Water International
Vol. 33, No. 3, September 2008, 274–278

Current directions: integrated water resources management – a second look

In 2004, *Water International* published my paper on "Integrated Water Resources Management: A Reassessment". I have been asked by the present editor to take a second look at my thoughts back then as an introduction to this collection of papers, each claiming to address integrated water resources management (IWRM) issues in a different way. I have taken that second look. I have not changed my mind.

The previous paper was written because of my increasing concern that the concept of integrated water resources management (IWRM) for macro- and meso-scale water policies, programmes and projects is proving very difficult to implement, at least in the 18 countries that I have been advising over the past decades. It became apparent that the IWRM concept and its implementation raised more questions than we had answers for, and also that it is very easy to talk about IWRM, but very difficult, if not impossible, to implement it in the real world. It has proved quite easy to organize meetings and activities on IWRM at national, regional, and international levels since most donors and international organizations have decided that the *mantra* of IWRM will lead the world to water resources *nirvana*, and, accordingly, they were, and still are, pumping an immense amount of funds into IWRM-related activities, irrespective of implementational complexities and failures.

My main objective in writing the paper was that the water profession needed to carry out a serious and objective debate to see whether, how and where IWRM is being implemented, extent of its implementation, and whether the concept, if implemented, is producing positive results which would not have occurred otherwise. If the concept is not being implemented, what are the constraints, and how can these constraints be realistically overcome?

The reactions to the paper, as soon as it was published, were immediate and overwhelming. More than 90% of around 670 comments received were complimentary. They felt that the paper had raised many very fundamental problems, both in terms of the concept and its implementation, with which they have been wrestling for some time as well. They were thus pleased that these fundamental questions were brought out of the closet so that they can be dispassionately discussed.

The impact of my paper far exceeded my wildest imagination. The paper has now been translated into many different languages, and has been quoted extensively. In fact, if one puts in Google "Biswas integrated water resources management water international", it lists 8980 citations. Following its publication, at least two major international agencies have expressed second thoughts about promoting IWRM.

The publication of the paper also unexpectedly brought out the worst in some people. One very senior person from the Global Water Partnership pressed one of our funding supporters to cut off our financial support! Fortunately, the concerned funding institution has a high level of integrity, as a result of which they not only totally ignored this crude and unethical attempt to suppress proper scientific discourse, but also brought this unethical approach immediately to my attention, and assured me of their continued support for our work.

ISSN 0250-8060 print/ISSN 1941-1707 online

DOI: 10.1080/02508060802272812
http://www.informaworld.com

Since the publication of the paper, our Centre has been involved in two major studies on a regional basis to determine if IWRM is being implemented, and, if so, to what extent it is better fulfilling the goals and objectives of water management. The two studies focused on south and southeast Asia (Biswas *et al*. 2005) and Latin America (Biswas *et al*. 2008). Both these studies further reinforced the analyses, observations, comments and conclusions of the 2004 paper.

Popularity of the concept

As noted in the 2004 paper, the concept of IWRM, in one guise or another, has been around for at least two generations. Accordingly, one question that needs to be asked is why it suddenly became so popular in the 1990s, to the extent that some have considered it to be a new "holy grail" of water management. There are many reasons for this sudden leap of popularity of this concept, and only two such reasons will be discussed herein.

Probably one of the most important reasons for the current popularity of IWRM is its simplicity: it is easy to understand at a conceptual level. In a world that operates on the principle of reductionism, integrated water resources management offers the impression of being comprehensive and holistic. Many people assume it will therefore produce the best results, and overlook the shortcomings and fundamental inconsistencies intrinsic to the concept.

The second reason for its popularity is the tens of millions of Euros that the various donors have pumped into its promotion. This enormous level of funding has been primarily responsible for the creation of a new and thriving industry on IWRM. This development is, of course, not new. As Hall (2003) perceptibly noted in his book *Merchants of immortality*:

> One needs to be realistic about how humans, universities and research institutions work. They are driven by egos and money. For example, when research on any issue starts getting hot, soon by land, sea and air, the field is invaded by researchers scrambling for a piece of action, pursuing their intellectual curiosity with all the decorum and dignity of the nineteenth century gentlemen geologists who pursued their curiosity about rumours of gold in California.

As long as the donors keep priming the pump, the bandwagon will keep rolling, and this old-wine-in-a-new-bottle approach is highly unlikely to yield any visible or measurable progress. Fortunately, there are increasing signs that several donors are at present carefully re-evaluating the universal applicability of IWRM as a solution to improve existing water management practices and processes. Equally, several developing countries are reassessing whether this concept, which they have made national policies at the urging of many donors and international agencies, has produced the expected benefits. All these reassessments are necessary and positive developments.

Increasing complexities of natural water resources management

If IWRM is considered essential by the water profession, other disciplines can justifiably promote very similar concepts like integrated energy management, integrated agricultural management, integrated environmental management, integrated rural development, and so on. Such terminologies already exist at present, even though the promotions of integration in these areas have received significantly less attention or emphasis, compared to water. Unfortunately, in an increasingly complex and interrelated world, issues like water, energy, agriculture, environment or rural development are becoming more and more interconnected and interdependent through a variety of pathways. Accordingly, exclusively and independent integrated management of any one of these resources is not theoretically possible, or institutionally and managerially feasible,

because of accelerating overlaps and interlinkages with the other resource and development sectors. Developments in the water sector invariably affect management of resources like energy, agriculture, or ecosystems, and the developments in these resource areas, in turn, affect water, both directly and indirectly.

As an example, let us consider the issue of water and energy management and their interrelationships. The water profession has mostly ignored energy, even though in many ways water and energy are closely interlinked. For example, water not only produces energy (hydropower), but also the water sector is a prodigious user of energy. In a country like India, hydropower accounts for slightly over 20% of electricity generated, but the water sector "consumes" a similar amount of India's electricity. In Mexico, the water sector uses even a larger percentage of national electricity generation. Furthermore, no large-scale electricity production, be it thermal, nuclear or hydro, is possible without water. In some countries like France, the biggest user of water is not agriculture, but the energy sector. Thus, it simply is not possible to consider water resources management in an integrative manner without reference to energy, or integrated energy resources management without considering water. In other words, conceptually, technically and managerially, it is not possible to consider parallel efforts which will focus exclusively on integrated management of water or energy as a single resource, because of their inherently extensive and intensive overlaps and interlinkages.

Since water and energy are closely interrelated, pursuing IWRM *per se* would contribute to "unintegrated" energy management, since these two resources have many common factors in terms of planning, operation and management, which are sometimes mutually exclusive. These two resources simply cannot be separately planned in an "integrative" manner, irrespective of how integration is defined. Optimizing the benefits of IWRM, even if this can be operationally achieved by a miracle, will not result in the maximization of the benefits of integrated energy management, or vice versa.

It can be conceivably argued that if water and energy cannot be managed in an integrative manner independently, perhaps these two resources can be managed together as integrated water and energy resources management. This is also not a practical solution because the processes available at present for the overall planning and management of water and energy are very different, and the areas of expertise needed to manage these two resources efficiently are also very different. Furthermore, if these two resources are combined under one institutional umbrella, in most countries it will result in the creation of a large and unmanageable agency, which is likely to be counterproductive. In a few countries, at least institutionally, water and energy are managed under the same governmental ministry. These countries, however, are invariably small, and thus the management of these two resources by one single agency may still be feasible. This, however, is not possible for large- to medium-size countries like Brazil, China, India, Mexico, Nigeria or South Africa.

The current global institutional arrangements for management of water and energy resources are often somewhat arbitrary. For example, hydropower in Brazil, India, Mexico or Turkey is placed outside the general mandate of the Ministry of Water. In some other countries, the Water Ministry is responsible for hydropower, even though hydropower contributes a very significant percentage of national electricity generation. There is thus no simple, elegant, practical and universal way to integrate management of water and energy individually. This fact has been consistently ignored by the proponents of IWRM. It is also interesting to note that in a country like Canada, the word "hydro" is synonymous with electricity, even though water and electricity are managed very differently, technically and institutionally, at both national and provincial levels.

Whether hydropower is located within the ministry of energy or water, neither water nor energy can thereby be managed in an integrated manner. What is thus needed is not integration in terms of

management of these two resources, but close collaboration, cooperation and coordination between appropriate public and private sector entities associated with the development and management of water and energy. In the real world, such collaborations are unfortunately limited, and often *ad hoc*. They also vary over time, even for the same country. One is reminded of Voltaire's assertion, "The best is the enemy of the good." The "best" approaches for integrated water management and integrated energy management may not be compatible. What we should strive for is a "good" solution which would result in improved, coordinated management practices for both water and energy.

The problem becomes even more complex when we consider other sectors that are closely linked to water, such as agriculture, environment, industry or tourism. Globally, the agricultural sector is the largest user of water. Clearly, neither agriculture nor water can be managed in an "integrated" way without considering the other. The issue becomes even more unmanageable if there is competition among energy, agriculture, industry, and/or environmental sectors to pursue "integration" on their own, independent terms. Thus, IWRM may appear to be holistic at first blush, but on deeper consideration, it is another reductionist approach.

Additional constraints to implementation

In the real world, IWRM, even in a limited sense, becomes difficult to achieve because of extensive inter- and intra-ministerial turf wars and bureaucratic infighting. In addition, the legal regimes make integrated management of water very difficult. Integrated management of two or more resources by agencies that have been historic rivals is almost an impossible task.

It should further be noted that water has linkages to all development sectors and social issues like poverty alleviation and regional income redistribution. It is simply unthinkable and totally impractical to bring them under one roof in the guise of integration, irrespective of how integration is defined. Such attempts at integration are more likely to increase the complexities and inefficiencies of managing water resources than to solve them.

Some have argued that IWRM is a journey, not a destination, and that the concept provides only a road map for the journey. The problem with this metaphor is that in the area of water management, we are long on road maps, but very short on actual directions or competent drivers! Road maps may be useful if we know and agree on where we are going and know when we reach our destination. Even with a road map, but no destination, any path will take us there.

Negative implications of IWRM, for the most part, have not been seriously considered. Let us consider the thorny issue of just who is to do the integrating.

Already, in a few countries, the main national water agency is trying to take over the water-related mandates of other agencies in the name of more effective integration. The assumption is that such integration will contribute to IWRM. However, even if this were possible, it is unlikely to be an efficient and socially-desirable approach since different institutions have different stakeholders and interests, and this diversity is a component of any effective governance process. The consolidation of institutions in the name of integration is likely to produce more centralization and bureaucratization, less transparency and reduced responsiveness of such institutions to the needs of the different stakeholders. This is not the way present societies and international institutions prefer to go – that road map is clear! Water management must be responsive to the needs and demands of a growing diversity of central, state and municipal institutions, user groups, private sector, NGOs and other appropriate bodies. Concentration of authorities into one or a few water agencies is a step away from real efficient and equitable water management.

Under most conditions, especially for macro- and meso-scale water policies, development objectives like stakeholders' participation and bottom-up approach at micro-level are often unlikely to result in "integration" at higher levels. This has been repeatedly observed in many

developing countries like India and Bangladesh. A variety of trade-offs between these development objectives will be necessary, since these objectives often are not mutually exclusive.

IWRM, like integrated rural development or integrated area development, has historically run into very serious implementational difficulties. Conceptually these integrated concepts may be easy to propagate, at least initially, but the world is complex, and many concepts, irrespective of their initial attractiveness and simplicity, cannot be applied to solve increasingly complex and interdependent issues and activities (Biswas and Tortajada 2005). Even after some half a century, it has not been possible to find a practical framework that could be used for the integration of the various issues associated with water management. There is absolutely no evidence at present, despite the international rhetoric of the past 15 years, that this situation is likely to change in the foreseeable future.

Concluding remarks

IWRM has become a popular concept in recent years, but its track record in application to macro- and meso-scale water policies, programmes and projects has been dismal. To be useful, concepts must be applicable in the real world, and must produce positive and measurable results.

Research carried out at the Third World Centre for Water Management indicates that on a scale of 1 to 100 (1 being no integrated water resources management and 100 being full integration), one is hard pressed to find even a single macro- or meso-level water project, anywhere in the world, that can be given a score of 30, based on medium- to long-term performance. This is a dismal implementation record for a concept that has been around for nearly two generations. It is a curious irony that the bilateral donor agencies included in our study, who are often the most ardent supporters of IWRM, have not managed to implement it in their own countries. Very surprisingly, this has not stopped them from promoting the concept in developing countries.

In coming years both the donors and the developing countries will finally appreciate the non-implementability of IWRM. Based on past experience, its promoters are unlikely to admit that the concept has not worked in the past, is not working at present, and is highly unlikely to work in the future for a rapidly changing world. Accordingly, the most likely scenario of the future will be that its past and present promoters will gradually and progressively start downplaying the strong rhetoric of IWRM, and start focusing on the "ends" of water management rather than focusing with the recent exclusive emphasis on only one of its many "means". Earlier unbridled enthusiasm for IWRM has already begun to wane perceptibly at several international and national institutions. This trend is most likely to accelerate in the future.

Asit K. Biswas
Third World Centre for Water Management, Atizapan, Mexico,
and Lee Kuan Yew School for Public Policy, Singapore

References

Biswas, A. K., 2004. Integrated water resources management: a reassessment. *Water International*, 29 (2), 248–256.

Biswas, A. K., *et al*., 2008. Integrated water resources management in Latin America. Special Theme Issue. *International Journal of Water Resources Development*, 24 (1), 1–152.

Biswas, A. K. and Tortajada, C., 2005. *Appraising sustainable development: water management and environmental challenges*. Oxford University Press.

Biswas, A. K., Varis, O., Tortajada, C., 2005. *Integrated water resources management in south and southeast Asia*. Oxford University Press.