



The WSS study

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- Aims at providing a baseline status of the WSS sector in India with a view to the future
- Based on secondary information available from different sources
- Separate studies for rural and urban

This Presentation...1

- Provides broad directions that initial study components are taking
- Provides some broad data drawn from more specific instances and data
- Discusses various problems of accessing and analyzing available data
- Incorporate insights and concerns of sector professionals and policymakers

This Presentation...2

- Access and Coverage
- Institutions
- Capacity Building
- Health

Expanding Quality WSS Coverage

Meeting the Goals of the Future

WSS in India

Access & Service

Characteristics of WSS

Water Supply

- Type of source
- Distance
- Exclusivity of use

- Quality of water
- Adequacy, Timeliness
- Quality of services

Sanitation

- Type of infrastructure
- Distance
- Exclusivity of use

- Cleanliness
- Privacy, odor etc.
- Services

Improvement in Urban WSS

Administrative Data

- Water Supply

Year	% population provided with Water Supply
2000	89
1993	84

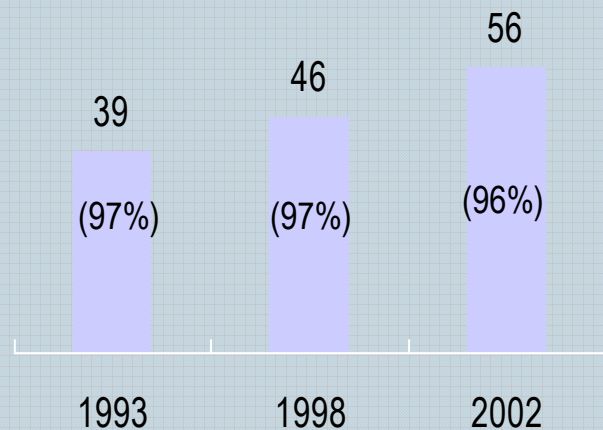
- Sanitation

Year	% population provided with sanitation facilities
2000	63

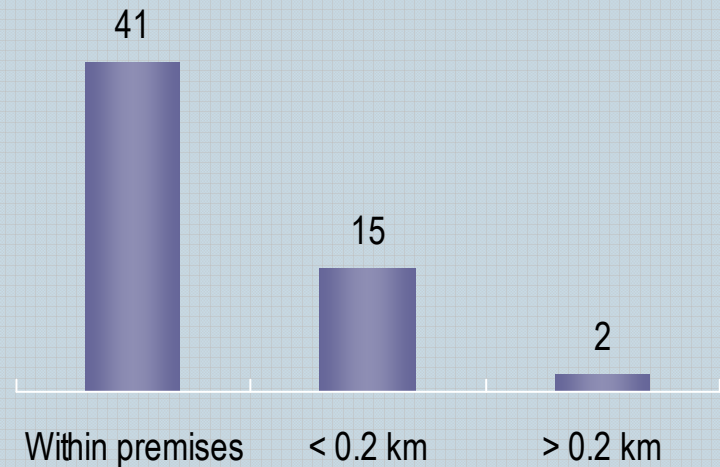
Urban Water Supply Status in India

Households (Million)

Water within 0.2 km



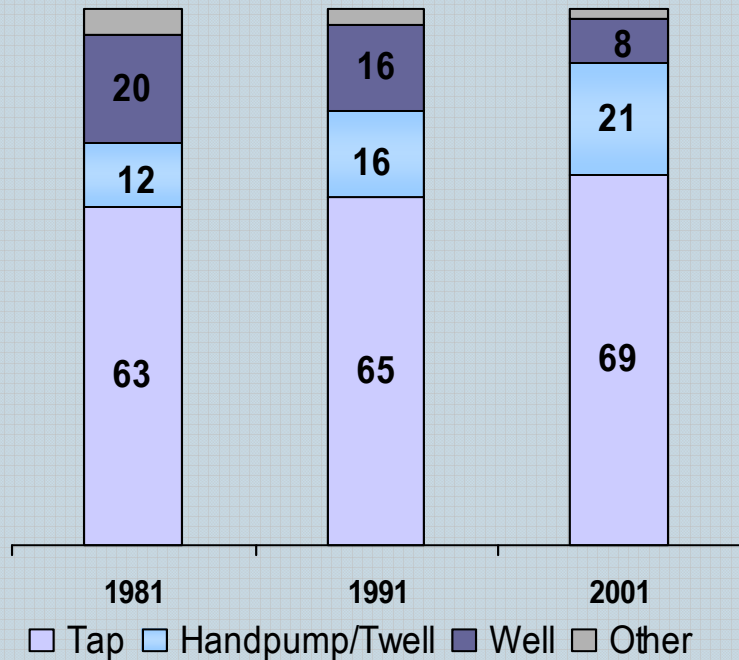
Distance to Water Source



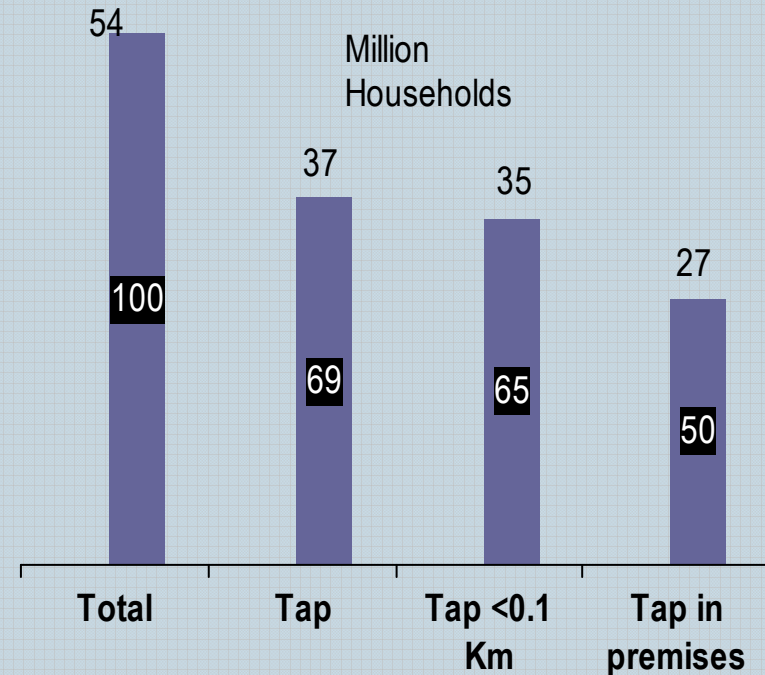
- **Issues of: Piped? Protected? Safe? Adequate?**
- **Significant increase in coverage**
- **But stagnant percentage covered**
- **Running to be in the same place**

Urban Water Supply – Type of Source

Types of water sources (%)

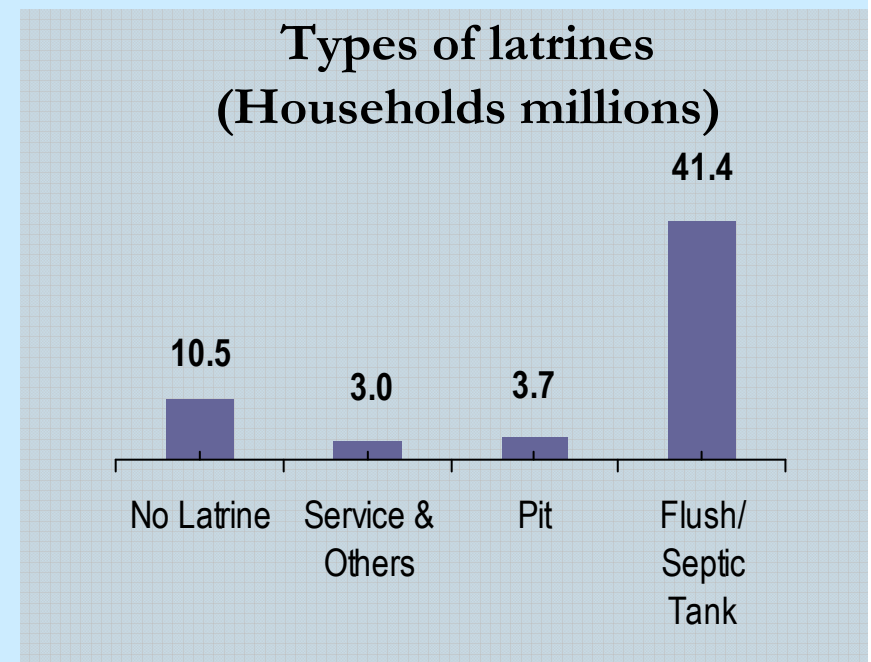
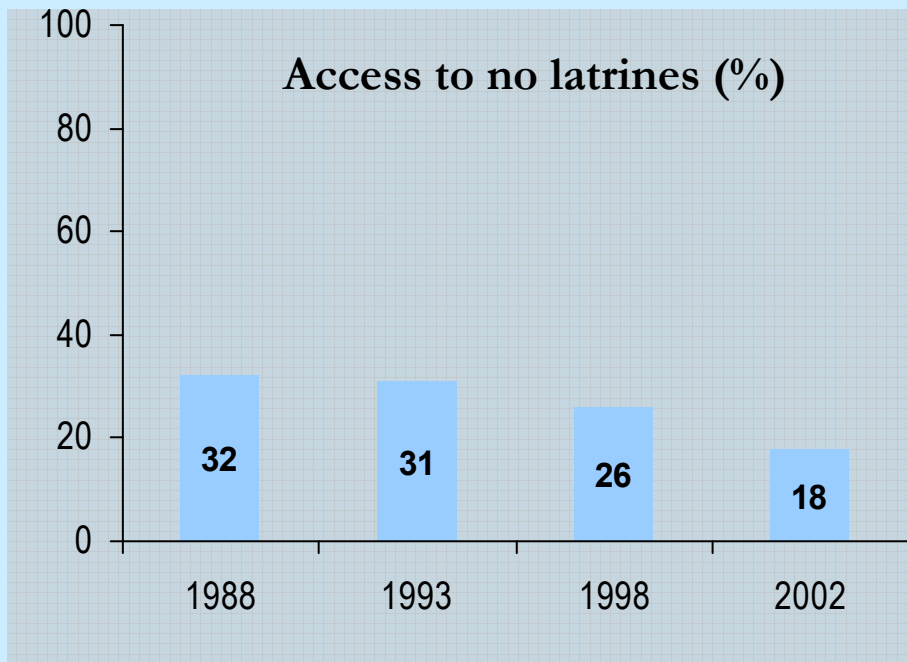


Better coverage indicator



- Taps and hand pumps are rising consistently at cost of Wells and others
- Coverage reduces with stricter benchmarks

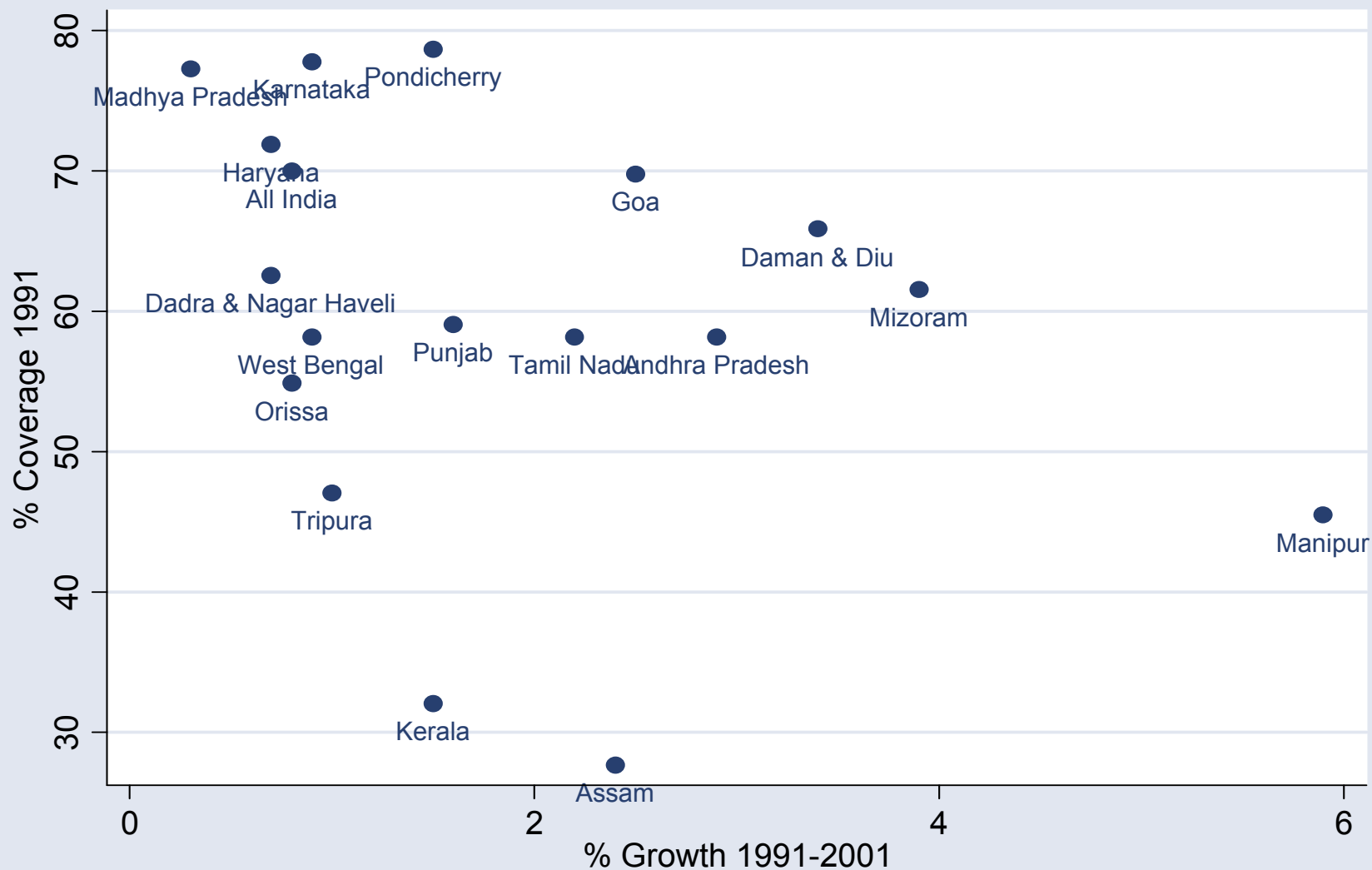
Sanitation Status in Urban India



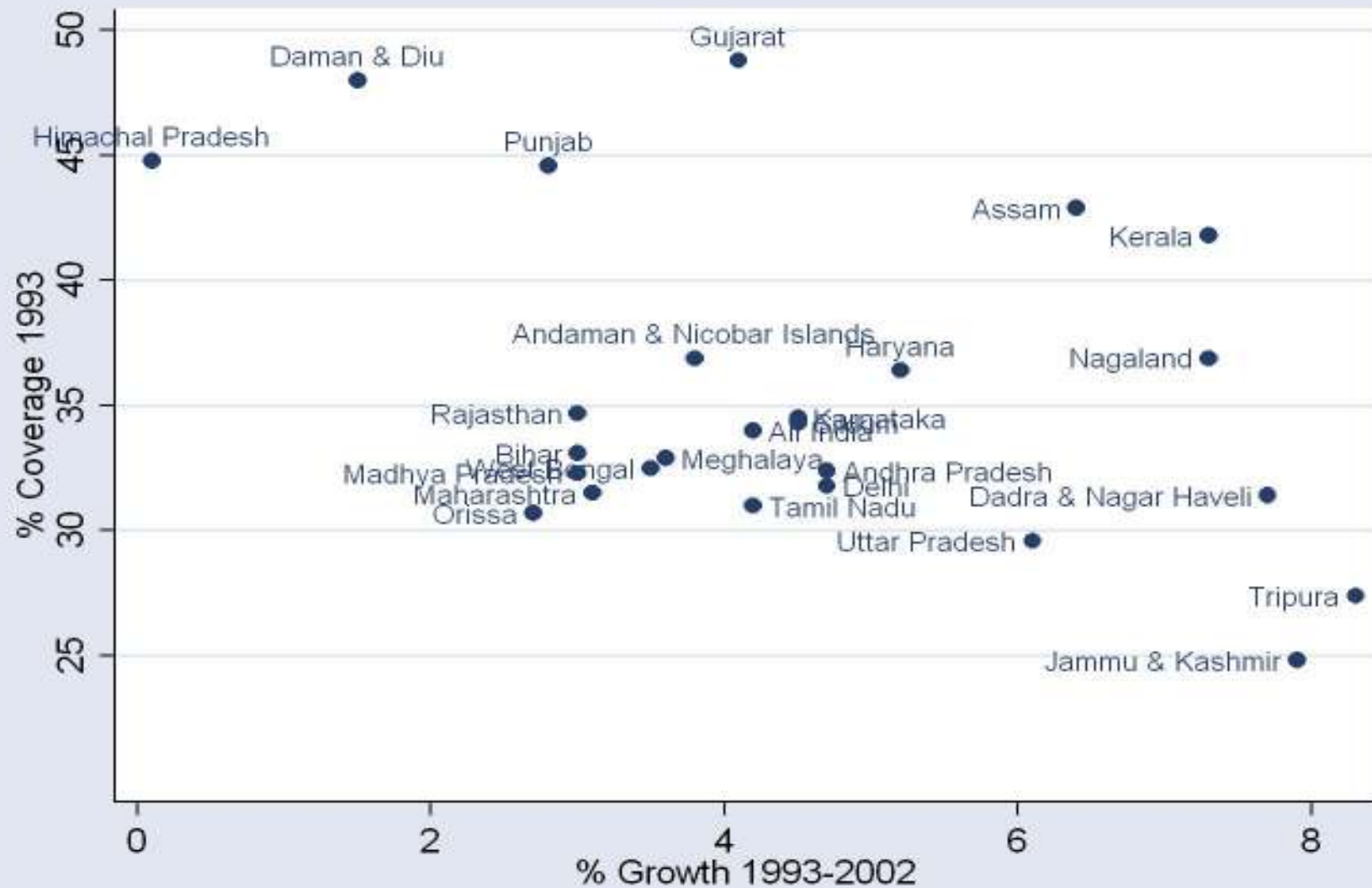
- **Almost 10.5 million households (about 45 million people) do not have access to any latrine in urban areas.**
- **However situation has been improving throughout 90s.**

Source: (NSSO 58th 2002)

Urban Coverage of piped services in 1991 Vs Growth in coverage of



Urban coverage of piped services in 1993 vs growth in coverage of



The States that have yet to meet MDG goals for urban water supply

Household service connections and piped stand-posts (CPHEEO, 2000)	Households having access to safe drinking water (Planning Commission, 2001)	Households having tap within premises (Census 2001)
Karnataka, Andhra Pradesh, Jammu & Kashmir, Assam, Bihar, West Bengal, Dadra & Nagar Haveli, Punjab, Orissa, Daman & Diu, Mizoram, Arunachal Pradesh, Lakshadweep, Haryana, Nagaland, Manipur	Lakshadweep, Nagaland, Kerala, Meghalaya, Manipur, Assam, Arunachal Pradesh	Chhattisgarh, Bihar, Assam, Orissa, West Bengal, Tripura, Kerala, Madhya Pradesh, Jharkhand, Tamil Nadu, Chandigarh, Delhi, Uttar Pradesh, Haryana, Karnataka, Dadra & Nagar Haveli, Nagaland, Lakshadweep, Arunachal Pradesh, Meghalaya, Manipur,

The states that have yet to meet MDG goals for urban sanitation

Households with no access to latrines (Census 2001)	Households with sole access to latrines (Census 2001)
Bihar, Chhattisgarh, Jharkhand, Pondicherry, Rajasthan, Tripura	Bihar, Chandigarh, Chhattisgarh, Daman & Diu, Goa, Himachal Pradesh, Jharkhand, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Pondicherry, Rajasthan, Sikkim, Tripura, West Bengal

Status Across Class of Cities

Status of drinking water and no access to latrines across class 1 and 5 cities

Class of City	Population Size	Access to Tap within Premises		Access to Community Latrines or No Latrines		Total Households
		%	(Million)	%	(Million)	(Million)
1	>= 0.1 mn	57	18.9	21	7	33.2
5	5,000 - 9,999	29	0.5	45	0.7	1.6

Source: Census 2001

- There is considerable variation in access to water and sanitation services across various classes of towns/ cities.
- Coverage is much poor in smaller towns.

Drinking Water Status across Class of Cities and States

% of households having access to tap by different class of cities

State	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
Bihar	38	15	12	7	20	.
WB	65	44	34	24	26	30
Orissa	59	37	34	37	41	51
UP	61	51	44	40	37	51
Punjab	71	66	65	52	39	58
Assam	35	31	29	26	34	9
Uttaranchal	96	64	81	77	70	85
Andhra Pradesh	75	68	60	60	58	62

Drinking Water Status across Class of Cities and States

% of households having access to tap by different class of cities

State	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
MP	73	66	67	59	50	43
Chattisgarh	65	59	52	55	44	.
Gujarat	84	85	76	72	83	90
Rajasthan	84	79	75	72	60	55
Maharashtra	92	85	77	79	74	89
J&K	95	82	76	82	65	71
Jharkhand	50	43	50	44	52	45
Karnataka	81	77	74	71	70	80
HP	95	.	95	93	93	93
Haryana	72	79	68	71	64	24
Tamil Nadu	63	74	65	63	68	70

Sanitation Status across Class of Cities and States

% of households having access piped sanitation services by different class of cities

State	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
J&K	95	24	17	22	17	16
Karnataka	56	27	19	21	36	55
Tamil Nadu	61	48	38	27	21	20
WB	62	49	36	30	25	23
Haryana	35	34	20	18	18	2
Rajasthan	48	37	29	25	32	46
UP	38	29	24	19	15	22
Orissa	54	40	34	30	37	49
Bihar	53	40	27	30	31	
MP	48	45	34	28	23	28

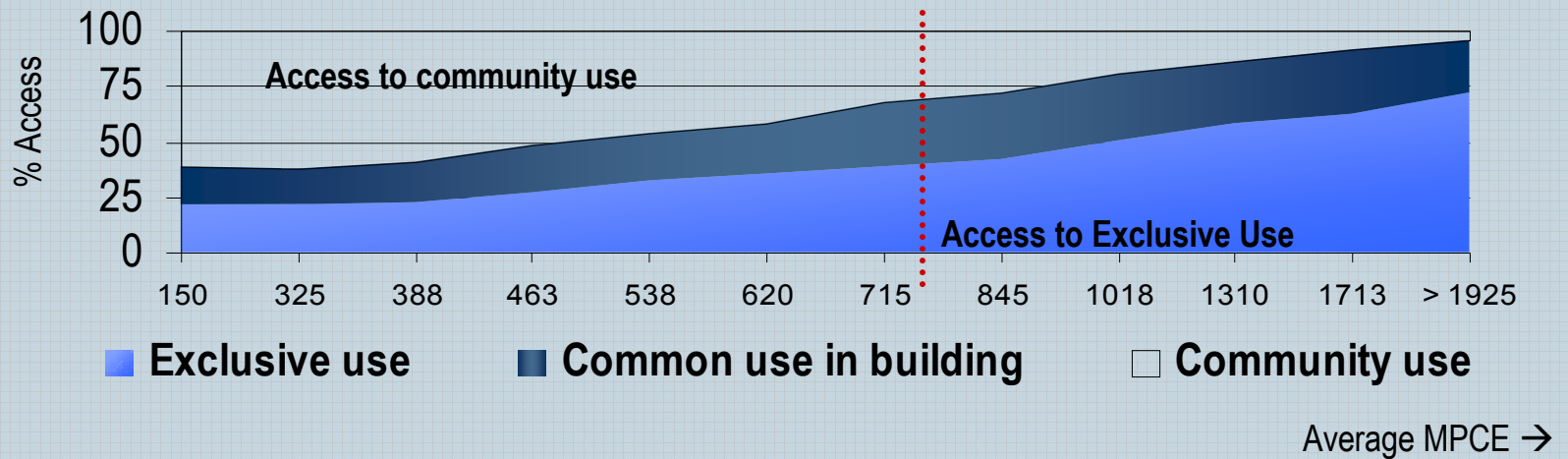
Sanitation Status across Class of Cities and States

% of households with piped sanitation services by different class of cities

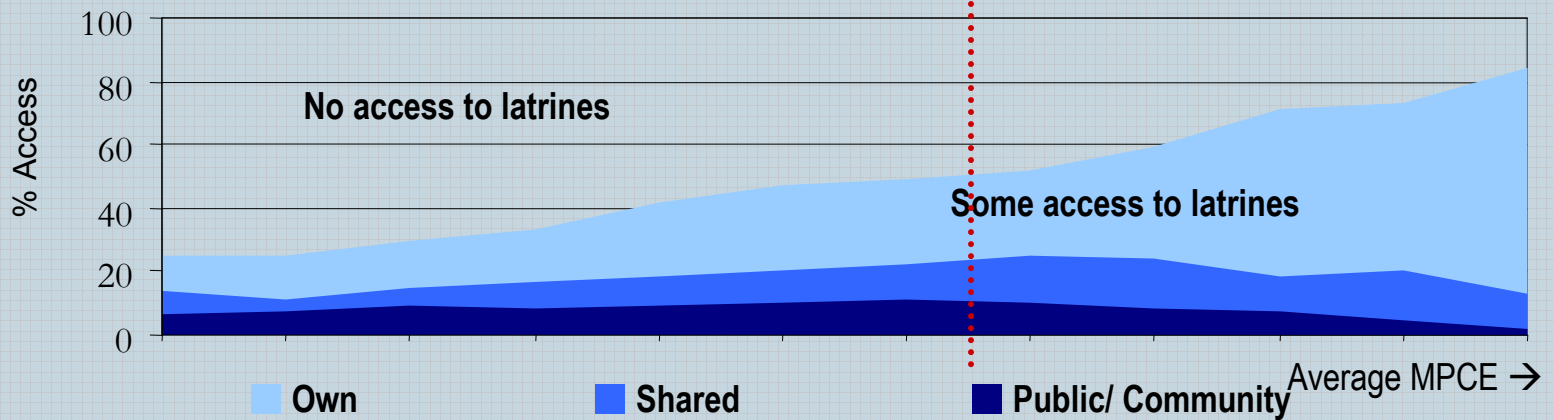
state	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
Gujarat	68	58	49	40	32	46
Punjab	52	49	33	32	22	32
Jharkhand	48	41	36	31	33	21
Andhra Pradesh	51	40	37	33	25	34
Maharashtra	48	37	29	31	28	34
HP	66		60	45	30	27
Chattisgarh	43	41	34	32	22	
Assam	67	65	53	51	44	38
Uttaranchal	39	45	48	30	35	29
Kerala	73	77	76	72	74	68

Urban Poor & WSS

Average MPCE and access to water supply sources



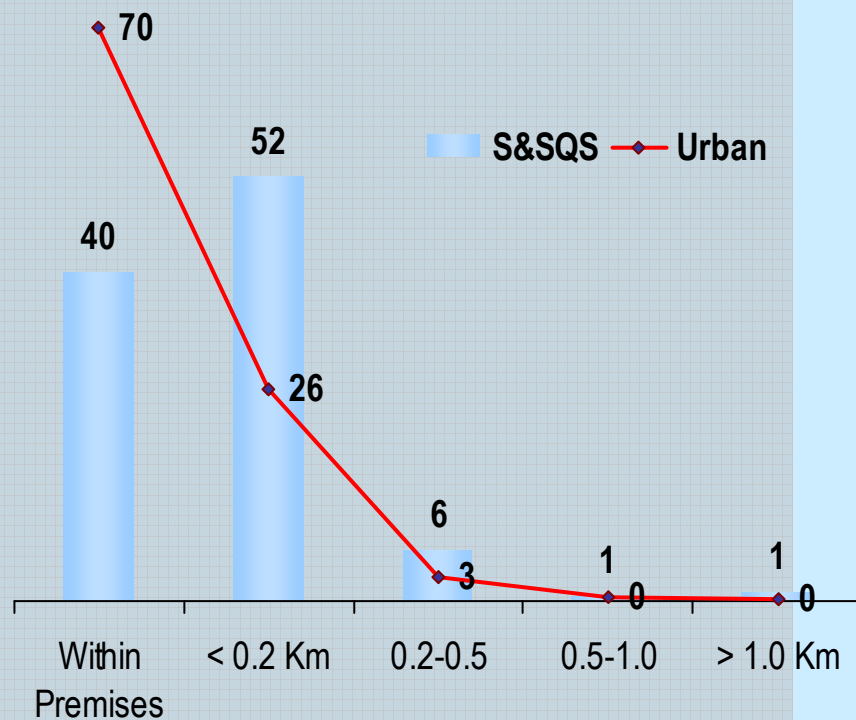
Average MPCE and access to latrines



The poor are worse off in accessing water supply & sanitation facilities

Status of WSS in Slums

Urban & Squatter settlement households by distance to the source of drinking water



Access to Latrines

Slums & Squatter settlement		
Type of Access	%	Millions
Own	20	1.22
Shared	13	0.78
Public/ community	34	2.10
No latrine	32	1.98
Others	1	0.04
Total	100	6.12

Source: NSSO 58th (2002)

Focus on services- Issues in Urban Areas

- **Household connections:** Only 51% urban household connections in 2002. (WHO-UNICEF JMP, mid term appraisal report 2004)
- **Hours of Supply:** E.g. In Gujarat the average number of hours of water availability in various cities was found to be from 18 minutes to 5 hours per day. (City Managers Association, 2001)
- **Months of Supply:** E.g. 15% urban households did not get sufficient drinking water during at least one month of the year preceding the date of survey (NSSO 54th 1998)
- **Quality:** 9% urban households reported that the drinking water during 1998 was of unsatisfactory quality. (NSSO 54th 1998)

Focus on services- Issues in Urban Areas - 2

- **Inadequacy:** In many large cities the water supply was not adequate as per the GOI norms. (Rajya Sabha Question, 2003)
- As per an NIPFP study 28 % of the Municipalities provide less than 50 LPCD which is less than half the norm recommended by Zakaria Committee for towns less than 20,000 persons (NIPFP 2000)
- 18% urban households had to access a supplementary source for drinking water supply. (NSSO 54th 1998)
- Around 8.7 million urban households use hand pumps for drinking water supply. (Census 2001)
- **Manual Scavenging:** 83% scavengers are in Urban areas. 37% dry latrines converted out of the sanctioned till March 2002. (CAG report)

Improvement in Rural WSS

Administrative Data

- Water Supply

Year	% population covered with Water Supply
1984-85	56
1996-97	92

Source: GOI, 8th Five Year Plan

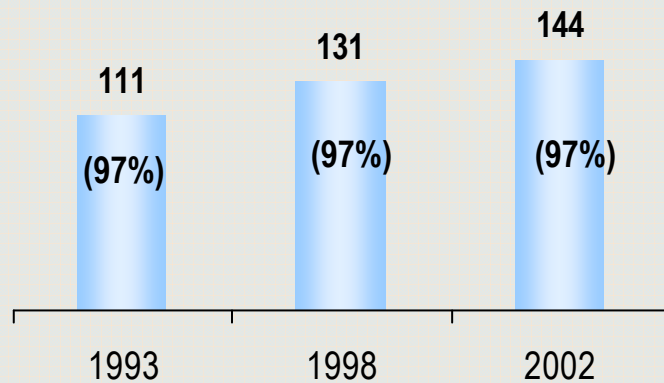
- Sanitation

Year	% population provided with sanitation facilities
1984-85	0.7
1996-97	5.0

Rural Statistics, 2003, MRD, GOI

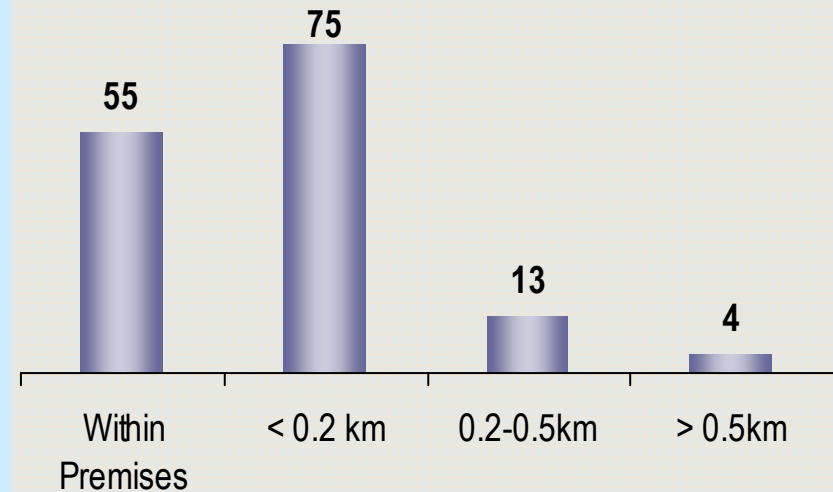
Water Supply Status in Rural India

Number of households having primary source of water within 0.5km from their premises (millions)



Source NSSO 49th, 54th, 58th rounds

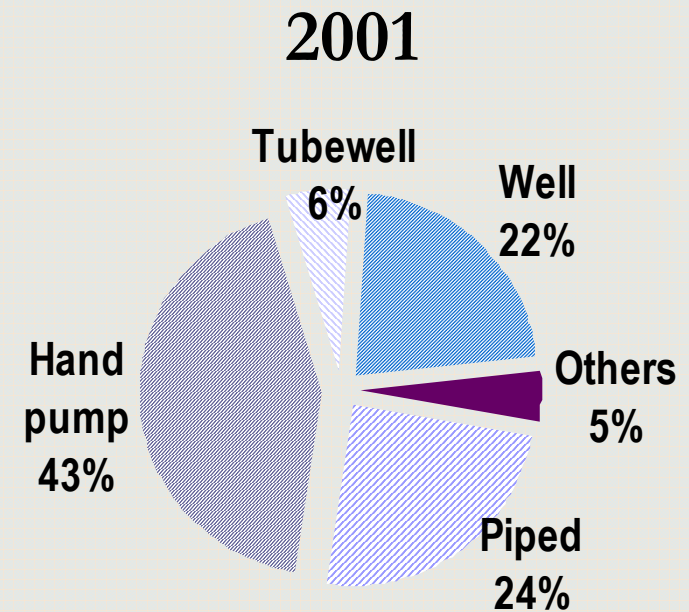
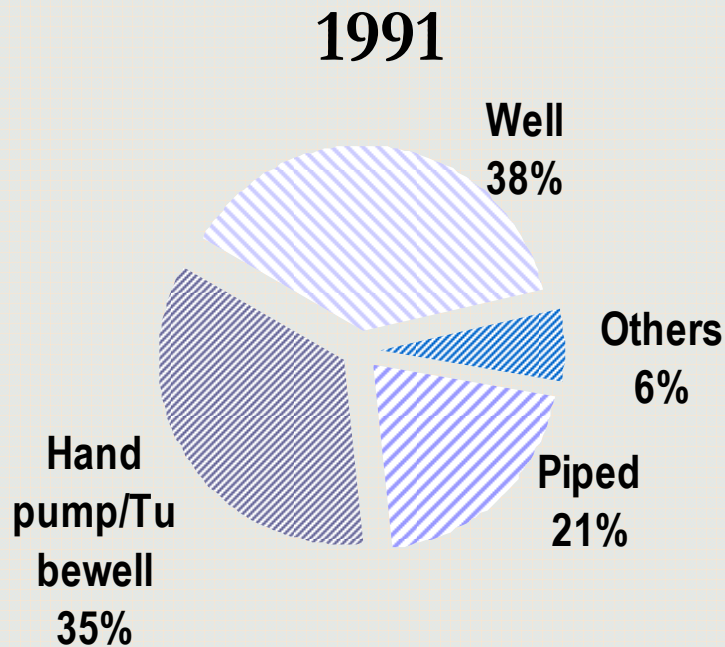
Number of households by distance traveled for accessing primary source of water (millions)



Source NSSO 58th : 2002

- **Issues of: Piped? Protected? Safe? Adequate?**
- **Significant increase in coverage**
- **But stagnant percentage covered**
- **Running to be in the same place**
- **1.6 km - Approx. 0.4 million households**

Rural Water Supply – Type of Source

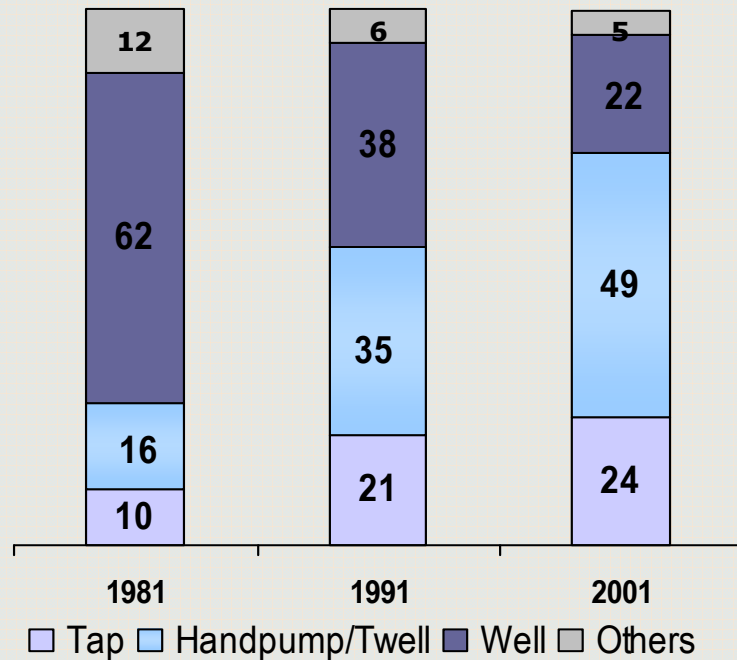


- Access to hand pump and piped sources has improved considerably between 1991-2001
- About 37 million households continue to access water sources other than hand pumps, tube wells, and taps.

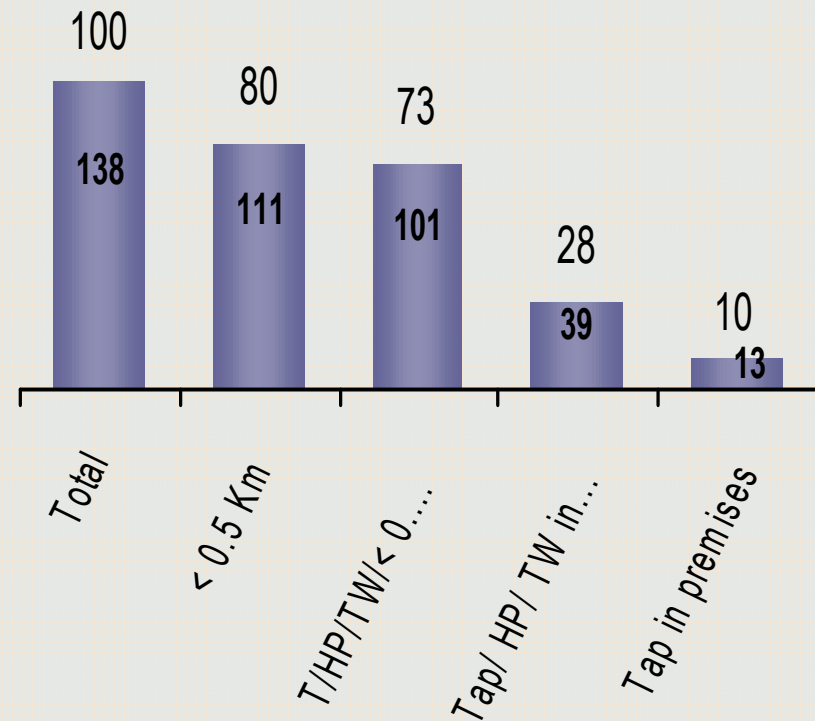
Source: Census, 1991 & 2001

Rural Water Supply – Type & distance of Source

Types of water sources (%)



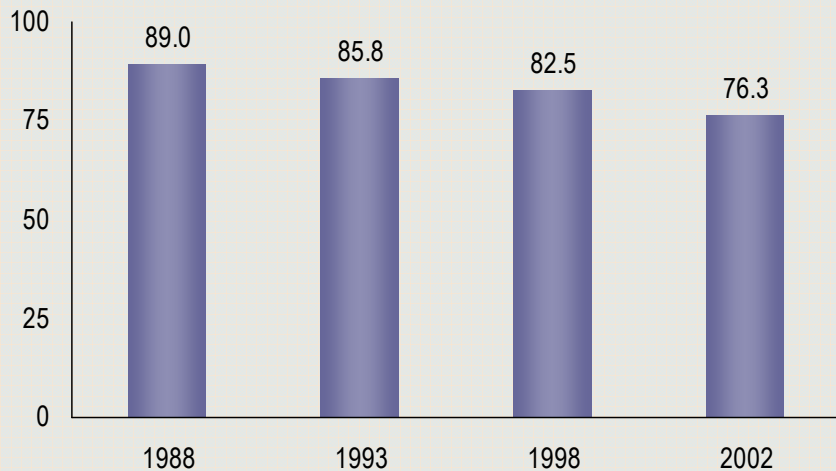
Variation in coverage for different benchmarks



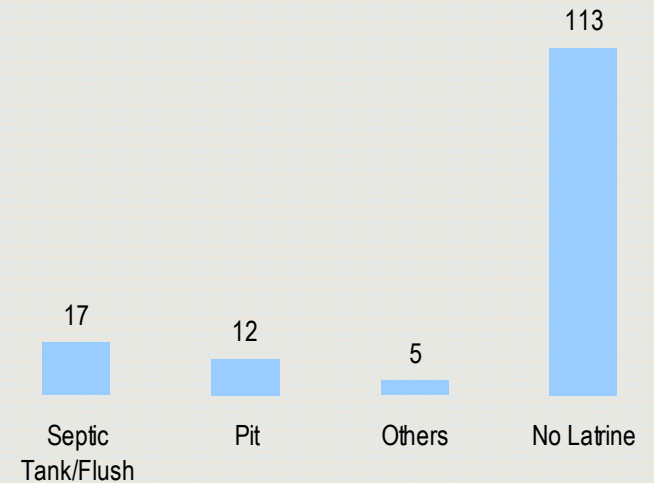
- Taps and hand pumps/tube well are rising consistently
- Coverage reduces with stricter benchmarks

Sanitation Status in Rural India

Access to no latrines (%)

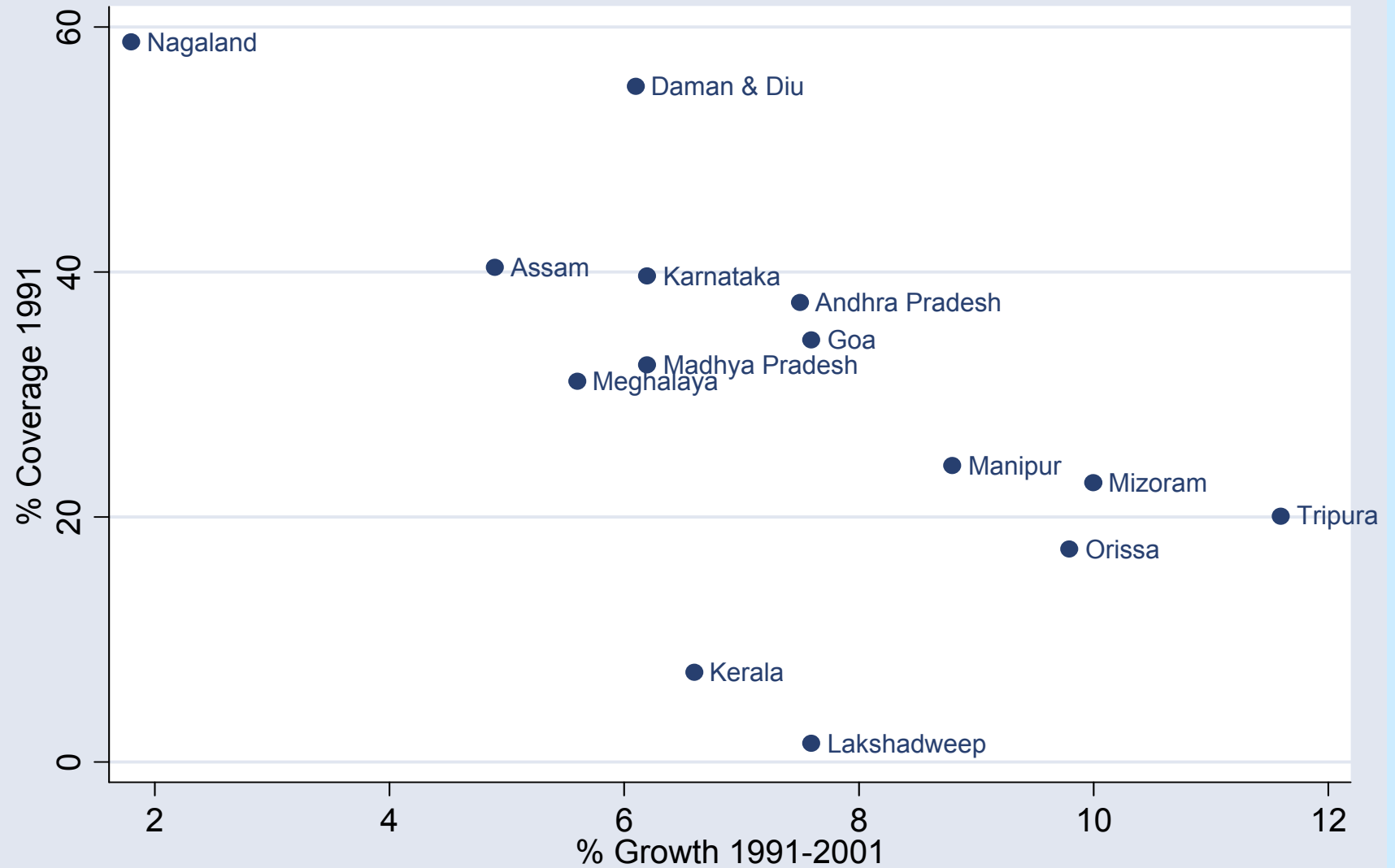


Number of Households by type of access to latrines in 2002 (millions)

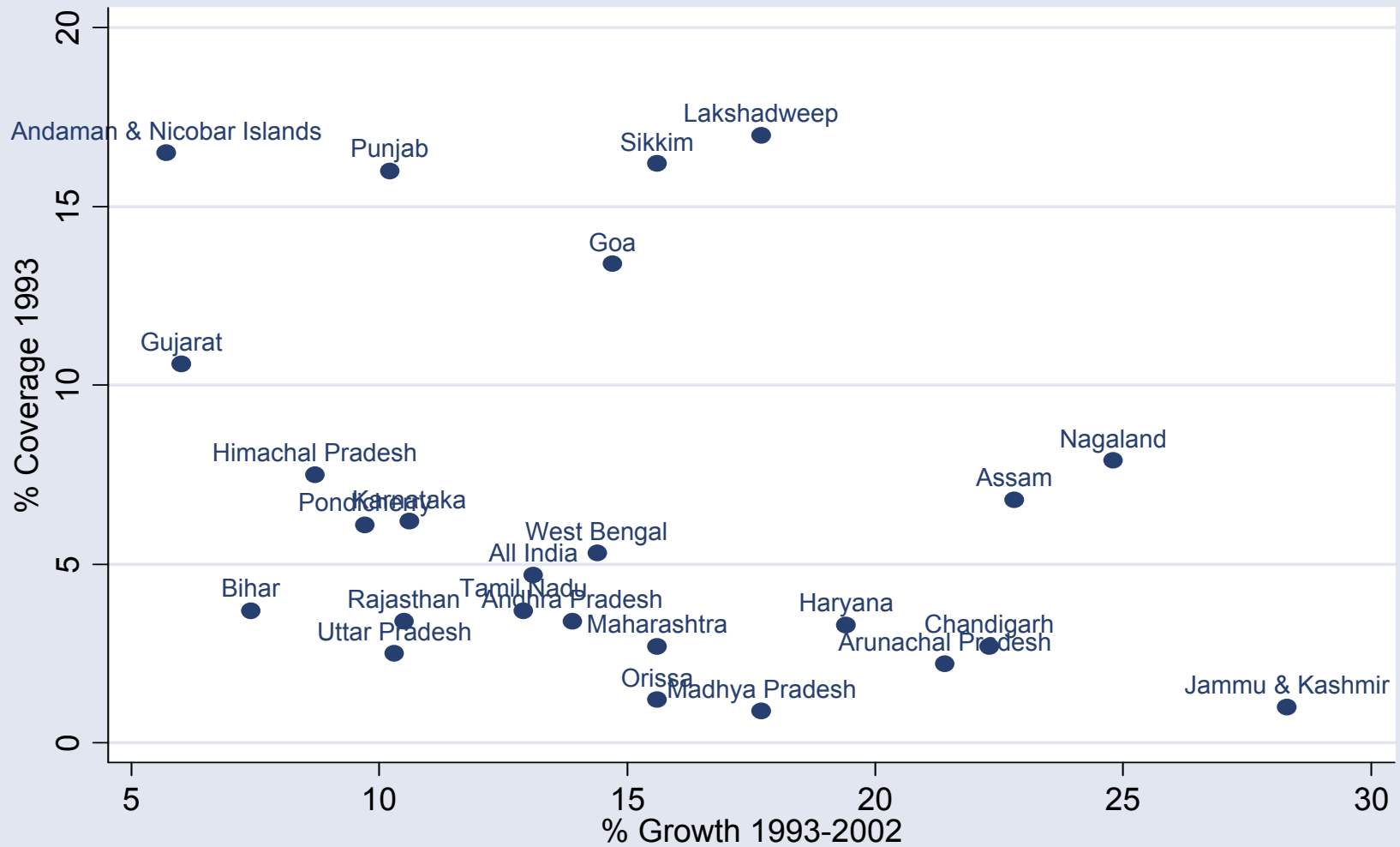


- **Three fourths of rural households did not have access to latrines**
- **Only 17 % of all rural households have exclusive use to a latrines facility (up from 8% in 88-89). Rest are shared/ community or open defecation**

Rural coverage of piped services in 1991 vs growth in coverage of piped



Rural coverage of piped services in 1993 vs growth in coverage of



The States that have yet to meet MDG in rural water supply

Habitations fully covered (2004)	Households having access to safe drinking water (2001)	Households accessing tap/hand-pump/tube-well within premises (2001)
Maharashtra, A&N Islands, Nagaland	Lakshadweep, Manipur, Nagaland, Kerala, Meghalaya, Sikkim, Mizoram, Delhi, Andaman & Nicobar Islands	Jharkhand, Dadra & Nagar Haveli, Manipur, Sikkim, Chhattisgarh, Lakshadweep, Mizoram, Meghalaya, Nagaland, Madhya Pradesh, Orissa, Tripura, Kerala, Tamil Nadu, Arunachal Pradesh, Assam, Delhi, West Bengal, Gujarat, Rajasthan, Karnataka, Uttaranchal, Himachal Pradesh, Andhra Pradesh, Andaman & Nicobar Islands, Bihar, Uttar Pradesh, Haryana, Maharashtra, Daman & Diu

The states that have yet to meet MDG goals for rural sanitation

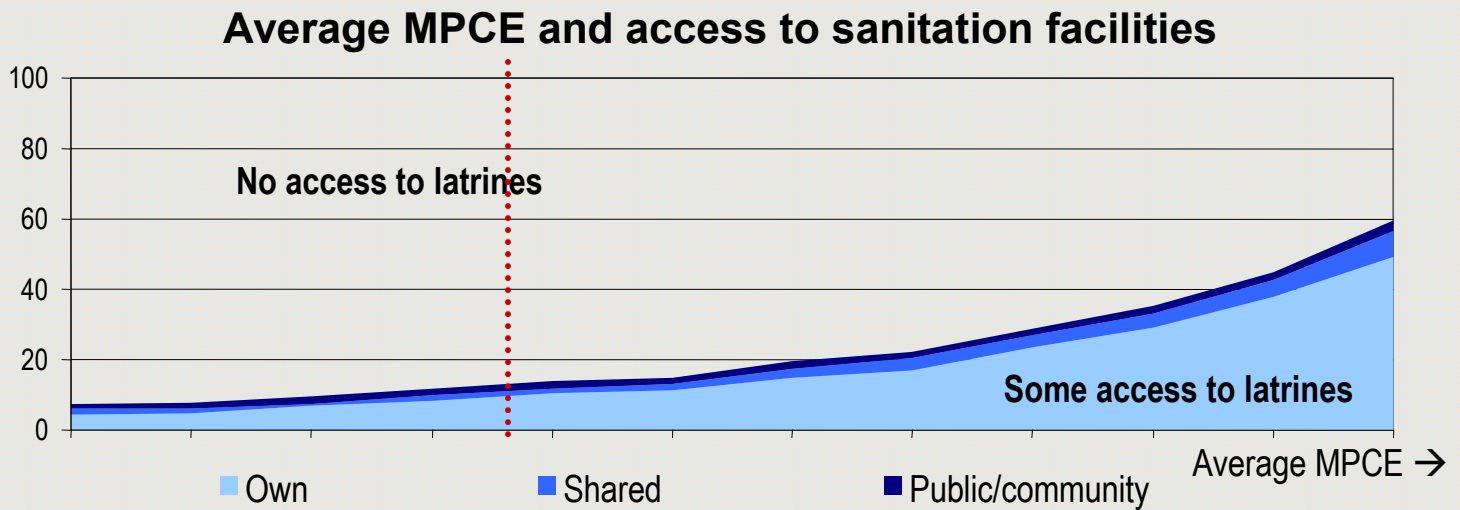
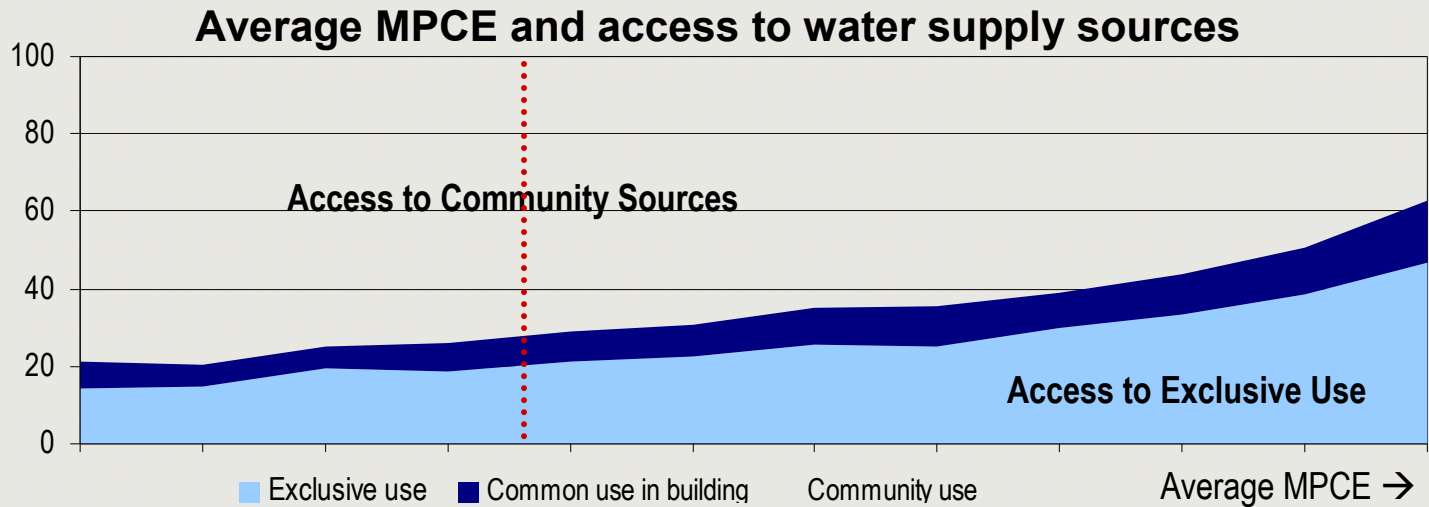
Households with no access to latrines (2001)

Madhya Pradesh, Rajasthan, Uttar Pradesh, Andaman & Nicobar Islands, Gujarat, Bihar, Orissa, Tamil Nadu, Maharashtra, Pondicherry, Andhra Pradesh, Karnataka, Haryana, Nagaland, West Bengal, Himachal Pradesh

Households with sole access to latrines (2001)

Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Delhi, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Lakshadweep, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Pondicherry, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal

Rural Poor & WSS



Focus on services- Issues in Rural Areas

Household connections: Only 13% rural household connections in 2002. (WHO-UNICEF JMP, mid term appraisal report 2004)

Months of Supply: 13% rural households did not get sufficient drinking water during at least one month of the year preceding the date of survey (NSSO 54th 1998).

Operation & Maintenance: 11% hand pumps are not in working condition (GOI- QPR 2002).

Quality: 15% households reported that the drinking water during 1998 was of unsatisfactory quality. (NSSO 54th 1998)

Source Sustainability: Re-emergence of problem habitations: contamination, drying up of sources, or sources being deficient.

Time Saving: Uttaranchal: Time saving: 3.5 Hrs /Target: 2.5 Hrs
Kerala: Time saving: 1.14 Hrs (The World Bank)

Recap

Progress has been made in providing access to WSS. But access to sanitation is still a major issue.

The progress is in terms of infrastructure indicators, service indicators, though limited, show wide gaps.

The need is to develop indicators that capture the level of services too.

Sanitation in rural areas can best be tackled by awareness

Institutions and Policy

Institutional structure

- Water and Sanitation – State subjects
- Further devolved after the 73rd and the 74th amendments
- State PHEDs, Water Boards....
- Role of the Central Government in harmonization
- Five year Plans and their role

At the Central Level

- Central Water Commission – MoWR
- Central Ground Water Board – MoWR
- National Rivers Conservation Directorate (NRCDD) – MoEF
- Central Pollution Control Board – CPCB

Central role

- RGNDWM for Rural water supply/sanitation
- Grants funds under Accelerated rural water supply programme
- Supervises RCRSP
- Under NHRDP, responsible for training

Ministry of Urban Development

- CPHEEO – Standards setting
- NEERI – Training and research
- AUWSP – 1994
- MoHFW
- National Institute of Communicable Diseases
- Role of LIC and HUDCO
- The National Water Policy, 1992

States and the National Water Policy

- Karnataka
- Madhya Pradesh
- Orissa
- Rajasthan
- Tamil Nadu

At the state level

- State Water & Sewerage Board (WSB) – generally statutory bodies set up under specific Acts of the state legislature, except Uttar Pradesh where the entity (Uttar Pradesh Jal Nigam) has been structured as a company
- City-level Water & Sewerage Boards – typically statutory bodies
- Public Health Engineering Department (PHED)
- Panchayati Raj Engineering Department (PRED)

The States...

- Development Authorities and other similar statutory bodies – typically, with jurisdiction over urban area, often along with Local Government entities
- Panchayati Raj/Rural Development Department – typically involved in the formulation of programs and release of funds to PRIs
- Urban Development Department – typically involved in formulation of programs and release of funds to ULBs
- Industrial Development Corporations – typically with jurisdiction over industrial estates
- Irrigation/Public Works Departments – handling rural WSS in some states

XI and XII schedule

- Drinking water, water and watershed management figure in the Eleventh Schedule as areas where PRI's are primarily responsible.
- For ULBs, the Twelfth Schedule includes water supply for domestic, industrial and commercial purposes as well as public health, sanitation, conservancy and solid waste management.
- Entry 11, Eleventh Schedule, Constitution of India
- Entry 3, Eleventh Schedule, Constitution of India
- Entry 5, Twelfth Schedule, Constitution of India
- Entry 6, Twelfth Schedule, Constitution of India

Laws

- Water Cess Act, 1977
- Water (Prevention and Control of Pollution) Act, 1974
- Environment Pollution Act, 1986
- Municipal Solid Waste (Management and Handling) rules, 2000

Delhi Municipal laws

State	Board	Outlay	Others
Delhi	Delhi Jal Board	The Ninth Five Year Plan approved outlay was Rs. 254000 lakhs	<p>The Board has an ambitious plan to provide round the clock water to the citizens.</p> <p>The project, called '24/7' in association with the World Bank. Focus on rooftop rainwater harvesting in residential compounds.</p>

Kerala Municipal laws

States	Authority	Others
Kerala	Water Supply Authority within each Municipality	There is an act specifying that the municipality <i>must</i> provide the water supply and the sanitation facilities. Throwing waste in the street, any premise or open is prohibited.

Karnataka Municipal laws

States	Authority	Others
Karnat aka	Municipal Council	<p>The council will have the powers to build and maintain the pipes and the sewers.</p> <p>Any person who has obtained a written permission from the council can empty his drain into the sewers of the council.</p> <p>Only a licensed plumber or water supply contractor can execute any of the above works.</p>

West Bengal Municipal laws

States	Authority	Others
West Bengal	Municipality	<p>No person is allowed to waste water during usage or due to lack of repair of the pipes, works or fittings etc.</p> <p>The chairman-in-council has the right to turn on or off the water supply to any premises under some given conditions.</p> <p>A person throwing solid waste in contravention of the provision of the law can be punished with a fine not less than Rs. 50 and not more than Rs. 5000.</p>

Uttar Pradesh Municipal laws

States	Authority	Others
Uttar Pradesh	Municipal Council	For a license to be given to a contractor of water-supply, the rate and mode of payment, and other terms and conditions can be negotiated between the council and the license holder.

NGO involvement

- Funding agencies
- Health sector NGOs
- Those working on gender issues
- On children and child health
- Total sanitation program

Private players

- Important stakeholders
- Many started as drilling contractors in the sixties
- Set up two for every one toilet by the government
- Public private partnerships

From assets to service

- Demand responsiveness lacking in policy and in law
- While policy has moved towards customer friendliness, institutional reform yet to happen

From assets to service

- Demand responsiveness lacking in policy and in law
- While policy has moved towards customer friendliness, institutional reform yet to happen

Capacity Building

Issues in WSS

- Providers
 - There is overwhelming emphasis on technical training and infrastructure creation (IWWA,2003; Sethuraman,1996)
 - There is insufficient Community participation and feedback
 - Require greater emphasis on service provision
- Local Governments
 - Lack of functional autonomy
 - Limited human resource capacity to take on additional responsibilities of higher levels of government/ providers
 - Increase autonomy and train expertise in specialized areas
- Higher Levels of Government
 - Follow the British based ‘Vertical’ model of governance
 - Dominated by regulation and rule based administration
 - Not much experience in a regulatory role
 - Require Policy reform to increase demand responsiveness and emphasis on service provision

WSS Staff

Three categories of staff include:

➤ **Engineering/ O & M/ technical staff:**

Geologists, Scientists, Para Medical Staff,
Engineers (Civil and Mechanical),
Hydrofracturing Staff, Pump Operators,
Wireman/Electricians, Fitters, Drivers,
Valvemen/Linemen

➤ **Administrative Staff**

➤ **Accounts/ Finance Staff**

Special Issues – rural/urban

- Rural Areas
 - The Panchayati Raj Institutions (PRIs) carry out the role of ULBs in the urban sector
 - Village Water and Sanitation Committees (VWSCs) play the role of facilitators and ‘change agents’
 - PRI issues
- Urban Areas
 - Not enough focus on the Urban Poor in the WSS schemes
 - Incorporate Slum and squatter settlements into scheme design and implementation
 - Capacity building required to add autonomy and skills to ULBs

Constraints of Panchayats

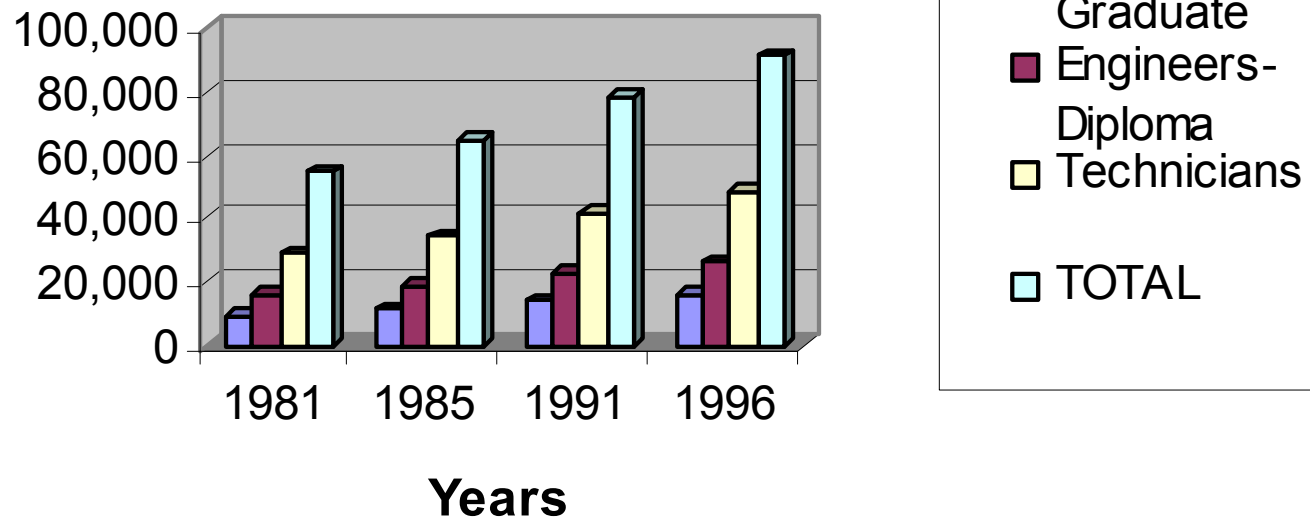
- **Lack of specialized skills to take on O & M and M &E responsibilities**
- **Gender sensitivity still low to WS and sanitation issues**
(Vikram Sarabhai Foundation; Aga Khan Foundation, 2003)
- **Low access to adequate Financial resources**
(Singh, HSMI , UNESCO-IHE, 2003)
- **Influenced by local constraints such as caste, gender and cultural practices**
- **Therefore..**
- **Require capacity building for the above**

Capacity of government providers

- Generally good levels of technical skills
- However not oriented towards services
- Infrastructure creation and maintenance focus
- Demand responsiveness lacking
- Supply orientation
- Target achievements
- Problem solving approach lacking
- Stakeholder feedback missing

Staffing

WSS Staff in Urban areas



Bottlenecks

- Low priority accorded – especially to sanitation services
- Inclination towards *one size fits all* models
- Reliance on subsidy
- Technology support inadequate
- Deficient infrastructure – absence of service
- Lack of feedback

Bottlenecks continued

- Under pricing leading to over use, poor service and reduced incentives
- Complex tariff structure
- Objective is to expand political capital not economic efficiency
- Waste management !!
- Attracting private investment!

Capacity in Private Sector

- Technical skills exist broadly across the country
- Also relatively more sensitive to consumer services
- However..
- Need to increase sensitivity to community needs
 - Eg: Ion Exchange India: trains women handpump mechanics; installs hand pump flourimeters through women's SHG's across India

Capacity building: The prototype

- Session I: Water as an economic asset, need and planning for water supply projects.
- Session II: Network planning for water supply (planning and design).
- Session III: Operation and maintenance and system management.
- Session IV: Sector reforms in water supply management.
- Session V: Leak detection in water supply system (site visit).
- Session VI: Tariffs and subsidies in water supply.
- Session VII: Integrated water use and conservation, rain water harvesting and revival of traditional technologies.
- Session VIII: Computer application in water supply management.
- Session IX: Public private partnership in water supply projects
- Session X: Commercially viable projects and planning.

Building capacity...

- Section XI: Community managed water supply services.
- Session XII: Mobilizing water user groups and capacity building.
- Session XIII: Promoting efficient water use (audio-visual).
- Session XIV: Framework for sustained and more equitable services.
- Session XV: Summing up.
- Target Group: Municipal engineers and concerned staff of water supply department in municipal bodies and water boards.
- Methodologies: Lectures, Case studies, Audio-visual aids, Site visits

Agencies involved

- Indian Water Works Association, HQ
Mumbai, 21 centres across India
- Administrative Staff college of India: ASCI,
Hyderabad
- Engineering Staff college of India (ESCI,
Hyderabad)
- HSMI

The Big Two

- **All India Institute of Local Self Government: AIILSG**
- **Council for the Advancement and Promotion of Rural technology (CAPART)** is funded by the Ministry of Rural Development. Its annual budget is Rs.800 million. CAPART employs 7 NGO's to carry out the training programmes.
- The NGO's are:
 1. People Science Institute, Dehradun
 2. Samaj Pragati Sahyog, Bagli, MP
 3. AFARM, Pune
 4. Hindi Swaraj Trust, Pune
 5. PDS, Edduki, Kerala
 6. Agragami, Bhuwaneshwar
 7. Development Supporting center, Ahmedabad

The National HR Program 1994

- Empowerment of PRI/ LBs to take up O&M activities relating to RWSS and to train at least one beneficiary especially women in each village through district level trainers.
- Improve the productivity of the sector professional through specialized courses.
- To introduce rural orientation in technical education sector coupled with publication of manuals on rural water supply and rural sanitation.
- Capacity building of local communities by giving requisite training to operate & maintain hand pumps and other water supply systems as well as to generate demand for sanitation facilities.

Reforms in the 10th Plan

- Adoption of a demand driven approach based on empowerment of villagers to ensure their full participation
- Focus of village level capacity building (Village water and sanitation committees)
- Ensure an integrated service delivery mechanism by streamlining the functions of the agencies involved in project implementation, and
- At least 10% capital cost sharing and 100% sharing of O&M cost by users. The rate of capital cost shared should increase proportionately with increasing service demand.
- Taking up of conservation measures for sustained supply of water through rainwater harvesting and ground water recharge .

Other stakeholders in capacity building

- Non Government organizations
- *Sulabh Sanitation programme, Vikram Sarabhai Foundation initiatives in sanitation*
- International institutions: AKRSP, DFID, WSP, DANIDA
- Private enterprises: Ion exchange..

Paradigm shift

- Training to be inclusive
- Needs identification through involvement of stakeholders – especially the Panchayats
- One size does not fit all
- Mindset change – service, consumers, flexibility across each level.

Health and the Impact of WSS

Rural and Urban India

“Water contributes much to health”
- Hippocrates, (460-354 B.C.)

Importance of Water and Sanitation for Health

Water impacts health in two ways:

- * Consumption

- For Eating, drinking, cooking

- * Hygiene/ basic health requirements

- Impacted by Quality of WSS Services
- And also good practices

Characteristics of WSS that enable desirable health outcomes

1. Good quality water
 - Quality, adequacy & timeliness
2. Good Quality Sanitation
 - Clean and working toilets
3. Distance and accessibility
 - Allow good practices to be sustained
4. Low 'load' on source
 - Low waiting time and accessibility

Impact of Good Quality Water

❖ Chemical Quality

- Arsenic: 17 mn. affected in West Bengal alone (WHO, 2003)

Sources state that more states are affected:

- **Bihar, Jharkhand, Assam** (UNICEF-Jadavpur University,02-04)
- **UP, Chhatisgarh** (CSE, 2004)
- Flouride: 66 million affected across India (WHO,2003)
 - Other documented chemical contaminants include: Chromium, chloride, Iron, Manganese and Sulphide(GOI, MoWR, 2003)

❖ Biological Quality

- Total morbidity due to WBD: 10 million (GOI,2003)
- Major WB Diseases: Over 1.5mn children die every year owing to diarrhea and WB diseases (WHO, 2003)

Chemical contamination of water across India..

Pollutant	Location of Occurrences (States)
Arsenic	West Bengal
Chloride	Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and West Bengal
Chromium	Punjab
Fluoride	Kerala, Andhra Pradesh, Gujarat, Haryana, Orissa, Punjab, Rajasthan, Tamil Nadu and U.P.
Iron	U.P., Assam, Orissa, Bihar, Rajasthan, Tripura and West Bengal
Manganese	Orissa and U.P.
Sulphide	Orissa
Zinc	Andhra Pradesh, Delhi and Rajasthan
Source: GOI, MOWR, 2002	

Impact of Improved WS & Sanitation

- **15-35% reduction of WB diseases – e.g. for diarrhea**
 - **With improved sanitation**
 - **Improvement in water quantity**
 - **Improvement in water quality**
- **Access to WS-Sanitation is primary barrier**
- **Hygiene is secondary barrier**
- **Millions of man-days - equivalent to a few billion rupees- are lost every year in India, because of poor sanitation-related diseases. (WHO, 2003)**

(Source: Esrey et al. WHO bulletin, 2003. Study conducted on South Asia)

Impact of Distance and Accessibility

❖ Gender Impact

- Women bear the brunt of distance and lack of accessibility to WSS
 - Sexual harassment, diseases due to infrequent defecation
 - Increase in drop out rates of girls and early marriage

Source: AKF, 2003; VSF- UN Habitat: 2003

❖ Health impact

- Back problems and schistosomiasis (WHO, 2001)
- Problems for pregnant women, aged and disabled

Source: VSF, 2003

Impact of 'load' on source

- Community conflicts reported by non- government agencies: Gujarat, MP, Maharashtra (AKF,2003)
- Saving of time leading to greater time for rearing of children and other tasks
- Reduction in schistosomiasis with improved hand pump access

Institutions and Mechanisms

- **Government emphasis on health:**
 - Swajaldhara
 - Total Sanitation Campaign
- **Non-government partners and agencies**
 - E.g. SPARC (Pune)
 - Sulabh Sanitation Campaign
- **International Agencies**
 - WSP, UNICEF, WHO, Aga Khan Foundation, DFID, DANIDA, SIDA, CIDA, DGCS, USAID, Oxfam and others