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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.

TECHNICAL BRIEF

Water resource management

Water as a driver of regional economic integration

A completed Water Research Commission (WRC) study explored the role of water as a driver of regional economic integration in Southern Africa.

Background

The availability of water has underpinned the development of a number of early civilisations, from Central America, Egypt and Mesopotamia to India, Java and China.

The historic linkages between water and socio-economic development in regional delineated by water has led to a widespread belief that water and its management can contribute to regional social and economic development and integration. Since regional integration remains a political and economic priority for Africa, the management of water resources in shared rivers has been identified as an important area for cooperation.

This WRC study addresses the general question of how the development, management and use of water resources contribute to promoting sustainable socio-economic development, which is usually cited as the primary goal of regional integration in Southern Africa.

It also reflects on evolving concepts of regional integration and the relevance of new ideas about regionalism to the discussion. Since much of Southern Africa's surface freshwater flows in rivers that are shared by a number of countries, it focuses on the specific challenges that these present and considers emerging forms of environmental regionalism and governance.

Main results and discussion

A review of evolving ideas about regional integration raises some questions about the validity of this assumption. While the initial drive for integration in Africa was political, attention is currently directed to its potential economic benefits.

There is an expectation that, by improving competitiveness and productivity, economic integration will help African countries to address the small size of most of their economies, the lack of structural complementarities between them as well as their dependence on imports to meet most of their needs.

In this context, one objective of regional integration is to ensure that the availability of key inputs to the economy, such as water, power and transport at reduced costs. But it is not obvious that the development achievements of the 'hydraulic past' can be replicated in the twenty-first century.

Technological innovation has provided many, often cheaper, alternatives to water as a source of power and a means of transportation. It has enabled the development of water-supply schemes that can capture water over a wide area and transport it, relatively economically, over long distances.

Investment in transport and communication infrastructure has opened up new areas for agricultural production. These factors have reduced the location-specific importance of water, whose availability thus no longer provides a unique stimulus for economic development.

There are similar grounds for questioning the contribution of water resources to regional economic integration. Whereas transportation and communication require the establishment of compatible infrastructure to enable neighbouring countries to interact and trade, water resources provide their own 'network infrastructure' in the form of rivers and lakes.

The large volumes of water required for economic purposes and their relatively low value means that the physical tradability of water is limited. Only in specific circumstances will

it be possible for the required amount of hydropower to be generated or, more rarely, water to be supplied to users, more cheaply by infrastructure shared by more than one country than at national or local level. Even then, the transaction costs and inherent risks of such cooperative arrangements may reduce their attractiveness.

Empirical investigation reinforces the need for caution. There is limited evidence of a significant potential in southern Africa for a direct contribution of cooperative water resource development and management to regional economic activity.

There is relatively limited trade in water-related production. There are not many high-impact strategic projects that, through cooperation, could yield significant net regional benefits much less directly promote greater regional integration and the value of proposed regional water projects is small relative to other infrastructure sectors. In addition, the inherent risks and transaction costs have constrained cooperation in a number of ways.

Is there scope for cooperation around water?

This is not to deny the obvious scope for cooperation. There have already been significant, usually bilateral, cooperative interventions in the region. The Lesotho Highlands Water Project augments water resource availability in South Africa and generates significant public revenues for Lesotho.

Joint power generation projects between Zimbabwe and Zambia and between Namibia and Angola contribute to those countries' electricity needs. Cooperation between Zimbabwe, Zambia, Mozambique and Malawi has helped to mitigate floods on the Zambezi. But these cooperative activities are limited in number and scale.

Further opportunities identified include hydropower projects that could serve regional needs although these are often only marginally cheaper than national electricity generating projects. The perceived benefits of cheaper generation may be outweighed by the costs of transmission and the perceived risks of dependence on external supplies.

Underlining the limited contribution of water to regional integration through power generation is the fact that the region has an expanding range of energy alternatives available to it – oil, gas, coal as well as new renewables. As a result, the proportion of electricity contribution derived from hydropower is unlikely to grow with the decline in the proportion of energy sourced from coal balanced by the increase in that sourced from gas and new renewables. Only the rapid development of the full potential of the Inga scheme in the Democratic Republic of Congo could alter this.

Greater cooperation in the operation of dams to regulate flows in the Zambezi River could further mitigate the impacts of floods and droughts more effectively than at present and yield more power, more reliably while still supporting agriculture and environmental protection. However, this would benefit some countries while imposing costs on others, notably upstream irrigators, and the design of a satisfactory compensatory mechanism to address this will present substantial political challenges.

The uneven distribution of water resources across the region as well as the fact that there is a relatively weak correlation of rainfall variability between different zones across the region also creates potential complementarities that could support regional cooperation in agriculture and strengthen food security.

But the political challenges of restructuring food production across 15 sovereign countries, in many of which agriculture is the mainstay of the economy and society, cannot be under-estimated.

How does water contribute to regional integration then?

The region's water resources may, nonetheless, contribute indirectly to regional integration. If and when shared transboundary rivers become more heavily used and competition emerges between actual and potential users, the management of potentially negative impacts on one country by the actions of another will become more important.

In this regard, the establishment of institutional arrangements to avoid conflicts, whether formal organisations or simply effective liaison, will do more than avoid unnecessary constraints on resource development and use. It may contribute to wider political and economic integration by demonstrating to sceptical national audiences that regional integration is not just possible but also beneficial.

The approach taken to achieve such cooperation is important. There has been a concerted effort to establish formal river basin organisations for water management in Southern Africa's shared rivers. But the study concludes that this has been driven primarily by environmental considerations, and a desire to establish new forms of environmental governance within environmental rather than administrative or political boundaries, a practical example of a 'new regionalism'.

It makes technical sense to use river basins as preferred geographical unit for hydrological and ecological analysis. However, successful water resource management requires engagement between water users and water for policy, monitoring, regulatory and financing purposes as well as for accountability to the wider society.

And most water users are organised at scales that reflect political boundaries while water uses occur within economic rather than hydrological boundaries. So the study suggests that regional integration will be more effectively supported if water management institutions are organised at those scales; focused on 'policy-sheds' or 'problem-sheds' rather than watersheds.

Conclusions

Based on these considerations, the key conclusion of the study is that, while the development and use of the region's water resources may not make a major direct contribution to regional integration, they do have the potential to make a significant indirect contribution.

Political symbolism may be more important than actual outcomes. Water may contribute to regional integration precisely because there are limited interactions on shared rivers and countries have less to gain or lose than in other domains, which makes it easier to cooperate.

The greatest contribution that water resources and their management can make to regional integration may be to show that cooperation for mutual benefit can, on occasion, generate greater benefits from all parties than through national action alone.

The study concludes with some practical recommendations for approaches that could ensure that water resource management contributes to the SADC goal of greater regional integration.

One recommendation is that the focus of cooperation should be functional rather than institutional – addressing specific shared problems rather than establishing institutions to deal with them if they arise. This recommendation is equally applicable to wider approaches to integration which are currently under discussion in Southern Africa.

The other key recommendation is that approaches to water management on shared rivers should by 'hydro-supportive' rather than 'hydro-centric'. Cooperation to achieve the region's socio-economic development ambitions is more likely to gain support and produce results than a focus on environmental protection.

Further reading:
To order the report, *The role of water as a driver of regional economic integration in Southern Africa* (**Report No. 2252/1/14**) contact Publications at Tel: (012) 330-0340, Email: orders@wrc.org.za or Visit: www.wrc.org.za to download a free copy.