

Strengthening human and institutional capacity for inclusive water management in West Africa

A rapidly growing population, expanding urban areas and rising food requirements are increasing competition for water and other natural resources in West Africa. To achieve inclusive water management, there is an urgent need to increase the technical and managerial capacity of people and institutions at all levels. The International

Water Management Institute (IWMI), in collaboration with partners, is working with next-generation researchers and entrepreneurs, universities, government agencies and private sector actors to build the capacity required to meet national and regional water management, food security and poverty alleviation goals.



Women transplanting tomatoes in Ghana (photo: Hamish John Appleby/IWMI).

Bridging knowledge and capacity gaps in the private sector

To meet growing food demands, smallholder farmers dependent on subsistence, rain-fed systems are increasingly investing in irrigated agriculture. Solar irrigation, in particular, has emerged as a possible game changer in farmer-led irrigation. This is especially the case in West Africa, which has among the lowest access to electricity on the continent (IEA 2019) and high irrigation potential.

Private sector companies are eager to capitalize on this potential by expanding the market for solar irrigation technologies. However, several barriers exist to the widespread adoption and scaling of these technologies. They include limited input and output market linkages (poorly developed distribution channels, inadequate input supply and few options to sell produce), which ultimately limit farmers' productivity and profitability. In addition, gender-based constraints to accessing information and financial resources negatively affect women's ability to invest in solar irrigation.

To address these barriers, IWMI identified [pitching contests](#) as a novel way to build capacity in the private sector. Targeting recent graduates and young entrepreneurs in Ghana, the contests aim to identify innovative solutions that bridge specific knowledge and capacity gaps.

The winners are awarded a paid internship or research placement with one of IWMI's private sector partners to develop and test their solutions, thereby contributing to the formulation of profitable and sustainable business models for irrigation technologies. At the same time, the winners gain valuable work experience in the private sector and also an appreciation of the sector's pivotal role in scaling development solutions. The contests will be held periodically over the coming years as part of the IWMI-led scaling research component of the Feed the Future Innovation Lab for Small-Scale Irrigation (ILSSI) project.



A farmer with his solar irrigation system in Ghana (photo: Hamish John Appleby/IWMI).

Beyond Ghana, IWMI is helping to scale proven irrigation technologies among farmers cultivating sorghum, rice and wheat in Mali, Burkina Faso and Nigeria. Through the IWMI-led Water Enabler Compact of the African Development Bank's flagship program Technologies for African Agricultural Transformation (TAAT-WEC), hundreds of extension agents and youth service providers are being trained in affordable irrigation technologies and in situ water conservation measures. In numerous demonstration sites, farmers have access to the solutions and are supported by extension agents and service providers to assess the feasibility of investing in these solutions. An accompanying small-scale irrigation development guide has been prepared alongside extension posters for 14 water management solutions in English, French and several local languages. Short extension videos are also being developed to assist farmers in installing and maintaining the solutions in their fields.



A wheat farmer taking notes during a visit to an irrigation technology demonstration site in Kano State, Nigeria (photo: Sander Zwart/IWMI).

Building research capacity and inclusive development planning

Building capacity to address specific knowledge gaps is also a key element of IWMI's climate adaptation work. In many rural areas of West Africa, high climate variability, pressures on the natural resource base and demographic shifts are creating structural changes in economic and social relations. Referred to as social transformation, these changes are most evident in the extent of migration, gender-youth dynamics and the overall resilience of communities.

There is a need for better understanding of diverse social transformation processes and, in the wake of the Covid-19 pandemic, how sudden disruptions can affect these processes. To fulfil this need, IWMI has partnered with higher education institutions to support a number of master's and doctoral students. The students, who are hosted by the University of Ghana and the University for Development Studies, follow research streams dedicated to gender, migration and

youth issues, with the aim of strengthening human and institutional capacity for social transformation analysis in development planning.

The capacity strengthening approach is being implemented under the Resilience Against Climate Change: Social Transformation Research and Policy Advocacy ([REACH-STR](#)) project. Students are an integral part of the project's research teams and are expected to continue working in the area of social transformation knowledge after completion of their studies. Using the research and analytical skills acquired during the project, the students will be well positioned to provide evidence-based recommendations on social transformation dynamics for inclusive development planning and implementation in their future careers, helping to link research knowledge to local policy priorities.

In the shorter term, IWMI is supporting the uptake of research knowledge by engaging with the critical actors involved in policy formulation and development planning, and identifying the types of social transformation

information these actors need for decision-making. This engagement revealed a lack of clearly understood definitions of, and methodological approaches to, social transformation analysis. Consequently, IWMI and partners organized a [participatory learning event](#) for district development planning, agriculture and gender officers.

During the event, IWMI presented a theoretical conceptualization of social transformation in the context of migration, gender and climate resilience. It also highlighted policy and implementation gaps in existing interventions in these three areas. In turn, the officers shared their practical experiences of social transformation and proposed ways in which theoretical understanding and practice can be integrated to better frame and facilitate transformation. As the REACH-STR project generates new research insights, the participants are expected to build on the core definitions and frameworks introduced at the learning event. This will enable the participatory design of analytical tools and pathways for mainstreaming social transformation in development planning.



Fetching water from the Nabogo River in Ghana (photo: Hamish John Appleby/IWMI).

Strengthening capacity to apply circular economy approaches

Moving from knowledge generation to knowledge uptake has long been a priority for IWMI. This process has come into sharper focus in recent years in the face of rapid population growth and urbanization, and the impact these have on food and water security, and human waste management.

In many West African cities, where costly sewerage systems are uncommon, people routinely depend on pit latrines or septic tanks to dispose of human waste. Often, this waste is discharged into the environment as fecal sludge, where it contaminates water bodies. A particular concern is the use of this contaminated water for irrigation, as farming expands in and around urban areas. One way of tackling this problem is to convert human waste into useful products, preventing it from entering waterways in the first place.

Building on more than two decades of expertise in resource recovery and reuse, IWMI has identified several viable business models for the safe use of waste. These include co-composting (which mixes fecal sludge with organic waste) to produce fertilizer, establishing aquaculture in wastewater treatment plants and generating renewable energy in the form of biogas or briquettes.

Municipalities and investors are increasingly interested in setting up waste-based businesses, but often lack the capacity to do so. Through the Creating and Capturing Value: Supporting Enterprises for Urban Liquid and Solid Wastes Recycling for Food, Energy and Clean Environment (**CapVal**) project, IWMI is implementing a [series of trainings](#) for public and private sector actors in Ghana. Covering real-life business cases as well as partnership and financing options, the trainings are designed to enhance the ability of participants to identify and implement appropriate business models for reusing different waste products. The theoretical component is accompanied by a field trip to production plants (many of which IWMI helped to establish) that are generating positive revenue streams from safe waste management.

By equipping participants with knowledge on and insights into successful waste-based enterprises, the trainings aim to encourage further investment in similar ventures, with significant potential to improve water access, sanitation and food security in Ghana and beyond.



Workers at a co-composting facility in Ghana (photo: Hamish John Appleby/IWMI).

References

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Projects

The Innovation Lab for Small-Scale Irrigation (**ILSSI**) project (2019-2023) is funded by the United States Agency for International Development (USAID) as part of the Feed the Future initiative. The project is led by the Norman Borlaug Institute for International Agriculture at Texas A&M University in partnership with IWMI, International Livestock Research Institute (ILRI), International Food Policy Research Institute (IFPRI), World Vegetable Center (WVC) and Household Water Insecurity Experiences – Research Coordination Network (HWISE-RCN). IWMI leads the project's scaling research.
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The Water Enabler Compact (**TAAT-WEC**) is one of 15 compacts in the African Development Bank-funded Technologies for African Agricultural Transformation (TAAT) program (2018-2021). TAAT-WEC aims to meet water needs in crop production systems by making high-potential irrigation and water management technologies available to farmers on a massive scale. IWMI is implementing the project in seven countries (Nigeria, Burkina Faso, Mali, Ethiopia, Sudan, Tanzania and Malawi), promoting optimal use of scarce water resources to maximize yields of wheat, rice, sorghum, maize and orange-fleshed sweet potatoes.
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The Resilience Against Climate Change: Social Transformation Research and Policy Advocacy (**REACH-STR**) project (2019-2025) is funded by the European Union under the Ghana Agriculture Programme (EUGAP). The project is led by IWMI in partnership with the University for Development Studies, University of Ghana (Centre for Migration Studies), and the Council for Scientific and Industrial Research – Science and Technology Policy Research Institute (CSIR-STEPRI).
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The Creating and Capturing Value: Supporting Enterprises for Urban Liquid and Solid Wastes Recycling for Food, Energy and Clean Environment (**CapVal**) project (2017-2021) is funded by the Kingdom of the Netherlands and managed by IWMI in collaboration with Jekora Ventures Limited, Kumasi Metropolitan Assembly (KMA), Yilo-Krobo Municipal Assembly (YKMA), RUAF Global Partnership, Training Research and Networking for Development (TREND) and World Agroforestry (ICRAF).
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The International Water Management Institute (IWMI) is an international, research-for-development organization that works with governments, civil society and the private sector to solve water problems in developing countries and scale up solutions. Through partnership, IWMI combines research on the sustainable use of water and land resources, knowledge services and products with capacity strengthening, dialogue and policy analysis to support implementation of water management solutions for agriculture, ecosystems, climate change and inclusive economic growth. Headquartered in Colombo, Sri Lanka, IWMI is a CGIAR Research Center and leads the CGIAR Research Program on Water, Land and Ecosystems (WLE).

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