

## Ecosystem services

### Linking property rights, ecosystem services and water resources

A WRC-funded publication introduces property rights, ecosystem services and associated concepts as they relate to water resource management; to illustrate their importance and relevance to the South African situation.

#### Background

A team of researchers conducted a research project for the Water Research Commission. The project was entitled 'Embedding property rights theory in cooperative approaches to the management of aquatic ecosystem services in South Africa'.

In conducting the research, engaging with other researchers and stakeholders, and compiling various reports four things became apparent, namely that well-defined property rights can make an important contribution to the equitable, efficient and sustainable allocation of the benefits derived from water resources; that the concept of property rights is poorly understood in South Africa; that water resources supply a host of ecosystem services; and that failure to develop and apply appropriate property rights regimes compromises attainment of the intentions of the National Water Act.

The final report aims to introduce property rights, ecosystem services and associated concepts as they relate to water resource management; to illustrate their importance and relevance to the South African situation, and to do so simply in a way that promotes a broader understanding and appreciation.

#### Ecosystem services

There are many ways in which people benefit from access to water resources. As competition for access to benefits increases, trade-offs among users become more necessary and complex. For some the trade-off may be measured in economic terms, while for others it may pose a threat to survival.

The only way in which we can achieve 'some for all, for ever' is to be able to regulate access to benefits of water resources



*Umngeni Vlei Nature reserve where farmers have negotiated the right to graze cattle*

so that adjustments can be made in response to changes in supply and demand for benefits. Internationally and in South Africa there is a growing research focus on understanding the water resource allocation process so as to address issues of scarcity, equity and sustainability. This research brings together the concept of property rights; of the water resource as a common pool resource; of cooperative approaches to water resources management; of the bio-physical nature of water; and of aquatic ecosystem services.

## What is a right?

A right provides us with the legal, social or ethical freedom to act or behave in certain ways. A right usually relates to the benefits we obtain from someone or something – a right to benefit from access to clean drinking water, for example. Rights come with responsibilities, to behave according to the rules.

Cattle farmers in the upper-Umngeni catchment have negotiated the right to graze cattle in the Umngeni Vlei Nature Reserve from the landowner, Ezemvelo-KwaZulu-Natal Wildlife (EKZNW). So, they have secured a right to benefit from the wetland. The right is regulated through contracts which contain numerous rules – who has access, how many cattle may be grazed, when can they graze, what are the costs etc.

## What is a property right?

Legally, in South Africa, all water resources are public property – they are 'owned' by the State and managed in the public interest. In the upper-Umngeni catchment Umngeni Vlei Nature Reserve is public property, owned and managed by EKZNW. That is quite simple. However, downstream of this the Umngeni River flows through wetlands that are on private property. The landowner manages and is able to sell on this land and its wetlands. The landowner can, effectively, exclude others from benefiting from the wetlands.

Despite this the state can intervene should it believe such intervention to be in public interest. Also downstream of Umngeni Vlei is a large dam, Lake Lyndhurst. It is surrounded by a syndicate of landowners who each own about 20 ha of land. However, the dam itself constitutes common property – it is owned and managed by the syndicate for the collective benefit of the members.

While we are usually conscious of property to which we have been granted specific rights, we are less conscious of property rights that we share with others. For example, we share national parks, dams and the sea-shore and we exercise our

rights to access and use these resources. However, we sometimes share in ways that exclude others, particularly when the resource is scarce and use by one person reduces the ability of another person to use the resource.

## The water resource as an ecosystem service

An ecosystem comprises a set of assets each of which delivers a set of benefits. The water resource, is not just about water. It includes the aquifer, river, lake, wetland or estuary that contains and directs it and the life directly supportive of and supported by water.

This water resource delivers multiple ecosystem services which benefit society and individual people. The Millennium Ecosystem Assessment divides these services into four inter-linked groups. These include provisioning services, such as food and water, which are tangible benefits that we make direct use of; cultural services, which are less tangible; and regulating and support services such as the purification of water and air, climate regulation and crop pollination, which acts as the ecological foundations for the other services (and for each other).

## The South African experience

In South Africa, with few exceptions, very little research has been conducted on how property rights affect the allocation of the full range of benefits we derive from water resources. But we can draw on numerous case studies to illustrate the effect.

### Pongola River floodplain

The Pongola River floodplain has been the home of the Thonga people for thousands of years. Their lives revolved around the seasonal flooding of the system which delivered many benefits from nutrient rich soil for subsistence agriculture, water for domestic use, pastures and stock watering, to fish for food. In 1973, the Pongolapoort Dam was built, and the lives of the Thonga people changed for ever. The supply of aquatic ecosystem services from the floodplain was disrupted in ways that diminished the ability of people to sustain their well-being and their social cohesion. The result is that conflict has dominated proceedings for the last 20 years.

#### What has happened?

- **Boundaries** – prior to the upstream dam being built those who had rights of access and the benefits they could access were well defined through a customary rights regime administered by the traditional authority.

Central government control of flood releases introduced stakeholders acting from outside of the system known by the people of the Pongola Floodplain; the government changed the boundaries of the biophysical resource and of those who had access to that resource.

- **Benefits and costs** – prior to the dam for the people of the floodplain, benefits matched costs and returns mostly exceeded investments. Post-dam, the balance became distorted.
- **Collective choice** – Prior to the damming of the river communal decision-making involving the users took place. Post-dam decision-making relating to flow was carried out by central government authorities largely without consultation.
- **Monitoring** – prior to the dam local users understood and monitored the biophysical conditions of the floodplain and the way rights were exercised. They adapted their resource-use behaviour based on what they encountered. Post-dam while locals continued monitoring they encountered unfamiliar flow conditions consequent on monitoring and decision-making by central government that did not acknowledge accountability to the people living downstream.
- **Sanctions** – prior to the dam rights were granted, recognised and respected. Where resource users broke the rules they were penalised accordingly. Post-dam with critical decision-making occurring outside of the customary system it became increasingly difficult to exercise authority at the local scale.
- **Rights to organise** – prior to the dam rights to organise at a local level were recognised and encouraged. Post-dam, while these rights were still recognised, rights were being negotiated outside of the traditional authority. The resultant legal pluralism caused uncertainty at best and opportunity for exploitation at worst.

It can be concluded that the pre-dam era was characterised by strong governance through a common property regime that regulated, in an equitable and sustainable manner, who could access the various aquatic ecosystem services and under what conditions they could be accessed. The post-dam era has been characterised by unstructured governance underpinned by a weak and inappropriate property rights regime.

## Where to from here

The report lists a couple of key lessons regarding property rights, ecosystem services and water resources.

- We cannot move forward toward a just and sustainable society (environmental justice) if we will not acknowledge the full range of aquatic ecosystem services and their beneficiaries.
- Our current approach to ecological sustainability is focused on sustaining the supply of benefits. To be successful we must also learn how to better manage the demand for benefits.
- We do not have to reinvent the wheel. Property rights evolved over thousands of years and offer the instruments to manage demand for benefits.
- We have reached a stage in South Africa where we have sufficient knowledge and understanding to engage in action research that focuses on giving effect to managing for 'mutual benefit' while sustaining the resilience of the resource.

### Further reading:

To order the report, *Linking property rights, ecosystem services and water resources: An introduction* (**Report No. TT 554/13**), contact Publications at Tel: (012) 330-0340, Email: [orders@wrc.org.za](mailto:orders@wrc.org.za), or Visit: [www.wrc.org.za](http://www.wrc.org.za) to download a free copy.