

Managing the Transition of Urban Water Systems

The following briefing note aims to promote thinking about how to manage the transition to a future paradigm of integrated and sustainable urban water management. It is aimed mainly at decision makers on integrated and sustainable urban water management, local government including urban planners, water utilities, and major international agencies working in developing countries.

Headlines

1. Transition is necessary to achieve a more sustainable approach to urban water management
2. SWITCH has been working towards making transition phase management a realistic means of achieving sustainable UWM.
3. SWITCH has developed demand led technologies and methodologies to drive the operation of the water systems in SWITCH cities towards a more sustainable paradigm that best suits their own needs
4. A range of barriers have been identified to the implementation of sustainable water options.

Introduction to the transition to Sustainable Urban Water Management

It is accepted on a global basis that transition is necessary to achieve a more sustainable approach to urban water management (UWM). A major outcome of the SWITCH project is to deepen knowledge of integrated and sustainable UWM to encourage this switch. It includes the application of strategic planning processes and the demand-led Learning Alliance approach of developing new technologies and methodologies which have a positive impact on the sustainability, performance and operation of water systems.



Green roofs Sao Paolo

What is transition theory?

A transition is a structural change in the way a society operates. In simple terms it is a process whereby culture, markets, networks, institutions, technologies, innovations, policies, individual behaviours and trends evolve together from one relatively stable system state to another.

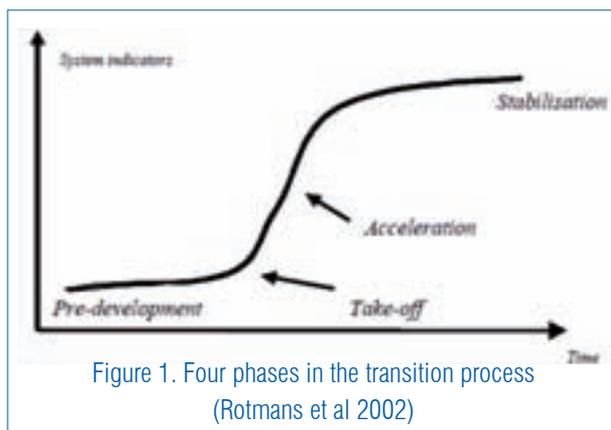


Figure 1. Four phases in the transition process (Rotmans et al 2002)

The transition pathway (Figure 1) can be illustrated by the S shaped curve showing the transformation away from the old system or processes through a period of quick and unstable development reverting to relative stability again, with new methods or processes becoming dominant. Many emergent technologies make it to the take-off stage, lose momentum and never reach the stabilization phase i.e. uptake into mainstream processes (Rotmans, 1994; Van der Brugge et al, 2005).



It is a central assumption that policy makers and communities want to improve the water system of their city. Each Learning Alliance identifies these specific needs. An integrated Learning Alliance (or regime) led strategy takes into account the cultural and socio-economic background of a city in order to foster interaction between all three levels. What may be viewed as radical techniques may be nurtured so that the leap can be made into existing markets and the acceleration phase of transitioning begins.

A bottom up approach to facilitate transitioning concentrates only on innovation or 'niche' development and practical implementation, such as the many demonstration projects and research that is underway in SWITCH. The uptake of the innovations is generally limited and whilst innovation development is important in the predevelopment phase, the financial cost must be supported in some way by society or stakeholders. Another approach focuses on the regime, for example, public bodies such as water utilities and municipalities who often work in isolation to manage their sector of the urban water process. This often results in expensive solutions and a 'technological lock in', as dominant innovation clusters (in each sector) make it difficult for less compatible newly developed technologies to enter an existing market (Van der Brugge, 2009).

Retrofitting sustainable UWM into existing systems

Integrated and sustainable UWM is considered to be the next technological revolution in the world of water managers, with the transition over time from pumped water supplies to piped systems. Current unsustainable practices are no longer acceptable due to the concerns of ecology (disruptions to the water cycle and habitats), public health (reduced water quality) and economics (the effects of flooding and drought).



Educational session – Belo Horizonte

The future paradigm of integrated and sustainable UWM for the city of the future requires a 'role switch' to meet expectations and challenges. The UWM transition process is currently in the take off phase. SWITCH is attempting to maintain the momentum through the acceleration phase by encouraging sharing of ideas and experiences of integrated UWM practices.

However, a range of barriers have been identified to the implementation of sustainable water options (Figure 4). SWITCH envisages a range of cities, which will have real options for sustainable UWM. However, many new visions for the water system will be constrained by the limitations of the existing supporting infrastructure, whether it is water supply, potable water treatment, sewage treatment, stormwater, river, lake, sea or other water systems. There are clear drivers for improvement which are imposed by water scarcity in some cities and water surplus in others. The infrastructure and geography of each city dictates that they are all different.

The perceived financial consequences and the disruption to existing societies of integrating new technologies are thought to be major hurdles. Yet many new practices will reduce costs due to reductions in sewer pipes (i.e. decentralisation of sewage systems) or distribution mains (i.e. stormwater reuse) etc.

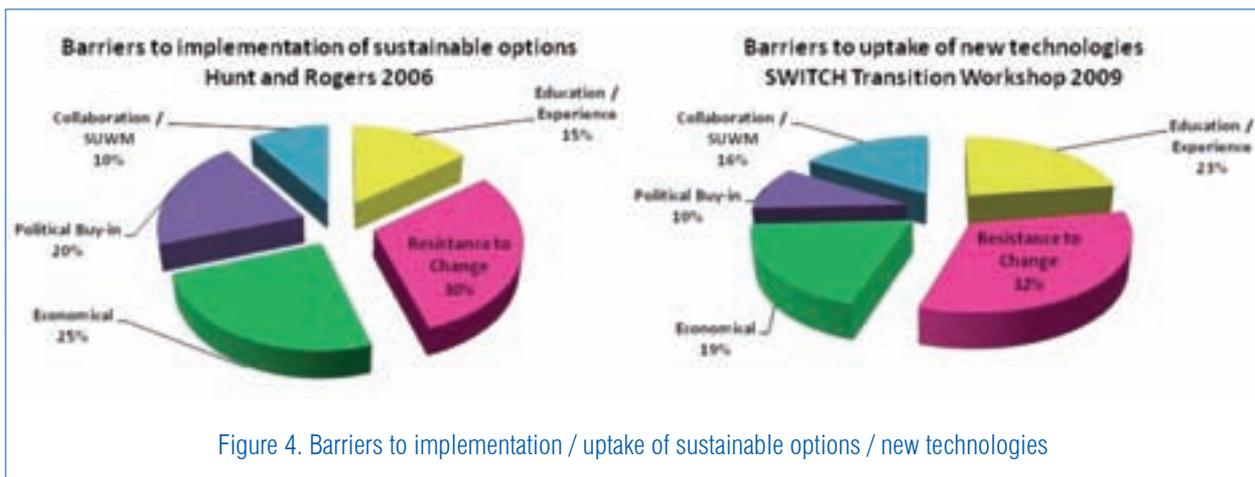


Figure 4. Barriers to implementation / uptake of sustainable options / new technologies

Conclusions

- There is a lack of political buy-in for a pro-active approach to implementing sustainable practices in the water services sector through legislation and funding mechanisms (to drive transition processes);
- There is a lack of adaptive and reflexive strategic planning processes to guide the implementation of new technologies and methodologies (to facilitate transition phasing);
- There is a need for increased capacity in two specific areas:
 - to train the operators and managers involved with the new technologies
 - increased use of the media as a means of raising awareness of the issues and the potential solutions that can be delivered by uptake of sustainable urban water practices. The media are a primary channel for effectively interpreting and communicating technical, institutional and economic issues to the public at a level that they can relate to, therefore it is important that they are briefed throughout the process in order to sustain the transition.
- The leapfrogging concept in urban water infrastructure development in newly urbanising cities provides the potential to omit the path dependant, high investment water networks that are typical of developed countries.

Key references

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The SWITCH project aims to achieve more sustainable urban water management in the “City of the Future”. A consortium of 33 partner organizations from 15 countries are working together on innovative scientific, technological and socio-economic solutions, which can then be more speedily replicated around the world.

For more information visit:

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