Achieving groundwater governance

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Achieving groundwater governance: the Ecosystem approach and the role of market-based instruments

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Groundwater is an elusive and largely unseen common pool resource. Yet driven by strong economic incentives, whether or not encouraged by existing policies, groundwater users think of it as a 'private good' that benefits them as any other good or service might, and in so doing, they are competing with each other to extract as much as possible and as quickly as possible with devastating consequences for its sustainability. Like many common pool resources, it effective management and governance therefore require a set rules, norms and values that should underpin its development in a manner that is consistent with the ecosystem approach. The challenges faced for sustainably managing such a common resource, on which people have established de facto individual rights are manifold. But creating a market for trades of some kind in ecosystem services associated with groundwater could actually enhance the protection of a critical resource such as groundwater on the basis that protection can benefit individual groundwater users economically as well as provide a broader public good. This piece examines the meaning governance in the *Global Framework for Action to achieve the vision on Groundwater Governance* document and the potential and challenges of using market-based approaches in its implementation, with a focus on developments in conservation policy and law.

What do we mean by governance?

The term governance is as elusive as groundwater itself. It can mean different things to different people but would generally be concerned with how decisions are taken and implemented. Generally, good governance is seen as promoting equity, participation, pluralism, transparency, accountability and the rule of law, in a manner that is effective, efficient and enduring. Such a characterisation suggests that good governance is not only concerned with governmental activity but also private sector and non-governmental actors. Which of these characteristics is seen as most important, and how issues will be resolved will vary greatly, depending on the broader governmental and legal context, but at the

minimum, there must be a means of ensuring that groundwater management schemes are widely accepted as having the legitimacy to enable them to continue, and especially to justify any financial advantages granted to participants. Good governance helps to build trust and confidence among the various stakeholders, which is central to the success of any market-based mechanism. However, the principles of groundwater governance outlined in the *Global Framework for Action to achieve the vision on Groundwater Governance* document would appear to go beyond those regarded above as the basic principles of good governance, to include consideration of wider principles such as the ecosystem approach which is evident in almost all the principles of groundwater governance, as the following analysis suggests.

Developments in conservation policy and law - Ecosystem approach

Since the 1990s, there has been a shift in focus from the narrow species or habitats approach in conservation efforts towards an ecosystems approach. According to the Convention on Biological Diversity (CBD) COP 5 Decision V/6 (2000), this new approach involves 'a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way'.

Central to this is the emphasis on the conservation of ecosystem structure and functioning, in order to maintain ecosystem services. This not only requires adopting a new way of thinking and working but also a shift in focus of policy-making and delivery towards a more holistic or integrated approach based on the entire ecosystem and its functioning. This is based on the increased recognition of the role of the 'natural' environment in providing a range of services, either directly or indirectly.

The more holistic approach encouraged requires a shift in the both the mind-set and practices of many of those who manage and use land. For example, farmers who depend on groundwater ecosystem services are now going to see themselves as 'integrated land managers' who produce food and provide ecosystem services rather than merely 'food producers'. This will require adaptive management to produce the ecosystem services that groundwater underpins but there are particular challenges as to how such adaptive management practices will be reconciled with established agricultural and other uses on specific lands where multifunctionality is yet to be recognised and the costs associated with such changes.

A starting point in the shift in our policies and practices to reflect the value of land (and groundwater) in providing ecosystem services is to calculate in economic terms the value of such services and to ensure that this is properly taken into account when decisions that affect the state of undeveloped land are being taken. Such an approach would fit the groundwater governance themes, by ensuring that the provision of groundwater ecosystem

services is integrated with other land uses and that there is coordination with other water sources. This is important because available evidence shows that the spatial layout of ecosystems is important for the interactions that give rise to ecosystem services. For example, linkages between ground water, surface water and rainfall within in the area of a river catchment mean that impacts on any one of these can affect hydrological processes within the catchment and the ecosystem services linked to these processes, such as clean water provision. Equally, the social value of ecosystem services (e.g. the thermal springs in Salto, Uruguay) relates spatially to where they are consumed, hence the emphasis on context-specific groundwater management.

Lessons from biodiversity conservation policies

The need to establish linkages to other water resources and to other sectors in groundwater governance requires not just better scientific understanding of these linkages but also provides an opportunity to look at the potential lessons from approaches already adopted in the management of other resources. Along these lines, developments in conservation policy and law are creating opportunities to look at habitats and their management in a new way, based on identifying and valuing in economic terms the ecosystem benefits that undeveloped land can provide.

Traditionally conservation law has been based on prohibiting direct harm to species and designating areas of habitat that have to be protected. Now there is interest in new approaches, in particular:

- biodiversity offsetting, whereby harmful development in one place is permitted if provision is made for compensating enhancements elsewhere, so that there is no net loss to nature overall;

- payment for ecosystem services, whereby there is recognition that "natural" land provides benefits to neighbours and the wider community (e.g. flood protection or recreational or aesthetic value) and payment is provided to ensure the maintenance of these services.

These approaches mean that there are opportunities for wetlands and aquifers to be re-evaluated. For example land where groundwater-related ecosystem services can be enhanced or established might be valuable as potential offset sites for developments elsewhere (e.g. building infiltration wells along the head area of one aquifer in order to store surpluses of water in the wet periods to offset for overexploitation of a nearby aquifer), whilst identifying the actual and potential ecosystem services that the groundwater can deliver might provide an income stream for land which is currently unproductive, thereby encouraging balance (rather than competing) of use from sources

that allows hydraulic equilibrium to be established in the aquifer. Although there is acceptance that groundwater should be under public stewardship and that the role of the private sector should be supplementary, the possibility of extending such approaches to groundwater has not yet been fully explored but may be a significant issue as our understanding of the inter-linkages between groundwater and various ecosystems and ecosystem services, and the vulnerability and resilience of groundwater-dependent systems improves.

There are significant challenges in the adoption of the new approaches. For offsetting, for example, this will include devising legal mechanisms to provide long-term guarantees for the protected land, whilst allowing some flexibility. For payment of ecosystem services , an important challenge will be determining whether payment should be based on "inputs" (e.g. work done to maintain or enhance groundwater levels) or "outputs" (e.g. the actual benefits delivered, such as the quantity and quality of groundwater benefited), noting that these may be separated in time by many years.

In addition to resolving the legal issues in creating appropriate mechanisms to implement such ideas, a fundamental requirement is sound science that identifies the actual and potential value of aquifers from this new perspective. Knowing what ecosystem benefits groundwater is currently providing, and could provide (and their value), is an essential building block in operating any offsetting or payment scheme and may call for a shift in emphasis in scientific research.

For further information:

- Global Framework for Action to achieve the vision on Groundwater Governance available at: http://www.groundwatergovernance.org/fileadmin/user_upload/groundwatergovernance/docs/general/GWG_FRAMEWORK.pdf

- For more information on applying the ecosystem approach to groundwater governance and management, see CGIAR Research Program on Water, Land and Ecosystems (WLE) 2015 report on Groundwater and ecosystem services: a framework for managing smallholder groundwater dependent agrarian socio-ecologies - applying an ecosystem services and resilience approach, available at: http://www.iwmi.cgiar.org/Publications/wle/corporate/groundwater_and_ecosystem_services_framework.pdf

- More information on developments in conservation law and policy can be found at CT Reid, 'The Privatisation of Biodiversity? Possible New Approaches to Nature Conservation Law in the United Kingdom' (2011) 23(2) Journal of Environmental Law 203-232.