Pragmatic but Principled

Background Report on Integrated Water Resource Management

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This report explains the background and theory of Integrated Water Resource Management (IWRM), how it is implemented and synthesises the main criticisms. The document reviews how IWRM is relevant to the supply of drinking water and sanitation, urban areas and low income countries. Then reviews when IWRM is relevant to WSUP

This review is intended as an initial guide condensing the core aspect of IWRM, how it can be applied and the sector perceptions. For further information, refer to the key resource listed at the end of the document.

Summary

IWRM is about integrated and 'joined-up' management. It is about promoting integration across sectors, applications, groups in society and time, based upon an agreed set of principles. IWRM has been widely applied and aims for more coordinated use of land and water and is divided into full (wholly integrated activities) and light (applying the principles at the local level). The main criticisms of IWRM are the failure to translate the theory into action and the lack of change on the ground. There is a need for both light and full IWRM, but future projects need to increase participation and engagement.

Supplying domestic water and sanitation impacts other water users at abstractions (water demands can be can be very significant during the dry season and there is increasing competition for resources) and discharges (wastewater); an integrated approach can help remediate conflicts. IWRM has been neglected in urban areas, yet cites are a dominate feature within catchments and have complicated water environments and a large number of stakeholders. IWRM has been advocated in low income countries to address the millennium development goal, resulting in changes in law and policy; however, the changes have been superficial and had little real impact. For WSUP the process of IWRM is generally not very useful, but the principles are.

Background to IWRM

At its simplest Integrated Water Resource Management is a logical and appealing concept [1]. Its basis is that the many different uses of water resources are interdependent, and unregulated use of scarce water resources is wasteful and inherently unsustainable[2]. IWRM has emerged as an accepted alternative to sector-by-sector, top-down management approach [i] and the principles have been widely accepted as 'a good idea'[3]. Its popularity has been driven by the recognition of increasing pressure on water resources (and poor management and governance of water. The *Global Water Partnership* (GWP - the self appointed guardian of the concept) defines IWRM as a process which *"promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital eco-systems[4]"*. There are various other definitions, but all contain the principles of equity (in terms of access to water resources and benefits), efficiency and environmental sustainability. IWRM emerged following the Earth Summits of 1992 and 2002, inspired by the sustainability agenda of the 1980s and 1990s (in particular the Bruntland report[5])[6], combined with the 1992 Dublin Principles[ii] (see box below). "*At its heart, IWRM is nothing more than the process of implementing them"*.

Box 1. The Dublin Principles 1992[7]

Principle 1: Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment

Since water sustains both life and livelihoods, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or ground water aquifer.

Principle 2: Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels

The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.

Principle 3: Women play a central part in the provision, management and safeguarding of water

This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programs, including decision-making and implementation, in ways defined by them.

Principle 4: Water has an economic value in all its competing uses and should be recognised as an economic and social good

Within this principle, it is vital to recognise first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognise the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

[ii] The principles were agreed at the International Conference on Water and the Environment in Dublin. 1992.

Implementing IWRM

IWRM in effect calls for a broader systemic approach to water management. Implementing it can require reforms of water management laws, institutions and regulatory systems, and capacity building at a range of levels[3]. It aims for a more coordinated use of land and water, surface and groundwater and up and down stream users. The GWP provide guidance on the 'Why, What and How' of IWRM and believe successful implementation relies on three pillars[4]:

- An enabling legislative and policy environment which sets up and empowers
- An appropriate institutional framework composed of a mixture of central, local, river basin specific and public/private organisations, which provides the governance arrangements for administering
- A set of management instruments for gathering data and information, assessing resource levels and needs and allocating resources for use

More details on what each of these entails and example case studies is provided in the GWP toolbox[8] of good practice. The GWP describe the actual process of implementation as cyclical[iii] (Figure 1), emphasising it is an iterative, ongoing process. IWRM affects the management of water allocation, pollution control, monitoring, finance, floods, basin planning and stakeholder participation. IWRM has been applied at a range of scales and its implementation has been (artificially) divided between 'full' and 'light' IWRM[3]. Full IWRM concerns wholly integrated activities based on legislative, legal and institutional reforms that lead to implementing cross sector activities at a catchment scale.

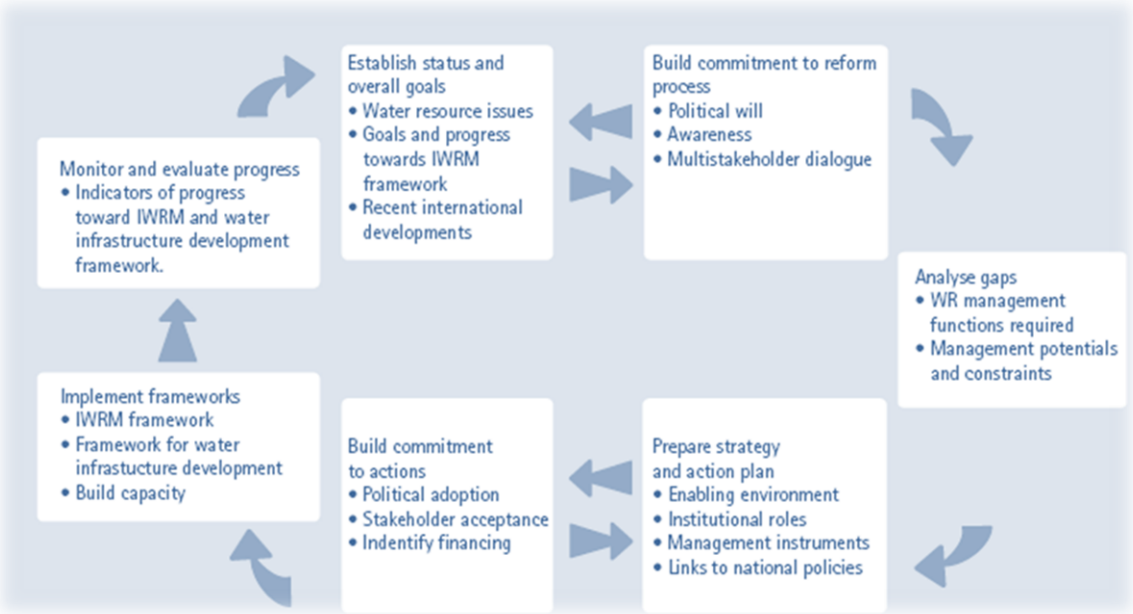

Figure 1 IWRM Process. Responds to changing situations and needs[9]

Light IWRM refers to the application of the Dublin principles by the individual or community within sub-sectors. It attempts to make it relevant at the community scale, where the over-arching legal and institutional framework is missing or ineffective. It aims to produce guidance for all stages of a project cycle, based on the logic that if all subsectors

[iii] The process is essentially a modified version of the standard decision making process model. It is an ongoing process

apply good IWRM at their own level this will lead to better local level water resource management. Light IWRM has been successfully applied at the village scale encouraging users to assess the impact of their action on other users and risks on a catchment scale[10,11]; however, the light process is less able to make the hard decisions required for water allocation and it is less prescribed as the process depends more on the individual's understanding. Table below outlines three examples of implementing IWRM.

What des it really mean?

"IWRM is about people (professionals and users) talking to each other more; about joint planning activities across sector boundaries; about integrated planning at the basin, but also at the community level. Critically IWRM is about information, and communication; about good planning based on a sound, and broadly based understanding of people's wants, and needs, but also their abilities and the constraints imposed by working with a finite resource[3]"

Experience of IWRM

The below table overviews the key component of each Dublin principles and synthesis results from an evaluation of 11 projects to identify the extent to which they incorporated the principles. 5 countries were from Africa, 5 Asia and 1 from South America.

Principle	Application (GWP)[124]	Lessons Learnt (1999)[13]
Fresh **water is** a **finite** and vulnerable resource, essential to sustain life, development and the environment	• Take holistic approach to management of water cycle • Recognise multiple use of water • Recognise limits of resource/consider water scarcity • Assess impact of human activities • Link up and down stream users • Promote integrated institutional approach	• Local communities can monitor and regulate their own catchments • Threats to water source and catchments recognised at all levels, but communities have limited understanding of cause and effect • Physical protection measures often limited to water source and did not include catchment • Unless government IWRM policies in place, catchment protection is unfocused and ineffective • Sustainable catchment protection and management requires a national framework • Interventions should be built on understanding of water catchment problems and local beliefs, customs and practice • Inefficiencies in water use may have several causes and there is little guidance on how to reduce them • People's 'view' of waste can sustain poor behaviours
Water development and management should be based on a **participatory approach**, involving users, planners and policy-makers at all levels	• Stakeholders should be part of decision making process • Participation is more than consultation (seek active engagement) • Empower ownership • Create participatory mechanism and capacity for community engagement • Make decisions at lowest appropriate level	• Good results achieved by involving communities in problem identification and solving • Stakeholders are more satisfied if decision making is transparent, but political or financial restriction reduce influence of stakeholders • Local initiatives can be strong but often lack capacity and orientation • Capacity building should be a priority, but it requires patience; learning is needed for effective engagement • Local tradition and skills are important assets • Governments are promoting decentralisation, back local government lack legal backing • Local authorities often lack resources while district and regional institutions lack management direction • Consultation for water resource allocation at a catchment level is not yet effective • Adequate water allocation can be agreed by stakeholders, using traditional and community based methods of water allocation • Conflict resolution mechanisms are not very effective
Women play a central part in the provision, management and safeguarding of water	• Involve women in decision making • Empower women into decision making roles • Consider gender roles	• National polices gradually favour a gender balance • Enabling environment for gender is promoted at local level (increased participation in water user committees) • Social pressure prevents women from fully participating • Focus on different roles of women and men proves positive • Gender equality is rarely achieved within implementing agency • Need to build capacity for women's involvement
Water has an **economic value** in all its competing uses and should be recognised as an economic and social good	• Water has a value an economic good that needs to be represented in the cost • Make subsidies transparent	• Willingness to pay depends on expected improvements • The economic and social value of water can be better recognised • Need to raise user awareness of investment and tariffs, enforce policies through payment incentives/penalties and adopt tariff variation for remote/poor areas or formally subsided users • Water is valued when it is scarce or because of tariffs

Criticisms of IWRM[iv]

There is a shared faith in the aims of integrated management, but despite some achievements and extraordinary investment, national governments have failed to sustain truly integrated programmes [14]. Thus IWRM is strongly criticised for failing to translate theory into action[15,16,18]. It lacks a clear operational definition and as such the implementation depends on the individuals involved, often the changes made are artificial and have little effect on the way water is used and managed on the ground. This is exemplified by interviews with IWRM practitioners of substantial experience who were unable to comprehensively define and describe the concepts and their purposes[17]. However, these failures are largely a result of the complex nature of the concept rather than failings of the practitioners - IWRM attempts to simultaneously address two highly complicated problems: sustainable development and cross sector planning[18]. Two recurring criticisms are (1) the lack of agreed indicators, making it difficult to compare and evaluate projects[19,20,21] and (2) that meaningful participation and engagement are missing[22] or the community lack the capacity to apply them[24].

Box 1: Main barriers to implementing IWRM[17]

Institutional: Effective water governance is crucial for the implementation of IWRM. Problems in management and governance go beyond mere technical challenges. In the case of IWRM, institutional reform is needed: correct policies, viable political institutions, workable financing arrangements, self-governing and self-supporting local systems. Institutions are rooted in a centralised structure with fragmented subsector approaches to water management, and often local institutions lack capacity. Awareness and priority of water issues at the political level is, in many cases, limited. Also information to support like what monitoring data sound management of water is generally lacking.

Evidence of success: The necessity of adapting the IWRM concept to suit different local contexts does not allow for a generic, complete description of strategies and techniques. In practice, the IWRM concept has not demonstrated its ability to increase the sustainability of water resources management. Empirical evidence is either missing or poorly reported. It will be important to identify the essential elements for IWRM, while avoiding rigid prescriptions and allowing for vast differences between individual situations

Ambiguity of definition: The most used definition of IWRM by the GWP gives very limited practical guidance to present and future water management practices. Besides the GWP definition, there are several other definitions that all differ from each other in one or more facets or dimensions. Ambiguity of definition further compounds difficulties in demonstrating success.

Complexity: IWRM takes into account relationships and dynamic interactions between human and natural systems, land and water systems, and key stakeholder agencies and groups. This interconnectedness on different scales and levels makes it very complex to translate the IWRM concept into practice. Management problems end up with ambiguous boundaries and complex links with other problems; goals, alternatives, and consequences that are not well defined or understood; pervasive uncertainty that may not be quantifiable; and iterative management that involves conflict and negotiation among multiple stakeholders with divergent interests and values.

[iv] The latest GWP publication (2010) provides a comprehensive review of the criticism of IWRM and responses. It also important to recognise that belief in IWRM is strongly divided betweens it advocates (principally the GWP) and its critics (mainly in academia).

Future of *IWRM*

> *"In many cases local agreement and capacity building on a better sharing and use will have greater impact than new national laws or international level treaties[2]"*

How can IWRM be used? The principles are accepted rational and it is clear IWRM is needed in WASH to incorporate the other sectors' needs. Yet how can real change be made on the ground? Biswas[v] one of the strongest critics of IWRM, advocates that what is needed is not integration but the fostering of collaboration, co-operation and coordination[23]. The latest GWP (2010) document[6] outlines lessons from 12 case studies highlighting the importance of higher level support (policy and institutions), that application will be specific to each society, there is not necessarily a contradiction between protection of the environment and economic growth and there is no 'magic bullet' for water management. A key recurring theme is effective management of water requires sustained and collective effort and engagement if it is to be successful.

A 2008 conference reviewing the implementation of IWRM in low income countries stated there is general agreement on the principles of IWRM, but there is a need for capacity building (particularly those lacking capacity to engage in decision making[24]), a greater focus on community level projects, integration of long-term water resource planning, more focused engagement, pragmatically working with city stakeholders (fostering joint planning and information sharing[24]), appropriate economic instruments and targets[25]. Results were presented from a joint project in South Africa (one of the first countries to apply IWRM nationally) that focused on moving towards decentralisation, capacity building and interactive learning. It concluded[6] that IWRM is no longer a thing to do but an interactive and emergent process of adaptive water resource management[vi]. Likewise, the GWP[6] (2010) now describes IWRM not as a prescription but a practical framework for addressing water management challenges (it is not an end in itself), outlining that 'integrated is short hand for the management approach it entails and could equally be described as holistic or systemic (*arguably the GWP's current emphasis on IWRM as synonymous with good water management could be considered as the GWP backtracking*). This approach was exemplified in the EMPOWERS[vii] project, which defined 7 principles for local water governance (Box 2). The local focus makes lighter approaches better suited to adapt and incorporate informal structures and institutions. Alongside this there has been a renew drive for infrastructure projects to compensate for the perceived ephemeral nature of IWRM[26].

[v] He argues there is absolutely no evidence from anywhere in the world that it will work for macro- or meso-scale policies, programmes and projects on a long-term basis!

[vi] Adaptive management seeks to increase the adaptive capacity of basins based on an understanding of the key factors that determine the basin's vulnerability.

[vii] Euro-Med Participatory Water Resource Scenarios Project, aimed to improve long term access and rights to water for underprivileged populations in local communities in Egypt, Jordan and Palestine, within the context of local water governance under the principles of IWRM.

Box 2: Seven Principles for Local Water Governance[27]

1. Local water governance should be based upon the integrated participation of all stakeholders and end-users at all levels
2. Local water governance requires that special efforts are made to include vulnerable groups
3. Locally appropriate solutions and tools should be developed through the use of participatory research and action
4. Capacities of stakeholders should be developed at different levels to enable them to participate in water resource planning and management
5. Water information should be considered a public good; and access to information be enabled for all citizens
6. Awareness must be developed for informed participation in water governance
7. The efforts of all actors (government, partners in development, civil society) should be harmonised and contribute to achieving agreed and locally owned visions and strategies

There are a wide range of light projects (EMPOWERS[28], LoGo Water[29], SWELL,[30] WaterAid/Oxfam[31], WATERCOURSE[32], WHIRL[33]) whose methods focus upon community participation. The methods vary but the main components are working with community owned knowledge and existing institutions, identifying risk, focusing on capacity building, active learning, engaging with local stakeholders and empowering them to make decisions. Essentially they believe that fostering community ownership and local decision making improves the success of the project, using IWRM as a medium for fostering the exchange of ideas and commitments. Additionally the hope is that success at the local level encourages buy-in from larger organisations, increasing the influence of the project. Some of the key tools for bottom up approaches are outlined below:

- **Community Based Water Resource Management (Water Safety Plans)** [3,11]**:** Derived from water safety plans, the process aims to link local level IWRM principles to the operation approach set out by WSP. The process entails risk identification and management in partnership with the community and consists of three key elements: [1] identification of credible risks to water supply systems services; [2] prioritisation of risks (based on community's priorities); [3] establishment of controls to manage identified risks (at an appropriate level for community water supply management). The work has focused upon rural communities and typically entails communities monitoring water levels and rainfall, mapping water resources, risk assessment for the water supply and land management
- **EMPOWERS Guidelines, Methods and Tools**[27]: A document outlining tools for participatory learning and action; assessing; working with stakeholders; and monitoring. The document describes the objectives of each tool, the required materials and resources, overviews the method and lists tips and tricks.
- **NEWATER Training and guidance booklet for adaptive water management**[34]**:** Describes instruments and applications that are can address various steps in the IWRM process. The tools are intended to raise awareness, explore potential management scenarios and encourage engagement and the exchange of information between stakeholders.

- **Resources, infrastructure, demand and entitlements (RIDe)**[35]: A simple framework with generic application. It is based on the understanding that water resources are linked to people by supply (and disposal) infrastructure, and that each of these three system elements (resources, infrastructure, users) normally has its own set of institutions, boundaries and other characteristics

- **Water Audits (Water Accounting)**[3]**:** this is a pragmatic approach to assess water resources and demands. It is promoted as a key step for effective and sustainable IWRM. It is based on the principles that knowledge of the current status of water resources and demand trends is essential for success and an understanding of factors affecting access and entitlement is fundamental for engagement with the poor. It implies a holistic view and interaction with society
- **IWRM guidelines for Local Authorities (LOGO)**, Local Governments for Sustainability have produce guidance on IWRM specifically tailored for local governments in the Southern African Development Community. The outline the benefits , the role of local government and practical steps for engagement[29]

Relevance of IWRM

The following sections outline how the principles of IWRM are relevant to different sectors.

IWRM and Water and Sanitation

IWRM occurs at the intersection of the different water sectors (Figure 2). IWRM interacts with the domestic cycle at inlets (abstractions) and outlets (discharges) impacting other users and the environment. Abstractions require a reliable quantity of reasonable quality water, which needs to be protected from competing interests and pressurised 24 hours a day (to avoid leaky pipes), whereas discharges can pollute the source, especially when treatment is forfeited. IWRM can also be applied to smaller decentralised systems to ensure good practice within domestic supply. The main challenges affecting drinking water supply and IWRM are due to the following[3]:

- Scale: conflict is typically at a local level or resulting from a failure to consider downstream users
- Boundaries: conflict is created because administrative and riparian boundaries are not necessarily concurrent
- Temporal variability: Water demand is constant (slightly higher in summer) but 44444supply is variable

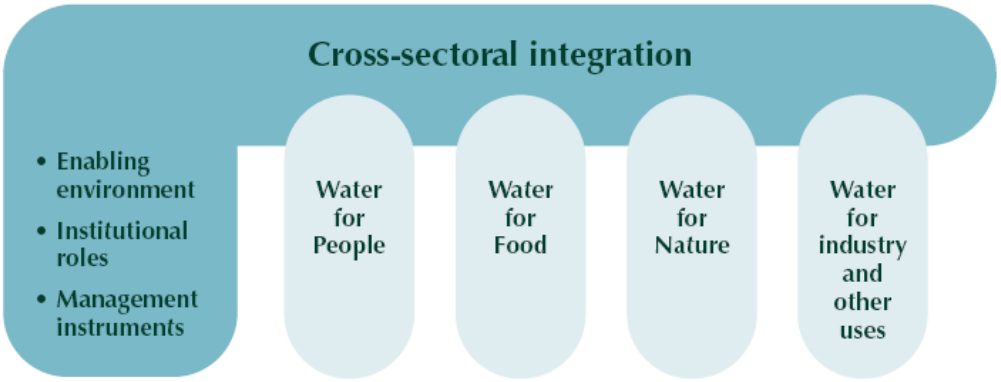

Figure 2: Cross-sector integration: the space for IWRM[4]

The various sub-sectors of the water sector can generally operate independently of each other without creating too many externalities[viii]. However, once demand is close to resource availability and the volume of polluted water rises, the need for a larger vision and integration effort is critical and IWRM provides an appropriate framework to address the challenges. Yet to date the WATSAN community has failed to engage adequately with IWRM[3]. Specific challenges and opportunities include:

- WATSAN demands are almost always given national priority, but the water demands are assumed to be trivial compared to other sectors; however, during dry seasons or droughts, they can represent a very significant share of the water resources
- WATSAN needs to shift from supply augmentation to demand management, as mechanisms to prioritise domestic water use often fail, due to increasing competition for resources as new sources are no longer available. As a result, the WATSAN sector increasingly has to compete for its water resource needs. This competition with other users can lead to conflict and increase costs, which IWRM can remediate
- Poor communities typically use water for multiple uses (backyard irrigation or keeping a few livestock) requiring 50-200 lpcd, significantly more than the expected 25-50lpcd. Multiple uses allow the diversification of livelihoods, improving income levels, health, and the sustainability of water systems (increasing both the willingness and ability of poorer communities to pay). IWRM provides a platform for discussing and managing multiple uses[36]
- Discharges can have major negative impacts on other sectors. IWRM provides a good framework for better understanding the issues and determining appropriate mitigation. Central to this will be accounting for downstream user's rights and the impact upon the environment of waste water. In particular, wastewater reuse for agriculture has become increasingly common and is associated with significant health risks both to farmers and food, requiring health hygiene education at the farm level and during food preparation [37]

[viii] A consequence of an economic activity that is experienced by unrelated third parties (can be either positive or negative)

- WATSAN affects 100 % of the population and thus is an entry point for increased participation in IWRM. It can provide the motivation and opportunity for individuals to get involved with IWRM and as utilities are already involved in service delivery they act as the obvious choice for representation.
- IWRM provides a framework for adapting to climate change, by building the capacity of countries to improve their ability to cope with today's climate variability[1,38,39]

IWRM and Urban areas

There has been little application of IWRM in urban areas, as it has been viewed as an issue for river basin management[40]. However, cities are dominant features within catchments and the need to consider the relevant activities (rural water supply, down-stream use, and agriculture) beyond the urban boundaries needs to be recognised[41]. At the city scale IWRM is relevant for addressing the complex sets of interdependent relationships existing within and between human and environmental systems, assessing the impact of all water-related urban processes on issues such as human health, environmental protection, water quality, water demand, affordability, land and water-based recreation, and stakeholder satisfaction. IWRM can be applied to urban areas to address the following negative externalities[42]:

- The negative externalities that arise from the uncoordinated use of water and land resources
- The opportunity costs of using water for low value/benefit purposes
- The benefits [costs] of a project or service may be limited [increased] by the failure to provide another service (e.g. water supply without hygiene /increased health cost if there is poor water supply)

Central to successful water management in urban areas is recognising the larger number of stakeholders than in rural areas, including those responsible for water supply and sanitation services, storm water and solid waste management, regulators, householders, industrialists, labour unions, environmentalists, downstream users and recreation groups. In urban areas these groups are typically fragmented in their roles and responsibilities and coordinating them of the main challenges[24]. In addition in urban areas there is often limited capacity to formal more participatory apaches and engage in decision making, related to limited access to and use of information on more integrated approaches[24].

IWRM in Low Income (IWMI AND 2010)

> *"there has been some recent improvement in the IWRM planning process at national level but much more needs to be done to implement the plans"*[43]

Low income countries have actively been encouraged to move from the traditional *supply-side orientation* towards *proactive demand management* under the broad framework of IWRM. However, what is usually implemented takes a narrow view of IWRM and tends to include a *blue-print* package including: [1] A national water policy; [2] A water law and regulatory framework; [3] Recognition of River Basin as the appropriate unit of water and land resources planning and management; [4] Treating

water as an economic good; and [5] Participatory water resource management[44]. Several of these mark a significant shift from current paradigms and making this transition is proving to be difficult. Drafting new water laws is easy; enforcing them is not. Renaming regional water departments as basin organisations is easy; but managing water resources at basin level is not. Declaring water an economic good is simple; but using price mechanisms to direct water to high-value uses is proving complex. This is combined with a lack of political will to seriously engage in water policy change, limited financing and national resources for water related development, low awareness of water issues, weaknesses related to human and institutional capacity, and discontinued support programmes[40]. Consequently, IWRM initiatives in low income country contexts have proved to be ineffective at best and counterproductive at worst. This is further complicated by the large proportion of the water sector that is informal, depending upon self-provision, informal exchanges and local community institutions that are not under the direct influence of formal public institutions. This challenges the standard IWRM approach as the institutional and legal reforms struggle to account for the informal sectors[45]. Despite these challenges, IWRM is advocated to advance progress on the Millennium Development Goals (MDGs)[43], as it encourages the sound management of freshwater resources, supply of unpolluted water and environmental sanitation. The UN –Water and GWP produced a guide[46] for advancing IWRM processes, outlining potential indicators (Box 3).

Box 3: MDG potential performance indicators[46]

MDG 1: Poverty and Hunger

- Infrastructure to store surface water, and further develop groundwater resources, is put in place
- The health and productivity of aquatic ecosystems - in particular related to fish productivity - is optimized and protected;
- Rural poor populations are protected against flood risks

MDG 4-6: Health

- Discharges of human waste waters are treated for bacterial contamination to prevent diarrhoea outbreaks
- Toxic emissions from industrial enterprises are controlled within international health standards
- Pesticide release to groundwater, wetlands and surface water is controlled

MDG 7: Environmental sustainability

- Appropriate environmental flows are ensured, to maintain wetlands goods and services
- Safe water supply and sanitation expansion has reached or exceeded target 10
- Urban slum dwellers are protected against flooding
- Social, economic and regulatory instruments are changing inappropriate water allocations and uses
- Water conflicts across the sectors are mediated through participation of appropriate stakeholder groups

When IWRM is relevant to WSUP

This section outlines whether and when integrated water resource management (IWRM) is relevant to WSUP. IWRM is internationally recognised as a good idea, but it can seem to be a confused concept, to both to policy makers and practitioners. It is really a synergy of sustainability, good water management, equity and collaboration, but it is criticised for lacking an operational definition and failing to sustain lasting change. The following reviews the situations when IWRM is relevant to water supply and sanitation services in peri-urban areas, outlines why the process of IWRM is generally not relevant to WSUP then summarises the benefits of incorporating the principles into WSUP's work and how to do this.

IWRM is sometimes relevant to WSUP projects:

- If **there is a localised water resource** (e.g. small aquifer) WSUP need to ensure the local partners understand how they impact the resource and assess its sustainability, setting up management structures to protect the resource, deal with conflict and manage the supply. WaterAid and Oxfam[31] have developed a process for community water resource management that can be used as a guide.
- If **water shortages are predicted** for the region, and increasing collaboration and participation will be central to reducing conflict. WSUP should support IWRM processes as the poorest are often the hardest affected, although domestic supplies are generally protected and for large resources WSUP is rarely involved with the resource management. For example in Antananarivo during the dry season there is often insufficient water for irrigation and industry but drinking water supplies are guaranteed
- If WSUP are **capacity building the regulators and the institutions responsible for managing water resources**. They need to encourage them to be proactive in collaborating with all the stakeholders, ensure they engage in IWRM dialogues and get them in contact with the regional Global Water Partnership representative[47]
- If **WSUP are representing disempowered water users**. WSUP will often be working with marginalised groups who are overlooked or excluded from water resource dialogues. WSUP should engage with these groups to represent their viewpoints, though this will often be done during the implementation of the project. For example WSUP have represented the peri-urban communities in Naivasha (Kenya) during discussions about Lake Naivasha

However, IWRM is often not relevant to WSUP because:

1. **WSUP work with the urban poor** who only require a minimal proportion of the water available and typically have onsite sanitation. Therefore they have little impact on water resources - IWRM can be more relevant for larger utilities who provide large volumes and sewage (domestic demand can be significant during the dry season and wastewater discharges can have a significant impact on water resources)

2. **WSUP aren't mainly involved with the water regulators/managers of the resource.** IWRM focuses upon governments and regulators. The majority of reports are for governments (local and national) and regulators, and there is little information to support IWRM for local water service providers in peri-urban and informal areas. WSUP principally work with utilities and community organisations that usually have their abstractions and discharges managed and determined by other organisations. The exception is localised resources on which the abstractions and discharges for the urban poor may have significant impacts

3. **There is no clear operational definition for IWRM.** The meaning of IWRM is vague, it is described as good water management, but what this actually means in the WSUP context is unclear. Therefore WSUP should focus on doing what they understand as good water resource management, but with more emphasis on collaboration.

4. **It's not an appropriate use of resources.** WSUP are not the appropriate organisation to provide the training or facilitate the process, they don't have experience of IWRM and aren't involved with government level institutions, in addition the benefits to the urban poor would be marginal

5. The benefits of IWRM are fiercely contested; donors are more interested in water safety plans and IWRM reportedly doesn't work in informal settings

In summary, the process of IWRM is generally not very useful to WSUP, but the principles are. The principles have been converted into benchmarks to measure water management and environmental sustainability, developing an audit tool[48] to assess water resources and project management – the tool emphasises better water management in the slums, not the process of implementing IWRM. This can be used independently, but it will be more effective if incorporated into the WSUP scoping assessment of projects.

For the situations when IWRM is relevant, the most pragmatic approach is to apply "light IWRM", applying the principles at the project level. This should bring about meaningful stakeholder participation, community resource management and bring together the key partners to improve the safety of the water. Applying the environmental sustainability audit will help establish a basic framework for addressing the issues. In addition, the tools outlined in the future of IWRM are relevant and WSUP should consider implementing Water Safety Plans[49]. These provide a framework for identifying the risks to the water supply from catchment to consumer and should identify the specific risks to the water supply associated with the above situations. Water Safety Plans are much more relevant to WSUP than exploring any IWRM process, as they specifically address water supply.

Resources

Primary:

- **IRC Thematic Overview Paper on IWRM and Water Supply (2004)[3]**. This is an excellent review of IWRM specific to the water sector, it is short and concise and list further reading and resources.
- **IRC links**: Description of key IWRM past and current projects http://www.irc.nl/page/16388 websites http://www.irc.nl/page/10676 and resources http://www.irc.nl/page/10677
- **IWRM in practice (2010)[6]:** The most recent publication from the GWP describes 12 case studies summarising the key lessons and experience. It considers practical examples, looking at how IWRM has contributed at different scales and reviews criticisms and the future of IWRM

Secondary:

- **EMPOWERS Guidelines, Methods and Tools[28]**: A document outlining tools for participatory learning and action; assessing; working with stakeholders; and monitoring. The document describes the objectives of each tool, the required materials and resources, overviews the method and lists tips and tricks.
- **GWP Toolbox:** The GWP is an international network created to foster IWRM. The toolbox is a series of tools and case studies for implementing IWRM. However some of the tools have limited information and how they would be applied is unclear. There is also an online library of key papers and other resources, and links to a wider range websites and related partners. www.gwptoolbox.org/
- **IWRM Critique** Three insightful papers critiquing IWRM:
    - IWRM: A Reassessment - Problems with the definition and concept of integration[23]
    - From Premise to Practice – Reviews the difficulties in implementing IWRM[18]
    - IWMI Water Policy Briefing 24 - Review how IWRM is typical applied in developing countries[36]
- **IRC Integrated Water Resource Management in Water and Sanitation Projects** (1999)[13] Review of 11 drinking water and sanitation supply (DWSS) and integrated water resource management (IWRM) projects from around the world. It examines their successes and failures and draws lessons for the implementation of IWRM strategies elsewhere.
- **LoGo WaterError! Bookmark not defined.**, Assessed the role of local governments in IWRM in Southern Africa., in particular the set of materials for local governments
- **NEWATER Training and guidance booklet for adaptive water management[34]:** Describes instruments and applications that are can address various steps in the IWRM process. The tools are intended to raise awareness, explore potential management scenarios and encourage engagement and the exchange of information between stakeholders.
- **SWITCH Project[24]** Overview the institutional side of integrated water management, looking at governance issues and learning alliances
- **Water SA 34 (6)** (2009) This is a special edition of the journal based on a conference on implementing IWRM, the papers are positive on IWRM and highlight successfully participation and examples. Refer to Anderson et al., 2008[25] for a synthesis of the presentations

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