

# Benchmarking of urban water and sanitation services

December 2006

# Definitions

## ⇒ Utility

→ Refers to corporations, boards, companies and departments responsible for water and sanitation services

# Current situation

## ⇒ Absence of reliable data

→ No picture of performance

→ No comparison

→ Over time

→ With peers

→ No linkage between data and decision making

→ Therefore no linkage between resources and results

# What is benchmarking

- ⇒ Measures and compares performance
  - across time
  - across peers
- ⇒ Can identify best practices
- ⇒ Is a useful means to achieve performance improvement provided
  - It is sustained
  - It is institutionalised
- ⇒ Useful for key stakeholders like utilities, regulators, Government and consumers

# What has been done so far

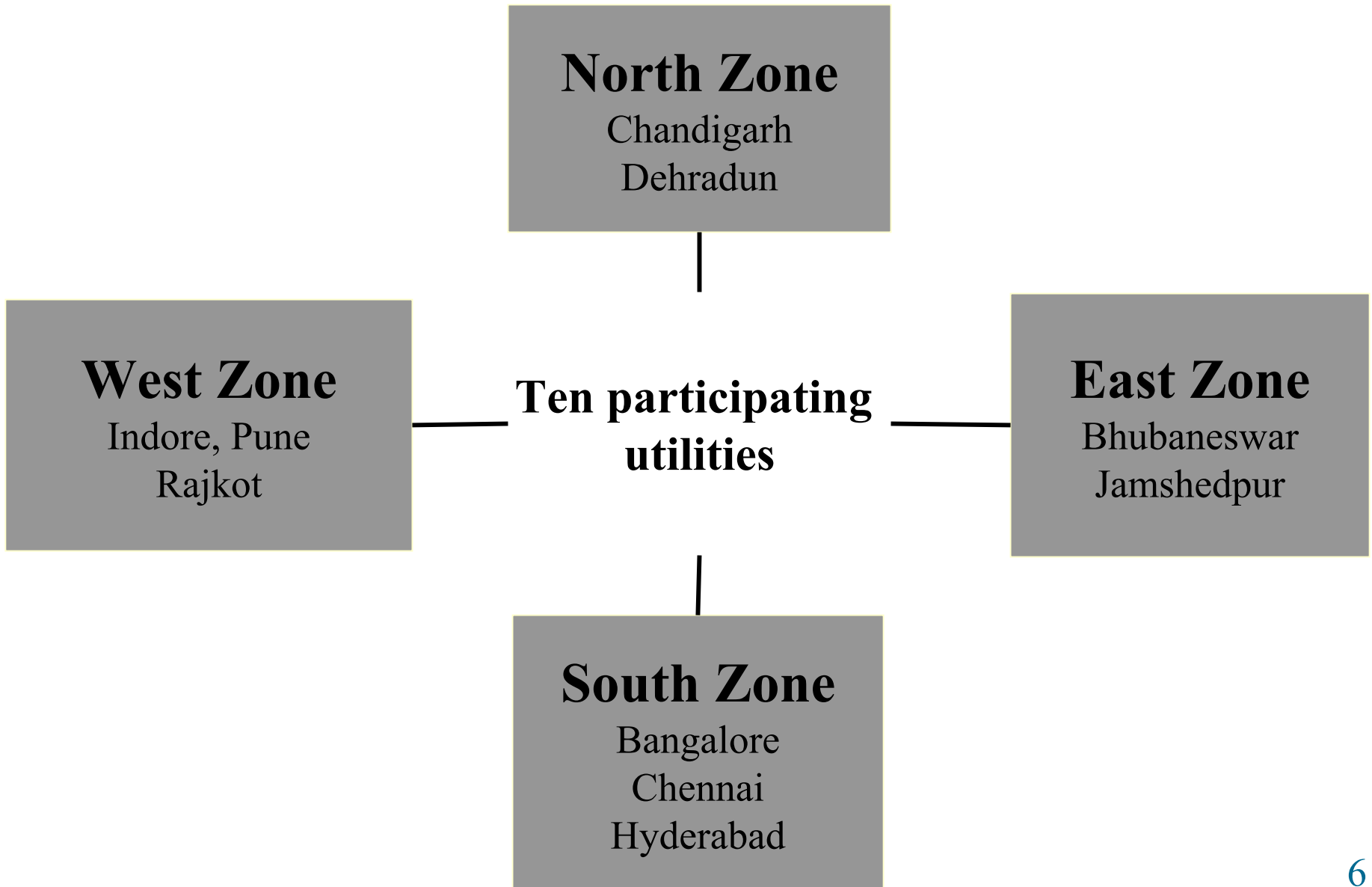
## Phase I

- ⇒ Awareness
- ⇒ Testing of concept
- ⇒ 16 cities/states covered

## Phase II

- ⇒ Time series data across ten utilities
- ⇒ Increased attention to data gaps and data reliability
- ⇒ Institutionalisation

# Phase II Benchmarking Participants



# Profile of participants

<b>Size</b>	<b>Corporation</b>	<b>Board</b>	<b>Department</b>	<b>Company</b>
<b>&gt; 4 million</b>		Bangalore, Chennai, Hyderabad		
<b>1 – 4 million</b>	Pune, Rajkot, Indore, Chandigarh,			
<b>&lt; 1 million</b>		Dehradun	Bhubaneswar	JUSCO

# Approach

- ⇒ Customise IBNET<sup>\*</sup>
- ⇒ Visit to cities
- ⇒ Validation of data
- ⇒ Second round of validation in cities
- ⇒ Analysis and results

# Acknowledgements

- ⇒ Ministry of Urban Development, Government of India
- ⇒ Secretaries, Chairpersons and Commissioners
- ⇒ Nodal Officers

# Analysis and Findings

# Key messages

- ⇒ Quality of data systems varies across utilities, and is generally weak
- ⇒ Terminology is not consistent across utilities – comparisons can mislead
- ⇒ Is performance measurement based on data?

# Performance Indicators

- ⇒ Coverage
- ⇒ Production and Consumption
- ⇒ Metering
- ⇒ Non Revenue Water
- ⇒ Customer Service
- ⇒ Financial Performance
- ⇒ Billing and Collection

# Service Coverage

# Coverage

- ⇒ Coverage refers to the proportion of population that is served by the utility
- ⇒ Coverage is the basic mandate of the utility ... and the right of the consumers
- ⇒ Coverage helps utility access all potential paying customers

# Water coverage

⇒ Includes water supplied by the utility through

→ Direct service connections

The most relevant for a utility

→ Public water points

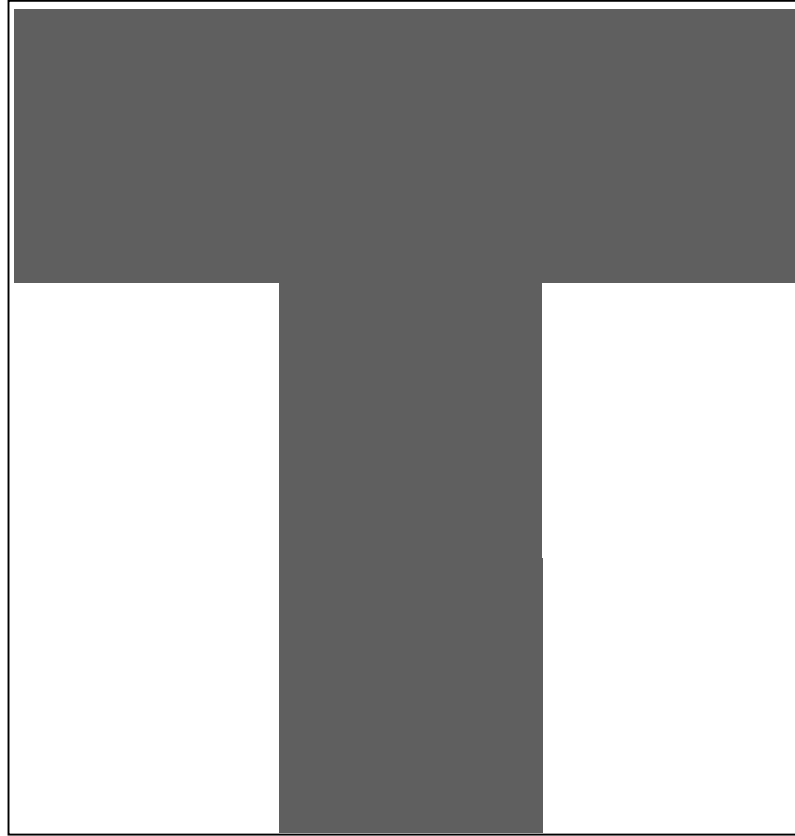
→ Other means of supply like tankers

} A norm based estimate is generally made to calculate coverage

# Water coverage

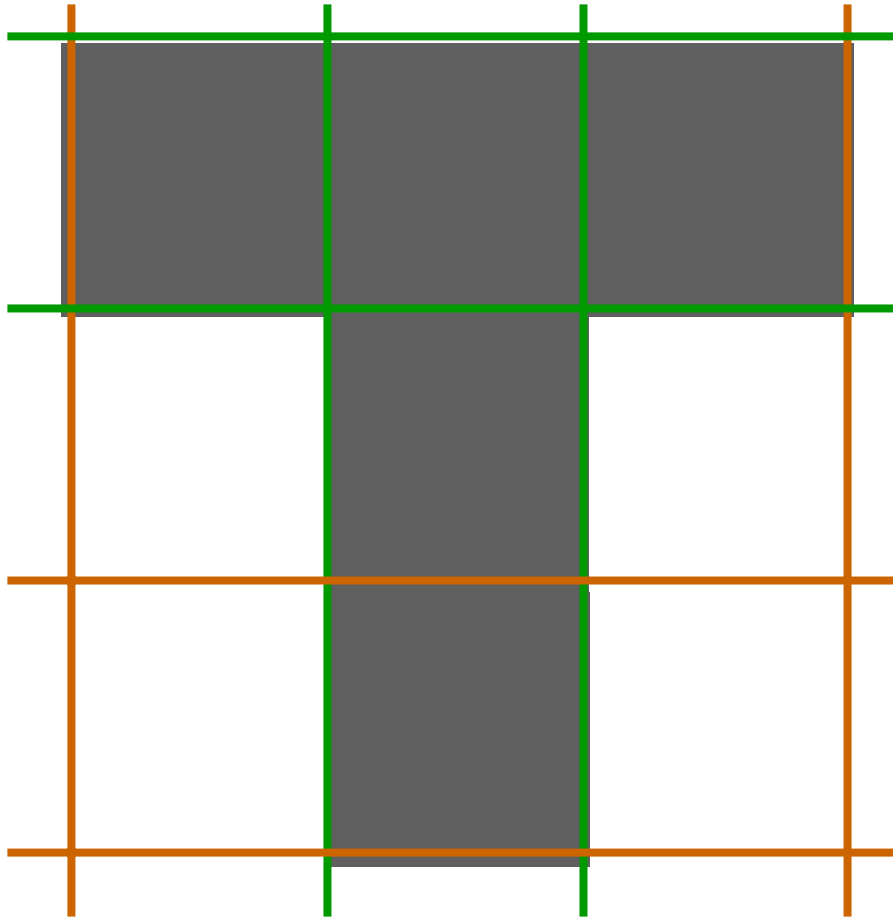
- ⇒ The method used to calculate coverage varies across cities

Some cities report total area that is estimated to be covered by the network



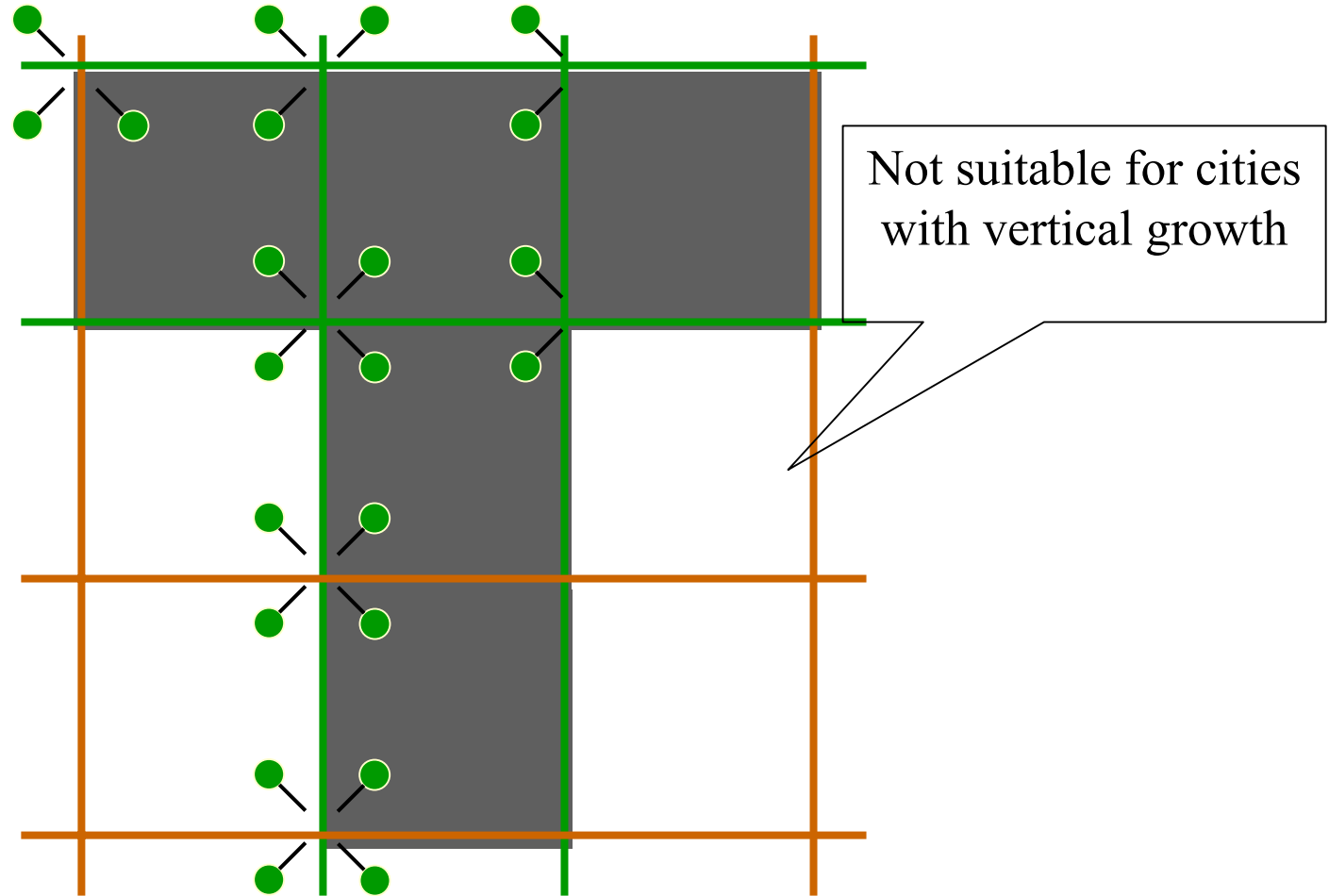
$$\text{Coverage} = \frac{\text{Area estimated to be covered}}{\text{Total area of the city}}$$

Some cities report percentage of roads covered with water network as coverage



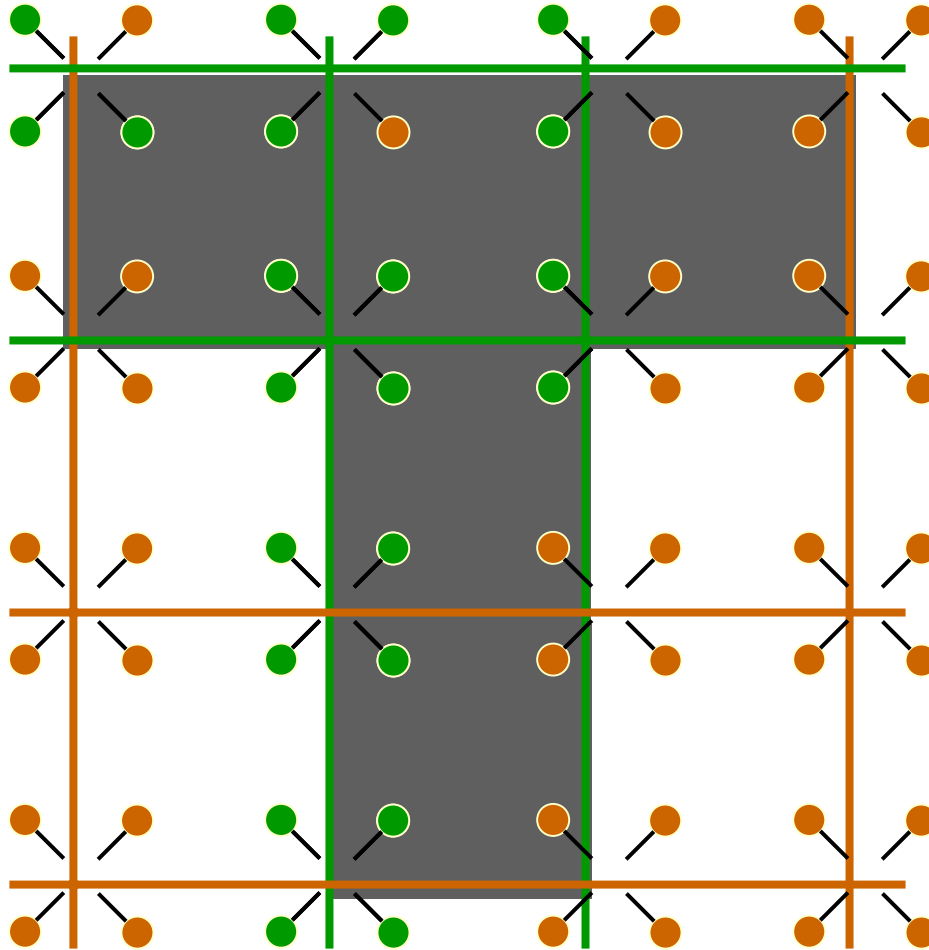
$$\text{Coverage} = \frac{\text{Length of water network}}{\text{Length of road network}}$$

# Some cities calculate coverage based on the connections on record



$$\text{Coverage} = \frac{\text{Number of connections} \times \text{Estimated persons per connection}}{\text{Estimated population of the city}}$$

The ideal method would be to have a comprehensive database of properties with connection status of each



$$\text{Coverage} = \frac{\text{Properties with direct service connection}}{\text{Total number of properties in the city}}$$

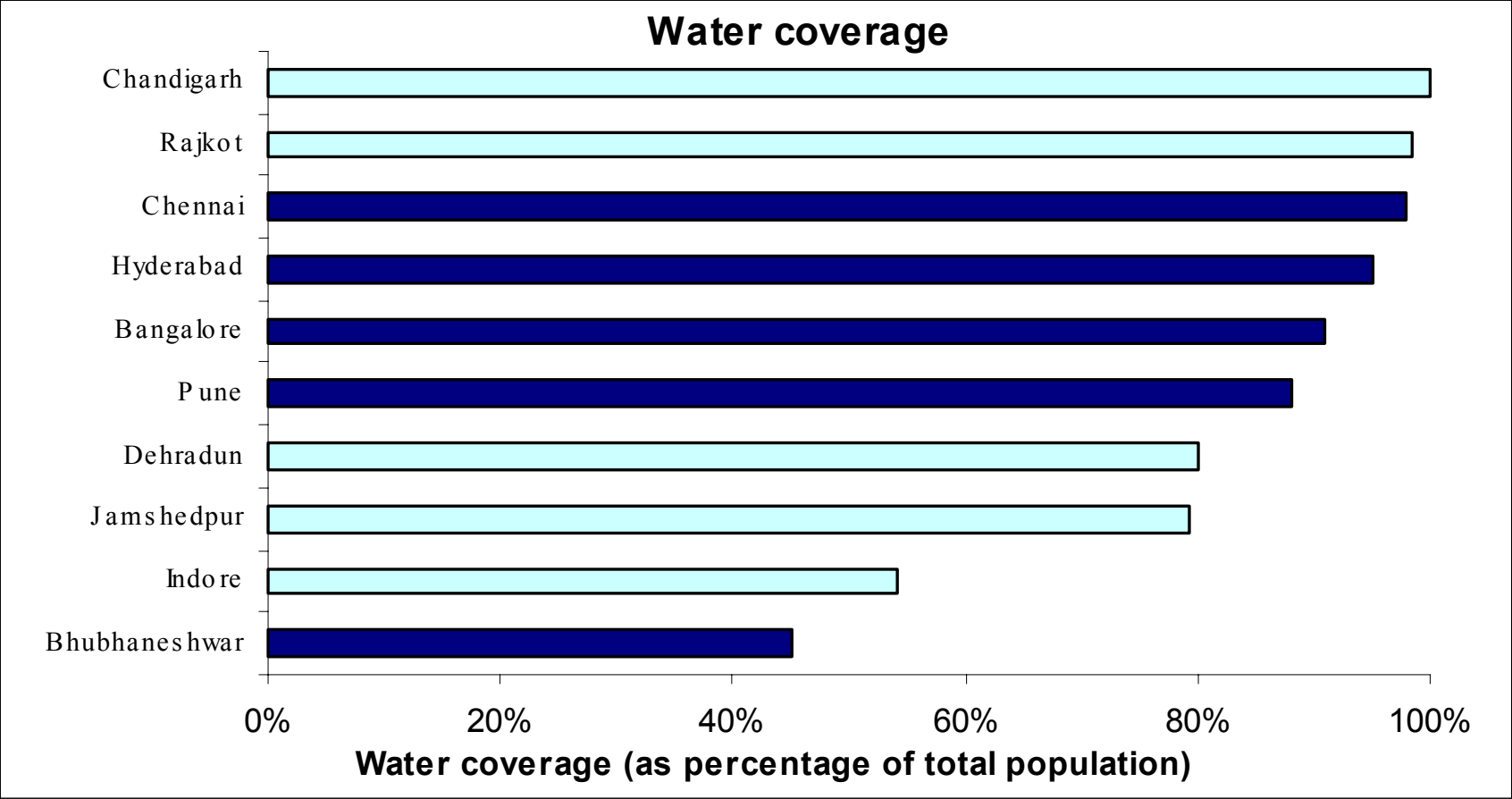
# Reliability Scale

- ⇒ Therefore, the reliability of data also needs to be assessed
- ⇒ A four point scale (A-D) is being used
  - “A” - Correct and consistent data
  - “D” - Data that is based on assumptions and estimations.
- ⇒ This scale is being used across all indicators to measure reliability

# How do Phase II cities measure water coverage

Reliability Scale	Description	Cities
A	Property coverage with upto date mapping	None
B	Property coverage with estimates	Chandigarh, Dehradun, Indore, Jamshedpur, Rajkot,
C		
D	Road network coverage Geographical coverage	Bangalore, Bhubaneswar, Chennai, Hyderabad, Pune

# Water coverage ranges from 45% to 100%

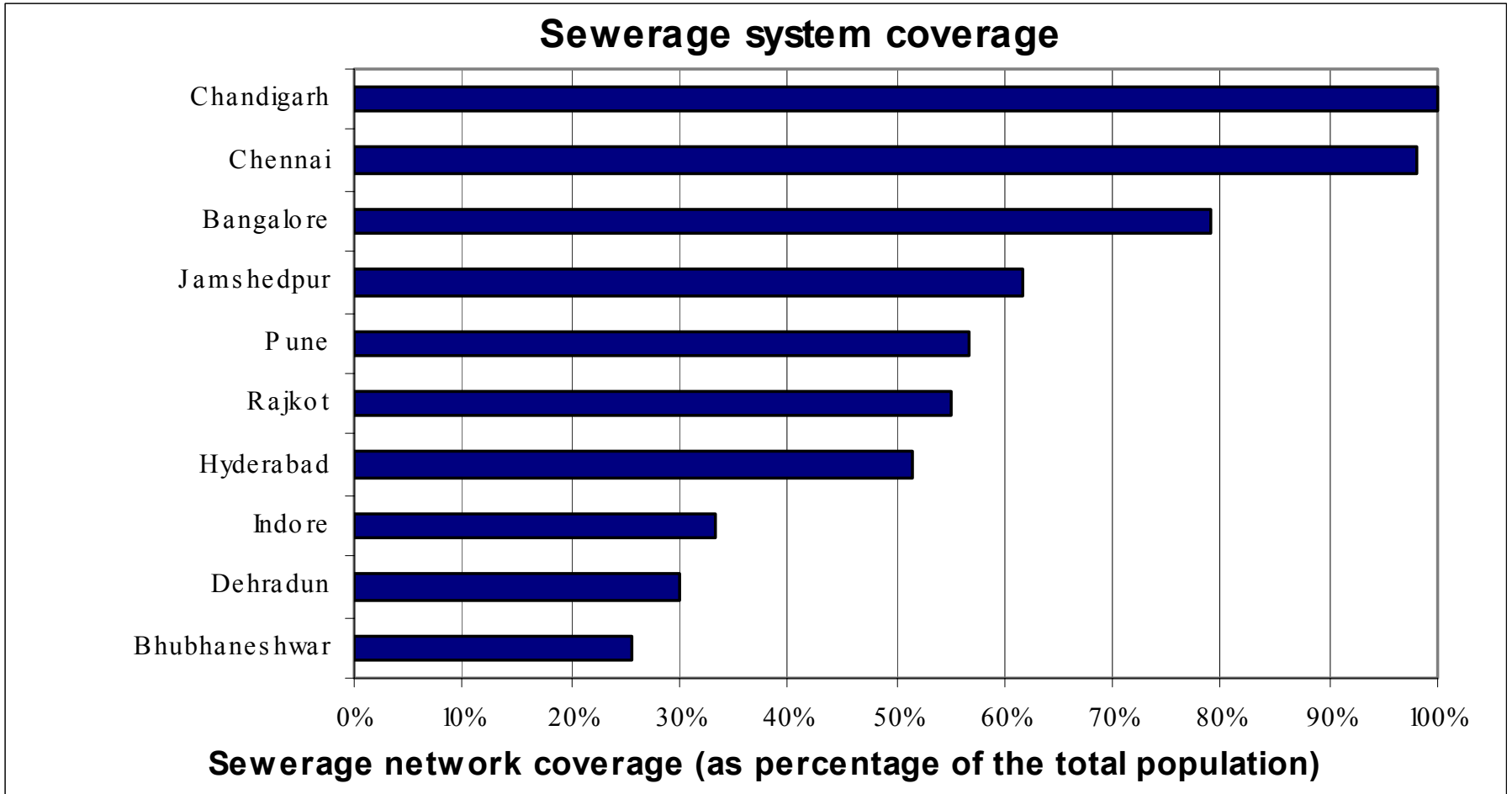


This is the data from the utility side.

Reliability Scale



# Sewerage Coverage



# Coverage - Key Issues

- ⇒ Mandate is not fully met
- ⇒ Potential revenue base is unutilised
- ⇒ None of the Phase II cities have “A” category data systems
- ⇒ Both Access and Network coverage are being used to define Coverage
- ⇒ A common terminology is necessary

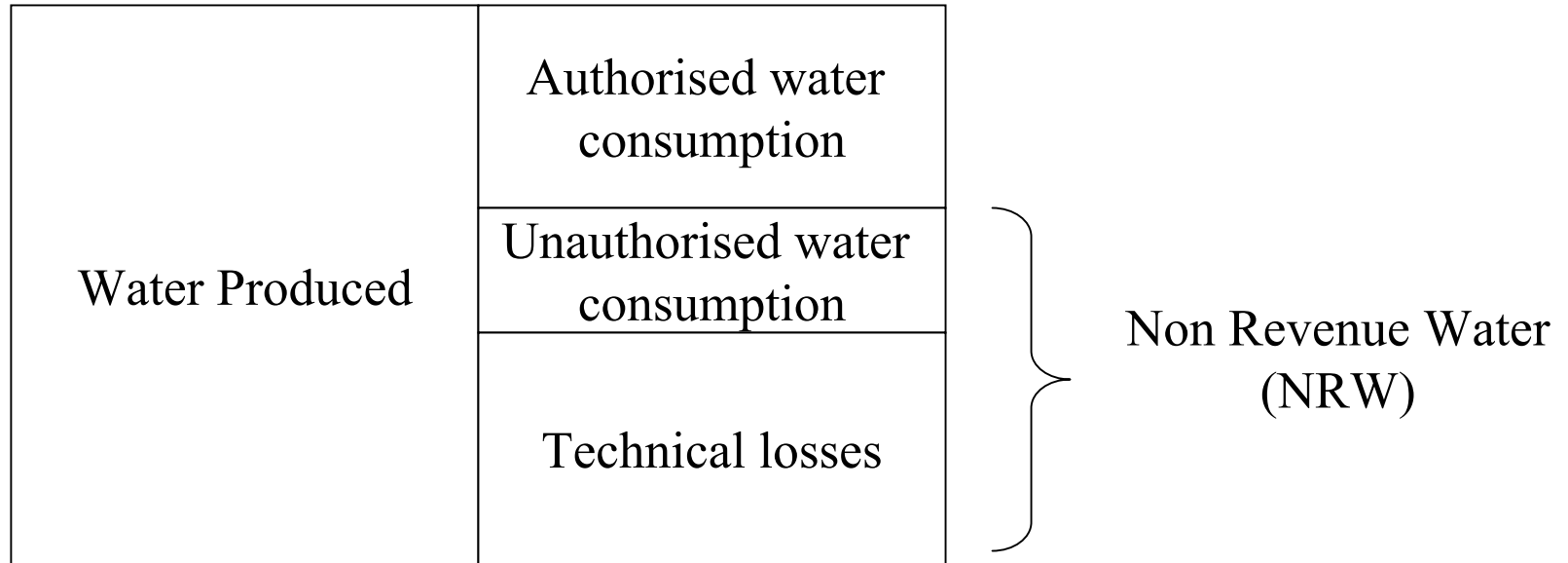
# Production, Metering and Consumption

# Production, metering and consumption

⇒ Shows a picture of operations

- Efficiency of utilising the water source
- Effective service delivery to consumers
- Optimising revenue, minimising expenses

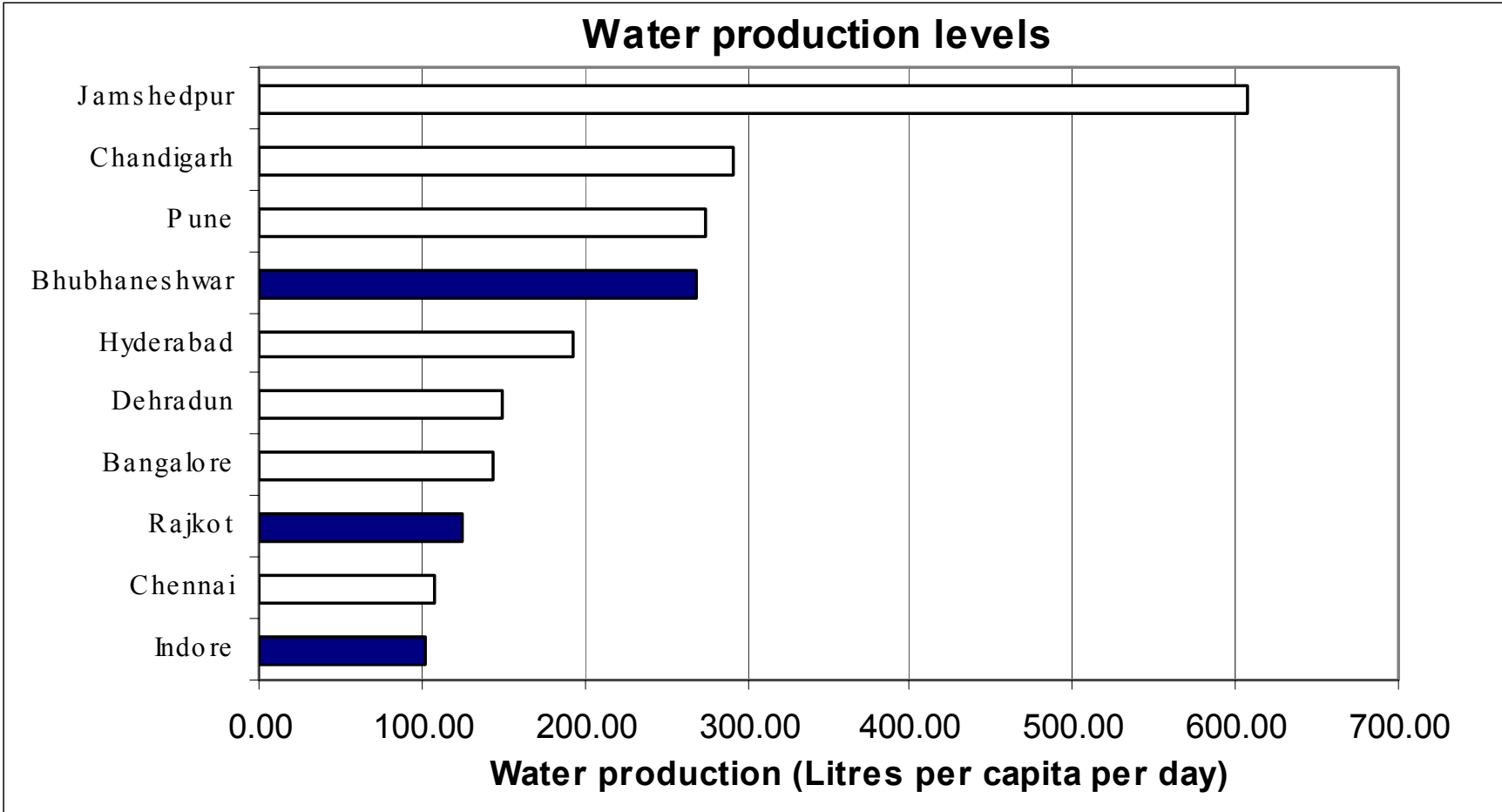
# Water Balance



# Water production – Reliability Scale

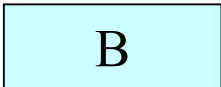
<b>Reliability Scale</b>	<b>Description</b>	<b>Cities</b>
A	Flow meters at all bulk production points	Bangalore, Chennai, Chandigarh, Dehradun, Hyderabad, Jamshedpur, Pune,
B	Intermediate reliability is not applicable	NA
C	Intermediate reliability is not applicable	NA
D	Estimated based on pump capacity and operating hours (or) water treatment plant capacity utilisation	Bhubaneswar, Indore and Rajkot

# Production levels



Jameshedpur has high industrial consumption

Reliability Scale



# Metering

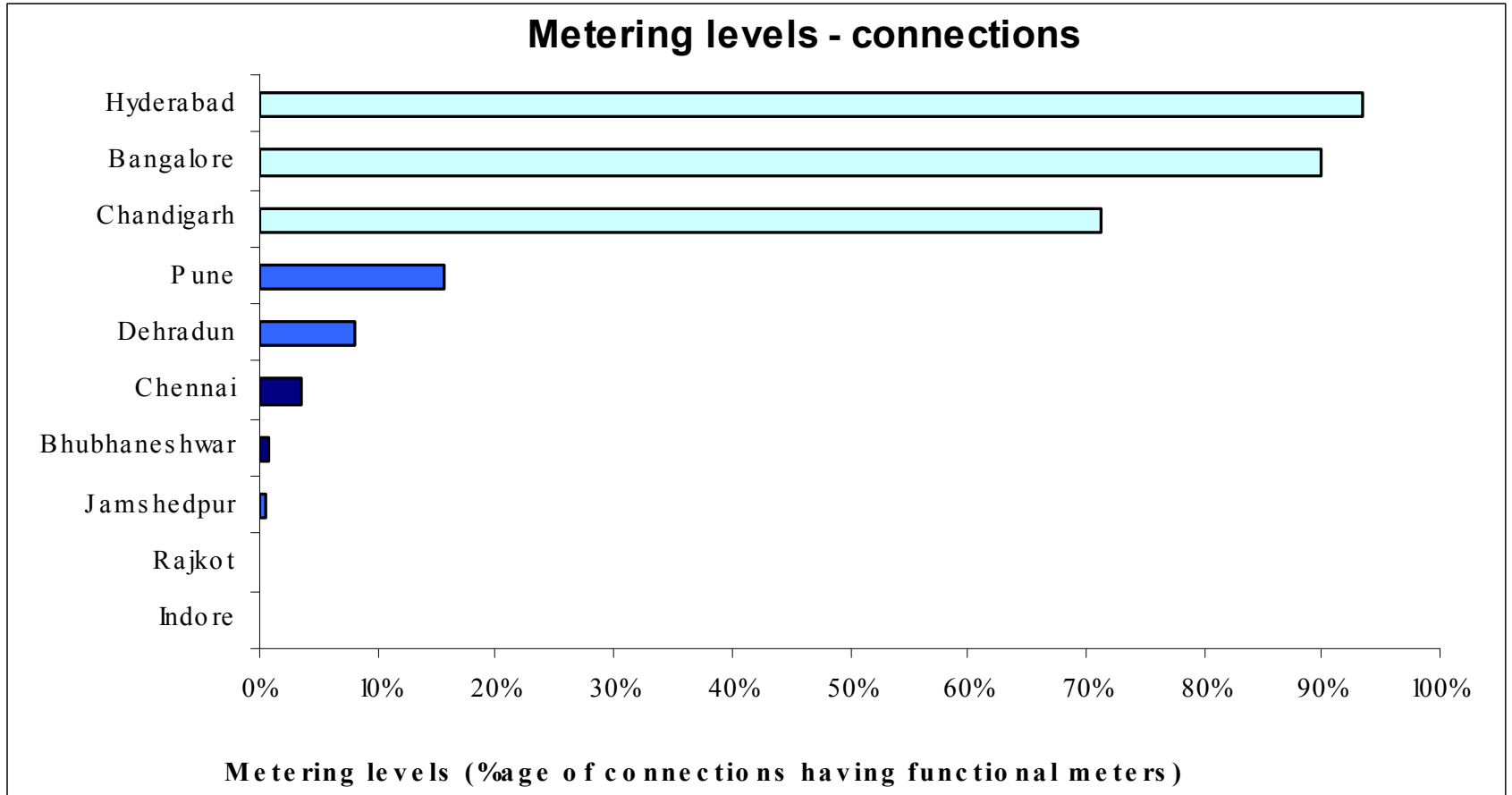
- ⇒ Measures proportion of connections that are metered
- ⇒ Determines the revenue model for the utility
- ⇒ Enables demand side management

# Indicator – Proportion of connections that are metered

Metering System	Description	Cities
A	Metering for all consumption points	None
B	Metering for all billed consumption points, intermediate level	Bangalore, Chandigarh, Hyderabad, Jamshedpur
C	Metering only for bulk consumers/ select category consumers	Dehradun, Pune, Rajkot
D	Negligible or no metering	Bhubaneswar, Chennai, Indore

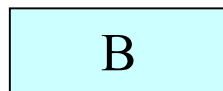
More than 70% of consumption in Jamshedpur is estimated to be from metered consumers

# Metering is not prevalent



Metering practices are in either extremes

Reliability Scale

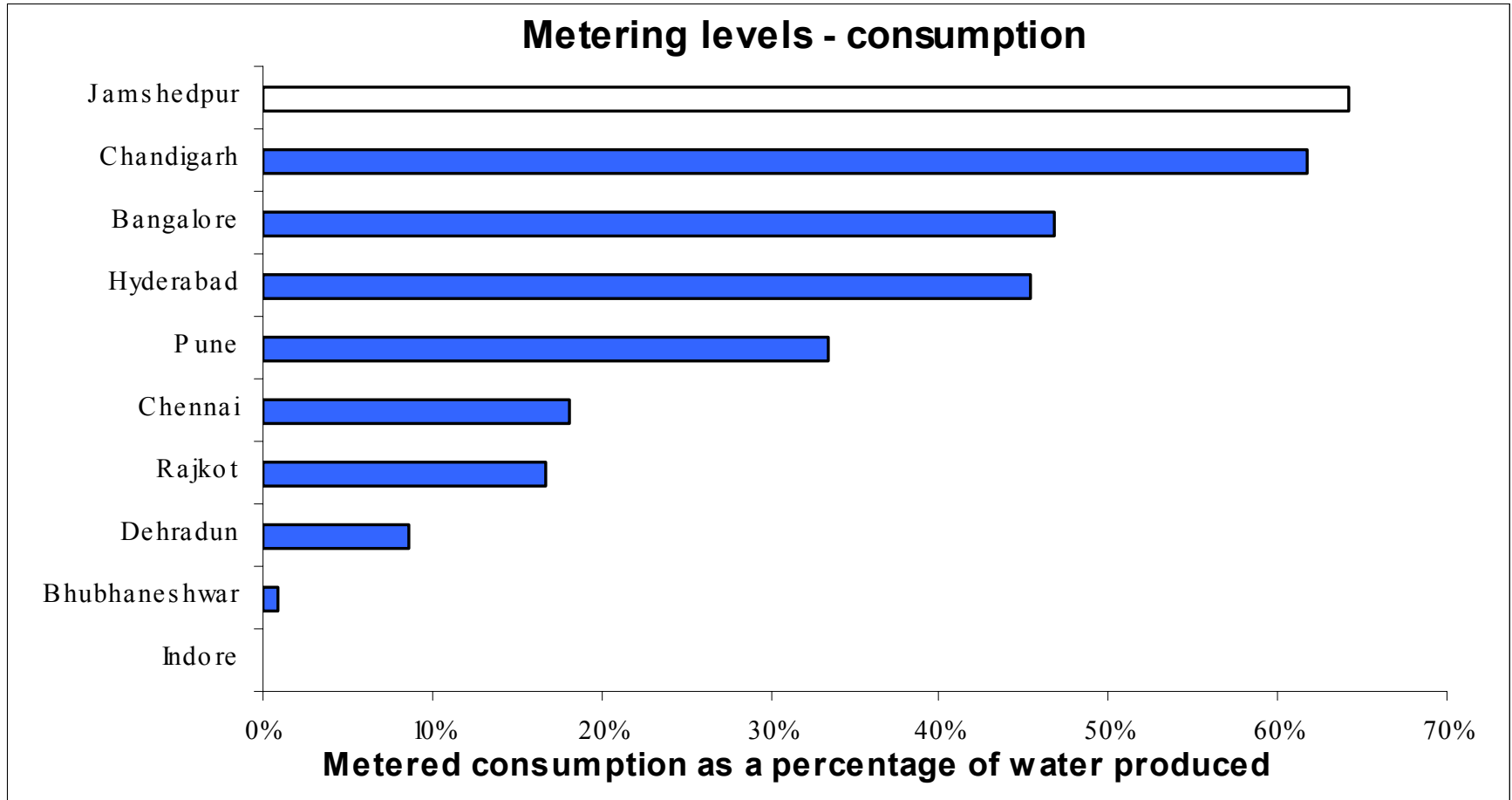


# Functionality of meters

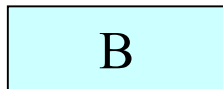
Reliability Scale	Description	Cities
A	All meters are tested regularly	Jamshedpur
B	Meters are tested infrequently (or) no record of functional meters is available	Bhubaneswar, Bangalore, Chennai, Chandigarh, Dehradun, Hyderabad, Indore, Pune, Rajkot
C	Not applicable	Not applicable
D	Negligible or no checking	

In the absence of functional meters, consumption data is not reliable

# Consumption through metered connections



Reliability Scale



# Non Revenue Water

- ⇒ Measures volume of water that is not sold
- ⇒ Indicates over-investment in production
- ⇒ Measures the in-efficiency that paying consumers bear

# Non revenue water

⇒ Is a derived value

⇒ Depends on the quality of measurement of production and billed consumption

→ requires quality of metering at production points and consumption points

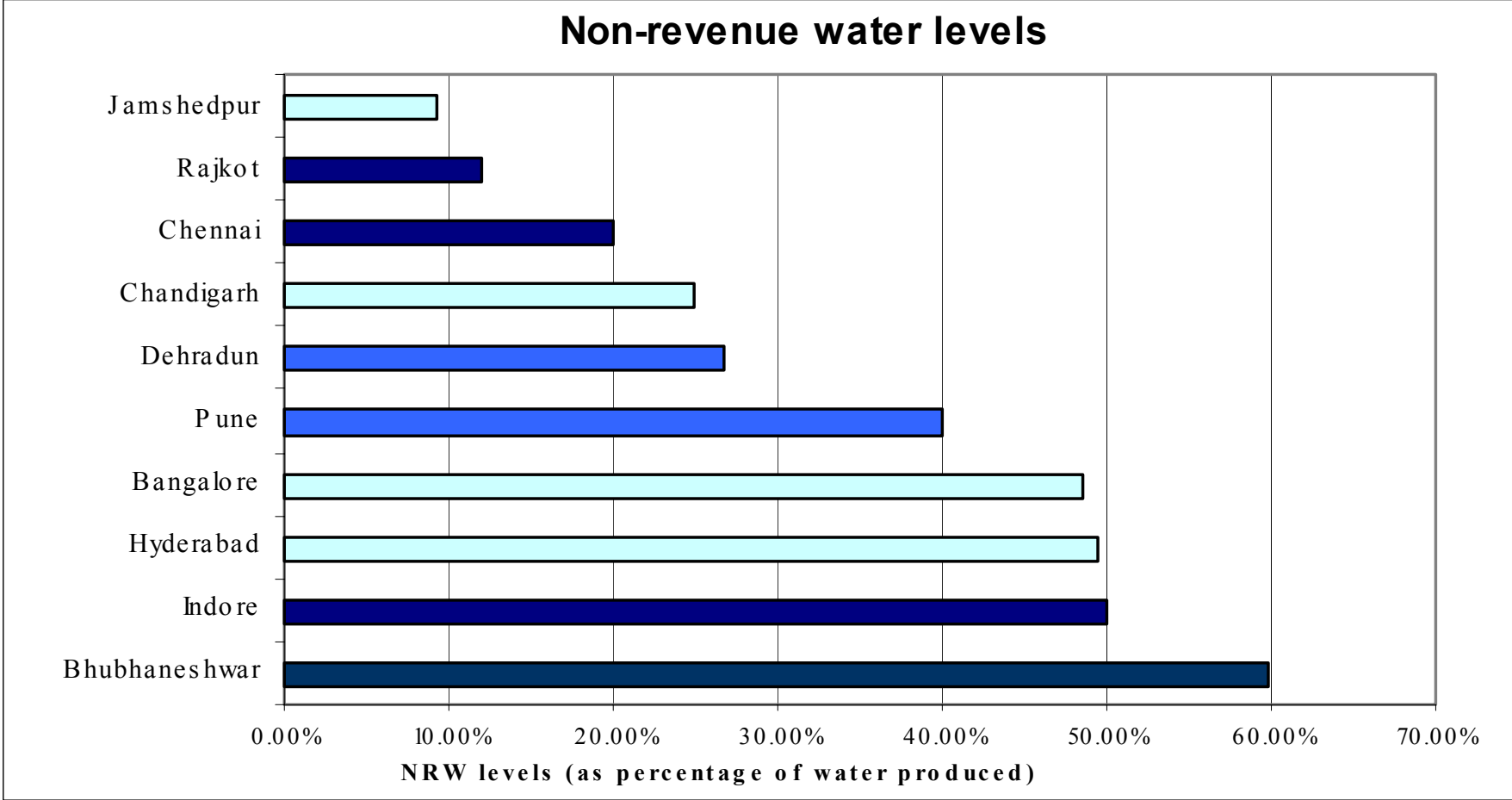
→ as well as the functionality of meters

# Reliability of NRW estimates

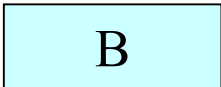
and is derived from....

	NRW	Production	Metering	Functionality
Bangalore	B	A	B	B
Bhubhaneshwar	D	D	D	B
Chandigarh	B	A	B	B
Chennai	D	A	D	B
Dehradun	C	A	C	B
Hyderabad	B	A	B	B
Indore	D	D	D	B
Jamshedpur	B	A	B	A
Pune	C	A	C	B
Rajkot	D	D	C	B

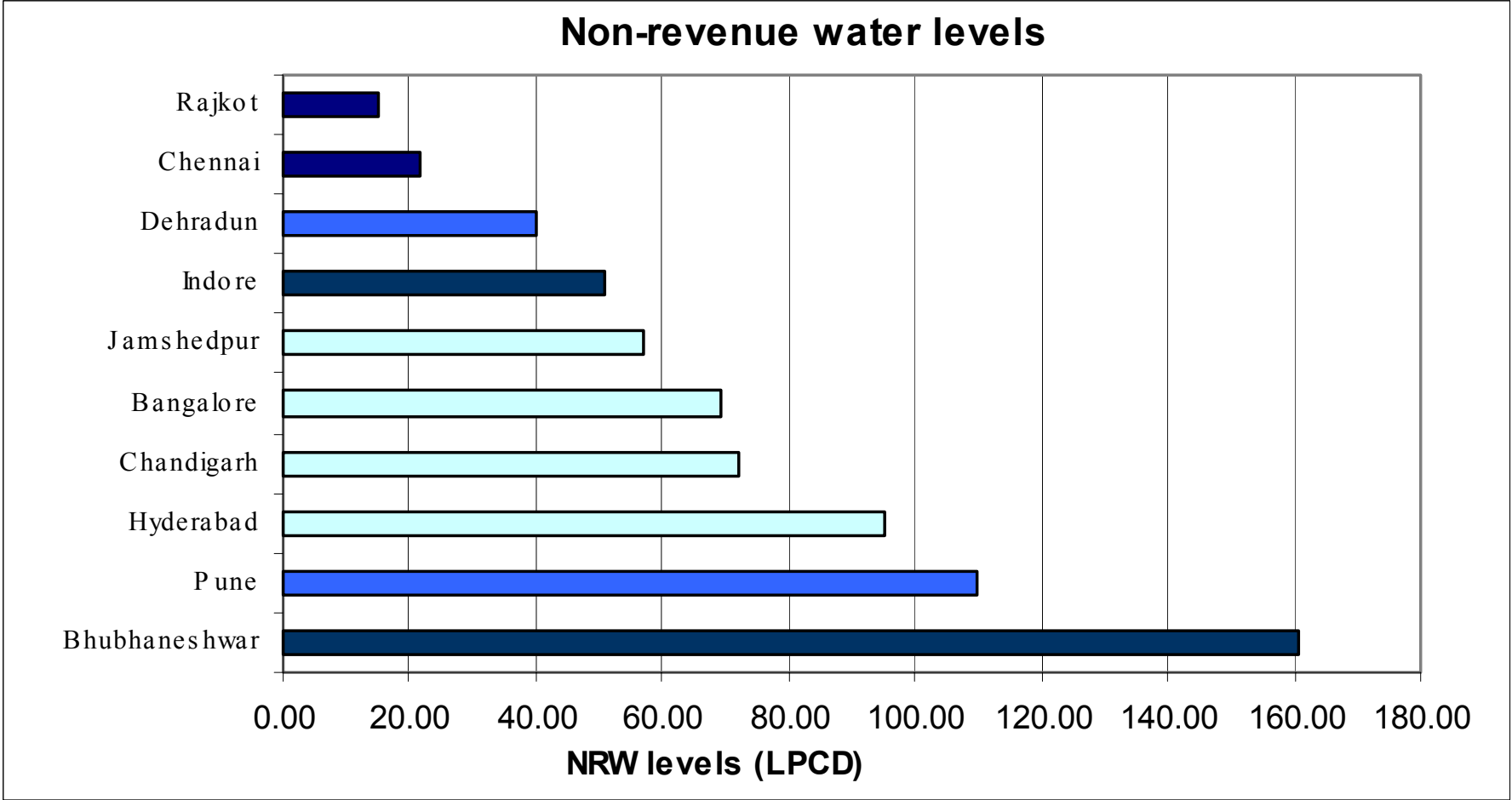
# NRW is at best a poor estimate



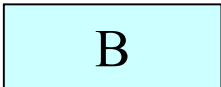
Reliability Scale



# NRW is at best a poor estimate



Reliability Scale



# Summing up...Production, Consumption and Metering

- ⇒ No reliable water balance
- ⇒ Increased production expenses, depressed revenues
- ⇒ Source augmentation has to be decided without certainty of
  - Service delivery improvement
  - Financial viability

# Customer Service

# Customer Service

- ⇒ Measures management response to customers
- ⇒ Customer complaints are a parallel input for utility management about weak areas
- ⇒ Can help prioritise

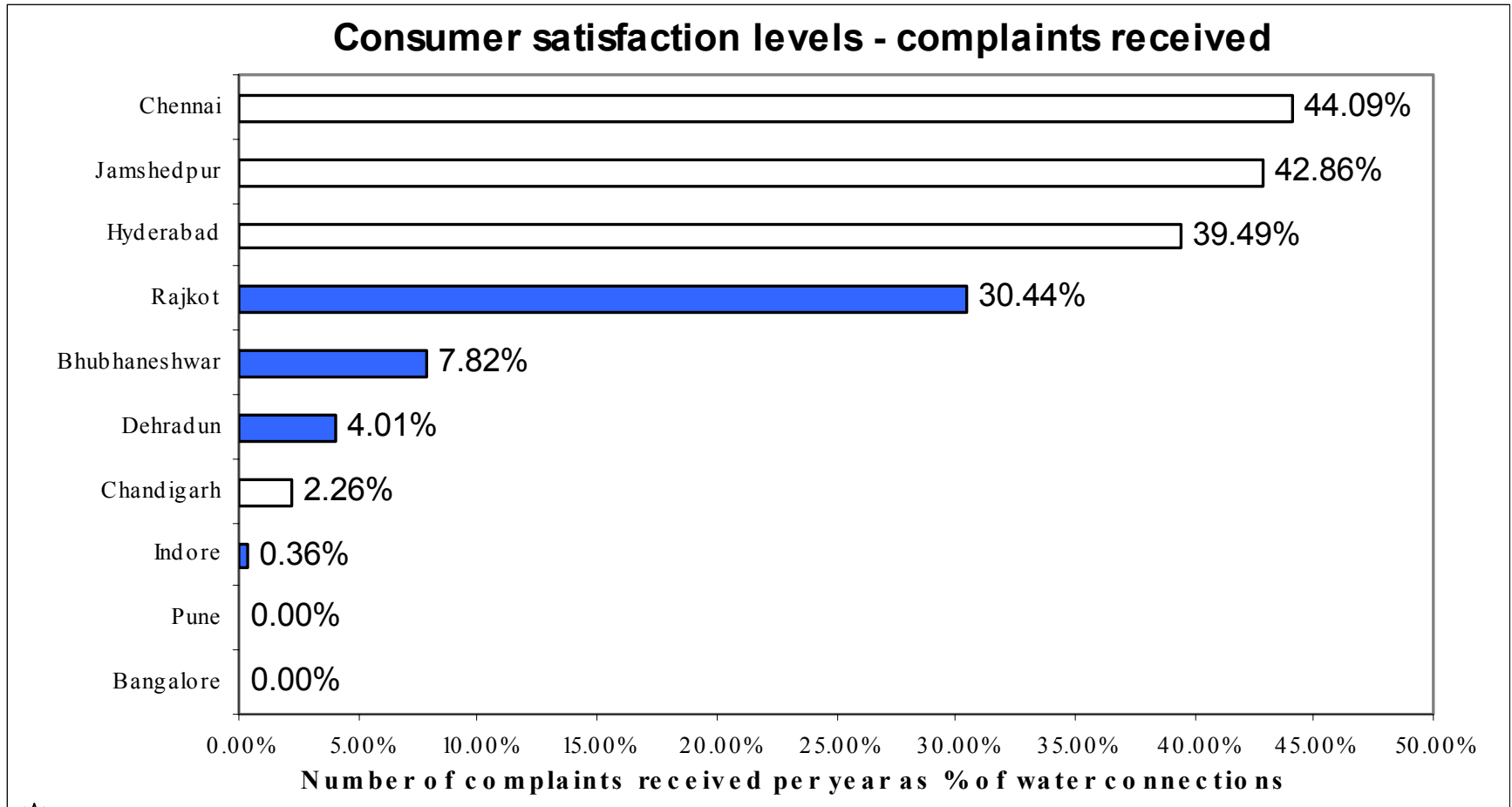
# Quality of service – Complaints recording

- ⇒ Providing various means for registering complaints
- ⇒ Aggregating at city level
  - In the absence of computerised records, reliability of aggregated data maybe low
- ⇒ Complaint redressal
  - This exercise has not assessed complaints redressal system
  - Data on pending complaints not reported

# Complaints Data - Reliability Scale

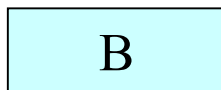
Reliability Scale	Description	Cities
A	Multiple mechanisms for registering complaints.  Complaints are categorised and aggregated	Bangalore, Chandigarh, Chennai, Hyderabad and Jamshedpur
B	None	
C	Complaints data not aggregated at city level	Bhubaneswar, Dehradun, Indore and Rajkot
D	No data maintained	Pune

# Consumer complaints

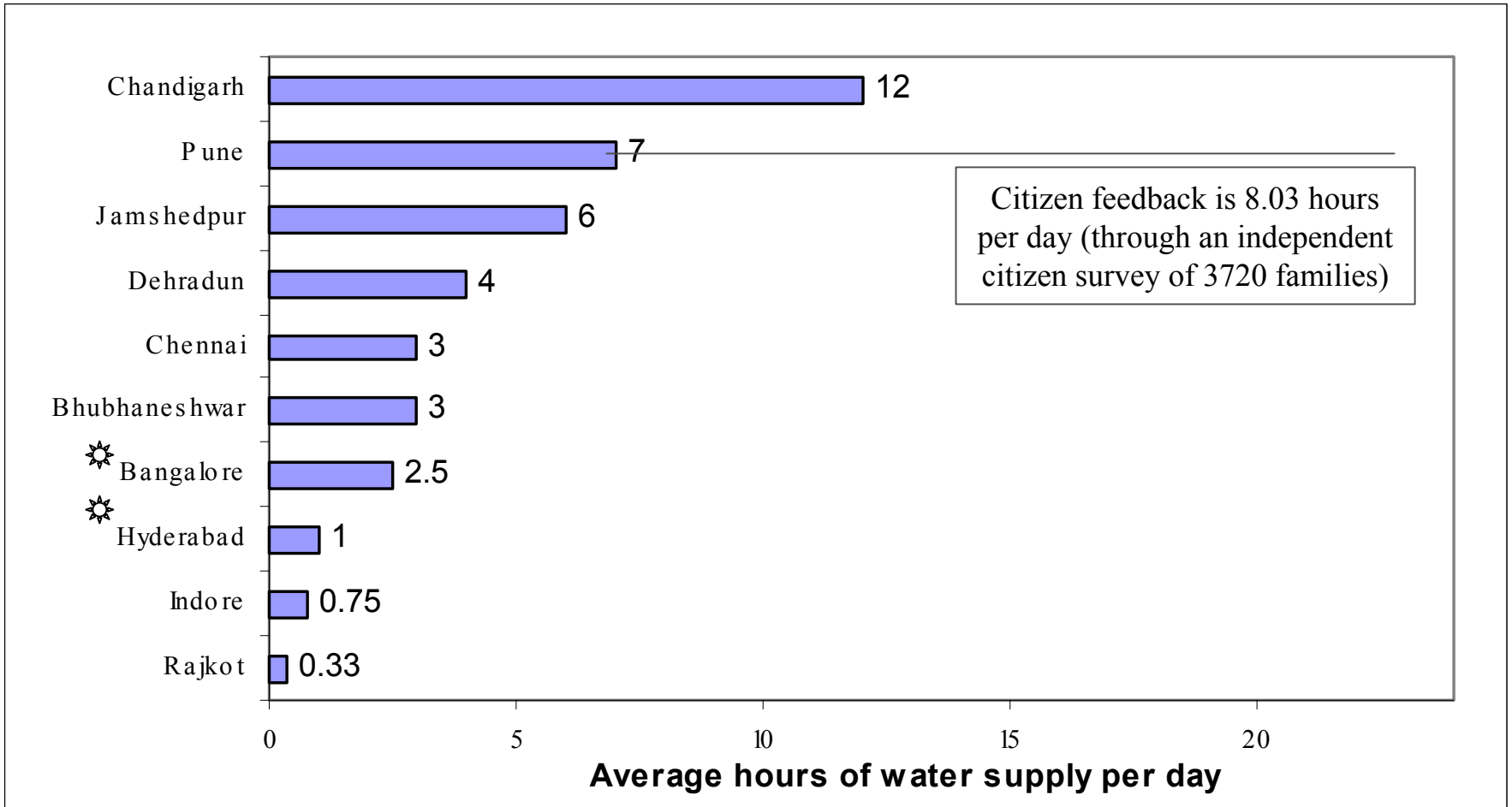


☼ Data not provided for Bangalore – Category A

Reliability  
Scale

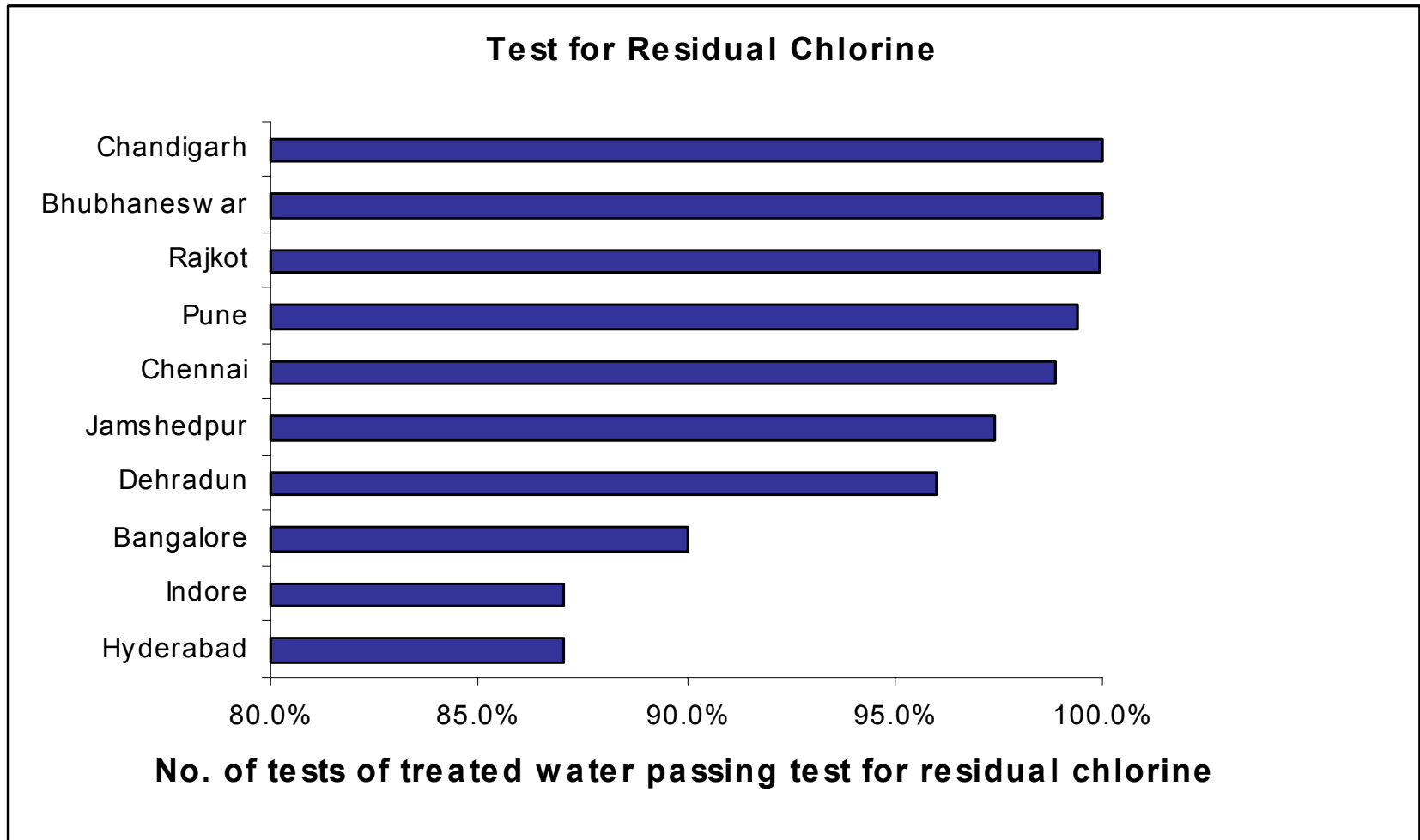


# Number of hours of supply



No reliable measure for assessing number of hours of supply

# Water quality tests



As reported by the utilities and not verified. Utilities in addition are also required to test for bacteriological contamination

# Key messages

- ⇒ More demand side information is required on customer service
- ⇒ Backend for customer service needs to be strengthened

# Financial Performance

# Financial Performance

- ⇒ Determines the level of financial flexibility the utility has
- ⇒ Its ability to invest timely

# Cost recovery – Operating ratio

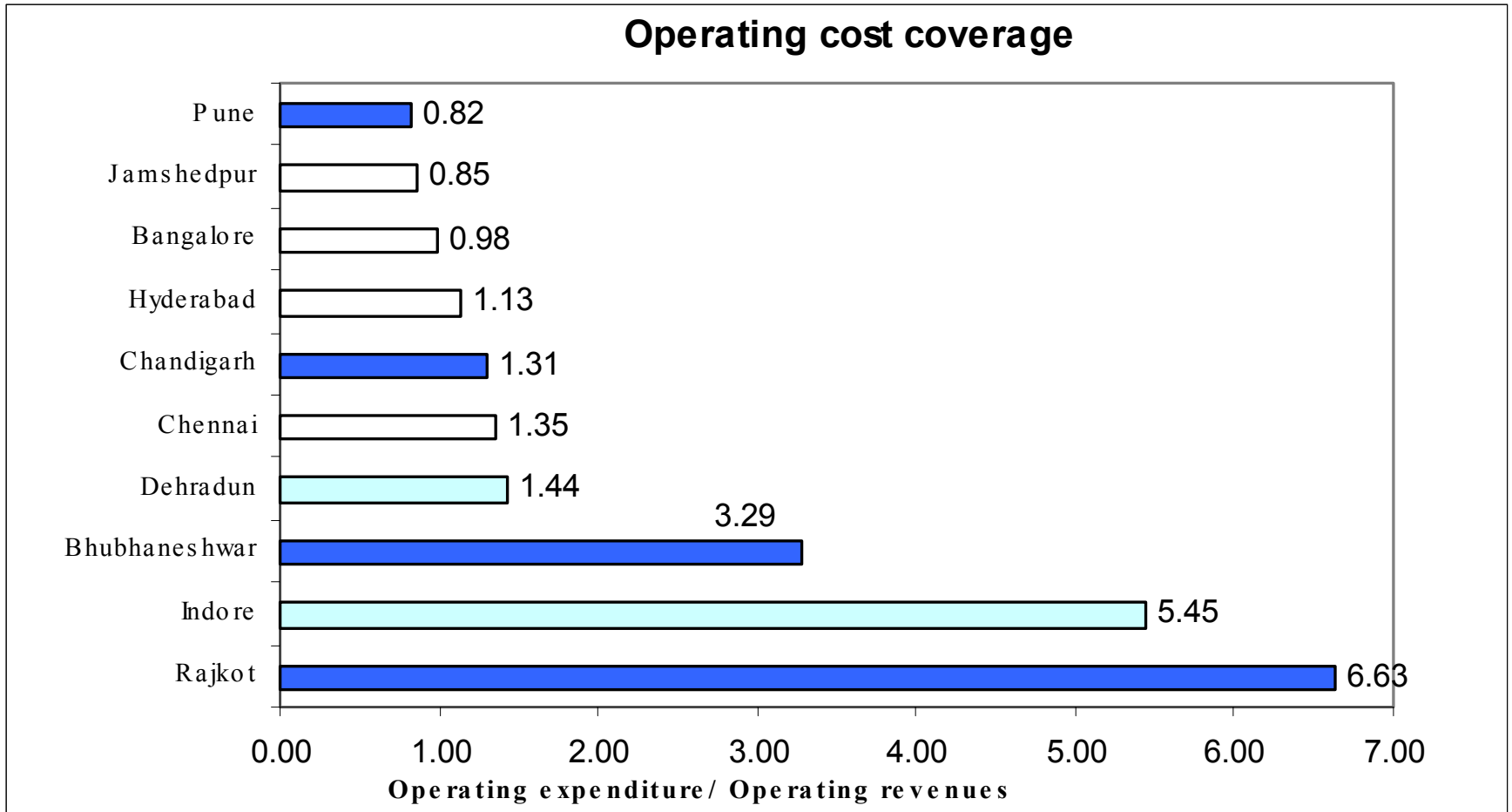
- ⇒ Measures operating expenses as a proportion of revenue
- ⇒ Requires
  - Segregated budgets or ring fenced operations
  - Double entry accrual based accounting system
  - Regular and timely disclosures in a standardised form

# Operating Ratio – Reliability Scale

Reliability Scale	Description	Cities
A	Segregation of water and sewerage budgets Double entry, accrual based accounting system Audited financial statements and published regularly	Bangalore, Chennai, Hyderabad and Jamshedpur
B	Segregation of water and sewerage budgets Double entry, accrual based accounting system Disclosures are not timely, regular or standardised	Dehradun, Indore
C	Major items of income and expenditure can be segregated. Key income and expenditure heads are recognised on accrual basis	Bhubaneswar, Chandigarh, Pune and Rajkot
D	No segregation of water and sewerage expenditure. Cash based accounting	

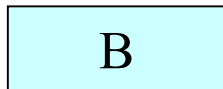
# Operating Ratio

Operating cost coverage



☼ Pune and Chennai – data presented for FY2005

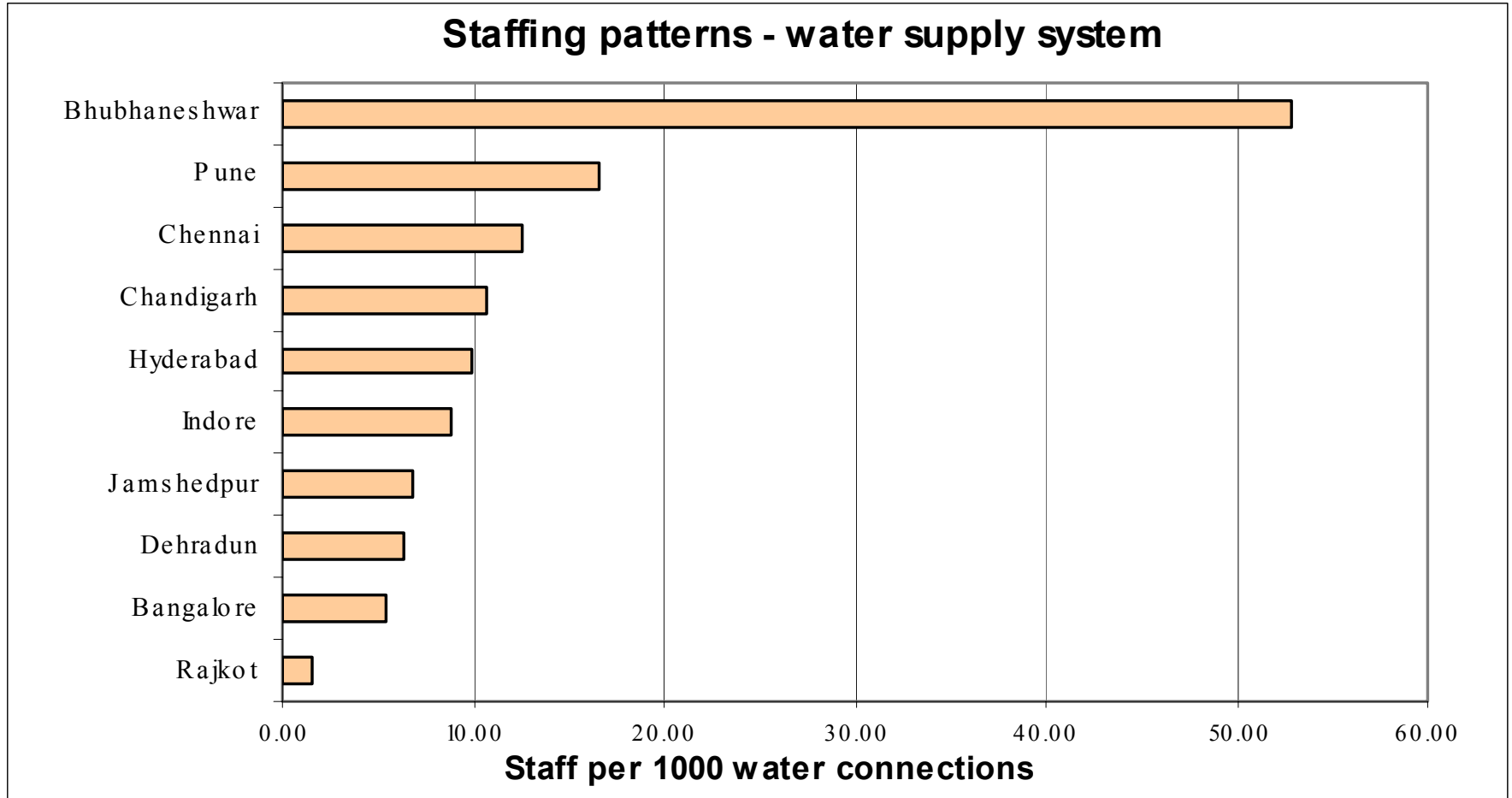
Reliability  
Scale



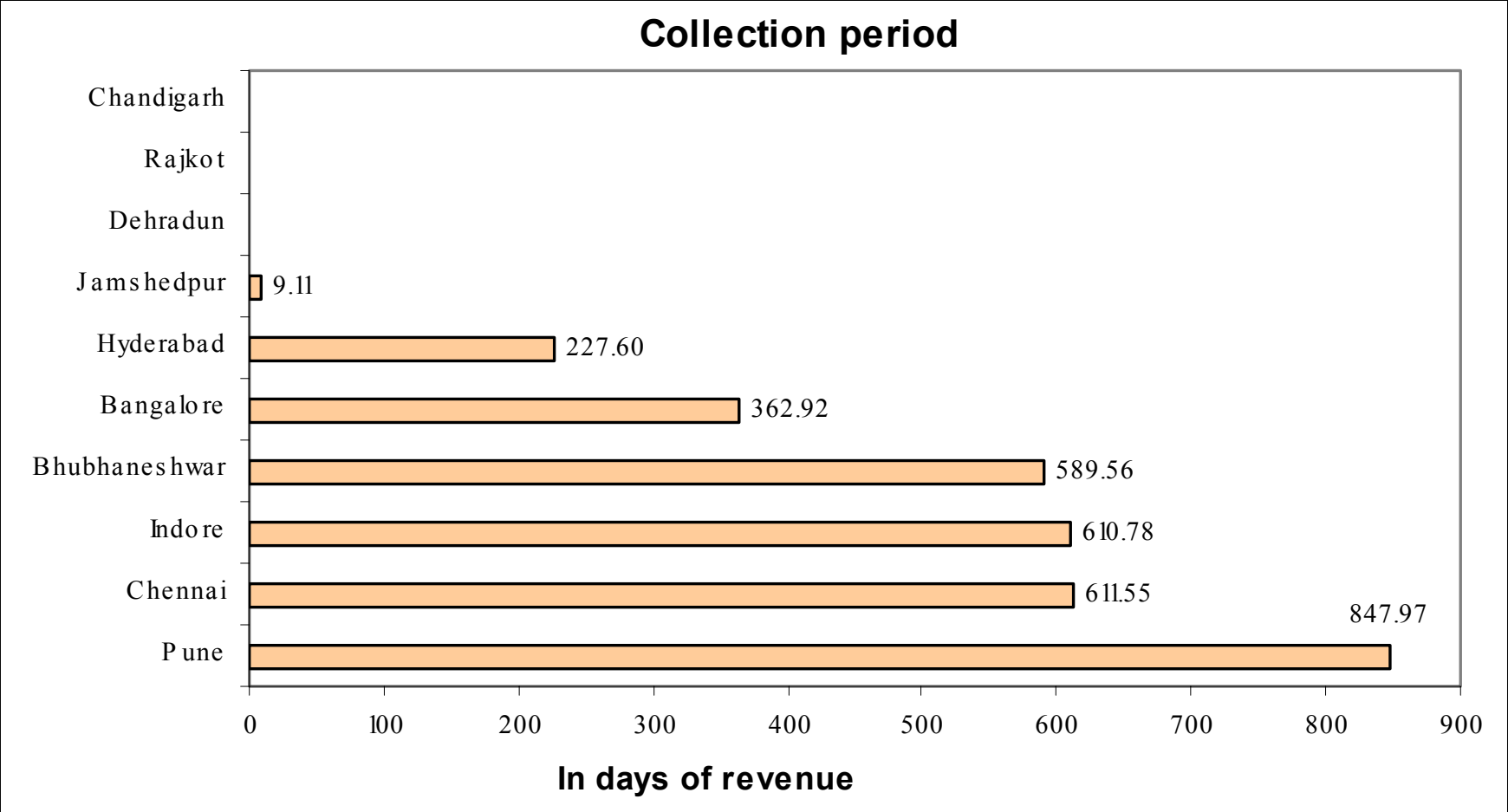
# Operating Ratio – Key Messages

- ⇒ Seven utilities depend on external support to meet operational costs
- ⇒ Ring fencing or segregating WSS budgets is a critical need
- ⇒ Accounting reforms are equally important

# Staffing levels



# Outstanding debtors



Reliability scale not developed for this indicator

# Tariff

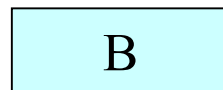
Utility	Type of Tariffs		Connection Charges (In Rs.)	
	Volumetric	Flat	Water	Sewerage
Bangalore	√√√	X	1400	250
Bhubaneswar	√	√√√	3060	1560
Chandigarh	√√	√√	500	500
Chennai	√	√√√	1930	3330
Dehradun	√√	√√	3715	1500
Hyderabad	√√√	X	1250	1250
Indore	X	√√√	2500	200
Jamshedpur	√√	√√	300	200
Pune	√√	√√	1200	2000
Rajkot	√	√√√	1650	500

# Summing up

# Summing up key indicators

		Coverage	Production	Metering	Working Ratio	Complaints	Daily supply
		in %	lpcd	% of total conn	Opex as % of oper rev	% of W conn	Hours per day
City Boards	Bangalore	91%	143	90%	1.0	NA	2.50
City Boards	Chennai	98%	107	4%	1.4	44%	3
City Boards	Hyderabad	95%	192	93%	1.1	39%	1
City Company	Jamshedpur	79%	608	1%	0.9	43%	6
City Corp	Chandigarh	100%	290	71%	1.3	2%	12
City Corp	Indore	54%	102	0%	5.4	0%	0.75
City Corp	Pune	88%	274	16%	0.8	NA	7
City Corp	Rajkot	98%	126	0.4%	6.6	30%	0.33
State Agency	Bhubhaneshwar	45%	269	1%	3.3	8%	3
State Agency	Dehradun	80%	149	8%	1.4	4%	4

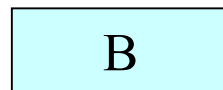
Reliability  
Scale



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Reliability Scale



# Key messages

## ⇒ Significant shortfalls

→ mandate, water balance, continuity of supply, financial position

## ⇒ Quality of data systems varies across utilities, and is generally weak

## ⇒ Terminology is not consistent across utilities – comparisons can mislead

## ⇒ Key questions?

→ Is performance measurement based on reliable data?

→ Can benchmarking data lead to improvements?

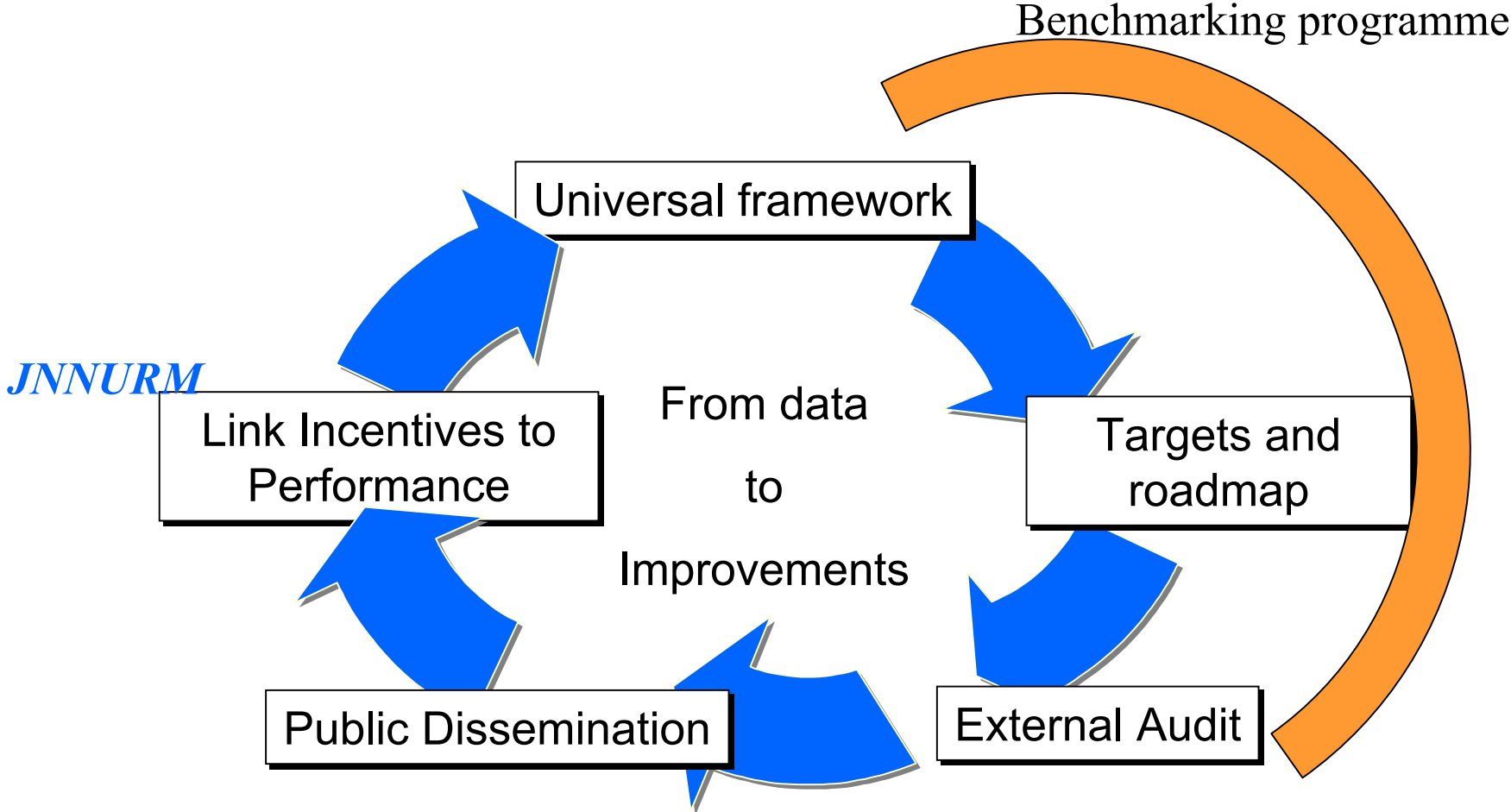
# Can benchmarking lead to performance improvements?

## ⇒ Necessary steps

- Improving the data systems
- Data orientation within the utility
- Anchoring the benchmarking exercise

## ⇒ But, is this sufficient?

# Ensuring success – Data to improvements



**Thank You**