



Storm water management and sustainable development throughout the world

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Background

Presentation based

- On an «International Report on Stormwater Management»
 - By B. Chocat and Jiri Marsalek for IWA (Berlin Congress, 2001)
 - Using 19 answers from 19 different countries
 - On a «position paper» written by a WG of the IWA/IAHR Joint Committee on Urban Drainage
 - By B. Chocat (coord), R. Ashley, J. Marsalek, M.R. Matos, W. Rauch, W. Schilling, B. Urbonas
 - Presented at the Novatech conference (GRAIE, Lyon, June 2004)
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Background

- Australia
 - Bulgaria
 - Canada
 - Czechoslovakia
 - Finland
 - France
 - Germany
 - Hong Kong
 - Japan
 - Korea
 - Malaysia
 - Poland
 - Portugal
 - South Africa
 - Spain
 - Sweden
 - UK
 - USA
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Introduction

- **Adverse effects** of stormwater discharges include flooding, increase in CSOs, erosion, sedimentation, temperature rise, O₂ depletion, toxicity and reduced biodiversity
- **Stormwater management** mitigates such effects

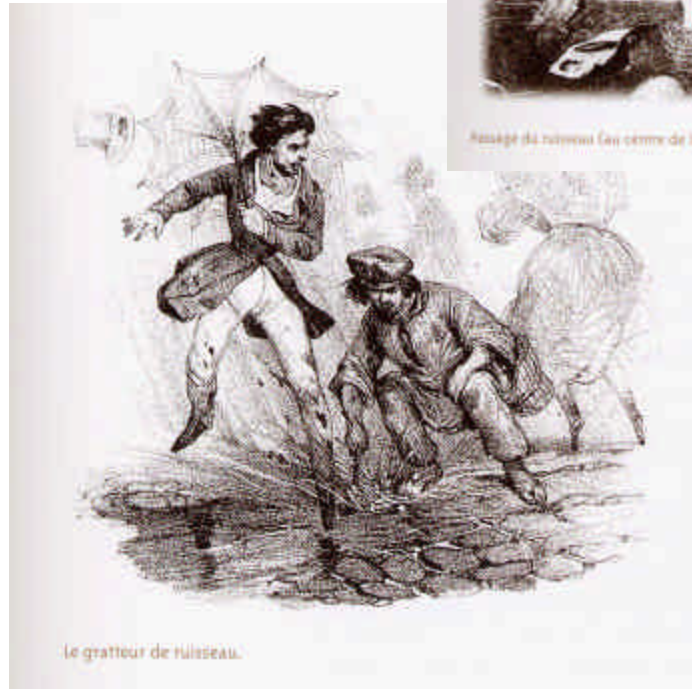


Problems origin

During the XIXth century in Europe, the **lack of public health and sanitation** is less and less accepted.



Tapotage du soir avec beaucoup de dérangement, gravure de 1889



Le gratteur de ruisseau.

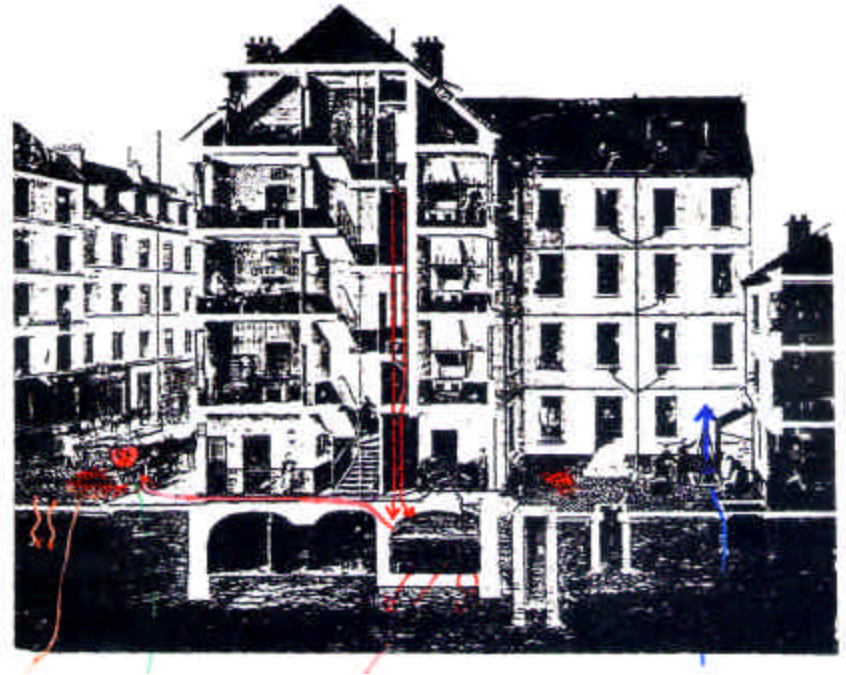


Passage du nouveau (au centre de la rue).

Problems origin

During the XIXth century in Europe, the **lack of public health and sanitation** is less and less accepted.

A **principle** for finding a solution: the **Sanitarianism**
And a **solution** : **Networks** for managing all kinds of urban water



A principle based on false ideas

“The bowels of earth are full of causes of death prepared by secret agents in underground places. The matters that make them dangerous are not known but we can see their ravages. (...). The mankind itself often digs out miasms, which after mixing with air, poison animals that breathe them in and then die.”

A principle based on false ideas

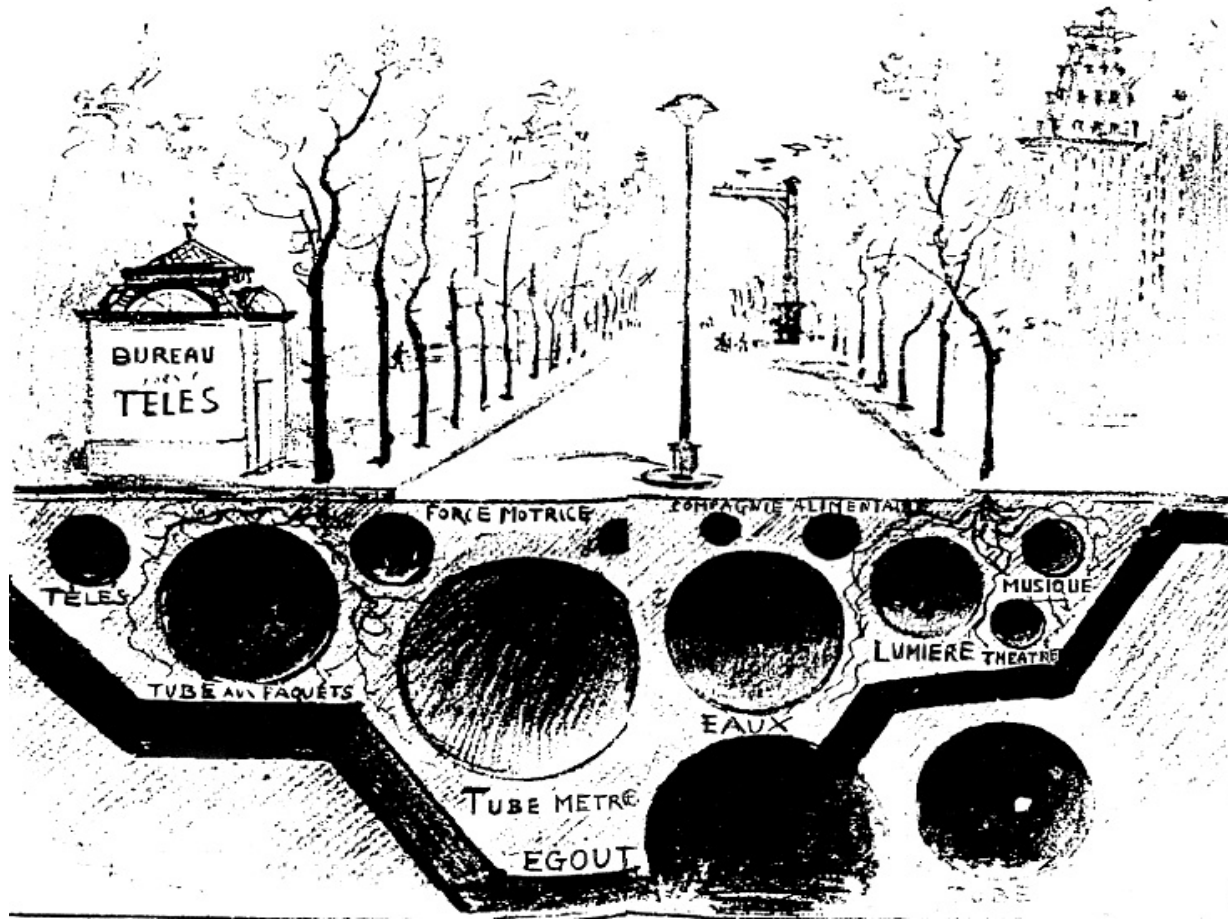
“We must link together the city and country by a vast tubular structure with two parts, one urban and one rural, each of them divided into an efferent or arterial system and an afferent or venous system, with both parts being driven by the same central heart. The system will operate on the basic principle of continual circulation of water that enters pure into the city, and the continual movements of wastes that must find their way out. Cisterns and tanks are the two forms of pestilential stagnation. »

Ward, 1852. (Circulation and stagnation)

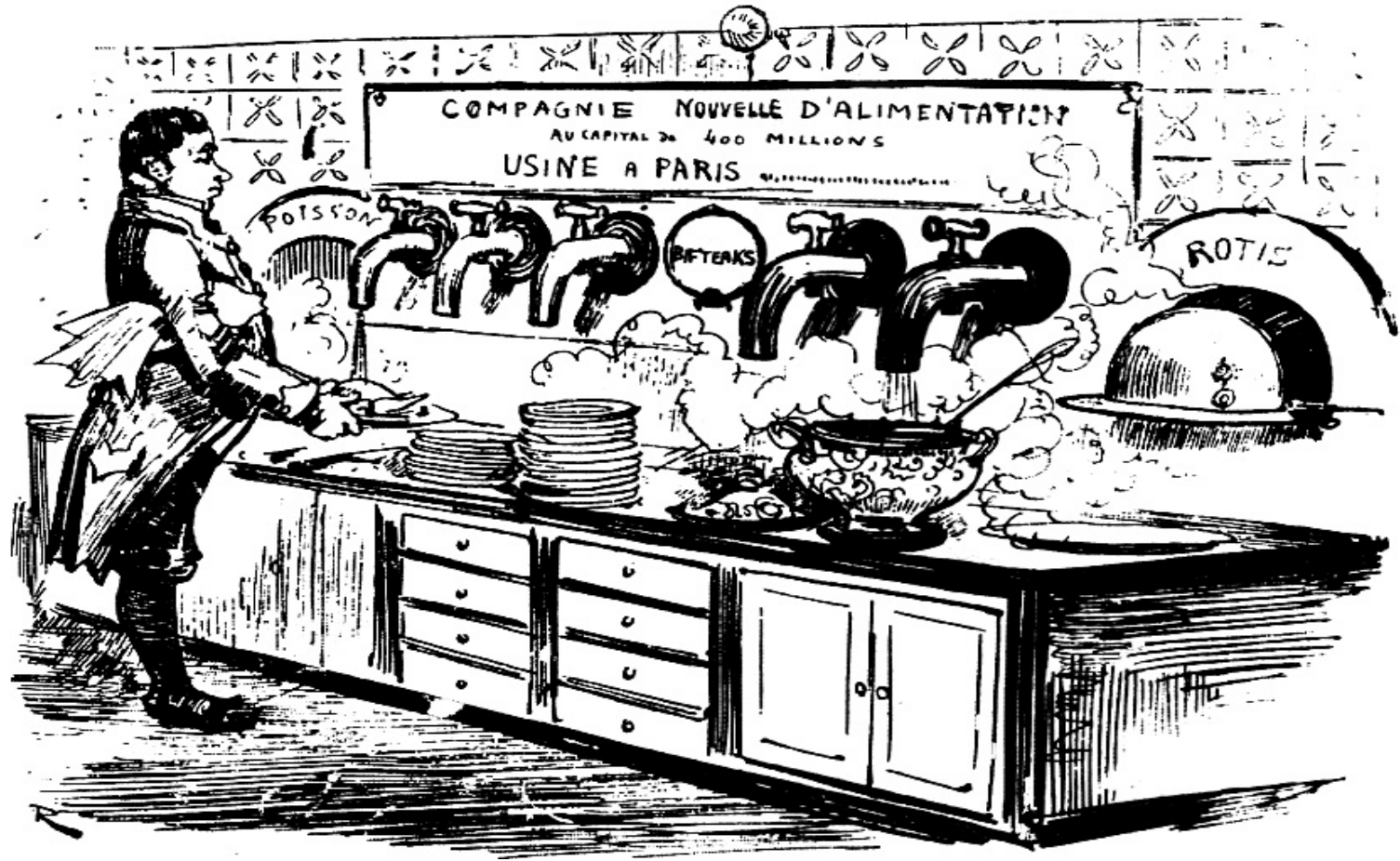
A period of time different from ours

- **Sanitarianism,**
 - **Centralization**
 - **Scientism,**
 - **Colonialism,**
 - **Capitalizm,**
 - **School,**
 - **Industrial revolution.**
-

The city in 2000 (as seen in 1900!)



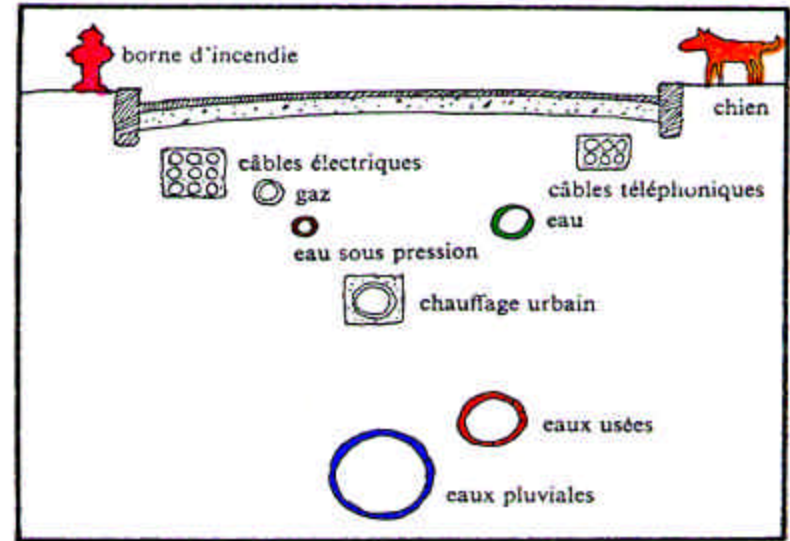
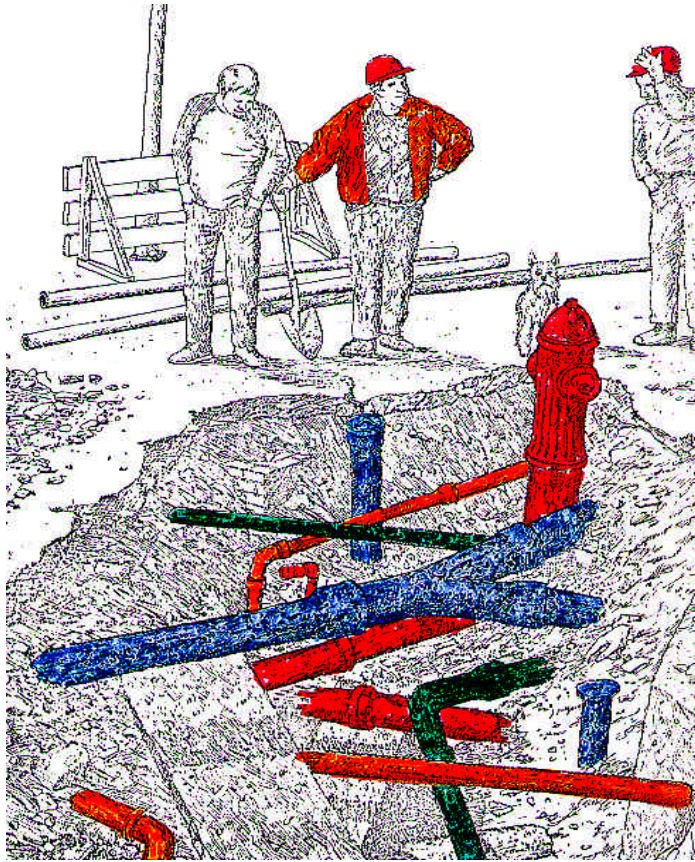
The city in 2000 (as seen in 1900!)



150 years later

- A set of **fragmented systems** :
water supply, wastewater
management, management of urban
runoff, management of «natural»
receiving waters, ...
 - **Do these systems function as well
as we wished?**
-

A very complicated technical system

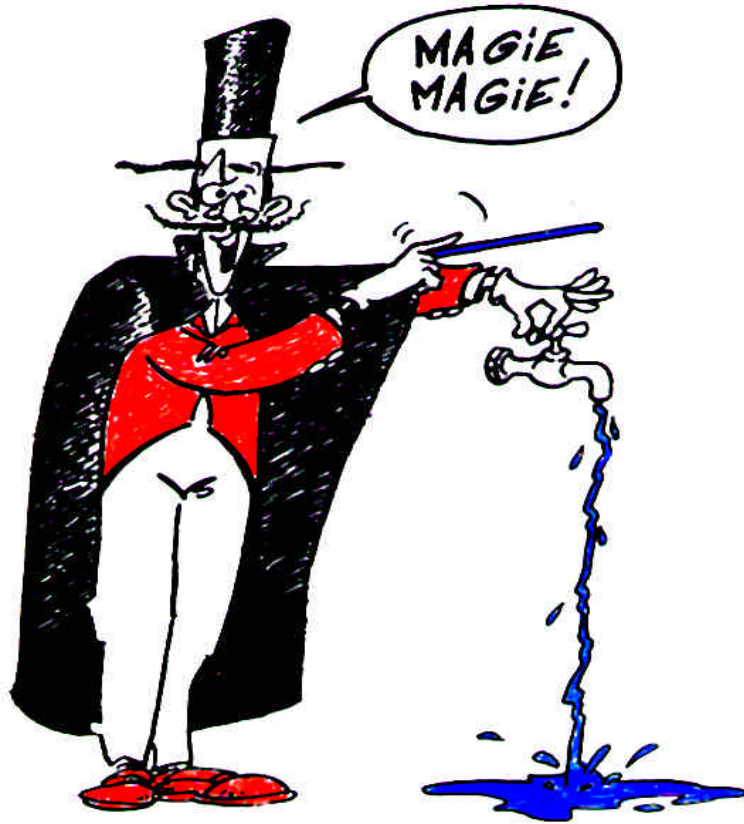


DISPOSITION THÉORIQUE

A too complicated system



An exclusive option : the technician



***« Water comes from the tap
as electricity from the
socket and money from the
bank. »***

Alfred Sauvy

A water which quality is discussed

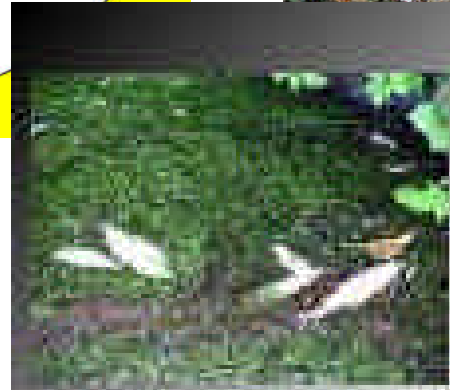
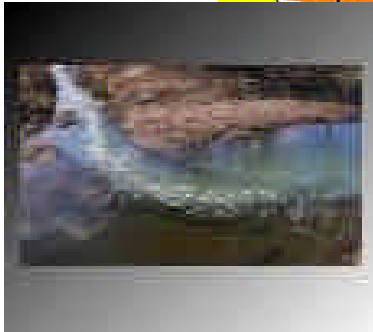


« I would like to talk about the quality of water... »

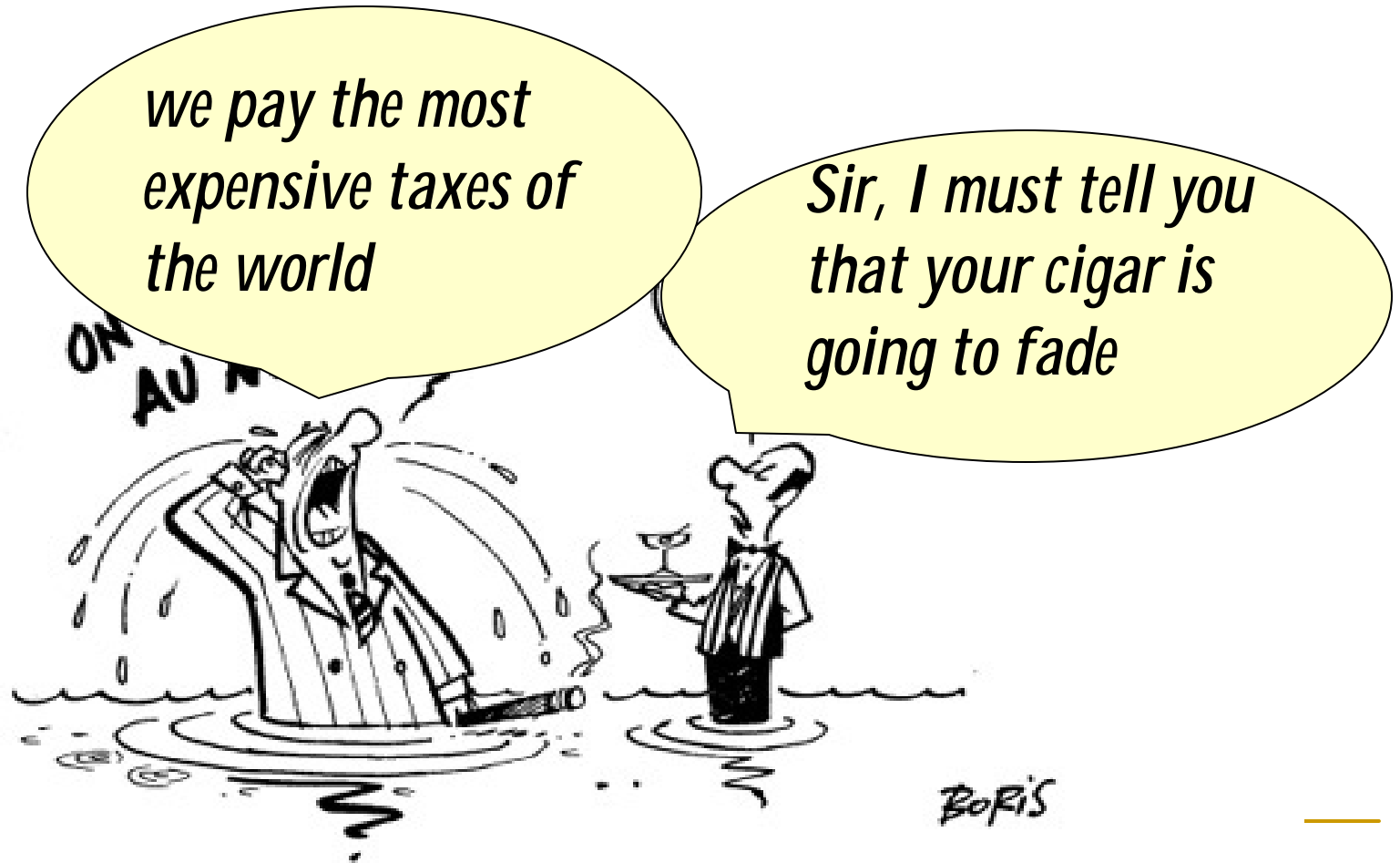
Flooding risks still exist



Receiving water's quality is still deteriorating



A very expensive system, but affordable for developed countries



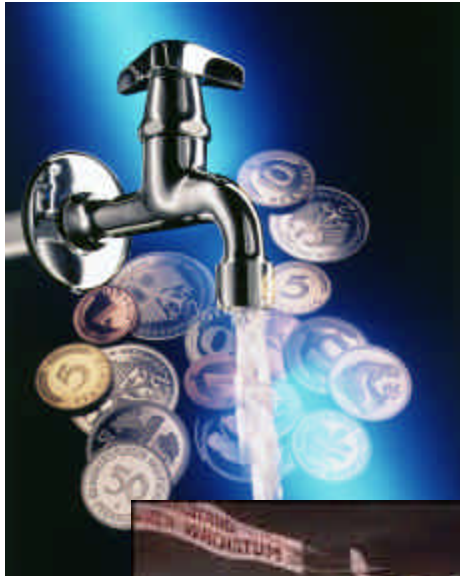
But a system which is too expensive for many countries



Le développement participatif est une source inestimable de mobilisation des bénéficiaires de projets



What will be tomorrow?



*I am the
Boss*



We need a new paradigm

Guess : What sign must be added to make the equality exact?

$$\text{IX} = \text{VI}$$

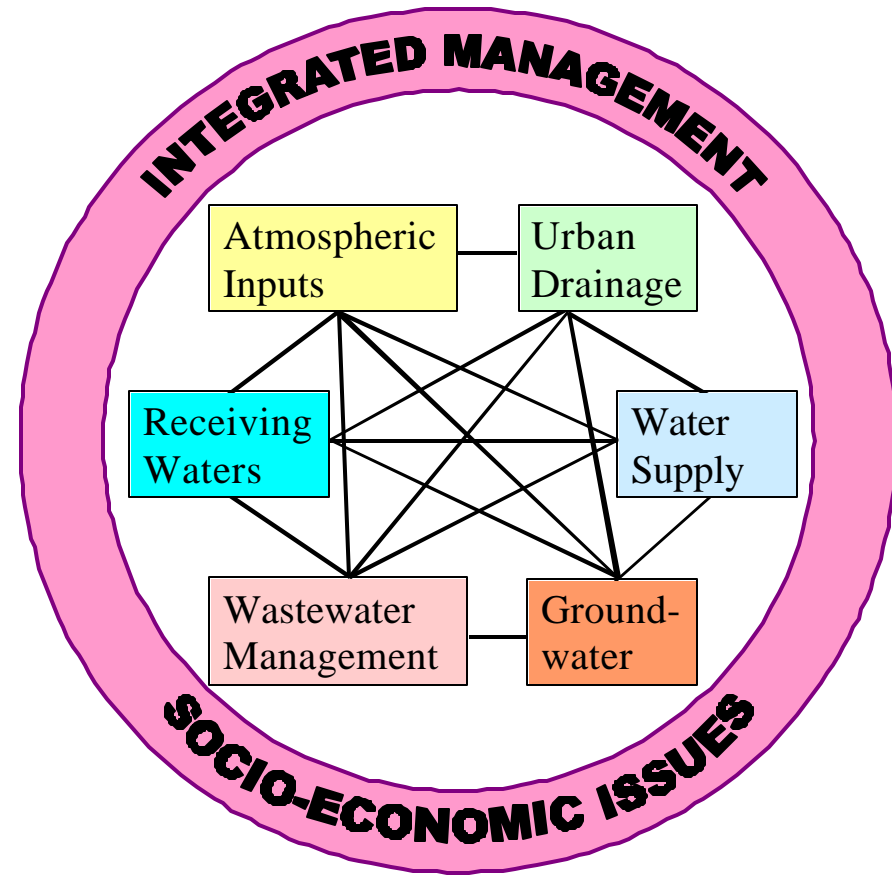
We need a new paradigm

Solution : think different.

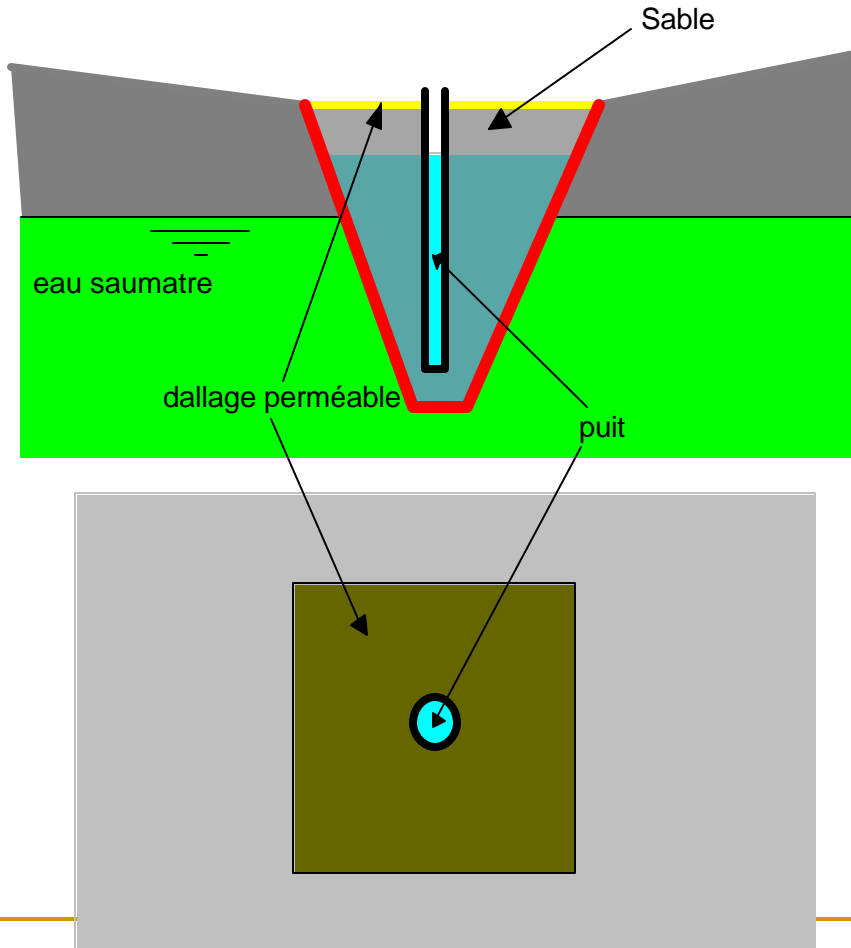
SIX = VI

A hope of solution : Integrated Storm Water management

SWM is designed to **mitigate the impacts of urbanisation**, and is an **integrated approach** to all urban water management issues (flooding, water supply, groundwater, wastewater management, urban drainage and receiving waters)



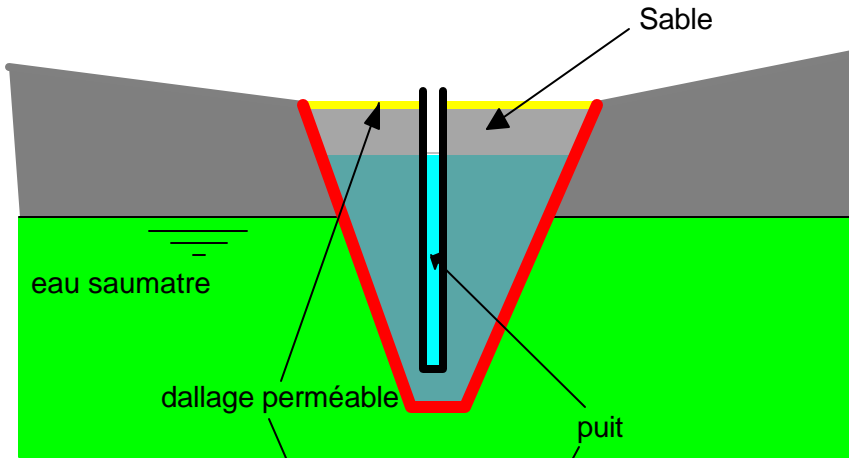
An exemple : Venice in the XVith century



Storm Water Management is **not a new idea.**

But can benefit of **new technologies**

An exemple : Venice in the XVIth century



Trends in SWM

1. Minimise inflow of stormwater into sewers

- Practised in both separate and combined systems (using BMPs)

2. Harvesting Stormwater and reusing wastewater

Trends in SWM

3. Changing modes of ownership and operation of stormwater systems

- ❑ Stormwater utilities are being set up, some as private agencies, often within larger water companies charge fees for services
 - ❑ For example fees are proportional to the impervious area, credits are given for BMPs
-

Trends in SWM

4. Adaptive Management

- ❑ Stormwater systems are rather complex
- ❑ Predicted results are somewhat uncertain
- ❑ **Adaptive-learning management** is needed (build the 'best' system, collect data and improve the system to meet expectations)

5. Existing systems must be maintained

Conclusions

All national reports share a common vision - a **holistic approach to SWM**, rather than traditional expansion. Six points made:

- Develop drainage in an environmentally sensitive and **sustainable** way, by preserving water balance and preventing pollutants entry into stormwater
 - Emphasise **source controls**
-

Conclusions

- Changing infrastructures - to more environmentally friendly, including ponds, wetlands, infiltration sites and swales
 - Such systems should be operated by dedicated agencies, within water authorities, financed by drainage fees. Various mixes of public and private partnership are tested - need to report to local clientele
 - Further progress in SWM - need for R & D, and knowledge sharing
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Conclusions

- Urban drainage affects lives of all urban dwellers. It is important to keep the public in the forefront of these activities, recognising that **SWM success depends on public support and participation**

