

PERSPECTIVES OF GLOBAL WATER BALANCE AND REGIONAL WATER RESOURCES

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Summary

The current water discourse is characterised by the changing water paradigm which places more emphasis on the sustainable use of the planet's water resources than ever conceived of in earlier or even ancient times. Traditionally global and regional water resources were thought of as an ever lasting supply to furnish the needs of human societies and thereby assisting in socio-economic development. Yet, the altering water paradigm also brought about a sea change regarding our perspectives of freshwater resources. Two notable perspectives are in the contemporary era put forward as alternative perspectives. The first is virtual water, with its accent on commodities, mostly food stuffs, found in the international political economy and also within regional economies. The other being that of blue and green water with its emphasis on the interaction between humans and ecosystems from which economic services are derived. Both these perspectives on the global water balance and regional water resources can bring us closer to the sustainable use of the earth's freshwater resources.

1. Introduction

As one of the most important resources available to all life support systems, and constituting such a system itself, water resources are becoming more and more exploited while the quantity and quality thereof is becoming inextricably limited. This is due to the fact that a number of constraints and limiting factors, such as population growth, industrialization and urbanization, is taxing global and regional water resources to their limits. If this sounds very pessimistic, there is however room for optimism. This

idealism lies in the fact that there are different perspectives regarding the global water balance and regional water resources. These perspectives can offer practical solutions to our water problems and can become one of the major practices of future generations to develop and use the water in the hydrologic cycle in a more sustainable manner. In this article the different perspectives of the global water balance and regional water resources will be discussed.

In the first section of the article an overview will be given of the changing water paradigm that highlight the move away from traditional water practices and uses, which are intervening in the global water balance and regional water resources in a profound manner. The new water paradigm also maps out the innovative thinking about the water resources contained in the global hydrologic cycle. In the second part of the article the perspective of virtual will be outlined, with the notion of blue and green water coming under scrutiny in the third section that might give some measure of optimism regarding the future of global and regional freshwater resources. Virtual water is prominent in the current thinking on global and regional freshwater resources in that it provides humans with a possible way out of the water predicaments we are facing. Another perspective with respect to current thinking on global and regional water resources, is that of green water and blue water. Both virtual water and green water and blue water have certain levels of scarcities, that are influenced not only by natural occurrences but also by anthropogenic factors, which is mostly of a political and/or political-economic nature.

2. An Altering Water Paradigm

From the onset it is important to note that water scarcities are a local, or river basin, phenomenon. The importance of this is quite extreme regarding strategic decision-making, for it allows for a conceptual difference to be developed between water scarcity at a local level, and the search for a solution at the regional or global level. Although there is enough water on earth, the distribution thereof is of such a nature that it is in abundance in some places and in others it can be extremely scarce. Water is therefore both scarce and bountiful over space. Not only that, it can also be limited or ample over time. Some regions of the world might experience periods of adequate rainfall while at others droughts can persist for some time. For instance, due to the El Niño/Southern Oscillation (ENSO) effect (see article *The Impact Of El Niño On Water Resources*) Southern Africa have seen over the past 20 years periods of drought (1981-1985 and 1990-1995) with intervals of sufficient rainfall that provided for most of the water requirements for the economic activities of the region. During such periods of drought many rivers will not be able to supply water to large urban, industrial and agricultural communities. In fact, during the severe drought of the 1930s in South Africa many of the large and important rivers, like the Orange and Vaal Rivers, stopped flowing. Rivers are therefore an important part of the hydrologic cycle and an important source of water for humans.

Current opinion shows that there are essentially three main drivers of the expansion in water resource infrastructure in the Twentieth Century. These are:

- Population growth.
- Industrial development.

- Expansion of irrigated agriculture.

For millennia humans have devised a number of measures to decrease our vulnerability regarding erratic river flows and rainfall patterns by mobilising natural waters (mostly river flow) to suite our basic (drinking purposes) and economic needs. Humans have intervened in the hydrologic cycle at an increasing rate over the centuries respectively. This was furthermore increased by the Industrial Revolution and rapid population growth (see article *The Impact of Demography on Global and Regional Water Resources*) of the nineteenth and twentieth centuries. This led to an even more dramatic and extensive change of the hydrologic cycle of the earth/atmosphere environment. The twentieth century has witnessed an unprecedented building of enormous engineering projects to supply people with more water for basic needs and for other purposes such as flood control, hydro-electric power generation and irrigation. This has led to a change in the thinking of water management that was not contemplated during ancient times.

A fundamental characteristic of traditional water resources planning, is that it has regularly and persistently concluded that future water demands will exceed actual water supplies, mainly due to the unchecked advancement of the three drivers. This will be called supply sided management (SSM). In terms of current social science theory, this form of management tends to focus on what has been defined as a first order resource scarcity - i.e. the scarcity of a natural resource such as water. Supply Sided Management was the dominant mode of water development and management in the United States of America (USA) prior to the 1980's, with the Bureau of Reclamation (BoR) and Army Corps of Engineers (ACoE) being the main instruments. Significantly, these organizations spawned a global paradigm due to the fact that they trained many of the hydraulic engineers who subsequently went on to construct the world's largest dams.

The main concern with respect to change in thinking about water resources development is that of sustainable water use. The scale of water mobilization has thus altered from modest scale water management construction endeavours to sustain local and relatively small populations to larger and grander projects for huge (in terms of population and economic productivity) societies.

Yet, during the last part of the twentieth century another change in the thinking about freshwater resources management and the human needs for water has taken place - the so-called changing water paradigm. Conventional planning and management system and approaches and a dependence on physical solutions continue to dominate the water discourse in many states and regions around the world. However, new methods are in the process of being developed in order to use the current infrastructure available to meet the demands of growing populations and economies without the construction of major water resource management projects (WRMPs). The improvement of the efficient use of water, demand management and the reallocation of water resources between different users are now being considered at an increasing rate by water planners and managers. The new change in the thinking about water resources management has not being easy to say the least. Old habits die hard. There has been strong opposition between and inside organizations responsible for water resources management. For

instance, during the 1990s the Namibian government started with plans to pipe water from the Okavango River to supply water to its urban and industrial centres in the central regions of the country. These plans were feverishly opposed by environmental interest groups, concerned about the ecological integrity of the Okavango Delta. These non-state entities even came up with alternative plans to augment Namibia's water supply. One of these plans was the implementation of water demand management (WDM) across the entire country. Yet, the strategies of the interest groups were countered by the Namibian government, invoking the sovereign right of a state to develop its water resources as it sees fit. Furthermore the methods mentioned are not yet globally accepted practices and they may not be a permanent solution to our water problems.

Notwithstanding these barriers, the new water paradigm is here to remain in addressing unresolved water problems. States have already started with the implementation of some of these measures and interest groups are already advocating the implementation of some of these actions such as in the case of Namibia. For instance, WDM has been initiated by a number of states in the Southern African region. Most notable of these are Botswana and South Africa. In South Africa the working for water programme (WWP) is but one of these actions with respect to the change in thinking about water resources management. The WWP is an initiative build on the approach of the eradication of alien plant species within individual river basins. These plants use a lot of water and by getting ride of them can improve the run-off of rivers and streams. In Botswana the Water Master Plan (WMP) proposes that WDM should be initiated alongside expanding water supply sources. This is a departure from earlier approaches that concentrated on water supply management (WSM). These changes in the thinking about water resources management represents a change in the paradigm of human water use. Many environmental interest groups have adopted the promotion of such measures as a central feature of their policy and influencing endeavours, in order to bring about more sustainable water planning efforts on the part of governments around the world. Currently the World Conservation Union (IUCN) in Southern Africa has, over the past two years, running a project on the implementation of WDM in the region, and are now looking at the constraints that can affect this water management strategy.

What brought about this changing water paradigm? The traditional approaches regarding water planning are beginning to change at an ever increasing rate due to a number of factors. Yet, many traditional approaches are still firmly entrenched in the hearts and minds of water policy planners, managers of water projects, individuals involved in the water discourse and states.

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Biographical Sketches

Richard Meissner received his training as a political scientist at the Rand Afrikaans University (RAU) in Johannesburg. He obtained a Magister Artium (M.A.) degree in Political Studies from the same university in 1999 and is currently busy with a D.Phil. in International Relations at the University of Pretoria (UP). He was one of the first students in South Africa to complete a Master's thesis on water politics.

He was employed by the Political Studies department at the Rand Afrikaans University from 1996 to 1998 as a research assistant. He is currently employed as a research associate by the African Water Issues Research Unit (AWIRU) which he joined in 1999. He was involved in a number of studies regarding the management of national and international water resources in Southern Africa and the Middle East. He has

also written a number of articles which were published in accredited journals. His scope of interest lies within the field of water politics and particularly the interaction of diverse actors within the domestic and international domains regarding water resource issues. Richard Meissner is a member of the South African Political Studies Association and the South African Institute of International Affairs.

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