



Integrated water resource management

Key point

- **Fragmented policies and uncoordinated governance lead to poor services and inefficient resource uses, which are major challenges in water infrastructure in Asian and Pacific countries. Adopting an integrated water resource management approach in designing and managing water infrastructure helps to overcome such problems.**

Integrated water resource management explained

According to the Global Water Partnership (2000), integrated water resources management is a process for coordinating the development and management of water, land and related resources in a way that maximizes economic and social welfare equitably, without compromising the sustainability of vital ecosystems and the environment.¹

How it works

The main objectives of integrated management are to overcome sector-based policy fragmentation and inefficient governance structures and thus achieve more compact water infrastructure in an ecologically and economically efficient manner. This may still require several other policies, but they are aware of each other and connected through a managing system.

The particularly critical objectives are: 1) integrating water resource provision and the wastewater treatment system, 2) optimizing water infrastructure and 3) promoting an environment-friendly water cycle system. Circumstances affect the specific policies. The content and extent of integration depends on the stage of socioeconomic development, geographic features, institutional capacity, financial constraints and public acceptance in a country. Because integrated water resource management is not a concrete blueprint – it is a philosophical concept – policymakers need to consider what should be included and to what extent integration should be conducted.

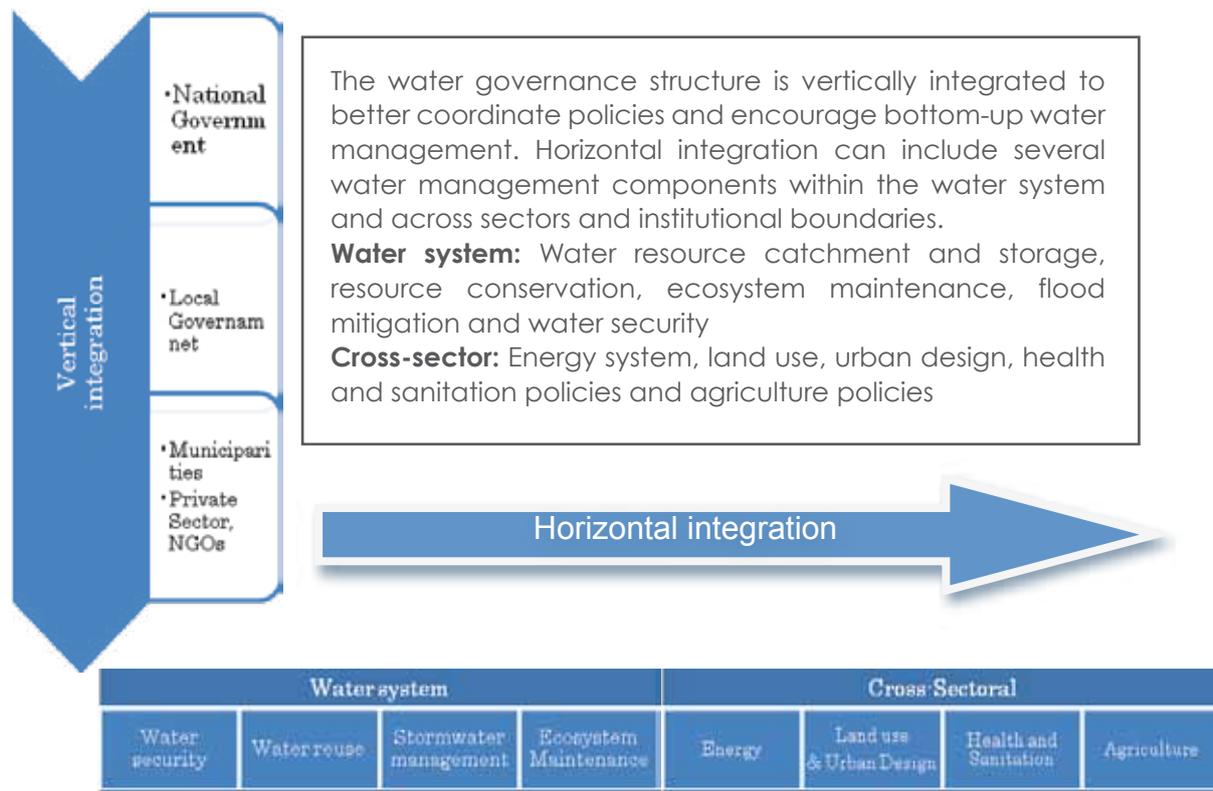
Minimizing the water demand is the first and the most effective step to significantly reduce wastewater treatment needs. Other critical sustaining issues are water resource conservation, ecosystem maintenance, disaster risk reduction, stormwater management and effective land use.

As the following diagram indicates, integration can take place vertically and horizontally. Vertical integration refers to the coordination of governance structures, which includes agencies from the central to local government, municipalities and communities. Horizontal integration refers to a sector-based coordination within the water system and across several sectors, such as health, agriculture and energy.²

¹ Global Water Partnership, Technical Advisory Committee, *Integrated Water Resources Management*, TAC Background Papers No. 4 (Stockholm, 2000). Available from www.unep.org/civil_society/GCSF8/pdfs/IWRM_water_efficiency_eng.pdf (accessed 2 February 2012).

² United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), *The Guidelines for Establishing of the National Strategies for Eco-Efficient Water Infrastructure Development* (Bangkok, UNESCAP and Korea International Cooperation Agency (KOICA), 2011).

Figure 1: Vertical and horizontal integration directions of water resource management



Strengths from integrating water resource management

- **Economic:** The fragmentation and overlapping of policies and systems inefficiently consumes extra costs. Fragmentation between the water supply system and the wastewater treatment system results in requiring more energy costs to piped water resources. Integrating their management cuts costs. Additionally, it is a valuable way to manage water-related disaster risks, such as floods and drought, and can possibly reduce economic losses caused by such disasters.
- **Environmental:** The integration of policies and systems enables water infrastructure to be built or adjusted to be more compact and eco-efficient. This brings several environmental benefits, such as water resource conservation and natural hydrological cycle maintenance. It also significantly reduces energy use in the provision of water and thus reduces CO₂ emissions.
- **Social:** Water policy is particularly correlated with health, gender and agriculture issues in developing countries. An integrated management perspective helps to implement cross-cutting policies. Additionally, because this approach entails the transfer of responsibility and ownership of water resource management from public bodies to communities, it strengthens communities and social capital.

Challenges to integrating water resource management

- **Lack of consideration to local context:** There is no one-size-fits-all blueprint for integrated management. Translating the concept into operations that are appropriate for local contexts requires adaptive work among policymakers. Integration that lacks adequate insight into the local context results in failure.
- **Lack of institutional capacity and arrangement:** Successful integration depends on a balance between management capacity and the level of integration. Lack of institutional capacity can be a major hurdle to integrate several sector-based policies with different interests and views regarding water resources. Lack of a regulatory framework and financial support also leads to unfavourable outcomes.
- **Conflicts:** People's interests and views in water resources vary and are relative to how and where they use the water resources. Upstream and downstream users have different demands in water quality and quantity. This conflict of interests can also emerge in cross-sector collaboration. Thus, any policy integration without adequate consideration to the different interests across sectors and institutions can heighten conflicts in water resource management.

Implementing strategies

Consider context specificity and decide the policy orientation of water infrastructure: To effectively apply the concept of integrated water resource management into policy actions, implementing strategies need to include context-specific consideration, institutional capacity, a regulatory framework and stakeholders' participation. While the basic principles underlying integrated water resource management may be commonly applicable, policymakers need to consider appropriate components and the level of integration.

Build up institutional capacity: Capacity building is needed at different levels of government to achieve vertical integration. In addition, the institutional arrangement is another factor for integration. In particular, a regulatory framework should be harmonized across sectors.

Require inclusive participation: One of the key principles of integrated water resource management is that the traditional top-down approach should be supplemented by bottom-up efforts. Thus, it is significant to integrate and harmonize various views and interests. The sustainable water integrated management and governance project conducted in Baguio City in Philippines is a good example of encouraging various parties' participation. Throughout the project, a total of 22 local water dialogues took place, with 805 participants, including local government representatives, private sector individuals, NGO staff, journalists and village leaders to overcome water system fragmentation.³ This multiparty approach was emphasized during the project so that everyone could clearly identify their role in a sustainable water system.

Develop a mechanism for coordinating activities and mitigating conflicts: Setting a guideline and creating a central committee are possible options for coordinating the interests of diverse actors and to encourage their participation in the decision-making process. For instance, the Republic of Korea enacted a basic water law and established a National Water Council, with an attempt to set up comprehensive institutional and regulatory frameworks for the nation's water resource management.

Look carefully at local contexts, different actors' interests and institutional capacity: Principles of integrated water resource management provide the policy directions. However, sufficient adaptive work is required for integration and thus it is important for policymakers to recognize that consolidating government organizations or sectors do not automatically lead to successful results. They need to also consider the local context, capacity and different points of views and objectives.

Further reading

Integrated Water Resources Management, Technical Advisory Committee Background Paper No. 4, (Stockholm, Global Water Partnership, 2000). Available from www.gwp.org/The-Challenge/What-is-IWRM/.

Integrated Water Resources Management (IWRM) and Water Efficiency Plans by 2005: Why, What and How? Technical Advisory Committee Background Paper No. 10. (Stockholm, Global Water Partnership, 2004). Available from <http://cap-net.org/sites/cap-net.org/files/TEC%2010.pdf>.

The Dublin Principles for Water as Reflected in a Comparative Assessment of Institutional and Legal Arrangements for Integrated Water Resources Management, Technical Advisory Committee Background Paper No.3. (Stockholm, Global Water Partnership, 1999). Available from www.cawater-info.net/bk/iwrm/pdf/tec_paper3_e.pdf.

The Guidelines for Establishing the National Strategies for Eco-Efficient Water Infrastructure Development (UNESCAP, 2011).

³ United Nations Economic and Social Commission for Asia and the Pacific, *Pro-poor Water and Wastewater Management in Small Towns: Integrated Water Management in Baguio City, Philippines* (Bangkok, 2007). Available from www.unescap.org/pdd/prs/ProjectActivities/Ongoing/Water/Baguio/Baguio_MR.pdf (accessed 2 February 2012).