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Applying the principles of integrated water resource and river basin management – an introduction

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The views of the author expressed in this publication do not necessarily reflect those of WWF.

Contents

Summary	3
1. Do we know what we mean by IWRM?	5
2. Why is so much attention being given to IWRM?	8
3. Do we know what is happening? Global monitoring of IWRM implementation	11
4. Finding the way – some commonly encountered opportunities and pitfalls of IWRM implementation	14
5. How can application of IWRM be measured and monitored in practice? Indicators of success	20
Conclusions	29
Annex 1: Key sources of further information on IWRM and IRBM	31
Annex 2: List of References	33

Summary

Purpose and target audience

WWF, one of the leading global proponents of environmentally sustainable, integrated water resource and river basin management (IWRM/IRBM), has commissioned this report with the aim of:

- setting out the global policy framework behind the current focus on IWRM/IRBM;
- reviewing, in general terms, global progress with IWRM implementation;
- presenting indicators of successful IWRM/IRBM implementation and means of measuring/monitoring such indicators, with examples to the extent these are available;
- providing clearly signposted links to sources of further information.

This report is aimed primarily at WWF staff working on freshwater issues, but also at interested professionals within the water management sector (e.g. water companies, civil servants). In seeking to promote better implementation of IWRM, it provides a critical analysis of the current ‘state of the art’.

Summary of conclusions

1. Integrated Water Resource Management (IWRM) and Integrated River Basin Management (IRBM) remain somewhat elusive terms that can end up meaning all things to all people. This means that potentially conflicting policies or activities could get masked by the emphasis on an ‘all inclusive’ process. However, there is equally a danger of putting so much energy into dissecting the terminology that implementation and – crucially – monitoring of implementation, get neglected.

2. The key difference between IWRM and IRBM is the spatial and ecosystem focus of IRBM, which emphasises river basins (and sub-basins) as the natural hydrological units within which sustainable water resource management can best be organised. In this way, IRBM can be seen as a sub-set of IWRM, which tends to stress the need for integration at all levels, independent of any particular spatial scale or hydrological unit.¹

3. The recent paradigm shift towards IWRM has been driven largely by global political processes, particularly those with a broader development (rather than purely resource management) focus, such as the *Millennium Development Goals* and *Johannesburg Plan of Implementation* of the World Summit on Sustainable Development. This brings both great opportunities and significant pitfalls. On the positive side, there are unprecedented levels of political, administrative financial and technical support potentially available for projects that claim to implement IWRM. On the other hand, the ‘reality gap’ between global policy agendas and on-the-ground implementation may mean that key elements of IWRM, such as the need to ensure long-term environmental sustainability, are overlooked or set on one side.

4. There are many different bodies (at international, regional and national/sub-national levels) promoting the principles of IWRM, organising training courses and providing resource materials, including case studies. However, review of the limited information available internationally (e.g. from the Global Water Partnership or the Ramsar Convention on Wetlands) suggests that worldwide take-up and implementation of IWRM principles is patchy. There remains, therefore, a substantial communication challenge. Advocates of IWRM have to explain not only *what* implementation of IWRM means in practice, but also *why* it is so important from both environmental and socio-economic perspectives.

¹ For the sake of simplicity and readability, ‘IWRM’ is used in this report as shorthand for ‘IWRM and IRBM’

5. Until very recently there appears to have been little or no concerted effort – either regionally or globally – to monitor the extent, quality and performance of IWRM implementation. This makes it difficult to evaluate whether the theories and concepts underlying the IWRM approach are really being applied in practice and if they are proving to be effective. The limited information available on implementation comes largely from governmental and intergovernmental sources. So, although IWRM is being vigorously promoted in some quarters (e.g. internationally by the Global Water Partnership), there is a notable absence of independent critical synthesis or analysis, including from the NGO sector. A useful exception is a recent World Bank study, which is cited in section 4 of this report.

6. The following six issues are explored in section 4 of this report as key to guiding successful implementation of IWRM:

- communicating clearly and effectively the concept of IWRM;
- setting out practical steps for operationalising IWRM;
- ensuring that ‘sustainable’ water management embraces environmental sustainability as well as economic and resource supply sustainability;
- creating the conditions for real and meaningful public participation;
- decentralising decision-making to the lowest appropriate level;
- translating IWRM principles into action through strong leadership.

7. It is possible to identify ‘indicators of success’ that can be used to assess the effectiveness (or potential effectiveness) of individual projects, plans or programmes that claim or seek to implement the principles of IWRM (see section 5). The indicators of success are typically characteristics of project planning or implementation that can be readily assessed (at least initially) on a presence/absence basis. At a more detailed level, such as for an individual river basin or sub-basin, quantitative measures of success could be developed for many of the indicators identified. Only by establishment of such a monitoring framework will it be possible to assess whether the gap between theory and practice is being bridged successfully and therefore whether there is a trend to more environmentally and socio-economically sustainable management of the world’s limited freshwater resources.

1. Do we know what we mean by IWRM?

Integrated Water Resource Management (IWRM) and Integrated River Basin Management (IRBM) are both approaches that seek to achieve more sustainable (environmentally and socio-economically) use of freshwater. In this section, the close relationship between IWRM and IRBM is described, beginning with a brief discussion of terminology and definitions. However, rather than focusing on relatively limited differences between the two approaches, we seek to underline the common ground and the potential this offers for synergy through harnessing the ‘best of both’.

IWRM and IRBM (and other similar terms such as Integrated Catchment Management) are broadly compatible approaches that have been developed as a reaction against the shortcomings of traditional supply-based water management. The latter has focused on technical solutions, with individual and – in many cases – completely unconnected projects designed and implemented by different agencies representing different sectors (agriculture, energy, transport etc), as exemplified by the numerous water control structures on the Danube River and its major tributaries in central and eastern Europe. This has typically resulted in the management of water being highly fragmented, with multiple, sometimes overlapping, responsibilities. This approach can be characterised as focusing on supply ‘fixes’, with little regard paid either to managing demand or to minimising adverse environmental and social impacts.

As well as segregation between different sectors, water management has also typically been fragmented spatially, with administrative and political boundaries – rather than hydrologically meaningful units – determining decisions about water use.

In contrast with the fragmented, ‘business as usual’ approach, both IWRM and IRBM place the emphasis squarely on integration.

The Global Water Partnership (GWP, 2000) defined 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 ecosystems.”

In its 2003 publication *Managing Rivers Wisely*, WWF built on this to articulate its definition of Integrated River Basin Management:

*“Integrated river basin management (IRBM) is the process of coordinating **conservation, management and development of water, land and related resources across sectors within a given river basin**, in order to maximise the economic and social benefits derived from water resources in an equitable manner **while preserving and, where necessary, restoring freshwater ecosystems.**”*

As emphasised by (our) use of boldfacing in this quote, fundamental to WWF’s approach is the focus on:

- conservation of resources (and not only on resource management and development);
- intersectoral cooperation at river-basin level (given that a river basin is the fundamental hydrological unit for which integrated management must be achieved, and that interventions carried out with insufficient basin-scale cooperation between key sectors/stakeholders may have serious adverse impacts on the basin as a whole);

- protection and restoration of aquatic ecosystems (given that the natural functioning of ecosystems is ultimately responsible for ensuring the continuity of the water cycle).

In short, IRBM focuses on the fact that naturally functioning river-basin ecosystems – including associated wetland and groundwater systems – provide the freshwater on which we all depend. When these ecosystems are no longer able to function naturally and begin to break down, water resources – for people and wildlife alike – shrink. Therefore, effective management of a river basin’s water resources must include maintenance of ecosystem functioning as a paramount goal.

In *Managing Rivers Wisely* WWF set out seven general principles for successful IRBM initiatives:²

- There is a long-term **vision** for the river basin, which is supported by the major stakeholders;
- **Integration** of policies, decisions and costs occurs across major sectoral interests such as industry, agriculture, urban development, poverty alleviation, navigation, fisheries management and conservation;
- Strategic decision-making occurs at the **river-basin scale** and is used, in turn, to guide actions at sub-basin or local levels;
- Great care is taken with the selection and **timing** of IRBM initiatives and actions; there is a need for readiness to seize unforeseen opportunities as they arise, providing that this will contribute clearly to realising the strategic vision;
- Priority is given to maximising active stakeholder **participation** in decision-making processes that operate transparently and are based on provision of adequate and timely information;
- There is sufficient investment by governments, the private sector, and civil society organisations in **building capacity** to enable effective river-basin planning, including the establishment and operation of participatory processes;
- There is a solid foundation of **knowledge** about the river basin and the natural and socio-economic forces that influence it.

These were further developed through an analysis and distillation of ‘lessons learned’ from WWF field and policy projects in river basins around the world.

Therefore, while IWRM and IRBM differ slightly in terms of definition and philosophy, they offer fully compatible approaches that – when properly implemented – incorporate the principles of:

- integration of land- and water-use planning
- cross-sectoral cooperation
- environmental sustainability
- economic efficiency
- social equity
- stakeholder participation.

All of these principles are likewise fully compatible with – if not central to – poverty reduction (alleviation/eradication) initiatives, notably in the framework of the UN *Millennium Development Goals* (see UN Millennium Project, 2005).

In view of the close relationship between IWRM and IRBM, and for the purposes of simplicity and clarity, IWRM is the term used in the remainder of this report. However, it should be understood that WWF remains convinced that the river basin (sometimes referred to as ‘catchment’ or ‘water basin’)

² The relevant synthesis chapter from *Managing Rivers Wisely* may be downloaded at:

<http://assets.panda.org/downloads/managingriversintroeng.pdf>

remains the most effective unit for the planning and implementation of IWRM, recognising that a ‘basin’ may range from a small, closed lake basin, to a vast transboundary system such as the Amazon, Danube or Nile.

Annex 1 provides links to recommended sources of additional background information on IWRM and IRBM.

Box 1: A note on WWF terminology – river basins and freshwater ecoregions

WWF has identified over 200 natural regions – or ecoregions – across the globe which represent the most biologically outstanding terrestrial, freshwater and marine habitats. Collectively, WWF refers to these as the ‘Global 200’ ecoregions.

WWF’s Global Freshwater Programme considers that for all practical purposes there is equivalency between river basins and freshwater ecoregions. While there is not a full overlap between Global 200 freshwater ecoregions and major river basin boundaries, ‘river basins’ is used by the Global Freshwater Programme because:

- (a) The outside world generally understands ‘river basins’ more easily than ‘freshwater ecoregions’ and engaging external audiences is a priority for WWF;
- (b) Long-term conservation of freshwater habitats frequently depends on administrative structures created around river basins, e.g. river basin authorities and commissions;
- (c) Conservation of freshwater ecoregions that include major deltas, lakes and marshes/swamps depends on sustainable management of the hydrology of the whole river basin;
- (d) In many instances, WWF has identified priority river basins within a broader freshwater ecoregion to focus delivery of its conservation goals.

2. Why is so much attention being given to IWRM?

This section explains the main political and policy drivers that are behind the emergence of IWRM as a global paradigm, looking in particular at the convergence of intergovernmental agendas for environmental management and poverty reduction. An understanding of this framework – and the organisations and processes that support it – can help ensure the appropriate alignment of water-related projects, plans and programmes with global, regional and national priorities, thereby helping to ensure high-level political, administrative and/or financial support.

The global policy framework underpinning the current and unprecedented focus on IWRM is essentially provided by the closely associated *Millennium Development Goals*,³ agreed by the United Nations (UN Millennium Project, 2005), and the *Johannesburg Plan of Implementation*, arising from the 2002 World Summit on Sustainable Development – see Box 2. These provide the framework for making the important connection between water resources management and poverty reduction, and thereby improving the inter-linkages between policy-making and implementing bodies that approach water resource management from an environmental/ecosystem perspective and those whose remit is primarily one of poverty reduction/eradication.

Other global frameworks supporting IWRM/IRBM

The principles of IWRM/IRBM have been adopted by the 150 member governments of the ‘Ramsar’ Convention on Wetlands,⁴ are actively promoted through the Global Water Partnership, and were key to the agenda of the recent 4th World Water Forum, where one of the four ‘Framework Themes’ addressed was *Implementing Integrated Water Resources Management (IWRM) Approaches*.⁵

Regional initiatives

At regional level, IWRM/IRBM is seen as a vital element of, for example, the New Partnership for Africa’s Development (NEPAD)⁶ and is also at the heart of the European Union’s Water Framework Directive (WFD),⁷ the overarching water law applying to the EU’s 25 member states as well as EU accession states.

³ The UN’s latest progress report on progress towards the MDG Targets can be found at:

unstats.un.org/unsd/mi/mi_goals.asp

⁴ Download the Ramsar Convention’s Handbook on river basin management in pdf or Word format from:

http://www.ramsar.org/lib/lib_handbooks_e.htm

⁵ Find out more about the Framework Theme on IWRM at the 4th World Water Forum:

http://www.worldwaterforum4.org.mx/home/cuartowwf04_01.asp?resp=02

⁶ Find out more about IWRM and its role in NEPAD at: <http://www.sarpn.org.za/wssd/may2002/water/page7.php>

⁷ Find out more about river basin management and the WFD at:

<http://europa.eu.int/comm/environment/water/water-framework/overview.html>

Box 2: The MDGs and the WSSD Plan of Implementation

Millennium Development Goals

Goal 7 of the United Nations' *Millennium Development Goals* (MDG7) is to "Ensure environmental sustainability". This includes three Targets, the first two of which are related to IWRM:

Integrating the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources;

Halving, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

Progress to achieving these Targets is, in turn, assessed by a set of Indicators. However, none of these relates directly to IWRM/IRBM, aquatic ecosystem functioning or the relationship between the management of water supply and sanitation and wider environmental management. The only Indicators that specifically mention water are: *Proportion of population with sustainable access to an improved water source, urban and rural* and *Proportion of population with access to improved sanitation, urban and rural*.

WSSD Plan of Implementation

Paragraph 26 of the *Johannesburg Plan of Implementation* (JPOI) adopted at the 2002 World Summit on Sustainable Development, requires governments around the world to "develop integrated water resources management and water efficiency plans by 2005". This is to be achieved through a series of measures, which, *inter alia*, include:

Implementing national/regional strategies, plans and programmes for integrated river basin, watershed and groundwater management;

Reducing losses incurred through inefficient water infrastructure and increasing recycling of water;

Using a range of policy instruments (e.g. regulation, monitoring, voluntary measures, market- and information-based tools, land-use management and cost-recovery of water services);

Allocating water resources among competing uses in a way that "gives priority to the satisfaction of basic human needs and balances the requirement of preserving or restoring ecosystems and their functions, in particular in fragile environments, with human domestic, industrial and agriculture needs, including safeguarding drinking water quality".

National Initiatives

A study of Poverty Reduction Strategy Papers (PRSPs)⁸ was carried out for WWF in 2004 (ODI, 2004). PRSPs are prepared by national governments and are given considerable weight by the international donor community. They are significant for WWF's freshwater conservation agenda since they have the potential to influence considerably the level and prioritisation of spending on water-resource management as it relates to poverty-reduction initiatives. This study revealed that inclusion of water issues is generally weak in existing PRSPs. Of ten African, Asian and Latin American countries studied,

⁸ Updated (at least in principle) every three years and reviewed in annual progress reports, PRSPs describe each country's macroeconomic, structural and social policies/programmes for promoting broad-based growth and reducing poverty, and are used as a means of identifying investment priorities and financing needs. Find out more about PRSPs at: <http://www.imf.org/external/np/prsp/prsp.asp> and in the WWF-UK guides to PRSPs and water: <http://www.wwf.org.uk/researcher/issues/internationaldevelopment/000000235.asp>

coverage of water-related issues in general, and management of water resources in particular, was patchy and inconsistent.⁹

Meanwhile, the 'beacon paper' on IWRM for the 4th World Water Forum (Mexico, March 2006) providing a 'cross-cutting perspective' on 'Institutional Development and Political Processes', underlined a key point, namely that water policies and institutions are both the *result* and *vehicle* of broader political processes that inform institutional change and development in relation to water, i.e. what goes on *beyond* the water sector affects policy *within* it.

⁹ There do not appear to have been any subsequent studies providing further information on the inclusion of water resource management under PRSPs.

3. Do we know what is happening? Global monitoring of IWRM implementation

While the laudable principles of IWRM are being very actively promoted both internationally and nationally in response to the political drivers summarised in section 2, do we know how far these principles are really being implemented? And do we have any idea of their practical effectiveness, rather than their theoretical value? This section looks at whether the ‘hype’ and momentum behind IWRM is backed up with the rigorous networks needed to measure global take-up, assess usefulness and share lessons learned.

Institutional mechanisms for monitoring water resources

While there are many international bodies that play a role in water-resource monitoring, there appears to be a lack of ‘joined-up thinking’ in terms of translating this monitoring effort into meaningful assessment of progress under the political and policy drivers described in the previous section. For example, the UN Task Force on Water and Sanitation has noted that there is “currently no global system in place to produce a systematic, continuing, integrated, and comprehensive global picture of freshwater and its management in relation to the MDGs” (UN 2005).

The UN’s World Water Assessment Programme (WWAP)¹⁰ has a potentially vital role in assessing the status and trends of freshwater resources throughout the world. Its primary output is the periodic *World Water Development Report*, the first of which was produced in 2003 (UN/WWAP 2003). The 2nd Report (WWDR2) was launched at the 4th World Water Forum in March 2006. While WWDR2 contains much useful information, the sectoral approach to many of the main chapter headings (Water and Agriculture; Water and Energy; Water and Health; Water and Industry etc) and the devolvement of responsibility for drafting these chapters to separate UN agencies/bodies does not provide for a cutting-edge approach to water resource management. In relation to IWRM, the key conclusions and recommendations chapter of WWDR2 states that:

“...there is no panacea for implementing IWRM; it must be tailored to prevailing conditions and flexible enough to permit this. Local circumstances can put obstacles in its way... Probably because of these and other difficulties, very few countries have met the Johannesburg Plan of Implementation (JPOI) target that IWRM should be incorporated into national water resources plans by the end of 2005. Thus, it is clear that more analysis of the practical means of moving from a fragmented, sector-by-sector approach to IWRM needs to be carried out for lower-income countries, and these experiences need to be shared widely.”

While accurate, it is disappointing that the report does not go further.

Institutional mechanisms for monitoring IWRM

In addition to the wider monitoring of water resources in relation to the MDGs, the international community, and specifically the UN system, should be tracking progress with the development and implementation of IWRM plans and strategies (as called for by the WSSD target – see section 2). This does not appear to be the case at present.

The UN Task Force on Water and Sanitation has pointed out that the information gathered through an improved monitoring process could be used by the international community during the second Water

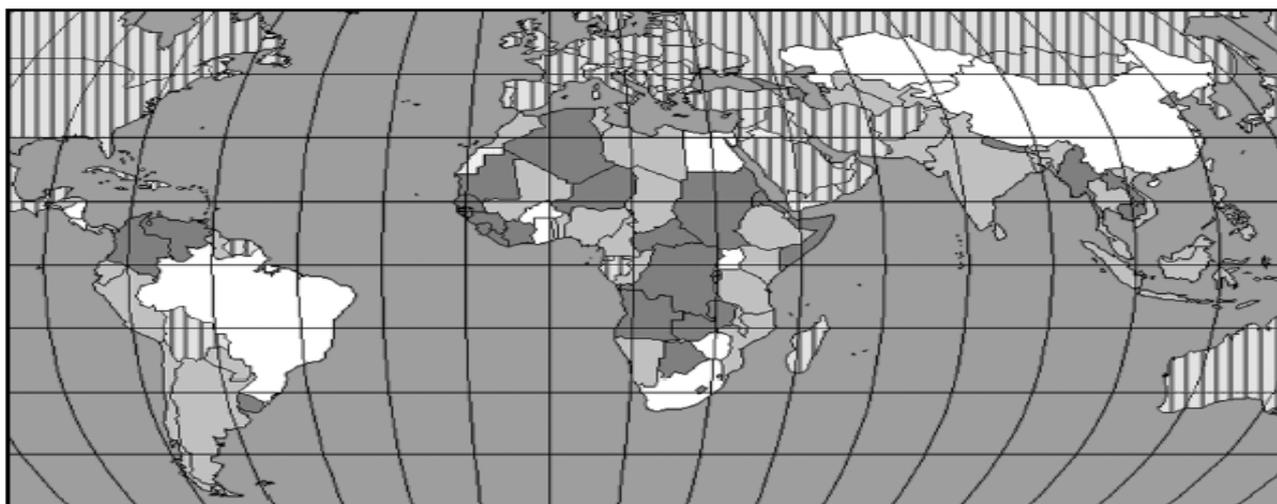
¹⁰ Find out more at the WWAP website: <http://www.unesco.org/water/wwap>

Decade, 'Water for Life' (2005 to 2015), in order to mobilise international awareness and political commitment to water resources planning, development, management. The Task Force suggested that the recently created 'UNWater' be mandated to report periodically, through the WWDR, on this, with provision of increased funding.

As noted in section 1, the GWP is perhaps the single most important international agency responsible for supporting IWRM at global and regional levels.

However, to date the GWP has focused its energies on acting as advocate and promoter of the concept and principles of IWRM, rather than objectively analysing progress in IWRM and monitoring its implementation. An 'Informal Stakeholder Baseline Survey' was carried out by GWP in 2003 and reported at the 3rd World Water Forum in Kyoto, March 2003, through a document entitled 'Current Status of National Efforts to Move Towards Sustainable Water Management Using an IWRM Approach'.

In the resulting world map (below) countries considered by the 2003 GWP survey to have made 'good progress' are shown in white, countries having implemented 'some steps' are represented in light grey, and countries remaining at the 'initial stages of the process' are shown in dark grey. However, the report recognised the "fundamental limitations" of the survey. A key limitation was that those countries with striped shading were excluded from the survey.



The restricted nature of GWP's work on assessing progress with IWRM implementation was also underlined by a 2004 evaluation by the Operations Evaluation Department of the World Bank, which observed that, while GWP was carrying out its "already widespread role as advocate and promoter" of IWRM, "without abandoning its underlying advocacy-oriented activities, it will have to pay greater attention to the role of water in poverty reduction by providing tangible technical assistance to developing countries to gain more equitable access to drinking water and water services and an increased voice in water management reform". GWP had not demonstrated "actual on-the-ground impact" and the latter was "not yet known". GWP's "outreach, including the dissemination of best practices and lessons, would benefit from demonstrating clearly how participatory processes resulted in improved [poverty] outcomes". The evaluation went on to say that GWP was aware that it needed to develop systematic performance indicators to assess its impact and "is in the process of establishing performance indicators – benefits at global, regional and local levels".

The findings of a second informal survey were launched by GWP at the 4th World Water Forum (March

2006) and billed as assessing progress on the WSSD target. The survey was conducted by the GWP network in November/December 2005 and focused on policies, laws, plans/strategies and other planning documents. Indeed, the GWP has underlined that: *“The questionnaire was carefully designed to capture the status of IWRM policies, laws and plans, but not at this stage to assess what is actually being implemented. This will require a different type and much more extensive survey. This survey is to be considered a forerunner of a more comprehensive initiative on monitoring integrated water resources management that GWP and others aim to carry out with the World Water Assessment Programme during 2006–2009.”* The 2nd informal GWP survey was also limited to 95 countries where GWP has established a Regional/Country Water Partnership or an ‘alliance partner’. These are mainly developing countries. The report contains regional maps and country profiles but no global map for direct comparison with the 2003 map reproduced above.

However, the following table compares the results for the 2003 and 2005 surveys and suggests that modest progress has been made, but note that (a) almost four out of five countries remain in the bottom two categories of progress, and (b) such progress relates to IWRM planning only and not to implementation.

Indicator	Percentage of countries surveyed in 2003	Percentage of countries surveyed in 2005 (n=95)
Plans in place/substantial progress made	13%	21%
Progress, but more to do	47%	53%
Initial steps taken	40%	26%

While any progress is to be welcomed, and it is certainly good news that WWAP and GWP are committed to a more detailed assessment of actual implementation, it is regrettable that it will be 2009 (at least) before such information is available and that an effective global monitoring programme was not established at a much earlier date.

Ramsar Convention on Wetlands – National Reports

The 9th Conference of Parties (COP9) to the Ramsar Convention, held in Uganda in November 2005, provided a useful opportunity to gauge the extent to which governments are engaged in ‘joined up’ thought and practice on IWRM; i.e. the extent to which the Convention’s work is being set in the wider context of integrated water resource and river-basin management.

A provisional analysis of COP9 National Reports was conducted in mid-September 2005 as part of the background research for this paper. This showed clearly that take-up and implementation of IWRM principles by the governmental authorities responsible for Ramsar implementation is patchy at best. For example, at global level, only 18% of Contracting Parties reported that the Convention’s own guidelines on river-basin planning had been implemented, while fewer than a quarter reported “projects that promote and demonstrate good practice in water allocation and management for maintaining the ecological functions of wetlands have been developed”.

4. Finding the way – some commonly encountered opportunities and pitfalls of IWRM implementation

So far, this paper has described what we mean by IWRM, how leading international agencies are promoting and supporting its implementation, and the extent to which implementation is actually being monitored or assessed. This section looks at the practical challenges of implementing IWRM in a given country or river basin, focusing on harnessing opportunities and avoiding common pitfalls. Awareness of such opportunities and pitfalls is more likely to result in an IWRM plan, project or programme that fulfils many of the ‘indicators of success’ presented in section 5.

Below we discuss six issues that typically present both important opportunities and potential difficulties for IWRM implementation. This is not intended to be an exhaustive list but rather an introduction to getting the overall context right. If serious errors are made in these areas, it is unlikely that specific implementation measures will succeed.

(a) Communication

The communication challenge of IWRM has two elements: communicating *what* implementation of IWRM means in practice, and *why* IWRM is important.

The inclusion of IWRM in a global intergovernmental water target has heightened policy attention to water-resource management, but also has the down side that ‘IWRM’ has become a fashionable ‘buzz phrase’ which may end up meaning ‘all things to all people’. There is a risk that ‘integration’ pays lip service to environmental and social correctness, without real attention to how improved environmental and social outcomes will be achieved in practice.

The concept of ‘integrated’ management of natural resources is well-understood by environmental managers, and sets an important technical standard for combined management of land/soils, forests, water and other natural resources at catchment level. But when taken into a wider policy realm, involving governance issues at a large river basin and/or national level, its message becomes less clear and simple.

The Global Water Partnership acknowledges that IWRM is often perceived as being complex and ambitious: “There is an inadequate appreciation of the gap between rhetoric and implementation, and the profound overhaul of laws, policies and practices which acceptance of the principles of IWRM necessitates” (GWP, 2003 – emphasis added).

For example, in England, the recently approved national strategy for flood management (*Making Space for Water*, DEFRA 2004) is designed to promote an ‘integrated’ portfolio of measures which are to be ‘embedded’ over a range of government policies – with flood-risk policy integrated, for example, with urban development policy. The draft *Planning Policy Statement 25* (‘PPS 25’, ODPM, 2005) proposes how local/regional (town and country) planning authorities in England should take account of flood-risk amongst other ‘material’ spatial-planning considerations and a ‘sequential test’ is elaborated to help steer new developments away from higher flood-risk zones. At the same time, government policy seeks to support regeneration of ‘brownfield’ sites, so ‘PPS 25’ has been drafted to include an ‘exception test’ to allow what is called ‘necessary development’, including in riverside locations.

In this case ‘integration’ as a water policy objective needs to be closely evaluated in the light of (planning) practice. The detail of the criteria in the exception test (when finalised) will define precisely

in what circumstances developments in flood-risk zones are deemed to be ‘necessary’ for economic/social reasons, over and above the warnings of water managers.

This example illustrates how the term ‘integration’ tends to mask trade-offs, at first sight implying that competing interests may always be reconciled, whereas in this case a choice will often be needed between a precautionary approach to climate change-related flood risk and ‘development pressures’. Currently, the result risks allowing ‘business as usual’, with, as one commentator has expressed it, the goal of managing flood risk (as one component of IWRM) being subject to ‘economic override’.

Some commentators are sceptical as to the feasibility of IWRM in developing countries; e.g. Allan (2003) who notes that “IWRM requires an unprecedented level of political cooperation” and that IWRM is promoted by countries from the ‘North’ in countries of the ‘South’ that are in significantly different stages of economic development.

By way of response, the GWP argues for an approach which can, it says, avoid becoming ‘mired in complexity’; the solution in practice being inter-sectoral ‘coordination’, which sets a less demanding governance standard than true integration. The idea of moving towards more coordinated, ‘joined-up’, government surely sets a clear direction in relation to a water sector that in many countries (both developing and industrialised) is fragmented, with multiple agencies working on water issues (water supply, irrigation, energy, transport, tourism etc) and holding often overlapping responsibilities.

The second part of the challenge is communicating to stakeholders in a given country or river basin why they should implement a better-coordinated approach to water-resource management, including allocating funding to that effort – especially given the severe economic constraints in developing countries.

The ‘why’ of IWRM is linked to the ‘what’. To achieve broader success, IWRM has first to succeed in attracting the motivation and commitment of a constituency of support from stakeholders within government and beyond it, in business and civil society, and among people who work on water issues and others who do not.

The recent report of the UN Millennium Project UN Task Force on Water and Sanitation (UN Millennium Project 2005) provides some useful insights into the ‘why’ of communication challenge. The remit of the Task Force covered both water and sanitation (WSS) aspects and water resources management (WRM) issues, including the challenges of meeting the WSS target and the IWRM target. But from that starting point, treatment of the two targets differed substantially. The views expressed in this Task Force report and approved by the UN Millennium Project at global level (i.e. this is a high-level policy document) are that:

- the sanitation target added at WSSD is ‘an integral part of Target 10’ under MDG 7, but that the IWRM target is not;
- the link between the WSS target and poverty reduction is clear and immediate, whereas the IWRM target is seen as ‘complex’;
- IWRM is an ‘enabling framework’, a fundamental component of any national strategy to attain the MDGs, but, it seems, more a means to an end (however strategic a means) – as the Global Water Partnership expresses it, a “larger hydrological and sustainable development *context*”;
- IWRM is a long-term process.

In other words, while the validity of IWRM *per se* is not disputed, the underlying message is that the urgent priority is to fill gaps in basic water needs and resolve problems of food security and hunger, whereas achievement of environmental sustainability is a secondary and longer-term objective.

International donor support is typically delivered through short- to medium-term programmes, of e.g. 3–5 years, and donor representatives, whose task it is to identify objectives for funding, will look for outcomes which are realisable within that timeframe. The tendency will be for them to choose sectors which can yield more rapid rates of result, with lower levels of risk.

This will be a critical factor in low-income countries in, for example, sub-Saharan Africa, where institutional capacities are low. In such contexts, mainstream ‘social’ sectors (such as health and education) often win out, in competition for funds, over the WSS ‘sector’, while tackling water resources is perceived as being too ambitious and long-term a challenge. Yet, the importance of addressing resource availability has been underlined by the recent severe drought in northern Kenya, with the grievous consequences for vulnerable populations which have been witnessed.

(b) Sustainability

For local resource-users, ‘sustainability’ combines different aspects.

The GWP definition of IWRM (cited in section 1) highlights a key ingredient of successful IWRM, namely the maintenance of ‘the sustainability of vital ecosystems’. A core message to be communicated to stakeholders is that the securing of economic and social benefits for people (two ‘pillars’ of the GWP definition) is dependent upon environmental sustainability (the third pillar).

Recent case studies commissioned by WWF (Schuyt 2004) showed that communities living close to water and other natural resources were “often the first to recognise that improved freshwater management was essential to improve their livelihoods” and that “sustainable freshwater resource management and livelihoods improvements were not approached as two separate activities, but as part of a holistic...approach”. In rural contexts in developing countries, environmental and social/economic sustainability are closely linked and local resource-users are aware of the benefits, wherever possible, of attributing equal priority to them. The mistake of water governance is to draw artificial institutional/administrative lines between them.

How then can the realities of linking water management for domestic and productive uses at local level be translated into policies and plans for ‘coordinated’ water management at national and basin levels? One avenue is to create closer links between IWRM and water and sanitation (WSS) initiatives of governments, civil society or private water-service providers. When WSS experts address issues of ‘sustainability’, they think of ‘sustainable’ access to new or improved water supply points, such as stand-pipes, boreholes and wells. They look at how water facilities may be sustained in physical and economic/financial terms. But, this view of sustainability overlooks the environmental component.

A useful lesson in relation to overcoming such separations made by water administrators arose out of the conduct of the water-sector review in Uganda. The review process there, in 2002–2003, avoided the habitual sub-sectors and organised itself around themes over which no one sub-sector could assert its dominance. The consequence was a dynamic process widely appreciated by its participants and which produced a set of monitoring and evaluation performance indicators (Republic of Uganda, 2003).

(c) Participation

IWRM cannot succeed in the absence of genuine and effective participation of ‘water stakeholders’, especially local resource-users.

The challenge is to create workable institutional mechanisms (e.g. river-basin councils, commissions and committees) that offer opportunities to promote deeper and wider participation. The degree of motivation felt by representatives of all stakeholders regarding the meetings of water-management institutions will be reflected in attendance levels. This will in turn depend on how such meetings are

planned and conducted and is likely to influence strongly whether and how institutional policies and decisions are actually supported and implemented on the ground.

The Member States of the European Union are currently implementing river-basin planning in accordance with the EU Water Framework Directive (EU 2000). Article 14 of the Directive requires public ‘participation’ and each country is in the process of interpreting what that will mean in its national context, though EU-wide guidance has also been produced.

Schuyt (2004) found that one of the common key factors for success among the developing-country case studies analysed was the positive motivation of local people.

Debates and decisions relating to policy traditionally occur within formal institutional ‘spaces’ (Cornwall 2002; Gaventa 2003). A key objective for basin-level (and other water-related) agencies is to create additional new spaces, opened by membership of decision-making bodies and fora. That evolution is unlikely to happen automatically; it will require proactive creating and ‘claiming’ of spaces by a range of stakeholders, including civil society.

For the purposes of social equity this includes representation of poor and marginalised populations, so that the voices of poor communities may be expressed and heard. The very fact of marginalisation makes involving those communities difficult, but it is an essential means (and end) of equity in allocation of water resources and a key condition for IWRM to play a successful role in contributing to poverty reduction.

A recent ODI/WaterAid study on the level of civil-society participation in water agencies in three countries in Asia (ODI in prep.) noted that: “One of the principles of IWRM is user participation in management at the basin or catchment level. Serious challenges remain, including how the new institutional structures (basin councils or committees) function as systems of inclusive decision-making, arbitrate in disputes and help promote more equitable resource allocation.” In many developing countries this is an ongoing challenge, and it is premature to assess whether this approach is succeeding.

The above study found that civil society in the water-resource sector in the three study countries is at present divided, and that civil society representation at policy meetings tends to be dominated by larger (national) NGOs, with local (grassroots) organisations inadequately represented. This may undermine the perceived legitimacy of civil society representation. In one of the three study countries, for example, government officials felt that civil society involvement was “not genuine” and that the process of consultation had been “hijacked”.

(d) Decentralisation

“One of the internationally accepted principles of river-basin management is to decentralise decision-making to the lowest appropriate level.”

So stated a recent report (World Bank 2005) containing eight in-depth case studies of river-basin management in seven countries from 2002–2005. This principle, it noted, has been promulgated extensively over the past 15 years, leading to the creation of many river-basin management organisations. But, the report continues: “...while the concept of management at the lowest appropriate level could be translated into laws and regulations relatively easily, its actual application often encounters obstacles...”

Decentralisation potentially opens up exciting new opportunities, provided that the following ‘enabling conditions’ for more effective water and natural resource management are met:

- There is genuine devolution of powers, with authority and autonomy transferred to decentralised agencies (e.g. river basin or sub-basin agencies);
- Local water-user associations and stakeholder groups are established and empowered via capacity-building measures to interact effectively with decentralised public agencies;
- The public officials of decentralised water management agencies are visible and accountable;
- Locally elected community leaders participate in the agencies' decision-making processes, opportunities ('spaces') are created for participation of grassroots community representatives, and emphasis is placed on enhancing self-identity and worth of local communities;
- As a corollary of the above, decisions on water-resource management are more responsive to local socio-economic conditions/needs, and are more likely to contribute to an improvement in rural resource management and livelihoods.

The World Bank case studies also provide examples and insights into many of the major pitfalls that need to be avoided in decentralisation of water management. These include the following (citing the report of the World Bank 2005 study):

- Partial decentralisation: devolvement of responsibility without parallel devolvement of authority and autonomy – especially from a financial perspective – means that decentralised agencies are unable to function effectively; real power remains vested in national/regional bodies and causes disillusionment and cynicism among local stakeholders.
- Shifts in power balance: the establishment of decentralised and participatory decision-making structures/processes inevitably involves shifts of power. Existing decision-makers may be unwilling to share or transfer responsibility and authority, local elites may dominate the process and capture additional powers, so that local inequalities are maintained or reinforced. The World Bank report comments that: “Even in settings where there is a desire for decentralised basin management, the political dimensions of public policy play a key role.” Case-study examples cited in the report include efforts by the Andalusian regional government (Spain) to exercise greater leadership over basin management in the Guadalquivir river basin; the initiative taken by water users in the Jaguaribe basin (Brazil) to gain more influence in decision-making processes; and the desire of the state water company in Indonesia to take over responsibility and authority for pollution control from provincial governments.
- Inadequate information-sharing: in most river basins information flows have traditionally been sector-based, with low levels of information exchange between sectors and poor to non-existent access for public/community stakeholders, especially in rural areas of developing countries. Such a context is opposed to the conditions favouring successful IWRM. Decentralised water/river-basin management agencies must therefore develop a key role as information brokers. This in turn requires significant and long-term investment.
- Over-emphasis on the whole-basin scale: the World Bank studies highlight that, although river basins are of crucial importance hydrologically and ecologically, not all aspects of stakeholder participation – and not all decisions and activities that contribute to IWRM – need necessarily be organised at the whole-basin scale. The 'lowest appropriate level' for some water-resource management functions may be a sub-basin, a local or regional unit of government, or a hybrid unit. In other cases, it may make sense for certain consultations or decisions to be at a supra-basin level, e.g. nationally. Selective delegation of functions may help to reduce the possibility that municipalities and other conventional administrative units contest or impede the functioning of new river basin agencies.

(e) Defining what integration means in practice

National and basin-level plans for ‘integrated’ water resource management need to define clearly how the concept of IWRM is to be operationalised.

In section 1 there is discussion on what IWRM means and why it is important. A failure to address these ‘what’ and ‘why’ issues in a particular country context means that tensions between differing interpretations of ‘integrated’ water resources management are likely to be masked, potentially leading to failure of implementation efforts. For proponents of successful IWRM, it is important that these tensions are recognised and openly debated, as opposed to being left blurred (administratively convenient as this may be).

For example, formalisation of water rights is increasingly presented as an essential means of ‘integrating’ competing claims for access to water resources, including in contexts of scarcity. From a poverty-reduction perspective there is a real concern that reform of water rights ignores and excludes small users, thereby reinforcing existing power inequalities and consequently opposed to the concept of IWRM as expounded by GWP, WWF and others.

For example, in Mexico, fast-track registration of water rights was introduced under the 1992 Water Law, and strengthened by the 2004 Water Law. On paper, these laws articulate the declared aim of ‘integrated development’ of water resources for achieving environmental and social goals, as well as economic efficiency. However, anecdotal evidence on the operation in practice of registration and trading of water rights in some basins indicates a rapid concentration of water rights in a few hands, with pressure on poor farmers to cede their water rights. This raises questions as to whether social, as well as economic, efficiency objectives of ‘integration’ are being realised in practice.

(f) Leadership

Strong leadership is required for successful IWRM.

Given that IWRM is a complex and relatively new approach that may be perceived by existing water power-brokers as threatening the status quo, strong leadership (whether at national, river-basin or sub-basin levels) is needed to maximise the opportunities for success.

This was demonstrated by WWF’s 2003 analysis of river basin management projects, *Managing Rivers Wisely*, which concluded that successful projects tended to have clear leaders or ‘champions’. These champions came from a variety of stakeholder types (i.e. both governmental and non-governmental, including community groups) but were crucial in driving the process forward, even if, acting alone, they were unable to actually implement the actions needed to implement IWRM.

For example, the success of the South African catchment-based management programme ‘*Working for Wetlands*’ was in large part attributed to there being a catalyst working at a national level. In this case, the catalyst needed to be an NGO, since NGOs tend to have greater freedom and flexibility than either governments or business and therefore – under certain circumstances – greater potential to act as an ‘honest broker’. Key activities by the NGO champion included raising awareness among key decision-makers, landowners and the wider public; lobbying other stakeholders in government and business; and generally enthusing, initiating, guiding, encouraging, and advising. In other instances, such as a transboundary situation involving intergovernmental consultations, a more formal approach may be needed, for example a river basin or lake commission, providing a platform for international leadership.

In China, WWF actively supported a Task Force on IRBM in the framework of the China Council for International Cooperation on Environment and Development (CCICED). In 2004 it published *Promoting Integrated River Basin Management and Restoring China's Living Rivers* (CCICED 2004), a concise report which provided focused recommendations dealing with:

- legislation and institutional arrangements
- stakeholder and public participation
- economic measures and financial incentives
- innovative IRBM-related methodologies and technologies.

These recommendations resulted in a range of positive impacts, not least the establishment in April 2005 of the Yangtze Forum. At the Forum's inaugural meeting, provincial governors and key ministers from China's water, environment, forest, and agriculture sectors gathered to initiate development of a common strategy and action plan for the entire basin.

The flip side of the opportunities offered by leadership is that lack of clear and effective leadership is unlikely to see the translation of IWRM principles into effective action. The forces of bureaucratic and political inertia will tend to favour 'business as usual'.

5. How can application of IWRM be measured and monitored in practice? Indicators of success

This section sets out a table of thematic indicators that can be used to assess the success (or otherwise) of water management plans, projects and programmes.

Taking into account the material set out in the preceding sections, and drawing in particular on the opportunities and pitfalls discussed in section 4, the following table is an indicative guide to successful application of IWRM principles in water management plans, projects and programmes.

Under each of ten major headings are listed relevant ‘Themes’. For each of these, one or more ‘Indicators of success’ are listed, together with a brief ‘Rationale’ explaining how and why the suggested Indicator is a key component of successful IWRM.

The Indicators of success are typically characteristics of project planning or implementation that can be readily assessed (at least initially) on a presence/absence basis. At a more detailed level, such as for an individual river basin or sub-basin, quantitative measures of success could be developed for many of the Indicators.

A water management project that is an overall success in terms of its planning and implementation, and sustainable both environmentally and socio-economically, ought to be able to respond affirmatively (‘tick the boxes’) against most of the Indicators suggested below. At a minimum, the project should be actively addressing themes identified under all ten of the main headings. A project that can only tick a few of the boxes does not meet basic requirements for effective IWRM, is unlikely to be sustainable in the long term, may be damaging environmentally and/or socio-economically, and probably represents a poor investment.

The Themes and Indicators can all be clearly related to WWF’s seven principles for successful river basin management (see section 1), especially the principles of Vision, Integration, Scale, Participation, Capacity, and Knowledge. In relation to the seventh principle – Timing – it should be remembered when using this table that:

- An attempt has been made to group the ten main headings – and the Themes within them – in a logical manner for ease of reading, but this should NOT be taken to imply either a hierarchy of importance or a step-by-step sequence of implementation.
- By definition, implementation of IWRM occurs as a series of interconnected matrices, with multiple activities taking place simultaneously. The starting point is likely to be project- or programme-specific, based on available information and opportunities.

1. Sustainable water allocation		
Theme	Indicator(s) of success	Rationale
Legal status of water	The legal status of water and water entitlements/water rights is clear.	This is essential to support effective decision-making, monitoring and enforcement for sustainable and just water allocations (see below).
Water allocations and flow management	<p>(i) Surveys have been carried out of water availability and demand in the basin Actual and potential/future water needs have been assessed for all resource user-groups including small-scale users <u>and environmental requirements</u>, and areas of significant competition/conflict between use types and/or user groups have been identified.</p> <p>(ii) Based on the above, water allocation/flow management plans that are environmentally and socio-economically sustainable are in place for all user groups.</p> <p>(iii) Water pricing and cost recovery are being used as demand management tools to support more sustainable water allocation, particularly among commercial-scale users.</p>	An understanding of the water allocation and flow management needs of the various stakeholders/users is essential baseline information. This should cover both actual and projected/future needs and should include both smaller and larger users. Exclusion of small users will only exacerbate poverty and powerlessness. 'Environment' should be considered as a key user.
Water for ecosystems	The water allocated to ecosystems is adequate to sustain their natural functioning and the services they provide.	Ecosystems need to be recognised as the drivers of the water cycle and must therefore be factored into policy and planning mechanisms as legitimate 'users' of water.
Incentives – positive and negative	(i) A range of positive incentive measures favouring sustainable water use has been developed and is being proactively implemented.	There are many different types of both positive and negative incentives that may influence corporate, community and/or individual use of water resources.

	(ii) Any negative (or ‘perverse’) incentives have been identified and removed.	These range from formal financial instruments to informal cultural factors. Time, effort and resources need to be invested in assessing and acting on the opportunities for and barriers to sustainable water use.
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2. Governance		
Theme	Indicator(s) of success	Rationale
Policy, laws and regulations	(i) Policies, laws and regulations that conflict significantly with the objectives of IWRM have been repealed or amended; (ii) Policies, laws and regulations that can be used for enforcement-related actions – if required – are in place (e.g. for pollution control, land- and water-use planning controls).	Successful IWRM requires an appropriate national and sub-national policy and legislative framework (particularly as it relates to key sectors such as water, agriculture, environment, industry/economic development) that specifically provides for and encourages sectoral integration in water management. This will only be the case if policies and laws that are in conflict with the principles of IWRM are harmonised.
Consultative, cross-sectoral processes	A multi-stakeholder river basin/water management body is in place and taking a leadership role.	A formal, organised, cross-sectoral and transparent IWRM process, that includes stakeholder consultation and participation, will help give substance and direction to IWRM implementation.
From sector-based to integrated governance structures	There is formal recognition at the highest levels of government that sector-based government agencies must pursue integrated approaches in relation to water management.	Administrative inertia and self-interest will tend to resist integrated ways of working unless there is the clearest possible policy imperative from government.
Multi-scalar management framework	A ‘nested’ management framework operating simultaneously at different spatial scales (but with full coordination) is in place and working effectively.	Planning under way for multi-scalar management approach with basin-level overarching, delegated to river reach or tributary-level management, and in turn to site-based management.
Transboundary basins (both international and	(i) A bi- or multi-country/state/province river-basin management body is in	Collaborative management approaches between countries/states/provinces etc are a pre-requisite for effective IWRM

intranational)	<p>place to promote cooperative management.</p> <p>(ii) There are tangible signs of transboundary cooperation such as joint protected area declarations, water-sharing policies etc.</p>	in the case of transboundary basins.
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3. Managing threats to freshwater systems

Theme	Indicator(s) of success Rationale	Rationale
Options assessments and impact assessments	<p>(i) Comprehensive options assessments are implemented for major water-related infrastructure developments (e.g. dams, inter-basin transfers) as recommended by the Report of the World Commission on Dams.</p> <p>(ii) Appropriate impact assessment procedures (including Environmental Impact Assessment [EIA], Strategic Environmental Assessments [SEA], and Cost Benefit Analysis [CBA]) and laws are in place <u>and are being implemented effectively</u> to support management of threats to sustainable water use (e.g. over-abstraction, point-source and diffuse pollution, habitat loss/degradation).</p>	Impact assessment procedures and laws need to be kept under review – and enhanced where needed – to avoid/mitigate adverse impacts such as those from major infrastructure developments, inter-basin transfers, water pollution, habitat destruction, invasive species etc (see also under science and assessments).

4. Integrating protected areas

Theme	Indicator(s) of success	Rationale
Management of areas of	(i) IWRM plan indicates that protection is a priority for these	Unless such sites are clearly identified and their management requirements

biodiversity, social, cultural or economic importance	<p>areas.</p> <p>(ii) Sites of biodiversity, social, cultural or economic importance being protected or rehabilitated through appropriate mechanisms (such as Ramsar listing, other protected area establishment) and actions being directed by site plan.</p>	recognised by key stakeholders, the environmental, social and economic goals of IWRM will not be met.
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5. Natural infrastructure

Theme	Indicator(s) of success	Rationale
Management of significant natural 'infrastructure' (such as headwaters, wetlands, floodplain areas etc)	<p>(i) The rehabilitation or restoration of degraded natural 'infrastructure' has been identified as a priority action in the IWRM plan.</p> <p>(ii) Rehabilitation or restoration of degraded natural 'infrastructure' underway.</p>	The rehabilitation or restoration of degraded natural 'infrastructure' can contribute significantly to the sustainability of water resources in terms of both quantity and quality.

6. Financing IWRM

Theme	Indicator(s) of success	Rationale
Government and other investments	Financing levels achieved that allow for IWRM implementation at 75% or more of anticipated budget.	The IWRM planning process needs to include development of a business plan or investment strategy to help mobilise investments from government, private sector development assistance agencies, bilateral donors etc.
Cost-sharing	Cost-sharing mechanisms being implemented successfully (e.g. application of the concepts of users and polluters pay; payment for environmental services)	The planning process should also consider development of cost-sharing mechanisms to cover implementation costs, e.g. beneficiary contributions to management costs where resource transfers are made.

7. Ensuring participation and building capacity

Theme	Indicator(s) of success	Rationale
Participatory	(i) Implementation of plan(s)	The real depth and breadth of

planning and management	<p>based on the principles of equity in participation and decision-making for all stakeholders.</p> <p>(ii) The ‘voice of the poor’ is represented in basin (and sub-basin) level decision-making processes; i.e. sufficient ‘spaces for participation’ are opened for local water users associations and ‘grassroots’ organisations representing poor and marginalised communities.</p>	<p>participation of civil society in basin (and sub-basin) level agencies is an important issue. “One of the principles of IWRM is user participation in management at the basin or catchment level. Serious challenges remain, including how the new institutional structures (basin councils or committees) function as systems of inclusive decision-making, arbitrate in disputes and help promote more equitable resource allocation” (ODI 2002).</p>
Information flow and transparency	<p>(i) Transparency is evident in the implementation phase, and</p> <p>(ii) Information and knowledge as it is gathered is being passed freely between government and civil society stakeholders.</p>	<p>There needs to be an undertaking that planning and implementation will remain transparent processes to all stakeholders, and that information and knowledge as gathered (see below – science and assessments), will be passed between government and civil-society stakeholders.</p>
Education and public awareness-raising schemes	<p>Education and public-awareness schemes operating effectively and targeting a range of stakeholders.</p>	<p>Acknowledgement must be given to the need to promote appropriate education and public-awareness schemes as effective tools for integrated management of river basins.</p>
Training and capacity building	<p>Training and capacity-building programmes ongoing to help process of building skills base of key stakeholders.</p>	<p>IWRM requires significant investment of time and human/financial resources in building capacity and know-how among all stakeholders and at all levels of both government and civil society.</p>

8. Applying science, monitoring and assessment

Theme	Indicator(s) of success	Rationale
Foundation knowledge base	<p>(i) Foundation knowledge base established; and</p> <p>(ii) Shared between all stakeholders.</p>	<p>Steps need to be taken to document the full range of ecosystem services provided by a given river basin, in order to inform planning in relation to important natural, cultural, social or economic assets.</p>
Impact assessments (see also under 3. Managing threats,	<p>(i) Legal tools to conduct EIAs, SEAs and CBAs in place, and</p> <p>(ii) Administrative capacity to</p>	<p>To ensure that the legal tools and administrative capacity for conducting Environmental Impact Assessment (EIA), Strategic Environmental</p>

above)	apply these tools being enhanced.	Assessments (SEA) and Cost Benefit Analysis (CBA) are accorded priority in the planning process.
Monitoring programmes	Monitoring programme operating and providing advice on performance with IWRM implementation.	Monitoring programmes need to be developed that are based on the priorities and objectives (environmental, social and economic) set in river-basin plan(s).
Adaptive management feedback loop	Adaptive management feedback loop operating effectively.	Adaptive management feedback loop to be built into river-basin plan, and to be informed by ongoing monitoring (see above).
Formal review	Review of water-resource/river-basin plan(s) formalised in the text of the plan(s).	To ensure that effective learning and adaptation occurs.

9. Integrating with socio-economic agendas

Theme	Indicator(s) of success	Rationale
National strategies	<p>(i) Links between provision of water supply and sanitation and environmentally sustainable water resource use are properly reflected in overall water management plans.</p> <p>(ii) IWRM principles included in PRSP texts relating to the water management sector and other key sectors (e.g. agriculture, tourism, energy, infrastructure) and listed among priority actions in implementation plans and costing schedules.</p>	It is a political reality that the factors driving water-resource management in developing countries are linked more closely with socio-economic agendas (especially poverty reduction/eradication/alleviation) than with environmental agendas <i>per se</i> . It is therefore essential that attention be given to monitoring the inclusion of IWRM principles at a national strategic level, including in the context of PRSPs.
Basin level	<p>(i) Baseline data on poverty and water have been collected so that future change can be monitored.</p> <p>(ii) Participatory poverty assessments carried out to provide up-to-date information on the extent and characteristics</p>	This takes the logical step of translating application of IWRM principles into socio-economic water agendas from the strategic, national level, to basin or sub-basin level – the scale at which most individual projects are implemented.

	<p>of poverty in a given river basin, including gaps in access to water for domestic and productive uses.</p> <p>(iii) Existing customary (and other informal) rights of access to water resources – particularly those informal rights exercised by poor and marginalised communities – are recognised.</p>	
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10. Improving resource condition		
Theme	Indicator(s) of success	Rationale
Natural disasters (flooding, drought etc)	Impact of natural disasters lessened, as shown by reduced flood damage, more reliable water-resource availability etc.	<p>The overall goal of IWRM can be summed up as improving resource condition. Particularly important elements of this from WWF’s perspective are:</p> <p>to reduce the environmental and socio-economic impacts of ‘natural’ disasters (which often have a strong anthropogenic component);</p> <p>to reduce the impacts of land-based pollution;</p> <p>to enhance biodiversity conservation, fisheries production, and overall water quality and quantity.</p> <p>There components require specific planning, implementation, monitoring and follow-up activities within the overall IWRM framework.</p>
Biodiversity conservation	<p>(i) Biodiversity conservation measures built into IWRM plans at each level (see multi-scalar management above), and</p> <p>(ii) Status of threatened species and ecological communities has improved.</p>	
Fisheries production	Fisheries production has improved following introduction of IWRM processes.	
Land-based pollution of freshwater and coastal/marine systems	Land-based pollution of freshwater and coastal/marine systems has been reduced by IWRM processes, as shown by monitoring.	
Water quality and quantity	Local/catchment water scarcities and poor quality are addressed as priority issues in IWRM planning.	

Conclusions

1. Integrated Water Resource Management (IWRM) and Integrated River Basin Management (IRBM) remain somewhat elusive terms that can end up meaning all things to all people. This means that potentially conflicting policies or activities could get masked by the emphasis on an ‘all inclusive’ process. Each term needs to be defined in national policies and then further elaborated and ‘operationalised’ in practice. However, there is equally a danger of putting so much energy into dissecting the terminology that implementation and – crucially – monitoring of implementation get neglected. While there are indeed certain differences of emphasis, at a broad level the two approaches are fully compatible, both being based around the principles of:

- integration of land- and water-use planning
- cross-sectoral cooperation
- environmental sustainability
- economic efficiency
- social equity
- stakeholder participation.

2. By way of response to concerns that ‘integration’ (in the first bullet principle above) may be too ambitious, the Global Water Partnership offers – as an alternative – the notion of inter-sectoral ‘coordination’, similar to increased ‘cross-sectoral cooperation’ (referred to in the second bullet above), setting a less demanding standard in terms of governance. The idea of moving towards more coordinated, ‘joined up’ government surely sets a clear direction in relation to a water sector that is fragmented, with multiple agencies working on water issues.

3. The key difference between IWRM and IRBM is the spatial and ecosystem focus of IRBM, which emphasises river basins (and sub-basins) as the natural hydrological units within which sustainable water resource management can best be organised. In this way, IRBM can be seen as a sub-set of IWRM, which tends to stress the need for integration at all levels, independent of any particular spatial scale or hydrological unit.

4. The report of the World Bank study cited above (World Bank 2005), underlines that, although river basins are of crucial importance, not *all* decisions and activities that contribute to IWRM need necessarily be organised at the *whole*-basin scale. For *some* water-resource management functions, the ‘lowest appropriate level’ may be a *sub*-basin, a local or regional unit of government, or a hybrid unit. Meanwhile, in other cases, it may make sense for certain consultations or decisions to be at a *supra*-basin level, e.g. nationally. This means that, in practice, functions should be delegated selectively.

5. The recent paradigm shift towards IWRM (and related approaches) has been driven largely by global political processes, particularly those with a broad development focus, such as the UN *Millennium Development Goals* and *Johannesburg Plan of Implementation* of the World Summit on Sustainable Development. This brings both great opportunities and significant pitfalls. On the positive side there are unprecedented levels of political, administrative and financial and technical support potentially available for projects that claim to implement IWRM. On the other hand, the ‘reality gap’ between global policy agendas and on-the ground

implementation may mean that key elements of IWRM, such as the need to ensure long-term environmental sustainability, are overlooked or set on one side.

6. There are many different bodies (at international, regional and national/sub-national levels) promoting the principles of IWRM, organising training courses and providing resource materials, including case studies. However, there appears to be little or no concerted effort – either regionally or globally – to monitor or evaluate the extent to which the theories and concepts underlying the IWRM approach are being put into practice and how effective such implementation is in achieving the goal of IWRM. The limited information available on implementation comes largely from governmental and intergovernmental sources. There is a notable absence of independent critical synthesis or analysis, particularly from the NGO sector.

7. As well as articulating clearly *what* IWRM means, national (and decentralised) government agencies have to communicate the *why* of IWRM. To achieve broader success, IWRM needs to mobilise a constituency of support amongst stakeholders, within government and beyond it.

8. A key element in mobilising a broad range of stakeholders will be providing opportunities for more open decision-making on water issues. That ‘democratic’ evolution is unlikely to happen automatically. It will require proactive creating and ‘claiming’ of spaces by civil-society groups. Participation should include representation of poor and marginalised populations, so that their voices may be expressed and heard.

9. It is possible to identify ‘indicators of success’ that can be used to assess the effectiveness (or potential effectiveness) of individual projects, plans of programmes that claim/seek to implement the principles of IWRM. The indicators of success are typically characteristics of project planning or implementation that can be readily assessed (at least initially) on a presence/absence basis. At a more detailed level, such as for an individual river basin or sub-basin, quantitative measures of success could be developed for many of the indicators. Only by establishment of such a monitoring framework will it be possible to assess whether the gap between theory and practice is being bridged successfully and therefore whether there is a trend to more environmentally and socio-economically sustainable management of the world’s limited freshwater resources.

Annex 1: Key sources of further information on IWRM and IRBM

Global Water Partnership (GWP) – virtual library and ‘IWRM ToolBox’

The GWP is the international agency responsible, since 1995,¹¹ for ‘supporting improved water resources management and development’, based on IWRM principles, at regional, national and local/basin levels (including poverty reduction aspects). As a leading international actor (both globally and regionally) in the IWRM debate, the organisation’s website includes a useful virtual library of key IWRM-related documents that can be downloaded in pdf format.

To access the GWP library, go to:

<http://www.gwpforum.org/servlet/PSP?chStartupName= library>

Particularly useful references include:

- IWRM At a Glance (GWP brochure)
- Integrated Water Resources Management Plans Training Manual and Operational Guide (Cap-Net/GWP/UNDP March 2005)
- Catalyzing Change: A handbook for developing integrated water resources management (IWRM) and water efficiency strategies (GWP and Norwegian Ministry of Foreign Affairs)
- *Setting the stage for change* – Second informal survey by the GWP network giving the status of the 2005 WSSD target on national integrated water resources management and water efficiency plans (downloadable as a pdf)
- Building Awareness and Overcoming Obstacles to Water Demand Management (IUCN).

The purpose of the IWRM ToolBox (aimed primarily at water resource planners, policy-makers, river-basin managers and political advisors) is “*to provide water management professionals [with] clear examples of good and bad practices and lessons learned from real life experiences of implementing IWRM*” as a means of promoting more holistic approaches to water resource management. GWP also explicitly identifies the IWRM ToolBox as part of the response needed to achieve the *Millennium Development Goals* and recognises that these, in turn, are predicated on the overarching goal of reducing or alleviating poverty.

International Water Management Institute (IWMI)

IWMI is a non-profit scientific organisation funded by the Consultative Group on International Agricultural Research (CGIAR). It has recently been recognised, alongside WWF, as an International Organisation Partner of the Ramsar Convention. IWMI’s work is organised around four priority themes relating to the management of land, water, livelihoods, health and environment, and focusing on the challenges confronting rural communities in developing countries. IWMI works collaboratively with partners in the North and South to develop tools and practices that will reduce poverty and improve management of water and land resources.

¹¹ After an informal proposal of the World Bank and UNDP, supported by SIDA (Sweden), and subsequently by other donors.

The four IWMI research themes, all of which are fundamentally meshed with IWRM/IRBM approaches, are:

- Basin water management
- Land, water and livelihoods
- Agriculture, water and cities
- Water management and environment.

The IWMI website includes a Library Gateway to some 40,000 documents (<http://www.iwmi.cgiar.org/library/index.htm>), with an integrated Google search engine, providing a powerful information tool. Other on-line resources, including summaries of work under each of the four priority themes, can be reached from the IWMI homepage: <http://www.iwmi.cgiar.org/>

The Nature Conservancy (TNC) Ecologically Sustainable Water Management Framework (USA)

This page sets out “a framework for developing an ecologically sustainable water management program, in which human needs for water are met by storing and diverting water in a manner that can sustain or restore the ecological integrity of affected river ecosystems”.

<http://www.nature.org/initiatives/freshwater/misc/art16771.html>

Environmental Flows Initiative (Australia)

This page provides links to a series of useful reports and case studies covering the management of river systems in different regions of Australia from the perspective of maintaining environmental flows.

<http://www.deh.gov.au/water/rivers/nrhp/flows>

World Bank

The report of the World Bank cited at length in section 4 above, entitled *Institutional and Policy Analysis of River Basin Management Decentralisation: The Principle of Managing Water Resources*

at the Lowest Appropriate Level – When and Why Does It (Not) Work in Practice?, edited by Kemper,

Dinar and Blomquist, may be downloaded (5.9MB) at:

http://siteresources.worldbank.org/INTSAREGTOPWATRES/Resources/Insti&Pol_Analysis_of_RBMDecent.pdf

WWF Global Freshwater Programme

WWF publications relating to IWRM/IRBM can be downloaded in pdf format from the webpages of the Global Freshwater Programme at:

http://www.panda.org/about_wwf/what_we_do/freshwater/index.cfm

Additional sources of useful information include:

IUCN – The World Conservation Union: <http://www.iucn.org/themes/wetlands>

Overseas Development Institute: <http://www.odi.org.uk/>

The Ramsar Convention on Wetlands: <http://www.ramsar.org/>

WaterAid: <http://www.wateraid.org.uk/>

UNESCO Water: <http://www.unesco.org/water>

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