

# **MAKING WATER SENSITIVE CITIES IN GANGA BASIN AIMED AT IMPROVING RIVER HEALTH/FLOWS**

**A Global South Water Sensitive Cities Framework/Index  
for Ganga Basin Cities**

# Why a need for a Global South Water Sensitive Cities Framework for Ganga Basin Cities

A normative thinking dominates the origin of the water sensitive cities discourse/framework emerging from developed north countries, that see population growth, economic development and climate change as driving forces that require us to move beyond an infrastructure focussed “conventional” approach to water and waste water management of the last century.

While there is nothing wrong in a normative approach for addressing urban water and waste water challenges – the interventions have to be contextualised to cities of global south. If this is not done, not only are the outcomes likely to fall short of expectations, there is also a risk that the interventions may inflict more damage than good.

# River of Arhaus town : Denmark

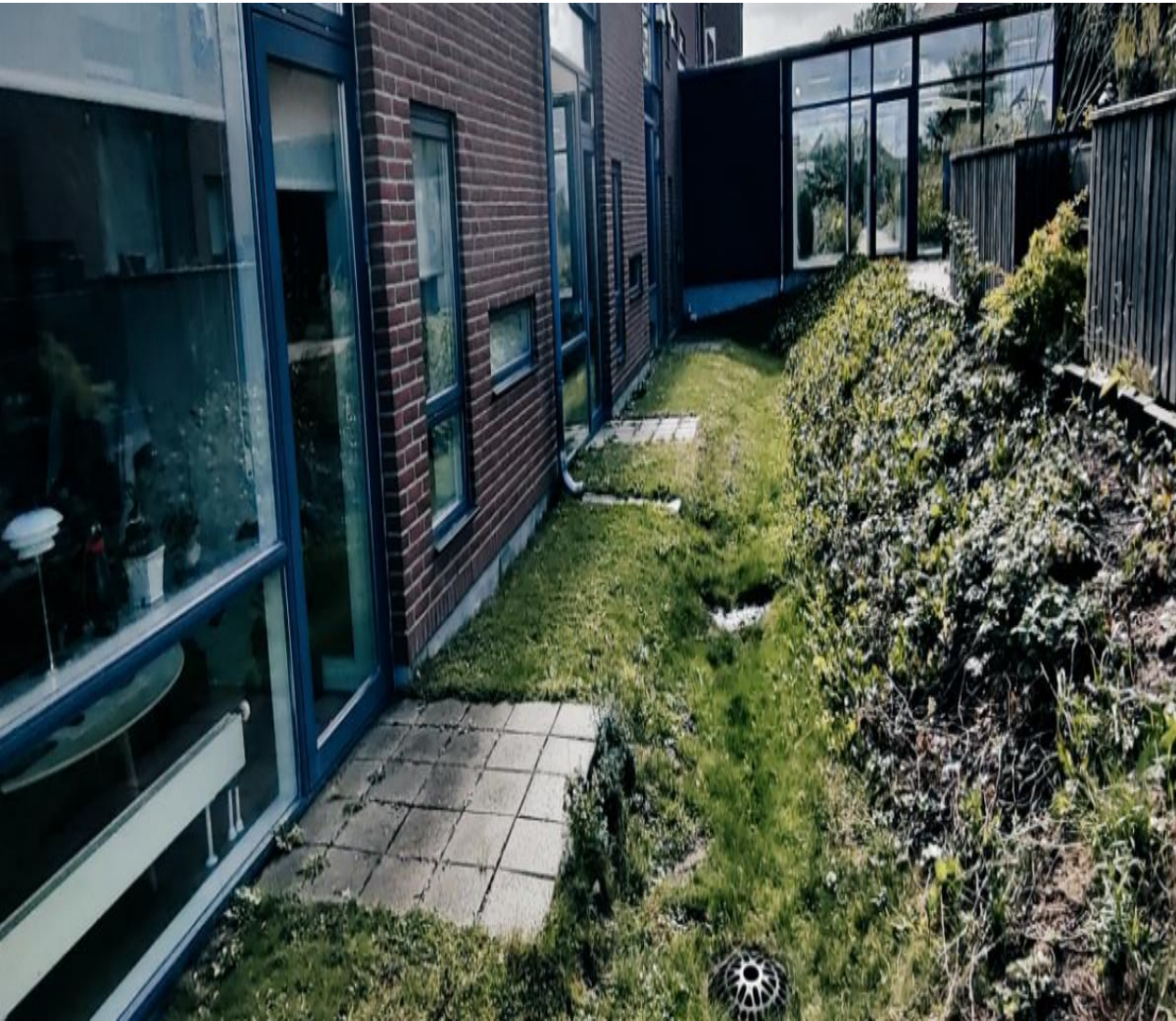


# City Layout



# Middelfart Town: Denmark

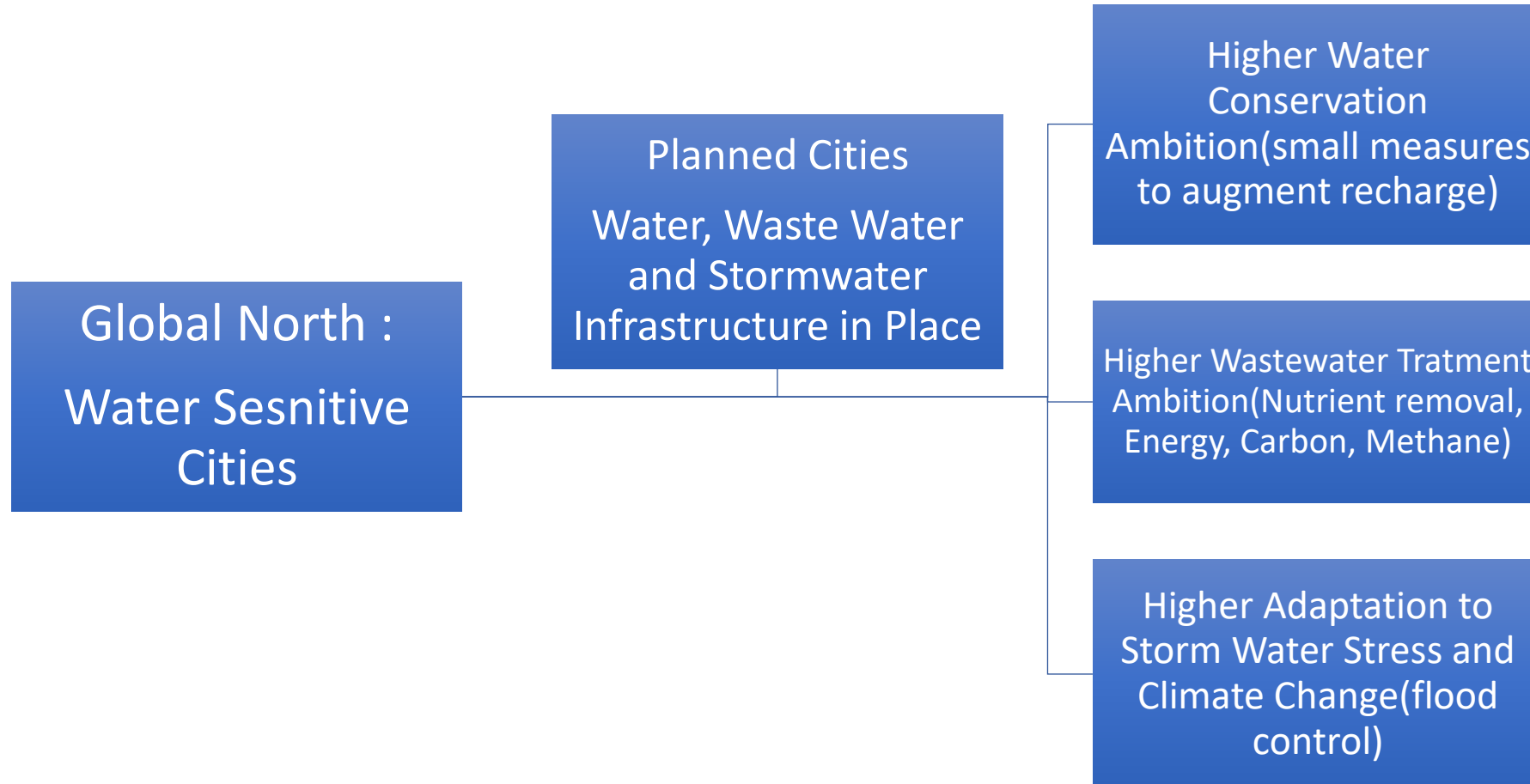
## Individual and Neighborhood level WSUDP



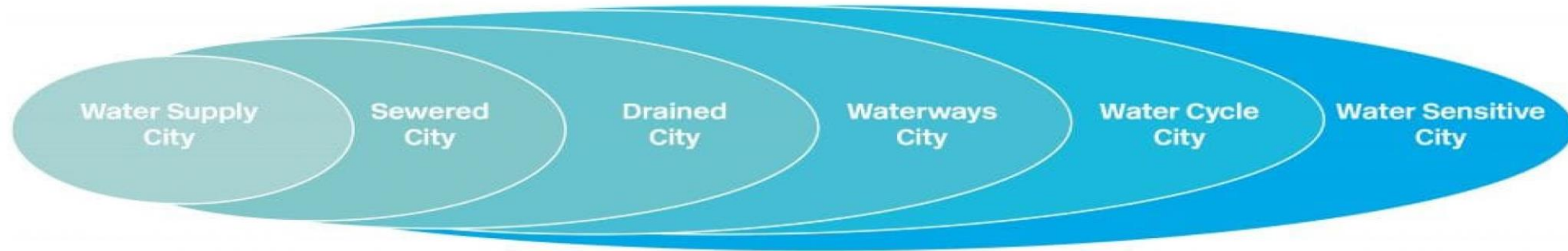
# Middelfart: Storm water drainage as WSUDP



# Global North Cities : Context and Ambition



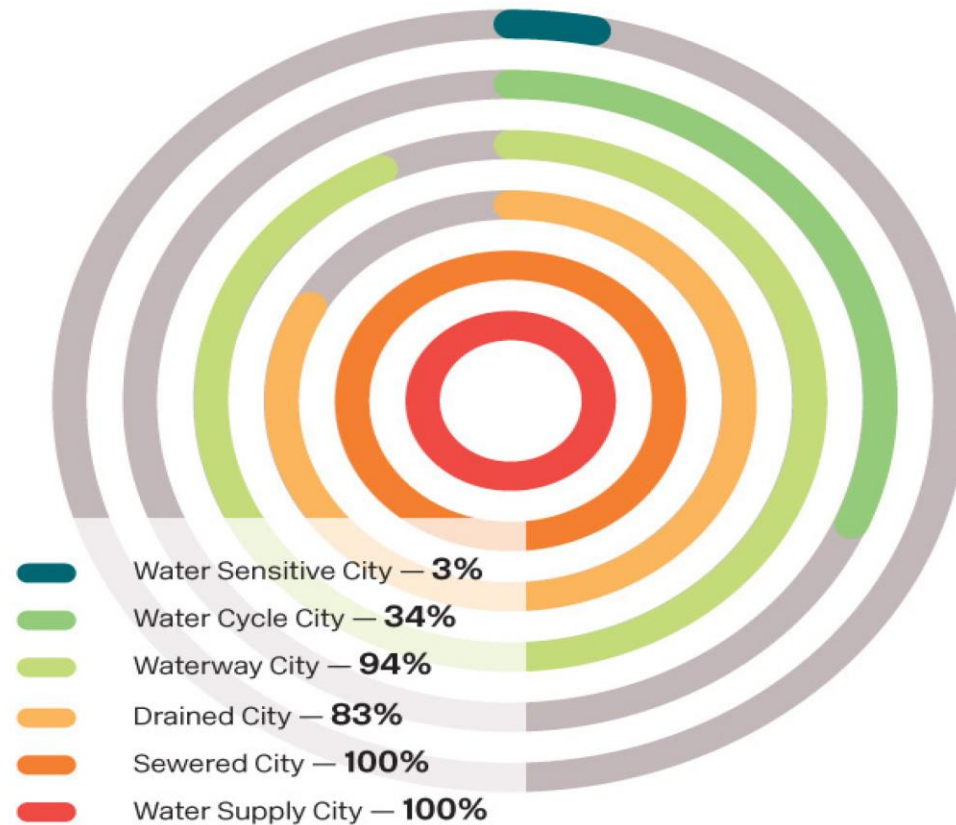
# Linear imagination of a Water Sensitive City





# Cities of global north are planned cities with basic infrastructure and service outcomes

## City-state position



# Dense Informal Settlements: Potential for WSUDP? What should be our Aim?







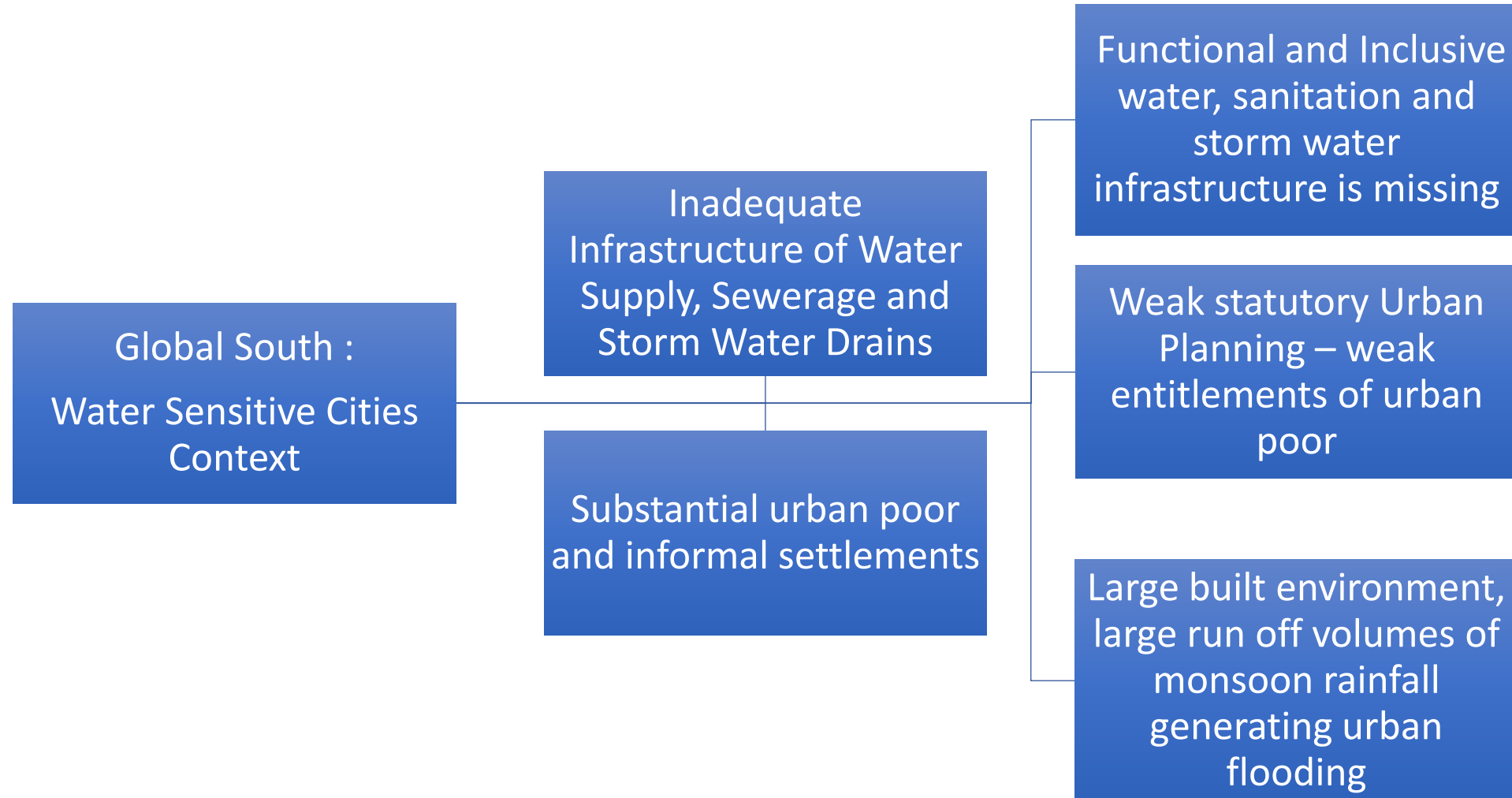
# Grey Infrastructure augmentation





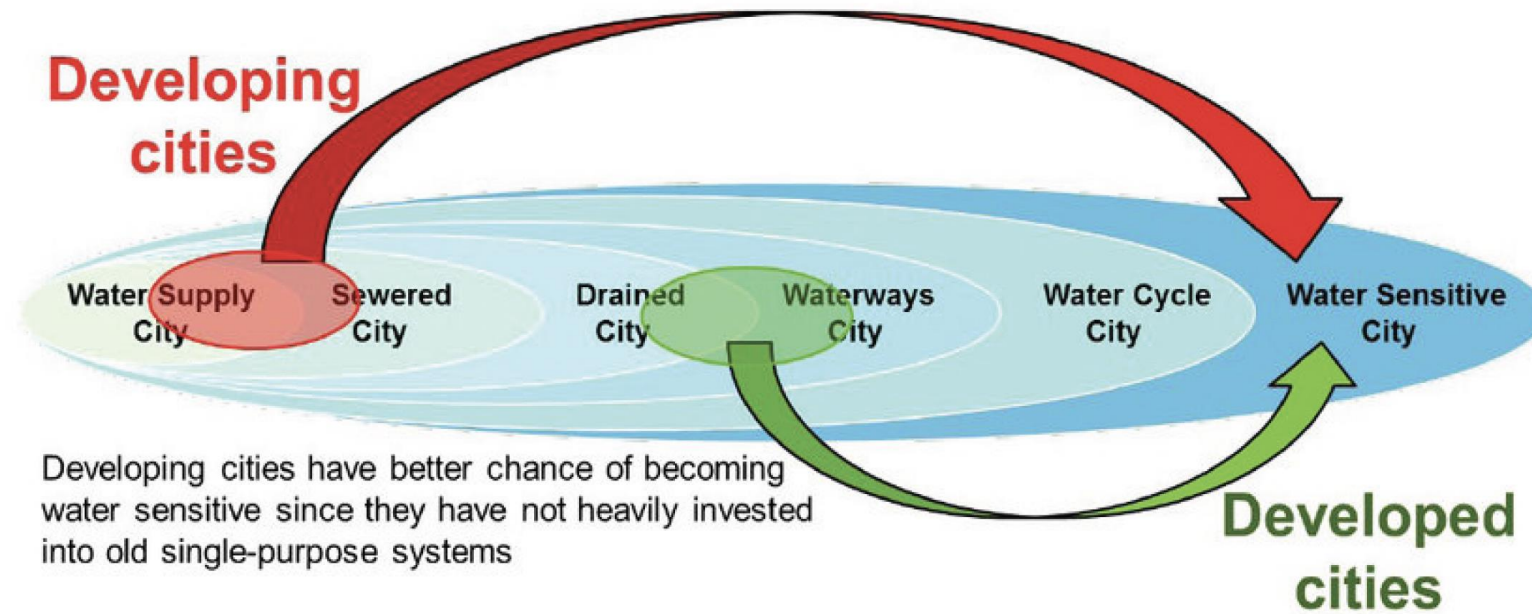


# Global South Cities : Context and Ambition





# Leap frogging: Theory vs. Reality



# Goal of WSC Framework

## **Goal**

***Cities commit to a “Just and Equitable Access, Use, Re use” of water supply, to sewerage/septage and storm water management.***

- Inequity in urban settlements is recognised as the basis of planning for and designing interventions for water sensitive cities.*
- There is no “leap frogging” possible without addressing infrastructure deficiencies, specially for the less privileged residents of our cities.*
- That climate change impacts everyone, yet the less privileged may get impacted more severely. That we need to strengthen urban planning and not look for only design interventions, place making and beautification as outcomes of water sensitive cities.*

# Guiding Principles

- **Larger and long term vision(firmly rooted in the equity, rights and justice goals).** Not just in projects. Inter city and urban-rural contextualisation of interventions.
- **Climate change exacerbates already existing water scarcity and flooding risks of cities.** Mitigation measures should not further inequity.
- **“Design” consciously for Equity and Justice.** Abandon a normative, techno managerial approach to “design” interventions for water sensitive cities.
- **Reducing conflicts.** Recognise existing and future conflicts around water and waste. Address them to the extent possible in programs and policy.
- **Improving functionality and efficiency grey and green infrastructure.**

# Applying the Framework

- **Equity and Inclusion.**
  - Those parts of the city that are densely populated and unplanned, and cannot conserve water, should not be expected to undertake ground water recharge. They are supplied piped water. They are also served with sewerage/septage infrastructure and services that are affordable and inclusive.
  - Economically better off settlements that are usually planned and have the means to undertake recharge measures, do so, and reduce their dependence on piped water supply. They also manage their septage in a decentralised manner, without loading the sewerage system to the extent possible.
- **Application of the Framework.** Habitat, bio diversity and environmental impacts are also important. However for the purpose of a Water Sensitive Cities Framework, as a planning and design guide for action by urban local bodies, these are too large domains to incorporate into one framework and hence not included here.
- **Measuring impact within and beyond the city.** Reducing the urban water and waste water footprint on rural areas in India and elsewhere, where still a large population depends on agriculture, is important purpose of water sensitive cities of global south. Considering most large Indian cities are drawing water from far away rivers and reservoirs, often impacting rural areas and their claim on groundwater and rivers. Their waste water production impacting rural areas.

# Developing an Index for Raking of Cities: What should be the considerations

- Outcomes: equity, inclusion and justice
  - Intervention neutral impact assessment done for inclusive outcomes.
  - Institutional strengthening : Urban Planning
  - Long term and sustainable
  - Water and Nutrient cycle integrity
  - Climate resilience

# Index for Ranking of Cities

- **Functional Infrastructure and services.** Fix all existing non functional water, sanitation and storm water infrastructure and services. To improve efficacy and treatment outcomes.
- **Functional and Inclusive Infrastructure for unserved areas.** Additional grey infrastructure and services will be needed for unserved informal urban settlements, that now dominate the urban landscape of cities of global south.
- **Substantial Re Use of treated waste water and bio solid.** Reduced waste water footprint and Re use of treated bio solids( for agriculture) and treated waste water. This may include all measures for re use and recharge of ground water and prevention of pollution of ground water, lakes and rivers. Inside or outside the city limits.
- **Mitigating in-situ urban flooding.** Enhanced storm water drainage dimensions/norms, to address in-situ urban flooding in cities(where built up area has reduced ground water recharge potential) that is witnessed in normal rainfall periods as well as in high intensity climate change induced episodes. Conserving rain water wherever possible, as contamination free as possible.

# Planning & Design Considerations

- **Water Sensitive Urban Planning and Design.** Statutory city development plans (Master Plans) need to have water sensitive city planning with clear aims and objectives.
- **Fixing responsibility and accountability.** Water supply, storm water and waste water management (including septage management) cannot be entirely left to the market and outside the formal statutory urban planning ambit.
- **Both grey and green infrastructure provisioning** is needed. Without grey infrastructure improving the living conditions, green infrastructure may have a limited impact.
- **Adapting to Climate change.** City grey infrastructure needs to plan for both floods and droughts, that impact our cities with intensification of water cycle as a result of climate change.
- **Look beyond urban “place making” and “beautification”.**
- **Monitor city level gains.** Electricity pumping cost of transporting water and waste water over hundreds of kilometers to the cities and to treatment plants – reduction.