WATER RESOURCES MANAGEMENT FOR SUSTAINABILITY.

By Marilyn Crichlow
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Broadly speaking water resources management means management of water resources which support an integrated and holistic approach to watershed management taking into consideration all sources and uses of water in a particular river basin and its support to socio-economic development.

To talk of water resources management without it being for sustainability must imply mismanagement of the resource or ineffective management.

However this apparently has been the case as globally the pronouncement is that water is in a crisis. This appears to be the result of our inability to see the importance of recognizing and establishing linkages with the sources of potential impacts on water resources. Linkages like the environment, land use, waste management and sanitation, etcetera.

We must therefore recognize that water is a connective issue and cannot be treated as an isolated sector issue. The very nature and characteristics of water must be understood to inform the management of this resource - one of the most important substances on earth.

FUNDAMENTALS

Water is essential for all life - without it all life would cease to exist. It is a finite renewable resource that is both space and time dependent as its movement through the hydrological cycle illustrates.

Water is inextricably linked to the environment. Therefore actions in the watershed impact on the water resources, which though indestructible unfortunately is easily polluted.

The behaviour of water in natural systems, its interactions and the variability of the processes that govern its presence and movement must be understood to manage water to meet its objective to support mankind, the species that inhabit the world and the existing and future environment.
SCOPE

The nature of water, the role it has to play to support life and its connection with almost everything in its path influences the scope of issues that must be addressed for water resources management. Basically anything that impacts on the water resources or that is impacted by water must be considered in water resources management.

Some of the issues which constitute water resources management include protection of the water sources and its resources, integrated watershed management, health and sanitation, water development and supply, optimization and efficiency of water use, water allocation, water quality and pollution, conservation, monitoring and assessment, land use planning and management, environmental impacts and management and waste management.

SUSTAINABILITY

Sustainability focuses on meeting the needs of both current and future generations.

According to the Brundtland Commission's report Our Common Future (WCED, 1987), water resources management is sustainable if

'... it meets the needs of the present without compromising the ability of future generations to meet their own needs', while

'... maintaining the ecological, environmental and hydrological integrity of the water resources systems involved'.

Sustainability is not only the physical aspects but the technical, financial, social, economic, institutional and Environmental aspects.

In assessing the sustainability of water resources the: Technical sustainability refers to a balanced demand and supply, knowing the available water resources and allowing no mining of water.

Financial sustainability is based on applying a cost recovery principle to the management of water. It seeks to recover costs for the supply of water for the various purposes and to protect the water systems from pollution based on the polluter pays principle. To provide adequate services, institutions involved will need to be financially self-sufficient. However the right of basic needs of all people must be given consideration with respect to the supply of drinking water for domestic uses.

Social sustainability aims at stability of water demand taking into account the population's willingness to pay. Addressing poverty alleviation and the health of the nation are major issues in facilitating social sustainability.
Economic sustainability must be towards sustaining economic development and production. Water must be given its proper economic value so that the water economy of the country can be integrated with the broader economy.

There must however be a balance with cultural and social concerns. In addition optimum efficiency and most beneficial use must be ensured whilst meeting the requirements for social development and environmental sustainability.

A balance must be maintained between ensuring that water for basic human needs is available to the poorest and that it is properly valued where it is used for production or other beneficial use.

Institutional sustainability is dependent on a framework with the capacity to plan, manage and operate the water resource systems.

Clearly issuing authority, responsibility and functions to the different levels in government to the lowest possible level in the organisational framework is increasingly being regarded as best practice and most likely to result in sustainable development.

The role of all major stakeholders and their functions must be clearly agreed to in the context of the water resources management policy, which seeks to encourage accountability, accessibility, transparency and efficiency of operations without undue bureaucracy.

Environmental Sustainability can be facilitated if both the water resources and the environment are managed so as not to cause any long-term negative or irreversible effects.

**TRENDS**

The trends in water resources show that the per capita availability has decreased with time and quality has deteriorated with use. In addition water withdrawals and consumption are expected to continue to increase in the region. Based on projected population growth, a simulation model used by UNESCO suggests that the number of countries in Latin America and the Caribbean facing water stress could increase from three (3) to eight (8) in the next twenty-five (25) years. When a projection on deteriorating water quality due to pollution was added to the simulation the number of affected countries increased to fourteen (14).

The forecasted increase in demand for human consumption, agricultural and industrial uses, and tourism means that surface and ground water resources as well as coastal areas, will experience increased pollution, increasing conflicts between the established beneficial uses and the new uses and the environment, endangering land, freshwater and marine biodiversity. These trends will also have a serious effect on the region's freshwater ecosystems. Large wetland areas are being transformed into other uses and new technologies are being applied to drain them with little consideration for the long term groundwater needs of the areas.
Valuable freshwater ecosystem functions and services have been generally ignored and left out of water resources planning, resulting in their deterioration and destruction. The benefits that freshwater ecosystems can provide to society in addition to water supply or flood regulation, such as protection from natural forces, micro-climate stabilization, high rate of production per unit of land, habitats for threatened species, etc. usually have not been considered.

In the past, emphasis was on subsectoral project based water resources development and not on integrated water resources management. The results of past fragmented approaches are leading to increased conflicts, inefficient use and deterioration of this valuable resource.

Similar findings in other regions have led to the consensus that current practices are not sustainable.

The solution to attain sustainable development and use is to implement a holistic and integrated water basin approach to water resources management and make water everybody's business.

**DRIVING FORCES**

The driving forces towards integrated water resources management in Latin America and the Caribbean include the growing demands and scale of developments; the need to make the best use of scarce resources among competing uses, users and generations; the need to conserve water, the need for environmental sustainability; the recognition that water has both an economic and a social value; and the fact that independent maximization of benefits for each specific use creates serious conflicts in quantity and quality.

**GLOBAL VISION**

The vision for water resources management as stated at the World Water Forum is *Making Water Everybody's Business* and managing water to ensure that

- All people have access to safe and affordable water and sanitation.
- All people have access to nourishment and sustainable livelihoods.
- Freshwater and terrestrial ecosystems are conserved.

Critical issues identified as levers for changing the future from crisis to sustainable water resources management includes limiting the expansion of irrigated agriculture, increasing
the productivity of water, increasing storage, reforming water resource management institutions, increasing cooperation, valuing ecosystems functions and supporting innovations.

INTEGRATED WATER RESOURCES MANAGEMENT PROCESS

The shift to an integrated water resources management approach requires:

· Drastic changes in attitudes and behaviour.

· Implementation of the concept of integrated water resources management to attain sustainable development and use of the country's water resources.

· Development of national policies for IWRM to provide a framework for planning in the water sector and its integration with planning in other sectors.

· Development of an integrated water resource management strategy of each country.

· Development of a plan of action resulting from the strategy.

· Establishment of an appropriate Institutional framework inclusive of a coordinating mechanism for sustainable development in water resources and autonomous the water resources management authority outside of the water utility.

· Development of legislation to provide a legal framework to facilitate effective operations.

· Development of an effective decision support system. This is necessary to inform the decision making process. This depends on reliable data and information, water resources monitoring and assessment, and research and development.

KEY ACTIONS TO FACILITATE SUSTAINABLE WATER RESOURCES.

· Making Water Everybody's Business

Fundamental to the management of water resources for sustainability is making water everybody's business. As a matter of fact this mandate was given to us when God gave us dominion over the earth - long before the World Water Council established this as the water vision.

Adopting this mandate or vision can only result in a positive path to sustainability whereby each person's actions facilitate protection of the resource and its sources and optimization and efficiency of use as the modus operandi. Indiscriminate actions resulting in negative
impacts will be minimized thereby reducing the resources required for protection and enforcement. Furthermore the direction taken for managing water will be less dependent on governance as there will be greater support at the political directorate to follow the right path.

To obtain the potential benefits that can be achieved by making water everybody's business, every person must understand the world of water. This leads to another key condition for sustainable water resources - Public education and awareness.

· **Public Education And Awareness**

Understanding the requirements for managing water resources for sustainability must be a pre-requisite for individuals and stakeholders to undertake their responsibilities and roles effectively. Water is a complex multi-sectoral issue with many linkages, which must be understood. Education for sustainable water resources management must enable a holistic and comprehensive understanding and appreciation of the resource, its management, its linkages and the impacts.

· **Stakeholder Participation**

Another necessary aspect of managing water resources for sustainability is the involvement of stakeholders in the planning, managing, decision making and implementation of actions.

Previously in the Caribbean, participation of stakeholders was rare and sometimes information dissemination was considered stakeholder participation. However consensus is now recognised as the preferred position for effective water resources management.

**Research And Technology**

Specific research topics for water resources assessment, watershed management, waste water and others are needed to inform the decision process with respect to water resources management and development in a country. There must also be easy access for technology transfer and the introduction of appropriate technologies as required.

· **Poverty Reduction.**

One of the problematic linkages to water is poverty, which must be addressed to truly attain sustainability. The poor are the people who settle spontaneously (squat) in the watersheds without planning permission. Their actions assist in the destruction of the watershed and pollution of the water sources. Additionally the poor cannot afford to pay for water, they live in less sanitary conditions and therefore their health is at greater risk. The only solution is to reduce poverty.
CARIBBEAN'S PERSPECTIVE

The water vision and framework for action of the Caribbean to the year 2025 states the Caribbean's vision as:

**Provision of water of appropriate quality and quantity to reliably meet the needs of the various uses for sustainable development and the well being of all the peoples in the region.**

This vision comprises a number of vision statements, which point the direction to be followed to attain a sustainable future with respect to water resources management in the Caribbean in 2025 as follows:

- Proactive stakeholders participation and management are conducted through coordinated institutional structures.
- An integrated water, land and coastal zone management system, which uses the watershed as the basic management unit.
- Caribbean peoples are knowledgeable on the value of water to the extent that each individual exercises responsibility in its management.
- National development plans take into account the value of water and give priority to vulnerability and sustainability.
- Application of appropriate / innovative technologies to optimize the use of water and allow sustainable development of the region.
- IWRM is supported by a cadre of personnel capable of directing and executing Research and Development for the region.
- IWRM utilizes Decision Support Systems based on reliable data, information and technology.

The supporting actions are expected to address the actual problems and alleviate or reduce negative impacts and strengthen positive impacts which if not reinforced can deteriorate to a crisis scenario. Some of these actions include:

- Identify and strengthen regional institution(s) to undertake the coordination of integrated water management in the region.
- Develop and/or enhance and effectively implement legislation and policies, institutional, regulatory and the administrative framework for IWRM.
- Recognizing water as an input has economic value, promote efficiency in use and management to facilitate a paradigm shift from the concept "water is free"
· Establish and implement mechanisms to facilitate stakeholder's participation in planning, decision-making and management.

· Promote integrated Water Resource Management (IWRM) as the preferred approach to water management in the region and obtain national level declaration and commitment for its implementation.

· Develop best practices for waste water management, water demand management and conservation, and watershed management and promote the implementation of same.

It must be noted that some of the actions were recommended to be undertaken at both the regional and national levels given the size and proximity of the countries and the lack of both financial and human resources and expertise in the field of water management. Coordination, collaboration and technology transfer are seen as areas that can be facilitated at the regional level to ensure the adoption of water resources management for sustainability throughout the region.

CONCLUSION

Managing water resources for sustainability is essential and complex because it constitutes managing a multisectoral and multidisciplinary connective issue involving not only the water resources as an issue but the linkages and sectors which impact on or are impacted by water to ensure sustainability of life and support to socioeconomic development.

Making water everybody's business certainly appears to be the right path for effective management and therefore we must commit to this mandate.

To achieve the potential benefits, actions such as public education and awareness, stakeholders participation, research and technology and poverty reduction are necessary.

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