Do local people accept gray-water technology?*

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A lot of effort is put in the last ten years in the search for low-cost and acceptable technologies to treat and reuse wastewater. Research on these issues is urgent as many people in this region suffer from important water scarcities and food insecurity. Technological contributions to solutions that respond to the demand for water at the household level are therefore a necessity. Such contributions will complement the search for more effective and participatory planning and policies in the water sector.

However, technology to be adopted by local people need to be embedded in their cultural and socio-economic reality. This applies to both rural and urban settings. It is great to be able to demonstrate that one or another technology succeeds to treat wastewater – gray or even black – in a way that is technically feasible and respects different ecological and quality/health criteria. However, if such a technology is financially not affordable and does not consider the cultural or even religious values that people adhere to, then it will become very difficult to apply such technology at scales that have the desired impact. Moreover, many technologies introduced from outside suffer from the fact that people have not really taken ownership for the development of such technologies and thus often do not see their relevance in their daily life. There may be four important questions that people will raise when exposed to a new technology for treatment and re-use of grey water.

1. **Am I allowed to use it?**
   How acceptable is the technology in view of cultural and religious values?

2. **Can I pay it and/or does it reduce my cost of living?**
   How affordable is the technology and what are the financial benefits?

3. **How difficult is it to use it?**
   What is the required knowledge to install, operate and maintain it?

4. **Does it give me more water to use in a safe way?**
   How does it improve access and rights to sufficient and good quality water?

It is important to give adequate answers to these questions which I think are critical to make sure that people will feel comfortable with such a new technology and will take ownership for its use and maintenance. Related to that, it is also important to use methodologies that develop "new" technology in a participatory way. Such Participatory Technology Development (PTD) has been tested since more than 20 years and would be useful to apply in this domain. A lot of work has still to be done to make relevant technologies acceptable and affordable. More emphasis should be given for this in future development programmes.

** This article is an excerpt from a key-note paper prepared for the IDRC/CSBE "Graywater Stock-Taking Meeting" (11-15 Feb. 2007, Aqaba, Jordan).*

Key Concepts in IWRM

By Patrick Moriarty, Charles Batchelor and Peter Laban

Water poses significant management challenges because of its special nature as a resource that is constantly in motion and whose availability and quality can vary dramatically in both space and time. These challenges can be discussed under the following four headings:

Scale
The most important aspect of scale is that all users of water from a common catchment or aquifer are in one way linked by the hydrological cycle. This is rarely evident to individual users. For example, people do not always experience directly the impact of their behaviour on downstream users. It is the aggregation of actions of thousands or millions of individual users, each action in itself possibly insignificant that, when taken together, lead to impacts that are critical to other users.

Institutional Levels
Institutional or administrative levels are closely related to issues of scale. However, one of the main challenges of IWRM is to deal with the frequent mismatch between institutional and natural or hydrological boundaries. In classic IWRM this is dealt with at the largest physical scale by creating basin or catchment level authorities. But what happens at the lower levels? At the community level, different uses and users of water are generally (though far from totally) integrated. Where different user groups -irrigators, livestock herders, domestic users- exist and as long as the community is not too large or divided, it is possible for coordination to be achieved at relatively low cost. However, as one moves up scales and administrative levels, the requirement of specialization and centralized control have led to the division of responsibilities between different sectors.

Sectors
At higher administrative and institutional levels, the development and management of water resources is typically divided between different sectors. In the EMPOWERS project the most important are domestic and irrigation sectors. Traditionally, when resources were less scarce, and budgets and planning more centralized, it made some sense to develop these sectors in isolation from each other. Yet this posed a key challenge of IWRM which is to break down sectoral barriers to planning, and to provide common platforms and frameworks for the development and management of all water resources.

Variability and Uncertainty
Water resource availability in space and time is inherently variable. Rainfall quite naturally demonstrates patterns of above and below average. Much of the history of mankind's interaction with water has been related to trying to reduce the impacts of this variability on people. Uncertainty relates to a wider range of issues than variability as there is uncertainty surrounding a whole range of physical and societal issues relating to IWRM. How much water do people receive through their domestic water supply system; what areas are planted under what crops; how much water is being applied in each irrigation cycle, and so on. Reducing this uncertainty is perhaps the most important reason for trying to improve information flows between sectors and levels.

This text is an extract from EMPOWERS Working Paper No.3, available in full at: http://www.empowers.info/page/1070