Urban Water Reforms – Maharashtra - MSNA

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Principal Secretary,
Government of Maharashtra

Plan

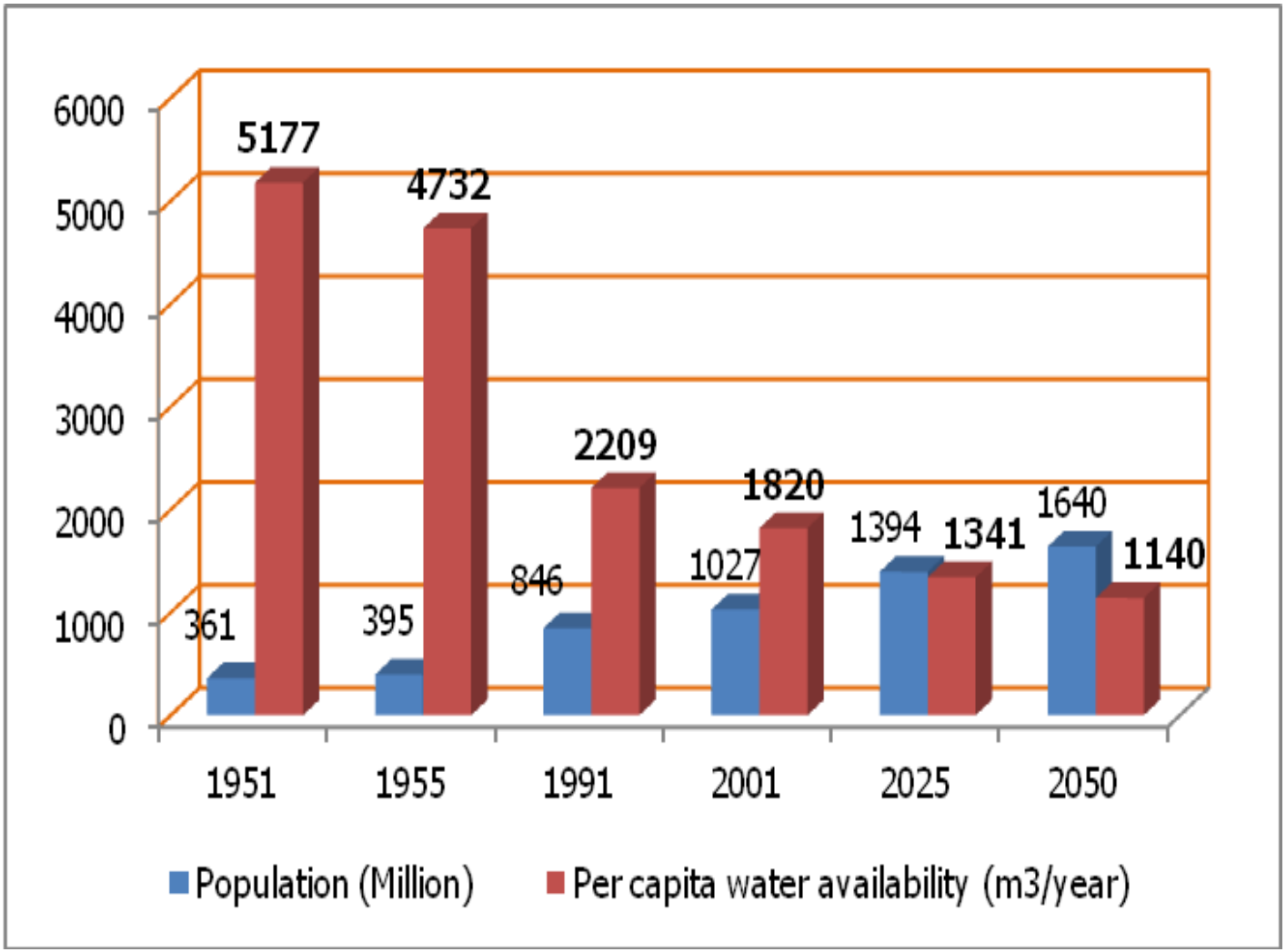
- *Scenario – Water*
- *Urban water supply scenario, Maharashtra*
- *Performance parameters and the need for reforms*
- *Reforms in Urban Water in Maharashtra – MSNA*
- *Emerging results*

Water Resources in India

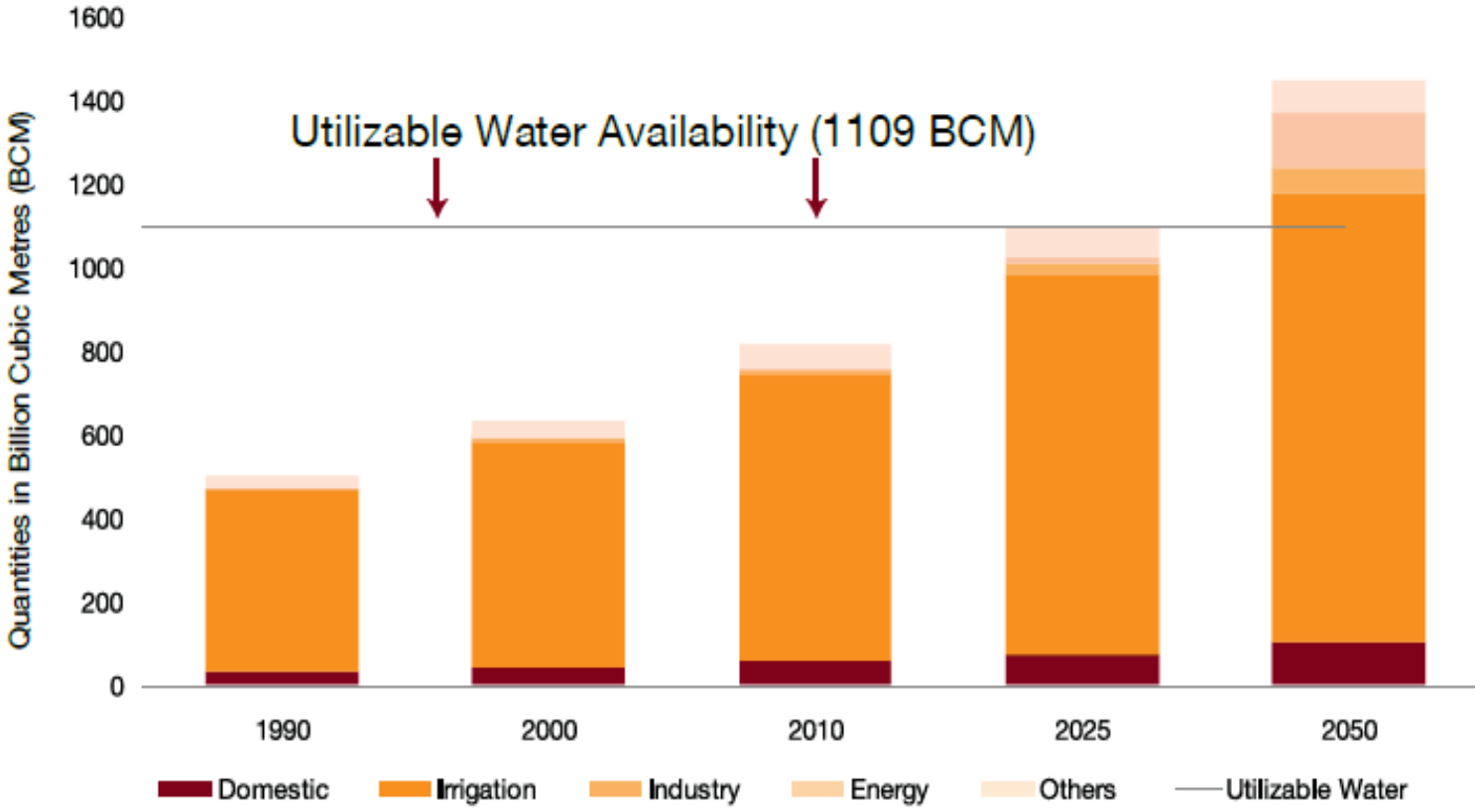
- Annual precipitation: 4000 km^3
- High spatial and temporal variability
- Annual utilizable water
  - *Surface water: 690 km^3/year*
  - *Groundwater : 396 km^3/ year (of which 71 km^3/ year is for drinking water*

(Source: Water Resources in India, R Kumar et al, Current Science 89(5), 2005)

WATER AVAILABILITY



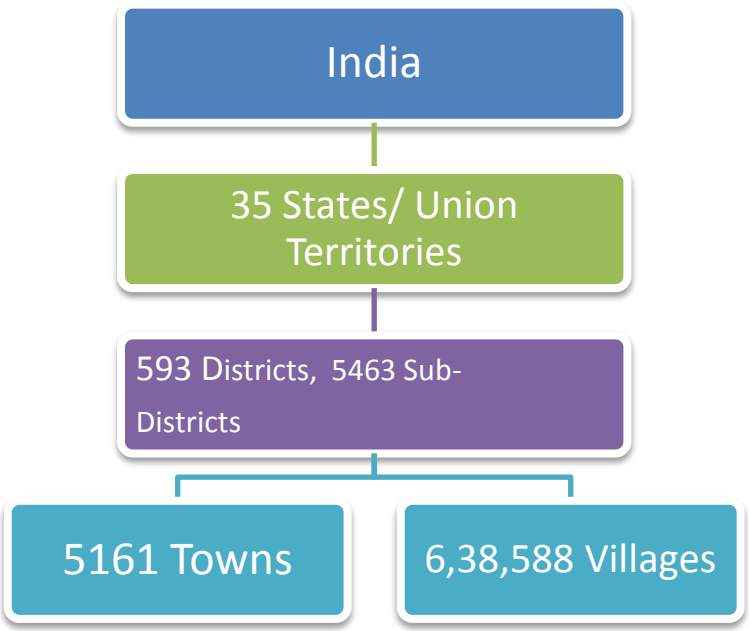
Demand Supply Gap

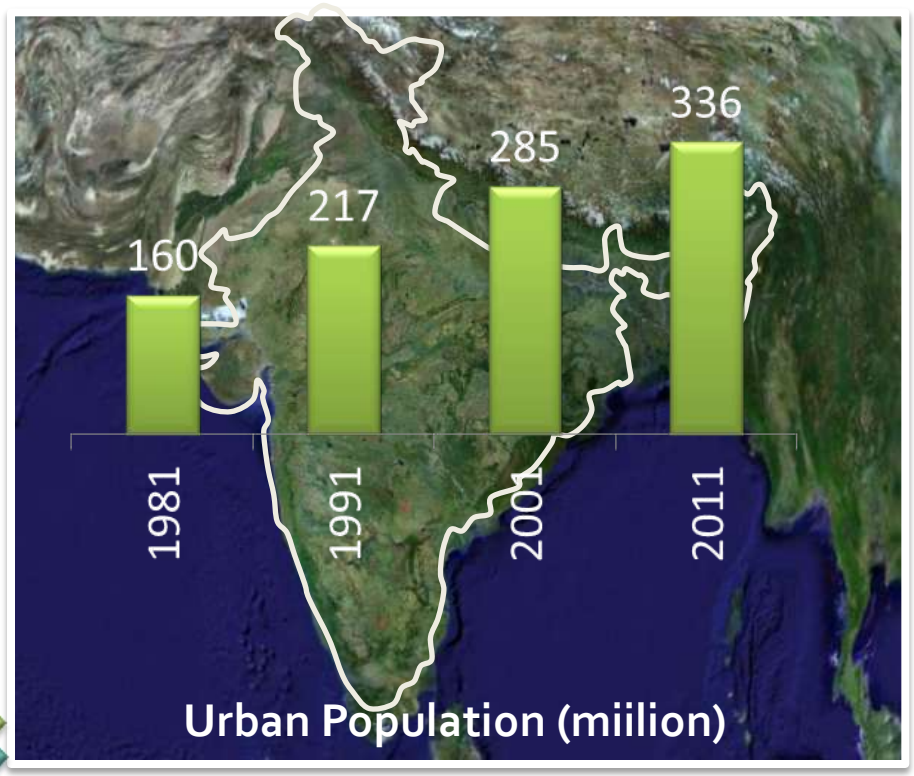


Source : www.indiastat.com; CWC

Urban Scenario

21st Century- Set to become India's urban century





2020
140 million will move to cities

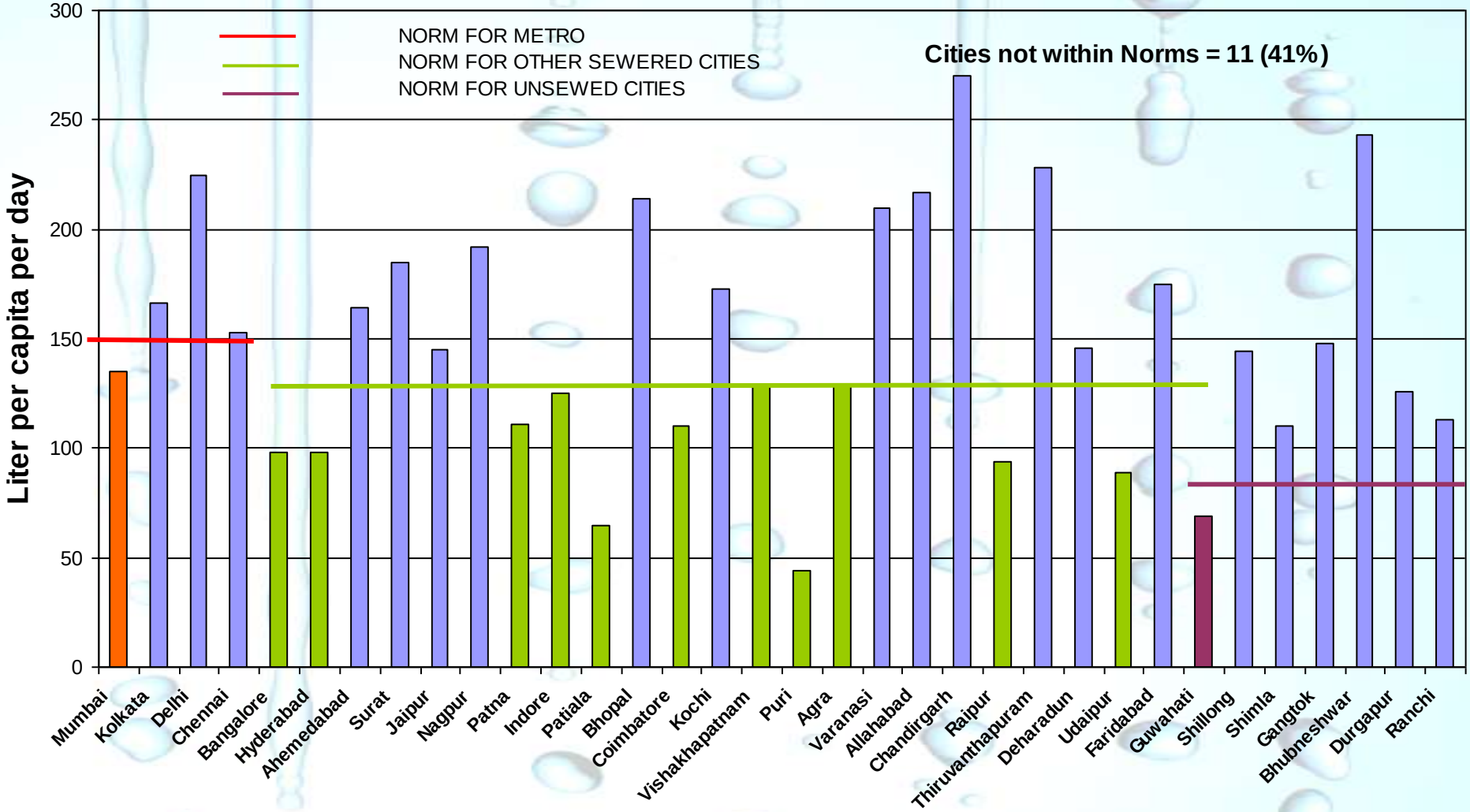
2020
No. of cities (Popu. > 10^6) will double

2050
700 million will urbanize

50% population will live in urban areas by 2050

Source: Mint, The Wall Street Journal, Mumbai, Dt 16 August 2007

WATER SUPPLY RATE (LPCD)



Source : NEERI

Daily Hours of Water Supply

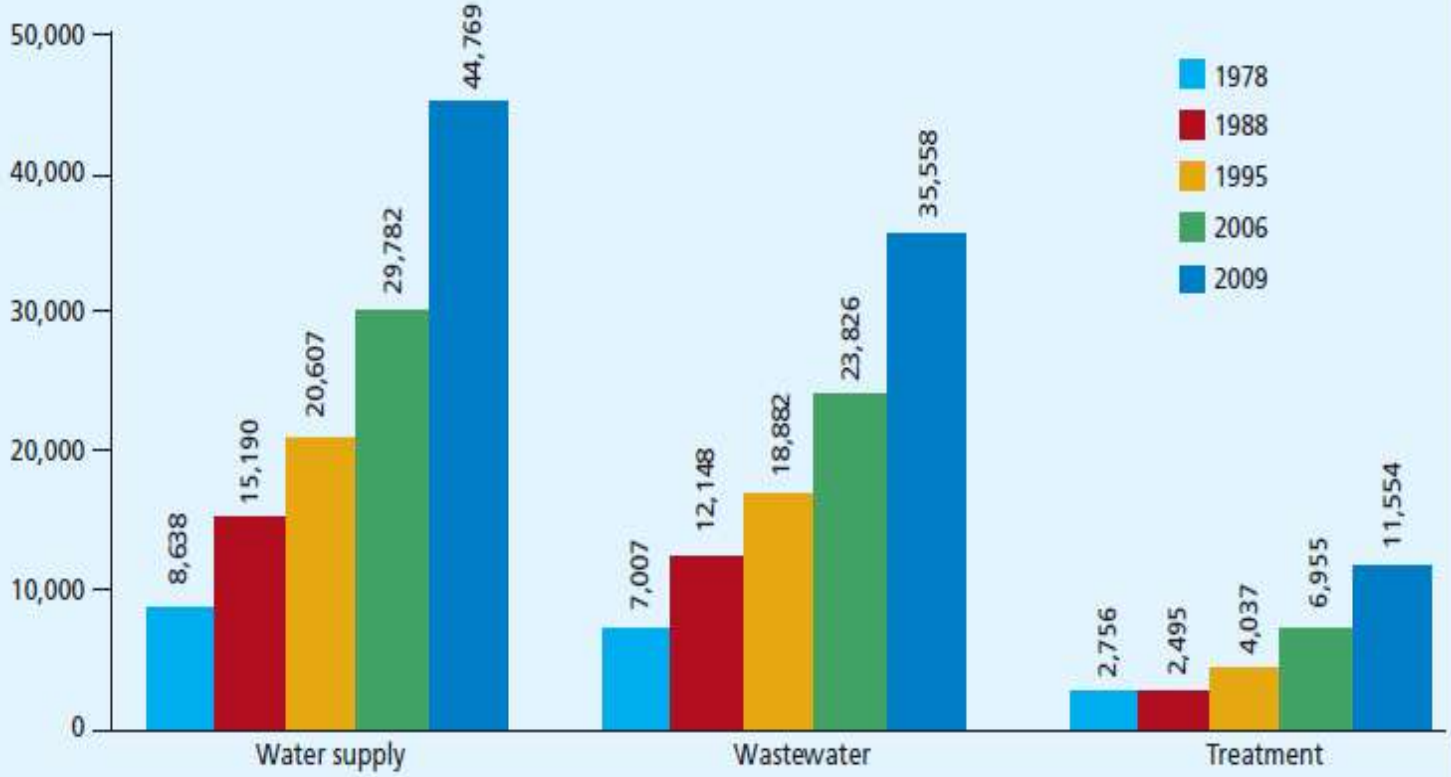
Source: Chary (2011).

No	City	lpcd	Hours of Water Supply
1	Goa	341	8
2	Mumbai	240	5
3	Delhi	220	4
4	Agra	220	4
5	Hubli-Dharwad	124	3
6	Ajmer-Pushkar	140	1–1.5
7	Vijayawada	157	4
8	Hyderabad	162	2
9	Surat	195	2–3
10	Nagpur	200	4
11	France	156	24
12	UK	135	24
13	Kuala Lumpur	132	24
14	Colombo	110	24
15	Dakar, Senegal	90	24
16	Jakarta	80	24

A12.1.2 Access Index, India

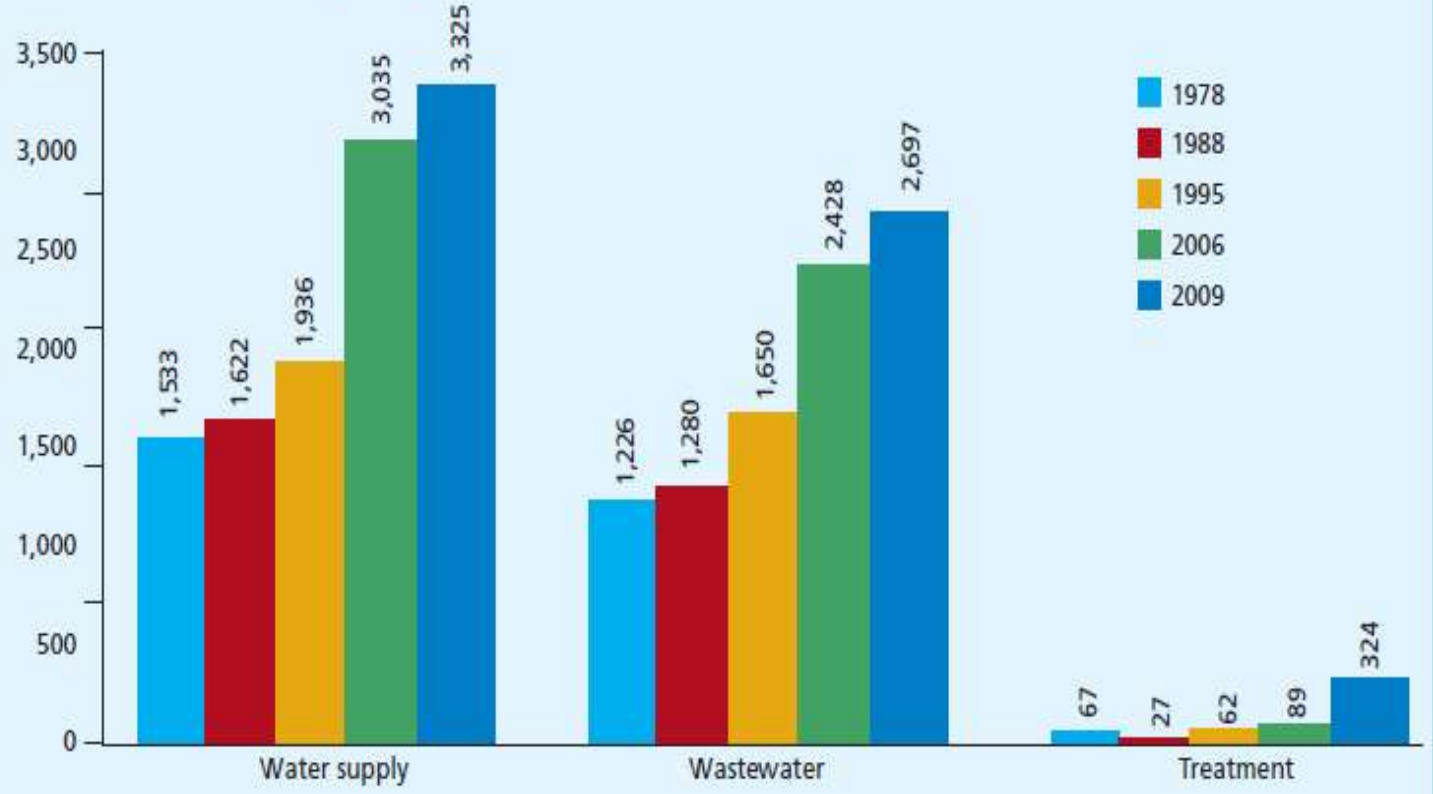
State	Percentage of households with access through tap (urban)	Percentage of households with access through tap (rural)	Percentage of households with access through tap	Access index
National	74.3	30.1	43.1	43.1
Andhra Pradesh	75.4	63.8	67.4	67.4
Arunachal Pradesh	87.2	79.8	81.4	81.4
Assam	36.6	6.3	9.8	9.8
Bihar	29	1.1	4.1	4.1
Chhattisgarh	60.5	7.6	17.5	17.5
Delhi	88	46.4	85	85
Goa	87.7	85	86.3	86.3
Gujarat	83.8	58	68.2	68.2
Haryana	76.9	61.2	66.1	66.1
Himachal Pradesh	88.5	78	79.2	79.2
Jammu and Kashmir	90.9	65.5	71.3	71.3
Jharkhand	49.1	3.5	10.7	10.7
Karnataka	91.3	70.2	78	78
Kerala	41.6	15.5	22.6	22.6
Madhya Pradesh	66.8	9.1	23.4	23.4
Maharashtra	88.9	56.9	71.1	71.1
Manipur	65.6	24.7	36.5	36.5
Meghalaya	95.6	50.6	59.3	59.3
Mizoram	72	14.6	40.1	40.1
Nagaland	25.7	28.6	27.8	27.8
Orissa	63.6	5.8	15	15
Punjab	82.1	36.3	54.2	54.2
Rajasthan	86.6	28.5	44	44
Sikkim	98.2	67.4	72	72
Tamil Nadu	81.4	87.3	84.6	84.6
Tripura	60.6	27.4	33.5	33.5
Uttar Pradesh	75	60.8	63.9	63.9
Uttaranchal	47.3	2.4	12.2	12.2
West Bengal	70.4	7.8	24	24
Andaman and Nicobar	98.9	83.1	88.3	88.3
Chandigarh	99.1	89.1	97.9	97.9

FIGURE 1.2: Water supply, wastewater generation, treatment in class I cities (MLD)



Source: CPCB reports (1978, 1988, 1995, 2006, and 2009)

FIGURE 1.3: Water supply, wastewater generation and treatment in Class II cities (MLD)



Source: CPCB reports (1978, 1988, 1995, 2006, and 2009)

How is Performance Gauged?

Nine Performance Indicators

1. Coverage, Water Supply Connections
2. Per capita supply of water
3. Extent of metering
4. Continuity of water supply
5. NRW Reduction
6. Quality of water Supply
7. Redressal of complaints
8. Cost recovery in water supply services
9. Efficiency in collection of water charges

Issues

Benchmarks	Ground Reality
24x7 supply, Universal access, Efficiency, Sustainability	Intermittent, Poor coverage(slums), High cost and NRW, Poor cost recovery

India- Low Level Equilibrium Trap

Source: CMG, ASCI, Hydrabad

<table>
<tr><td rowspan="8">Water produced</td><td rowspan="4">Authorised consumption</td><td rowspan="2">Billed & Unauthorised Consumption</td><td>Billed & Metered</td><td rowspan="2">Revenue water</td><td>Collected</td></tr>
<tr><td>Billed & Unmetered</td><td>Uncollected</td></tr>
<tr><td rowspan="2">Unbilled authorised consumption</td><td>Unbilled & Metered</td><td rowspan="6">Non-revenue water (NRW)</td><td rowspan="6">Unbilled</td></tr>
<tr><td>Billed & Unmetered</td></tr>
<tr><td rowspan="4">Water Losses Unaccounted for Water (UFW)</td><td rowspan="3">Apparent losses</td><td>Theft</td></tr>
<tr><td>Customer Meter Errors</td></tr>
<tr><td>Data Errors</td></tr>
<tr><td rowspan="3">Real losses</td><td>Storage Losses</td></tr>
<tr><td>Transmission Main Leakage</td></tr>
<tr><td>Service Connection Leakage</td></tr>
</table>

Source: India Infrastructure Report 2011

Urban Water

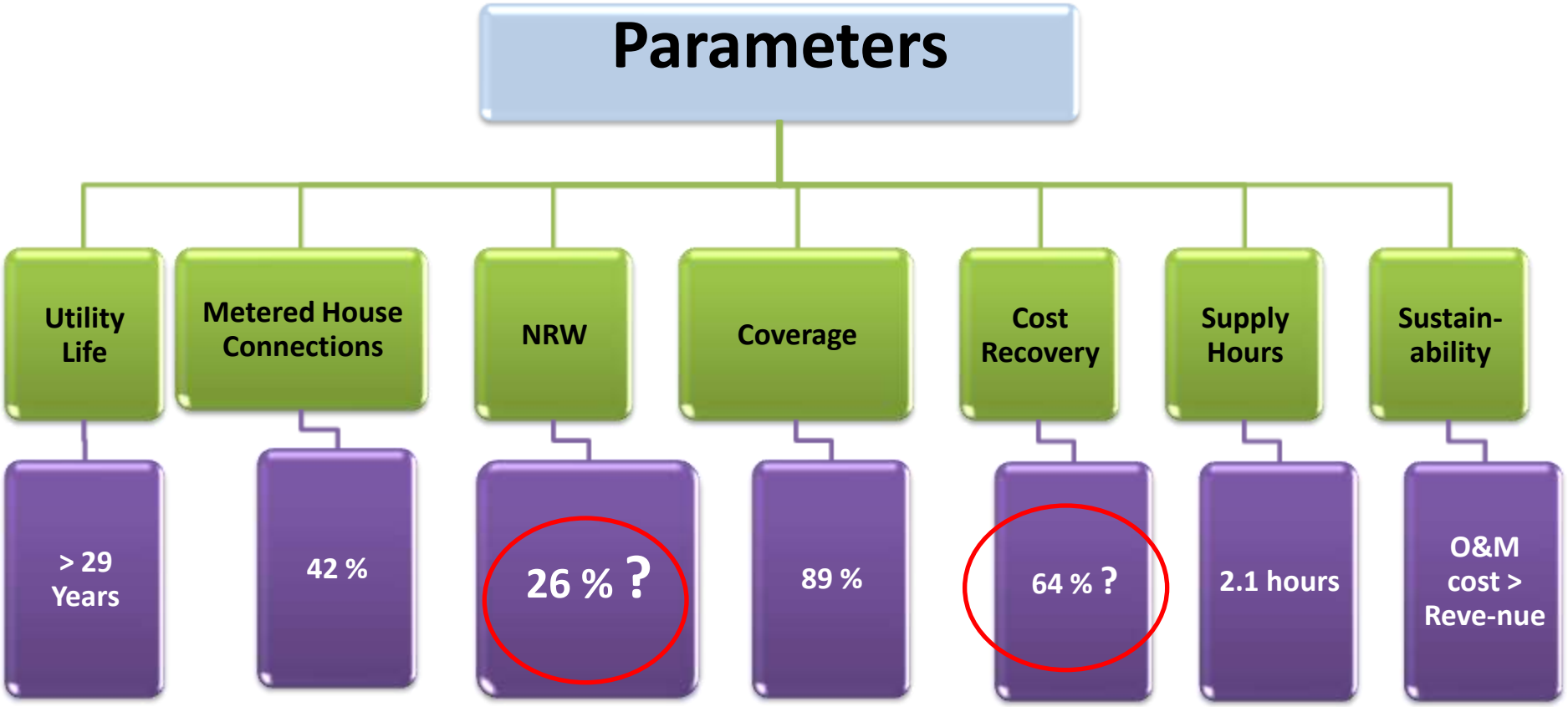
the need for Reforms

Maharashtra Urbanization Scene

Population - 2011	**112.37**
Urban Population	**45.38 %**
Urban Local Bodies	**252**
Class I Cities 100000 & above	**38**
B Class Council (40000 – 99999)	**60**
C Class Council (< 40000)	**147**
Nagar Panchayats	**7**

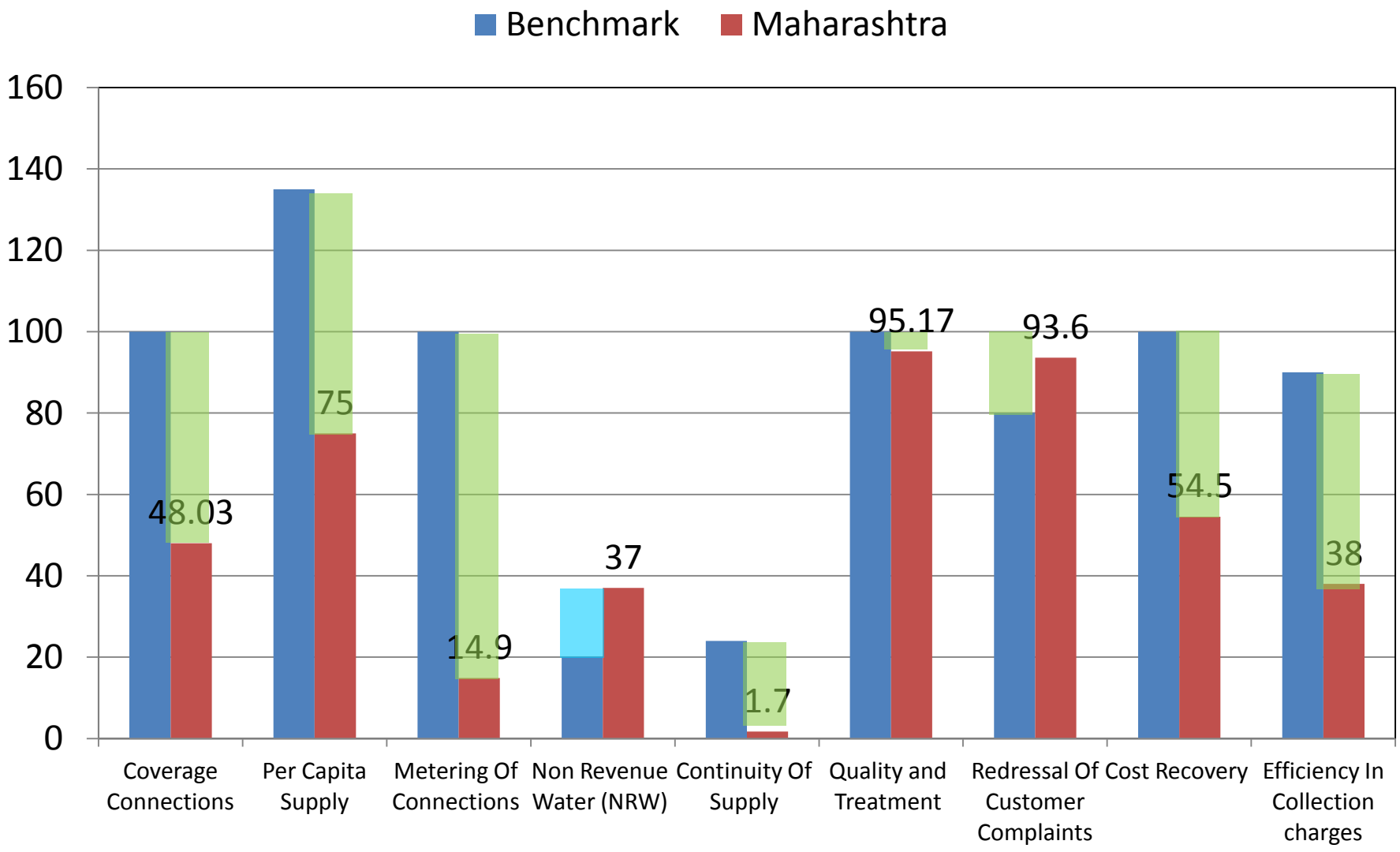
Growth Rate	1991-2001	2001-2011
Maharashtra	22.73	15.99
Rural	15.25	10.34
Urban	**34.57**	**23.67**

Maharashtra – Urban water



Source - March 2012, GoM Gazette

Gaps in Service Level Benchmarks



UNDERYING CAUSES OF PROBLEM

- WATER – AN ECONOMIC, SOCIAL, EMOTIVE GOOD
- PRESUMED RIGHT TO BE SUPPLIED FREE OF COST
- INCREASING COST OF PRODUCTION AND TRANSPORT OF WATER
- LARGE BUDGETARY REQUIREMENTS

UNDERYING CAUSES OF PROBLEM

- LOW DEBT SERVICING CAPABILITY OF ULBs
- FINANCIAL VIABILITY AN ISSUE
  - Reluctance to levy appropriate tariff
  - Weak enforcement of recovery
- LACK OF PROFESSIONAL MAINTENANCE OF ACCOUNTS
- POOR BILLING AND COLLECTION EFFICIENCIES

UNDERYING CAUSES OF PROBLEM

- WEAK APPROACH TOWARDS WATER MANAGEMENT (limited to water supply)
- LACK OF DEDICATED AND TRAINED PROFESSIONALS AND WEAK INSTITUTIONAL ARRANGEMENTS FOR O & M

Challenges

- Competing demand
- *Increasing demand*
- Sustainability of source
- *Affordability & willingness to pay*
- Maintenance of assets
- *Operational sustainability*

We need Urban Reforms

We Build-
Neglect and
Rebuild


MSNA -Reforms in
Urban Water Supply

POLICY ENVIRONMENT

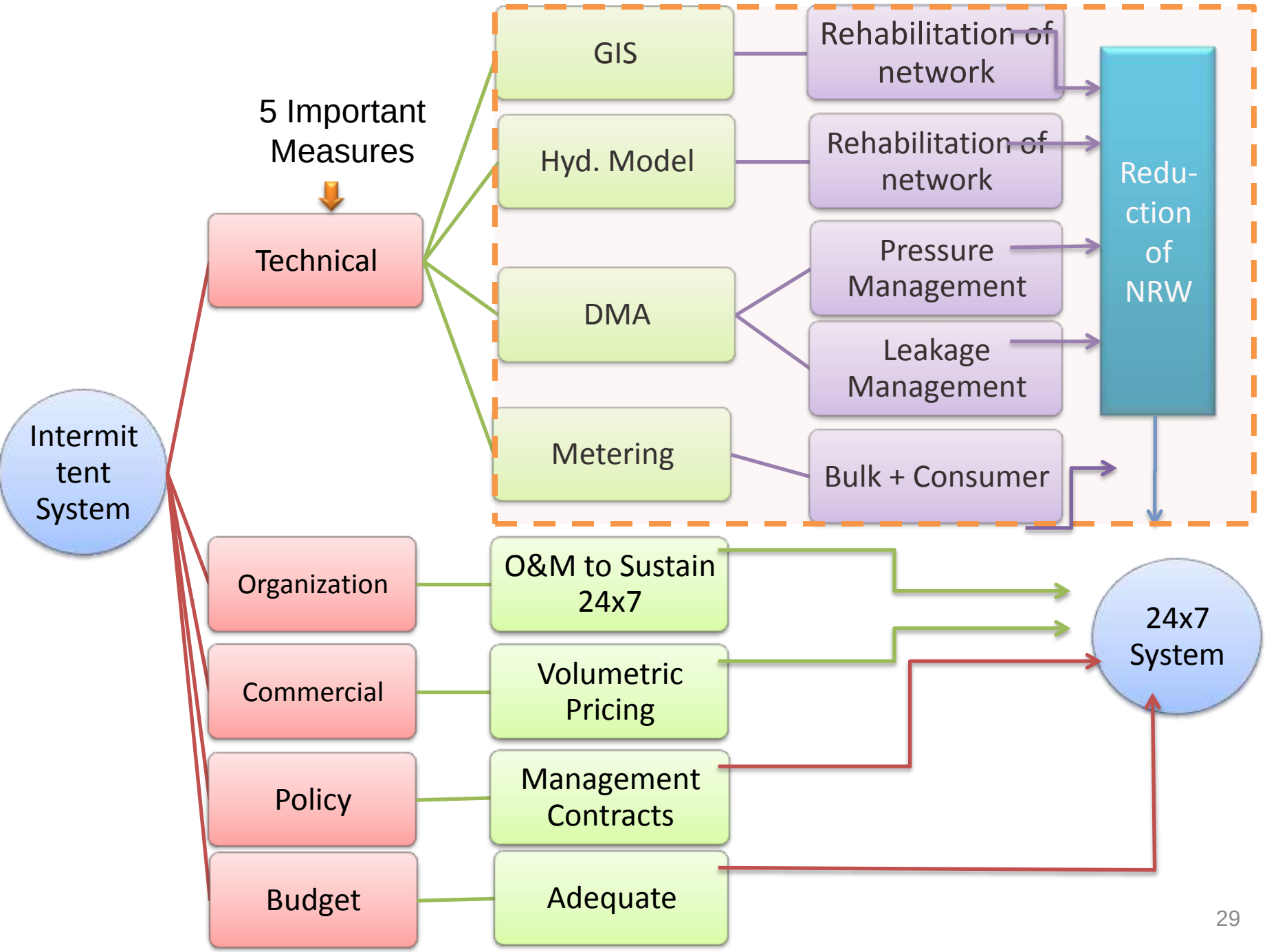
- 74TH AMENDMENT CONFERRED RESPONSIBIITY OF WATER AND SANITATION ON ULBs
- JNURMM AND UIDSSMT ENCOURAGED REFORMS IN URBAN SECTOR, ***BUT NO SECTOR SPECIFIC REFORMS TARGETED***
- MSNA LAUNCHED IN MAHARASHTRA IN 2010, TOOK OFF IN 2011-12

Key feature of MSNA

Reforms led investment for improved, sustainable services

- **GoI has prescribed Benchmarks**
- **MSNA is an approach to reach the benchmarks; implementation in 3 phases**

Sujal and Nirmal Maharashtra Abhiyan


5 Important Measures
Intermit tent System
Technical
Organization
Commercial
Policy
Budget
GIS
Hyd. Model
DMA
Metering
Rehabilitation of network
Rehabilitation of network
Pressure Management
Leakage Management
Bulk + Consumer
Redu-ction of NRW
O&M to Sustain 24x7
Volumetric Pricing
Management Contracts
Adequate
24x7 System

MSNA Phasing

Phase-I (2009-12)

- House to House Survey
- Hyd. Model
- Bulk Meter
- Water + Energy Audit
- Pressure Management
- GIS Mapping
- PPP in O&M
- Computer Billing

Phase-II (2012-17)

- 24x7 in pilots
- Sustainable sources
- Metering 80%
- Collection efficiency (80%)
- Sewerage system
- MIS
- Tariff framing
- Solid waste Mgmt.
- ODF cities

Phase-III (2017-25)

- 24x7 System
- Metering 100%
- Collection efficiency (100%)
- Sewerage including STP

Reforms and Expected Outcomes

Consumer Survey	• Detect illegal connection • Regularization • Increased Revenue
Water Audit and Metering Volumetric Pricing	• Assess NRW, Reduce leakages • Save water, reduce expenditure
Hydraulic modelling	• Rationalize network • Reduced Capex, and O & M

Reforms and Expected Outcomes

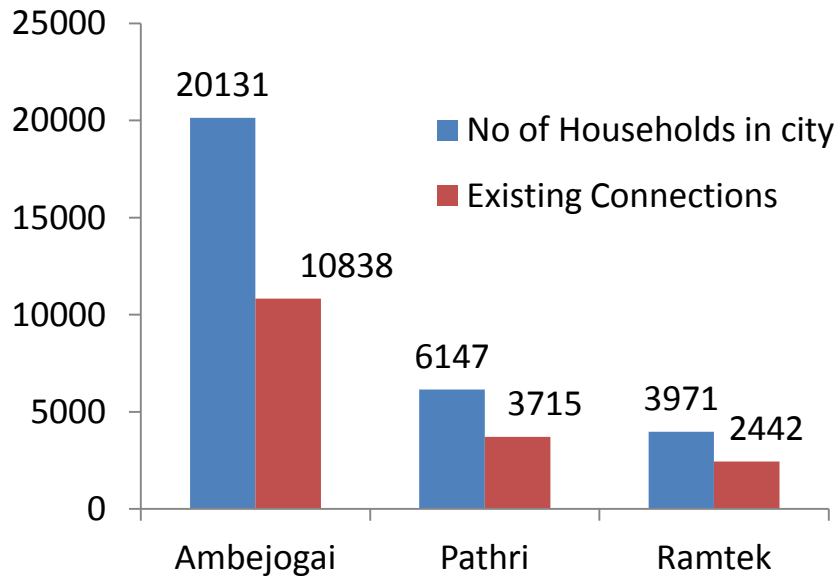
Energy Audit	• Increased efficiency • Reduced expenditure
Computerized billing	• Increased billing efficiency • Increased income
O & M	• Management Contracts • Sustainability

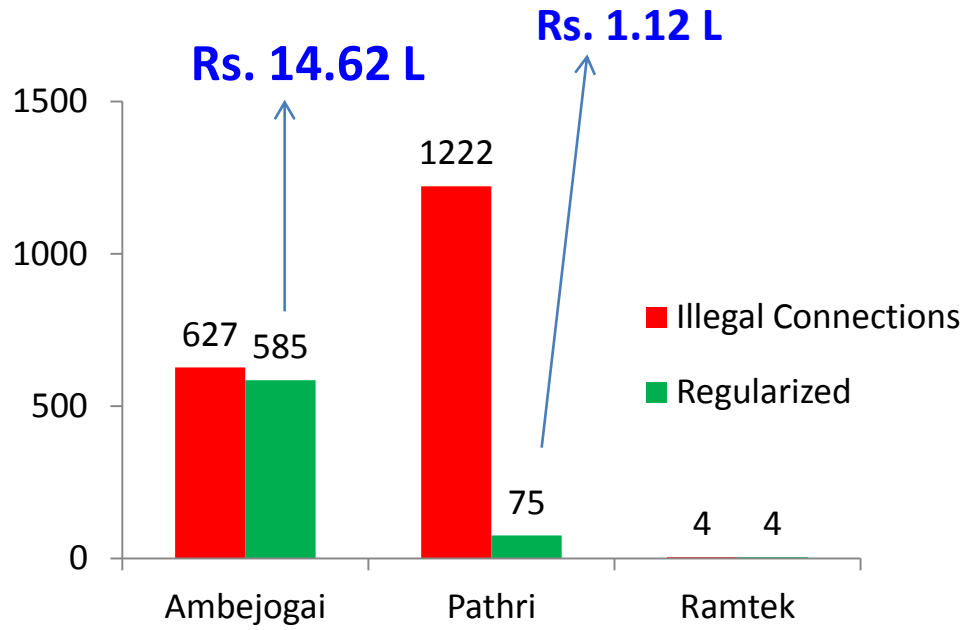
Results emerge

MSNA

Results start emerging…

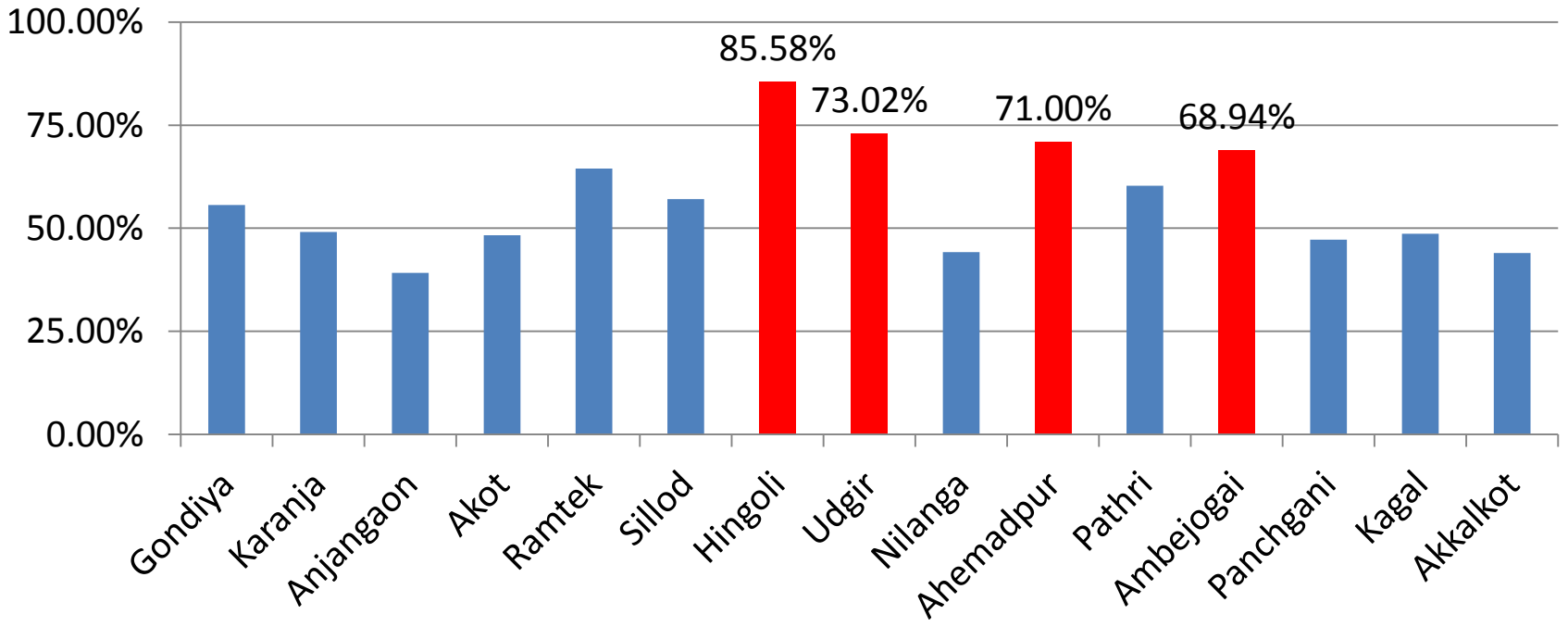
- **Increase in Revenue**
  - *Illegal connections identified*
  - *Better and regular billing cycle*
  - *Improved collection efficiency observed*





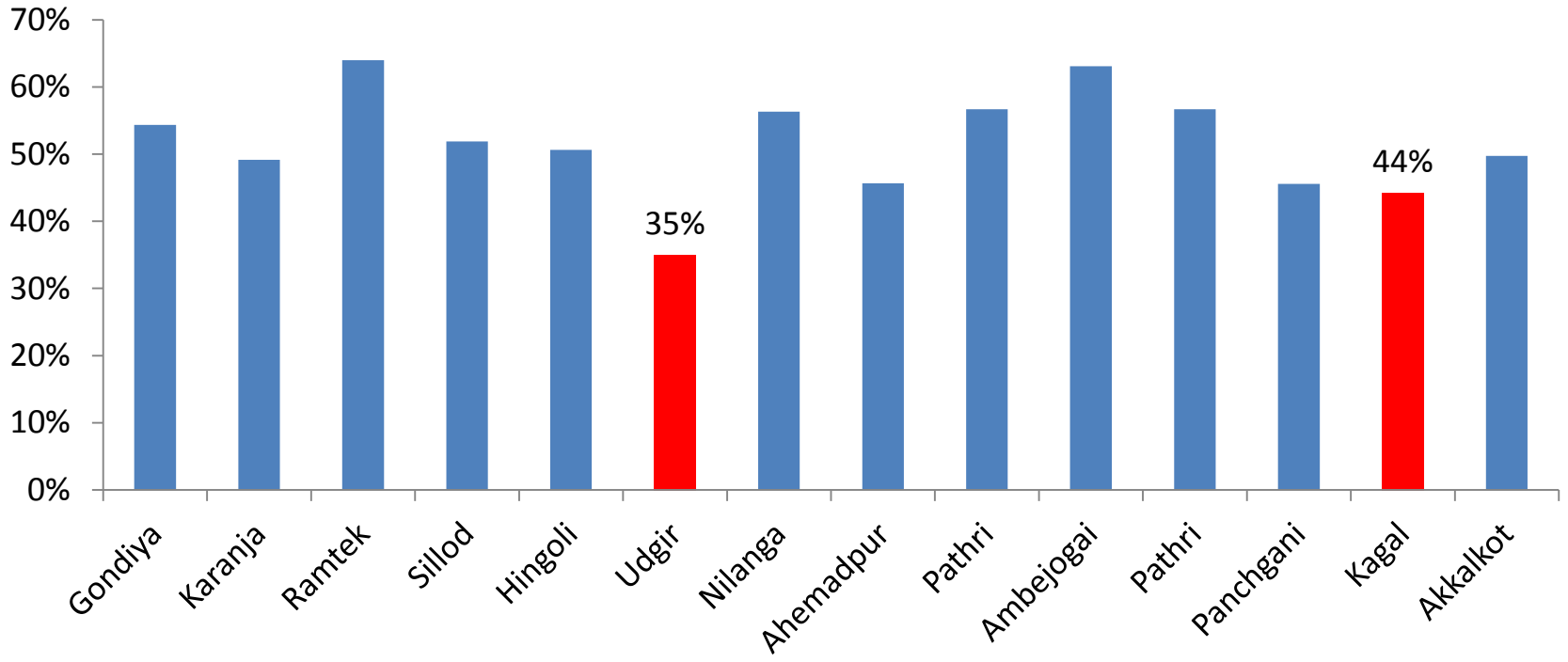
Identification of % NRW

- *Water Audit carried out*
- *Awareness regarding NRW took place due to reforms*
- *NRW in internal distribution is more*
- *Greater scope for household metering and efficient water management*



Energy Audit

- *Increased pump efficiency leading to saving in power cost +*
- *Due to decreased NRW, pumping hours saved →*
- *Expenditure on operations reduced (added savings)*



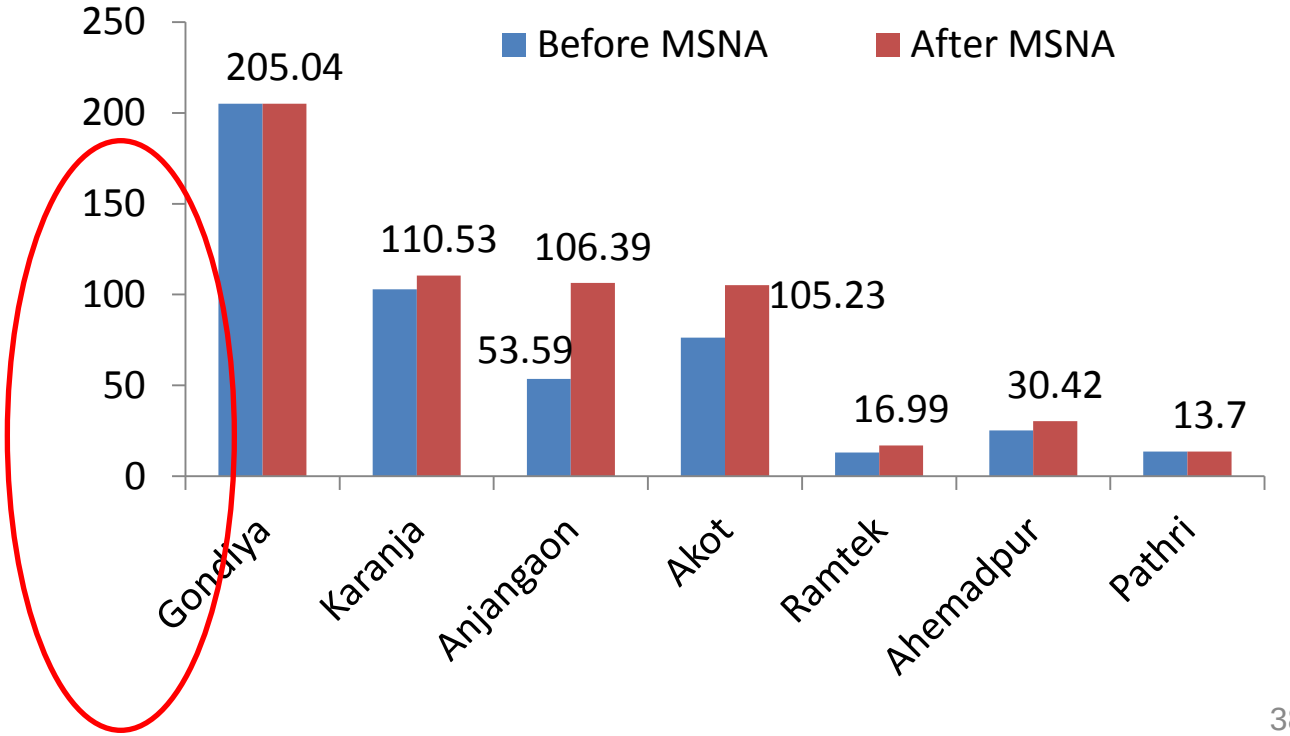
Translates to savings in expenditure…

Indicator	Srivardhan	Manmad	Manvat	Ramtek
Pump Efficiency %	50%	43%	44%	75%
Energy Bill Saving, Rs. Lakhs	**0.87**	**37.51**	**3.66**	**2.44**

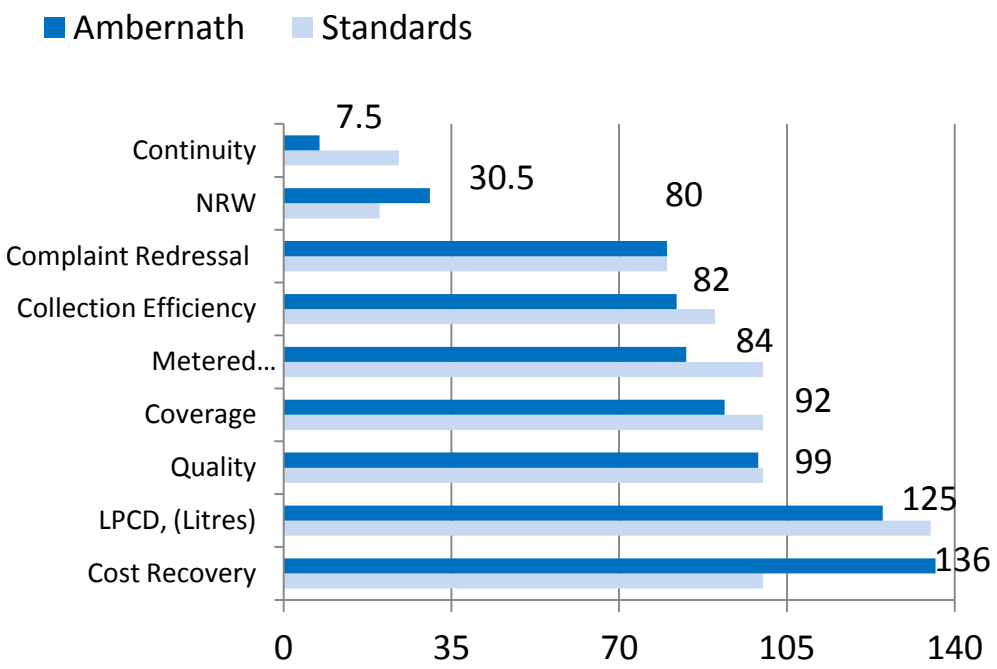
Improvements in Water Tax Collection

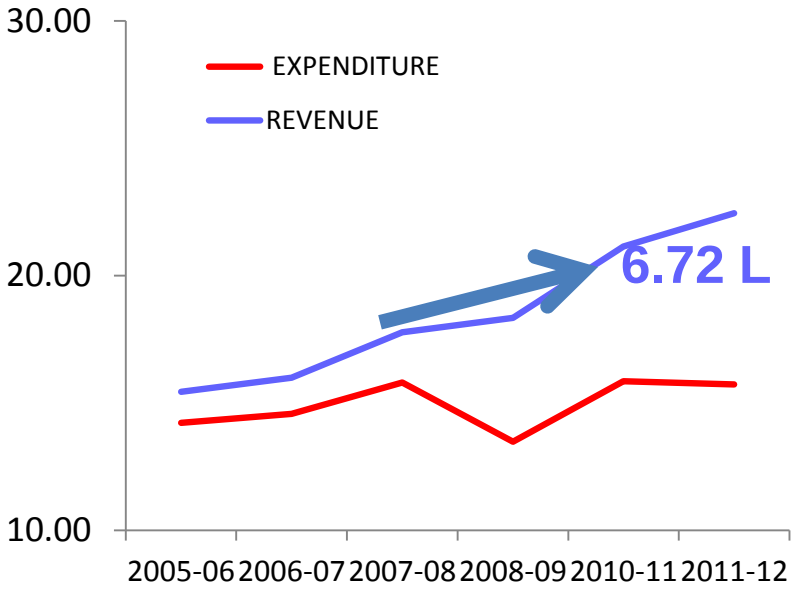
(Rs. Lakhs/year)

- *Billing efficiency has enhanced*
- *Monthly billing cycle being adopted*
- *Computerized billing mechanism adopted*
- *Outsourcing has also been done in some cases*
- *Tax Collection doubled in some cases*



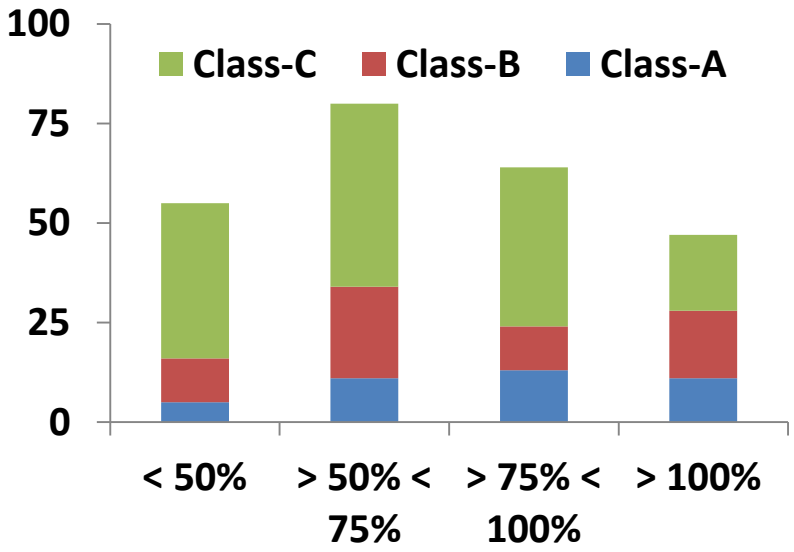
Ambernath, Thane





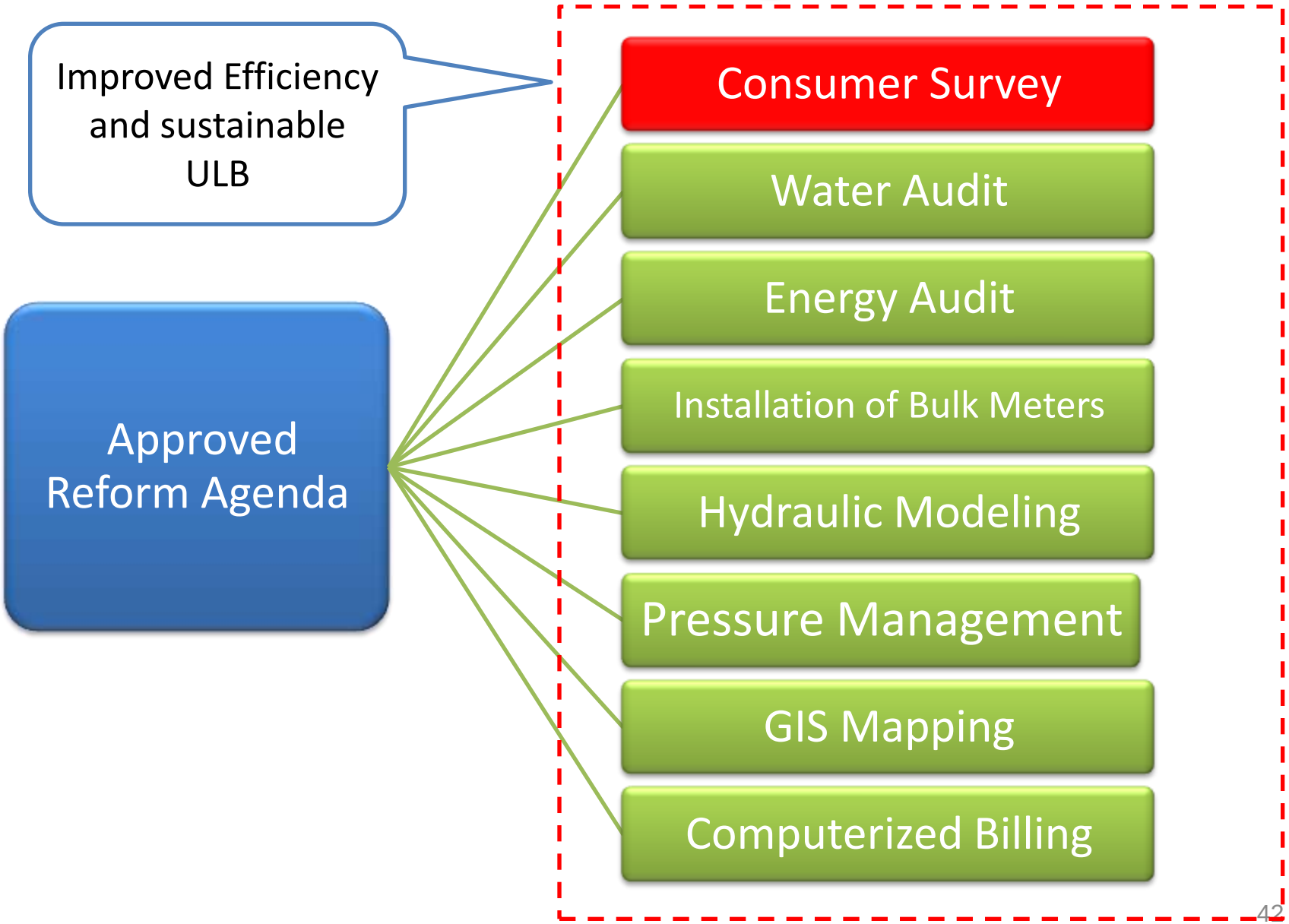
Thank you

Status – Water Supply *(No of Cities & Percent of Households)*

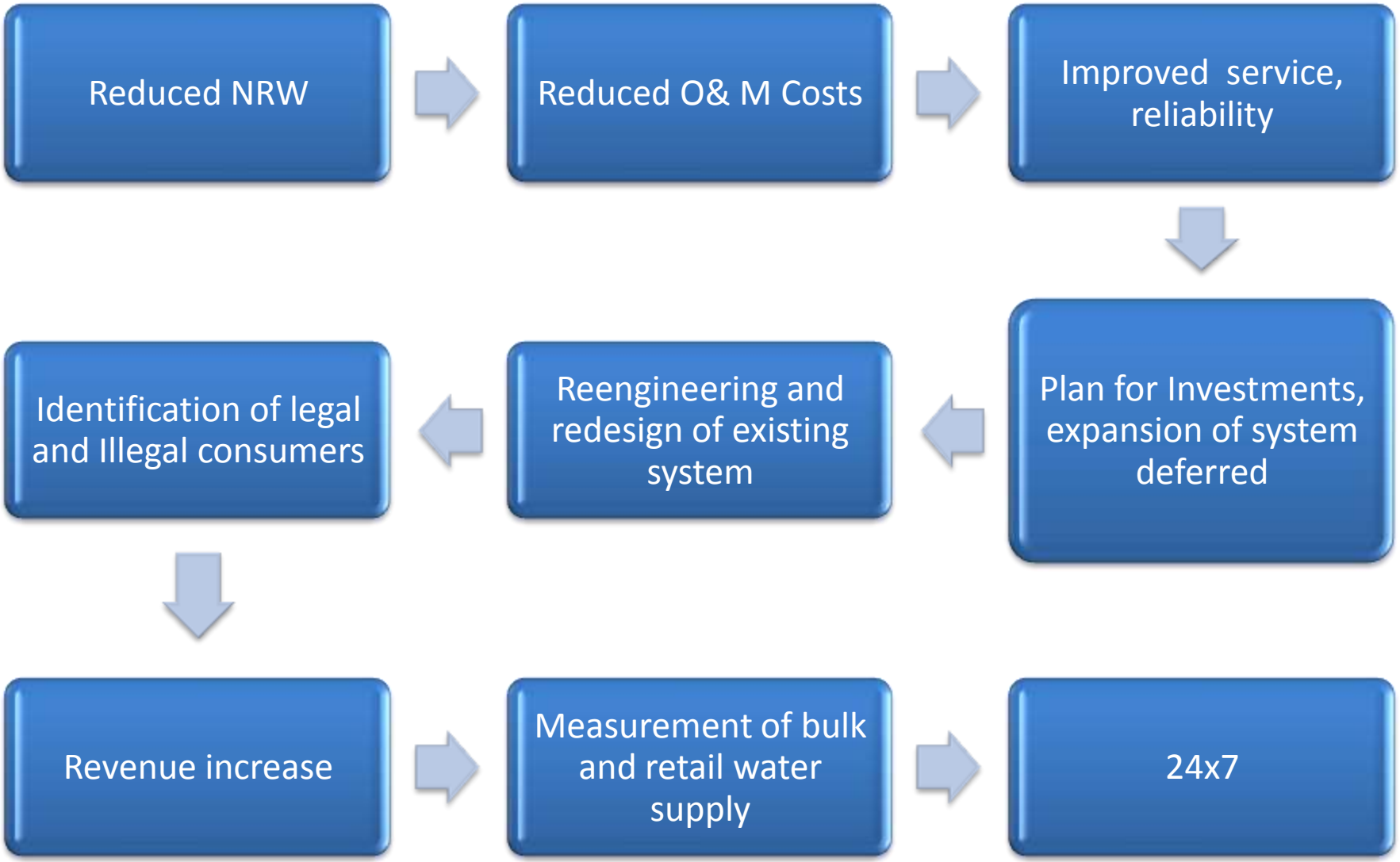


Existing Situation	Class-A	Class-B	Class-C	Total
< 50%	5	11	39	55
> 50% < 75%	11	23	46	80
> 75 % < 100 %	13	11	40	64
100%	11	17	19	47
Total	**40**	**62**	**144**	**246**

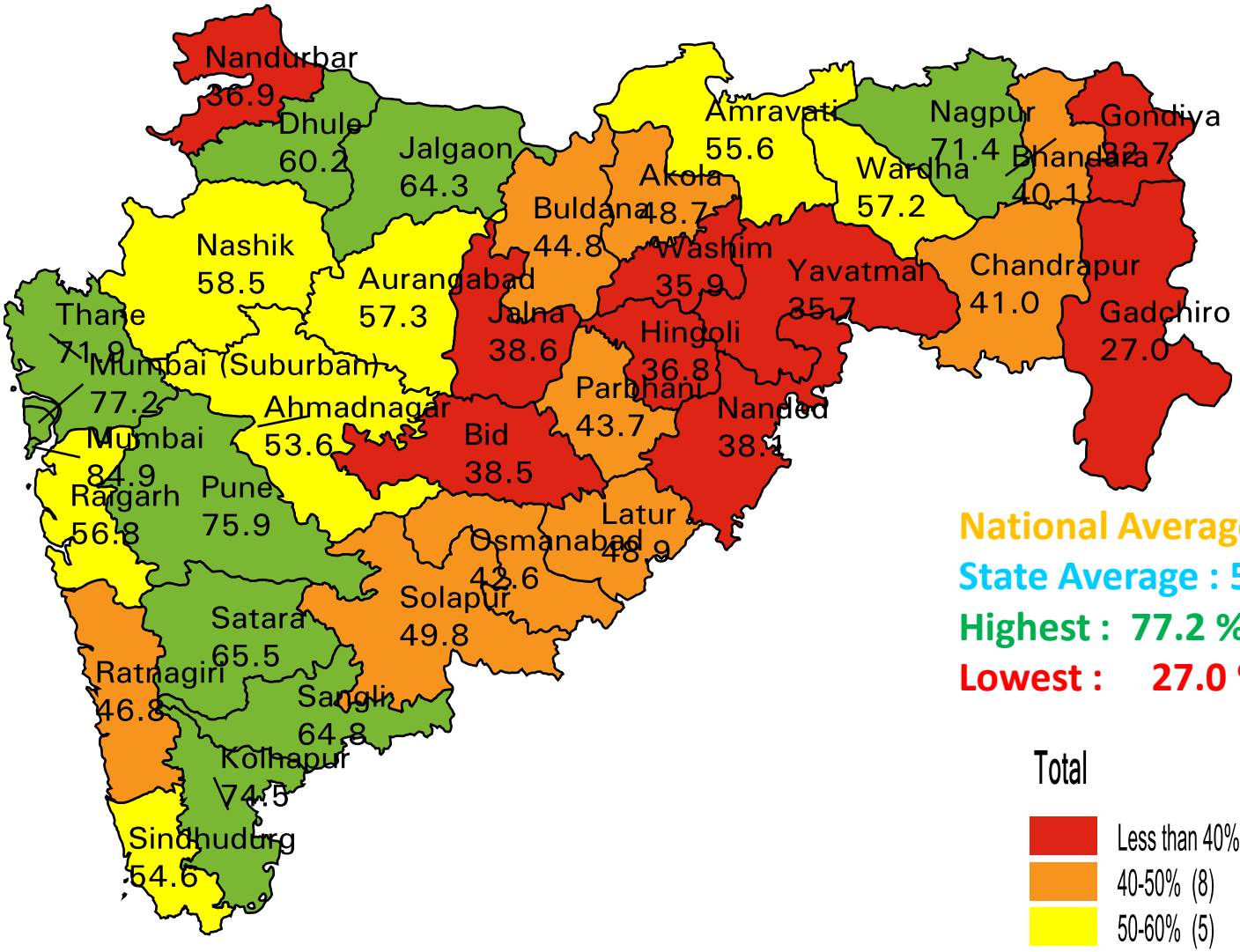
Reform Components



Benefits of Implementing Reforms



Percentage of households having drinking water facility within the premises by district, 2011



National Average : 46.6%

State Average : 59.4%

Highest : 77.2 % Mumbai (suburban)

Lowest : 27.0 % Gadchiroli

Total	Number of districts
Less than 40% (15)	09
40-50% (8)	09
50-60% (5)	07
More than 60% (7)	10

Phase-wise Activity Targets under MSNA

Phase I – Short Term (2009-12)

MSNA I	Activity / Target
Water Supply	- House to house data base - Hydraulic Modeling & Bulk Metering - Metering of Industrial, Commercial & Bulk Consumers - Conducting Water & Energy Audits
Sewerage	- Mapping sources of pollution of water bodies - Improving existing network & treatment system - Increasing Coverage - Study of existing onsite systems - Implementing de-centralised & low cost sewerage system
Sanitation	- Preparing Sanitation Plan & survey for coverage
Solid Waste	- Preparing City solid waste plan

MSNA I	Activity / Target
Finance	- Improving Billing & Collection system - Ring Fencing UWSS Operations - Achieving Financial Sustainability
Services for Urban Poor	- Improving services for Urban Poor on **"Mumbai Pattern"**
General	- Establishing Complaint redressal system - Preparing City level UWSS Business Plan - Initiating O&M Contracts - Preparing Institutional Reforms - Preparing Regulatory Frame work - Restructuring of MJP

Outcome

- Blue print for institutional reforms prepared
- Improved services & financial Sustainability within existing infrastructure
- Improvement plan in place

Phase II – Medium Term (2012 - 17)

MSNA II	Activity / Target
Water Supply	- Improving service delivery including universal coverage - Sustainable source of water - Metering all household consumers - Implementing Augmentation schemes
Sewerage	- Implementing Comprehensive sewerage schemes
Sanitation	- Implementation of City Sanitation Plan
Solid Waste	- Ensuring Full coverage & safe disposal
Finance	- Continuation of improved services ensured
Services for Urban Poor	- Achievement of Financial Sustainability
General	- Implementation of Complaint redressal system - Implementation of O&M Contracts - Implementation of Institutional Reforms - Adoption of Regulatory Frame work - Restructuring of MJP

MSNA Phase II – Medium Term (2012-17)

Outcome

- Universal Coverage
- 24X7 water supply in Pilot cities
- Full Cost recovery
- More accountable, autonomous & customer oriented service delivery models
- Contractual arrangement for service delivery in place

Phase III – Long Term (2017 - 25)

Achievement of Service Level Benchmarks	
Water Supply	• 24 x 7 in all ULBs implemented
Sewerage	• Additional facility for Treatment & disposal of waste water provided
Sanitation	• Efficient maintenance of sanitation facilities achieved
Solid waste	• Developing additional scientific landfills to cater to the needs of next 25 years developed
Improving Financial Sustainability	
• Credit rating at least 2 notches more that investment grade rating (BBB+ or above) achieved • ULB's raise Municipal Bonds based on escrowing of water supply & sewerage revenues	
Improved Environmental Sustainability	
• The NRW sustained at targeted levels (less than 15%) • 100% waste water treatment implemented to adhere to MPCB norms	

Funding Capex (Rs. Million)

S. N.	Requirement of Funds for Capital expenditure (in Rs. Million)	MSNA I	MSNA II
Funds requirement			
1	JNNURM	17,279	28,800
2	MMR Towns	2,730	12,017
3	Other towns	15,096	49,089
4	**Implementation of reforms**		
	- Support to MSNA CMU	194	0
	- Capacity building at ULB level and other reforms	4	0
	- Water and energy audit	672	0
	- Billing and AB Double Entry Accounting System	151	0
	- Preparation of City Sanitation Plan	580	0
	Total investment requirement till 2012	**36,706**	**89,906**

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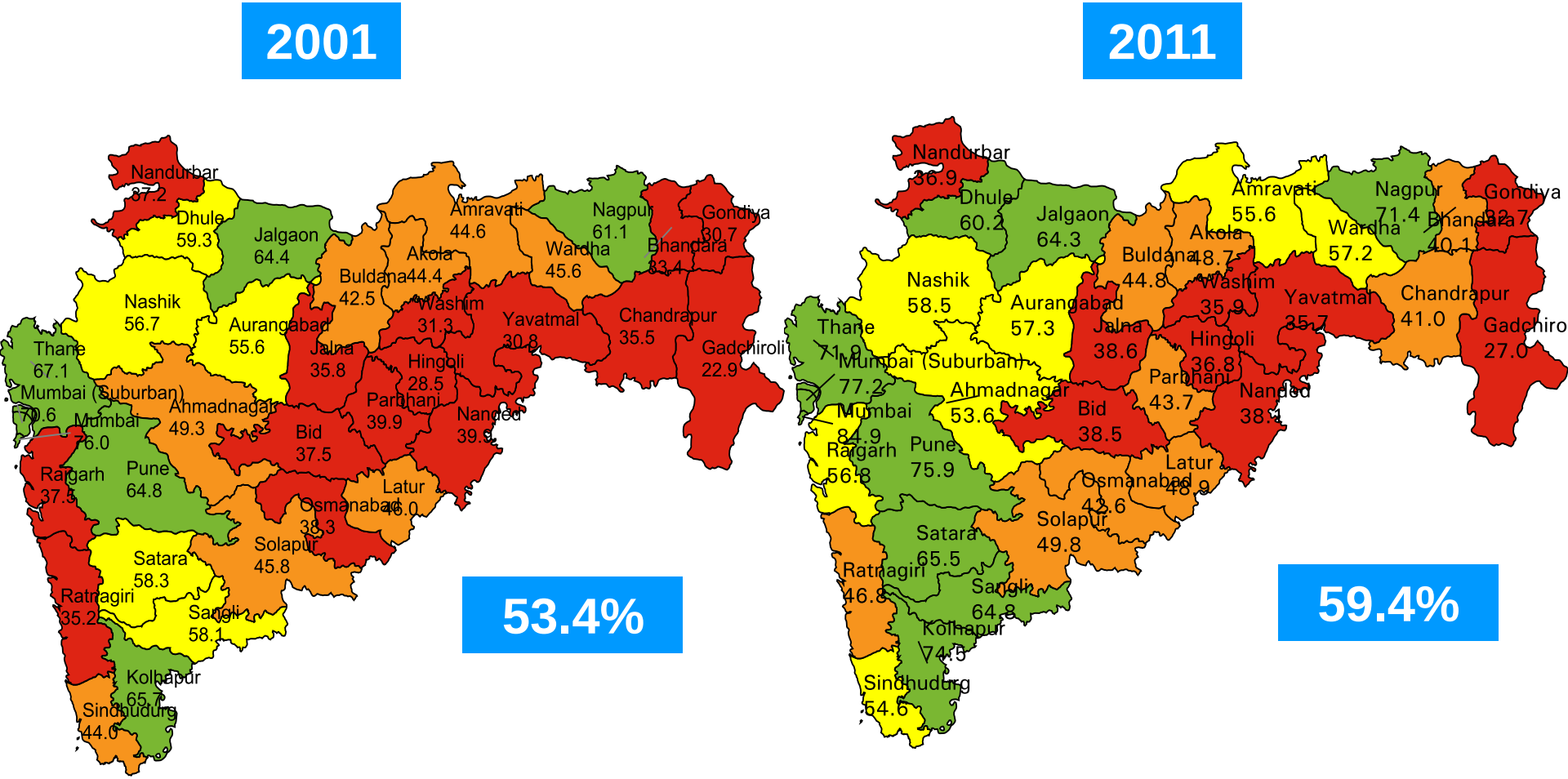
Funding Opex (Rs. Million)

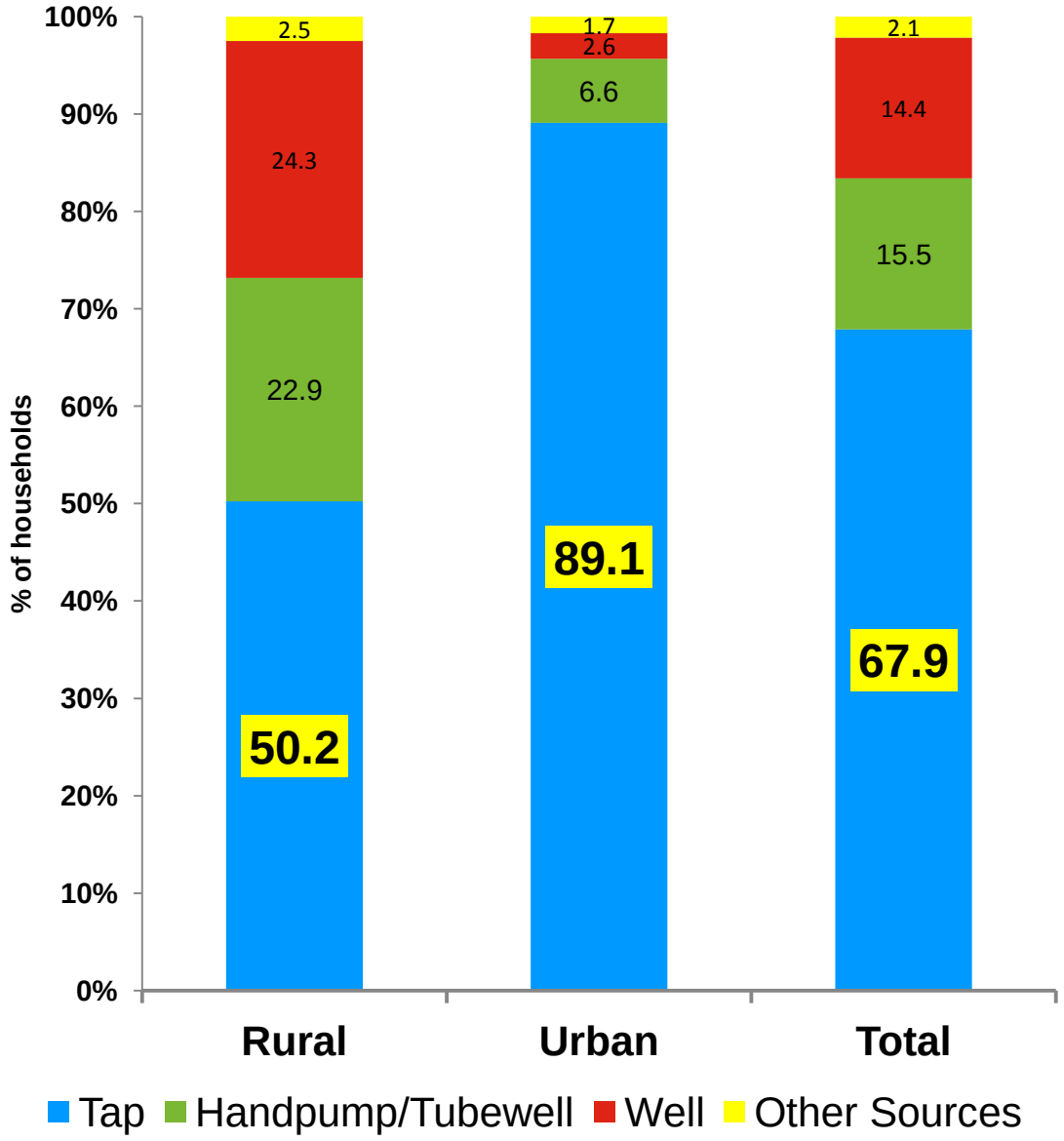
S. N.	Requirement of Funds for O&M deficit	2011	2016
Annual O&M requirement for towns in Maharashtra (A)			
1	JNNURM excluding Mumbai	22,657	25,156
2	MMR Towns excluding Mumbai	5,620	6,239
3	Other towns	25,559	28,378
Cost Recovery through user charges (B)			
1	JNNURM excluding Mumbai	14,703	16,325
2	MMR Towns excluding Mumbai	3,647	4049
3	Other towns	16,595	18,425
O&M deficit (A – B)			
1	JNNURM excluding Mumbai	7,953	8,830
2	MMR Towns excluding Mumbai	1,973	2,190
3	Other towns	8,964	9,953
TOTAL GAP			
O&M gap to be met through efficiency improvements, increase in tariffs, better collection efficiency, etc.		**18,890**	**20,973**

Percentage of households having drinking water facility within the premises by district



Number of districts	Total	Number of districts
15	Less than 40% (15)	09
08	40-50% (8)	09
05	50-60% (5)	07
07	More than 60% (7)	10

Percentage of households by source of drinking water facility in Maharashtra, 2011



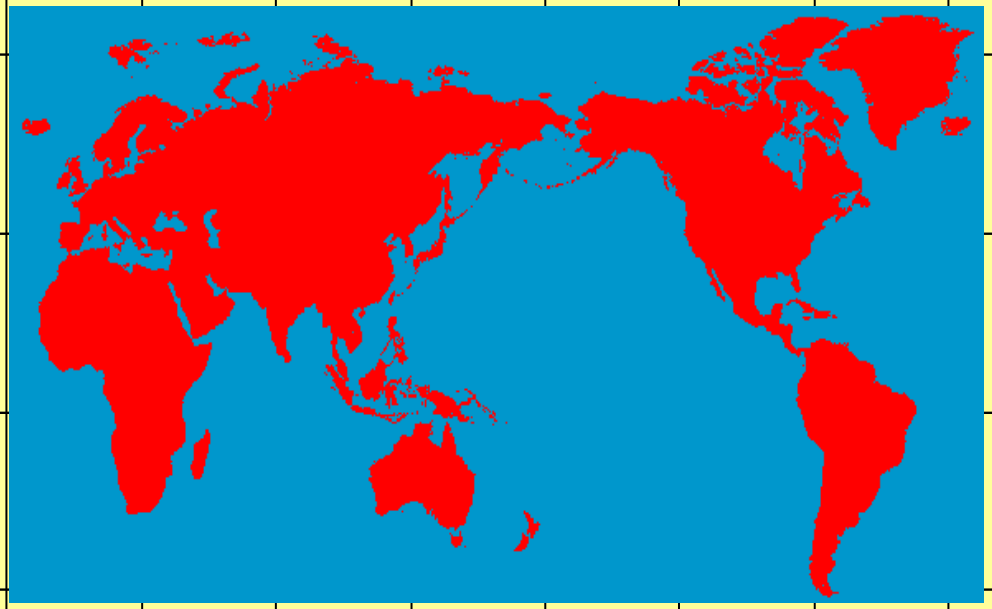
- More than half (50.2%) of the households have tap as source of drinking water in the rural areas while in urban areas it is 89.1%
-

Scenario

Water - India

Population of The World

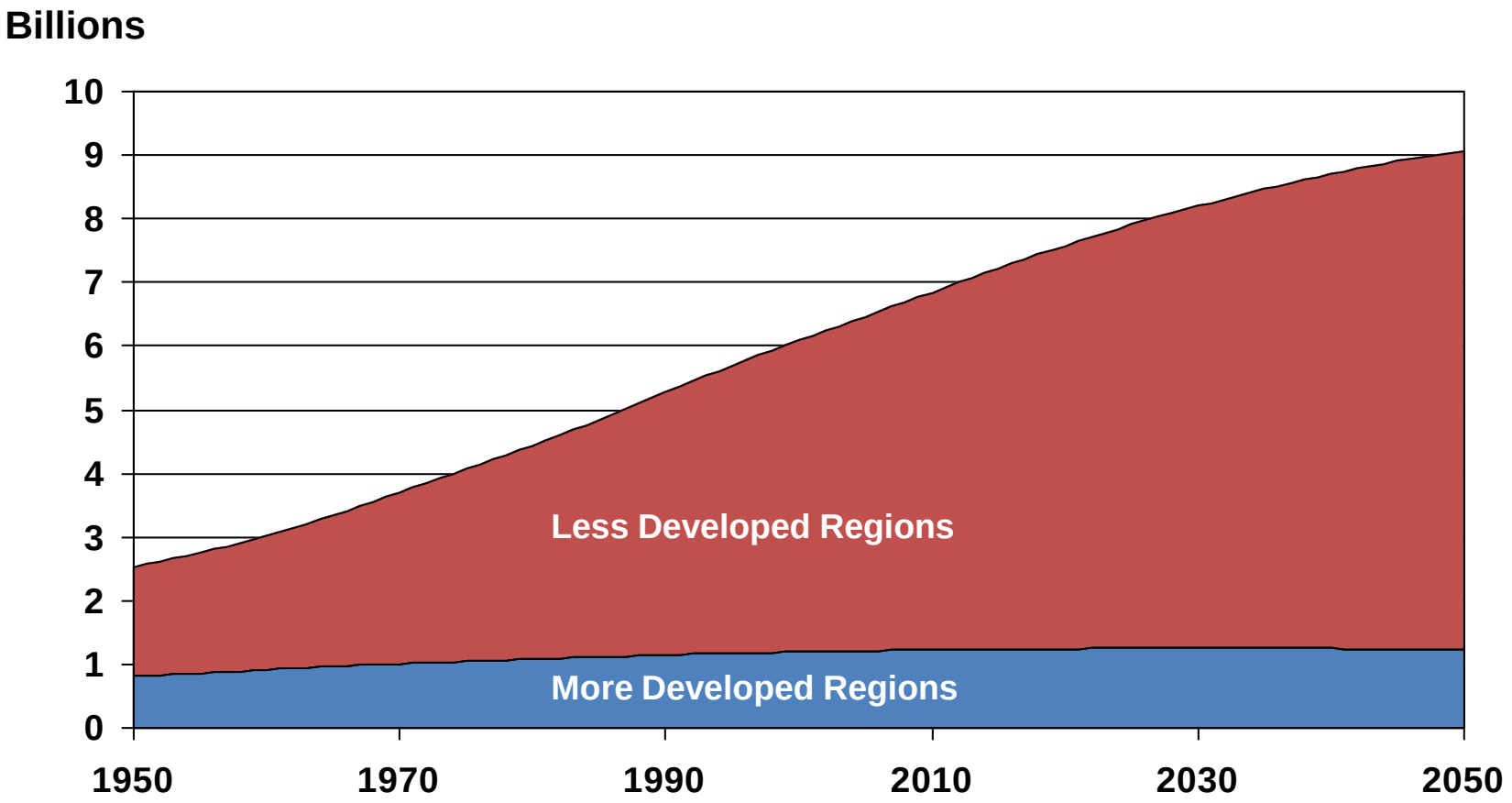
(million)



12000
10000
8000
6000
4000
2000
0

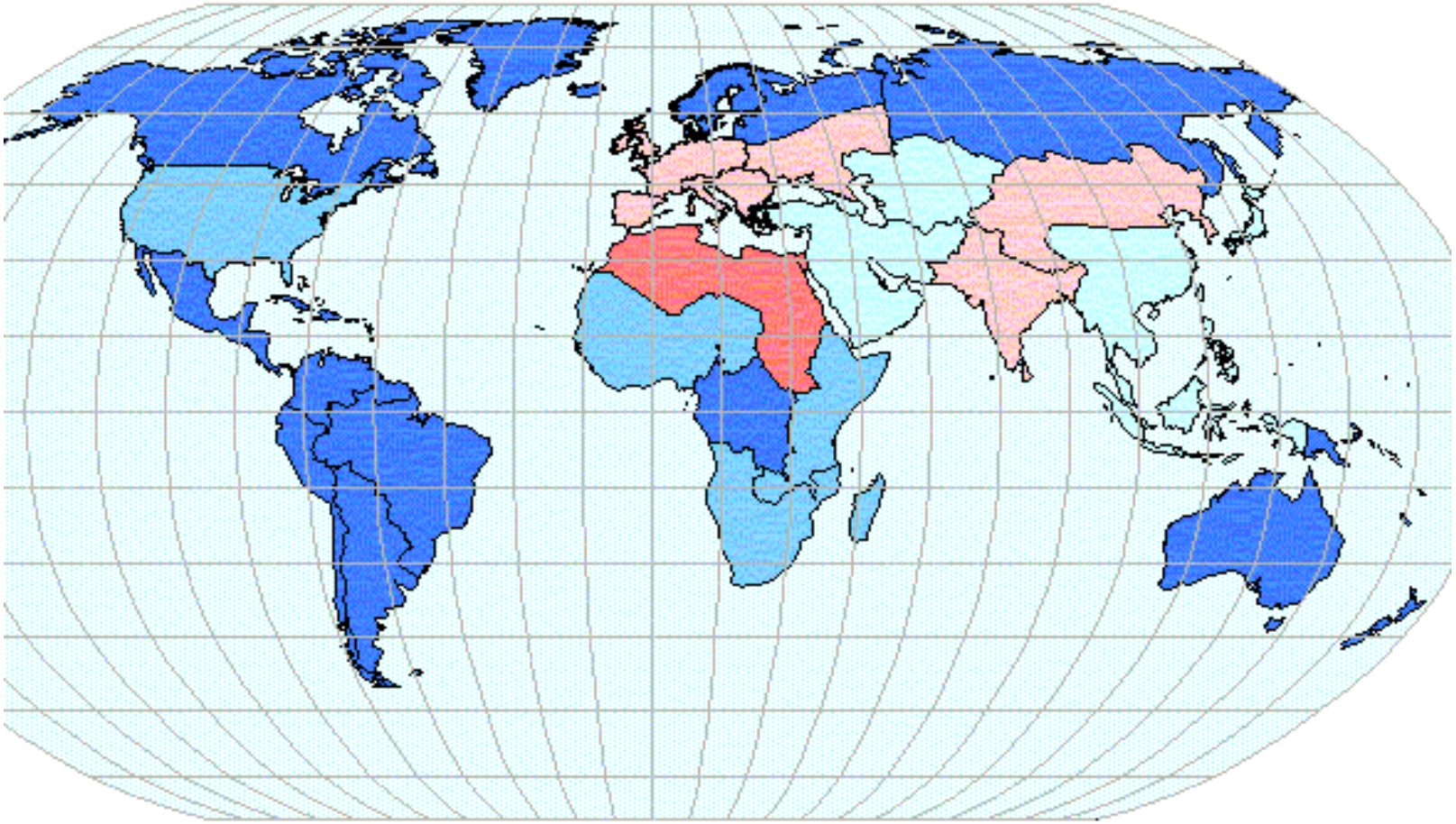
BC400 BC200 AD1 200 400 600 800 1000 1200 1400 1600 1800 2000 2200

Growth is More in Less Developed Countries

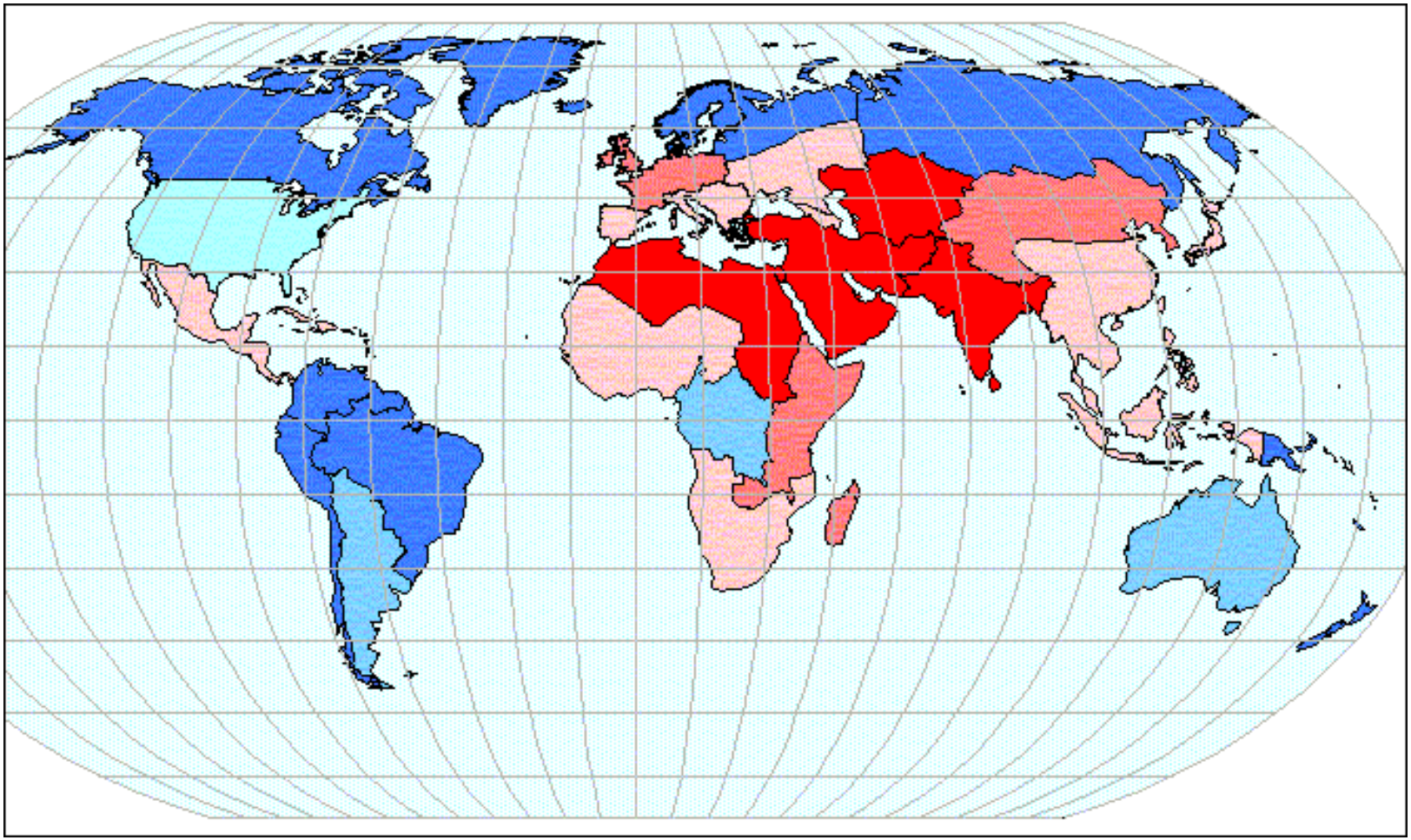


Source: United Nations, *World Population Prospects: The 2004 Revision* (medium scenario), 2005.

Water Availability Per Capita 1950

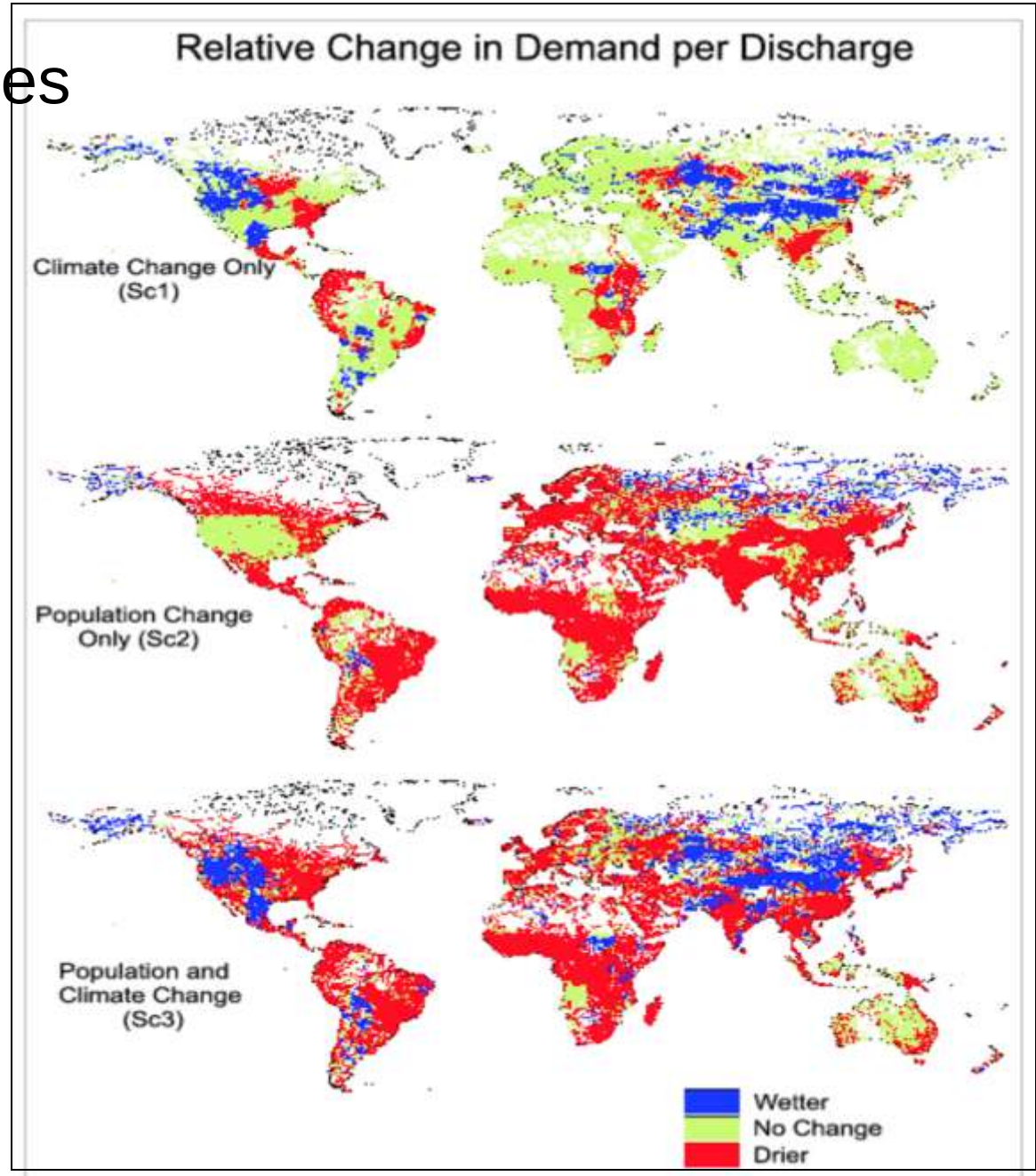


Water Availability Per Capita 2025



Water Stress Changes to 2025

- 80% of future stress from p**opulation** & **development**, not **climate change**!

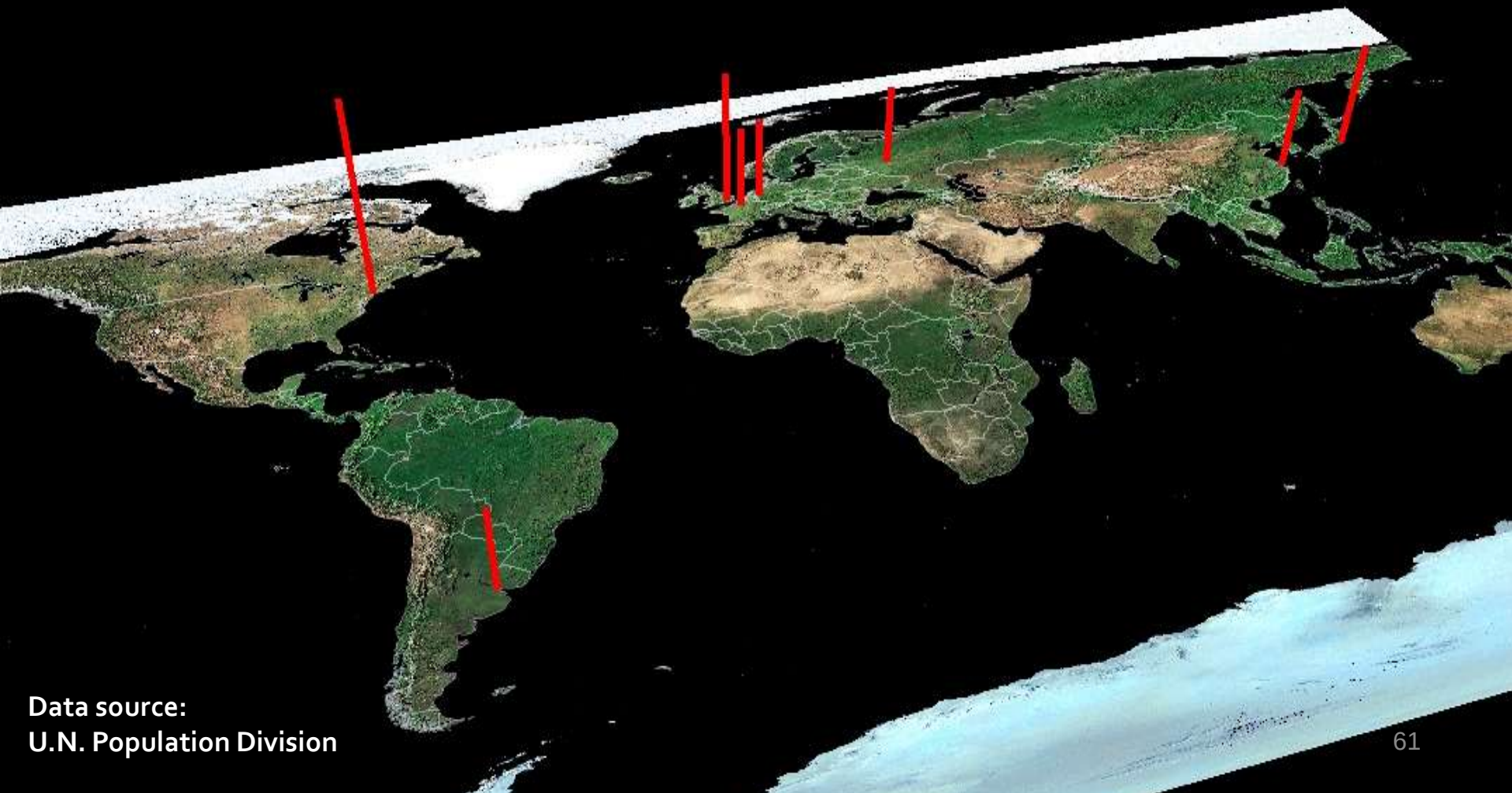


Vörösmarty et al. 2000

Development of world cities

1950

World Cities exceeding 5 million residents

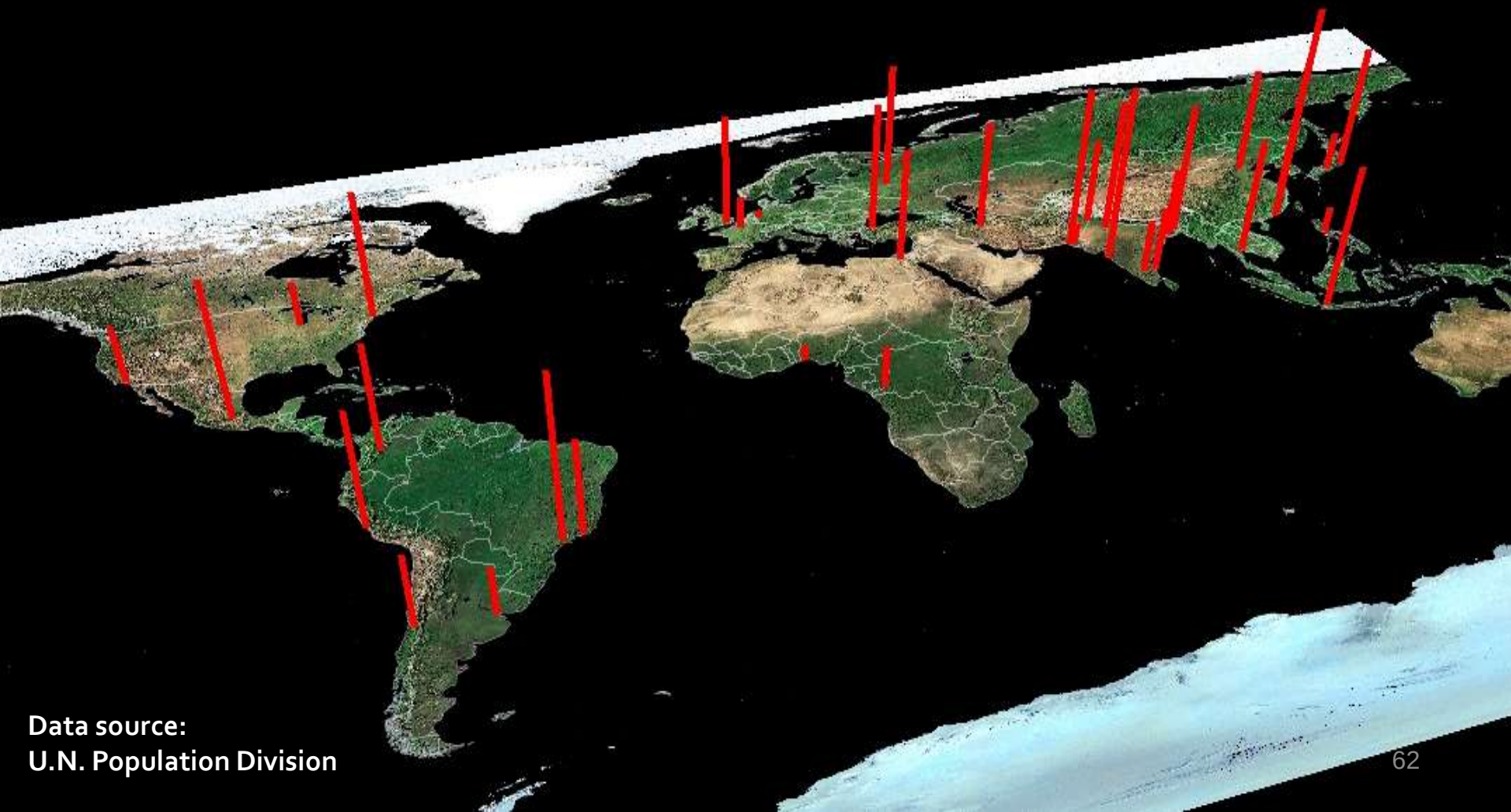


Data source:
U.N. Population Division

Development of world cities

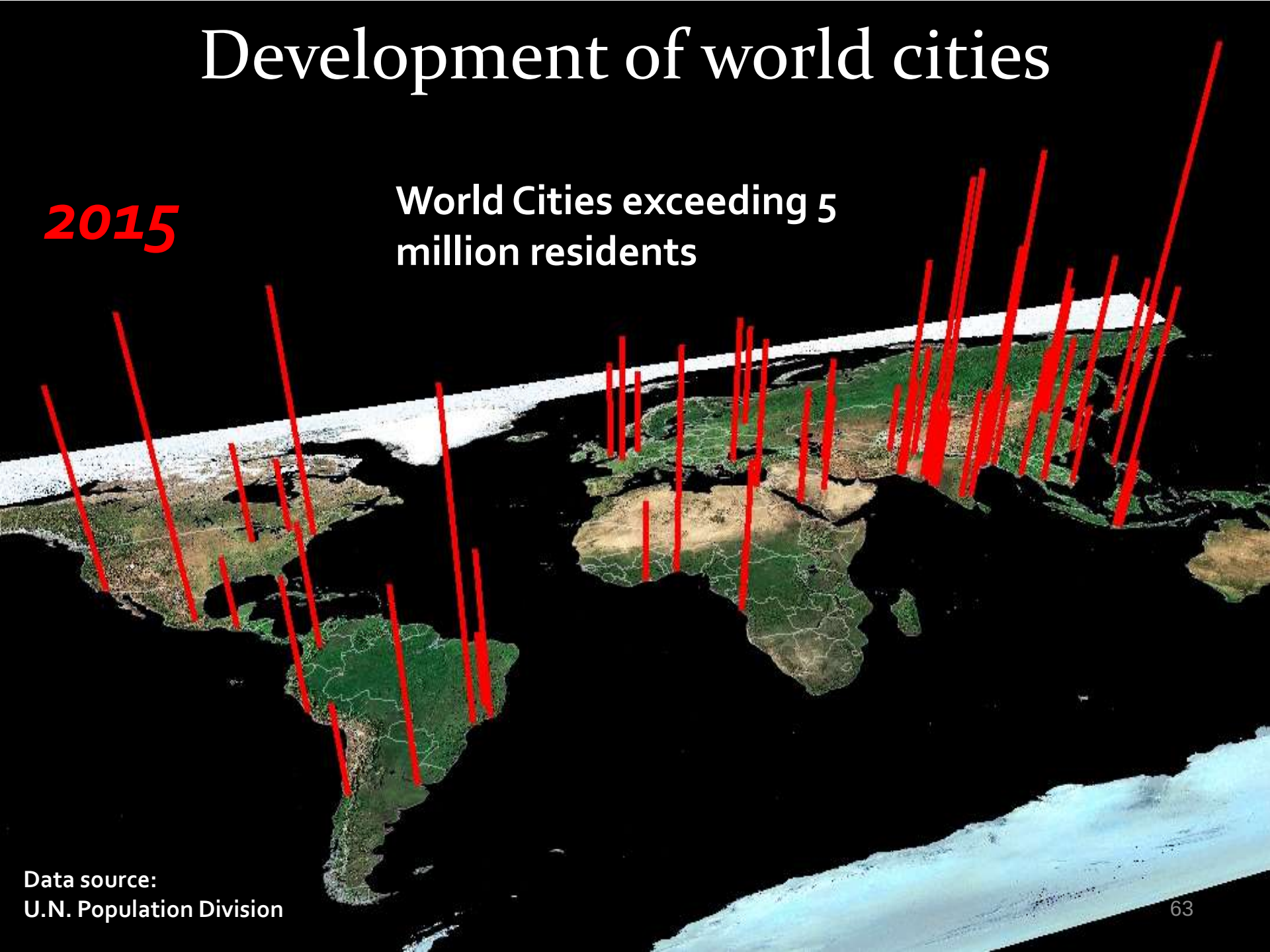
2000

World Cities exceeding 5 million residents



Data source:
U.N. Population Division

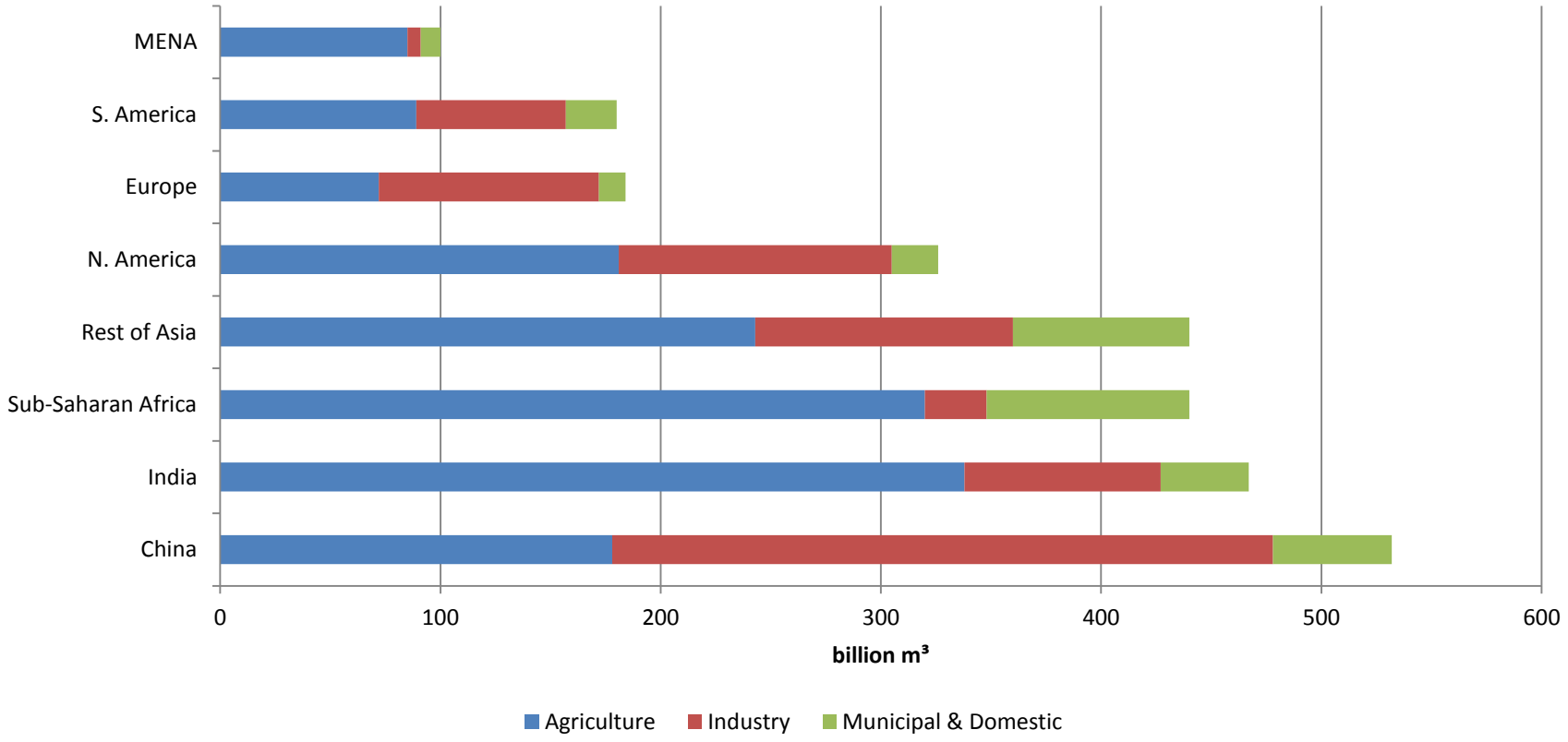
Development of world cities



Data source:
U.N. Population Division

Competing demands

(Source: Charting our water future: Economic framework to inform decision-making 2030 Water Resources Group, 2009)



Worldwide Water Use by Sector