Significance of Integrated Water Resource Management

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ABSTRACT: ***For some 60-70 years, the idea of Integrated Water Resource Management (IWRM) has been known around. It was rediscovered in the 1990s by a researcher while the idea of IWRM appears promising at first glance; a deeper analysis gives rise to many problems, both in concept and execution, especially for macro-scale projects. IWRM's meaning remains amorphous, and there is no consensus on fundamental issues such as what elements should be incorporated, how, by whom, or even if such integration is necessary in a broader sense. In this paper, the history and description of the Integrated Water Resource Management and its four important dimensional resources has been discussed.***

KEYWORDS: ***Integrated Water Resource Management (IWRM), climate, resource, environment, water users, special scales, temporal scales.***

INTRODUCTION

The greatest of all things is water according to the Greek philosopher Pindar. This view is not surprising as the need for water has always been appreciated throughout human history. It is present everywhere, and life would actually cease to exist without water, as it is known. Water is flowing continuously from one state to another and from one place to another. Whether the water is in motion or stationary as it is in the reservoirs, it contains inevitably exotic materials, some due to natural causes but others caused by human activity. All these, plus natural water quality variations, make its rational planning and management under the best of circumstances a very complex and difficult task. Water can be anywhere, but the availability of water has always relied on its quantity and quality [1].

Worldwide water issues are not homogeneous, constant or linear in time. They also vary greatly from region to region, often even within a single country, from season to season, and also from year to year. Water solutions rely not only on the availability of water, but also on many other factors, including the processes by which water is managed; competence and skills of the organizations managing water; Expected waters planning, growth and management practices; adequacy and implementation of legal and regulatory frameworks; availability, when and when required, of investment funds; climatic, financial, environmental conditions of the countries involved; levels of accessible and utilizable technology; attitude at national, regional and international levels and Modes of governance include questions such as policy intervention, accountability, corruption, etc.; requirements for education and development and quality, reliability and pertinence of research carried out to solve national and sub-national water issues and local problems [2].

Water has a direct interest in society as a whole, and is directly attracted to most central, state and municipal development public institutions, academia, the private sector, and NGOs. This pervasive interest in water is not a unique situation, as has often been claimed by many water professionals: it applies equally to other essential sectors such as food, electricity, the

atmosphere, safety, communication or transport. In all contemporary societies, all these problems have high levels of social and political concern, even though their relative importance will differ over time from country to country. In an ever more interrelated context and diverse world, there are many problems that are of common interest in ensuring people's good quality of life. Water is one of these important cross-sectoral issues, but it is definitely not the only issue, or often the most important socio-political issue, irrespective of many views in the water profession. In recent years, it has become increasingly apparent that only water professionals and/or water ministries can no longer solve a country's water problems alone. Many of the water issues have already become far too complicated, interconnected and broad to be addressed by any single institution, irrespective of the authority and resources given to it, available technical expertise and management capability, level of political and public support, and all the good intentions [3].

Current and predictable trends indicate that future water issues will continue to become increasingly complex and will become increasingly interconnected with other development sectors such as agriculture, energy, industry, transportation and communication, and with social sectors such as education, environment, health, and rural or regional development. The time is fast approaching when water can no longer be viewed in isolation by primarily one institution or any group of professionals, without explicit and simultaneous consideration of other related sectors and water management issues, and vice versa. Nonetheless, it can be argued successfully that the time has come for water policies and major water-related issues to be evaluated, examined, checked and resolved in an overall context of society and development, otherwise the key objectives of water management, such as improving people's standard of living and quality of life, poverty alleviation, regional and equitable distribution of income One of the main issues facing the water profession is how to respond effectively to this challenge in a way that is socially acceptable and economically efficient [4].

Over the past 15 years or so, and heavily promoted by donors, the slogan has often been that integrated water resource management can solve water problems all over the world, given the various physical, cultural, social and environmental conditions in a very heterogeneous world and irrespective of the rapidly increasing complexities of water management practices and procedures. The present paper analyzes how practical the world's water management problems are with this commonly advertised universal solution [5].

Integrated management of water resources: History and description

A few water experts began to realize during the early 1980s that the overall global water situation was not as strong as it seemed. This feeling increased during the 1990s, as many more in the field started to realize that water problems had become multi-dimensional, multi-sectoral, and multi-regional, enmeshed with multi-interest, multi-agenda, and multi-causes that could be addressed only through effective multi-disciplinary, multi-institutional, and multi-stakeholder collaboration. The biggest question at the moment, however, is not whether such a method is feasible, but whether this can be done in a cost-effective way in the real world [6].

In the face of such unparalleled complexities of management, many in the water profession started to look for a new management model that would address the current and repetitive problems in different parts of the world. Nevertheless, there was no new solution that was chosen and became increasingly popular. It was the rediscovery of a concept that was basically more than 60 years old, which could not be implemented successfully beforehand: integrated

management of water resources. Many who' discovered' this definition did not even realize that the' new' idea was not really new, but had been around for many decades, with a questionable implementation record that had never been tested [7].

Before the status of the implementation of integrated water resource management can be debated, what exactly is meant by this definition is an important and fundamental topic that needs to be considered first. A detailed and unbiased review of the recent writings of individuals and institutions that have actively advocated integrated water resource management reveals that not only does no one have a clear idea of what precisely this definition means in terms of practice, but also their opinions on it in terms of what it actually means and what it implies, vary widely. It can even be argued that this very vagueness has led to the high popularity of the idea of integrated water resource management as people could continue to do what they had done before, or are doing now, but bring such practices under an increasingly popular umbrella for which donors and international institutions have made substantial resources available [8].

The most frequently cited concept at the moment is the one developed by the Global Water Partnership (GWP, 2000), which shortly after its inception began championing comprehensive water resources management as a major component of its technical program. It was defined by GWP as: A mechanism that promotes integrated water, land and related resource development and management so as to optimize economic and social benefits in a fair way without undermining the sustainability of critical ecosystems [9].

Unfortunately, for a variety of reasons, a fundamental question that has never been asked, let alone addressed, either by the GWP or the proponents of this concept who have uncritically adopted the GWP definition as the Gospel is whether this well-intentioned and good-sounding definition has any practical value in terms of its application and execution to improve existing water administration Or it just adds trendy words that collectively provide an amorphous definition that does not really help water planners and managers to apply the concept to solve the actual water problems that exist in various parts of the world.

People are becoming more aware of the need for effective management of water resources, as: There are limited fresh water resources; Such limited resources of fresh water are rapidly polluting and unfit for human consumption as well as for protection of the ecosystem; These priority limits for fresh water must be split between balanced social needs and demands; Adequate and secure freshwater services are not yet accessible to many citizens; It is increasingly recognized that there is enormous potential for growing crops and achieving food security through more effective use of rainfall through enhanced soil and water management and harvesting techniques; Water control mechanisms (for example, dams and dikes) can often have unwanted environmental consequences; There is an intimate connection between groundwater and surface water, marine and fresh water and so on. It may not be possible to control one system and not the others [10].

It is therefore necessary to consider technological, economic, social, environmental and legal aspects, as well as quantitative and qualitative aspects, as well as supply and demand. In addition, the' management process' (planning, control, operation and maintenance, etc.) must also be consistent. Therefore, integrated management of water resources seeks to manage water resources in a systematic and holistic manner. Therefore, from a number of different perspectives

or dimensions, it must consider the water resources. Once these different dimensions are considered, it is possible to make appropriate decisions and arrangements.

The following four dimensions must be taken into account due to the nature of water (Fig 1): Water resources or natural measurements, taking into account the entire hydrological cycle, including stocks and flows, as well as the amount of water and water quality; identifying, for example, rainfall, soil moisture, water in rivers, lakes and aquifers, wetlands and estuaries, even taking into account flows of water, etc. Water consumers, the human element, both economic and stakeholder interests; Spatial scope, including spatial distribution of water resources and uses (e.g. well-watered upstream watersheds and downstream arid plains); Temporary scale; taking into account the temporary variation in water resource availability and demand, but also the physical structures that were built to even out fluctuations and better match supply with demand.

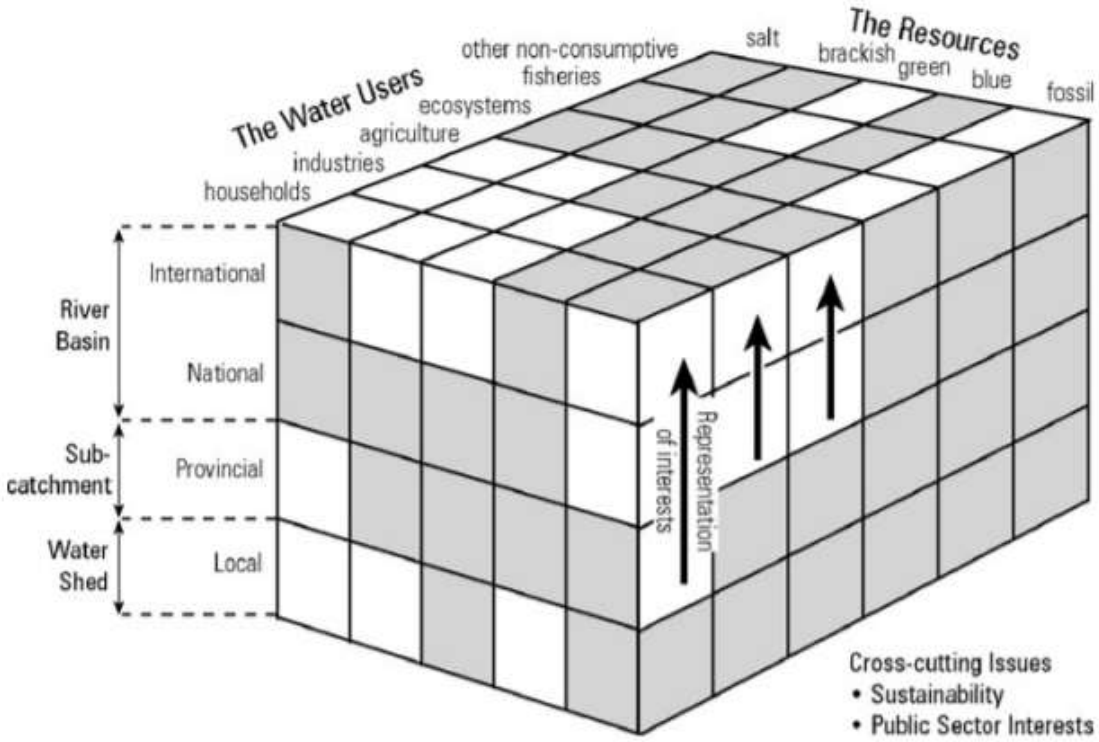

Fig. 1 - Three of the four dimensions of Integrated Water Resources Management

The four dimensions of Integrated Water Resource Management (IWRM):

Dimension 1 - Water resources: All types of water, including salt water and fossil groundwater, are included in water resources. An interesting difference that can be made is between green and blue water. Blue water, water in rivers, lakes and shallow aquifers, has received all the attention from planners and engineers of water resources conventionally. Green water, the water in the unsaturated soil region responsible for biomass production has been largely neglected, but it is green water that accounts for 60% of world food output and all the biomass generated in forests and pastures. This resource is the most vulnerable to the destruction of the ground. Fossil water, the deep aquifers containing non-renewable water, should be regarded as a mineral resource that can be used only once at the expense of future use.

Dimension 2 - Water users: Water and its purposes are many different consumers. Functions can be divided into functions of production (for economic production activities), functions of control (for maintaining a flexible equilibrium in natural processes), functions of carrier (for sustaining life forms) and functions of transfer (as a contribution to community, religion and landscape). The requirements include: households, manufacturing, forestry, fisheries, forests, hydropower, transportation, recreation, etc. Water users are consumers of both consumption and non-consumption (often in-stream). In addition to quantity, users are largely dependent on the resource quality. As far as consumer use is concerned, an important concept is" virtual' water,' where products are expressed in the amount of water required for their production. This principle is useful both as an efficiency tool and as a way of addressing food safety.

Dimension 3 - Spatial scales: Issues of water resources are evident at various levels: international, national, provincial or district, and local. Hydrological system boundaries such as river basins, sub catchments and watersheds are parallel to these administrative levels. There is unusual consensus between hydrological boundaries and administrative boundaries. River basins are very suitable operational management units, but they present problems for institutions with different spatial logic. There should always be two-way coordination between the institutional levels. Different water resource management decisions belong at different levels, which mean that the idea of subsidiary (decision making at the lowest appropriate level) must be a guiding principle in IWRM development. In order to be taken into account at higher levels, especially at national and international level, priorities and decisions at lower levels need to be carried upwards. An important element in this process is stakeholder engagement at all levels of decision-making processes.

Dimension 4 -Temporal scales and patterns:There are distinct temporal trends for both the water resources themselves and the water uses. Temporary distribution of water resources (floods, droughts, base flows, and flood patterns) is critical, as is the distribution of demands over time (peak demands, constant demands, crop patterns, etc.). The total amount of water available depends heavily on the possibility of capturing floods in water resource assessments. The staging of demands (simultaneous or staggered demands) on demand can have a major impact on the required development.

Therefore, Integrated Water Resources Management considers the whole water cycle with all its natural aspects, as well as the needs of water users in the various sectors of a society (or country as a whole), thereby addressing both the natural and human dimensions of water. Decision-making will include, where possible, the alignment of the different priorities and, where necessary, a trade-off or priority-setting between those objectives by carefully evaluating them in an informed and transparent manner in compliance with societal goals and constraints.

CONCLUSION

It is argued that integrated water resource management has become a popular concept in recent years, but its implementation track record to handle water policies, programs and projects on a macro- and meso-scale scale has been disastrous. Conceptual appeal is not enough on its own. It should be noted that detailed analyzes and work carried out at the Third World Center for Water Management show that it is difficult to find a single macro-or meso-level water policy, program or project anywhere in the world that can be given a score of 30, based on medicine. Yes, for a

philosophy that has been around for nearly two decades, it is a very poor record of implementation.

Concepts and paradigms must be applied in order to obtain better and more efficient solutions if they are to have some meaning and usefulness. Not only is this actually not occurring with centralized control of water resources, but there are also no visible signs that the situation is likely to change in the foreseeable future. However, the environment is heterogeneous, with various cultures, social norms, and physical attributes, distorted availability of renewable and non-renewable capital, investment funds, management skills, and institutional structures. Governance systems, legal frameworks, decision-making processes, and institutions ' styles and effectiveness often vary in very significant ways from country to country.

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