



Conference Report

Workshop on Integrated Water Resources Management for the Americas

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Introduction

It was until the Renaissance, that the Europeans believed Terra to be at the center of the Universe. It needed some science, confrontation, political devotion, and humble attitude to change this view, but the worldview changed and the people now appreciate the Terra as a component of a highly complicated and sophisticated planetary system.

It might appear a bit rudimentary to draw an analogy of the water community of today and the pre-renaissance Europeans, but the comparison might not be totally wrong. All water agendas stipulate perennially that water should be managed in a basin-wide context, all stakeholders on water management should be brought at one single table and so forth and so on.

Integrated Water Resources Management (IWRM) is the overarching concept that entitles these and a number of other principles and is endorsed by all recent international recommendations related to water management. According to the IWRM paradigm, the social, environmental and economic aspects should be all be developed hand in hand in a sustainable manner, under the prevalence of good governance, participation of all stakeholders and in a basinwide context.

The objective of the workshop¹ on which this volume is based on was to assess the present status of implementation of IWRM policies, programs and projects in Latin America. This paper summarizes the findings of all of the other contributions to this volume, and draws overall conclusions of the workshop. The following five questions were used as entry points to the analysis and discussion:

- What do we mean by IWRM in Latin America?
- Identify successful implementation of IWRM in Latin America (reasons for success and impacts of success).
- Identify bottlenecks and failures and the reasons for such bottlenecks and failures.

¹ The Instituto Pró-Ambiente (IPA), and the Agencia Nacional de Aguas (ANA) of Brazil, and the Inter-American Development Bank through the IDB-Netherlands Water Partnership Program, organized a workshop in Rio de Janeiro, 9-11 January 2006, on IWRM in Latin America.

- Identify potential alternatives to IWRM within the Latin American context and any experience of their application.
- Assess the overall situation in Latin America and define key issues for a road map for the future.

These questions were presented to two working groups, consisting of the workshop participants. We summarize the major findings of the two working groups and our own observations during the workshop. We have classified the outcomes in a somewhat different manner below, due to character of the working group results and overall discussions at the workshop, which did not fully fit into these questions.

We use the geographical term Latin America in a broad sense, to include all South and Central American and Caribbean countries, plus Mexico.

What is meant by IWRM in Latin America, and what are the main experiences

Consensus if it comes to principles and instruments

It is easy to argue that IWRM is conceptually attractive and painless to accept. Equally easy is to argue that it is not conceptually a novelty. As a philosophy, IWRM must be ages-old; the paradigm follows in many ways the common sense of managing water, and hence we can go and discover forerunners of the concept even centuries if not millennia back in time. Valencia, Spain, for example, has the experience of over one thousand years of participatory water tribunals. Many countries such as Spain, Mexico and the United States have had river basin planning and management in place for some 60-80 years (Barkin and King, 1986; Tortajada 2004, Scott 2006). IWRM has many similarities with for instance the concept of comprehensive water resources planning, which was recommended and widely implemented in various parts of the world in the 1970s and 1980s (Rahaman and Varis 2005).

The concepts listed in Table 1 were suggested at the workshop as operational principles and instruments of IWRM in Latin American conditions.

García (2006) presented the following quadrangle as an institutional model for regulatory bodies of IWRM:

- Water allocation among competing uses
- Regulation of water uses as a social service and as a production factor
- Conservation and/or improvement of the quality of the environment
- Reliable and timely provision of basic water resources and other related information

He also classified the concept into three levels of action:

- *Constitutional level (enabling)*: Establishing laws and policies – a national strategy for integrated water resources management
- *Associative level (rules, strategies)*: River basin management – allocating water flows, assimilative capacity, ecosystem maintenance

- *Operational level (execution):* Water uses and users-using water resources, subject to operational rules, to meet demands and needs

The workshop appeared to accept these models since they were subsequently adopted in the used vocabulary.

Table 1. Crucial operational principles and instruments of IWRM in Latin American conditions.

Principles	Basin as the unit of planning
	Water has multiple uses
	Water has economic but not only economic value (multiple objectives including economic, social and environmental)
	Decentralization
	Coordination with other areas and levels of government (national / regional planning)
Instruments	Legal framework
	Financial instruments (water charges, pollution charges)
	Administrative and control instruments (permits, concessions)
	Water basin plans
	Institutional framework with decentralization and users participation (an open decision-making process)

No consensus if it comes to operational definitions

As all the international recommendations and commitments choir the IWRM concept, it is thus tempting to accept this concept without sufficient scrutiny. The experience documented in this volume is not unique in pointing out that whereas all seem to agree with the concept of IWRM, everybody seems to interpret it in a specific way. At the operational level, the situations and conditions faced are diverse enough to necessitate a careful and case-specific elaboration of the concept so as to add value to contemporary practices.

Pointed out by García (2006), IWRM is a small step for conceptualists, but a giant step for practitioners. Almost every country in Latin America has experience and many have even embraced the concept, as inspired by the international for a since the shift of the millennium. The implementation has been mixed, in terms of interpretation of IWRM as well as of its outcomes. Some of the financially strong and autonomous countries have been most successful in operationalizing the concept, whereas IWRM has benefited from external assistance in many other countries.

The workshop even identified the “lack of understanding of the IWRM process” as a prime bottleneck of the implementation of the concept.

Analogies

Analogies from somewhat more remote fields can be enlightening and useful in conceptualising where we are philosophically and methodologically with our IWRM. Take for instance Economics; from the first lecture onwards, a certain structure and taxonomy is introduced, which

makes theories and concepts far more context-specific than in our water field. This structure consists in one dimension from microeconomics and macroeconomics, one axis from political economy and institutional economy and so forth. It would be banal to talk about Integrated Management of Economic Systems.

Success stories

As almost every Latin American country has experience on the implementation of IWRM, there are various success stories and failure stories from each country. An excellent selection of both are given in the analyses of García (whole region), Biswas (whole region), Braga and Lotufo (Brazil), Blanco (Colombia), Scott (Mexico), Silva (Mexico) and Reyes (Central America), all in this volume. Drafting IWRM plans has not been a problem, but budgeting and to some extent institutionalisation has not always followed those plans.

As essential items for the successful implementation of IWRM, the following issues were mentioned most frequently:

- A perceived need for IWRM exists. This is often related in outcomes such as power generation, irrigation, salinity control, improved water quality, and improved water services.
- A consistent legal framework.
- Cooperating institutions
- Political will.
- Improvement of local participation and use of local wisdom.

Some highlights of positive outcomes of successful implementation of IWRM include:

- *Sao Francisco river basin plan (Brazil)* – Empowerment of the Basin Committee
- *Paraíba do Sul River Basin (Brazil)* – All the instruments of water resources policy were implemented. Water permits, the water charge, the creation of the basin committee and the basin agency and the basin plan is operational.
- *Ceará (Brazil)* – Water charging system
- *Lerma-Chapala basin (Mexico), COIRCO (Colorado river), and AIC (Limay and Neuquen rivers, Argentina/Patagonia)* – River basin committees.
- *Mexico and Costa Rica* – Regionalization with Basin Committees, inclusion of environmental services.
- *PNGIRH (Costa Rica)* – Strategic work
- *Cornare (Colombia)* – water pollution and water use charges.
- *Colombia* – Pollution reduction with implementation of water pollution charges in Rio Negro River.

It was pointed out that even in the successful cases bottlenecks and failures are easy to identify. The most intrinsic and typical factors for success and failure are summarized below.

Axes, caveats and controversies

Within vs. outside the water sector

One important caveat is due to the fact that whereas water professionals commonly see water as a consolidated sector, many other sectors consider water to belong to their own sectors. Take for instance the energy sector, forestry sector, agricultural sector, or the health sector, not to talk about water's cultural, political and sacral dimensions. All these sectors and dimensions have their own claims within their own *modus operandi*, and water is a part of such claims.

The water sector itself is a many-dimensional mosaic of activities, with no clear disciplinary boundaries (cf. Mohile 2005). Water has a very varied, crosscutting function that goes across and links many different sectors. Clearly, water resources management should be integrated, but the drivers, needs, investments, policies and solutions come often outside of the water sector proper. Administrational, water belongs usually under up to ten ministries and only the core water profession considers for instance the river basin as an appropriate unit for water management, others go along jurisdictional borders, technical access, ownership of the resource, economic region or some other criteria in defining their geographic dimension for planning and operation.

Process: static vs. dynamic

Another typical caveat is that flair that IWRM gets from most international recommendations is that IWRM is a one-shot plan. This flair is not only theory, but many large international and donor agencies finance over and over again comprehensive plans, without knowing that such plans have been done already many times but what is missing is implementation (cf Varis et al. 2006).

IWRM is thus rather a philosophy, ideology, and a process than a distinct plan, which should be for instance finished by the end of the year 2005, as the Johannesburg WSSD Plan of Implementation postulates.

Means and ends are thus mixed: from the Johannesburg plan of implementation, it is easy to get the somewhat blurred view that the IWRM and water efficiency plans are the goal per se. Can a plan be the end... evidently not—it is a means to an end. Water resources management and development is exposed to very demanding and important pressures and challenges in many parts of the world. There are burning problems that await solutions.

History

River basins are the cradles of the mankind, and each basin has its own ages-old and recent history. The former one is a potpourri of cultural, ethnic, political and other factors and the latter one includes institutional arrangements, governance characteristics; locally, nationally and internationally. They all influence the implementation of IWRM. Scott (2006) documented from Mexico and Varis et al. (2006) from the Mekong and Senegal River Basins the fundamental role of institutional history as the ground on which the contemporary rivalries and possibilities stem.

Orientation: hardware vs. software

Institutions provide the rules for the society. Their various functions range from legislative, juridical and administrative to many informal aspects such as culture, religion and ethnicity (North 1990). Institutional set-up stays high in prevalent development theories. It should be flexible, but provide social stability, and allow the country to solve the problems it is facing.

A typical caveat of water professionals is to be far too hardware-oriented in water resources management. This means that dominantly the resources and their development are the starting point, but too seldom the institutional and human capacity dimension is reflected. The “people out there” are amazingly often ignored and forgotten. Governance, institutions, human skills and education are typical bottlenecks of implementation of IWRM, and the tendency seems to be that they are inadequately addressed.

As a dynamic concept, IWRM takes its time to evolve. If the dissemination of a demanding concept is too swift, too widespread, too open and in too large scale, the implementation will definitely face problems. If new concepts are brought to practise faster than the administrative system even at the individual level is able to digest, ruminate and adapt into, the whole process can be blocked by various reasons. One of these reasons can be the exposition to public participation.

The time required is very different from case to case, but the overall impression is that have its time to evolve systematically and with patience. Plenty of adaptation and revision is needed since the issues to be handled with are far from trivial.

One institutional cornerstone of the implementation of IWRM is legislation. In Latin America, there are many examples from successful incorporation of the IWRM concept in laws. Brazil is one, provides the backbone for the implementation of IWRM, as documented by Braga and Lotufo (2006) in the case of the São Francisco River Basin. Mexico is in the way of reforming its laws and institutions, but still major institutional hurdles and vested organizational interests prevail (Scott 2006).

Motivation: local, national or external

Often it seems that the outcome of implementation of water plans and policies is different if the motivations grows from local and national needs and leans and nurtures the local capacities or if it is driven by external motivations and may therefore not fully get rooted to local conditions. The agendas of international donors may differ substantially from the practical needs and priorities from the local people, and if these two do not meet, the local ownership and the whole success of the activities are at high risk of not becoming effective. Latin America has equally many examples of locally poorly rooted actions as other continents.

All in all, international recommendations are prone to dictate harmonization at the national level but no harmonization is claimed at the donor side.

Participation and cooperation

Public participation and stakeholder involvement are among the mantras of IWRM and, in a more general context, sustainable development. It is again easy to agree with such claims. In a representative democracy, the governance system includes or at least should include the representation of different groups of people, with their viewpoints and opinions. Of course this concept is an idealistic one and does not always fully work, but at least in democracies, this should be the starting point of a policy process.

In principle, power and responsibility should always go hand in hand; if they do not, problems are inevitable. This is valid to all stakeholders, be they government bodies, private enterprises, non-governmental organizations, users associations and any other groups. It is tempting to claim for power as a stakeholder in opposing or backing a development concept, but the corresponding responsibilities are not always so easy to take. Who is a stakeholder is an essential question, not often asked though.

As we emphasize the justified requirement of efficiency, one essential factor is the efficiency of the policy process. Transaction costs should be kept low. This builds up a certain dilemma with the requirement of stakeholder participation and public participation. If very many stakeholders are heard and consulted very frequently, the efficiency along with motivation goes rapidly down, particularly as many water actions do not yield very short-term results and this reduces motivation to participate. Administrational approaches, institutions, and regulators' capacity shortcomings were identified as bottlenecks in this respect. There must be a balance, which may not always be close to the Bonn Keys statement of bringing always all stakeholders into the same table. The open communication should not be compromised though.

Informal sector

The division of society into formal and informal sectors is most evident in the rapidly urbanising centres of developing countries. Besides presenting a major challenge to any aspect of water and infrastructure development, it equally involves issues of safety, revenue collection, health issue and skilled labour.

The hope tends to be that the growth of industry and urban services will somehow absorb the excess immigrant labour force. However, this usually remains pipedream for a considerable proportion of people. Even in the most successful countries in this respect, such as Brazil and Thailand, only one fifth of the population is engaged in industry. The informal sector has to absorb 20 to 70 percent of the urban workforce (Todaro 1997). According to Langman (2003) eight of 10 new jobs in Latin America are in the informal economy.

The informal sector pays virtually no taxes, is partly outside the legal system, receives only marginal services from the government, etc. Officially, in most countries, its volume is strongly understated, even neglected; although a grand share of citizens—the poor in particular—are fully dependent on that sector. Provisions of water services, managing the environment, etc., in this context, are tasks that go beyond most concurrent water management paradigms. Most of the heavily endorsed and recommended issues such as decentralisation, cost recovery, economic instruments, legislation, private sector involvement, stakeholder participation, adaptation of

costly, non-conventional water technologies such as recycling and desalinisation, and many others have often totally different shades in the informal sector in comparison to how they appear in the formal sector.

The urban informal sector is partly associated to slums. UN HABITAT (2003) has estimated that in the year 2001, Latin America had an urban slum population of 128 million people, which is 32 percent of all of its urban people. The countries differ considerably in this respect. Proportionally the largest slum problems are in countries such as Haiti (86 percent), Nicaragua (81), Peru (68), Belize (62), Guatemala (62) and Bolivia (61). In terms of the number of slum dwellers, Brazil is at the top with 52 millions, which is 31 percent of the country's urban population.

Despite the importance of the informal sector, few assessments of water issues address it anything like adequately. Also this workshop was very immune to the issue. Yet the informal sector is the soaring and almost ignored urban water problem (Varis 2001, 2006). Informal settlements and economic systems are the most vulnerable to economic cycles, and natural disasters such as floods and droughts, as well as to environmental problems.

Technocracy vs. democracy and the single agency paradigm

Each country is different in its administrative and macroeconomic structure. In terms of IWRM planning and implementation, the conceptual caveat is to attribute the task to a single agency. This might, at least at the constitutional level, be still correct in some very centralized countries, but it is very difficult to find examples in which the operational implementation would be the task and responsibility of one single administrative body.

The IWRM recommendations, as given at major UN events and World Water Forums, have a philosophical flavor of leaning on strong and centralized planning units. Now that many societies have evolved to increasingly market-driven, civil societies, the centrally planned, planning-optimistic approaches are quite under challenge. Planning optimism used to be characteristic to relatively closed and controlled economies of some decades ago. This is despite of the experience from many rapidly industrializing countries, which have been able to create an attractive environment for investment and economic development through well-executed planning and consequent provision of, legislation, infrastructure, educated work force, infrastructure, and other services.

In Brazil, for instance, the institutional map appears still to be fairly clear and the few agencies are clearly mandated. In many other countries, instead, the actors are very many, and the challenge is in managing a highly multi-pole system, and still keeps it operational. Often it is felt that the users and user organizations have a too low control over their own business. But the dilemma arises with the central planning ideology, which does not always comply well with market economy and full democracy. Reasonable trade-offs are necessary to allow both of these necessary ends work.

In some way, we meet here the demarcation line between modern and post-modern development thinking (Table 2). The technocratic common-sense of a bulk of water professionals and many politicians alike approaches the world from a 'modern' viewpoint, and confront in the 'outside

world' a more complex, less organised, less idealistic 'post-modern' world which operates somewhat differently from the 'modern' concept.

Table 2. Modern and post-modern development thinking (modified from Maxwell 1996)

	Modern	Post-modern
Underlying reality	Simple, uniform	Complex, diverse
Objectives	Growth Preoccupation with macro	Development Preoccupation with micro
Research approach	Measure Survey Reductionist Deduction Abstract models Aggregate	Listen Participatory rural appraisal Holistic Induction Complex reality Disaggregate
Planning approach	Plan Model Top-down Centralize	Enable Interact Bottom-up Decentralize
Implementation	Blue-print Role culture Standardization	Process Task culture Flexibility, innovation

Chronic lack of data, information, funding and political commitment

Data shortcomings are a perennial cry in the water field. There are perhaps only few workshops among the myriad that takes place these days that does not conclude that we need more data and monitoring. This might be one of the few things in which almost everybody seems to agree. But why this rare consensus does not lead to the solution of the problem? A good question. Also in the presentations of this workshop, a common feature was that data gaps are huge, particularly in water quality, in social aspects, in environmental aspects and so forth. It was also concluded by many, that this data and information shortage is one of the major bottlenecks of successful implementation of IWRM (cf. McDonnell 2006).

Equally perennial is the cry due to insufficient funding and deficient political commitment. Issues such as the inclusion of IWRM as one of the standard components of Poverty Reduction Strategy Papers (the documents that are used as the baseline for targeting donor funds) have been discussed lately, and even recommended in the Ministerial Declaration of the World Water Forum 4 in Mexico City, March 2006. This enhances the political visibility of the water sector at least in the donor community. Water needs political slogans in order to catch political attention; otherwise it gets fainted beyond the needs of sectors such as health, energy, agriculture, environment and so forth, as we saw at the Rio Summit of 1992. This was despite water has a unique cross-cutting role that links all these sectors and many of their challenges together.

Potential alternatives to IWRM context and the experience on their application

Given that the IWRM concept has an array of challenges and caveats at the implementation level, where would then be the entry points of finding a better concept?

The workshop identified a number of such entry points, including the following ones:

- *Appreciation of multiple paradigms:* Water has so many functions in the society and the nature, that the validity of one single paradigm such as IWRM is somewhat challenging. The UN system, for instance, while promoting IWRM at full force, promotes many other paradigms at the same time. For instance the Millennium Development Goal (MDG) approach does not easily fit to the IWRM approach in many practical situations. Reaching the MDGs calls for prioritization and moreover they are very socially centered, to certain extent to environmental sustainability, but not really giving a note for economic development. Thus the misfit to IWRM is obvious.
- *Targeted, sectorial policies:* The drivers to develop and manage water resources come mostly outside of the water profession. There might be health problems due to improper urban or rural water infrastructure, a flooding problem due to changed land use or whatever one could imagine. To approach such everyday problems with “Integrated Water Resources Management” is a bit out of context. The framework and concept must be there, clearly, and IWRM is fine for that, but operational needs are often quite explicit. Specific, targeted solutions are needed and viewing things too much through the IWRM looking glass is not always the best way to go. This does not mean that the IWRM philosophy should not be there at the back as one of the guiding principles, but it is crucial to take a flexible approach to IWRM as a tool of solving everyday water problems.
- *Regional development approach:* As the water is a central component in many other sectors besides the water sector itself—including agriculture, health, forestry, energy and many others—the water policies must comply with the dimension of the policies of those sectors. Very often, such policies are operational on a jurisdictional basis, or are related to a certain technical dimension, such as urban water infrastructure, or comply with ownership of a resource such as land tenure, or are dominated by regional development needs. Brazil’s Northeastern Region (Braga and Lotufo 2006) as well as Argentina’s Lima and Caño Negro Region are examples of a successful case of regional development approach.

Key issues for the future

Latin America has certain characteristics, which make it very special in its water requirements and water-related future challenges. First, it is the most water affluent continent. Second, it is the far most urbanized part of the developing world. Thereby, the urban challenges as well as water quality challenges pop up as particularly critical in Latin America, in comparison to other matters.

Water pollution and insufficient sanitation and waste water treatment infrastructure is a prime challenge. This is particularly burning issue in large and dense urban agglomerations, but not

neglectable either in smaller urban areas. Links to environmental management and urban planning are close, as well as to social policies, since the informal sector and slums are a major problem in most of urban Latin America. Financing challenges are enormous and obvious.

Water use inefficiency is also a big and growing issue, both in rural and urban areas. Water has not been traditionally considered as a scarce resource, but with the very intensive agriculture and growth of large urban areas this attitude must be revised. Again, the appreciation of water quality must follow.

Other important aspects in Latin American water challenges are many, but perhaps the most pronounced ones are related to the side effects—both social and environmental—of the spread of large-scale infrastructure, the disparities and capability gaps between different social groups which often have an ethnic dimension, and financial challenges which are most pronounced in urban water infrastructure.

Summary and conclusions

If we reduce the IWRM definition from all complexity, it very easily falls into a simple rule of thumb. If you impose an economically targeted water project, plan, policy, program or strategy, you must take into account also social and economic concerns. Equally, if you impose an environmentally targeted one, the social and economic concerns should be taken into account. And analogically, a socially targeted one should be economically and environmentally viable. Would this simple reduction be worthy?

All in all, the water professionals should perhaps look more systematically and seriously back into the history and survey whether the water management paradigms would need a renaissance in seeing water as a part of a very sophisticated system of governance and nature. In the IWRM rhetoric, the water sector is typically seen as too disconnected from other sectors. The water sector itself is a many-dimensional mosaic of activities, with no clear disciplinary boundaries. Energy, agriculture, environment, health etc. sectors are part of the water sector, but they are also sectors by their own right, and parts of other sectors. We should of course try to bring these all together, but recognize too that many other sectors are suffering with similar integration challenges—in some of them water being an important component. Seeing the water issues in the broad, cross-cutting framework of other development issues—and integrating the visions and policies of the sector—would be the way to go towards a better future through successful freshwater management.

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