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More than 700 million people globally, more than half in Sub-Saharan Africa, depend on contaminated and often limited water to survive and support their crops and livestock. It is a problem with significant consequences for health, productivity, and prosperity, and water shortages have severe implications in conflict prone areas.

# WATER

## CONTRIBUTOR

Mary Renwick is a water resources specialist with more than 20 years of experience developing, managing and implementing water resource projects, programs and initiatives. She has led Winrock International's Water Innovation Program since 2005 and has worked in Sub-Saharan Africa, South and Southeast Asia, and in the U.S. with a number of Native American tribes. Prior to joining Winrock, Renwick was a senior fellow in water policy and economics at the University of Minnesota, and an adjunct professor in applied economics. She was also a Fulbright Visiting Professor in interdisciplinary water resources management at Khon Kaen University in Thailand and visiting scholar at Cornell University's International Institute for Food, Agriculture and Development. Renwick holds a Ph.D. and master's in applied economics from Stanford University.

## MULTIPLE-USE SERVICES: WATER FOR HEALTH, WEALTH AND FOOD SECURITY

The need for clean and reliable water has been the focus of development initiatives for decades and much has been accomplished in many parts of the world. But, the conventional approach to water services focuses on water for a single-use—typically for drinking or irrigation—and often ignores the multiple water uses families need to thrive. Once water is available, not surprisingly, people use this water to meet all of their needs. Drinking water systems are used for livestock watering, food production and small water-dependent enterprises. Irrigation schemes are used for drinking, bathing and other unplanned uses such as livestock and home gardens.

These diverse, unplanned demands on single-use services are a widespread phenomenon that often lead to unintended yet serious consequences—spread of disease, overuse, conflict and system breakdowns. The disconnect between the way the people use water and the way services are provided ultimately undermines the intended goal of water services for the poor—improved health and livelihoods. It is also a major cause of sustainability problems for water services and resources. Single-use water services miss a valuable opportunity to maximize the

poverty impacts of water services and increase system sustainability.

By contrast, multiple-use water service (MUS) approaches are changing the way water is delivered to people living in poverty and enhancing health, improving food security, increasing incomes and reducing workloads for women and children in the process. MUS examines how people use water for various needs, who uses it and identifies what renewable supplies are available. This information forms the basis for development of a water delivery and management plan that balances needs and water resources, and that is created using a participatory process with local communities.

Across Sub-Saharan Africa, families are enjoying better access to the water they need—for drinking, hygiene, sanitation, irrigating crops, watering livestock and water-dependent enterprises. They no longer have to devote hours each day carrying water from a distant community water point that may be miles from their home and intended for a single purpose (domestic uses, irrigation or livestock). They are healthier thanks to access to potable water coupled with improved hygiene and sanitation practices, and they are earning greater income because they have enough water and skills to expand their agricultural activities or jobs resulting from new water services.

In the past 15 years, a growing body of evidence has revealed that planning and managing water for multiple uses can enhance health, improve food security, increase incomes and reduce workloads for women and children. Systematic cost-benefit analyses of single-use versus MUS indicate that while MUS approaches may initially cost more, they offer wider benefits and significant advantages in the long term making MUS a cost-effective investment.

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**Studies have shown that multiple-use water services offer significant advantages because they:**

- › Generate more income and benefits (improved



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**A drill team is trained in Tanzania.**

health, nutrition, time savings, food security and social empowerment) for a wider range of poor people than most single-use water services

- › Decrease vulnerability and increase resiliency by allowing more diversified livelihood strategies
- › More effectively reduce poverty by simultaneously addressing the multiple dimensions of poverty
- › Increase sustainability of services—productive water use generates enough income to cover ongoing operation, maintenance and replacement costs of multiple-use systems. Because they better meet the water needs of communities, MUS increases returns on community investment and decreases conflict related to water access as well as damage to infrastructure caused by “illegal” or unplanned uses

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The MUS approach places people at the center of planning, financing and managing integrated water services. While technology and infrastructure are important, a key focal point of MUS is building the capacity of communities, governments and the private sector to develop and manage water services for multiple purposes. This democratic collaboration among a variety of stakeholders contributes to greater participation and support for water programs and other development initiatives. In many instances, families contribute to construction and maintenance of the systems they rely on. In Burkina Faso, multigenerational families are investing an average of \$235 to upgrade existing household wells within their compounds to meet their multiple water needs. The upgrade involves deepening the wells to increase water availability, adding rope pumps to ease water lifting, covering and disinfection to make the water potable.

Training is an integral part of MUS projects that addresses local priorities as well as fundamental aspects of water services. Introduction of basic hygiene practices such as hand washing, safe water storage and improved sanitation complements improved access to potable water that limits the spread of contamination and disease. Simple changes in daily activities can result in a dramatic drop in illnesses, particularly for children.

Water users are introduced to improved farming techniques

and new technologies such as drip irrigation that help them efficiently maximize the benefits of newly available water. They also learn about improved crop and livestock practices, and new opportunities for farm income realized from the diversification of crops and alternatives made possible with improved water services, like raising fish. Training and support is provided for long-term sustainable management of the water services focusing on effective local governance and decision-making structures and ensuring financing for ongoing operations and maintenance of the system. Efforts also focus on ensuring availability of post-construction support and strengthening the local supply chain of water-related products and services.

**“The impact of MUS is truly remarkable. By developing integrated services that sustainably meet people’s water needs for drinking, sanitation, growing food, and earning an income, we see visible improvements in health and livelihoods.”**

**- Mary Renwick, Ph.D.,  
Winrock International  
Director, Water  
Innovation Program**



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**Women and children in Niger wash their hands.**



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**Multiple-use services include water provision for livestock.**

Multiple-use water services are a proven and practical answer to addressing the need for safe and reliable water supplies for some of the world's most hungry and impoverished populations. Winrock International, a private nonprofit organization that works globally, implements MUS programs across Sub-Saharan Africa and South Asia, helping the rural poor access one of the most fundamental resources on which so much depends.

## THE MUS APPROACH IN NIGER

Hadiza Ali used to walk nearly two hours every day carrying 20 liters of water for her family on each of six trips to an open well that served people and animals. When it rained, runoff carried contaminants into the well contributing to proliferation of a wide variety of water-borne diseases. Her husband Ali Maman had a shallow well in their small farm plot, but it was difficult work hauling up water and carrying it plant by plant to ensure that not a drop was wasted. Not only was their labor grueling, but their ability to earn income was constrained. They could barely sustain a small number of plants which kept Hadiza and Ali from growing more crops.



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Innovations in sourcing water are helping farmers forgo long walks and improving plant health.

Multiple-use water services have changed their lives and those of their neighbors. A new, clean water source has been installed much closer to their home. Using a rope pump fitted on a manually drilled borehole, Hadiza is able to easily access clean water for family use and forgo the long walks to retrieve polluted water. She has extra time to devote to more meaningful tasks. Ali purchased a treadle pump and learned

how to build small irrigation canals to irrigate his garden. Because he received training in vegetable production and has to spend less time moving water, Ali has expanded the garden in size and diversity of crops which now includes onions, cabbage and lettuce for home use and for sale.

In Hadiza's village of Kabori and the surrounding communities in the Zinder region of Niger, MUS projects offer information and training tailored to meet local residents' needs. Guidance in improved hygiene and sanitation practices coupled with clean, abundant water reduces the potential of disease and keeps families healthier. Farmers are learning how to increase their yields and earning power through improved farming practices and water management. Better access to water has opened up other opportunities. Aquaculture is now an option to increase food supply and supplement a traditional diet based on limited protein. Reliable access to water results in longer growing seasons and increased resiliency to the risks presented by climate changes.

Also in the Zinder region, technical and business training is provided to local enterprises that are building rope and treadle pumps and manually drilling boreholes. These enterprises provide a ready source of equipment and technical expertise to local areas while increasing income and employment opportunities. The locally manufactured pumps have proven to be more sustainable than traditional hand pumps that have been installed in other areas and in other countries. Hand pumps provide safe water but can be difficult and expensive to maintain. Some replacement parts for the hand pumps that are common in Niger cost over \$500, far beyond the resources of most villagers, many of whom survive on less than \$2 per day. Even if the funding is available, the lack of local supply chains makes it difficult to find parts. In contrast, repairs to the new Zinder-manufactured rope pumps can be made by local metalworkers, with spare parts costing under \$25. Low costs and easy maintenance help ensure that water systems function properly into the future.