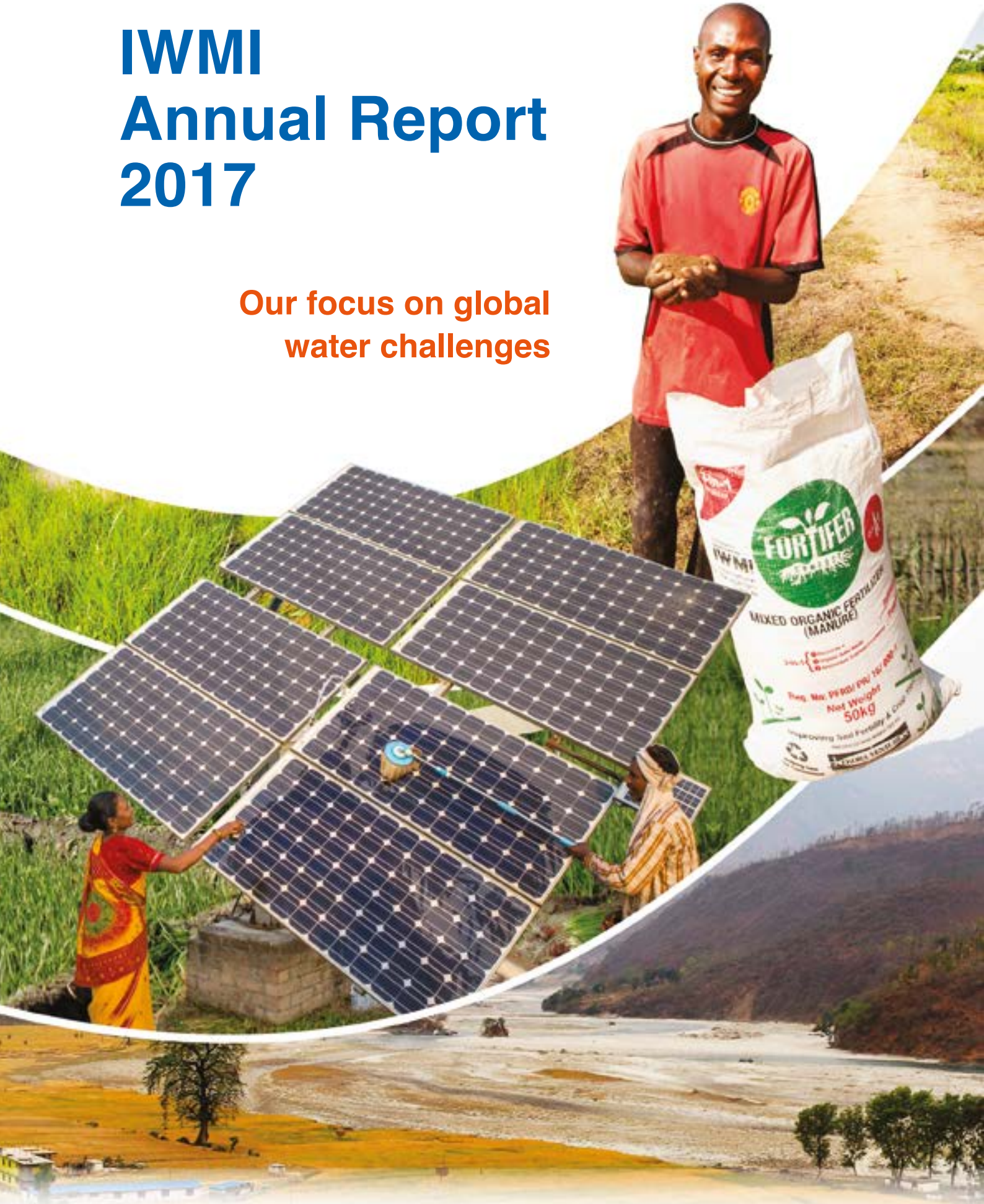
IWMI Annual Report 2017

Our focus on global water challenges



IWMI
International Water Management Institute

A water-secure world

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Turning a compost heap at the JVL Fortifer Compost Plant in Ghana's Greater Accra area.

Rising to global water challenges

Message from our Board Chair and Director General

Catastrophic flooding around the globe, together with severe drought in Eastern Africa, kept water-related disasters very much in the public eye during 2017. The water crisis in Cape Town, South Africa, unfolding several months prior to publication of this annual report, further intensified worldwide concern about the perils of water scarcity and possible solutions.

These events offered a vivid reminder of the need for renewed efforts to curb the destructive power of water, when and where there is too much or too little. At the International Water Management Institute (IWMI), we advanced many such efforts throughout the year, including index-based flood insurance and the sustainable use of solar-powered irrigation. At the same time, we helped realize multiple opportunities to harness the productive potential of water for sustainable growth.

Drying lake in Sri Lanka's Anuradhapura District during the severe drought that hit the country in 2017.

Amplifying the wastewater theme of this year's World Water Day and World Water Week, we gave special emphasis to IWMI's research on the recovery and reuse of valuable resources from waste. Our novel approach to this work is distinguished by its strong emphasis on promoting business models to generate revenues that can help cover the costs of waste treatment. Showing much potential to help build more circular economies, this approach has struck a responsive chord with open-minded municipal authorities, entrepreneurs and academics across the developing world.

Sharpening our development focus

Those and other advances reinforced the conclusion we reached late in 2016 that, for maximum relevance and impact, IWMI needs to sharpen its focus on the central water-related development challenges of our time. To this end, we adjusted the Institute's thematic structure, clustering our research capacities around three strategic programs: (1) Building Resilience, (2) Sustainable Growth, and (3) Rural-Urban Linkages. Stories of our programs' recent achievements, which constitute the centerpiece of this annual report, convey a powerful message: Better water management is critical for delivering on the United Nations (UN) Sustainable Development Goals (SDGs). Water underpins most of the 17 SDGs and is the exclusive concern of SDG 6, which calls for ensuring the availability and sustainable management of water and sanitation for all.

IWMI's programs helped channel our intensive efforts this year to build new projects and partnerships, which better enable us to translate research results into development outcomes and impacts. In 2017, we undertook new initiatives aimed at informing and influencing development funding and investment – for example, through the Water Innovations Technologies project in Jordan and a new knowledge partnership agreement with the World Bank.

Reaching out to a wide audience

To share the development benefits of IWMI's research with a wide audience, we engaged throughout the year with partners, donors and other stakeholders at numerous events. In mid-March, for example, we launched a new report on water productivity and signed the above-mentioned partnership agreement with the World Bank at its annual Water Week event in Washington, DC, USA. Another

Donald Blackmore
Chair, Board of Governors

Claudia Sadoff
Director General

highlight was the Indus Basin Knowledge Forum, which we hosted during July in Colombo, Sri Lanka. Convened jointly by IWMI, the International Centre for Integrated Mountain Development (ICIMOD) and the World Bank, this groundbreaking event advanced collective efforts to pull together the best knowledge for addressing water-related challenges in the riparian countries.

IWMI made a strong showing at World Water Week in Stockholm, Sweden, where we launched an advanced sample of materials from the just-published book *Resource Recovery from Waste: Business Models for Energy, Nutrient and Water Reuse in Low- and Middle-income Countries.* Together with the Food and Agriculture Organization of the United Nations (FAO), we also launched the executive summary of a book titled *Water Pollution from Agriculture: A Global Review.* In addition, we joined FAO and other founding members of The Global Framework on Water Scarcity in Agriculture (WASAG) to advance its agenda of support for national efforts to meet key commitments, such as the SDGs and the Paris Climate Agreement.

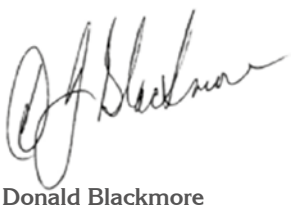
Major outputs, together with our researchers' participation in World Water Week sessions, reinforced IWMI's standing as a global leader in addressing the enormous health and environmental threats posed by inadequate handling of fecal sludge and other waste. To extend the reach of this message, we promoted news stories on related research with the international media, generating coverage by BBC, Deutsche Welle, Reuters and others.

IWMI had a significant presence at the UN Climate Change Conference, which took place in November at Bonn, Germany, and in the Global Landscapes Forum (GLF), also held in Bonn during December. The first event offered an excellent opportunity to showcase our work on solar-powered irrigation in collaboration with the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). At GLF, researchers representing the CGIAR Research Program on Water, Land and Ecosystems (WLE), which IWMI leads, highlighted efforts to improve water and land management in key river basins of Africa and Asia.

IWMI/WLE publications booth at Stockholm World Water Week 2017.

Water challenges at center stage

Growing concern about water security, and its importance for people and the environment has steadily moved this issue to center stage in the eyes of the world. The shift represents an important opportunity for those of us addressing water security on diverse fronts. As we trust is evident from the content of this annual report, the partners and investors who supported and worked with us throughout the year have placed their confidence in an institute that is rising quickly to global water challenges.



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Connected thinking, compelling solutions

CGIAR Research Program on Water, Land and Ecosystems (WLE)

WLE connects IWMI to networks delivering solutions that change agriculture from a driver of environmental degradation to part of the solution.

At the 2017 United Nations Climate Change Conference, leaders adopted a draft agreement to address climate change through agricultural solutions. This reinforced the foundational role agriculture needs to play in climate change and food security.

Against this backdrop, WLE (led by IWMI) and its 12 other core partners launched Phase Two, with the support of CGIAR Fund Donors. The program continued to build resilience through better management of land, water and biodiversity – and the ecosystems in which people depend on these natural resources. As a research-for-development program, WLE connects IWMI to networks of partners delivering integrated solutions that change agriculture from a driver of environmental degradation to part of the solution.

Land and ecosystem solutions

WLE works to improve soil health – vital for food production. Research partners developed a growing suite of tools to support decision making on soil rehabilitation. These include soil nutrient maps for Kenya and for sub-Saharan Africa via the Africa Soil Information Service. In Ethiopia, scientists are recommending ways to precisely target fertilization. Researchers improved soil health cards for farmers in India, while finding low-cost ways to rehabilitate land in Ethiopia, bringing immediate benefits and buy-in for communities.

WLE is also at the forefront of promoting soils as carbon sinks, with research showing that up to 7 billion tons of CO_2 can be removed from the atmosphere each year through better soil management. Partners are working to ensure decision makers consider carbon sink services in landscape decisions.

Water and ecosystem solutions

WLE reinforces IWMI's water work through cross-sectoral partnerships and resources. In India, scientists trialed groundwater recharge methods, which expanded to Vietnam. In Africa, WLE found that investments in water management technologies could potentially triple crop yields, and irrigated areas could be sustainably expanded by 15 million hectares.

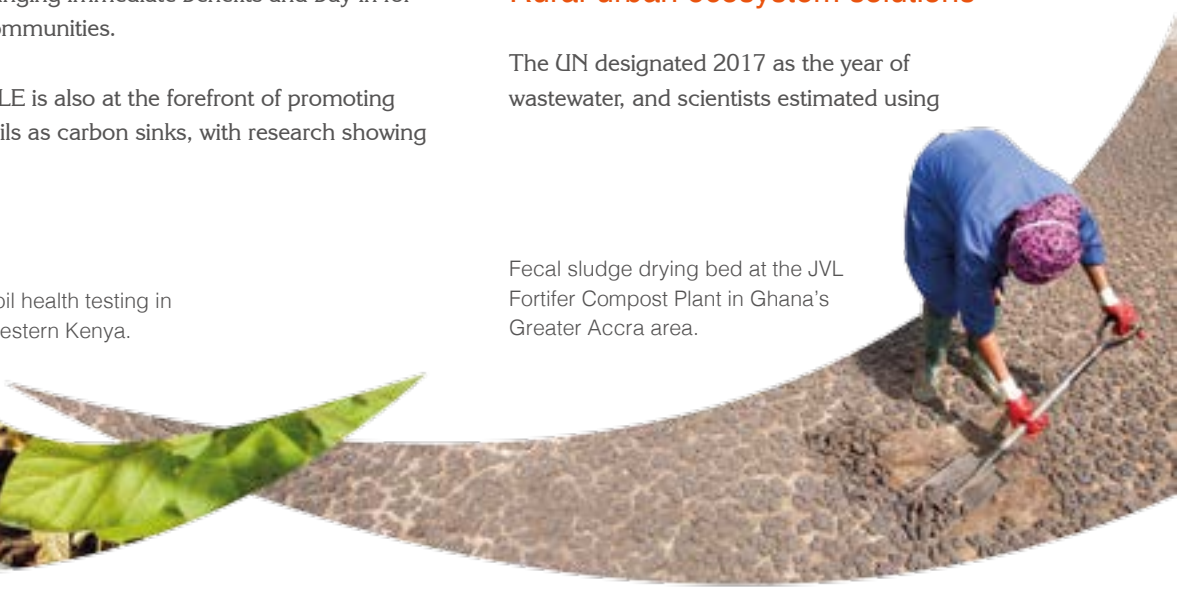
Given the potential for groundwater depletion, researchers are developing sustainable, inclusive business models for small-scale irrigation, starting with solar in Ethiopia, with plans to expand around Africa.

Safeguards were proposed to ensure sustainable groundwater use, including through energy sector financial incentives. A new tool to assess environmental flows in rivers can also help decision makers assess limits for extraction. For surface water, scientists are providing solutions in the face of dam and infrastructure development. In Kenya, partners support future-proofing the Tana River Basin through a public-private water fund.

Rural-urban ecosystem solutions

The UN designated 2017 as the year of wastewater, and scientists estimated using

Soil health testing in Western Kenya.



Fecal sludge drying bed at the JVL Fortifer Compost Plant in Ghana's Greater Accra area.

untreated urban wastewater for irrigation is 50% more widespread than previously thought.

WLE/IWMI led by developing 24 business models for reusing waste products from urban centers. One is a public-private model in Ghana, where a co-composting plant turns fecal sludge and waste into pelletized compost. Another model helps women in Kenyan refugee camps produce fuel briquettes from waste.

Risks, trade-offs and ecosystem solutions

One agricultural decision, such as irrigation or planting a particular species, brings a cascade of impacts throughout an ecosystem. WLE partners are examining the services provided by nature, for example, finding that changes in pesticide use can substantially increase insect populations, providing economic services, such as pollination and pest control. The next step is to build awareness among farmers and policy makers.

WLE/IWMI scientists are providing evidence for how natural infrastructure like wetlands can mitigate floods and drought. The WISE-UP to Climate project in Kenya demonstrates ecosystems' value in mitigating climate impacts.

Floods and droughts will still happen, but a pilot of an index-based flood insurance scheme allowed insurers to compensate households in Bihar, India. Soil moisture measurement tools are helping us predict and prepare.

Inclusivity and capacity solutions

After years of gender research, WLE proposed four undervalued lines of inquiry on working with women in agriculture, with a suite of tools to guide decisions.

Migration is a key focus, and WLE/IWMI established the Migration, Agriculture and Resilience: Initiative for Sustainability (MARIS) network on interactions between migration and agriculture. Research found that migration trends can bring women greater control over decisions but sometimes additional burdens, while in other cases, migration is part of coping with climate change.

Building local capacity is key. Communities engaged in participatory research in Vietnam realized intensive farming was harming ecosystems, so they adopted new practices, while practitioners were trained on ecosystem-based approaches.

Connected thinking, compelling solutions

WLE connects researchers, farmers, implementers and policy makers to discover and apply these sustainable food solutions. WLE will continue to link the best thinking on interconnected challenges and solutions, while connecting researchers through the new Thrive Network. The world must move forward on agriculture solutions that address not just individual problems but broader ecosystems.

WLE connects researchers, farmers, implementers and policy makers to discover and apply sustainable food solutions.

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Building Resilience

Floods, droughts and other water-related hazards, together with pressures stemming from unsustainable agricultural practices, water pollution and overuse of aquifers, pose serious risks for food systems, rural livelihoods and the ecosystems on which all of us depend. IWMI researchers deliver water management solutions and decision-support tools that better enable smallholder farmers, resource managers and policy makers to reduce the risks and create new opportunities for communities to thrive, despite climate change impacts and other stresses.

Vital assistance to prepare for climate disasters

Governments need to know where disasters are likely to take place, and which people and economies will be most affected.

Extreme weather takes a heavy toll on communities and economies around the world. The number of climate-related disasters, globally, has increased from an average of 195 per year between 1987 and 1998 to 338 per year between 2000 and 2011. For effective disaster planning, governments need to know where current and future disaster events are likely to take place, and which people and economies will be most affected. But, how?

Putting hazards on the map

IWMI researchers are helping provide answers through work that forms part of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). A new report, *Mapping Multiple Climate-related Hazards in South Asia,* presents methods for mapping the primary risks and estimates their potential impacts on people and agriculture.

The study was launched in June 2017 at a policy dialogue organized by IWMI jointly with the Government of Bihar, India; the Indian Council of Agricultural Research (ICAR); Japan's Ministry of Agriculture, Forestry and Fisheries; as well as CCAFS and the CGIAR Research Program on Water, Land and Ecosystems (WLE). "Our report has already attracted considerable attention from development banks and has been downloaded from IWMI's website 182,000 times," says lead author Giriraj Amarnath, who leads IWMI's Water Risks Research Group.

His team used both historical and current satellite and observational data to map the risk on a regional scale from floods, droughts, heat waves, sea-level rise and coastal vulnerability due to sea-level rise. For example, to ascertain flood risk, they examined rainfall patterns using remote sensing and field data, and developed algorithms to illustrate where high rainfall in mountainous areas would pose a potential flood risk downstream. They then used spatial population and agricultural data to examine where high risk from individual or multiple

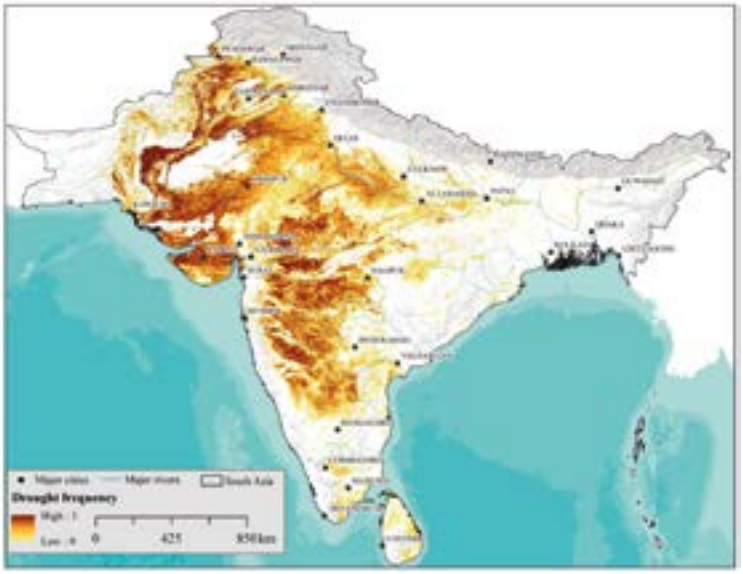
hazards overlapped with high population density or important food production areas.

The study showed that approximately 750 million people – over 45% of the region´s entire population – were affected by climate hazards during the decade after 2000. Of this total, 72% were in India, 12% each in Bangladesh and Pakistan, and the remaining 4% in Bhutan, Nepal and Sri Lanka. Study results further emphasize that agriculture is particularly vulnerable to climate extremes (mostly drought and flooding), with more than 58% of agricultural areas across the region damaged by multiple hazards. Drought affects the largest area (786,000 square kilometers), followed by extreme temperature, extreme rainfall, floods and sea-level rise.

Pinpointing vulnerable people and places

The next step was to identify locations with the greatest vulnerability to hazards. This

Bihar is India's most flood-prone state, having suffered agricultural losses worth an estimated USD 0.34 billion in the past 12 years.



Spatial distribution of drought frequency in South Asia, based on data for 2001-2013 from the National Aeronautics and Space Administration (NASA), USA.

involved overlaying data from the Human Development Index (HDI) of the United Nations Development Programme (UNDP), which provides information on factors such as life expectancy, education and per capita income indicators. "Bhutan and Sri Lanka's HDI is high compared to other parts of South Asia, because these countries have good education, medical facilities and employment levels. If a hazard strikes, they can cope reasonably well," explains Amarnath. "Bangladesh, on the other hand, has a lower HDI, which reduces its adaptive capacity when affected by climate events."

Since the report's publication in September 2017, two development banks have approached IWMI about conducting related research. The Asian Development Bank (ADB) hopes to employ the mapping method to investigate financial exposure, and the World Bank has sought IWMI's help to identify hotspots of high risk for sea-level rise in South Asia's coastal areas. IWMI is also planning to develop a village-level risk mitigation tool, which will help pinpoint vulnerable rural communities more accurately. "This information could be used to target corporate social responsibility programs, for example," says Amarnath.

In search of security for smallholder farmers

IWMI's Index-based Flood Insurance scheme, which was developed through CCAFS and WLE, shows how satellite mapping and modeling can help make a difference in poor rural communities. A pilot project was established in Bihar, where 76% of the population lives under the recurring threat of floods. The Agriculture Insurance Company of India agreed to insure 200 farmers against damaging floods for the 2017 monsoon season, on the basis of scientific data showing the depth and duration of floodwaters in paddy fields.

In early 2018, 14 farmers, who suffered total crop loss during the monsoon, received the full compensation amount of INR 20,000 (USD 300) per hectare. Others received between INR 7,000 and INR 14,000 (USD 100-200), depending on the extent of their losses. IWMI is currently in talks with state governments and donors, with a view to scaling up the plan across eastern India.

IWMI plans to develop a village-level risk mitigation tool, which will help pinpoint vulnerable rural communities more accurately.

Laying the groundwork for solar-powered irrigation

Solar power for irrigation in Zambia's Central Province.

The potential benefits of solar energy for irrigation in developing countries are clear. It offers smallholder farmers the possibility of "free" uninterrupted daytime power, provides governments with a means to reduce carbon emissions, and has the potential to create new markets for solar pumps and related technology.

However, solar-powered pumping is no panacea. If not implemented with care, it could encourage over-extraction of groundwater, with dire consequences for communities and the environment. In 2017, IWMI conducted studies and pilot projects in Ethiopia and India, with the aim of helping nations to introduce solar irrigation successfully.

Charting a way forward in Africa

In sub-Saharan Africa, connectivity to the grid is low; the cost of fuel is high; and groundwater is largely unexploited. Particularly for remote areas, solar energy offers an irrigation option to smallholder farmers at the mercy of variable rainfall.

IWMI scientists have just published a new methodology for mapping the suitability of solar-based irrigation in the report *Business Model Scenarios and Suitability: Smallholder Solar Pump-based Irrigation in Ethiopia*. They conducted the study through a project supported by the International Fund for Agricultural Development (IFAD) and as part of WLE. The authors identified three business case scenarios for guiding future investments. They found that the direct purchase of pumps by farmers would be feasible, as would out-grower schemes and pump supplier options with bundled financing.

"We undertook suitability mapping to identify where the solar radiation levels, surface water, groundwater and biophysical conditions would be appropriate for implementing the technology," explains one of the report's authors, Nicole Lefore, who is a senior project manager with IWMI. "Then, on the socioeconomic side, we looked at the adoption of solar technology by individuals versus groups and explored gender implications. Finally, we undertook a comprehensive economic analysis to consider the actual financial returns that could be gained. Millions of hectares across sub-Saharan Africa could potentially be irrigated using solar pumps."

Finding the best fit in India

In India, solar irrigation is already established and expanding rapidly. While fewer than 5,000 pumps were installed in 2012, today there are 170,000. Government subsidies, unreliable grid power supplies and the high cost of diesel are driving farmers to embrace solar irrigation. The IWMI-Tata Water Policy Research Program, a partnership between IWMI and the Tata Trusts, has been working here to identify the role that solar plays in the wider food-energy-water nexus.

IWMI conducted studies in Ethiopia and India, with the aim of helping nations introduce solar irrigation successfully.

Solar-powered irrigation in India's Haryana State.

"We believe that solar will need to be incentivized in India for some time to come," says IWMI senior fellow Tushaar Shah. "In parched aquifers of western India, it is much better to do so by offering farmers a remunerative market for their surplus solar energy. So, we have demonstrated multiple collateral benefits of doing this through a pilot project at Dhundi, a village in the state of Gujarat. Over the past 20 months, the Dhundi pilot has demonstrated an approach to provide green energy, while incentivizing water conservation and improving the livelihoods of poor farmers."

Another pilot study at Chakhaji village in eastern India's Bihar state investigated how an off-grid system run by solar-Irrigation Service Providers (sISPs) might operate. Here, while groundwater is plentiful, electricity is not available to farmers, and the high cost of diesel contributes to low agricultural productivity. Six sISPs were each provided with a large solar pump and a network of buried pipelines. Sixty percent of the cost of the equipment was subsidized, with the (sISPs) repaying the rest in an upfront sum and annual installments. The pumps were located with overlapping command areas to stimulate competition between providers.

Before the pilot began in 2016, 18 diesel pump owners served 1,623 plots owned by 403 smallholders. By March 2017, the new service had effectively replaced them by offering a faster and better irrigation service for a lower price. As a result, gross irrigated area in the village increased by 40%.

Solar-powered irrigation figured among the *10 Best Bet Innovations for Adaptation in Agriculture,* the title of a working paper released by CCAFS at the 2017 United Nations Climate Change Conference held in Bonn, Germany. The paper cited the work at Chakhaji as an exemplary case study.

The Dhundi pilot demonstrated an approach to provide green energy, while incentivizing conservation and improving livelihoods.

The water productivity renaissance

The longstanding concept of agricultural water productivity, which involves the valuation of farm outputs relative to the amount of water used, is undergoing a renaissance. IWMI began developing this approach two decades ago as part of a widening effort to address water scarcity.

The life story of an influential idea

While the United Nations Sustainable Development Goals (SDGs) were still being formulated, IWMI joined forces with the World Bank to conduct a study tracing the history of work on improved water productivity in agriculture over the last two decades.

Launched at the World Bank Water Week during March 2017, the resulting report, *Beyond "More Crop per Drop": Evolving Thinking on Agricultural Water Productivity,* describes how the water productivity concept took shape, what methods are being used to measure it and what lessons IWMI and its partners have learned from applying the concept in their research. The insights and opportunities that the report highlight should prove especially useful for developing indicators to track progress towards SDG 6, which calls for efforts to ensure availability and sustainable management of water and sanitation for all.

"The renewed focus on water productivity has helped draw attention to the issue of water scarcity, and the complexities of trying to manage limited water resources," explains Meredith Giordano, interim leader of IWMI's Building Resilience Strategic Program and the report's lead author. "The lessons learned from 20 years of research on this topic offer insights that point to a more nuanced approach for applying the water productivity concept to deliver on the SDGs."

Irrigated production of onions in northern Ethiopia.

In 2017, IWMI made good use of an opportunity to share knowledge on water productivity through its involvement with The Global Framework on Water Scarcity in Agriculture (WASAG). The Institute is a partner in several WASAG working groups and leads the one on sustainable agricultural water use.

Getting irrigation just right

As part of its global effort to address water scarcity, IWMI researchers continued their search for ways of enabling smallholder farmers to enhance water productivity. In April 2017, the Institute began work on a 3-year project led by the Food and Agriculture Organization of the United Nations (FAO) and funded by The Netherlands government, which aimed to develop a multi-scale remote

sensing database on water productivity for continental Africa and the Middle East and North Africa (MENA) region.

Water productivity maps derived from the database can help national governments pinpoint where farmers need to use water more wisely. Systematic spatial assessments of water productivity enable us to evaluate water productivity gaps and identify appropriate solutions. IWMI leads the project's work on capacity building, with a focus on irrigation sites in Ethiopia, Lebanon and Mali.

"Our early efforts to monitor agricultural water use in one of Ethiopia's largest smallholder irrigation schemes revealed that farmers typically over-irrigate at the beginning of the dry season," says IWMI researcher Lisa-Maria Rebelo. "This results in conflicts between irrigation users, when water levels in the reservoir are low due to over-irrigation early in the season."

Project scientists are using innovative tools to enhance the capacity of farmers, water user associations and irrigation scheme managers to improve water productivity. With them, the project is piloting simple devices that indicate when crops have received sufficient water, combined with the use of a short message service (SMS)-based platform for irrigation scheduling and thermal imaging to monitor crop stress.

The water accounting imperative

Assessments of water productivity at the field level must go hand in hand with water accounting at the basin scale. This is the systematic study of the current status and trends in water supply, demand, distribution, accessibility and use in a particular basin.

To bring a more standardized approach to water accounting, IWMI and IHE-Delft Institute for Water Education have devised Water Accounting Plus (WA+). It quantifies the state of water resources in a geographic region over a certain period of time, based on open-access remote sensing data, datasets in the public domain and global hydrological models. In a new push to gain recognition for water accounting, IWMI, IHE-Delft, FAO and the World Water Assessment Programme (WWAP) of the United Nations Educational, Scientific and Cultural Organization (UNESCO) have formed the Partnership for Water Accounting. These organizations contributed to a white paper and policy brief on water accounting, published in March 2018.

Measuring water levels in the Ajuri River near the city of Bahir Dar in northern Ethiopia.

"The partnership facilitates global quantification of benefits from water management in unprecedented detail, giving rise to big data systems that would be impossible based only on field measurements or hydrological modelling," says Julie van der Bliek, director of partnerships and knowledge management at IWMI. "With more countries facing water scarcity, there is an urgent need for wider adoption of WA+ to provide coherent and consistent reporting both nationally and across transboundary river basins."

With more countries facing water scarcity, there is an urgent need for wider adoption of Water Accounting Plus.

How to manage “hidden” water resources

Pumping groundwater for irrigation in Anand District, Gujarat, India.

The pressure on surface water has risen steadily over the past decade, as climate change has made its availability more variable, and as expanding cities, industry and agriculture have all increased water demand. In response, nations have increasingly turned to groundwater as an alternative, reliable water supply.

Groundwater governance insights from global experience

IWMI has been at the forefront of efforts to ensure sustainable use of this valuable resource. In 2016, we took the key step of establishing the Groundwater Solutions Initiative for Policy and Practice (GRIPP), which links and informs groundwater projects and initiatives, while sharing lessons on good practices and solutions globally. In 2017, the Institute collated and disseminated information on global challenges and current progress by publishing the book *Advances in groundwater governance* with CRC Press.

“I had the idea that we needed to spell out issues related to groundwater governance explicitly and in relation to the management of surface water resources,” explains lead editor Karen Villholth, leader of IWMI’s Groundwater Research Group. “Groundwater is especially in need of governance, because it’s a hidden resource. It’s also a huge resource with the potential to underpin water and food security in the face of an uncertain future climate, but people are not necessarily paying attention to protecting it and managing it sustainably, or putting adequate governance measures in place.”

The book draws together a host of expert researchers and practitioners working on issues related to groundwater governance. The first of four sections sets the scene by providing information on how groundwater governance emerged as an issue. Part two outlines some of the key elements of groundwater governance and explains the links between them. Part three examines groundwater’s relationship with external factors, such as energy, food production, transboundary groundwater issues and poverty. Part four provides case studies. The publication is aimed at a broad range of readers, from water managers and academics to groundwater specialists seeking to understand the wider context in which they work.

Chapter 26 consolidates IWMI’s extensive work on groundwater governance in the MENA region. In this water-scarce region, over-extraction is threatening the sustainable economic and social development of some countries, and presenting a clear challenge for policy makers, managers and academics. Another issue, groundwater contamination, is discussed in chapter 28 on governance in the São Paulo and Mexico City metropolitan areas.

“The book will undoubtedly contribute to raising much-needed awareness of groundwater governance and to boosting its implementation,” says Mohamed Bazza, a

Groundwater is a hidden but huge resource with potential to underpin water and food security in the face of an uncertain future climate.

former senior water resources officer at FAO, in his review of the book.

Toward cooperative management of transboundary aquifers

While consolidating and disseminating its knowledge on groundwater governance, IWMI continued to work toward equitable and sustainable use of internationally shared groundwater. In June 2017, the Institute launched phase two of the project "Potential of the transboundary Ramotswa Aquifer" with Botswana and South Africa. This project seeks to promote cooperation around aquifer management among countries of the Southern African Development Community (SADC) and in particular the Limpopo River Basin.

In the first phase, the project assessed hydrogeological, socioeconomic and institutional conditions around the aquifer, increased institutional capacity for assessing and managing transboundary aquifers, and began developing a hydrogeological model to identify options for managed recharge of groundwater. Building on this progress, the second phase aims to identify joint actions and investments that Botswana and South Africa can take forward to harness some of the numerous opportunities for improved water security provided by the shared resource. Formalization of the bilateral cooperation through a new or existing institution is also in the making.

"There is great potential for water security and economic development in the region through cooperative use of both groundwater and surface water resources," says Jonathan Lautze, a senior researcher at IWMI.

There is great potential for water security and development through cooperative use of groundwater and surface water.

Monitoring soil moisture with a chameleon sensor for irrigation scheduling in Botswana.

Sustainable Growth

Current patterns of global economic growth are neither sufficiently inclusive nor are they environmentally sustainable. It is difficult to see how countries can attain the United Nations Sustainable Development Goals (SDGs) without a major change in direction. Building on a solid record of achievement, IWMI researchers inform policy debates and identify practical solutions to guide decisions and investments toward better resolution of issues such as the trade-offs between water, energy and food security, and more equitable sharing of development benefits.

Water and women's empowerment

IWMI was among the first organizations to reveal the connections between gender and irrigation, and is today considered an authority on gender and water for multiple uses.

IWMI rural sociologist Barbara van Koppen was invited to share the Institute's expertise by preparing a paper for an Expert Group Meeting held in September 2017, ahead of the 62nd session of the United Nations Commission on the Status of Women, which took place in March 2018. Titled "Challenges and opportunities in achieving gender equality and the empowerment of rural women and girls," the meeting was called by UN Women, the International Fund for Agricultural Development (IFAD), Food and Agriculture Organization of the United Nations (FAO) and World Food Programme.

Water is a key entry point to improve opportunities for women in rural areas.

Water is key to gender equality

The IWMI paper stressed that rural women and girls in developing countries are the most water insecure and also the worst hit by climate disasters. These pressures are compounded by growing competition for water resources from private companies and large-scale acquisitions of fertile land with water resources.

A final meeting report, which the UN will use to advance global policy dialogue, incorporated recommendations to increase women's control over water infrastructure and thus overcome its monopolization by men. This requires both informal investment in self-supply as well as public services, designed to provide water for multiple uses. A further challenge is to better protect customary water rights in the face of "water grabbing."

"Water is a key entry point for improving opportunities for women in rural areas because of the mixture of productive and domestic chores they perform," explains van Koppen. "It also intersects with rights to food, health and an adequate standard of living. In rural areas, most work is highly water

Transplanting onions in Ghana's Upper East Region.

dependent, but climate change is making the availability of water resources more variable. A strong strategy for adapting to climate change in farming communities must therefore improve access to and control over water."

Challenging ingrained assumptions

Often, however, development interventions are based on inaccurate assumptions about women. IWMI researchers highlighted this insight in two book chapters published in 2017. The first, by van Koppen, appeared in *The Oxford Handbook of Water Politics and Policy*. The second, written by former senior IWMI researcher Floriane Clement and research officer Emma Karki, was a contribution to the book *Water Security across the Gender Divide,* published by Springer.

In her chapter, van Koppen examined the history of the relationship between gender and water. She concluded that the attempts of development programs to "empower" women based on the historic notion of "male breadwinner-female housewife" are outdated. Instead, she proposed taking an inclusive people-driven approach to providing water services to meet both men's and women's domestic and productive water needs.

Clement and Karki examined two multiple-use water systems implemented by a project in Nepal to see if improving access to water for women translated into empowerment. The findings highlighted the importance of understanding local values and perceptions of empowerment, as these can differ from Western views. For example, they found that it was important to involve men and other relatives in a household in critical discussions on gender norms and roles, rather than solely targeting women for training or taking leadership roles in water management. Not doing so, limited the potential for transformative change in gender relationships.

Ujeli BK (seated) manages the family farm in western Nepal, while her husband works abroad.

Taken together, IWMI's latest gender outputs suggest that more emphasis must be placed on the intersection between water and gender. While there are separate SDGs addressing water (SDG 6) and gender (SDG 5), the challenge is to encompass both. "Most water projects undertake technical feasibility studies but not social feasibility studies," explains Clement. "It's important to do both; otherwise, interventions may empower some but disempower others."

Water as a catalyst for cooperation not conflict

Irrigation canal in Pakistan.

Narratives around transboundary water management all too often highlight potential conflicts. Yet, IWMI's ongoing work in at least eight major international river basins suggests that such views can be misleading.

In 2017, IWMI researchers improved knowledge sharing in support of sustainable management of water resources in the Indus Basin; shared valuable expertise and experiences through new books; and helped lay the groundwork for effective water resource governance in Southeast Asia's Salween River Basin. Findings from this body of work indicate that managing transboundary rivers presents great potential for stimulating cooperation on multiple scales.

To bring together this growing body of work, we conceived the IWMI Transboundary Waters Initiative, which provides a framework for the development of partnerships, and improved policies and practices.

Managing transboundary rivers presents great potential for stimulating cooperation on multiple scales.

Expanding knowledge frontiers

Three hundred million people live in the Indus River Basin, across Afghanistan, China, India and Pakistan. The river supports substantial agricultural, hydropower and industrial production, but is under pressure from climate change, environmental degradation and population growth. IWMI has worked since 2015 on the Informing Change in the Indus Basin (ICIB) program, which promotes cooperation and improved decision making, with support from the UK's Department for International Development (DFID).

In 2017, IWMI researchers continued working with local partners to develop a platform for knowledge sharing (www.indusbasin.org). They also created a digital mapping system that uses hydrological, geophysical and social data to underpin effective decision making; installed telemetry for gathering and sharing data to promote water management dialogue between provinces of Pakistan; and encouraged the media to use evidence-based science in their reporting.

"Various elements are now coming together to create a more cohesive decision-making environment in the basin," explains Alan Nicol, leader of IWMI's Sustainable Growth Strategic Program. "In 2017, we added new material to the knowledge platform and refined its search mechanism. With the World Bank and International Centre for Integrated Mountain Development (ICIMOD), we hosted the Second Indus River Basin Forum in July. The event brought together more than 100 researchers, government experts and development practitioners with international experts and partner organizations to agree on ways of bringing science and decision making closer together."

The power of collective action

Collective action – in which disparate actors, from states to civil society, work together to achieve a common objective – is considered key to delivering on the SDGs. However, it requires a complex marriage of needs and capabilities.

The 2017 publication *Water Governance and Collective Action* – edited by Alan Nicol with IWMI colleagues Diana Suhardiman (leader of the Governance and Gender Research Group) and Everisto Mapedza (senior researcher) – collates and showcases global experiences with collective action in sustainably managing freshwater resources. In 16 chapters, the book presents case studies from Africa, South and Southeast Asia, and Latin America. The authors highlight links between community-based water management, national decision making, transboundary water governance and global policy dialogue, and consider how collective action could contribute to achieving positive environmental and development outcomes.

All about a basin

IWMI researchers published another book, *The Zambezi River Basin: Water and Sustainable Development,* as part of ongoing efforts to assemble and disseminate knowledge on water basins around the world. Published at a time when economic growth is both providing new opportunities and placing greater pressure on the basin, the book covers everything from hydrology and transboundary water governance to climate risks and strategies for using the Zambezi's resources in a sustainable and equitable way. "We focused on prominent issues in the basin and brought in 25 experts as contributors, half from the basin or southern Africa and half based internationally," explains Jonathan Lautze, a senior researcher at IWMI.

Giving local people a stake in river development

The Salween River Basin is Southeast Asia's last free-flowing international river. Plans are in the works to develop hydropower dams on the waterway, however. Some such infrastructure projects in Myanmar have historically been associated with conflict, and hydropower development on the Salween is closely linked to wider discussions of the ongoing peace process in the country.

Through an opinion article in The Conversation, a global media resource, Diana Suhardiman added IWMI's voice to the debate on this river's future. Her article underlined the complexity of hydropower projects and urged that dam development should take place only if it serves a greater purpose (such as food security) for the local population, beyond its potential to promote economic growth. As IWMI's considerable experience has shown, giving local people a stake in river development can promote inclusive and accountable water governance that favors cooperation over conflict.

Fishing on Myanmar's Inle Lake in the Salween River Basin.

Gauging progress toward global water goals

As the SDGs were taking shape several years ago, IWMI worked closely with United Nations agencies to ensure that water quantity and quality, along with ecosystem health, were incorporated into the indicators for monitoring progress toward the goals. This was particularly the case for SDG 6, which seeks to ensure availability and sustainable management of water and sanitation for all.

In the process, the Institute helped draft methodologies for countries to use in reporting on their efforts to reach several water-related targets. For example, IWMI researchers led the drafting of SDG indicator 6.6.1 (water-related ecosystems), contributed the bulk of the method for 6.4.2 (water stress) and supported in various ways the development of other protocols, including those for 2.4.1 (sustainable agriculture), 6.2 and 6.3.1 (wastewater), 6.3.2 (water quality), and 6.5 (integrated water resources management).

Practical methods as well as the necessary data and capacities to use them are the basic building blocks of a reliable system to monitor progress toward the SDGs. Only by handling this task effectively, can countries make sound decisions about the investments needed to ensure they are making steady progress along a pathway towards sustainable development.

Practical methods as well as data and capacities are the building blocks of a system to monitor progress toward the SDGs.

Reporting step by step

In 2017, IWMI helped facilitate accurate reporting on two SDG indicators, pertaining, respectively, to targets 6.6 and 6.3. The first target calls for countries to "protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes." Initially, IWMI researchers helped develop a step-by-step reporting methodology for indicator 6.6.1 and then offered further support by publishing the report *Guidelines and Indicators for Target 6.6 of the SDGs: "Change in the Extent of Water-related Ecosystems Over Time."* During previous years, IWMI helped develop indicator 6.3.2, which concerns ambient water quality.

This year, IWMI contributed importantly to building global capacity to apply these two indicators. Under a United Nations contract, our experts gave online webinars and ran 2-day workshops in nine countries around the world to provide guidance on submitting reports for these indicators.

Data on any basin, anywhere

The Institute also undertook work related to target 6.4, which concerns improving water-use efficiency and reducing the number of people

Lake Volta, Ghana.

who suffer from water scarcity. The related water stress indicator – "freshwater withdrawal as a proportion of available freshwater resources" – requires data on environmental flows. This refers to the quantity and timing of water flows required to sustain freshwater ecosystems in such a way as to protect the lives and well-being of people depending on them.

IWMI researchers previously provided the indicator for water stress and are now providing an online database on environmental flows that in the future will be used by all countries as part of their SDG submissions. To support the use of these data, the Institute published in 2017 the report *Global Environmental Flow Information for the Sustainable Development Goals*.

"A link to the database on IWMI's website is now included in the methodology for reporting on target 6.4," says Chris Dickens, a principle researcher at IWMI and head of its office in South Africa. "Countries can use the database to calculate environmental flow data for any river basin, anywhere."

Main data provider

Another important role that IWMI plays in support of national and international efforts to gauge progress toward the SDGs involves its contribution as the main data provider for the wastewater section of FAO's AQUASTAT database. Institute researchers collect national data relating to wastewater production, collection, treatment and reuse, and then analyze and check the data against validation rules before preparing it for inclusion in AQUASTAT.

"AQUASTAT is one of the databases that will be used to monitor progress for some SDG indicators," explains Javier Mateo-Sagasta, leader of IWMI's Water, Health and Nutrition Research Group. "For example, for the first indicator of target 6.3 – 'proportion of wastewater safely treated' – AQUASTAT is listed as one of the key data sources. By contributing data to AQUASTAT, we are indirectly supporting the global SDG effort."

IWMI provides an online database on environmental flows that will be used by all countries as part of their SDG submissions.

Polluted stream feeding into the Ganges River near the city of Kanpur, Uttar Pradesh, India.

Rural-Urban Linkages

Rapid urbanization is putting enormous pressure on cities and the surrounding countryside to provide safe food and water, while enhancing human and environmental health. For peri-urban communities struggling to meet these needs, mounting volumes of untreated waste present both challenges as well as opportunities. IWMI helps address both through pioneering research that delivers new knowledge together with advisory services focused on wastewater management, and new business approaches to the recovery and reuse of potentially valuable resources from waste.

The vast extent of wastewater irrigation

Watering maize and vegetables in Ghana.

More than two decades ago, IWMI published a report indicating that some 20 million hectares of farmland around the world were being irrigated with wastewater. The publication estimated for the first time the extent to which farmers in developing countries were relying on contaminated water to grow crops, and drew attention to the scale of the potential health risks of the practice.

Wastewater irrigation revisited

In 2017, with more advanced technology available, IWMI conducted a new global assessment of wastewater use, in collaboration with the University of California, Berkeley, and Stanford University in the USA. The resulting report, *A Global, Spatially-explicit Assessment of Irrigated Croplands Influenced by Urban Wastewater Flows,* showed that using untreated wastewater from cities to irrigate downstream crops is about 50% more widespread than previously estimated.

Wastewater finds its way to farmland by two means. The first is direct reuse, meaning that treated wastewater is sent directly to agricultural fields from a treatment plant. Since data are readily available on the capacity of treatment plants, volumes of wastewater treated and areas of agricultural land irrigated, it is relatively easy to calculate the extent of crops irrigated in this way.

"The challenge arises where crops are irrigated indirectly," explains Pay Drechsel, leader of IWMI's Rural-Urban Linkages Strategic Program. "In such cases, farmers simply use water from rivers downstream of urban areas, which contains unsafe amounts of usually untreated wastewater. In fact, the area under indirect and usually unsafe irrigation is about 30 times larger than the area with planned wastewater reuse.

The authors turned to geographic information system (GIS) technology to help find out just how much farmers now rely on this predominant indirect form of wastewater reuse for irrigation. Using satellite images, geospatial datasets and computer modelling of the urban water cycle, they defined wastewater-dependent croplands within different distances from urban areas; considered urban population numbers; and

examined the share of wastewater in relation to all available water within a catchment. Wastewater-dependent croplands located in countries where less than 75% of wastewater received some form of treatment were deemed to be irrigated croplands with a high likelihood of untreated reuse.

A serious health risk for urban consumers

The work revealed that 65% of all irrigated areas within 40 kilometers of major urban centers are affected by wastewater flows to a large degree. This equates to an area of land equivalent in size to Italy or Germany. Some 29.3 million hectares of that land – more than 80% of the total – are located in countries with emerging wastewater treatment, primarily China, India, Pakistan, Mexico and Iran. Until treatment coverage catches up with population growth, about 885 million urban consumers are likely to be exposed to serious health risks.

"There are two pathways we can take to try and overcome this challenge," explains Drechsel. "In the short and middle term, we have to encourage behavior change to reduce health risks from farm to fork, while in the long term, we need many more treatment facilities, tailored to the type of desired water reuse." IWMI has expertise in both these areas. Past research examined ways to encourage risk-reducing behavior change, such as washing vegetables and irrigating crops at the roots to avoid water contaminating salad leaves.

More recently, the Institute has put considerable effort into developing public-private initiatives for treating and recycling "fecal sludge" (human waste produced by households and pre-treated in on-site pit latrines or septic tanks) into useful products, such as fertilizer, biogas and fuel briquettes, to prevent it from polluting water bodies. In May 2017, after 5 years of development and 10 years of research, the first large-scale plant in West Africa to produce human waste-based fertilizer in pellet form officially opened in Tema, Ghana, as a commercial venture.

Eggplant crop irrigated with treated wastewater near India's East Kolkata Wetland.

The challenge ahead

Published in *Environmental Research Letters,* IWMI's report provides a first reliable estimate of the growing extent of wastewater use in agriculture. It confirms the challenges ahead and the need for urgent action to address, in particular, indirect wastewater use, which will require action beyond treatment plants to reduce the associated risks. "There are only 12 years left until 2030, and the clock is ticking," Drechsel warned on the Closing Panel of the 2017 World Water Week in Stockholm.

IWMI's work has stimulated considerable interest, as is evident in the 2017 United Nations World Water Development Report, *Wastewater: The Untapped Resource,* which cites more than 30 IWMI papers.

Showcasing effective resource recovery and reuse

Application of the organic fertilizer *Fortifer*™ to a rice crop in Ghana's Eastern Region.

With a growing global population, increasing demand for meat and dairy products, and the need to produce climate-friendly biofuels, more water is needed for agriculture. Yet, cities and industry increasingly compete with farmers for already tight water supplies, and climate change is making the availability of water more variable. Where groundwater is scarce, desalination impractical and long-distance water transfers too costly, recycling of wastewater will be key to overcoming this challenge. Specifically, it will help strengthen resilience, underpin food security and contribute to the green economies of our future cities.

Filling a major knowledge gap

Seeking to show how this might be achieved, IWMI compiled findings from 7 years of research in the book *Resource Recovery from Waste: Business Models for Energy, Nutrient and Water Reuse in Low- and Middle-income Countries*. Following an extensive literature survey of more than 150 reported business cases, the authors analyzed 60 initiatives in detail through site visits and expert interviews. Some 47 empirical cases were included in the book, with 24 business models developed from them.

"We selected cases on the basis that they must be scalable, safe and technically feasible in low- or middle-income countries, and to a large degree independent of public subsidies," explains Drechsel, who is joint editor of the book with Miriam Otoo, leader of IWMI's Resource Recovery and Reuse Research Group. "We tested several of the models to assess their feasibility in different geographical contexts and gain an understanding of how well they could be replicated," Otoo added.

Aimed primarily at students in civil engineering and business schools, the book attempts to fill a major knowledge gap. While civil engineering schools teach very little about business related to wastewater treatment and reuse, business schools tend to exclude the waste and sanitation sector in their teaching programs.

"You find case studies, such as Coca Cola, on the curricula of business schools, but you don't find any examples from sanitation or resource recovery," explains Drechsel. "That's why we created the book. We extracted generic business models, using three or four cases, which students can study and apply to other locations."

Recycling of wastewater will help strengthen resilience, underpin food security and contribute to the green economies of our future cities.

Blueprints for an increasingly parched world

The book is divided into five sections: Business models for a circular economy; Energy recovery from organic waste; Nutrient and organic matter recovery; Wastewater for agriculture, forestry and aquaculture; and Enabling environment and financing. Some case studies – from Ghana and Sri Lanka, for example – derive from IWMI's own work, but the majority are external initiatives. Several of the business models are particularly innovative and could well act as blueprints in an increasingly parched world.

One such business model, which builds on inter-sectoral water exchange, was based on cases from Spain and Iran. A severe drought during 2007-2008 in Spain's Llobregat Delta resulted in billions of dollars of damage, prompting investment in wastewater treatment infrastructure. During prolonged periods of drought, the nearby city of Barcelona can now offer farmers highly treated wastewater for irrigation in exchange for their freshwater entitlement. In the Iranian city of Mashhad, a similar deal is permanently in place. Here, farmers were incentivized to transfer their freshwater rights in exchange for a greater volume of wastewater than the amount they offered the city.

As a next step, IWMI plans to extract key lessons and teaching modules for transfer into the curricula of business and civil engineering schools. In time, it may also use the book as a source of training materials for other possible beneficiaries, such as in the public and private sectors.

In the book's epilogue, Jaideep Prabhu, a business professor at the University of Cambridge UK, and author of *Jugaad Innovation,* echoes IWMI's intentions, saying: "It is my strong belief that this handbook is a vital resource for all those seeking to help the world grow sustainably and equitably through the 21st century and beyond. I am confident that it will soon become the standard reference for all those who study and practice these important issues, in developed and developing countries alike."

Production of biochar from waste to enrich compost for soil health improvement near Colombo, Sri Lanka.

ABOUT IWMI

IWMI International Water Management Institute

Mission

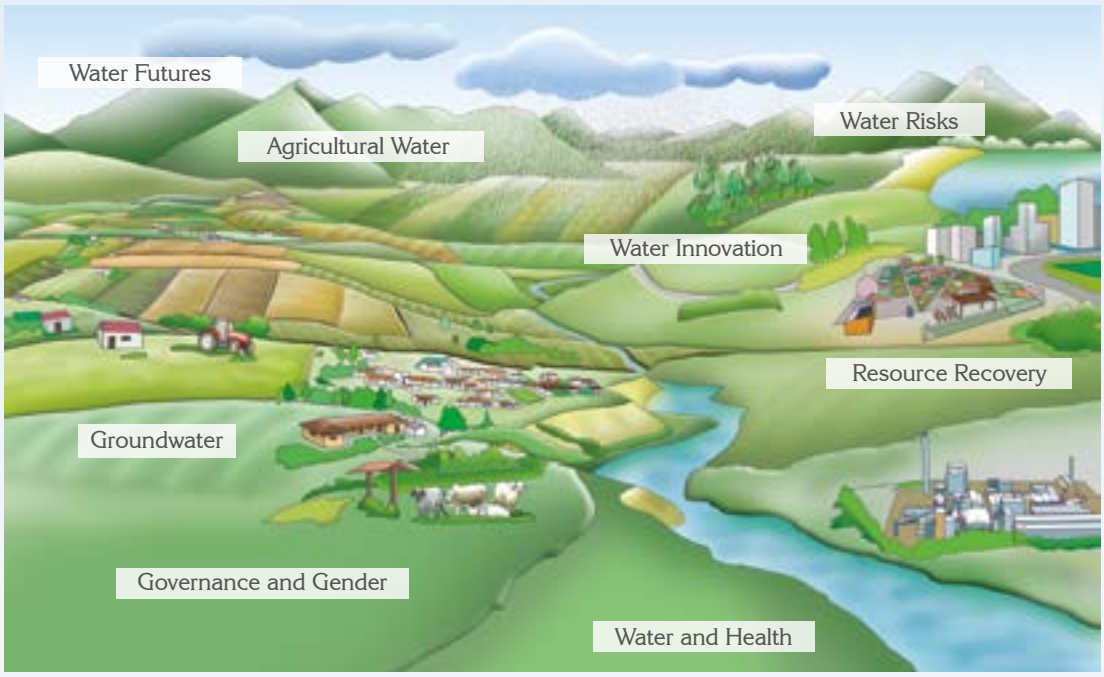
Provide evidence-based solutions to sustainably manage water and land resources for food security, people's livelihoods and the environment.

The International Water Management Institute (IWMI) strives to fulfill its mission through three strategic programs (listed below) whose purpose is to build an evidence base for new approaches that address key water-related development challenges. Our researchers work across sectors and disciplines through eight research groups (as indicated in the drawing) to deliver new knowledge, policy advice and capacity development.

Building Resilience

Sustainable Growth

Rural-Urban Linkages



Headquartered in Colombo, Sri Lanka, with offices across Asia and Africa, IWMI works in partnership with national and local government bodies, academic institutions, community-based groups, international organizations and the private sector, with emphasis on strengthening capacity.

IWMI is a CGIAR center focused on research for development. CGIAR is a global research partnership for a food-secure future. Its work is carried out by 15 centers in close collaboration with hundreds of partners across the globe.
As of January 2017, IWMI contributes importantly to CGIAR Research Programs – leading Water, Land and Ecosystems (WLE) and playing an active role in Climate Change, Agriculture and Food Security (CCAFS); Policies, Institutions and Markets (PIM); Fish; and Livestock – while also taking part in the CGIAR Platform for Big Data in Agriculture.

CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

CGIAR Climate Change, Agriculture and Food Security CCAFS

CGIAR RESEARCH PROGRAM ON Policies, Institutions, and Markets

CGIAR RESEARCH PROGRAM ON Fish

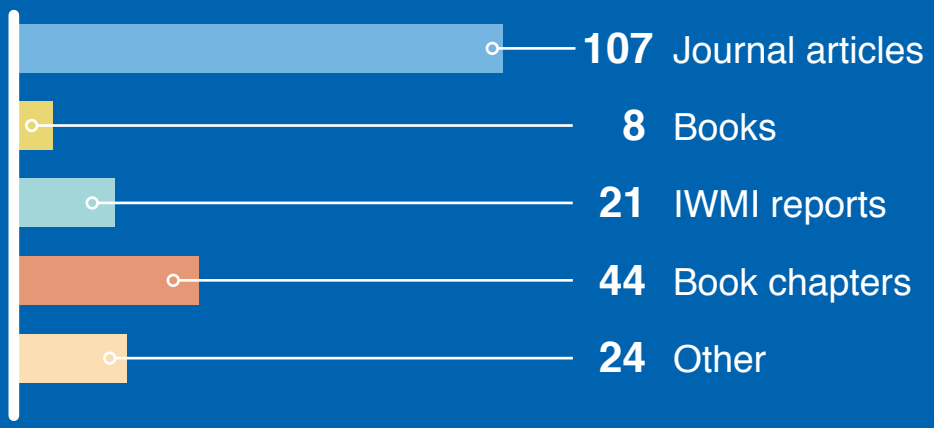
CGIAR RESEARCH PROGRAM ON Livestock

CGIAR Platform for Big Data in Agriculture

STAFF NUMBERS

Africa	Asia	Total
84	160	244

PUBLICATIONS

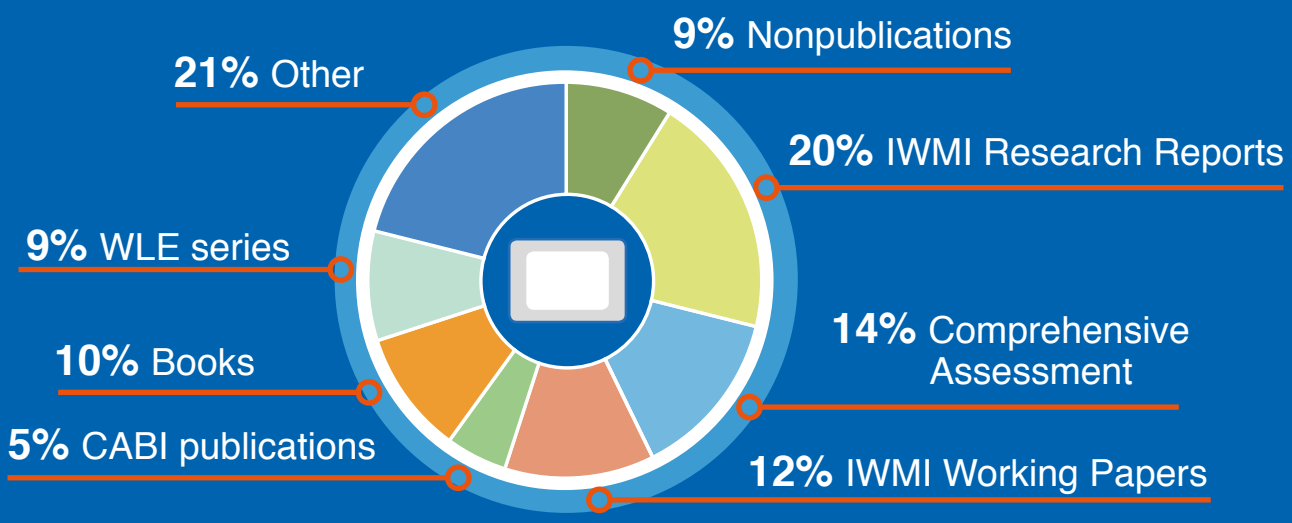


107	Journal articles
8	Books
21	IWMI reports
44	Book chapters
24	Other

Total **204**

This year saw a total of nearly **1.9 million downloads** from IWMI's publications repository.

IWMI WEBSITE DOWNLOADS



In **2017**, we registered a total of more than **3 million document downloads** from IWMI's website.

Finance and administration

IWMI successfully completed its transition to International Financial Reporting Standards (IFRS) at the end of 2017, having started the process in 2016. We also made improvements in ensuring donor compliance reports.

Global volatility in funding continued to affect IWMI's bottom line. Against this background, we made strategic investments in key research areas and in the improvement of skills. In addition, we contributed to six CGIAR Research Programs and research support Platforms, while managing 107 bilateral projects in 2017.

The 2018 budget approved by IWMI's Board of Governors includes revenues amounting to USD 33.118 million. We are upgrading our enterprise resource planning (ERP) system to fully meet increased donor requirements. We expect to complete implementation by 2018. We are also in the process of improving our human resources compensation system.

Statement of Activity
For the years ended December 31, 2017 and 2016
(expressed in thousands of U.S. dollars)

	2017	2016
Windows 1 & 2	8,806	20,005
Window 3	2,980	3,972
Bilateral	11,388	10,971
Total grant income	23,174	34,948
Other revenue and gains	638	390
Total revenue	**23,812**	**35,338**
Research expenses	22,953	33,764
General and administration expenses	4,196	4,280
Total expenses and losses	**27,149**	**38,044**
Operating deficit for the year	**(3,337)**	**(2,706)**
Financial income & disposal gains	**764**	**570**
Other comprehensive income	634	469
Total comprehensive deficit for the year	**(1,939)**	**(1,667)**

Statement of Financial Position
As of December 31, 2017 and 2016
(expressed in thousands of U.S. dollars)

	2017	2016
Current assets	27,557	34,232
Non-current assets	1,801	2,381
Total assets	**29,358**	**36,613**
Current liabilities	14,975	19,490
Non-current liabilities	2,570	3,371
Total liabilities	**17,545**	**22,861**
Designated net assets	1,801	2,373
Undesignated net assets	10,012	11,379
Total net assets	**11,813**	**13,752**
Total liabilities and net assets	**29,358**	**36,613**

Expenses by Function
For the years ended December 31, 2017 and 2016
(expressed in thousands of U.S. dollars)

	2017	2016
Personnel costs	13,223	15,746
CGIAR collaboration expenses	3,808	7,637
Non-CGIAR collaboration expenses	2,849	6,339
Supplies and services	5,572	6,064
Travel	1,153	1,277
Depreciation	338	752
Cost sharing percentage	206	229
Total expenses and losses	**27,149**	**38,044**

Principal investment partners

IWMI research receives support from the CGIAR Fund donors as well as grants from various organizations. We gratefully acknowledge their support for our collaborative efforts to achieve water security across the developing world.

- African Development Bank (AfDB)
- Asian Development Bank (ADB)
- Australian Centre for International Agricultural Research (ACIAR)
- Bill & Melinda Gates Foundation (BMGF)
- Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety), Germany
- Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ) (Federal Ministry for Economic Cooperation and Development), Germany
- CGIAR Fund
- Department for International Development (DFID), UK
- Department of Foreign Affairs and Trade (DFAT), Australian Government
- Directorate-General for International Cooperation (DGIS), Government of the Netherlands
- European Commission (EC)
- Food and Agriculture Organization of the United Nations (FAO)
- Global Affairs Canada
- Government of France
- Government of Ghana
- Government of India
- Government of Japan
- Government of Nigeria
- Government of South Africa
- Government of Thailand
- International Fund for Agricultural Development (IFAD)
- Rockefeller Foundation, USA
- Sir Dorabji Tata Trust and Sir Ratan Tata Trust
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- Swiss Agency for Development and Cooperation (SDC), Switzerland
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- United States Agency for International Development (USAID)
- World Bank

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- Ethiopia
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- Laos
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- Nepal
- Pakistan
- South Africa
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IWMI office locations and countries where we have projects underway

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Left to right: Sisira Kumara, Barbara Schreiner, Gebisa Ejeta, Don Blackmore (Chair), Claudia Sadoff, Roberto Lenton, Syon Niyogi (Corporate Services Director), Chemutai Murgor and David Grey.

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* Completed term in December 2017.

** Joined in January 2018.

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Talangama Lake, which forms part of the Colombo Wetlands Complex in Sri Lanka. The lake was created in the 16th century to supply irrigation water, a purpose it serves to this day.

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