



# INTEGRATED WATER RESOURCES MANAGEMENT (IWRM): What Is It and What Does It Mean for Resilience Food Security Activities?

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## INTRODUCTION

Integrated Water Resources Management (IWRM) is increasingly part of Resilience Food Security Activity (RFSA) programming. Yet the meaning of IWRM is not always clear, nor is where to go for more information or what activities should be done to implement IWRM. IWRM and water resources management (WRM) are also different things, but the difference between them is not always clear. This learning note, written by PRO-WASH, an initiative funded by the United States Agency for International Development (USAID)'s Bureau for Humanitarian Assistance (BHA) and led by Save the Children, aims to fill these gaps. PRO-WASH supports partners to improve WASH work through capacity strengthening, knowledge sharing, and applied WASH and WRM research opportunities.

## WHAT IS IWRM, AND WHY IS IT NEEDED?

IWRM is a broad approach to water management and governance that looks at many scales, sectors, and stakeholders, both in the present and in the future. IWRM considers the various purposes, benefits, costs, and trade-offs of using water and aims to achieve more holistic, productive, and coordinated water management. IWRM includes the environmental goods and services that water supports, such as grazing, forests, food crops, clean rivers, and animal habitats. It also recognizes water's social, cultural, and religious values.

One of the most common definitions of IWRM is provided by the [Global Water Partnership](#):<sup>1</sup>

**“Integrated Water Resources Management (IWRM) is a process which promotes the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment.”**

IWRM is closely related to WRM; in general, however, IWRM takes a wider, catchment- or country-level view across multiple sectors such as power generation, urban water supply, and agriculture. In contrast, WRM is often applied more at a local level (e.g., a sub-catchment view) and includes activities such as tree planting, runoff control, water retention, pollution reduction, and rainwater harvesting. While there is overlap between IWRM and WRM, the latter is often seen as a natural component, at local level, of a broader IWRM approach.

When water resources are managed following IWRM and WRM principles, food security, human health, agricultural production, and the environment can benefit substantially. Natural resources that depend on surface water and groundwater, such as forests and wetlands, are healthier and can in turn provide firewood, fish, building materials, flood protection, and other ecosystem services more reliably. IWRM can also help make communities more resilient and self-sufficient, particularly as climate change risk increases. Approaches to water assessment and management such as IWRM are recognized by USAID and other partners as an important part of RFS and water security programming and research, and as part of Title II-funded food security programs. IWRM does not only apply to WASH but is also part of all humanitarian assistance programming, including humanitarian response (emergency) and ER4 (early recovery, risk reduction, and resilience) work.

## WHERE DID IWRM COME FROM?

The ideas behind IWRM are not new, but it is only in the last few decades that IWRM has become an important idea in water management. In 1977, the United Nations (UN) water conference in Mar del Plata, Argentina recognized the many linkages between water, food, and energy. During the UN International Decade for Clean Drinking Water in the 1980s, there was increasing agreement between water management specialists that water needed to be managed more holistically. Most specialists realized the need to understand the impact of water use across multiple sectors, such as agriculture, energy, health, transport, and mining; and to have better water planning and policy. IWRM is usually seen as an improvement on past approaches to water management that concentrated on only some sectors (e.g., irrigation or power generation) and favored “engineer-led” or technocratic solutions.

IWRM also has economic and even ideological roots: The UN’s *Our Common Future* report<sup>2</sup> of 1987 defined sustainable development and recognized that economic growth and the environment are joined. The “Dublin Principles,” arising from the International Conference on Water and the Environment in Dublin in 1992,<sup>3</sup> stated that “water has an economic value in all its competing uses and should be recognized as an economic good.”

1 <https://www.gwp.org/en/gwp-SAS/ABOUT-GWP-SAS/WHY/About-IWRM/>

2 United Nations (1987) Report of the World Commission on Environment and Development: “Our common future” (also known as the Brundtland report), Oxford University Press.

3 Statement of the International Conference on Water and the Environment (ICWE), Dublin, Ireland, 26–31 January 1992.

## HOW IS IWRM APPLIED AT THE PROJECT SCALE?

Food and nutrition security programs need sustainable and reliable water supplies. To ensure these supplies, the other stakeholders who use or influence water must be understood, along with the climate and environmental factors that influence water's availability and quality. An IWRM approach also considers the institutional, gender, and socioeconomic aspects of water management, which are just as important as the technical aspects.

There is not a simple method for applying or doing IWRM—it is a set of approaches or principles, and it depends on context and location. Most water management practitioners see IWRM as a process rather than an end result, and they judge its success by the change or improvement it brings. Essentially, IWRM means looking widely at all water resources and stakeholders (including the environment) and using all available data and information from various disciplines to make good decisions that increase benefits and reduce harm. IWRM approaches are also usually seen as open, flexible, and consultative instead of authoritarian or top-down. More specifically, IWRM at the project scale encourages the following principles:

- Understanding of different uses and users of water, at different scales and at different times. For example, agricultural programming (both crops and livestock) can consider its impact on local water resources, and water projects can include farmers and agricultural priorities in their plans.
- Understanding which organizations, industries, and individuals are theoretically responsible for water management in a particular catchment, and understanding how and why actual decisions about water management are made—in other words, understanding the political economy of water management.
- Knowledge of where and how water exists in the environment and what factors affect water quantity and quality. For example, information about rainfall, drought, water flows and levels, and likely water quality can be part of the planning stages of food security, resilience, WASH, and other RFSAs.
- A focus on the poorest people, who are often the most water insecure. This includes women and girls, young children, and the elderly. Women are usually responsible for collecting household water, and their knowledge and experience can help to improve water management.



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- linking of water availability and quality, type of users, and environmental needs into the design, installation, maintenance, and operation of water infrastructure. For example, if a water source is going to serve multiple purposes, such as providing drinking water and supporting nature-based solutions, then all of these needs should be considered.
- planning for the operations and maintenance of water infrastructure and the financial sustainability of institutions and organizations that are responsible for it. Many water points fail after only a few years, and this has a large impact on communities.
- understanding how changes to the environment (such as reforestation, increased grazing, permaculture initiatives, or anti-erosion and runoff works) can impact local water availability and quality
- understanding how climate change is impacting water resources, and the different ways that this can happen—particularly the impact of drought.

The extent to which these goals can be achieved depends on many project-specific factors, but they do represent principles that can guide planning and resource allocation.



**A study by the International Water and Sanitation Centre (IRC)<sup>4</sup> summarized IWRM in water and sanitation projects as having the following eight principles, which are another way of looking at how IWRM can be applied:**

1. Water source and catchment conservation and protection are essential.
2. Water allocation should be agreed on between stakeholders within a national framework.
3. Management needs to be handled at the lowest appropriate level.
4. Capacity building is the key to sustainability.
5. Involvement of all stakeholders is required.
6. Efficient water use is essential and often an important “source” in itself.
7. Water should be treated as having an economic and social value.
8. Striking a gender balance is essential.

<sup>4</sup> See resource list

## EXAMPLES FROM BHA AND USAID PROJECTS AND ACTIVITIES

At the local level, in **Zimbabwe** the Amalima Loko RFSAs aim to strengthen holistic watershed-wide management by working with traditional leaders, communities, and local government to improve water and natural resource governance in an equitable manner. Amalima Loko is also recording the location and design of water points that it rehabilitates, so that they can be better understood in relation to local groundwater resources. In **Ethiopia**, the Lowland Water, Sanitation and Hygiene (Lowland WASH) Activity has introduced new design guidelines for water and WASH infrastructure to improve reliability and service delivery. Among other things, this is helping to make the work of private sector service providers more viable, since breakdowns and the need for many spare parts are reduced. In **Malawi**, the Ubale RFSAs focused on improving food security for poor households through better farm management, including technologies to reduce soil erosion, increase fertility and water conservation, promote crop diversification, and increase yield. In **Nepal**, the PAHAL RFSAs focused on supporting communities' access to clean water and sanitation, by taking a holistic approach that included technical aspects of multi-use water systems, as well as engaging with gender and caste barriers.

At the regional scale, USAID is funding a number of **activities** on WRM in Africa, the Middle East, and Asia that have substantial overlap with IWRM. These include the following:

- The Resilient Waters Program in **southern Africa** aims to improve conservation and biodiversity in the region by strengthening transboundary WRM. The program also aims to improve access to WASH services and strengthen institutions and communities as they adapt to climate change.
- In **Afghanistan**, USAID is funding the Strengthening Watershed and Irrigation Management (SWIM) project to support sustainable, agriculture-led economic growth by increasing the sustainable and productive use of water livelihoods and by strengthening WRM. Work includes rehabilitating poorly performing irrigation infrastructure and training water user associations.
- USAID is also working with the Government of **Jordan** on a Water Management Initiative to strengthen water supply systems, water conservation and demand management, water sector governance, and cost recovery in the water sector.

## IWRM AND POLICY

In its 2017 Global Water Strategy,<sup>5</sup> the US Government recognized water as an opportunity to advance core democratic values around equality, transparency, accountability, women's empowerment, and community organization. Although IWRM is not mentioned specifically, Strategic Objective 2 of the strategy is aimed at sound management and protection of freshwater, engaging all stakeholders and integrating water management activities to improve resilience.

USAID's Water and Development Strategy (2013–18)<sup>6</sup> considers water to be fundamental to USAID's programming. This strategy "specifically endorses the principles and proven approaches of integrated water resources management (IWRM) and encourages the use of all appropriate technologies and tools in achieving those objectives" (p. 3). Resilience, sustainability, appropriate pricing of water resources, balancing the competing demands of multiple users, and basin water productivity are among the IWRM principles in the Water and Development Strategy.

<sup>5</sup> US Government (2017) Global Water Strategy, Washington DC.

<sup>6</sup> USAID (2013) Water and Development Strategy, 2013-2018, USAID, Washington DC

USAID’s Implementation Research Agenda (2020)<sup>7</sup> supports multisectoral and holistic basin management approaches, stating that “prioritizing the key obstacles at the margin that hamper our ability to effectively implement IWRM or of other holistic frameworks and processes is critical” (p. 22). USAID’s BHA works to support economic growth, enhance global food security, and maintain ecosystems, mindful of the linkages between water programs and food security activities.

## IS IWRM CONTROVERSIAL?

IWRM (but not WRM) is seen by some water specialists as being vague and as moving resources away from more practical concerns. In its stricter applications, IWRM has contributed to a radical restructuring of water governance in developing countries, potentially promoting unnecessary new basin-centered or catchment management organizations, unsustainable water user associations, or the breakup of national-level water departments and the dilution of expertise. Often, it is not easy to establish exactly what is meant by IWRM, and the promotion of IWRM has been seen by some water specialists as a way of legitimizing social, political, and economic agendas that might otherwise be controversial.<sup>8</sup>

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More recently, some water specialists maintain that IWRM has become an end in itself, focusing too exclusively on water. Consequently, these specialists argue that IWRM-centric approaches should be replaced by a “nexus” management paradigm, in which water is seen as more closely linked to other sectors—for example, the “water-energy nexus” or the “water-food nexus.” Nexus approaches imply a reemphasis on those sectors in which water is a key input (e.g., energy or food), with water management in a supporting role.

Despite such debate and critiques, there is wide agreement that IWRM approaches, particularly in their milder and less controversial forms, are a useful set of organizing principles for water management and governance that can help us proceed more holistically and equitably. IWRM therefore remains a core part of the strategic water plans of many countries globally and an important part of USAID’s thinking.

<sup>7</sup> USAID (2020) Water for the World. Implementation Research Agenda. USAID, Washington DC.

<sup>8</sup> For further reading on these debates, see the IWRM Critiques and Evaluations section at the end of this note.

## IWRM RESOURCES

The following resources expand on the topics that have been summarized in this learning note. They can be downloaded from the links provided. Please respect copyright or other restrictions that are placed on the material by the publishers. USAID and PRO-WASH do not take responsibility for the accuracy of any of the information in the resources listed below, and cannot be held liable for their use.

### IWRM Introductions and discussions

Smith, M., and T. J. Clausen. 2017. "**Revitalizing IWRM for the 2030 Agenda.**" Background paper for the High-Level Panel on IWRM, IWRA XVI World Water Congress, May 29–June 3, 2017, Cancun.

US Army Corps of Engineers (USACE). 2017. "**Building Strong Collaborative Relationships for a Sustainable Water Resources Future: Understanding Integrated Water Resources Management (IWRM).**" Washington, DC.

World Water Council (WWC). 2015. "**Integrated Water Resource Management: A New Way Forward.**" Marseille.

### IWRM Critiques and Evaluations

Allan, T. 2004. **IWRM/IWRAM: a New Sanctioned Discourse?** Occasional Paper 50, SOAS Water Issues Study Group, SOAS, University of London.

Biswas, A. 2004. **Integrated Water Resources Management: A Reassessment.** Water International 29:2, 248-256.

Giordano, M., and T. Shah. 2014. "**From IWRM Back to Integrated Water Resources Management.**" International Journal of Water Resources Development 30:3, 364-376.

Muller, M. 2015. "The "**Nexus**" as a Step Back toward a More Coherent Water Resource Management Paradigm." Water Alternatives 8:1, 675-694.

### Local implementation of IWRM

Cox, D., K. Van Niekerk, V. Govender, B. Anton, S. Smits, C. Sullivan, E. Chonguiça, F. Monggae, N. L. Nyagwambo, R. Pule, M. Berraondo López, and M. Bonjean. 2008. "Local Government and Integrated Water Resources Management (IWRM): **Part I; Reaping the Benefits – How Local Governments Gain from IWRM.**" ICLEI – Local Governments for Sustainability, Africa Secretariat.

International Water and Sanitation Centre (IRC). 1999. "**Integrated Water Resource Management in Water and Sanitation Projects: Lessons from Projects in Africa, Asia and South America.**" IRC Occasional Paper Series OP31/E, Delft.

Philip, R., B. Anton, D. Cox, S. Smits, C. Sullivan, E. Chonguiça, F. Monggae, N. L. Nyagwambo, R. Pule, and M. Berraondo López. 2008. "Local Government and Integrated Water Resources Management (IWRM): **Part II; Understanding the Context – The Role of Local Government in IWRM.**" ICLEI – Local Governments for Sustainability, Africa Secretariat.

Philip, R., B. Anton, M. Bonjean, J. Bromley, D. Cox, S. Smits, C. Sullivan, K. van Niekerk, E. Chonguiça, F. Monggae, N. L. Nyagwambo, R. Pule, and M. Berraondo López. 2008. "Local Government and Integrated Water Resources Management (IWRM): **Part III; Engaging in IWRM – Practical Steps and Tools for Local Government.**" ICLEI – Local Governments for Sustainability, Africa Secretariat.

Sullivan, C., M. Bonjean, B. Anton, D. Cox, S. Smits, E. Chonguiça, F. Monggae, N. L. Nyagwambo, R. Pule, and M. Berraondo López. 2008. "Local Government and Integrated Water Resources Management (IWRM): **Part IV; Making Water Work for Local Governments.**" ICLEI – Local Governments for Sustainability, Africa Secretariat.

### **Nature-BASED Solutions for Water Management**

Coates, D., and R. Connor. 2018. "**Nature-based Solutions (NBS) and Water.**" UNESCO World Water Assessment Program. Columbella, Italy.

United Nations Environment Programme (UNEP), UNEP-DHI Centre on Water and Environment, and International Union for Conservation of Nature (IUCN). 2018. "**Nature-Based Solutions for Water Management: A Primer.**" Nairobi, Kenya.

### **Further reading, training resources, and Capacity Building**

The [Global Water Partnership](#) has an online "[IWRM Toolbox](#)," including capacity building and knowledge resources on IWRM. The [Case Study](#) pages include links to examples of practical implementation of IWRM at the local level.

Examples of USAID-funded projects and activities focusing on WRM can be found [here](#).

Finally, open online course providers such as Coursera offer free courses in WRM, such as the [Water Resources Management and Policy](#) course. These courses can usually be taken in your own time and outside of normal office hours.

## **RECOMMENDED CITATION**

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## **CONTACT INFORMATION**

### **PRO-WASH**

PRO-WASH is an initiative funded by USAID's Bureau for Humanitarian Assistance (BHA) and led by Save the Children. PRO-WASH aims to provide support to implementing partners in order to strengthen the quality of WASH interventions through capacity strengthening, knowledge-sharing and applied WASH research opportunities.

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