BLUE & GREEN
agenda for water efficiency for greener buildings

Sakshi C. Dasgupta
Sustainable Building Programme, CSE
Spotlight: Cities
policies, investment and public attention

Urban explosion
-- By 2025 around 65 per cent of the world’s population is projected to live in cities – equal to the global population in 1986. -- A billion more will be added over the next three decades in Asia – almost adding a whole new India. More than half of them will be living in cities.

India’s urbanisation is still modest at 30 per cent and is expected to be 40 per cent by 2030. But this is more than the population of the United States.

India’s urban mosaic

Skewed growth: 70% of urban population are in about 400 cities. The rest in about 4000 towns and cities. About one third of the total urban population in the megacities.

Shadow growth: Top rung cities show strong trend towards suburbanisation.

Slow growth at the bottom: Lower rung towns stagnating. Some have grown due to infrastructure investments and rural to urban migration.

The urban population of Rajasthan in the last 10 years has increased by 29.26 percent.
Buildings: Earthscrapers

**SHARE OF BUILT ENVIRONMENT IN RESOURCE USE**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Use</td>
<td>40</td>
</tr>
<tr>
<td>Raw Material Use</td>
<td>30</td>
</tr>
<tr>
<td>Water Use</td>
<td>20</td>
</tr>
<tr>
<td>Land</td>
<td>20</td>
</tr>
</tbody>
</table>

**SHARE OF BUILT ENVIRONMENT IN POLLUTION EMISSION**

<table>
<thead>
<tr>
<th>Emission Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 Emission</td>
<td>40</td>
</tr>
<tr>
<td>Solid Waste Generation</td>
<td>30</td>
</tr>
<tr>
<td>Water Effluents</td>
<td>20</td>
</tr>
</tbody>
</table>

Jaipur: Urban growth 1975 to 2009: The compact city design under pressure

- Built up land increased from 46.39 sq km in to 197.96 sq km whereas the maximum expansion is observed in low density built up land.
- Residential area has higher rate of expansion after 1975
- the major expansion is observed in the western, southern and south-eastern parts and along the national highways 8, 11 and 12.

City’s built-up area has increased with the rate of 4.46 sq km per year or 1.02 percent per year.

The crop area has shrunk by 1.60 sq km per year, fallow land 2.94 sq km per year, and wasteland 0.59 sq km per year in last 34 years

Recent report published by the UN-HABITAT on the "State of The World's Cities 2012-13; Jaipur
- expected population of 4.2 million by 2025,
- will rank 10th in the list, jumping 4 spots from 1990
- the average population increase of Jaipur UA from 1990-95 to 2020-25 will be 26.3%
- seven new townships over 20,000 Ha along the proposed Delhi-Jaipur Expressway, hyper real estate growth along the 265-km road.

Sprawling Jaipur

1975

2008

Source: http://sapiens.revues.org/932
City: The focal point of climate mitigation and energy security discussions

Cities: the central focus of discussion in the Rio+20 conference ....

Energy Outlook 2009 tracks cities for the first time

- Already 2/3rd of world’s energy is consumed in cities – by half of world’s population.
- By 2030 cities will be consuming 73% of world energy.
- Globally cities account for 70% of CO2 emissions.
- Big increase in global CO2 from increase in floor space in buildings of various types, -- especially in non-OECD countries.
- Massive increase expected in ownership of household appliance

Cities collectively consume 75% of world natural resources, generates 50% of waste, and emits 70% of greenhouse gases.
Water for Growth

• Though energy issues are dominating the city and green buildings debate

• But water is emerging as a major limiting factor for real estate growth

• Reduce water imprints of urban consumption – buildings represent the microcosm of urban demand
Trends in building spaces – how big is the problem?

We don’t know enough............. Real estate sector lacks transparency

Very poor data base on trends in building spaces in India:
Ministry of housing and poverty alleviation tracks demand for housing but not other built up areas. Planning commission and others on trends in the construction sector. But buildings are a very small component of the construction industry.....

Real estate service providers, investment banks, and research foundations are the principal source of information......But very opaque and not verifiable......

A few cities – Hyderabad, Bangalore, Chennai, Delhi, Mumbai have a little better data due to new growth etc.

Disparate estimates make a curious jigsaw ..... But indicative of an explosive trend: Eg.

Constructed area in 2005: close to 25 billion square feet.
Expected to be 5 times and reach to approximately 104 billion square feet by 2030. A CAGR between 5 to 10 percent to be achieved ..... Hospitality and Retail to achieve higher CAGRs -- 8– 10%. By 2030, -- 7 to 11 times of the level in 2005.
Maximum growth in residential and commercial sector -- four to five times of 2005 figures. (EDF)
India’s challenge: The ECO-III forecasts - 70% of building stock that will be there in 2030 is yet to come up in the country.

Developed countries, a very small addition is made to the building stock each year. In the UK, at least 80% of the homes to stand in 2050 have already been built. In France buildings constructed before 1975 thermal regulations will represent over 50% of the building stock in 2050.
Lifestyle pressure

Middle class growing rapidly:

The 2010 McKinsey study on urban infrastructure estimates that the seeker class (with household income of 200,000 – 500,000 per annum) will be the most dominating income class and is expected to be half of all urban households by 2025.

Cities will see more concentrated buying power, transformation of lifestyle and aspiration for high end resource intensive comfort level.

The seeker class will demand

- Luxury services
- Uninterrupted supplies
- Services at par with western world
Townships: Made to order

A report by McKinsey states that there is a need to build around 20-25 new townships closer to 20 metros and cities across the country.

IDFC’s India Infrastructure report 2009 states -- the size of private ‘integrated’ townships ranges from 100 to over 1000 acres

Around 32 townships coming up around the major metros with an aerial coverage between 30000-40000 acres alone. This is increasing.

On Delhi Mumbai Industrial Corridor (DMIC), 6 townships are on the cards.

Reliable government estimates on actual number of townships and their actual aerial coverage are still scarce.

Touted as Walk to Work Green Towns – without green benchmark
Glitzy towns in dark shadows…..

Gurgaon: Slum of the rich

Privatised new towns……

Town of affluent but infrastructure of poor
-- 70% of water needs from ground water;
Groundwater table falling at a rate of 1 to 1.2 meters annually; dropped by 16 meters in last 20 years
-- Only 40% of the DLF area connected by sewer line
-- Only 70-75% of solid waste transported; No landfill site
-- Poor public transport connectivity
-- Due to acute power shortage heavy dependence on generator-sets
-- Violation of development rules related to open spaces and community services
real estate keeps growing unabated

The desert state’s cities are not far behind

Examples from Jaipur
Promise the world, but is it feasible or sustainable?
Water is a major limiting factor

- Punjab Haryana High Court imposed a moratorium on further construction if the builder was using groundwater
- Greater Noida too, CGWB permission is now a major requirement for getting building clearances
- Prices and property market is responding to water availability and quality
- Buyers are becoming wary of projects/areas with water concerns
Green Regulations and Good Practices comes to the rescue

- Rainwater harvesting bye laws
- Wastewater treatment is emerging as a mandatory requirement in several clearances
- Dual plumbing is been prescribed
- Increased impetus to reuse of treated wastewater in horticulture etc.
But, Safeguards are Extremely Crucial
accountability is the key

- Benchmarking - how much is been consumed and generated
- Monitoring – against the set benchmarks set
- Appropriate Practice - doing it the correct way
- Regular Operation and Maintenance - sustaining the systems
Safeguards Extremely Crucial
accountability is the key

NO BENCHMARK

CSE reviewed Minutes of the Meetings Haryana’s SEAC, 2008-2009

• 2% of the total residential projects had actually stated 135 lpcd (CPHEEO)
• 22% projects had per capita water consumption >150 lpcd
• Variation 48-226 lpcd
• 47% have lpcd 50-100
• Either these buildings are highly water efficient or these are unsubstantiated estimates

ECs IN WATER STRESSED AREAS
• Haryana SEAC held in March 2009 have granted EC to 3 projects from DLF despite recognizing water scarcity in the area
• Project falls in the 24 villages notified by the CGWA
• CGWA bans exploitation of groundwater in such areas HUDA will not be able to supply water to this project in 3 years
Safeguards Extremely Crucial
accountability is the key

Proposed Residential colony ‘estate one’ Ludhiana Punjab - Contradictions.
- Form 1 states the total domestic water requirement as 902 KLD
- **Project water requirement has three different values in 2 different forms**

Bestech India’s proposed IT-Complex, Parkview Business Tower, Gurgaon.
- Water requirement stated 1048 KLD
- Wastewater generated 330 KLD (only 30% will be wastewater generated)
- STP capacity 400 KLD
- **Thumb rule of 80% - WW should be around 838 KLD, STP very low capacity**
Low Hanging Fruits

water efficiency is attainable
**Water Use…. prescribed by CPHEEO**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Use</th>
<th>Consumption in litres/day/person*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drinking</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cooking</td>
<td>5 Litres</td>
</tr>
<tr>
<td>3</td>
<td>Bathing (incl. ablution)</td>
<td>55 Litres</td>
</tr>
<tr>
<td>4</td>
<td>Washing clothes</td>
<td>20 Litres</td>
</tr>
<tr>
<td>5</td>
<td>Washing of utensils</td>
<td>10 Litres</td>
</tr>
<tr>
<td>6</td>
<td>Cleaning of houses</td>
<td>10 Litres</td>
</tr>
<tr>
<td>7</td>
<td>Flushing of latrines</td>
<td>30 Litres</td>
</tr>
<tr>
<td></td>
<td><strong>Total for urban areas</strong></td>
<td><strong>135 litres/person/day</strong></td>
</tr>
<tr>
<td>8</td>
<td>Extra for large/metro cities for more institutional needs</td>
<td>15 Litres</td>
</tr>
<tr>
<td></td>
<td><strong>Total for Metro cities</strong></td>
<td><strong>150 litres/person/day</strong></td>
</tr>
</tbody>
</table>
The truth is…

• Little information about actual use
• But, households are beginning to use more
• Lifestyle is changing and becoming more aspirational
• We are inching closer to our counterparts in USA-261 lpcd, Aust- 320 lpcd
• In UK the average HH uses 55% more water than they did in 1980’s
## Water Use....actual in America
(American Water Works Association)

<table>
<thead>
<tr>
<th>Purpose</th>
<th>LPCD</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Showers</td>
<td>43.8</td>
<td>16.8</td>
</tr>
<tr>
<td>Clothes Washers</td>
<td>56.7</td>
<td>21.7</td>
</tr>
<tr>
<td>Other Domestic Uses</td>
<td>3.8</td>
<td>1.4</td>
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</tbody>
</table>

## Water Use....Emerging Trend in India

<table>
<thead>
<tr>
<th>Purpose</th>
<th>LPCD</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilets</td>
<td>69.9</td>
<td>26.7</td>
</tr>
<tr>
<td>Baths</td>
<td>4.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Leaks</td>
<td>35.9</td>
<td>13.7</td>
</tr>
<tr>
<td>Faucets</td>
<td>41.2</td>
<td>15.7</td>
</tr>
<tr>
<td>Other Domestic Uses</td>
<td>6.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Total</td>
<td>261.8</td>
<td>100</td>
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<table>
<thead>
<tr>
<th>Purpose</th>
<th>LPCD</th>
<th>%age</th>
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<tbody>
<tr>
<td>Showers</td>
<td>80</td>
<td>43</td>
</tr>
<tr>
<td>Kitchen taps</td>
<td>42.4</td>
<td>23</td>
</tr>
<tr>
<td>Laundry</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>Toilets</td>
<td>27</td>
<td>15</td>
</tr>
<tr>
<td>Leaking fitting</td>
<td>6.48</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>184</td>
<td>100</td>
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</table>
Greener pastures beckons

Moving away from bucket bath
Water Efficient Fixtures

<table>
<thead>
<tr>
<th>Fixture</th>
<th>Water use in standard fixtures</th>
<th>Water-efficient fixture</th>
<th>Water saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilets</td>
<td>Single flush toilet uses 10-13 litres/flush</td>
<td>Dual flush toilet in 3/6 and 2/4 litre models</td>
<td>4-11 litres/ flush</td>
</tr>
<tr>
<td>Urinals</td>
<td>4 liters; 10-13 litres if toilet pan is used</td>
<td>Sensor operated adjustable flush</td>
<td>2.2 – 10 litres per flush</td>
</tr>
<tr>
<td>Taps</td>
<td>10-18 litres/minute depending on pressure</td>
<td>Sensor taps</td>
<td>5.5- 15.5 litres/ minute</td>
</tr>
<tr>
<td>Showers</td>
<td>10-25 litres/minute</td>
<td>Flow restrictors</td>
<td>4-20 litres/minute</td>
</tr>
</tbody>
</table>

Source: Parryware Roca and others

- Of the 135 lpcd water consumption nearly 30% is for flushing and 40% for bathing & washing
- Significant 35 % water savings (AWWA) through water efficient fixtures
Water Guzzling Mindset on the rise

**New Delhi:** Per capita availability of water is **209 litres/capita/day**.

**Copenhagen:** Per capita water consumption in 1990 was **190 litres/capita/day**. But their target was to bring it down to **111 litres/capita/day in 2002**.

**Delhi** will increase per capita availability to **360 litres/capita/day by 2005**.

A grand idea. A mindless idea.

Transportation costs are high. Distribution costs high. Cannot be recovered. Subsidy to some. Water inequity .... We looked at buildings once again...........
A Glance at the Status

- No standards on Water Efficiency in BIS
- Voluntary standards on manufacturing process, leakage, material etc.
- National Building Code makes no reference to water efficiency
- Manufacturers claim to have their own tests
- No independent validation of water use and performance efficacy
- No incentives for manufacturers to develop and promote water efficient technologies except for green building rating system
- Almost 45-50% sanitaryware market is informal
- A large segment of the big and small cities and rural areas catered by the informal manufacturers
- Low consumer awareness on water use
Plateful of Technologies

Toilets

- **Dual flush**- 6/3 & 4/2 litres/ flush - An old style toilet uses 10-13 litres per flush. The dual-flush toilets use 6 liters on full and 3 liters on a half-flush', 4/2 litres models also available

- **Interruptible Flush Cistern**- The flushing action can be interrupted at will by pressing the button.

- **Ecosan**- Not very common for commercial buildings- urine-separating toilets separate the waste at the source
Urinals

Low water use urinals - Water is applied automatically through a continual drip-feeding system or by automated flushing at a set frequency.

- Average urinal - 4 litres
- Water-efficient urinals 2.8 litres
- Smart Flush urinal 0.8 litres per flush

Sensor operated - urinals detect the presence of people through movement sensors or door switches

Waterless urinals - there are various technologies available for waterless urinals like oil barrier, collapsible silicon seal and biological blocks
Faucets

- **Aerators**: Taps now available with aerators to save water and reduce splashes. Aerator spreads the water flow into many small droplets, it compensates pressure and provides the same flow regardless of pressure.

- **Flow Fixtures**: controls, deliver a precise volume of water in faucets, showerheads etc. (5.6 – 8.3 liters per minute), irrespective of varying line pressure.

- **Sensor taps**: are automatic shut-off taps, such as push-button or lever operated.
  - Sensor taps shut off automatically after a set time to reduce the potential for taps to be left running too long or not turned off
  - (e.g. a 6-star WELS-rated tap has a running time set between 5 to 10 seconds at a flow rate of 4 litres per minute).
• **Showers**
  – Water efficient showerheads
  – Flow regulators – 6, 8 to 10 litres/minute
  – Showers can also be fitted with digital read-out meters that show the user the amount of water being consumed and the duration of the shower

• **Washing Machines**
  – Water efficient- Front load
Star Labelled Appliances

- Frost Free Refrigerator
- TFL
- AC
- Direct Cool Refrigerator
- Distribution Transformer
- General Purpose Industrial Motors
- Monoset Pumps
- Openwell Pump Sets
- Submersible Pump Sets
- Ceiling Fans
- Domestic Gas Stoves
- Stationary Storage Type Water Heaters
- Color Televisions
International Benchmarks

- Australia’s **Water Efficiency Labelling and Standards (WELS)** made *mandatory* by the Water Efficiency Labelling and Standards Act 2005- Australia’s Department of the Environment, Water, Heritage and the Arts.

International Benchmarks

• Water Efficient Product Labelling Scheme in United Kingdom, operated by The Bathroom Manufacturers Association of UK, recognized by UK government

• Water Efficiency Labelling Scheme (WELS), 2006, implemented by the Public Utilities Board (PUB)
Several countries already have a Rating System....some have it Mandatory

<table>
<thead>
<tr>
<th>Water Efficient Initiatives - Europe</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply (water fittings) Regulations : WC Suite Performance</td>
<td>Mandatory</td>
</tr>
<tr>
<td>Specifications (UK); 1999</td>
<td></td>
</tr>
<tr>
<td>BMA Water Efficiency Labeling Scheme (UK); 2007</td>
<td>Voluntary</td>
</tr>
<tr>
<td>Waterwise Marque (UK); 2006</td>
<td>Voluntary</td>
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<tr>
<td>Enhanced Capital Allowance Scheme (UK); 2003</td>
<td>Tax rebate</td>
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<tr>
<td>Ordenanza de Gestion y Uso Eficiente del Agua en la Ciudad de Madrid</td>
<td>Mandatory</td>
</tr>
<tr>
<td>(Spain); 2006; Local coverage in Madrid</td>
<td>regulations</td>
</tr>
<tr>
<td>Decreto 202/1998 (Spain); 1998; Local coverage in Catalonia</td>
<td>Mandatory</td>
</tr>
<tr>
<td>Distintivo de Granjia de Calidad Ambiental Catalan (Spain); 1994; Local</td>
<td>Voluntary</td>
</tr>
<tr>
<td>coverage in Catalonia</td>
<td></td>
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<tr>
<td>Ambientale al Regolamento dell Citta di Avigliana – Allegato Energetico</td>
<td>Voluntary</td>
</tr>
<tr>
<td>(Italy); 2007; Local coverage in Avigliana</td>
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<td>Variante all’ Art.B delle Norme Tecniche di Attuazione del P.R.G.</td>
<td>Regulation</td>
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<tr>
<td>(Italy); 1997; Local coverage in Urbino</td>
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<td>Regolamento Energetico Ambientale (Italy); 2008</td>
<td>Regulation</td>
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<tr>
<td>Local coverage in Sassari</td>
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<tr>
<td>Regulamento gerls dos sistemas publicos e predias de distribuicao</td>
<td>Regulation</td>
</tr>
<tr>
<td>de aguas de drenagem de aguas residuals (Portugal); 1998</td>
<td></td>
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<tr>
<td>Certificacao de Efficiencnia Hidrica de Produtos (Portugal); 2008</td>
<td>Voluntary (E to A+++ rating system)</td>
</tr>
<tr>
<td>Building Regulations (Ireland); 2008</td>
<td>Mandatory</td>
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<tr>
<td>The Blue Angel (Germany); 1978</td>
<td>Voluntary</td>
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<tr>
<td>The Nordic Eco-label (Nordic countries); 1989</td>
<td>Voluntary</td>
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<tr>
<td>The European Eco-label (Europe); 1993</td>
<td>Voluntary</td>
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### Water Efficient Initiatives - Australia & USA

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>WELS (Australia); 2005</td>
<td>Mandatory 5 star rating system</td>
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<tr>
<td>Smart Approved WaterMark (Australia); 2004</td>
<td>Voluntary Label</td>
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<tr>
<td>The Car Wash Water Saver Rating Scheme (Australia); 2004</td>
<td>Voluntary Label (Rating System)</td>
</tr>
<tr>
<td>New Zealand WELS (New Zealand); 2009</td>
<td>Mandatory 5 star rating system</td>
</tr>
<tr>
<td>WaterSense (USA); 2006</td>
<td>Certification Mark</td>
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<tr>
<td>Energy Star (USA); 1992</td>
<td>Certification Mark, Voluntary Label</td>
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</table>

### Water Efficient Initiative - East Asia

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<th>Initiative</th>
<th>Type</th>
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<tbody>
<tr>
<td>WELS (Singapore); 2006</td>
<td>Mandatory / Voluntary Label (5-star rating system)</td>
</tr>
<tr>
<td>Singapore Green Labeling Scheme (Singapore); 1992</td>
<td>Voluntary (Accredited Tested products)</td>
</tr>
<tr>
<td>WELS (Hong Kong); 2009</td>
<td>Voluntary Label</td>
</tr>
<tr>
<td>Korea Green Label (Korea); 1992</td>
<td>Voluntary Label</td>
</tr>
<tr>
<td>Japan Eco Mark (Japan); 1989</td>
<td>Voluntary Label</td>
</tr>
<tr>
<td>Thailand Green Label (Thailand); 1994</td>
<td>Voluntary</td>
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</table>
CSE’s Initiatives

Rating System for Water Efficient Fixtures
A Way to Sustainable Water Management in India

Roadmap for Rating System for Water Efficient Fixtures
A Way to Sustainable Water Management in India
Draft Rating System for Water Efficient Fixtures

### Water Closets
- European water closet with cistern or flush valve using not more than 6 litres per flush.★★
- European water closet with dual flush cistern or flush valve using 6 litres for full flush and 3 litres for half flush.★★★
- High-efficiency European water closet using 5 litres single flush.★★★
- High-efficiency European water closet using less than 5 litres per flush.★★★★
- Combination or Asian / Indian pan using 6 litres per flush; cistern or flush valve.★★
- Combination or Asian / Indian pan using 6 litres per full flush and 3 litres for half flush; cistern or flush valve.★★★

### Urinals
- Urinal with flushing device using 4 litres per flush.★★
- Urinal with flushing device using 3 litres per flush.★★★
- Urinal with flushing device using 2 litres per flush.★★★★

### Shower Heads / Hand-held Showers
- Shower head with flow-rates of 9.5 lpm.★★
- Shower head with flow-rates of 7.5 lpm.★★★
- Shower head with flow-rates less than 7.5 lpm.★★★★

### Faucets

#### Faucets (Private use)
- Non-metered faucets or faucets with aerators with flow-rates of 8 lpm.★★
- Non-metered faucets or faucets with aerators with flow-rates of 5.7 lpm.★★★★
- Non-metered faucets or faucets with aerators with flow-rates less than 5.7 lpm.★★★★★

#### Faucets (Public use)
- Metered faucets with or without aerators with flow-rates of 1 litre per cycle or non-metered faucets with flow-rate of 2 lpm.★★
- Metered faucets with electronic actuator with flow-rates of 1 litre per cycle.★★★★

#### Kitchen Sink Faucets
- Kitchen sink faucets or faucets with aerators with flow-rates of 8 lpm.★★
- Kitchen sink faucets or faucets with aerators with flow-rates of less than 8 lpm.★★★★

#### Handheld Bidet Spray (Ablution faucet with hose and trigger)
- Handheld bidet spray with flow-rates of 8 lpm.★★
- Handheld bidet spray with flow-rates of less than 8 lpm.★★★★

### Dishwashers
- Dish washer with a Water Factor (the quantity of water used in liters per full machine wash and rinse cycle) of 22 litres:★★
- Dish washer with a Water Factor (the quantity of water used in liters per full machine wash and rinse cycle) less than 22 litres:★★★★

### Clothes Washer
- Clothes washer with a Water Factor (the quantity of water in litres used to wash each cubic meter volume of machine drum capacity) of 5 litres for private use and 8 litres for public use:★★
- Clothes washer with a Water Factor (the quantity of water in litres used to wash each cubic meter volume of machine drum capacity) of less than 5 litres for private and less than 8 litres for public use:★★★★
Other Common Sense Interventions
Water efficient landscapes

- USA, UK etc. have water restrictions
  - Notices to consumers using hosepipes for watering gardens, washing cars, driveways, filling ornamentals ponds, filing swimming pools
  - Regulated irrigation schedules based on water needs
  - Assigned irrigation days, water wastage fees
  - Scheduling irrigation during early and late hours
  - Region/climate/ soil specific plants
  - Unpaved areas to increase recharge and reduce runoff

Not to irrigate when it rains
Water Guzzler Grass… avoid

six to eight litres a square metre per day in winter and somewhere between 12 and 16 litres per square metre in summer.

Read more: http://www.thenational.ae/lifestyle/house-home/make-your-lawn-thrive-even-in-the-summer-heat#ixzz2K1krS3cw
Capacity Building of Water System Managers

• With increase in gated communities and growing role of RWAs in managing them, need to address some concerns
• The RWH and WWTS are often installed by builders but have to be managed by the RWAs
• Some instances where these systems are not been managed properly leading to serious concerns or have gone into disrepair
• Ensuring awareness and capacity building is mandated for RWAs to handle these systems
• It is a great opportunity for decentralizing water systems
Thank you for your attention!