



RESEARCH
PROGRAM ON
Water, Land and
Ecosystems

Led
by:



CGIAR Research Program on Water, Land and Ecosystems Annual Report 2013

Revised submission to the CGIAR Consortium Office
April, 2014

WLE Partners





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CGIAR Challenge Program on
WATER & FOOD
Andes • Ganges • Limpopo • Mekong • Nile • Volta



Acronyms

AAS	CGIAR Research Program on Aquatic Agricultural Systems
ADB	Asian Development Bank
AfSIS	Africa Soil Information Service
AWM	Agriculture Water Management
BSM	Benefit Sharing Mechanisms
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CIAT	International Center for Tropical Agriculture
CPWF	CGIAR Challenge Program on Water and Food
EPA	Essential Program Activities
ESS	Ecosystem Services
FAO	United Nations Food and Agriculture Organization
ICARDA	International Center for Agricultural Research in the Dry Areas
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDO	Intermediate Development Outcome
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
MINAM	Ministry of Environment (Ministerio del Ambiente) Peru
NGOs	Non-Governmental Organizations
PPA	Program Participant Agreement
PES	Payment for Environmental Services
RUAF	Resource Center on Urban Agriculture and Food Security Foundation
SADC	Southern African Development Community
Sida	Swedish International Development Cooperation Agency
SISLAC	Latin-American Soil Information System (Sistema de Información de Suelos de Latinoamérica)
SRP	Strategic Research Portfolio
TAGMI	Targeting AGwater Management Interventions
THPC	Theun Hinboun Power Company
TNC	The Nature Conservancy
UNEP	United Nations Environment Program
UNU	United Nations University
USAID	United States Agency for International Development
UTFI	Underground Taming of Floods for Irrigation
VBA	Volta Basin Authority
WHO	World Health Organization
WLE	CGIAR Research Program on Water, Land and Ecosystems

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A. Key Messages

A.1 Synthesis of progress and challenges

In 2013, the CGIAR Research Program on Water, Land and Ecosystems (WLE) made significant advances in adjusting its science and research for development approach and in directing the program towards its strategic objectives.

A key component of the harmonization was clearly articulating WLE's added-value within the wider set of CGIAR research programs through a stronger thematic and regional integration across its 11 partners. This exercise will culminate in the 2015-16 WLE extension plan where WLE promotes a more cohesive approach to sustainable agricultural intensification, in which the overall health of ecosystems is the entry point for sustainable natural resource management, human well-being and resilient food systems. The WLE approach adds value to the set of CGIAR Research Programs by working across scales, taking a landscape perspective and exploring land and water development scenarios which address possible negative trade-offs for ecosystem services. WLE provides evidence-based solutions and investment scenarios to different clients such as governments, development banks, private sector and regional bodies. The development of the WLE impact pathway took advantage of the successful completion of the CGIAR Challenge Program on Water and Food (CPWF) to build on its regional partnerships, trust and structures.

To ensure a stronger thematic and regional focus, WLE initiated a strategic planning meeting of all partners, regional and thematic leaders in December 2013 in Amman, and regional planning meetings in the four priority regions. The progress was documented in 2013 through a number of success stories; the approved WLE gender strategy; a proposed monitoring, evaluation and learning strategy; a communication and knowledge management strategy; a draft ecosystem and resilience framework; and a draft partnership strategy.

A major structural investment was the adoption of a focal regional approach, where increasing fund allocations in initially four regions (West Africa, East Africa, Greater Mekong and Ganges) will complement WLE's global mandate with a high level of thematic integration along clearly defined impact pathways. WLE further initiated an Innovation Fund to inspire and energize innovative research and uptake processes, which are aligned with the program's strategic goals and outcomes including those of WLE's gender strategy. Additional funds from the Consortium Office were only made available in December thus limiting the operationalization of the Focal Regions in 2013.

A.2 Significant Achievements

A significant achievement in 2013 has been around the articulation of the paradigm shift in development and management of natural resources that will be required to realize the sustainability goal for agricultural intensification.

WLE's framework for the agriculture-ecosystems-people relationship cuts across the WLE Strategic Research Portfolios (SRPs) and emerging regional initiatives with a strong focus on agricultural landscapes, the direct benefits that people obtain from the services provided by ecosystems and a balance between the natural and built environment. A [draft framework](#) was developed and presented at the Ecosystems Partnership Meeting in August 2013 that forms the foundation for how the ecosystems based approach will be applied across themes and regions.

The framework opened the door for WLE to partner with important global players working on the eco-agri-food system, like the U.N. Environment Program (UNEP)-hosted global initiative on The Economics of Ecosystems & Biodiversity (TEEB) and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). A memorandum of understanding was signed with The Nature Conservancy (TNC) to collaborate with the Natural Capital Project (Stanford University, TNC, World Wildlife Fund (WWF), and the University of Minnesota) on the application of ecosystem service mapping and modeling tools, like InVEST (Integrated Valuation of Environmental Services and Tradeoffs), to assess changes in the value of ecosystem services under different agricultural development scenarios and bring this perspective into the mainstream of decision-making on water resources and agriculture planning. In collaboration with the Stockholm Resilience Center, resilience measures for Socio-Ecological Production Landscapes (SEPLs) were established to guide the development of agricultural investment scenarios in WLE's focal region work. This work is being

complemented by WLE's framework for decision making under uncertainty, which explicitly quantifies uncertainties and risks associated with intervention investments.

Finally, WLE's emphasis on agriculture-ecosystem linkages were demonstrated in 2013 in several benchmark publications with a variety of key partners, namely the "[Management of Water and Agro-ecosystems for Food Security](#)" with UNEP (CABI, 2013) and "[Wetland Management and Sustainable Livelihoods in Africa](#)" (Routledge, 2013). Through this, WLE has established a clear thematic research focus around the tight but fragile connection between natural resources management and strong ecosystems services. The Steering Committee and Management Committee have captured this new approach in a [paper written in 2013](#) and to be prominently disseminated in 2014.

A second noteworthy achievement was the reorientation of the program in designing focal regions. Here the Steering Committee set out a vision to pilot an integrated approach to achieving the paradigm shift. The WLE focal region approach seeks to identify incentives to improve how ecosystems are considered in large-scale investments and national and regional policies and how evidence based research can best support this. An example of this approach is the newly established WLE Mekong Focal Region program that builds upon the successful engagement of CPWF around the issue of sustainable hydropower in the region. With more than 150 dams in various stages of development, hydropower in the Mekong is taking place at a unique scale and is a primary driver of change to the water resource of the region with potentially significant impacts across the water-food-energy nexus as well as ecosystem services. Building on evidence-based research, WLE (involving CPWF, the International Water Management Institute, the International Food Policy Research Institute and WorldFish) cooperated with more than 60 local partners to maximize the benefits from hydropower including for agricultural productivity, while mitigating potential negative impacts. One output was the first comprehensive and interactive open-access [online map that details the location](#) and sphere of influence of all planned, under-construction, and operating dams in the Mekong region. The map provides a sound basis for considering the opportunities from hydropower development beyond energy generation and provides a focus for wider regional stakeholders to understand the scale of dam building and add their own information. The media has used the [map extensively](#).

Hydropower development is a highly contested space and improvements in planning and implementation require a change in perception from the developers and financiers. Based on initial [participation in a project](#) comparing compensation and resettlement policies and ground reality, Sinohydro Power, one of the most influential private sector representatives in the region, has expressed interest to further cooperate with WLE including trial testing the International Hydropower Sustainability Assessment Protocol. Likewise, another dam developer, Mega First, which is constructing the politically sensitive Don Sahong Dam, has expressed interest in collaborating with WLE on the company's fish monitoring work. A third firm, Theun Hinboun Power Co. (THPC), supported testing of a [WLE recommended integrated rice-fish system as part of a compensation scheme](#) and is now evaluating whether to scale this up to other relocated areas. These very encouraging partnerships and developments were possible through the trust that WLE's regional work can build on, symbolized by seven MOUs between CPWF and various governmental agencies and a constructive, objective and neutral collaboration with the hydropower sector.

A.3 Financial summary

	2013 Activity plan (USD 000's)			2013 Actual expenditures (USD 000's)		
	W1 & W2	W3 and bilateral	Total	W1 & W2	W3 and bilateral	Total
Total	28,220	31,692	59,912	23,776	34,688	58,461

Table A: Summary of WLE expenditures against budget in 2013. *Note:* The WLE financial report shows actual expenditures against the budget USD 28.2 million agreed in December 2013, whereas throughout the year, WLE was operating on a much lower forecasted W1 and W2 budget (see text below)

WLE's original plan of activities for the year was based on a W1 and W2 budget of USD 25.37 million. The mid-year CGIAR financing plan forecast a reduction in funding for WLE with a W1 and W2 budget of USD 21.85 million, which was increased to USD 22.92 million in August, 21% less than the 2012 budget of \$29,06 million. Partners reduced work plans and budgets accordingly, with some centers, notably IWMI, agreeing to use reserves to cover the shortfall. In late December 2013, the Consortium

Board agreed that an additional USD 12 million (as an adjustment to the 2013 fund allocation) would be allocated to WLE to cover this shortfall, which may be used to fund activities in 2014.

W1 and W2 expenditures in 2013 were USD 23.77 million. W3, bilateral and other expenditures were USD 34.69 million, almost USD 3 million above the original budget. The Gender budget target was set at 10% of all expenditures in 2013; although confident that this target is likely to have been reached, financial reports received from partners show total gender expenditures of USD 14.68 million, or 25% of the total program expenditure. Clarifications are being sought from some partners on the basis for these figures, and this may consequently reduce.

B. Impact Pathway and Intermediate Development Outcomes (IDOs)

The WLE intermediate development outcomes (IDOs) underwent a review in early 2013 and are now guiding the program. [These comprise](#) the following;

IDO	WLE IDO
Productivity	Improved land, water and energy productivity in rainfed and irrigated agroecosystems.
Income	Increased and more equitable income from agricultural and natural resource management, and ecosystem services in rural and peri-urban areas.
Gender & Equity	Increased decision making power over, and benefits from, agriculture and natural resources for women and marginalized groups.
Adaptation/ Resilience	Increased ability of low-income communities to adapt to environmental and economic variability, demographic shifts, shocks and long-term changes.
Environment	Increased resilience of communities through enhanced ecosystem services in agricultural landscapes.

The [WLE Theory of Change](#) and [Gender Theory of Change](#) can be found at the embedded links.

Impact pathways were developed in June for major research areas. The pathways are indicative of the output and outcomes that WLE is aiming for. Some of the main outputs include: assessment and recommendations, returns on investments, tools and models. The outcomes that WLE seeks include: national and regional policy and legislative changes, changes in investment patterns and guidelines and tools used in decision-making – all leading to livelihood improvements.

C. Progress along the Impact Pathway

WLE comprised 130 major research-for-development activities in 2013, each led by a WLE partner. The program's 'Essential Program Activities' (EPA) budget also supported small grants for innovation, communication activities and initiatives to further embed gender and ecosystem services into WLE. The indicators presented in Annex 1, Table 1 are compiled from data provided by partners responsible for implementing WLE's 130 research activities.

C.1 Progress towards outputs

WLE delivered an impressive range of outputs in 2013, reflecting its focus on improving livelihoods while protecting ecosystems. The program produced 235 papers in 2013, 76 of which appeared in ISI registered journals. It supported the establishment of 50 open access databases and 51 tools across its partner institutions. Noteworthy outputs include:

a) Benchmark publications and assessments

In support of a new thinking on the fundamental linkages between water, land and ecosystems, a number of key outputs were published with support of WLE in 2013:

- A [state-of-the-art review was launched](#) on the 'Management of Water and Agro-ecosystems for Food Security', in collaboration with UNEP and CABI, with contributions from Bioversity, FAO and IWMI.

- Different WLE partners contributed to the Routledge publication on [“Wetland management and sustainable livelihoods in Africa”](#). The authors argue for a shift in the way African wetlands are considered. Current policies and wetland management are too frequently underpinned by a perspective that views agriculture simply as a threat and disregards its important contribution to livelihoods, in particular via wetland agriculture and fisheries.
- In a joint effort by the Ramsar Convention, FAO and IWMI, [“Wetlands and Agriculture: Partners for Growth”](#) was published, highlighting key opportunities for linking wetlands management with sustainable agriculture.

In 2013, WLE published two inter-linked publications on groundwater. WLE published 15 ISI papers on [groundwater availability and use in sub-Saharan Africa](#). The papers were accompanied by an [open-access text book](#)¹ and form the most comprehensive overview on groundwater in Africa in recent years. Although an estimated 100 million rural people throughout sub-Saharan Africa are serviced by groundwater for domestic supplies, livestock rearing and crop production, the low state of knowledge is a significant barrier to sustainable groundwater development. The analysis covers two of the WLE focal regions, providing a baseline for groundwater use in these regions.

An assessment of water-related challenges with recommendations for improved water and land management was produced as part of a study in the [dry zone of Myanmar](#). The study represented collaboration between WLE and the CGIAR Research Program on Aquatic Agricultural Systems (AAS). International Fund for Agricultural Development (IFAD), Oxfam, and the Livelihoods and Food Security Trust Fund (LIFT) are using the work to inform their dry zone investments in Myanmar.

b) Databases and tools

In 2013, the open source and online decision support tool [Targeting Agricultural Water Management Interventions \(TAGMI\)](#) was launched to improve investment efficiencies in the Volta and Limpopo river basins of Africa. TAGMI is based on a Bayesian network model that incorporates social and biophysical factors with a GIS interface. The tool is the culmination of three years of work led by the Stockholm Environment Institute, as part of the work carried out by the CPWF. TAGMI will help non-technical users determine which parts of the two river basins have the highest chance of success for particular water management interventions, such as conservation technologies, small-scale irrigation equipment and small reservoirs. The Volta Basin Authority and Southern African Development Community (SADC) have endorsed the tool, and WaterAid, IFAD and FAO have expressed interest to test it further. TAGMI also will be featured in future work carried out in the WLE focal regions.

Land use change maps were produced based on high-resolution satellite images and other data products for the Upper Tana Basin in Kenya, as part of a partnership between the International Center for Tropical Agriculture (CIAT) and TNC. The project focuses [on ecosystem-based approaches](#) to mitigate sedimentation and erosion in the predominantly rural upstream watersheds, while also providing an adequate quantity and quality of water for downstream users. The maps show how land use contributes to degradation and will aid in recommendations on how to control destructive quarry chains. It is anticipated that the Kenyan government and UNEP will use the data in land management decision-making processes.

A [flood risk mapping and analysis tool](#) was developed in collaboration with the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) to determine flood risk areas in South Asia. The tool is being expanded to Southeast Asia as part of WLE’s Underground Taming of Floods for Irrigation (UTFI) research – the concept that aims to capture catastrophic floods by recharging shallow aquifers – for use for small-scale groundwater irrigation in subsequent years.

The Flood Mapping tool also proved relevant for disaster response. In July 2013, heavy monsoon rains arrived early in the northern India state of Uttarakhand causing severe flooding. [Researchers contributed to the relief coordination](#) efforts through the preparation of flood inundation maps. Researchers captured and mapped the impacts of the floods using satellite images and supplied the maps to the Indian National Disaster Management Authority as well as to the United Nations Office for Outer Space Affairs (UNOOSA) for wider dissemination.

In Sudan, [a service was established 2013](#) whereby information on extent and duration of flooding is being delivered to pilot farmers through easy-to-understand SMS text messages. More than 130

¹ Planned for 2012 but only published mid 2013.

farmers in the Gash Irrigation Scheme participated and benefited using Smart-ICT platform and online portal called Fieldlook. Irrigation authorities, water users associations and agriculture extension agents were able to find out if farmer fields were inundated and their performance in crop productivity. Based on the outcomes, managers of the Gezira Irrigation Scheme in Sudan, are now interested in scaling up the results.

The [Water Information System for Sri Lanka](#) was developed in 2013 and officially launched by President Mahinda Rajapaksa in January 2014. The GIS-based tool is available free online and is the first of its kind for helping scientists and policymakers in Sri Lanka to accurately monitor the dynamics of the country's water resources. It also provides a secure platform for cooperation among all the agencies involved in water management to share their data.

WLE scientists developed a [probabilistic decision analysis tool](#) (Global Intervention Decision Model) for a risk-return analysis piloted across WLE's portfolio in collaboration with [Hubbard Decision Research](#). The tool supports future decisions and provides guidance for what should be tracked in a metrics database. The analyses have had some significant impacts on recommendations for interventions. For example, the method was used to model a planned project in northern Kenya to pipe water into the Wajir County capital. The latter model engaged various stakeholders in the model building in an effort to lead to a more equitable project design. The WLE experience with decision analysis has been incorporated into Doug Hubbard's third edition of the book "How to Measure Anything: Finding the Value of Intangibles in Business".

c) Uptake and outreach

Addressing the eminent challenges of water quality for food production and the environment, WLE supported via IWMI a joint initiative with UNEP, FAO, WHO and the UNU to build capacities on risks and risk mitigation in support of safe wastewater reuse. The program reached out to 70 countries across all WLE focal regions and resulted in [5 regional workshops with 160 nominees from various sector ministries](#).


As CPWF is ending, an analysis was carried out of a number of its engagement platforms as they are a critical element of the research for development pathway. The analysis was presented by WLE in collaboration with the CGIAR Research Program on Humid Tropics, and discussed during the [Africa Agricultural Science Week 2013](#). The [analysis presents](#) key lessons from successful engagement platforms in CPWF's three African basins: the Volta, Nile and Limpopo. Many of these stories were included in a [series of practice briefs](#) produced by CPWF and the Humid Tropics Research Program.

The WLE [Agriculture and Ecosystems Blog](#) has been one of the major communication outputs to engage scientists in debate and raise awareness about ecosystem based agricultural perspectives. The blog was established as a critical space to stimulate discussion on agriculture, poverty and environmental sustainability among development professionals, leaders and practitioners. In 2013, the blog had more than 100,000 views. The blog has gained a reputation for looking at topics in a novel way and sparking debate among readers. It has contributed to improved engagement with new partners and clients, and changed the attitudes of many researchers about the benefits of blogging.

C.2 Progress towards the achievement of research outcomes and IDOs

IDO 1: Improved Land, Water and Energy Productivity

[A WLE pilot project](#) in the Mekong River basin has spurred hydropower companies and district officials to consider new options to improve the livelihoods of relocated communities in and around reservoirs in Laos and Vietnam. In each area, researchers spent time to gain the trust and cooperation of local officials and dam operators. In the Theun-Hinboun area of Laos, rice-fish farming systems were identified as a potential option for livelihood diversification from rice monoculture based on a detailed feasibility study conducted by the researchers. Theun Hinboun Power Company (THPC) supported the pilot financially and based on the results of the pilot, THPC is currently evaluating whether to promote an integrated rice-fish system in wet season rice farming areas of the THPC relocation sites. In the draw-down area of Yali Dam in Vietnam, researchers, in close collaboration with the Department of Agriculture and Rural Development (DARD), conducted a pilot project in 2012 and 2013 that tested other promising varieties of cassavas. Farmers reported their incomes almost doubled due to higher selling prices and higher yields, while input costs remained roughly the same.



Due to the pilot's success, DARD and Yali Hydropower Co. have entered into an agreement to expand dam draw-down agriculture to other areas. Yali Hydropower also has agreed to provide local communities with a reservoir water level calendar and to compensate for labor and seedlings in the case of crop damage caused by the hydropower company.

In poor countries, increasing urbanization is placing greater pressure on already strained water and land resources. Rural-urban food flows result in the degradation of farmlands, while waste accumulates in urban centers and leads to severe sanitation problems. The 'Business opportunities for resource recovery and reuse' study screened more than 150 resource recovery and reuse (RRR) success stories across Asia, Africa and Latin America for the most interesting business cases, and eventually assessed 60 of these cases comprehensively. Based on this analysis, about 20 promising business models for the safe reuse of nutrients, energy and water were developed. The [feasibility of implementing these models](#) at scale is currently being studied in 10 locations across the globe (Kampala, Hanoi, Bangalore, Lima, Accra, Kumasi, Tamale, Dhaka, Colombo and Hyderabad) and will result in production of investment briefs. So far, donors have pledged USD 4 million to test RRR business models, including a public-private partnership model to turn fecal sludge into fertilizer pellets that started in Accra in 2013. The product is in the process of been trademarked as *Fortifer*, and underwent field tests in northern and southern Ghana. The trials showed that cabbage and maize yields were as high with *Fortifer* as with the use of an inorganic fertilizer.

IDO 2: Income


In Zimbabwe, WLE scientists, through the CPWF Limpopo Basin Development Challenge, have demonstrated the value of investing in [mixed crop-livestock systems in dryland areas](#) to increase household incomes. The researchers, led by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), used an innovation platform approach to bring farmers, the government and traders together. The platform in Gwanda has helped to create a strong local market for goats, which led to an increase in the value of one goat from USD 10 to USD 60. This has proved to be an enormous incentive for farmers to invest in their goats by growing their own stock feed, complementing it with (purchased) commercial feed and improving their rangeland management techniques, which have significant positive environmental impacts. The results are of great interest to the Zimbabwe National Water Authority, as it examines new ways to targeting food security.

IDO 3: Gender and Equity

In order for women to benefit from agriculture and natural resource management, there is a need for them to be involved in decision-making processes. In India, [an IFPRI-led activity assesses](#) how communities can better manage scarce groundwater and surface water resources. The work is taking place in both Colombia and India. Work will be scaled up through NGOs in both countries. The study explores the use of experimental games in helping communities understand, visualize and quantify the gains from collective action in groundwater and surface water management. Experimental games were held with communities (women's and men's groups separately) to simulate crop choices, resulting water use, and changes in overall resource availability. Preliminary findings indicate that women were at least as likely as men to over-extract groundwater resources; funding has been raised to further explore gender issues. NGO staff in India were trained on how to run the experimental games, and work with communities to better manage water collectively. The Indian NGO, Foundation for Ecological Security, has since explored expanding this tool to other issues, such as forests and rangelands, in Andhra Pradesh where it works with more than 5,000 villages. In Colombia, Engineers without Borders will be able to use the results of the study to determine whether they need to tailor their outreach strategies for men and women.

IDO 4: Adaptation/Resilience

WLE has been instrumental in influencing wetland management policies globally, through its research and involvement in the Ramsar Convention on Wetlands, the only global environmental treaty that deals with specific ecosystems. WLE scientists in particular have contributed to the discourse on conservation versus sustainable use of natural resources and influenced thinking about the "wise-use" of wetlands. Since 2008, IWMI has contributed to 10 Ramsar resolutions, which provide a framework for the convention's 168 signatory countries to manage wetlands wisely. In 2013 specifically, WLE researchers worked with FAO to influence thinking in advance of World Wetlands Day (February 2014) by producing a series of publications on wetlands and agriculture: "[Wetlands and People](#)" and "[Wetlands and Agriculture: Partners for Growth](#)". An IWMI/WLE researcher currently is coordinating



the Ramsar working group on wetlands and poverty alleviation, while another is leading the working group on wetlands and agriculture.

IDO 5: Environment

[WLE has worked in six sites of the floodplains of Bangladesh and India to strengthen community-based organizations](#) (CBOs), by building leadership skills, ensuring access and benefits to the poor, and increasing fish production. Pilot farmers in turn are successfully demonstrating new crops and practices, which are being adopted by other farmers. Seasonal floodplains in Bangladesh provide a diverse range of livelihood and ecosystem services, and require broad-based consultation to identify solutions for sustainable use. They are also an essential source of food for some of the poorest in the region. The seasonal floodplains are under private, public/private and public ownerships. CBOs lease an area from a land authority for three years, and pay rent to private ditch owners within the floodplains (fish are plentiful in the ditches at times). During the wet months, CBOs stock fingerlings by setting up fences in water inlets. This allows un-stocked small fish from surrounding areas free movement for breeding. Both the production of stocked fish and un-stocked small fish have increased as a result, providing benefits to fishermen, poor landless people and consumers. The floodplains under the fish culture project also make it easier to grow rice with less water and fertilizer, which is a topic that is similarly being studied in the Tonle Sap floodplains of the Mekong.

C.3 Progress towards Impact

Two examples are presented below of how WLE intends to move toward impact using an integrated multi-level approach. This focuses on influencing major investment decisions at different levels while still providing innovative research.

Further achievements were made in Peru based on work carried out in the [The Cañete River Basin](#). CIAT and CPWF have worked since 2005 to better understand how benefit-sharing mechanisms can be seen as an institutional innovation to improve water resources management and livelihoods in the Andes region. In a region with wealth inequities, the goal is to improve the distribution of economic benefits through a system of valuing the ecosystem services provided and sharing the benefits. It is also hoped that the program will help avert potential water-related conflicts. The Cañete River Basin, important for its water flow and biological diversity, was designated by the Ministry of Environment (Ministerio del Ambiente [MINAM]) of Peru as a pilot project to guide the development of PES and benefit-sharing mechanisms. Two significant achievements were made in 2013. First, IFAD agreed to contribute start-up capital for an ecosystem services program in the Cañete River Basin, which will allow for the benefit-sharing mechanism to be fully implemented. Second, draft legislation to catalyze such schemes was approved by a congressional committee, and is expected to be voted on by the full Congress in Peru this year. If passed, it will recognize the role of a benefit-sharing mechanism as a central element of PES schemes and the program could be replicated in as many as 53 basins along the Peruvian coast.

WLE has incorporated much of the work of the multi-partner [AgWater Solutions Project](#) which has continued to be influential in helping to generate funding for programs that will benefit smallholder farmers in Africa. For example, the project influenced the USAID-funded 'Feed the Future Innovation Lab for Small-scale Irrigation' project (2013-2018, USD 12 million), and the USAID/Swedish International Development Cooperation Agency (Sida)-funded 'Securing Water for Food: A Grand Challenge for Development' project (USD 25 million). The 'Feed the Future' component is led by the Norman Borlaug Institute for International Agriculture at Texas A&M University along with IWMI, IFPRI, International Livestock Research Institute (ILRI) and North Carolina A&T State University. The project focuses on small-scale irrigation expansion in Ethiopia, Ghana and Tanzania. Building on the progress reported last year, the AgWater Solutions Project resulted in several African countries considering an increase in budgets or policy changes to boost smallholder farming. Recently, Nigeria decided to fund a project that will, in part, replicate components of the AgWater Solutions Project. IWMI has also been working closely with the Ethiopian Agricultural Transformation Agency to encourage the adoption of water-lifting devices for irrigation in four regions of the country.

D. Gender research achievements

Gender-specific research gained ground in 2013 with each of the SRPs focusing resources on a gender-specific research project. WLE developed a comprehensive gender strategy, which focuses on bringing issues related to power, equity, and roles of men and women in decision-making to the forefront. The strategy recognizes that decisions are influenced by cultural values and norms and tests the hypothesis that gender equity is a pre-requisite to achieve ecosystem-based sustainable intensification. Thus, gender is seen as a critical means to improve management of natural resources, rather than an end unto itself.

Reflecting its commitment, WLE is setting aside at least 10% of its budget for gender-related work, including innovative gender research, and initial reports show that this is likely to have been exceeded in 2013. Gender audits are being undertaken to benchmark and assess the activities already being carried out within the SRPs. This is a challenging task due to the limited information available, but a framework is emerging that will enable WLE to identify gender research areas, interventions and data.

WLE's gender analysis in 2013 found that four of nine of its "flagship" research products have explicit targets for women farmers. Three of nine flagship products, 20 percent of the tools and one of the technologies were assessed for likely gender implications (see indicators of progress). The analysis found that WLE is making good progress in doing gender analysis, so research users can make decisions that improve the livelihoods of women as well as men. WLE will be providing further support to partners in 2014 to better monitor and evaluate gender-related targets.

WLE's gender component also looks at specific research gaps within the water, land and ecosystems dialogue. Knowledge generated on gender will improve WLE interventions at the policy, programming and community implementation levels.

WLE held 'A Community of Practice on Gender and Water' in Sri Lanka in November 2013 to increase the gender research capacity within IWMI and WLE partners. The workshop was also used to pool and share resources, discuss indicators for gender equity in WLE, and initiate a cohesive portfolio of gender research. A conference to discuss the status of women's leadership skills in the water sector was held in early 2014 in Manila, Philippines in the lead up to a global conference to be held in South Africa later in the year.

An important aspect of the gender work is to ensure that it is leading and supporting work that demonstrates how to foster approaches and data that implement WLE's mandate. For example:

- WLE gender funds were used to introduce more fuel-efficient cooking stoves, in efforts to reduce women's fuel collection time, and combat land degradation and climate change. Gender funds also examined the innovative use of [gender-related data in hydrological modeling](#) (Soil and Water Assessment Tool, or SWAT model, that quantifies the impacts of land management practices in large, complex watersheds) to improve watershed management in Gondar.
- [CPWF and Australian Aid supported Oxfam's 'Balancing the Scales'](#) project that produced a Gender Impact Assessment Manual, which provides an analysis of the laws and regulations that protect women's rights in the Mekong, and makes recommendations for strengthening assessment tools to consider women's rights and gender.
- A study of 121 integrated landscape initiatives in Latin America highlighted the need to include gender and youth in the visioning and planning stages of project management. As part of the review, WLE asked program managers to identify priorities that brought multi-stakeholder groups together to work on integrated natural resource management. Responses indicated that women and youth were typically not included in project design, and only became integrated at the project execution stage.

E. Partnership building achievements

WLE recognizes the critical role partners play in achieving its vision of sustainable and equitable agricultural intensification. WLE outcomes and theory of change depend on an effective partnership strategy. More than 340 partner organizations have been identified in the 2014 WLE workplan, amongst which government institutions and authorities, which are key partners for any policy-related impact pathway, are well represented. For example, WLE has a close relationship with key ministries in India and was asked to assist in drafting the irrigation component for the latest Twelfth Five Year Plan (2012-2017) and is influencing the next five-year plan.

Another major partner of WLE is FAO. A meeting was held in March to develop a more collaborative plan of work. Almost all WLE research themes work with FAO, and FAO national and regional offices will be used to help engage and influence decision-makers at the these levels.

Interactions/partnerships related to CGIAR Research Programs

In Bangladesh, WLE, through CPWF, brought together three CGIAR Research Programs (Global Rice Science Partnership -- GRISP, WLE and AAS) to work jointly to reduce poverty and strengthen livelihood resilience, through improved water governance and management in coastal areas of the Ganges River Basin. As the CPWF winds down in Bangladesh in 2014, further mechanisms are being explored to twine initiatives between AAS, GRISP and WLE. This partnership also led to a scoping study being conducted for the Lower Irrawaddy Delta in Myanmar, with a view to developing a cross-CGIAR Research Program R4D project.

WLE works closely with CCAFS; the two programs have collaborated in a number of areas. For examples in regards to water resources variability, WLE focuses on existing variability, while CCAFS explores climate induced variability. This was highlighted in a [jointly sponsored webinar](#) on improving food security and livelihoods at a time of increased climate variability. CCAFS and WLE also organized a [joint workshop on how to use Theories of change and impact pathways](#) for improving how communication and knowledge management can be used to support outcome based research.

Government partnerships

The successful [ICRISAT-led Bhoochetana rainfed agricultural productivity project in Karnataka](#), India, has led to a close partnership with the state government in southwest India. Karnataka officials requested that ICRISAT form a consortium of CGIAR centers to implement the scheme in four ecologically-different districts covering 320,000 hectares of land. The goal is to increase productivity and income from selected crops in the four target locations by 25% and 20%, respectively, over four years. The first phase of the Bhoochetana project has already benefited 4.2 million farmers.

Public-private partnerships

As mentioned in Section A, WLE is working closely with hydropower companies in the Mekong. Besides this, WLE has other private sector partnerships. ICRISAT and IWMI received support from the Tata group, Coca-Cola India Foundation, JSW Foundation, Jain Irrigation Systems Limited and SABMiller to enhance resource-use efficiency and incomes in dryland areas. SABMiller is investing in natural capital accounting, which recognizes the important role of both ecosystem services and resilience in the sustainability of a value chain in a landscape. IWMI is facilitating public-private partnerships, e.g., to adopt business models to turn fecal sludge into fertilizer pellets in Accra, and [working with Nestlé on coffee production in Vietnam](#).

Global strategic alliances

WLE's strategic alliances are vital in order to transform opinions and investments, and to ensure that innovations developed by WLE are adopted at scale. Most notably, WLE has engaged with the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), and attends and contributes to all IPBES stakeholder consultations. WLE has nominated experts to the task forces and expert groups, and has developed and delivered various ecosystem models, tools and methodological assessments. WLE also fostered close relationships with global leaders in ecosystems services, including the Natural Capital Project, King's College London (Co\$ting Nature) and Conservation International (ARtificial Intelligence for Ecosystem Services [ARIES]). In regards to safe use of water, WLE has partnered with United Nations University for capacity building across all four of its focal regions, and with the World Health Organization (WHO), FAO and UNEP to contribute research into international databases and United Nations publications.

F. Capacity building

WLE currently conducts capacity building, mostly on an individual project basis. In 2013, WLE facilitated short-term capacity building programs for almost 5,900 male and 2,250 female trainees, and long-term programs for 144 men and 51 women trainees. At least 22 multi-stakeholder R4D innovation platforms have been established.

In 2014, WLE will conduct an assessment of the role of capacity building to reach outcomes. The discussion will include whether capacity building needs to be re-oriented with a more formalized, strategic approach linking to impact pathways.

Capacity building highlights for 2013 included the following:


- In Africa, [WLE supports the coordination of IMAWESA](#) (Improved Management of Agricultural Water in Eastern and Southern Africa), a program to improve community-level management of water resources. The 'Learning Alliance' project, which ran from 2011 to 2013, worked with, in particular, water users' associations (WUAs) in-field training workshops in Ethiopia, Tanzania and Swaziland. In the evaluation of IMAWESA in 2013, there was evidence that participants were applying new practices introduced through the Learning Alliance. For example, local changes were made in procedures for building feeder roads, following actions taken by WUAs that were part of the Learning Alliance in Ethiopia. More women were participating in WUAs in pilot areas in Ethiopia following the Learning Alliance activities.
- WLE is supporting a soil management capacity building platform under AfSIS, in partnership with the Earth Institute of Columbia University. Globally, 717 (171 female) scientists and technicians received training in land/soil health surveillance field or laboratory techniques, so that they can use these techniques in their own work.
- Forty-five professionals from Latin America were trained on the management of soils databases and/or generation of digital soil maps. Efforts will continue in 2014 with the kickoff of phase III of the Latin-American Soil Information System (Sistema de Información de Suelos de Latinoamérica [SISLAC]) project, funded by FAO through the Global Soil Partnership.
- More than 700 stakeholders, including government officials and students, were engaged in a variety of capacity building activities related to WLE's work on safe wastewater and excreta use. More than a third of those who participated were women. A particular initiative was started with UNU, UNEP, WHO and FAO to train 160 representatives from 70 countries in safe wastewater use.

G. Risk Management

In 2013, a major risk faced by WLE was funding uncertainty. The funding freeze in 2012 disrupted activities and the subsequent cuts in allocation of funds to WLE in 2013, although reversed at the end of 2013, led to significant delays in planning work in the focal regions. This posed a specific risk to WLE compromising its ability to capitalize on the momentum gained from 10 years of CPWF research, and partners potentially losing confidence in WLE's ability to build upon the CPWF research results. The program has attempted to address this through a concerted effort to capitalize not only on CPWF research results, but to build upon its well-placed basin-level engagement platforms and partnerships.

WLE programmatic coherence is a continuing risk that the program has taken measures to mitigate. The WLE 2013 portfolio was mainly based on 'heritage activities'. Although each of these is a strong research project in its own right, some do not clearly contribute to the WLE framework. WLE has addressed the potential risk through a series of initiatives to improve alignment to programmatic goals. For example, [WLE has improved communication with Science Focal Points](#) in participating centers, and is focusing on managing results through critical feedback on annual plans and progress reports. Science Focal Points were more regularly consulted on program activities, and WLE held its first Science Focal Point meeting in December 2013, so that they could engage with SRP leaders and better understand the higher goals of WLE. As a result of this, heritage projects are starting to be replaced by new initiatives. In addition, the Innovation Fund and focal region activities that will start in 2014 have been specifically designed to meet the defined outcomes of the program. Both initiatives will ensure that proposals are directly linked to WLE IDOs.

A major challenge faced by WLE is the resistance in many developing (and even developed) countries surrounding concepts such as sustainable intensification and placing ecosystem



considerations centrally in decision-making. WLE has addressed this by providing evidence-based research and translating this into practical interventions that are seen as relevant by governments and others. WLE has managed this issue in a number of ways. First, its Steering Committee comprises a wide range of eminent science and development thinkers who ensure that the program is receiving input from different perspectives. WLE has also initiated a consultative process to develop its focal regions to ensure programmatic relevance at the basin level.

A final challenge identified concerns WLE's monitoring and evaluation systems. After an initial unsuccessful recruitment process in February 2013, a Monitoring, Evaluation and Learning Coordinator was selected for the program in August 2013 but will only be able to start work in mid-2014 due to personal constraints. WLE has tackled this challenge by developing a draft Monitoring and Evaluation strategy, elements of which are already underway, namely the development of a Results Based Management system, the set-up of an appropriate Monitoring Information System (MIS) and preparations for external evaluations to be held in 2014. Within the reporting and planning process, the indicators comprising Table 1 are part of WLE's annual planning framework within which partners are asked to set targets that are then assessed during reporting at the end of each year.

H. Lessons Learned

While precise background details are available for indicators related to publications, deliverables and other materials, as well as outreach initiatives such as stakeholder meetings and platforms (as noted in the section, *Progress towards outputs*), estimating and measuring data related to outcome- and impact-themed indicators has been difficult, e.g., those related to agroecosystems and their populations. Indicators for policy analysis and outcomes on the ground have been reported in detail by some partners, but have gone unreported from others; it is likely that WLE has had a higher impact in these areas than the data currently available show. WLE needs to define certain targets and indicators better to ensure that partners have the same interpretation; indicator 8 'users of databases', for example, could be measured by individuals registered to a system, or by the number of downloads, which produce different figures in terms of scale. It would be useful to reconsider what the program is trying to measure through the agroecosystem and population-related targets and potentially reformulating these: Is WLE trying to estimate the entire population in agroecosystems or direct beneficiaries of the program? Once defined, WLE will need to develop clear guidance on what is required for measuring outcome- and impact-related targets, and build capacity within its partners in order to improve on reporting against indicators in the future.

Still in the early stages of the program, WLE's strength is at 'Stage 1' in terms of policy development, i.e., the analysis stage. There has been some progress into 'Stage 2' with five policies being presented to stakeholders. WLE still has work to do in ensuring women natural resource managers are targeted and gender disaggregated impacts are measured within activities – these aspects are not well represented in the 2013 set of indicators. WLE will need to find out whether this is not being adequately addressed or whether it is considered but not reported.

A major lesson learned has been how WLE articulates its transformative agenda. In 2012, WLE explored the use of 'development trajectories', but this did not sufficiently explain the ethos of the program or incorporate the innovative work on ecosystems services. In 2013, WLE began articulating a 'paradigm shift' for how it sees the role of ecosystem service-based approaches as a means to improve sustainable intensification of agriculture, improve livelihoods and influence large-scale investments. This paradigm shift has become a central tenet of the program. In order to operationalize this, WLE has initiated the focal regions and the Innovation Fund which will develop tools and approaches to embed ESS within the focal regions. The design of the focal regions will incorporate this from the start; the Innovation Fund will also concentrate on developing tools and approaches to support the integration of ESS. The next challenge is to communicate this approach in practical ways to policymakers and others, highlighting that it is an idea worth supporting.

Annex 1: WLE Indicators of Progress for 2013

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
KNOWLEDGE, TOOLS, DATA					
1. Number of flagship “products” produced by CRP		None	9	9 Flagship products 1. Suitability analysis of underground solutions in terms of mitigation of flood risks (UTF) 2. Draft ecosystem and resilience framework; 3. Catalogues of promising RRR business cases and models for nutrient, water and energy (to be published in 2014); 4. Water Accounting (WA+) framework that summarizes water resources conditions and management at the basin level (draft website & two journal papers); 5. Probabilistic Intervention Decision Modeling Platform 6. Global Information and Knowledge Facility for Agrobiodiversity Conservation and Usage 7. Targeting AGwater Management Interventions (TAGMI) - decision support tool 8. CPWF engagement platforms/innovation platforms 9. WLE Gender Strategy	
2. % of flagship products produced that have explicit target of women farmers/NRM managers		None	15%	44% (4 from 9) • Global Information and Knowledge Facility for Agrobiodiversity Conservation and Usage • Targeting AGwater Management Interventions (TAGMI) - decision support tool • CPWF engagement platforms/innovation platforms • WLE Gender Strategy	

² 2014 targets have not been included here. These are being finalized within WLE’s current exercise of refining annual activity plans.

³ Based on lessons learned in measuring indicators in 2013; WLE is reviewing guidance provided to partners. This will include the setting of targets for 2014, which will be provided at a later date.

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
3. % of flagship products produced that have been assessed for likely gender-disaggregated impact		None	15%	33% (3 from 9) <ul style="list-style-type: none"> Socially-explicit integrated solutions to increase eco-efficiency of production systems and enhance ecosystem services and livelihoods; Probabilistic Intervention Decision Modeling Platform; WLE Gender strategy 	
4. Number of "tools" produced by CRP	N/A	41	Not available	51 tools Examples include: <ul style="list-style-type: none"> Tools for designing crop varietal mixtures for pest and disease management; Tools and approaches for soil carbon determination; manual "Safety guidelines for grey and waste water use in Palestine"; calibrated SWAT model for use in arid environments (Jordan and Ethiopia); Booklet on community based approach for reuse of Grey-Water at the farm household and Video film on community based approach for reuse of Grey-Water at the farm household; Water Impact Calculator (WIC) for irrigation scheduling; Experimental games protocols to measure--and strengthen--collective action for water management (India and Colombia) 	
5. % of tools that have an explicit target of women farmers	N/A	Not available	Not available	35% of WLE tools had an explicit target of women farmers in 2013⁴.	
6. % of tools assessed for likely gender-disaggregated impact	N/A	15%	Not available	20% of WLE tools have involved gender disaggregated impact assessment in 2013⁵	

⁴ It is possible that this figure is an underestimate; WLE will be providing further support to partners in 2014 to better target, monitor and evaluate gender related targets

⁵ Idem

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
7. Number of open access databases maintained by CRP	N/A	None	Not available	50 databases Examples of databases maintained by WLE partners include: <ul style="list-style-type: none"> • Database on soil and nutrient losses via runoff in potato-pasture rotations (Colombia) • Global Weather Data for SWAT http://globalweather.tamu.edu/ • AfSIS spectral and reference library • Land health surveillance databases • Data from field experiments at micro-watersheds, water use efficiency, varietal performance and conservation agriculture • National databases on diversity and disease field measurements assessment; • 4 on farmer access to seed sources for traditional varieties • 2 community seed bank data sets (China and Uganda) • 4 on farmer diversity management practices • Water accounting portal TAGMI 	
8. Total number of users of these open access databases	N/A	Not available	Not available	105 users/ 12000 downloads confirmed ⁶	
9. Number of publications in ISI journals produced by CRP	N/A	158	Not available	76 ISI Journals reported and 235 peer reviewed publications	
10. Number of strategic value chains analyzed by CRP				Not applicable to WLE	

⁶ Some partners that have indicated that they are maintaining databases (indicator 7) have not been able to indicate the total number of users. For those that have, the interpretation of how to quantify users has varied from downloads to specific registered users; in the case of the latter, the number is low since at least one database is currently in a development stage, for wider involvement of users later. Further guidance would be needed to be able to seek more accurate data for this indicator.

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
11. Number of targeted agro-ecosystems analysed/characterised by CRP	N/A	3	3	96⁷ targeted agro-ecosystems. Examples include: <ul style="list-style-type: none"> • Floodplains/delta rice and fish of Southern Bangladesh and Mekong • Plains of West India (Bengal and Bihar) • Maize and bean systems Ecuador highlands; • Traditional rice diversity upland and lowland zones; • Traditional maize diversity upland and tropical maize; • Bolivia, mixed cropping dominated by potato in upland and subtropical areas. • Burkina Faso, mixed crop, livestock systems in sub-Saharan, sub-Saharan and Sahelian areas. • Nepal, mixed cropping dominated by rice in upland (2500 masl) and subtropical areas. • Uganda, mixed crop and livestock system in highlands, medium high farmlands and wooded savannah. • Mixed crop-livestock system: potato - pasture rotation (Colombia) in Tropics-cold • Forest and mixed cropping in the Amazon (Colombia and Peru). • Rangeland in marginal areas (Jordan). • Highland rainfed systems of Ethiopia • Guinea savannahs mix crop systems of maize/cowpea or maize/soybean, • DR Congo, Kenya, Tanzania and Nigeria; grain and legume cropping systems 	
12. Estimated population of above-mentioned agro-ecosystems	N/A	Not available	Not available	Not available at this stage⁸	

⁷ WLE has not received the full details of all agro-ecosystems therefore this figure cannot be verified; there may be some double-counting within the total of 96.

⁸ It is not possible to provide an estimated population of the above agro-ecosystems at this stage as some details are still missing from partner data provided to WLE. Even for those partners that have provided clear details of the agro-ecosystems to be characterized, interpretation of this indicator have varied from figures in the few thousands to a potential population of 1000 million. This indicator and indicators 21 and 24 which relate to the populations of agro-ecosystems will require further guidance from the CO.

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
CAPACITY ENHANCEMENT AND INNOVATION PLATFORMS					
13. Number of trainees in short-term programs facilitated by CRP (male)	N/A	2458	Not available	5,875 male trainees Examples of training topics include <ul style="list-style-type: none"> • Gender in WLE • Crop model validations, trade-off analysis model Salinity sampling and measurement, • GIS/GPs for data management; • Remote sensing in irrigated agriculture • How to run experimental games, • Debriefing communities on how they can manage water better collectively • Integrated farming techniques • Mekong Regional Forum on Water, Food and Energy (250) 	
14. Number of trainees in short-term programs facilitated by CRP (female)	N/A	1443	Not available	2,232 female trainees⁹	
15. Number of trainees in long-term programs facilitated by CRP (male)	N/A	183	Not available	Total long term male trainees in 2013: 144¹⁰ These were: <ol style="list-style-type: none"> 1. PhD – 10 2. Master's – 27 3. Other (includes Bachelors) – 107 	

⁹ It is likely that this figure is underestimated; some partners that provided data of training courses were unable to provide disaggregated information, creating a false impression that some courses were run without any female participants and reducing this overall program indicator.

¹⁰ WLE partners have been asked to consider a long term trainee only once; i.e. that the same individual should not reappear in a future annual report. WLE has not yet been able to verify this.

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
16. Number of trainees in long-term programs facilitated by CRP (female)		114	Not available	Total long term female trainees in 2013: 53 These were: <ol style="list-style-type: none"> 1. PhD – 3 2. Master's – 8 3. Other (includes Bachelors) - 42 	
17. Number of multi-stakeholder R4D innovation platforms established for the targeted agro-ecosystems by the CRPs		None	Not available	22 Stakeholder Platforms: These include: <ul style="list-style-type: none"> • Mekong platform on sustainable hydropower • Local innovation platforms on rainwater management in Nile Basin Development Challenge • Local innovation platforms on goat markets in Zimbabwe • Integrated Water Resource Platform in Ghana and Burkina Faso • Community seed banks (Uganda, China) • Legume and Inoculant Technology platforms • Field days; DR Congo radio broadcasts to showcase N2Africa legume technologies (estimated two million listeners). • Intervention decisions with sufficient representation from multiple stakeholders to fulfill the criteria (Sasumua, rainfed, Merti) 	
TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT					
18. Number of technologies/NRM practices under research in the CRP (Phase I)		10		140 technologies/ NRM practices under research in WLE Examples of these technologies and practices include: <ul style="list-style-type: none"> • Knowledge and practices, where intra-specific diversity is being used to manage pest and disease pressures, gives global trend that increased on-farm crop varietal diversity reduces variance in pest and disease damage – a measurement of reduced likelihood (reduced vulnerability) to crop loss from crop varietal diversity; • On-farm and on-station experiences identified high and medium resistance in traditional varieties of target crops; 	

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
				<ul style="list-style-type: none"> New guidelines developed for mixture experiments to better test whether increasing the level of diversity in a field, in a controlled selected repeatable way, with well chosen components, gives a benefit over monocultures, or treatments with less diversity crop varietal mixtures to manage pest and diseases; on farm plots; experimental station plots. raised bed, deficit irrigation, nitrogen management, salinity management, water harvesting in Jordan, graded contour bunds and diversification options in Ethiopia. Holistic assessment of the costs and benefits of technologies is a main component of all intervention decision models, with all models made in 2013 evaluating a particular practice. Optimizing the available natural resources; sustainable crop intensification in development; crop diversification with high value crops; safe wastewater use in agriculture. GAMES: sustainable groundwater management practices (India) and surface water management (Colombia) Underground Taming of Floods for Irrigation 	
19. % of technologies under research that have an explicit target of women farmers				6% (8 technologies) ¹¹	
20. % of technologies under research that have been assessed for likely gender-disaggregated impact				9% (12 technologies) ¹²	
21 Number of agro-ecosystems for which CRP has identified feasible approaches for improving ecosystem services and for establishing positive incentives for farmers to improve ecosystem functions as per the CRP's recommendations				49 agro-ecosystems ¹³ (See indicator 11 for examples)	

¹¹ It is possible that this figure is an underestimate; WLE will be providing further support to partners in 2014 to better target, monitor and evaluate gender related targets

¹² One partner noted 'This was evaluated in all cases, but the level of analysis was too coarse for all decisions'. It is possible that this figure is an underestimate; WLE will be providing further support to partners in 2014 to better target, monitor and evaluate gender related targets

¹³ WLE has not received the full details of all agro-ecosystems therefore this figure cannot be verified.

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
22. Number of people who will potentially benefit from plans, once finalised, for the scaling up of strategies				Aggregated figures from partners show a potential population of 19,192,766 that could benefit from the plans. This needs further review ¹⁴	
23. Number of technologies /NRM practices field tested (phase II)				70 technologies /NRM practices field tested¹⁵ Examples include: <ul style="list-style-type: none"> • Community seed banks, enhanced varietal mixtures; improved agronomic practices use crop varietal diversity. • Conservation agriculture in potato-pasture rotation/ Improved water and soil management in rice systems in Colombia • Model watersheds at 15 locations in India within different agro-ecological regions and rainfall zones; districts in Karnataka blue and Green water use efficiency; 	
24. Number of agro-ecosystems for which innovations (technologies, policies, practices, integrative approaches) and options for improvement at system level have been developed and are being field tested (Phase II)				52¹⁶ Agro ecosystems in which innovations are being tested Examples include <ul style="list-style-type: none"> • Conservation agriculture in potato-pasture rotation • Improved water and soil management in rice systems in Colombia • Water harvesting in the rangeland system and graded contour in the rainfed highland system • Watershed technologies have been developed to address various needs of different agro-ecological regions 	
25. % of above innovations/approaches/options that are targeted at decreasing inequality between men and women				55%	

¹⁴ Estimates range by project from 4000 to 70 million, with one sample project providing a range of 20,000 – 10,000,000 possible beneficiaries. With the development of the M&E strategy in 2014, WLE will propose a basis for beneficiary estimates.

¹⁵ WLE has not received full details of these technologies hence examples are provided

¹⁶ WLE has not received the full details of all agro-ecosystems therefore this figure cannot be verified

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
26. Number of published research outputs from CRP utilised in targeted agro-ecosystems				23	
27. Number of technologies/NRM practices released by public and private sector partners globally (phase III)				12 ¹⁷	
POLICIES IN VARIOUS STAGES OF DEVELOPMENT					
28. Numbers of Policies/ Regulations/ Administrative Procedures Analyzed (Stage 1)				112 policies analyzed Examples include: <ul style="list-style-type: none"> • Synthesis of water policy research on i) human rights and gender dimensions of AWM in South Africa and ii) Politics of IWRM in Africa • Analysis of irrigation Southern Africa Development Community policies and linkages with SADC MAAP and CAADP Pillar 1 processes • Review of Irrigation policies in Cambodia • Review of hydropower and land concession compensation mechanisms and relocation policies of Lao PDR (CPWF Mekong) • Analysis of how national and institutional policies and national laws (seed laws, subsidies, credits, crop insurance schemes, etc.) influence: 1) crop diversity available to farmers for cultivation; 2) farmers' choices on what to acquire and from whom; 3) exchange of knowledge and seed among actors (Bolivia, Burkina Faso, Nepal, Uganda, Uzbekistan). • Understanding of policy formulation, and implementation of policy, better understanding of policy processes and decision making of bureaucracies within Uzbekistan • Policy analysis undertaken in India of Underground Taming of Floods for Irrigation (UTFI) 	

¹⁷ Further details to be obtained; verification needed that technologies are not repeated in phases I to IV

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
				<ul style="list-style-type: none"> Policy analysis on Payments for Forest Environmental Services for Vietnam has been published in a peer-reviewed journal. ICRAF's Ecosystem Health program published 2 papers related China's environmental policy and India Hydropower policy 	
29. Number of policies / regulations / administrative procedures drafted and presented for public/stakeholder consultation (Stage 2)				5 policies presented, including: <ul style="list-style-type: none"> Ministry of Agriculture in Sri Lanka interested to amend their current national policy to strengthen urban farming based on work with IWMI and Western Province of Sri Lanka Consultations held to improve policy dialogue on national irrigation policy in SADC region and linkages to CAADP Upper Tana Landscape level work on soils has led to consultations and discussions in how local level policy making is being carried out in relation to decisions on land use and water management 	
30. Number of policies / regulations / administrative procedures presented for legislation(Stage 3)					
31. Number of policies / regulations / administrative procedures prepared passed/approved (Stage 4)				1 National Legislative Process influenced As a result of previous and on-going initiatives within the framework of WLE, MINAM (since 2011) has been actively leading conversations about how to develop laws which might catalyze the creation and management of Payment for Ecosystem Services (PES)-type schemes. As part of these discussions, MINAM has met with some of its key partners in PES-type scheme development to discuss a draft-version of such a proposed Eco-System Services (ESS) Law.	
32. Number of policies / regulations / administrative procedures passed for which implementation has begun (Stage 5)		1			

Indicator	Deviation narrative (if 10% from target)	2012	2013		2014 ²
		Actual	Target	Actual	Target ³
33. Number of hectares under improved technologies or management practices as a result of CRP research				15,471,050ha ¹⁸	
34. Number of farmers and others who have applied new technologies or management practices as a result of CRP research				35000 ¹⁹	

¹⁸ Location details not currently available

¹⁹ This is a minimum amount. Partners have not been able to associate precise figures to each location but do confirm that more farmers are adopting these technologies



RESEARCH
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CGIAR Research Program on Water, Land and Ecosystems

The **CGIAR Research Program on Water, Land and Ecosystems (WLE)** combines the resources of 11 CGIAR centers, the Food and Agriculture Organization of the United Nations (FAO) and numerous national, regional and international partners to provide an integrated approach to natural resource management research. WLE promotes a new approach to sustainable intensification in which a healthy functioning ecosystem is seen as a prerequisite to agricultural development, resilience of food systems and human well-being. This program is led by the International Water Management Institute (IWMI) and is supported by CGIAR, a global research partnership for a food secure future.

WLE Partners

