



OUR WORK IN NEPAL

IWMI's priorities in Nepal include enhancing climate and disaster resilience by improving water data, tools, technology, and governance; advancing low-emission water-food-energy solutions, inclusive governance and gender equality, disability, and social inclusion (GEDSI); supporting nature-based and basin scale management, and irrigation-led agrifood transformation — aligned with national priorities to strengthen growth, water security, livelihoods, resilience, and equitable development.

Since 1986 we have been developing and applying approaches and technologies to address national water challenges and priorities. We have contributed to Nepal's development strategies and plans across water resources and watershed management; participatory and agricultural water management; solar-powered irrigation for climate resilience; hydro-economic modeling; environmental flows; gender equality and social inclusion; water governance; locally led, climate-resilient water, sanitation, and hygiene (WASH) systems; and nature-based solutions for spring revival.

IWMI collaborates closely with national, provincial and local governments, development partners, farmers' organizations, civil society and non-governmental organizations, research, academic and finance institutions, and the private sector.

WATER MANAGEMENT IN NEPAL

Despite possessing substantial freshwater resources, totaling about **225 billion cubic meters**, **Nepal currently utilizes less than 7% for socio-economic development.**

Effective water management remains limited. Seasonal and spatial variations, exacerbated by climate change, affect the availability of drinking water, irrigation, energy production, and biodiversity. Rapid urbanization exceeds the capacities of the country's water network. Water supply falls short of demand nationwide. Nationally, **while 94% of households have basic coverage**, only **16.5% access safely managed drinking water services.** Governance fragmentation, limited contextual analytical tools, land degradation, inequitable access, weak institutions and collaboration, and systemic social and gender-related barriers further complicate sustainable water management.



65-70% of cultivated land is rainfed, preventing year-round agriculture.



\$1.1 billion in potential annual returns could be generated by harnessing Nepal's untapped groundwater to irrigate an additional 613,000 hectares.

AREAS OF WORK

Water resilience and climate

IWMI strengthens climate-resilient water policies and practices by enhancing interdisciplinary water science, data, decision-support tools, and institutional capacity. We work with governments at all levels to understand water risks to climate change, evaluate water scenarios, and plan resilient investments. By improving evidence use, skills, and coordination, IWMI enables informed decisions that safeguard people, agriculture, and ecosystems in a changing climate.

Through the **Water Resilience Tracker**, IWMI supports national and sub-national governments to strengthen climate-resilient water management. We do so by improving water-climate policy alignment, creating an enabling environment for climate finance access and building inclusive capacity, so that resilient water management becomes the core of evidence-based, sustainable climate action.



Agrifood systems transformation

IWMI advances data-driven irrigation and agricultural transformation by linking real-time water data with farm-level decisions. Sensors and digital dashboards guide farmers, water user associations, and irrigation managers how much water to deliver and when, reducing conflict, and improving productivity. Pairing innovation with capacity building and an enabling environment, IWMI supports Nepal's shift to efficient, equitable, climate-resilient irrigation systems.

IWMI and Nepal's Department of Water Resources and Irrigation equipped the Babai Irrigation Project with flow and soil-moisture sensors and a weather station, using real-time data to improve water distribution and crop health. IWMI trained irrigation managers on scheduling, and farmers in western Nepal and mid-hills learned soil-moisture conservation and smart irrigation to grow off-season vegetables, sell surplus, and strengthen resilience.

Nature-based solutions

IWMI promotes nature-based water solutions like restoring degraded watersheds and springsheds, protecting recharge zones, and enhancing aquifer replenishment. By combining hydrogeology, modeling, and socio-technical intervention analysis, we help governments plan resilient water systems, support dry-season farming, reduce extraction pressure and environmental risks, and enable landscapes to store, recharge, and manage water.

In a study on sustainable groundwater management, IWMI combined basin-scale modeling with a survey of nearly 2,000 households to identify where floodwater recharge is most effective in the Chure-Bhabar area of the Madhesh Province. It also pinpoints key rainwater harvesting and infiltration zones in Kathmandu, that will support local authorities, planners, and development partners with prioritized investment pathways.



Gender and inclusion in water management

IWMI designs inclusive water solutions that strengthen local leadership, reduce women's workload, and expand opportunities for youth, women, and marginalized groups. By embedding gender equality, disability, and social inclusion into water governance, we ensure that water systems are technically sound and socially transformative, shifting power, and improving participation and livelihoods.

In Indrawati rural municipality in Bagmati Province, a **solar-powered water-lifting system** provides reliable water to a marginalized Majhi community, easing women's workload and enabling dry-season farming. A user committee, supported by tailored training in agriculture and system operation, ensures local ownership. The municipality has dedicated annual funding in their policies and programs for operation and maintenance of lift irrigation.



Water, energy, and food security

IWMI strengthens water, energy, and food security interconnectedness. It promotes the integration of clean energy into irrigation to provide year-round water and reduce farmers' costs and emissions. By combining technology with local governance, tailored capacity building, resource management, and gender and social inclusion approaches, IWMI creates an enabling environment for climate-smart, affordable water services for food security and livelihoods.

In Chhipaharmai, a rural municipality in Madhesh Province, IWMI commissioned a 20-kilowatt peak (kWp) **grid connected solar irrigation plant**. Thanks to this pilot, farmers irrigate year-round, reduce irrigation costs, and earn income by selling water to neighboring plots. We actively involved community members, particularly women, to promote ownership and the sustainable maintenance and operation of pumps. The pilot informs Nepal's wider shift to clean, service-based irrigation and strengthens public-private-community partnership.

Water governance

IWMI strengthens transformative water governance by aligning data, policies, institutions, and inclusivity. We convene evidence-based dialogues and provide policy support to scale inclusive water solutions, helping governments assess trade-offs and use science to enhance cooperation. By connecting evidence to policy, we advance equitable, resilient, and accountable river-basin planning and water management.

In western Nepal, IWMI's hydrological models informed the National Irrigation Master Plan and environmental flow requirements to balance irrigation demands with ecosystems needs and the interests of downstream users. In Madhesh, IWMI supported the establishment of municipality-led **multi-stakeholder platforms** to ensure coordinated, empirical water management, translating research into policy and planning. IWMI also strengthened policymakers' capacity, and facilitated multi-stakeholder dialogues for the advancement of Nepal's Water Resources Bill.



IMPACT STORIES



Nepal's present and future leaders use the WEFE-nexus approach

Together with the Tribhuvan University, Nepal's largest public university, IWMI **crafted a curriculum on the water-energy-food-ecosystems (WEFE) nexus**. Piloted in 2023, the modules are now embedded in postgraduate programs of the Institute of Engineering and Institute of Forestry, equipping about 120 students each year to consider these linkages in their work.

Since 2023, 22 mid-career professionals (nearly 80% women) from water, energy, agriculture, and environment sectoral ministries and non-state actors have strengthened their leadership and negotiation skills, and enhanced their technical knowledge and tools through Nepal's first WEFE Nexus Leadership Program. Together with the program's alumni, IWMI and its partners have trained more than 1,500 representatives from various organizations in the government and private sector, civil society, academia, and the media to make use of the WEFE nexus approach in their workplaces. The training manuals and educational videos are freely available to help with future training.

WASH systems become more resilient and inclusive

IWMI and partners assessed climate risks, environmental degradation, and disaster impacts on water supply systems in four rural municipalities in the Karnali and Madhesh Provinces at municipal, ward, and Water, Sanitation, and Hygiene (WASH) system levels, and evaluated how, on the other hand, WASH systems exacerbate climate change, environmental degradation, and disaster impacts. **Climate and hazard modeling revealed that over 80% of the WASH systems** in two of the four municipalities are highly vulnerable to floods, landslides, droughts, earthquakes, and wildfires. Officials and water user committees were trained on implementing government-endorsed WASH plans, integrating "building back better" and climate-resilience principles into local planning.

Under the **RES-WASH project**, IWMI assessed 220+ WASH systems in two districts to understand how climatic vulnerabilities and GEDSI factors affect access to services. Findings revealed that women, persons with disabilities, and Dalit communities face barriers to participation and decision-making. The assessment recommended inclusive WASH design, targeted capacity building, and GEDSI integration into policy and planning across government tiers.



ABOUT IWMI

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 with offices in 17 countries and a global network of scientists operating in more than 57 countries.

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