Mission for Clean India

SWACHHA BHARAT MISSION (SBM)

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Status of Sanitation facility in 4041 Towns of India

- (Million households,% coverage)



- Total No of Cities: : 4041
- Total Urban Population : 318 Million
- Total Urban Households : 67 Million
- Class I Town: 476 (>1.0 Lakh Population)

National Urban Sanitation Policy, 2008

- **Vision:**

All Indian cities and towns become totally sanitized, healthy and liveable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women.

- Goals are:
  - Awareness generation and behavior change;
  - ✦ Achieve open defecation free cities;
  - ✦ City wide Sanitation: Safe disposal of 100% human and liquid waste; recycle, reuse, septage management and proper O&M.
- The policy requires - state sanitation strategies & city sanitation plan.

Initiatives Under NUSP So Far

Service Level Benchmarks (SLBs)

- Ministry formulated SLBs as per International Best Practices
- Focus to shift from infrastructure to service delivery
- The SLBs circulated to the States in year 2008 for adoption
- 13th Finance Commission made it mandatory for improvements in SLBs.

Sanitation Rating under NUSP

- Sanitation ratings for 423 class-I cities - No city falls under Green category (scoring marks above 90)
- 4 cities viz., Chandigarh, Mysore, NDMC and Surat fall in Blue category (scoring marks between 66 and 90)
- 419 cities are in the Black and Red categories
- 2nd Sanitation survey is in progress.

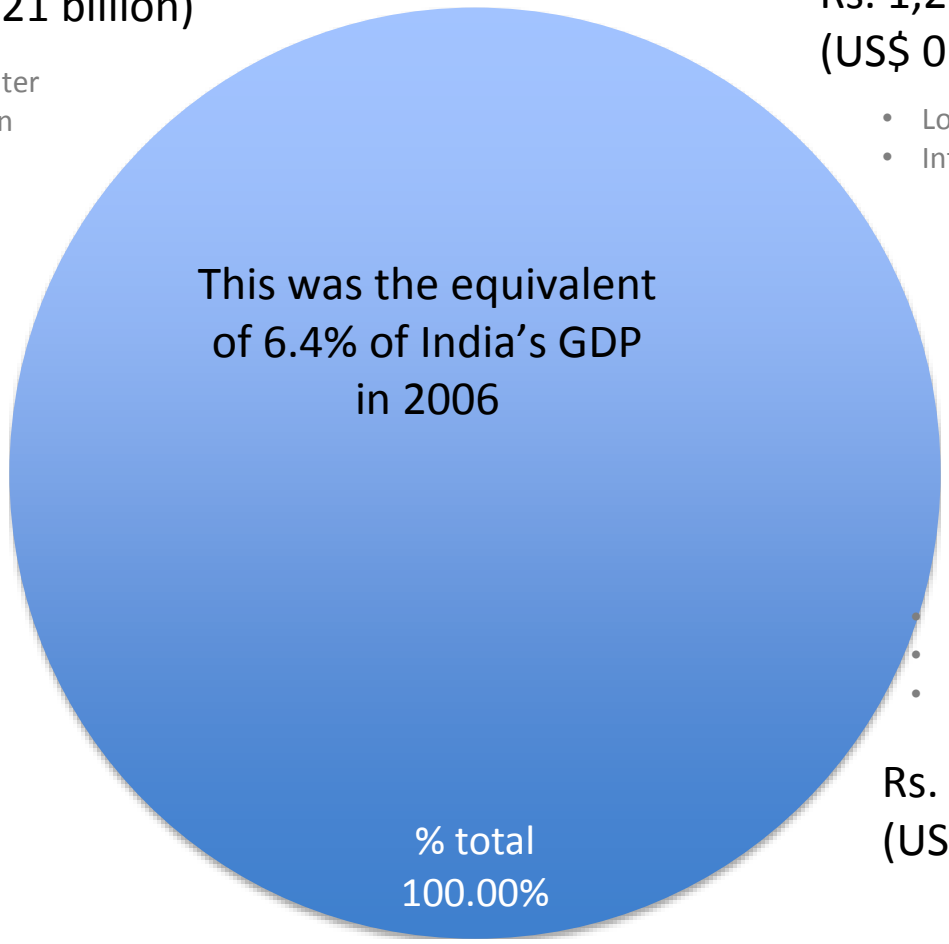
Economic impact (Loss) due to poor sanitation

Rs. 19,100 crore
(US$ 4.21 billion)

- HH treatment, drinking water
- Bottled water consumption
- Piped water
- Cost of fetching water

Rs. 1,200 crore
(US$ 0.26 billion)

- Lost tourism earnings
- International tourist illness



- Rs. 48,700 crore
- (US$ 10.73 billion)
  - HH access
  - School access
  - Workplace access

- Premature mortality
- Productivity loss
- Health care

Rs. 1.75 lakh crore
(US$ 38.49 billion)

Source: WSP. 2006. Economic Impacts of Inadequate Sanitation in India. New Delhi: World Bank

Swachha Bharat Mission: Strategy

- **GOI**
  - Framework
  - Standards & Protocols
  - Financial & Policy support

- **States**
  - Monitoring & Evaluation
  - Enabling Environment for Private Participation

- **ULBs**
  - Citizen Engagement
  - Implementation & Maintenance : Use of GIS and IT
  - Enforcement

Components of SBM

Soft:

- People's Participation
- Mass Campaign for Behavioural Change
- Enabling Private Sector Participation
- Capacity Building

Hard/Physical :

- Construction of New Individual House Hold Toilets
- Conversion of Insanitary Latrines into Pour Flush Toilets
- Construction of Community/Public Toilets
- Integrated Solid Waste Management

Programme Strategy-I

Individual Household Toilets:

- Milestone based Incentives;
- Standard Designs (Pre Fab);
- Beneficiary to apply online;
- Capacity Building and IEC drive;
- Funds to States based on outcomes as assessed by Third Party; and
- Empanelement of Service Providers by ULBs.

Programme Strategy-II

Public Toilets:

- For Floating and Mobile Population;
- Aesthetically designed with Modern Facilities;
- Land leveraging (10%-15% commercial);
- 100% on PPP including O&M;
- Land by ULB / District Administration; and
- Advertisement for Revenue.

Programme Strategy-III

Community Toilets:

- For Poor and Slum Dwellers;
- Simple, Robust and Functional in Design;
- Ownership by Local Community;
- Expenditure including O & M on PPP;
- Land by ULBs/District Admin./Local Development Bodies; and
- Maximum of 40% VGF.

Programme Strategy-IV

Solid Waste Management:

- Implementation and O& M on a PPP mode.
- Segregation at Source: Mandatory/Incentives.
- Move towards 100% Reuse and Recycle .
- Waste to Energy/ Building Material.
- A maximum of 20% VGF.
- Policy Support: Sale of Power,Use of Compost, Reuse of Construction & Demolition (C&D) Waste.

Desired Outcomes of SBM

- Elimination of Open Defecation;
- Conversion of Insanitary Latrines into Pour Flush Toilets;
- Eradication of Manual Scavenging;
- Prevention of Pollution of Water Sources;
- Ensuring Cleanliness and Hygiene in Public Places;
- Awareness Creation; and
- Capacity Building.

SMART CITIES

The Infrastructure Part

1. TRANSPORT
2. ENERGY
3. WATER
4. WASTE

Smart cities: Linkage to energy efficiency

Energy efficiency / alternative source of energy use optimization, service level enhancement and improved infrastructure at city level

<u>Challenges of Cities</u>

"Cities are 50% of the world's population, 75% of its energy consumption and 80% of its carbon emissions - and cities are growing."

- By schneider-electric.com

Basic framework for Energy Management in a Smart City

Energy demand

Smart Meters

Prioritising demand

Energy efficient devices

Green building design

Reducing demand for transportation

ICT Technologies

"Internet of things"

Sensors – temperature, air quality, traffic flow

Communication b/w power generation and consumption

City dashboard

Data collection and analytics

Cleaner generation

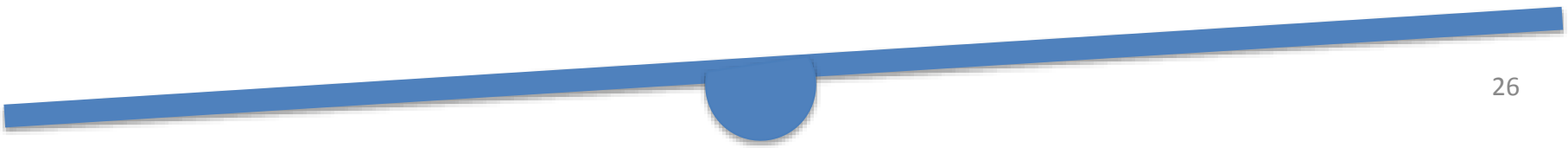
Geothermal cooling

Solar rooftops

High efficiency thermal power

Cutting AT&C losses

Efficient distribution



Opportunities for smart energy management in the Indian context

- What do have?
  - Growing solar and solar rooftop sector (Surat, Delhi)
  - Green building standards such as GRIHA
  - The Energy Conservation Building Codes
  - Access to extensive mobile phone networks

- What next?
  - Smart metering and smart grids
  - Maximising distributed or localised generation
  - Energy efficiency awareness

WATER

Water Scenario

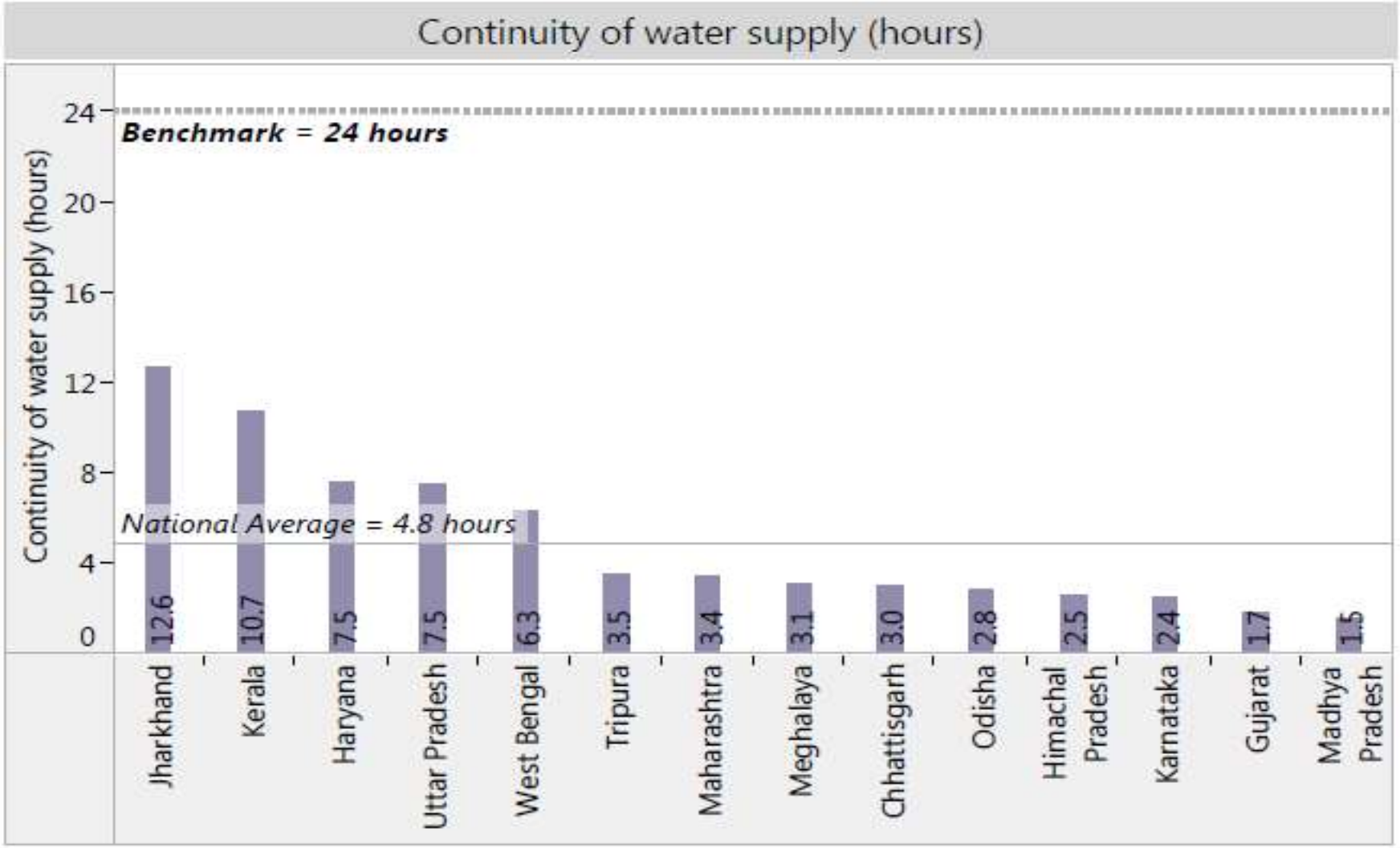
- Water Access Points (Census 2011)
  - Over **71.2%** of India's urban households had access to drinking water within their premises;
  - Another **20.7%** households had a water source within 100 m of their premises.
  - Over **8%** of India's urban households need to move beyond 100 m from their premises to access drinking water, is a cause for concern.

- **Non- Revenue Water** estimated about **40-70**% (World Bank Report)

- Per Capita Availability **– 90 to 120 litres** per day. Daily supply average is **4 hours**

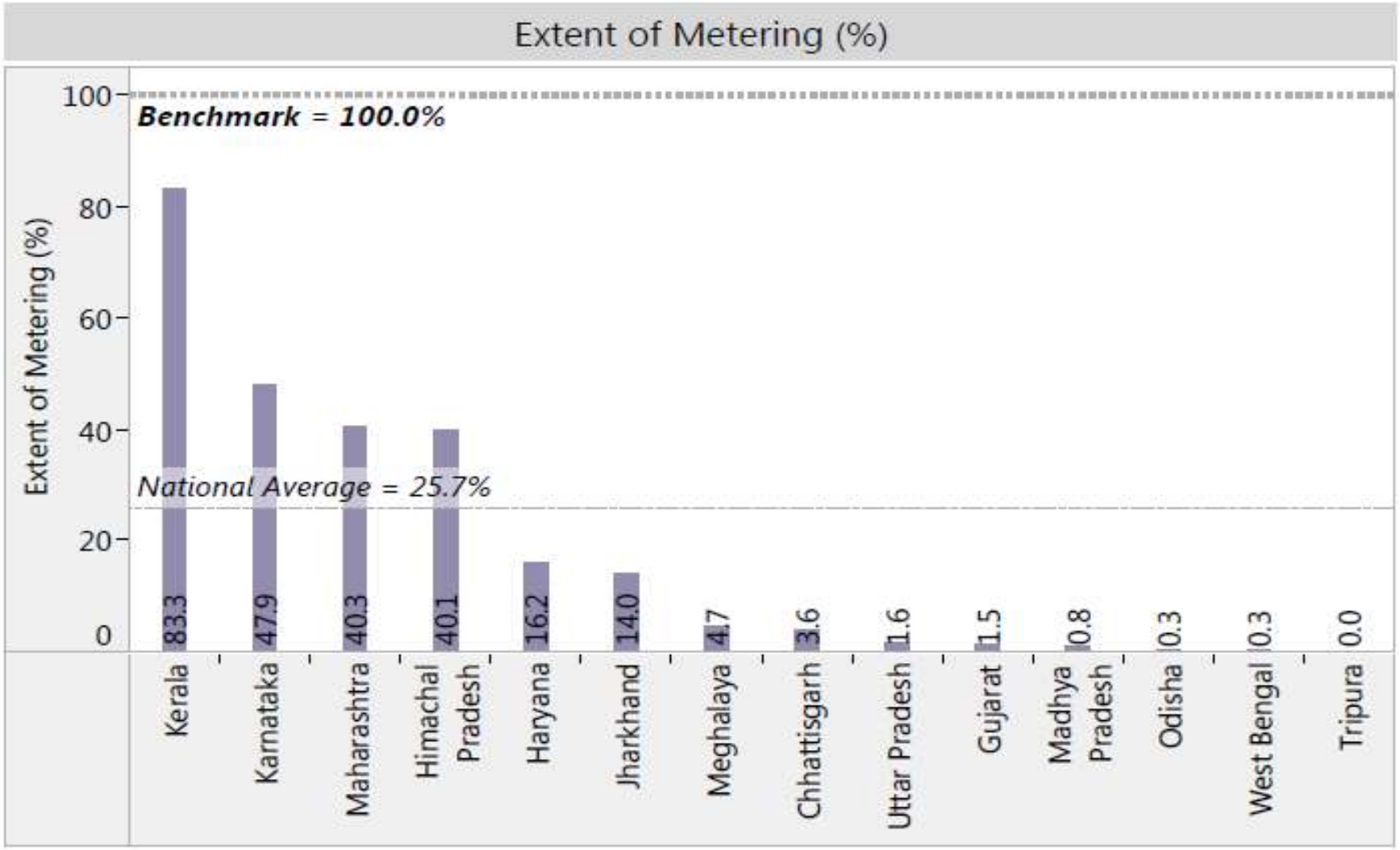
- MoUD benchmarking at **135 litres lpcd**, **24/7 availability**

24x7 supply of water: State averages (2012-13)



No Indian city meets this benchmark. National average 4.8 hours

Monitoring of water supply



Very low levels of metering of consumer connections

Online performance monitoring: Gujarat

pas performance assessment system

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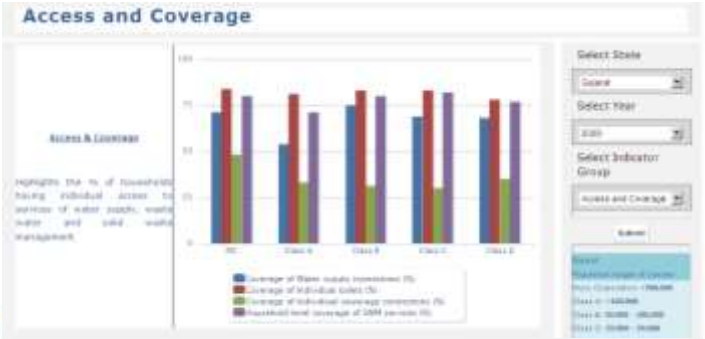
Framework | Toolkit | State Profile | Know Your City | Interactive Dashboards

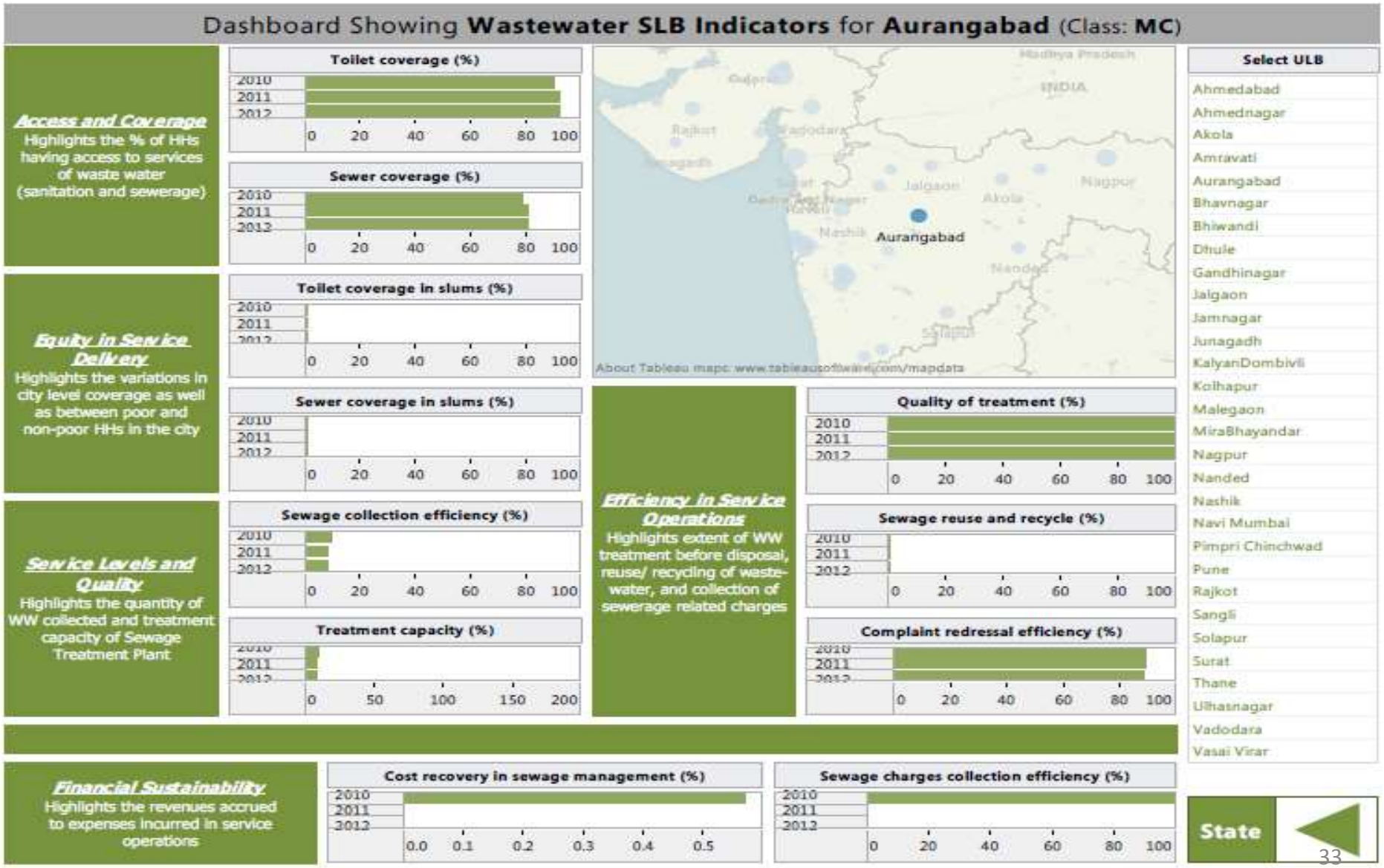
City profile of all SLBs

State profile of all SLBs



Monitoring of data entry/ targets

City dashboard: Maharashtra



Source: CEPT University, Performance Assessment System (PAS) project

Smart City: Water Supply

- Water master planning
- Development of alternate source for Raw Water
- Water Supply Grid System
- Water Quality Assurance
- Pressured water supply
- Leakage Mapping and NRW reduction
- (GIS) based technology:
- Online Complaint Management
- Electric power load related to distribution is reduced and pressure distribution is corrected for each zone.

WASTE MANAGEMENT

Waste management for smart cities

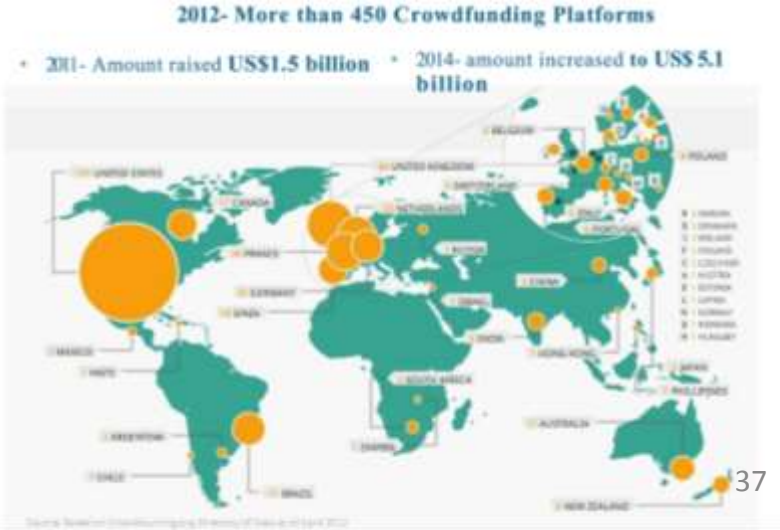
- Technology options
  - Segregation at the source
  - Tracking generation using sensors and ICT
  - Traditional and modern composting
  - Waste to energy

- Good practices from India
  - Leveraging mobile technologies in waste collection in Surat, Ahmedabad, and Chennai

Innovative Financing for water and sanitation

Strengthening Revenue streams for PPP operators:

- Compost
- Waste to Energy
- Regulation for Reuse & Recycle



- PPP
- VGF
- Pooled Financing
- Market Borrowings
- External Aid
- User Charges

POSSIBLE SMART SOLUTIONS For Liquid Waste Management

- Online and GIS based
  1. leakage management
  2. Hydraulic modeling for waste water
  3. water quality monitoring system
- Energy saving:
  1. Use of power saving devices for STPs
  2. Solar PV for electricity in facilities
- Technical
  1. Onsite treatment and usage of grey water for bulk generators
  2. Double plumbing system for separation of grey and black water
  3. Decentralized solutions for un-served areas
- Capacities of ULBs

Integrating energy, water and waste management in Smart Cities

- Can we use ICT technologies to promote segregation at the source and eliminate energy costs / emissions from transportation of waste?
- Can we divert municipal solid waste for generation of energy and / or compost?

- A smart city should know its carbon foot print – can we use inventories to cut water and energy consumption?

THANK YOU

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