

# A Review Paper on Water Resource Management

Mamta Parwal

**Abstract**— Water is a key driver of economic and social development while it also has a basic function in maintaining the integrity of the natural environment. The paper argues for the need to rethink content and strategy of these initiatives so that the aspirations of the local community and its member fulfilled in a way that buffers the interests and efforts. In this paper we review the concepts of experts for water resource, recently monitored traditional methods and water resource funding allocations. We also concerned about the women's who are disproportionality affected due to lack of water and guidelines regarding natural water resources policy.

**Index Terms**— Water Resource, Initiation, women's, monitoring, sanitation.

## I. INTRODUCTION

Water management activities generally involve constructing water control structures (dams, polders, drainage ditches etc) to increase water access and reduce the risk of water-related natural hazards such as floods.[1] However, these structures often change water regimes, with consequences for the distribution and allocation of water resources among different stakeholders.

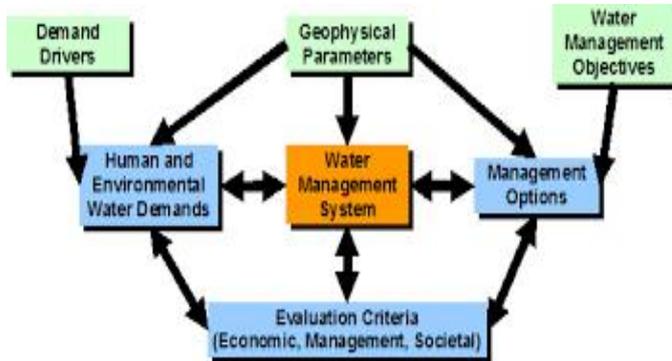


Fig 1- Conceptual diagram of water management

Although the intention of water resource development projects is to provide economic benefits to society. Water is a source of life for the planet. Access to water for life is a basic human need, a fact that is complicated by 1.6 billion people living in areas of physical water scarcity (UNEP, 2011).[2]

Yet in our increasingly prosperous world, 783 million people have no access to clean water and if the current trend continues there will be 2.4 billion people who lack adequate sanitation (WHO and UNICEF, 2014). Some regions are

naturally inadequate access to safe water, yet they are also the population groups whose livelihoods and immediate dietary needs are most dependent on these resources.[3] Water is not only a basic human right in itself, but it is also critical in farming and other livelihood activities. Irrigated agriculture accounts for 69 percent of all water withdrawals in the world, and the proportion exceeds 90 percent in some situations such as in arid countries.

Now in 2015 the pressures on water resources that more and more countries are experiencing will continue to increase over the coming years. Feeding a world of 8 billion people will require a much more efficient use of water for agriculture. The demands on water for energy, for cooling, extraction and production, will more than double. Higher rates of urbanization will increase demand for drinking water and industrial use with consequent higher waste disposal and treatment, also requiring greater energy use. These challenges are compounded by the additional level of complexity considering more than half of global freshwater, 276 international watercourses, crosses.[4]

International political boundaries where often no treaty exists to manage these transboundary waters.

These basins account for 40% of the global population and 60% of global freshwater.

## II. THEORY

There are differences in water availability from region to region, from the extremes of deserts to tropical forests. In addition there is variability of supply through time as a result both of seasonal variation and inter-annual variation.

Water resource management has been sectorally divided, especially between irrigation agencies and those involved in water supply and sanitation. Industrial uses have received less attention, governed (when governed at all) by a patchwork of permits from irrigation or municipal systems, and varying degrees of regulation of water quality. Water needs of aquatic habitats or other types of environmental flows have generally been under yet another set of environmental agencies. But with rising human populations and changing production and consumption patterns, water withdrawals have increased rapidly, bringing different uses into contact and competition with each other.[5]

These are some of the concept shared by the experts which are helpful in water management- Torkil jonch clause, Anders Jagerskog Torgny Holmgeren and Karin- The theme for Stockholm World Water Week 2014, (Water) – is a logical next step from the previous themes “Water and Food Security” (2012) and “Water Cooperation” (2013): water is a critical resource for development, and the watercommunity needs to connect with make the connection to vital

water-dependent societal sectors of society in order to properly manage this resource. The flow of the Weeks will continue towards the theme “water for development” in 2015, the year when the global community will adopt a set of Sustainable Development Goals (SDGs) for the Post-2015 development. [6]

Giulio Boccaletti (McKinsey) - presented on-going work that pilots a methodology for estimating financial needs in the water sector. The analysis estimates the upcoming water gap (comparing future water needs with existing water resources), identifies and costs measures that would contribute to close the water gap, and estimates the cost of closing the water gap using the most cost-effective measures.

Yann Laurans – His analyses about the cost of implementing the EU Water Framework Directive in the Seine-Normandy basin as well as the likely impact on household water tariffs. He discussed the French financial model (water pays for water), the cost of governance, extent of cross-subsidies from households to farmers in addressing wastewater treatment, the potential for French municipalities of using market-based finance to pay for infrastructure needs over longer timeframes, and the upcoming financial demands of renewing drinking water infrastructure for which no provisions have been made over the last decades. Robert Martín-Hurtado (OECD)- He introduced the OECD and the OECD’s Water Programme, stressing that the OECD wanted learn how to provide added value in this policy area.

Alan Hall (GWP)- He highlighting that guidance on strategic financial planning for water resource management at the national level is badly needed, and that work in this area could use a similar approach as OECD’s work on strategic financial planning of water services. [7].

From the Beyond (2015) drafting team leaders - End Water Poverty, WASH United and Freshwater Action Network.

### III. AREAS THAT COULD BE ADDRESSED FURTHER

#### A. Governance and accountability

The section on accountability in WASH should include more information around participation and access to information. Participation is mentioned in the Youth and Civil Society voices section but not in the actual recommendations.

Beyond(2015) paper:

The current framework lacks accountability and coordination mechanisms to ensure that agreed aims are fulfilled.

Accountability of governments towards their citizens is also vital and civil society must be empowered with the legal tools that ensure access to justice when their rights are violated or not effectively taken into account. Participation and access to information oblige governments to engage in genuine consultation with all societal groups and at all stages of decision-making, from priority setting to planning, implementation and monitoring. There is growing consensus and evidence that development interventions are most effective when people are empowered to engage and their needs are at the centre of government planning. Public

participation also ensures the legitimacy of the process, so that plans, programs, policies and projects can proceed with the endorsement of those potentially affected.

Consultation processes must include (awareness raising and sensitisation) so that communities understand and are well aware of the detail and impact of any planned interventions and have the confidence to express their position. With respect to sanitation and hygiene, the taboos and misinformation that often surround these topics must be understood and overcome.

#### B. Gender

There is not enough in the paper around gender and WASH. It is included in the MDG section.

From Beyond (2015) paper: Women are in many ways disproportionately affected by the lack of water and sanitation, and have to literally carry the burden when water resources are scarce, as they are most often responsible for water collection. Lack of access to safe and private sanitation facilities increases women’s and girl’s problems. Waiting long hours to relieve themselves also means that women risk severe long-term health impacts, such as urinary tract infections, which can lead to more serious infections, and have been associated with low birth weight babies.

#### C. Targeting of aid and sector budgets

There doesn’t seem to be anything in the paper around the targeting of aid and sector budgets. This is one of Beyond 2015’s key recommendations under ‘Governance and Human Rights’.

## IV. A SOLID FOUNDATION

Although the final formulation of a potential water goal is not known a starting point for developing the mechanism is the UN-Water recommendations and the draft goal and targets proposed by the OWG (open working group).

Critically, the framework must be grounded on what is measurable, affordable and applicable across a wide range of countries with differing capacities. The framework should be country-led as far as possible and avoid placing an unnecessary burden on Member States. The initiative will develop protocols to guide countries in their quest for useful water knowledge that enables them to better target action to where it is most needed.

## V. A PARTNERSHIP TO KICK START NEW MONITORING

UN-HABITAT, UNEP and WHO have developed this initiative, with UN-Water, and it is expected that others will join. A collaborative approach is anticipated that will involve several UN entities and international actors – many of them part of UN-Water. The Swiss Agency for Development and Cooperation has committed a significant investment over the coming nine years. The interest of other donor partners is being explored.

#### A. Harmonize monitoring mechanisms:

By guiding the development of post-2015 monitoring reports and harmonizing intended data collection methods for each report. Approaches will optimize use of traditional methods (e.g. national data, household surveys,

utility and regulator-provided data) and new and novel approaches (e.g. earth observations and derived data).

B. Establish and maintain a post-2015 global monitoring mechanism to establish baselines and track progress:

By developing monitoring protocols in partnership with Member States for wastewater, water quality and water resources management and supporting capacity development for data collection, quality assurance and analysis to inform baseline reports early in the post-2015 period as well as regular progress reports. An operational framework for inter-agency monitoring body/ies will also be established.

C. Extend monitoring to cover analysis of inputs and enabling environmental factors:

By additional analysis of findings and from 2018, produce regular reports covering inputs and enabling environment factors (drivers and bottlenecks) that influence progress in wastewater, water quality and water resources management (building on UN-Water GLAAS and on the UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management).

Integrated Water Resources Management (IWRM)—the systematic process of sustainably developing, allocating and monitoring the use of water resources in the context of social, economic and environmental objectives is key to development in SIDS. Successful IWRM approaches for SIDS must take into account these special characteristics, as well as local cultural and social contexts.[8].

The Berlin 2013 Nexus Policy Forum made clear that 'investing in natural infrastructure is a cost-effective way of improving water, energy and food security'.

Three vital and interdependent dimensions that, taken together, can secure universal access to water, for all, forever.

A. The primacy of ensuring WASH access was explicitly and strongly voiced. Despite enhancing water sources for 2 billion people since 1990, 783 million still lack access, 1.8 billion drink 'improved' but unsafe water, 2.5 billion lack improved sanitation and 1.1 billion defecate in the open. The absence of WASH spreads preventable disease and death to millions. It costs 1.5% to 4.3% from GDP, stunts childhood growth, drains women's time and energy, empties school chairs, forces needless risks, and denies human dignity. But the converse is also true. Investing \$1 in WASH yields at least \$4.30 in revenue, a conservative estimate that rises as one includes tourism, natural asset protection, and productivity from combining WASH with classrooms and health facilities.

B. Largely ignored in the MDGs, the crosscutting nature of water resource management was explored in depth. Water's horizontal linkages reveal competition between energy, agriculture, industry, and nature. Rising affluence, temperatures, populations, and pollution further intensify water stress. Yet potential routes to collaboration also emerged. Such efforts to reduce waste can improve access for vulnerable populations, boost climate resilience and ease tensions in shared watersheds. But at root the water crisis was seen as a governance crisis. Resolution combines soft reforms transparency, accountability, participatory

decision-making with hard investments in both civil works and 'natural infrastructure' that stores, conveys, cools and filters water.

C. Pollution of our rivers place billions of thirsty, hungry urban families that live downstream in danger. The dialogue on wastewater management and water quality confirmed that dilution of pollution was no longer a solution. Parties discussed how prevention, reduction, or removal of pollution to be both possible and profitable. They reconsidered the use, reuse, value and even meaning of "waste" water. As more than half of humanity lives in cities, contaminated discharge and surface runoff spread water-borne disease among billions. While real solutions yield high returns, the urban poor who need them most generate almost no taxes or influence; meanwhile politicians rarely invest if direct costs are immediate and indirect benefits appear only after they leave office or help those at a distance.[9].

## VI. CONCLUSION

Based on the preliminary results of the analysis, the cost of implementing cost-effectiveness programmes would seem large but not unachievable .

Peter Borkey (OECD) presented the conclusions of recent work on financing water supply and sanitation (i.e. strategic financial planning), as the starting point for OECD's thinking in the area of financing water resources management.

One tool to improve accountability towards future aims is the targeting and prioritisation of aid and sector budgets with regard to those regions, people and issues most often left behind. Progress in sanitation, for example, will not be achieved unless the budgetary gap is closed and legal and policy frameworks are created to ensure that narrowing gaps is given priority.

The countries in the United Nations system have agreed to development goals and targets which require that people be allowed to participate in planning, designing, selecting and implementing activities, projects, programmes which could contribute to their social and economic development.

National water resources and general guidelines:

- a) Strengthening environmental (SISNAMA) and water resources management (SINGREH) national systems
- b) Water as a cross-cutting theme
- c) Participation and social accountability
- d) Gender enquiry
- e) Decentralization

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