

Urban stormwater management in developing countries



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Context

Why to focus on Urban stormwater management:

- because stormwater is one frequently raised by local decision-makers in developing countries
- because this issue becomes particularly problematic when there is heavy rainfall that floods the settlements situated in the lowest parts of towns
- because effects of such rainfall are manifold: sanitation, material, economic and environmental impacts

Objective of the study

- To analyse issues and existing practices in stormwater management in developing countries
- In order to identify the needed areas for research

Urban stormwater management, as understood in this document, refers to all the measures undertaken to improve the way in which the flow and volumes of water generated by rainfall and surface runoff in urban areas are controlled and managed.

LESSONS LEARNED FROM THE LITTERATURE REVIEW

Stormwater management history in developed countries

- Step one: channel and store for evacuation or flow management (before 1980's)
 - public health + hydraulic approach
- Step two: treat the discharge and regulate flow (1980's)
 - regulatory and environmental approach
- Step three: reuse the stormwater considered as a resource (End of 20th)
 - regulatory and environmental approach

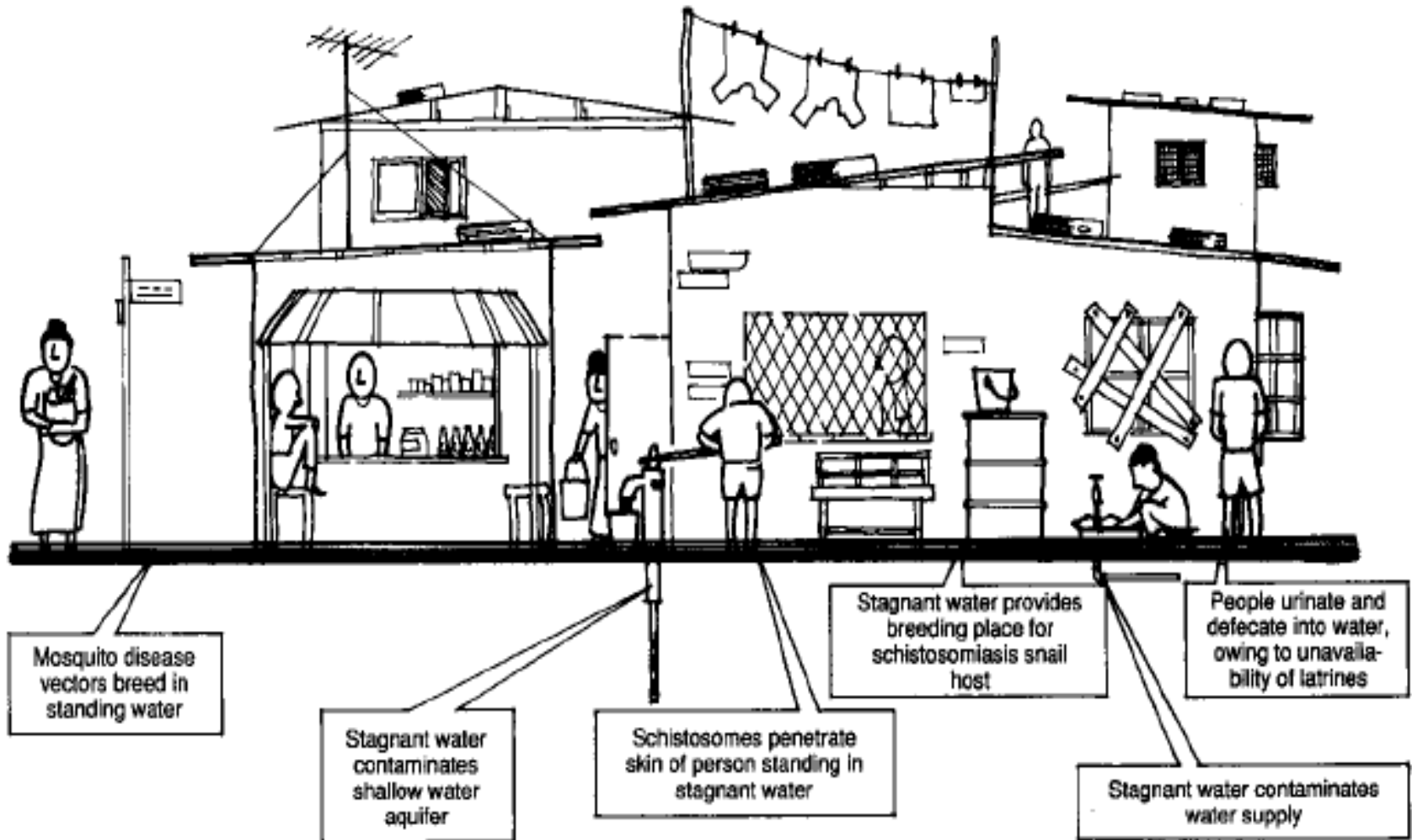
→ Long process before to consider stormwater not only as constraint, but also as a resource

Issues driving stormwater management in developing countries

- Increasing urbanisation of the world's population is constantly creating new challenges for stormwater management.
- Although rain is vital for both human beings and their environment, rainfall events generate flows and volumes of water difficult to control

The impacts of lack of stormwater management can be broken down into four categories: public health, infrastructure, economic and environmental.

Stagnant water and disease transmission - the health consequences of poor drainage



Source : (Cairncross et Ouano, 1991)

Impacts of lack of stormwater management

- **Safeguarding public health**
 - Stormwater-related diseases
 - Accidents and injury
- **Protecting the land, housing and urban infrastructure**
- **Safeguarding economic development**
- **Protecting the environment**

Factors influencing stormwater management

- **Natural factors**
 - Rainfall patterns (frequency and intensity):
 - Characteristics of the catchment area
 - Soil type
 - Presence of a river
- **Human activity-related factors**
 - Extension and densification of urban areas
 - Impermeability
 - Degradation of plant cover
- **Factors linked to the management of urban space**
 - Lack of planning and poor land management
 - Overlap between stormwater, wastewater, solid waste and drinking water
- **Factors directly linked to stormwater management**
 - Lack of coordination between sector stakeholders
 - Poor alignment of planning to local capacities
 - Failure to take the populations' expectations into account
 - Limited local capacities for financing investment, operation and maintenance

Innovative activities implemented in developing countries

- **Activities influencing the natural factors**
 - Controlling runoff upstream from the city
 - Reducing erosion
- **Activities for improving the management of urban space**
 - Developing multi-service approaches
 - Integrated management of urban water
- **Activities for improving stormwater management**
 - Improving operation and maintenance services
 - Using alternative techniques
 - Involving different stakeholders
- **User-targeted activities**
 - Flood risk prevention and reduction strategies
 - Involving the most vulnerable users in the improvement of the service

Conclusion and way forward

All this analysis highlights the needed to go forward.

It suggests for us the following areas for research:

- The different scale of intervention and complementarity between a global approach and small scale interventions
- Inclusion of the storm water management in urban management
- Interrelation/complementarity between stormwater management and other urban services
- Analysis the real cost of the stormwater management
- Explore new technological approach, low cost technology
- User participation



Thank You!

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