Optimising Local Water Resources and Availability in Urban and Peri-urban Chennai

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In most of the urban context we encounter five basic challenges:

- Ever increasing demographic pressure
- Continuous rural – urban migration
- Swift industrial growth
- Vast urban expansion – both push and pull effect
- Rapid ecological and environmental degradation

All these need to be viewed in the context of looming climate risks and associated vulnerabilities
Consequences or emerging problems are,

- Scarcity of land for urban use
- Drinking water scarcity - Inadequate, inequitable, unsafe and irregular supply
- Lack access to sanitation
- Huge flooding, water stagnation and lack of adequate storm water drains
- Degradation of coastal ecology and seawater intrusion
- Lack of land for housing
- Mushroooming of slums - Unsanitary living conditions in slums, open drainage systems and lack of access to toilets
- Unhealthy solid waste management – including sewage and bio-medical wastes
- Transport / traffic congestion and declining per capita road space

Resulting in Pollution of air, water and land and overall secular decline in quality of life in both urban and peri-urban areas, restricted livelihood options and rising health concerns
In most of the situations, with a view to reducing stress, cities eat into resources available in peri-urban areas by way of

- Transporting groundwater
- Encroaching upon lands
- Encroaching upon and polluting surface water bodies such as tanks and common lands
- Disturbing and occupying the upstream drainage system
- Dumping solid waste, urban sewage, bio-medical, electronic and industrial wastes

Resulting in severe environmental, ecological and health implications

This builds up enormous pressure and often results in conflicting interests between urban and peri-urban areas
SOME IMPORTANT ISSUES WHICH WE CANNOT AFFORD TO IGNORE

Since the urbanization is an inevitable process, should we let the peri-urban population / areas to suffer? Or

Is there a way in which the spread of urbanization could be made inclusive?

To what extent the conventional notion that cities are engines of growth?

I will essentially restrict myself to the case study of Chennai and its peri-urban areas based upon my continued research in over 50 villages during the years 2007-2013
### CHENNAI- WATER SOURCES AVAILABILITY

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Name of Source</th>
<th>Safe Yield in MLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Poondi – Cholavaram – Red Hills lake system (including diversion of flood flow from Araniyar to Korataliyar)</td>
<td>227</td>
</tr>
<tr>
<td>2.</td>
<td>Ground water from Northern well fields</td>
<td>68</td>
</tr>
<tr>
<td>3.</td>
<td>Southern Coastal Aquifer</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>Local sources in AUA &amp; DUA</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td><strong>Sub Total (A)</strong></td>
<td><strong>332</strong></td>
</tr>
<tr>
<td>5</td>
<td>Krishna Water I Stage</td>
<td>400</td>
</tr>
<tr>
<td>6</td>
<td>Krishna Water II Stage</td>
<td>530</td>
</tr>
<tr>
<td>7</td>
<td>New Veeranam (CWSAP – I)</td>
<td>180</td>
</tr>
<tr>
<td>8</td>
<td>CWSAP – II (Proposed)</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>Sea Water Desalination</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td><strong>Sub Total (B)</strong></td>
<td><strong>1230</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total (A) + (B)</strong></td>
<td><strong>1562</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Projected Demand (2021)</strong></td>
<td><strong>1763</strong></td>
</tr>
</tbody>
</table>

**Source:** CMWSSB
## Chennai - Water Demand

<table>
<thead>
<tr>
<th>Area</th>
<th>Water Demand (MLD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
</tr>
<tr>
<td>Chennai City</td>
<td>861*</td>
</tr>
<tr>
<td>Industries</td>
<td>100</td>
</tr>
<tr>
<td>Adjacent Urbanised Areas (AUA)</td>
<td>249</td>
</tr>
<tr>
<td>Distant Urbanised Areas (DUA)</td>
<td>113</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1326</strong></td>
</tr>
</tbody>
</table>

*Water requirement was worked out @ 140 lpcd for a population of 6.15 Millions*

Source: CMWSSB
Water supplied to Chennai City

Quantity of water supplied to City

Year


Quantity in mld

0 100 200 300 400 500 600 700

City Supply in mld

Source: CMWSSB
Supply and Demand of water in Chennai

- **Demand in MLD**: 219, 259.5, 370.5, 492, 604.5, 748.5, 760.5, 771, 777, 792, 798, 805.5, 807
- **Supply in MLD**: 71.21, 150.2, 302.23, 217.66, 230.97, 155.14, 292.23, 140.4, 166.5, 333.3, 570, 579.15, 586.55
CHENNAI WATER

Per capita water supply to the Chennai city’s population is still the lowest (76 lpcd) compared all big cities in India; that too not assured at all months for all sections of population.

Gap between and supply and demand is increasing.

How the gap is met in Chennai?

Piped water supply accounts for about less than a fifth of the demand in Chennai.

Informal and unregulated water market which brings water from peri-uran areas into Chennai.

Own wells at one’s own source (about 60% of total needs of a household) - There are 4, 20,000 wells with a density of 2400 wells per sq.km as on 2005. (State Ground and Surface Water Resources Data Centre, WRO, PWD, GOTN, Taramani, Chennai:113, March 2005).

Bottled water – there are over 500 water companies around Chennai.
CHENNAI PERI-URBAN AREAS

Groundwater table has dropped to a significant low and in many parts, groundwater is completely dried or reached a dead-end with hard-rocks.

Many farmers have become heavily indebted due to heavy investment on wells.

The existing surface water bodies are neglected or encroached or polluted (used as a dumping yard for urban wastes).

All these have adversely affected overall health, agricultural activities resulting in shrunk in agricultural income. Employment opportunities have also reduced quite considerably. In turn, unemployment has emerged as a serious problem in these villages.

Landless agricultural labourers and marginal farmers started migrating to other villages and towns for want of employment; many have become foot-loose population migrating to cities and towns, creating pressure on the already stressed urban infrastructure.

Whatever non-farm job opportunities that have emerged in the peri-urban villages are only incidental and unplanned.
Water being pumped from a huge pump (collection point) for distribution in the city.
Collection point and pumping station of the Metro Water Board
Located in a peri-urban village
Trucks standing in a row awaiting their turn to pump water from an agricultural well – Village: S.Kupam
Water being pumped from agricultural wells
Village: Sennerkuppam
Some pertinent questions are

Since the urbanization is an inevitable process, should we let the peri-urban population / areas to suffer? Or

Is there a way in which the spread of urbanization could be used for the best use and advantage of both the populations?
Climate Risk Alert

Damages due to major climate induced disasters in megacities, in particular in South Asia could run to several billion dollars mainly because of reasons such as

• High density of population of up to 30,000 per sq km
• High urban poverty, High concentration of slums with dreadfully poor drinking water, sanitation, health care facilities
• Clearly the threat of climate induced disasters, in mega cities will complicate all poverty alleviation and welfare measures of governments;
• Will have very serious health implications on urban poor due to lack of access to safe drinking water sanitation
What does all these convey?

A bad urban planning coupled with poor governance can be disastrous to ecology and environment, which eventually put enormous pressure on the present as well as future generations.

A mere promulgation of laws will guarantee nothing if policy implementation and monitoring mechanisms are weak.
Policy options

• There is an urgent need to look into the peri-urban issue from the angle of single ecosystem and as a part of an integrated socio-economic developmental process of an economy.

• A fragmented approach would only bring about rural-urban and peri-urban – urban divide, more intense conflicts, besides contributing to destruction of ecology, environment and livelihood options in the rural and peri-urban areas.

• Surface and groundwater bodies and land use should be an essential and integral part of the urban planning.

• The solutions to water crisis are quite closely associated with integrated view of water governance and sustainable development.

• In the particular context of climate change threat, there is an urgent need to view floods and droughts in an integrated manner – taking care of flood would mean taking care of drought and the vice-versa.

• Water management should mean not only freshwater management but also “used water management” - It is high time for the Indian hydro-crazy to imprint this concept in their vocabulary.

• This calls for long-term perspective, commitment, participatory planning and governance and a broad based partnership for SHARED LEARNING EXERCISES from grass-roots onwards and a sustained dialogue among all key stakeholders.
Objectives of the ongoing project:

To take inventory of all irrigation tanks managed by the PWD in the two adjoining districts of the Chennai city which are at the moment disappearing due to fast urban expansion – inventory as per the tank memoirs as well as through field checking (survey)

To map all the tanks using the GIS technique

To estimate the cost of rejuvenation of all tanks in the two districts and to analyze and quantify the potential benefits of rejuvenated tanks

Assessing and analyzing the current water use pattern for agriculture, industry and the urban sector and preparation of the water budget for Chennai and peri-urban
1400 tanks around Chennai have been identified, surveyed and mapped through GIS.

INDIVIDUAL TANK MAAPING (AS EXAMPLES) FOLLOWS IN THE SUBSEQUENT SLIDES.
The project results clearly indicate that the locally available water is quite substantial and ecologically sustainable and cost effective.

A win-win situation where urban and peri-urban areas can co-exist while at the same time local ecology can be preserved.
Manamathi Tank: Location - Tiruporur – Tirukalukuntram Main Road – 30 KM from Chennai - Next to Amur village – 1091 acres command area – Tiruporur Irrigation Section – Tiruporur
Sirudhavur Tank: Location - Tiruporur – Tirulalukuntram Main Road – Tiruporur to Sirudhavur – 6kms – Tiruporur Irrigation Section - 1027 acres command area
**Kondangi Tank:**  Location – Tiruporur – Chengelpattu Main Road – 1592 acres command area – Tiruporur Irrigation Section – Guduvancheri 14kms
THANK YOU

Thaiyur Tank in January 2013