Annual Report 2013

Working together towards a water-secure world

IWMI
International Water Management Institute

Joint message from the Board Chair

> IWMI's role is to work across multiple sectors and inform decisions related to achieving water security at various scales.

The issue of the world's limited water resources was high on the global agenda in 2013. Not only was the year designated as the United Nations (UN) International Year of Water Cooperation, but discussions around the evolving UN Sustainable Development Goals placed greater emphasis on water resources and wastewater management than ever before. This was good news for IWMI, as it helped increase awareness of the importance of scientific research in underpinning future water security.

In light of these global debates, we chose 2013 to reflect on IWMI's recent achievements and outline its future strategic directions. Just published, IWMI's *Strategy 2014-2018: Solutions for a water-secure world* defines the Institute's role going forward as a think tank driving innovative research, providing science-based products and tools, facilitating learning and capacity building, and achieving uptake of research findings. It confirms IWMI's role to work across multiple sectors and inform decisions related to achieving water security at various scales.

Recent reforms of CGIAR lie at the heart of IWMI's future research agenda. The Consortium has created 16 CGIAR Research Programs aimed at resolving increasingly complex issues of global climate change, agriculture, food security and rural poverty. IWMI is leading the CGIAR Research Program on Water, Land and Ecosystems (WLE) and contributing to several others. The program is now getting into its stride and is commissioning new research aligned with CGIAR's development outcomes.

A main aim of the reforms of CGIAR is to encourage collaboration between its centers and external partners. At IWMI, we have been fortunate to host and play an active role in the CGIAR Challenge Program on Water and Food (CPWF), which has acted as a role model for the new CGIAR Research Programs. CPWF, which was drawing to a close in 2013, successfully brought CGIAR centers together to work on common issues, and involved local partners in the design and implementation of projects. Most importantly, it defined its success in terms of the impacts it had on the ground. IWMI aims to emulate this model as it leads WLE.

With reaching out and forming new partnerships a high priority, we took the decision in 2013 to open a new office in Myanmar. This will build on our first project there, a six-month scoping study of water resources in Myanmar's Dry Zone.

Did you know that ...

Publication Downloads

On average, **5,700** files were downloaded **every day** from IWMI's websites, or one download every **15 seconds**

Social Media

- Followers on *Twitter* increased by **50%**
- IWMI's presentations on Slideshare were viewed nearly **76,000** times
- Likes on *Facebook* **doubled** in the 12 months to December 2013
- Videos on IWMI's official YouTube channel were **watched just under 15,000 times**

and Director General

> Ultimately, we aim for our work in existing and new territories to help inform policies that will bring about positive change for local people.

With the country opening up at an unprecedented rate, there is a great demand for research to inform decision making coming from government officials and development agencies. This represents a great opportunity for IWMI. Our remit, as elsewhere, will be to work with local partners to help ensure Myanmar's development is sustainable, equitable and of benefit to the local people.

In Africa, too, we are reaching out to new audiences. Following devastating floods in Nigeria in 2012, IWMI was approached for assistance by the country's government. The Institute is now embarking on a three-year project that will find ways to capture floodwater and utilize it productively in agriculture. The project is highly important for IWMI, given the scale of its potential impact, the lessons it will hold for other African countries seeking to use floodwater management for productive purposes, and Nigeria's new status as Africa's leading economy.

Ultimately, we aim for our work in existing and new territories to help inform policies that will bring about positive change for local people. To this end, in June 2013, we held a high-level dialogue meeting in India to bring together global experts on agriculture and water science. Our goal was to ensure IWMI's science reaches policymakers, so they can help make India's rapid transition to a major global economy as environmentally sustainable as possible. This dialogue with policymakers will be expanded to other regions.

In many ways, 2013 was a year of consolidation for IWMI. As 2014 gets under way, we are excited to be able to build on these strong foundations as we set out along the path we have defined for the 2014-2018 strategy period. In 2014, we will be reorganizing our research structure to capitalize on the fresh opportunities that the Strategy provides. We look forward to working with our CGIAR colleagues and external partners across the world as we tackle diverse water and land management challenges in the year ahead. Together, we will continue to deliver sustainable solutions that improve food security, enhance people's livelihoods, and support a healthy and productive environment.

Donald Blackmore
Board Chair

Jeremy Bird
Director General

WEBSITE VISITORS

On average, nearly **15,000 visitors** viewed content on the IWMI website each month in 2013

Photo: Petterik Wiggers/IWMI

Tapping into Africa's groundwater

New study sheds light on the potential for groundwater use in sub-Saharan Africa

A team of IWMI researchers is behind one of the most comprehensive surveys on the availability and use of groundwater in Africa yet published. Covering 15 African countries, the study helps address some of the knowledge and data gaps that hinder sustainable groundwater development in sub-Saharan Africa (SSA).

Experts estimate that only 3% of groundwater resources of SSA are used for irrigated agriculture. This figure comes as something of a surprise, given that groundwater is abundant, renewable and ideal for small-scale irrigation in many areas. Investments that are well-targeted in terms of location and scale, and link to services and support could unleash smallholder farming and make it a major driver of economic growth, poverty reduction and improved food security.

"This study identifies aquifers and areas suitable for development," says IWMI's Paul Pavelic, one of the authors of the study, "But the capacity to manage the groundwater effectively and sustainably remains very weak in some countries."

According to the authors, the key challenge that lies ahead is not only to address technical issues, but to also convince decision makers that access to groundwater is an important and proven strategy for addressing development goals.

> ***This study identifies aquifers and areas suitable for development, but the capacity to manage the groundwater effectively and sustainably remains very weak in some countries.***
> **Paul Pavelic, Principal Researcher - Hydrogeology**

Sustaining nature, supporting lives

Africa's wetlands recognized as a vital resource

Malawi, in southern Africa, experienced long droughts a number of years ago. During this time, Samuel and his wife Chancy started growing vegetables in a seasonal wetland to feed their family. They not only got by during the droughts, but the garden eventually did so well that they were able to buy pigs, a bicycle to take produce to the market and, eventually, build a new house.

Chancy told researchers that she learned that a wetland was similar to milking a cow. "You must treat it well and then it will produce benefits for you."

A book published in 2013, *Wetland management and sustainable livelihoods in Africa,* argues that wetlands can play a critical role in reducing poverty, if there is a paradigm shift from conservation to people-focused sustainable development.

"Wetland conservationists frequently regard agriculture as a threat," says Matthew McCartney, an IWMI researcher and co-editor of the book. "But that disregards the critical contribution wetland agriculture can make to improving livelihoods."

The researchers advocate for an economic, social and environmental balance in wetland policies and management, and urge that these recognize the important role local communities have in managing resources for future generations.

"Inevitably, there are trade-offs and sustainability is a delicate balance," says McCartney. IWMI researchers continue to be involved in wetland and poverty alleviation issues. In collaboration with the Food and Agriculture Organization of the United Nations (FAO) and WorldFish, IWMI researchers are developing briefing notes on the wise use of wetlands for fisheries and aquaculture. In addition, IWMI leads a project, with Wetland International and others, to develop guidelines on best wetland management practices that address poverty eradication and conservation.

Photo: cc: Julien Harneis on Flickr

Coffee boosted by smarter irrigation

Study aims to influence national water guidelines in Vietnam

Vietnam's Ministry of Agriculture and Rural Development (MARD) is considering a series of recommendations made by IWMI and its partners aimed at reducing the water footprint of its world-renowned coffee crop.

It is hoped that the recommendations will support new guidelines for farmers to reduce irrigation of the plants by as much as one-third, thereby easing the pressure on water supplies.

Water scarcity is regarded as the most significant threat to the success of the country's thriving coffee sector, which accounts for 3% of gross domestic product (GDP), includes some 500,000 farmers and employs a total of around two million people.

With climate change expected to intensify dry-season water shortages, IWMI was invited to join a project funded by the Swiss Agency for

Development and Cooperation (SDC) and Nestlé (a major buyer of Vietnamese coffee) to develop recommendations for more sustainable production. The project was implemented by EDE Consulting, together with the country's Western Highlands Agriculture and Forestry Science Institute (WASI).

Researchers analyzed water use by coffee farmers in Dak Lak Province, one of the country's biggest coffee zones. They found that more than half of these farmers over-watered their coffee trees during the dry season. As well as putting pressure on groundwater reserves – the main source of water for irrigation at that time of year – it was also making the coffee more expensive to produce: farm owners needed to pay for both the energy to pump the water, and farm laborers to apply it.

The study showed that smarter irrigation scheduling could reduce groundwater irrigation withdrawals for coffee significantly while maintaining coffee yields, particularly if combined with improved on-farm practices.

A video illustrating the new approach has now been produced and will be shown to farmers throughout the coffee-growing regions.

Photo: EDE Consulting

Managing water to future-proof agriculture

New report addresses challenges of climate change

Photo: Hamish John Appleby/IWMI

Climate change will have a "profound" impact on water resources that could have serious knock-on effects for agriculture, according to a report published by IWMI scientists.

Launched during the 19th session of the Conference of the Parties (COP 19) to the United Nations Framework Convention on Climate Change (UNFCCC) in Warsaw, Poland, *Tackling Change* synthesized years of IWMI research, and was funded by the CGIAR Research Programs on Climate Change, Agriculture and Food Security (CCAFS), and Water, Land and Ecosystems (WLE).

The report details a range of options for governments and communities to "future-proof" food production. These options include small-scale methods for storing rainwater on-farm and using it more efficiently, and the better management of, and investments in, large-scale water infrastructure, such as dams and reservoirs. It highlights underground storage of floodwater as one promising new avenue of research.

The report also stresses the need for more equitable access to water for women and marginalized groups to ensure they are not disproportionately burdened by the effects of climate change. It also flags the need for improved institutional processes to ensure water management policies are implemented effectively.

Projected rises in average temperatures, more extreme weather and changes in precipitation patterns are expected to exacerbate current problems of competing demands on water from urban areas, industry and agriculture.

Mountain meltdown

How much global warming can the world's glaciers take?

Photo: Petr Podrouzek

The huge glaciers in the Himalayan Mountain system are often referred to as the 'Water towers of Asia'. These immense reservoirs feed the rivers that feed the world's most populated continent.

There is a growing concern that both melting of glaciers and seasonal snow, due to climate change, will have severe effects on the food security of millions of people. However, there is no consensus on how much water glaciers and snow actually contribute to river flow.

Two new research reports published by IWMI aimed to address this deficit in knowledge. The reports assessed water storage properties, and the hydrological role of glacier systems and seasonal snow coverage in six major Asian river basins under a changing climate.

The researchers found that, at the basin scale, climate change had caused a pronounced decrease of permanently glacier-covered area and seasonal snow coverage over the past 50 years, in some cases by as much as a third. The water storage properties of glaciers and snow also decreased. By the end of the twenty-first century, under projected air temperature increases of 4-5 ˚C in the river basins studied, only the Syr Darya and Mekong basins are likely to become glacier-free.

It is projected that the large and diverse glacier systems in the Indus, Ganges, Brahmaputra and Amu Darya river basins, however, will be able to endure that degree of warming.

"The findings suggest that the reduction of the water storage properties of glaciers and seasonal snow in the future will affect the seasonality of river flow in different ways," says Oxana Savoskul, one of the authors of the reports. "Seasonal snow will overshadow glaciers as a prominent meltwater resource."

Solutions underground

Managed Aquifer Recharge in the Fergana Valley

IWMI and its partners have been looking at ways to address one of the most pressing issues faced by farmers in the Fergana Valley region of Central Asia: seasonal swings between plentiful and insufficient water.

About half of the farmers in the region depend on pumping river water for irrigation, but when the river levels drop in the summer, there is not enough water for crops. In addition, poor management and maintenance of Soviet-era irrigation systems means that the little water that exists during the dry months often doesn't reach the farms, especially those at the tail-end of inefficient canal networks.

IWMI scientists, in collaboration with The Institute of Hydrogeology and Engineering Geology of Uzbekistan, propose increasing the use of groundwater for irrigation through Managed Aquifer Recharge (MAR). This involves the use of man-made infrastructure, modifications to the landscape or some combination of these to increase the amount of water captured and stored underground. This water can then be pumped to the surface and used for irrigation during the dry months.

The researchers studied MAR schemes from the arid regions of India and China, and tested several options on the ground and using computer simulations.

They found that more than half of the irrigated land in the valley could benefit from a 'conjunctive' system, where farmers irrigate by using river water channeled along canals and by pumping groundwater. The researchers believe that establishing such a system will be challenging, but are investigating a number of opportunities for incorporating it into official policy.

What is MAR?

- Modifications to river channels to include infiltration ponds, sand dams and subsurface water harvesting systems.
- Construction of wells, shafts and boreholes to transfer water to the aquifer.
- "Induced bank infiltration", where groundwater is withdrawn at one location to create or enhance a hydraulic gradient.
- Rainwater harvesting, where rain landing on hard surfaces (e.g., roofs, paved car parks) is captured in tanks above or below the ground, and then allowed to slowly infiltrate into the soil.

Pond, tank or well?

New water storage management tool will help African farmers' investment decisions

Reservoirs, aquifers, soil and wetlands all store water, but not every option works in every context. Variables such as cost, environmental and health risks, and political and socioeconomic factors can all affect the performance of water storage options.

"In sub-Saharan Africa, we see all of these storage options being widely used already," says Lisa-Maria Rebelo, an IWMI researcher. "But often, a lack of information, and minimal and ad hoc planning mean that they are not used to their full potential. There is a lack of both data and scientific knowledge."

Now, a new rapid assessment tool, developed by IWMI, addresses these issues by assessing the need and effectiveness of a range of different water storage options. The strength of the framework is that it is based on a variety of broad criteria, such as reliability, resilience and vulnerability. These criteria are then matched with other variables such as the amount of water available at certain times of the year, size of the local population and how well the various water storage options are likely to perform.

The researchers applied the tool to sub-Saharan Africa, looking specifically at the Volta River Basin and the Ethiopian portion of the Nile River Basin. They found that, within Ethiopia, the greatest need for water storage exists in the Central Highlands. In Ghana, the highest need exists in the South and in patches in the North. In other words, the results showed that the greatest need was not within the driest areas, but in those that are most densely populated. In these areas, there is still a significant need for storage in order to fulfil the requirements of large rural populations that depend on agriculture for their livelihoods.

“In both these river basins, climate change will lead to a decrease in the effectiveness and an increase in the vulnerability of water storage,” says Rebelo. “Making the most appropriate choice is key to effective planning and management, and improving community resilience.”

What happens when the pit is full?

New agreement will contribute to Sri Lanka’s future waste management

Photo: Manoj Jayasuriya/IWMI

Large numbers of Sri Lankans depend on septic tanks to manage human waste, but what happens when the pit is full? Where does the waste (septage) go? Could it be a valuable resource, if safely treated?

To help answer these questions, IWMI signed a Memorandum of Understanding with the Sri Lankan Ministry of Water Supply and Drainage. The new partnership will focus on the safe management of septage with options for resource recovery and reuse to mitigate environmental and health risks.

IWMI will also contribute research data for the drafting of the septage management component of the new national sanitation policy which will be implemented by the Ministry. Septic tanks need to be regularly serviced and

the waste disposed of in a manner that won't damage the environment or endanger human health. However, such treatment facilities are currently lacking in large parts of many countries. A new approach, being piloted by IWMI in cities in Sri Lanka and around the world, seeks to process the waste collected so that it can be safely used, potentially as agricultural fertilizer or in forestry. Septage is a valuable nutrient source that is regularly wasted.

Producing high-quality organic fertilizers by composting municipal solid waste with dried septage could also provide business opportunities, or at least options for partial cost recovery.

> ***"Sri Lanka's rapid development in recent years has put tremendous pressure on sanitation and wastewater management systems. In times of transition and rapid growth, it is unrealistic to assume that everyone will be connected to sewerage systems. So, as cities grow, we need to put much more effort into other options, such as septic tanks and safe fecal sludge management, to avoid damaging people's health and degrading their water resources."*** **Pay Drechsel, Theme Leader – Water Quality, Health and Environment, IWMI**

Financial reporting

Statement of Activities

For the Year Ended December 31, 2013

(In US Dollars '000)

Statement of Activities by source

	2013				2012
	Unrestricted	CRP	Non-CRP	Total	Total
Grant revenue					
Window 1 & 2	-	27,957	-	27,957	26,852
Window 3	-	5,309	153	5,462	4,644
Bilateral	-	12,924	280	13,204	14,209
Other	37	-	-	37	447
Other revenue and gains	1,085	-	-	1,085	1,440
Total revenues and gains	**1,122**	**46,190**	**433**	**47,745**	**47,592**
Research expenses	1,300	41,702	411	43,413	41,890
General and Administration expenses	4,313	-	-	4,313	4,622
Other expenses and losses	-	-	-	-	-
Subtotal Expenses and Losses	**5,613**	**41,702**	**411**	**47,726**	**46,512**
Indirect Cost Recovery	(4,510)	4,488	22	-	-
Total operating expenses	**1,103**	**46,190**	**433**	**47,726**	**46,512**
Surplus for the year	**19**	**-**	**-**	**19**	**1,080**
Expenses by function					
Personnel Costs	4,066	11,907	406	16,379	15,369
CGIAR Collaboration	-	10,203	-	10,203	11,586
Other Collaboration	-	10,657	-	10,657	7,926
Supplies and Services	409	7,086	5	7,500	8,139
Travel	477	1,758	-	2,235	2,758
Depreciation	661	91	-	752	734
Subtotal Expenses and Losses	**5,613**	**41,702**	**411**	**47,726**	**46,512**
Indirect Cost Recovery	(4,510)	4,488	22	-	-
Total operating expenses	**1,103**	**46,190**	**433**	**47,726**	**46,512**

Note: CRP - CGIAR Research Program

Statement of Financial Position

As at December 31, 2013

(In US Dollars '000)

	2013	2012
ASSETS		
Current Assets		
Cash and cash Equivalents	24,407	40,318
Investment	35	36
Accounts Receivable:		
Donor	8,949	3,016
Employees	427	286
Other CGIAR Centers	850	776
Others	1,485	1,473
Prepaid Expenses	260	208
Inventories	32	33
Total Current Assets	**36,445**	**46,146**
Non-Current Assets		
Property, Plant and Equipment, net	1,895	1,799
Total Non-current Assets	**1,895**	**1,799**
TOTAL ASSETS	**38,340**	**47,945**
LIABILITIES AND NET ASSETS		
Current Liabilities		
Accounts Payable		
Donor	8,339	11,819
Employees	1,123	1,057
Other CGIAR Centers	1,860	4,027
Others	2,769	2,561
Amount held for Challenge Program	1,395	5,330
Accruals	514	958
Total Current Liabilities	**16,000**	**25,752**
Non Current Liabilities		
Accounts Payable		
Employees	3,320	3,192
Total Non Current Liabilities	**3,320**	**3,192**
Total Liabilities	**19,320**	**28,944**
Net Assets		
Unrestricted		
Designated	5,180	4,180
Undesignated	13,840	14,821
Total Net Assets	**19,020**	**19,001**
TOTAL LIABILITIES AND NET ASSETS	**38,340**	**47,945**

These financial statements were approved on 05th May 2014

.....) Director General

.....) Director Finance & Administration

Principal Donors

ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
AfDB	African Development Bank
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung
DFAT	Department of Foreign Affairs and Trade, Australian Government
DFATD	Department of Foreign Affairs, Trade and Development, Canada
DFID	Department for International Development, UK
DGIS	Netherlands' Directorate-General for International Cooperation
EC	European Commission
FAO	Food and Agriculture Organization of the United Nations
Finland	Government of Finland
France	Government of France
Gates Foundation	Bill & Melinda Gates Foundation
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
IDRC	International Development Research Centre, Canada
IFAD	International Fund for Agricultural Development
India	Government of India
Ireland	Government of Ireland
Japan	Government of Japan
Rockefeller	Rockefeller Foundation
SDC	Swiss Agency for Development and Cooperation
Sida	Swedish International Development Cooperation Agency
South Africa	Government of South Africa
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
World Bank	World Bank

IWMI thanks all its donors, including those of the CGIAR Fund Council, for their support and contribution to the Institute's research in 2013 and looks forward to further strengthening these partnerships in the future.

Front cover image: Neil Palmer/IWMI

International Water Management Institute (IWMI). 2014. **IWMI Annual Report 2013.** Colombo, Sri Lanka: International Water Management Institute (IWMI). 14p. doi: 10.5337/2014.214

ISSN 1017-5954

IWMI International Water Management Institute

IWMI is a member of the CGIAR Consortium and leads the:

CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

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