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The WRC operates in terms of the Water Research Act (Act 34 of 1971) and its mandate is to support water research and development as well as the building of a sustainable water research capacity in South Africa.

Business and water resources development integrated: The case of Saldanha Bay

A Water Research Commission (WRC) study has been completed on managing water as a constraint to development with decision-support tools that promote integrated planning: the case of the Berg River water management area.

Rationale

There is an increasing recognition that the combined effects of climate change, population growth and continued urbanisation are exerting pressure on limited water resources. At the same time, economic growth remains vital for alleviating poverty, unemployment and inequity.

Therefore, growth is required in spite of significant water resource constraints. At issue then is how to allocate water optimally to enable economic growth, while also ensuring that human needs are met and ecological systems maintained.

Understanding of the economic impacts of water access is limited, and there is a lack of tools available to address the trade-offs that may be required when allocating water in a water scarce system. This is needed in particular in water-constrained catchments where all readily available water is already allocated, such as the case of the Berg River water management area (WMA).

In such catchments, future development requires additional water resources, either through the development of new resources or the reallocation from other users within the WMA or beyond, for example, via inter-basin transfers.

A three-year study aimed to better integrate water into economic development planning, and vice-versa was initiated. The project aimed to develop actionable insights and tools for governmental decision-makers that link water as a resource and its availability to economic outcomes in terms of growth and job creation.

The project structure was highly collaborative (action research), utilising research generated by Masters students at the University of Cape Town (UCT) African Climate and Development Institute (ACDI) and adapting the approach

and outputs to the evolving requirements of government stakeholders. The Berg River WMA was selected as a case study area.

Analysis was done on the (potential for) integration between development planning, water allocation and water resource development processes, with an emphasis on enabling implementation of the findings.

The analysis aimed to understand how decision support tools could add value to existing legislated processes by filling knowledge gaps or by providing a collaboration mechanism. This analysis highlighted how the Integrated Development Plan (and SPLUMA) is the key integrated planning tool, but that it is not taking water resource availability sufficiently into account.

Furthermore, that the municipalities, which are also the Water Service Authorities (WSAs), do not have the capacity nor resources to develop their own local water resources, and are struggling to access water from the regional schemes, managed nationally by the Department of Water and Sanitation. In this context, provincial government has a coordinating and supporting role to play. The study was co-funded by the Provincial Department of Economic Development and Tourism.

Aims

The main aim of this project was to conduct analysis on how economic development can be met when water resources are over-allocated. The following were the core research objectives:

- To develop a guideline for a planning approach that recognizes the cyclic interdependency of economics and water resources
- To conduct an economic, social and environmental Cost Benefit Analysis (CBA) and Cost Effective Analysis

(CEA) of economic developments and water resource interventions

- To build a spatial hydro-economic model (HEM) for use as a tool to manage regional allocations in constrained catchments, which can be customized for use in other regions/ contexts
- To develop research products in close collaboration with decision-makers, and implement research outcomes to address current development challenges

Study approach and product

The Berg River WMA refers to the Berg Catchment area within the Berg-Olifants WMA. The Berg River WMA comprises the Upper Berg area which includes the Berg River catchment down to Misverstand Weir; the Lower Berg area, which includes the downstream reaches of the Berg River together with areas along the west coast including the Diep River catchment and the Greater Cape Town area.

The Berg River WMA includes a number of local municipalities, as well as the City of Cape Town metro. This region was the focus for the study, and wherever possible the boundary of the WMA was the extent of the study analysis.

The exception to this was during some of the economic analysis of the local municipalities, where those municipalities fell across the boundary but where it was difficult to distinguish the specific economic outcomes for the proportion that fell within the WMA.

Additionally, Saldanha Bay Local Municipality, was the focus for the “local tool” intervention, and many engagements were held within the municipality to assist with the water constraints being experienced and the impact that this was having on the development potential of the area.

The analytical focus area of the study was largely concerned with the impact of water availability (i.e. not water quality) on the economic outcomes of the region (i.e. jobs and investment). The assessment of the planning systems looked into the intersection of development planning, water allocation and water resource infrastructural development.

The economic analysis valued water on the basis of Gross Value Add (GVA) and employment. The calculation of water requirements was based on water access for production and human consumption. Therefore, the impact of water availability on the environment was not included in the analysis.

A regional hydro-economic GIS tool was developed to understand how water scarcity may constrain development in local economies within the Berg River WMA, currently and into the future due to exogenous factors such as climate change. The study links water usage to economic indicators (e.g. gross value add (GVA), jobs) to highlight where these constraints have the most significant economic implications, thereby allowing for the prioritisation of interventions to improve water supply to particular local economies.

The results indicate that under all climate change models, as expected, irrigated agriculture will require more water to remain sustainable. However, at the same time, urban centres will demand increasingly more water. The water required for urban areas generates greater value to the regional economy, with the City of Cape Town continuing to dominate regional economic outcomes.

However, when water is analysed as a constraint to the local economy, the West Coast municipalities of Swartland, Saldanha Bay and Bergvliet emerge as the municipalities where water is likely to be a significant constraint to future development, unless water supply augmentation options are developed urgently.

In the case of Saldanha Bay, where water is already a constraint to development, a Multi-Criteria Decision Analysis (MCDA) tool (weighted criteria, using Excel) was developed that allows the municipality to prioritise new development applications on the basis of the socio-economic outcomes from the various projects in comparison to the water required, rather than just allocate water on a first-come-first served basis.

This tool allows for transparent and collaborative decision-making (arriving at trade-offs) that assists the municipality in improving the livelihoods of their community and increasing the productivity of water in the local economy.

The project outcomes have been shared with local stakeholders responsible for development planning and water management. The tools have been favorably received with provincial government departments declaring their intent to adopt them immediately.

Conclusions and Recommendations

Overall, the project is considered a success on the basis of having developed tools that meet the needs of the intended beneficiaries, enabled capacity development for water sector challenges and allowed knowledge sharing at

a national level (primarily through conference presentations and publications).

Significantly, the project has had impact in terms of creating awareness of the need for integrating water resource planning and economic development planning – there is clear evidence of a change in awareness and mindset within key institutions and individuals involved in water resource planning and economic development planning in the Berg WMA, and agreement to adopt the tools in two provincial government departments.

The work is considered replicable in other water constrained catchments, and with both the key institutions committed

to further dissemination of the work and continued engagement with relevant stakeholders in the Berg WMA, the impact of this project is expected to be extended further in future.

It is critical that the Provincial Government and Local Municipalities/Metro include the water and economic development tools, strategic plans, such as IDP, SPLUMA, etc. This indeed must be accompanied by appropriate capacity to implement the guidelines.

Further reading:

To obtain the final report for the project, Economic development under water constraints guidelines (**Project no. K5/2453**) contact publications at Tel: (012) 761-9300; Fax: (012) 761-9300; Email: orders@wrc.org.za or Visit: www.wrc.org.za.