



## 2019 Plan of Work and Budget (POWB)

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



RESEARCH  
PROGRAM ON  
Water, Land and  
Ecosystems

LED BY:  
**IWMI**  
International  
Water Management  
Institute

IN PARTNERSHIP WITH:



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

Led by the [International Water Management Institute](#) (IWMI), WLE is a collaboration between CGIAR centers, the Food and Agriculture Organization of the United Nations (FAO), the RUAF foundation, and several national, regional and international partners. Through these partners, we provide evidence and solutions on natural resource management to influence key decision makers, including governments, international development organizations, and financiers. Leadership of the program's flagships is as follows:

**Flagship 1:** International Center for Tropical Agriculture (CIAT), World Agroforestry Centre (ICRAF)

**Flagship 2:** International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Water Management Institute

**Flagship 3:** International Water Management Institute, RUAF Foundation

**Flagship 4:** International Food Policy Research Institute (IFPRI), International Water Management Institute

**Flagship 5:** Bioversity International (Bioversity), WLE

International Center for Agricultural Research in the Dry Areas (ICARDA) is also an active member of the program

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## Acronyms

4p1000	4 per 1000 Climate Initiative
AFR100	African Forest Landscape Restoration Initiative
ALWM	Agricultural Land and Water Management
Bioversity	Bioversity International
BMGF	Bill and Melinda Gates Foundation
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CIAT	The International Center for Tropical Agriculture
ESA	WLE Flagship Program on Enhancing Sustainability across Agricultural Systems (FP5)
FAO	Food and Agriculture Organization of the United Nations
FinPlan	Finance Plan
FISH	CGIAR Research Program on Fish Agri-food Systems
FTA	CGIAR Research Program on Forests, Trees and Agroforestry
GDSDM	Global Soil Data Manager
GYI	Gender, Youth and Inclusion
ICARDA	International Center for Agricultural Research in the Dry Areas
ICRAF	World Agroforestry Centre
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	The International Food Policy Research Institute
IWMI	International Water Management Institute
LWS	WLE Flagship Program on Land and Water Solutions for Sustainable Intensification (FP2)
M&E	Monitoring and Evaluations
MAR	Managed Aquifer Recharge
MENA	Middle East and North Africa
MUFPP	Milan Urban Food Policy Pact
NRM	Natural Resource Management
OIBS	Online Irrigation Benchmarking Service
PIM	CGIAR Research Program on Policies, Institutions and Markets
RDL	WLE Flagship program on Restoring Degraded Landscapes (FP1)
RRR	Resource Reuse and Recovery Flagship 3 Research Theme
RUAF	RUAF Foundation (sustainable Urban Agriculture and Food Systems)
RUL	WLE Flagship program on Sustaining Rural Urban Linkages (FP3)
SAI	Sustainable Agricultural Intensification
SAMS	Strategic Asset Management System
SLM	Sustainable Land Management
ToC	Theory of Change
UN-SPIDER	United Nations Platform for Space-based Information for Disaster Management and Emergency Response
UNCCD COP14	14th Conference of the Parties to the UN Convention to Combat Desertification
UNFCCC COP	Conference of the Parties to the United Nations Framework Convention on Climate Change
VCR	WLE Flagship program on Managing Resource Variability, Risks and Competing Uses for Increased Resilience (FP4)

## 1. Adjustments/ Changes to Theories of Change (ToC)

Our program-level [theory of change](#) (ToC) is reassessed annually as part of a process of reflection and learning. This is to ensure that the ToC accurately reflects new information (e.g. new bilateral projects) and new understanding (e.g. of how WLE delivers outcomes and impacts). In 2019, WLE recognized a number of adjustments were necessary to reflect a clearer sense of WLE's role, in tackling the inter-sectoral and scale mismatches, identified in WLE's original ToC, that present as key threats to living within planetary boundaries. These adjustments include:

- A focus on three 'foundational' impact pathways: (1) transdisciplinary innovation; (2) policy influence; and, (3) brokering practices and technologies, and enhancing capacity to implement them.
- Central recognition that we work with complex systems, at different scales (local, landscape or national), in which our role must be to identify and harness positive feedback loops to create a virtuous cycle to amplify change (e.g. more effective linking of water management at the watershed scale with water management at the farm scale). Accordingly, WLE has modified its Monitoring and Evaluation (M&E) functions to be more complexity-aware and able to more quickly identify emerging outcomes.
- Ensuring that WLE interventions and approaches lie fundamentally at the intersection of equity and sustainability. Focusing on one or the other – or for that matter on agriculture, water and environment – without attention to both is risky.
- Recognition of WLE's role as both a producer of knowledge and as an 'innovation broker'. This change is rooted in the understanding that to deliver impact, WLE must ensure research questions are timely, appropriate and co-developed with the potential users.
- Developing and strengthening partnerships with development agents. Through experience, WLE recognizes that greater impact rests on working alongside partners through a flexible, tailored, collaborative approach that facilitates ownership of solutions.

WLE continued to improve Flagship milestones. The revisions ensure better alignment with the research portfolios, and better reflection of the annual steps towards outcomes. This remains work in progress as flagships move further towards an increasingly explicit outcome focus. Some changes through to 2021 targets are still required, and WLE will finalize this work in 2019. All changes are reflected in WLE's Flagships [results frameworks](#). Notable adjustments include:

- **FP1 - RDL (Restoring Degraded Landscapes):** strengthening science-based approaches for informing landscape restoration investments and the monitoring and evaluation of land restoration interventions.
- **FP2 - LWS (Land and Water Solutions for Sustainable Intensification):** using scientific evidence on agricultural land and water management through to policy and practice, and testing and validating tools for revitalizing medium and large-scale irrigation schemes in newly established irrigation schemes.
- **FP3 - RUL (Sustaining Rural Urban Linkages):** an alignment of targets, with new bilateral funding, to include an additional new application of resource reuse and recovery methods to refugee camps.
- **FP4 - VCR (Managing Resource Variability, Risks, and Competing Uses for Increased Resilience):** slight modifications to streamline outcomes to 4.1 'Uptake of solutions to enhance resilience to extreme water variability at different levels'; and 4.2 'Uptake of solutions and investment options better able to address trade-offs across competing water-energy-food needs'.
- **FP 5 - ESA (Enhancing Sustainability across Agricultural Systems):** streamlining and focusing on two outcomes: tools development and learning from practical application of the tools in 'live' landscapes.

## 2. Plans and Expected Progress towards Outcomes

**Flagship 1: Restoring Degraded Landscapes (CIAT, ICRAF, Bioversity, IFPRI)** finds solutions for restoring agricultural lands that have been mismanaged or overexploited, and measures that will reduce degradation. **2019 priorities include:**

*Pooling of science and evidence on land restoration from across Uzbekistan, Tanzania, Ghana, Kenya, Ethiopia, Colombia, Peru, and El Salvador to:*

- Develop a compendium of the most effective science-based decision support tools to help ensure best decision options for different contexts (e.g. Digital Soil Mapping with 'AGRI', a water harvesting tool, in El Salvador) and support scaling of good restoration practice by funders and managers of land restoration projects. These tools will be tested in Kenya, Ethiopia and El Salvador.
- Build cases for public and private investment in land restoration in three countries: Colombia, Peru and Kenya.
- Elements of these investment cases will be used to establish a pilot land restoration project in Makueni District, Kenya, as a 'live' proof of concept of new research for development techniques, targeting restoration of highly degraded agricultural landscapes, in collaboration with the CGIAR Research Program on Forest, Trees and Agroforestry (FTA) and the CGIAR Research Program on Policies, Institutions and Markets (PIM). The aim is to generate more effective public or private investment in integrated landscape management. Innovative governance approaches (collective action, trans-disciplinary) will demonstrate how such methods can better enable local decision-makers to articulate their research needs, and, foster co-development of more effective management methods.

*Responding to the growing demand for guidance on soil carbon management especially in the context of the African Forest Landscape Restoration Initiative, AFR100, restoration goals, by conducting:*

- Reviews and modelling studies including sustainable land management (SLM) interventions on soil carbon stocks under different environments and land management systems; an *ex-ante* modelling study on what management practices and organic matter input are needed in tropical environments to best sequester soil carbon, and not just slow down loss.
- Quantification of soil carbon sequestered during eight years of SLM in four watersheds to estimate the impact of AFR100 restoration goals on soil carbon in Kenya and Ethiopia.
- Building capacity through courses on *Soil Health and Soil Carbon – assessment tools, methods, and mapping* and the CIAT-SLU developed *Global Soil Data Manager (GDSM)*, both in Kenya. GDSM work will also map areas of carbon sequestration potential to guide interventions.

*Collating and making more accessible the best tools for more effective monitoring and evaluation of land restoration and risks:*

- Expanding collaboration across WLE, FTA and PIM on land health and land restoration progress assessment tools, to better support large national and regional restoration investments/programs in Africa and Asia.
- Ongoing engagement on soil spectroscopy tools and procedures for scaling these technologies through governments and the private sector. Scaling (for impact) trials will take place in two countries.
- Assessing the effectiveness of impact assessment approaches for land restoration through decision analysis and the development of Stochastic Impact Evaluation approaches. Work will continue on a reforestation project in Ethiopia started in 2018, and be further tested in new restoration projects in Uganda, (in partnership with FP5).



*Addressing gendered constraints and opportunities to the adoption of sustainable land management options, through:*

- Publication and dissemination of a framework that assists in identifying gender opportunities in soil health management (from results of a two-year study in Uganda).
- Establishing a review of the impacts of restoration initiatives on gender equality in Cameroon, Peru and the Philippines, with extension to projects in Western Kenya and Ethiopia.

**Flagship 2: Land and Water Solutions for Sustainable Intensification (IWMI, ICRISAT, IFPRI, ICARDA)**

provides research evidence on the processes and opportunities for adoption of sustainable agricultural land and water management (AWLM) solutions at scale. **2019 flagship priorities include:**

*Upscaling of farmer led agricultural water management initiatives by:*

- Expanding the WLE/ CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)/TATA Foundation-funded work on solar irrigation from India to Nepal, Pakistan and Bangladesh through a new leveraged SDC initiative (potentially up to \$8m). The solar suitability mapping tool will be developed into an online facility, in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ, Powering Agriculture), to enable better assessment of market and sustainability potential in Sub-Saharan Africa.
- The work on investment models for agricultural water management has helped lead to a Phase 2 of the Feed the Future Innovation Lab on Small Scale Irrigation, which will continue with upscaling of small-scale irrigation in Ethiopia and Ghana and learning from this effort. WLE will also investigate the potential of remote sensing to assess potential of small-scale irrigation and guide scaling efforts.
- Developing a strategy on enabling gender equitable opportunities when scaling water-lifting technologies for farmer-led irrigation in India, Ethiopia and Ghana, and linking this work, where relevant, to an ongoing review of gender and farm – small scale irrigation conducted as a collaboration of several LWS centers. The intention is to deliver robust evidence on what adjustments are required to ensure equity and sustainability in small-scale irrigation and link this to larger initiatives such as the African Development Bank Continental Initiative on Technologies for African Agricultural Transformation (TAAT).
- Two reviews which build through from 2018 will be published (i) the opportunities and challenges of securing intra-seasonal water supply through small reservoirs to help guide new climate resilience investments and, (ii) solutions to communal irrigation development.
- Completion and publication of the Randomized Control Trial of smallholder irrigation technology uptake in Northern Ghana and conducting a further connectivity and asset access study. In irrigated Nile delta systems, novel applications of remote sensing and capacity development will identify opportunities to improve water productivity.

*Building evidence on essential interlinkages between farm – landscape level water management to influence policy and practice, through:*

- A synthesis of evidence on soils and water management in agricultural landscapes, will be finalized with inputs from several centers, and published in a high impact journal, with the key aim being to use the evidence through 2020 for policy influence.
- Defining and producing guidance on the design and implementation of income generating interventions that can more equitably reach women and youth (focused on Parasindh watershed India), to deliver insights on how to achieve more gender equitable watershed management in India.
- Development of watershed rehabilitation training materials in Pakistan; piloting of a method, using remote sensing at landscape scale to evaluate water management in Ethiopia; and, bringing community-watershed planning perspectives to predominantly farm-level interventions within the Africa Rising Program in central Tanzania.

- Identifying indicators for tracking environmental and social objectives when out-scaling agricultural water management solutions
- A set of policy briefs on recommendations for improving water management using remote sensing in 10 countries of the Nile Basin.

*Testing of tools for the better social and environmental performance of medium to large sized irrigation schemes, by:*

- Testing (by invitation) in a 20 000 ha growth corridor development program in Ethiopia of two new tools developed by WLE/IWMI in 2017-18: Strategic Asset Management System (SAMS) and [Online Irrigation Benchmarking Service \(OIBS\)](#).
- Scaling of WLE/ICRISAT pilot (Australian Centre for International Agricultural Research (ACIAR)) work which integrates practical water and nutrient monitoring tools in communal irrigation schemes to 30 additional schemes in Matabeleland, leveraging new investment by Zimbabwe's Department of Irrigation, and delivering a Special Issue on small scale irrigation based on this work.

**Flagship 3: Sustaining Rural Urban Linkages (IWMI, ICRAF, CIAT, RUAF Foundation)** assesses the performance of urban and peri-urban agriculture within city region food systems, while identifying innovative ways to turn urban challenges into new strategies and business opportunities. **2019 priorities include:**

*Expansion of the application of resource reuse and recovery (RRR) methods/technology to East Africa and the Middle East and North Africa (MENA) region for water reuse and energy recovery, through:*

- A 3-year collaboration between IWMI, ICRAF and CIAT (linking FP1 and FP3) to investigate RRR methods for soil rehabilitation and energy generation for refugees and host communities. WLE's RRR training materials will be tailored for communities in six refugee camps in East Africa. Gender-sensitive approaches will be adopted given the key role of women in the household energy supply. Expansion of RRR work into MENA will apply RRR knowledge for safe wastewater reuse in Egypt, Jordan and Lebanon. With national and regional partners, WLE will develop a water reuse sourcebook, local reuse plans, national strategies for innovative water reuse approaches.
- WLE/IWMI will explore the option of joining the Bill and Melinda Gates Foundation (BMGF) advisory consortium for Fecal Sludge Management in South Asia. This has the potential to catalyze policy engagement and impact (O3.2). WLE/IWMI aims to work with FAO to update their normative guidelines on water quality and wastewater use in agriculture.

*Application of RRR business models into teaching materials, using:*

- The 2018 benchmark publication on RRR business models is being used to develop teaching curricula in six engineering/business schools, extending in 2019 to several other schools. In parallel, to identify uptake partners, WLE is surveying institutions with potential to bridge engineering and business teaching on the circular economy. WLE will also use the survey information in development of a ranking system for academic circular economy programs, with the intention of providing global guidance on program quality, and motivating institutions to improve their ranking and potentially adopt WLE's curricula extensions.

*Expanding engagement on city region food systems, with:*

- WLE partner, RUAF Foundation, will continue mainstreaming gender in the Milan Urban Food Policy Pact (MUFPP) indicator framework, and work with FAO to secure the adoption of the framework and these indicators in at least four cities (still to be defined) to inform urban authorities of opportunities to equitably enhance urban food security (in context of climate change). WLE will also undertake a study on CGIAR opportunities/comparative advantage for engaging in pro-poor Controlled Environment Agriculture (CEA) in low and middle-income countries, and business strategies for food waste reduction. WLE will support a new cross-CRP initiative (with CGIAR Program on Agriculture for Nutrition and Health (A4NH)) led by CIAT that will study carbon and



water footprints of rural-urban value chains based on a Life Cycle Assessment, planned for Hanoi and Cali.

**Flagship 4: Managing Resource Variability, Risks and Competing Uses for Increased Resilience (IWMI, IFPRI)** aims to reduce risks and losses that farming communities suffer from water-related disasters, and finding better ways of maximizing the opportunities that competing uses of land, energy and water can provide. **2019 priorities include:**

*Expanding work on integrated water risk management solutions, through:*

- Publication of guidance on how to ensure marginalized groups such as women benefit from flood insurance, including recommendations on reducing distributive and procedural inequities.
- Further development of advisory products to enhance responsive capacity linked to the South Asia Drought Monitoring System (e.g. AgRICE app monitoring crop health under flooding and drought).
- Engagement with South Asian disaster management agencies, which focus on pre and post-flood management response (e.g. provision of flood-tolerant seeds, rapid post-flood seed distribution), and emergency response mapping. Training on (water-related) disaster management in Sri Lanka, India and Myanmar in collaboration with Indian Council of Agricultural Research (ICAR) and the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER).
- Further identifying and promoting nature-based solutions to water resource management with new work on integrating ecosystem services in water resource planning in Nepal, integrating wetlands into urban planning (in Sri Lanka and possibly Lao PDR). WLE will work with the CGIAR Research Program on Fish Agri-Food Systems (FISH) to build on donor interest in traditional flood-based farming systems in Myanmar.
- Trials in Vietnam on Managed Aquifer Recharge (MAR) will continue to achieve better technical, social and economic understanding. WLE will conduct a new study in Gujarat to evaluate the multi-scalar impact of MAR on groundwater storage and agricultural productivity.

*Key Water-Energy-Food (WEF) assessments to build an understanding of how to manage trade-offs, include:*

- Assessing the potential of solar irrigation under climate change in Sub-Saharan Africa, building on an assessment of the role of irrigation in managing climate risks in West Africa, and modeling of energy supply and demand in East Africa.
- An assessment of energy and irrigation development plans with the Ethiopian Ministry of Water, Irrigation and Electricity; and, a previous assessment of energy-irrigation linkages in Asia for ADB has led to demands for similar work in India, to support joint energy-irrigation investment portfolios.
- Moving earlier results on water-energy-food solutions into implementation including renewable energy in the Philippines (supported by CCAFS, PIM and WLE) that triggered a (bilateral) request by the Government to assess the role of alternative emissions reductions on the economic growth prospects of five key sectors, particularly agriculture and forestry.
- The work on groundwater solutions will continue with a focus on improving governance, decision support tools for conjunctive transboundary water management in southern Africa, and promoting the agenda of sustainable groundwater management through networks and global dialogue with PIM and others.
- Deeper cooperation with FISH in the integration of fish within water management initiatives; linking fisheries-focused analyses with broader research on multiple uses of water and land at landscape and river basin scales.

**Flagship 5: Enhancing Sustainability across Agricultural Systems (ESA) (Bioversity, ICRAF, IWMI, IFPRI)** makes 'how-to' evidence more accessible, and develops user-friendly approaches and tools that better support development decisions and investments for more sustainable agricultural landscapes. **2019 priorities include:**

*Building evidence on what works for sustainable agricultural intensification, through:*

- The establishment of a Commission on Sustainable Agricultural Intensification (SAI), which will bring together research and evidence on from across the CGIAR, and externally. This initiative responds to the multiple expressed demands for evidence on what approaches, systems and technologies will help deliver more sustainable and healthy food from a low and middle-income country and farmer perspective.
- WLE will explore an additional cross-FP effort which could be to carry out an analysis of business models applicable to sustainable natural resource management (NRM), facilitated by the RUL FP3.

*Further development of the decision support framework:*

- Informed by a literature review, survey and interviews with actors from natural resource management programs, the framework will consist of a number of toolkits to help decision-makers and their advisers to access information and identify appropriate analytical approaches. It will bring together tools, methods and evidence developed by previous WLE projects, and from across other Flagships, especially FP 2, such as the work on upscaling of agricultural land and water management. Frameworks will include analytical tools and approaches to understand impacts on women, youth and other groups.
- Decision analysis approaches will be applied and developed in two countries (Ethiopia and Uganda) with an expectation to develop national capacity in the principles and methods of these approaches.
- WLE will conduct a review of NRM management tools from ongoing and previous WLE projects to explore which methods best fit particular purposes and how can they be incorporated into the decision support framework.

*Testing the framework with decision makers in live landscapes:*

- Bespoke frameworks and land management advice will be developed in two case-study landscapes (Uganda and Ethiopia), using action research approaches, iterative improvements to the framework, toolkits and knowledge brokering protocols. When possible, WLE will also engage in emerging NRM programs and ongoing bilateral projects. Through this tailored advice, WLE will develop evidence-based options for natural resource management in the case-study areas. The aim is to have a robust knowledge brokering approach, which WLE will further test in 2020 and develop training and capacity building tools.

**Table 2A: Planned Milestones**

FP	Mapped to sub-IDO	2021 Outcome	2019 Milestone	Relationship to proposal milestone	Means of verification	Cross-cutting markers (0=not targeted; 1=significant; 2=principal)				Risk to reaching milestone	For medium or high risk; main risk
						Gender	Youth	CapDev	Climate change		
1	#28: Increased resilience of agro-ecosystems and communities, especially those including smallholders	1.1: Better informed landscape restoration policies, approaches and interventions.	Decision support tools for targeting restoration interventions finalized and presented to key stakeholders to inform restoration plans or investments in at least two countries (e.g. Ethiopia, Kenya, El Salvador)	New	Decision support tools published online; Partner- and government documentation (e.g. workshop reports) on restoration plans.	1	0	1	1	Low	
1			Land restoration investment cases, built on scientific evidence generated from pilots implemented during 2016-2018, are finalized and shared with key public/private sector stakeholders in two countries (Kenya, Colombia, Peru)	Changed	Land restoration investment cases published; Three dissemination and validation meeting reports with stakeholders.	1	1	1	2	Low	
1			Empirical evidence on good practices for gender-equitable restoration consolidated and shared with restoration practitioners (in at least 12 projects, 3 countries)	New	Gender-equitable restoration analysis published online.	2	1	0	1	Low	

1	#31: Reduced net greenhouse gas emissions from agriculture, forests and other forms of land-use (Mitigation and adaptation achieved)	1.2 Policies, strategies and interventions investing in practices that rehabilitate or protect soil fertility and soil carbon	Strengthened capacity of national science institutions to monitor and verify soil carbon stocks and measure soil health in land restoration and management projects in two East African countries	Reworded	Reports on meetings with two national government stakeholders in Africa, to present farm level DSS for estimating and measuring soil carbon and fertility including evidence of potential uptake. Evidence of capacity improvements.	0	0	2	1	Low	
1			Mapping, quantification and technical analysis of soil carbon sequestration benefits from sustainable land management (SLM) in six watersheds in Ethiopia is completed and made available for policymakers at UNCCD CoP14 and UNFCCC COP	New	Soil carbon sequestration report is published online; Workshop report and/or evidence of UNFCCC response.	0	0	1	2	Low	
1			National level engagement with key stakeholders in Uganda around the results of a soil health, land management and gender analysis leading to an improved understanding of how to deliver more gender responsive land management policies and decisions	New	Published report on gender and soil health; Evidence of dissemination: blogs and info briefs on engagement activities; Evidence of Ugandan stakeholders' response to findings.	2	0	1	0	Low	
1	#40: Increased capacity of partner organizations, as evidenced by rate of investments in agricultural research.	1.3 Strengthen approaches to the monitoring and evaluation of land restoration and the assessment of land degradation risks.	M&E tools for land restoration scaled out in two countries in Africa	Changed	Business plans, training reports, online software	0	0	2	1	Low	
1			Decision Analysis Framework for Planning and Performance Measurement of Land Restoration is extended and used to improve land restoration investment decisions by governments and projects in at least three land restoration initiatives in two countries (Ethiopia and Kenya)	New	Decision analysis framework published online; Partner- and government documentation on restoration plans based on DA framework.	1	0	1	1	Low	

2	#2: Reduced smallholders production risk	2.1: Policy and practice informed by more effective agricultural land and water management solutions and investment options	Agriculture, land, water management (ALWM) investment options shared in 2018, are further refined with stakeholders during out scaling of these technologies in 2 countries (or states)	New	ALWM investment reports and publications; Remaining 'business models' Solar irrigation suitability maps (Ghana, Mali and others)	1	1	2	1	Low	
2			Evidence of what works for: AWLM, watersheds and marginalized groups, soil and water management, reservoirs, communal irrigation, translated into policy recommendations and practitioner guidance and shared with national stakeholders.	New	3 documents: outlining guidance and/or recommendations on watersheds and gender equity (ICRISAT), a special issue on restoring degraded landscapes and fragile food systems in tropical dryland systems published, reservoirs guidance.	2	2	1	1	Low	
2	#26: Agricultural systems diversified and intensified in ways that protect soils and water	2.2: Improved management of new and revitalized medium to large scale irrigation schemes	Consolidate transferring knowledge from tested WLE solutions on farm level tools and management into demonstration in irrigated systems in two countries	New	Workshop reports; Publications on irrigation service delivery; Investment project designs, Impact assessment.	1	1	2	1	Low	
2			Tools and institutional recommendations for improved irrigation scheme management disseminated through engagement in key platforms and partnerships with national policy makers and other stakeholders (1 African, 2 Asian countries)	Changed	Publicly available tools (SAMS, OIBS) and recommendations; Progress reports on possible outcomes (uptake), lessons, and convening sessions with stakeholders reported and promoted.	1	1	1	1	Low	

2			National policymakers, academics and key stakeholders gain accesses to improved evidence base on small-scale irrigation through the publication of a Special Issue of the International Journal of Water Resources Development	New	Published special issue of high impact journal.	1	1	2	1	Low	
3	#41: Conducive agricultural policy environment	3.1 Improved capacity of urban stakeholders to implement evidence-based policies and practices in support of urban food security and resilience.*	Field tested methodology and approaches to assess and increase climate resilience in three city region food systems	New	Records by cities of use of methodology, ICLEI and FAO. 3 CRFS reports.	1	0	1	2	Med	External environment (political, economic, legal, market)
3			Adoption of gender indicator recommendations into the Milan Urban Food Policy Pact (MUFPP) framework in four cities	New	Locally updated MUFPP Framework Indicators	2	1	1	1	Med	External environment (political, economic, legal, market)
3	#46: Increased capacity for innovation with partner development organizations and in poor and vulnerable communities.	3.2 Increased business capacities in nutrient, water and energy recovery from domestic and agro-industrial waste for intensified food crop production	Completion of analysis of gender dynamics in resource recovery and reuse and inclusive business models	New	Document highlighting issues and providing recommendations on how to address these	2	1	0	0	Low	
3			Six (plus) universities and business schools are using RRR teaching materials developed by WLE	New	Letters, syllabi, or equivalent evidence from universities to confirm use of RRR teaching materials.	1	0	2	0	Low	
3			Strengthened institutional capacity for RRR in the MENA region and refugee camps in East Africa based on new evidence-based training materials	New	Training materials published online; Project progress report; Capacity building workshop reports	1	0	2	2	Low	



4	#34: Enhanced capacity to deal with climatic risks and extremes (Mitigation and adaptation achieved)	4.1: Uptake of solutions to enhance resilience to extreme water variability at different levels *	Innovative approaches for mitigating flood and drought risk and exploiting potential flood benefits further tested in four countries (India, Vietnam, Myanmar and Sri Lanka) with associated recommendations and plans for upscaling developed	New	Project reports on continued field tests from 4 countries	1	0	1	2	Low	
4			WLE diagnostic and planning tools (particularly software) developed for flood and drought mitigation across Asia (Sri Lanka, Myanmar, Vietnam, India) are used and supported by national/state governments and UN-SPIDER	New	UN SPIDER and government announcement; Diagnostic and planning tools published online; References to tool	1	0	2	2	Low	
4			Guidance on what mechanisms enable disadvantaged groups to benefit from insurance vehicles delivered and disseminated to relevant government agencies, insurance companies and NGOs in India and Bangladesh	New	Document highlighting issues and providing recommendations on how to address equity issues in flood insurance	2	2	1	2	Low	
4	#25: More productive and equitable management of natural resources	4.2: Uptake of solutions and investment options better able to address tradeoffs across competing water-energy-food needs	Decision support tools that facilitate greater understanding of inter-sector trade-offs associated with different water management options developed and applied in at least one major basin in Africa and one in Asia	New	Reports/ Decision support tools published online	0	0	1	1	Low	
4			Cohort of technical staff in relevant national and regional governments, as well as local partners, have new/improved knowledge, skills and confidence to employ nature-based solutions for improved surface and groundwater management	New	Capacity building and workshop reports	0	0	2	1	Low	

4			Completion of analysis of Africa-wide potential and trade-offs for solar-irrigation assessed across water-energy-food dimensions	New	Scientific article submitted and presentations at professional conferences	0	0	0	2	Low	
5	#46: Increased capacity of innovation in partner development organizations and in poor vulnerable communities	5.1 Policymakers have improved access to evidence, tools and expert advice to design and manage agriculture and natural resource interventions sustainably *	Publication of two reports on knowledge brokering approaches and policy interventions for NRM at the landscape scale are used for co-learning dialogue with key research partners (e.g. Food and Land Use Coalition)	New	Reports outlining knowledge brokering published online	1	0	2	1	Low	
5			Decision support tools reviewed, assessed for their utility for different types of decision dilemma, and screened for inclusion in decision support frameworks	New	Database of tools published online	1	0	1	1	Med	Partnership - risk that partners won't deliver a key piece on time
5			Sustainable Agricultural Intensification Commission established to explore policy approaches to manage trade-offs in smallholder agricultural landscapes between environmental sustainability, healthy diets and livelihoods	New	Initial commission meetings held	1	1	1	1	Med	Financial - funding not fully confirmed/ risk of being cut
5	#28: Increased resilience of agro-ecosystems and communities especially those including smallholders	5.2 Natural and agricultural resource interventions are more cost-effective by minimizing negative trade-	Completion of large-scale survey targeting key policymakers (e.g., in NGOs, national governments, development banks, etc.) to identify gaps in capacity to use evidence, and to determine demand for decision support tools	Changed	Analysis report of survey results published online	1	1	1	1	Low	

5		offs that degrade landscapes*	Pilot landscapes established and co-developed with stakeholders in three countries.	New	Workshop reports for Uganda/ Ethiopia published online	1	1	1	1	Med	External environment (political, economic, legal, market)
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\*Outcomes have been reworded since POWB 2018 for clarity

**Table 2B: Planned Evaluations/Reviews, Impact Assessments and Learning Exercises**

CRP	FP	Status	Planned studies/learning exercises in the coming year	Geographic scope	Who is commissioning this study
WLE	3	Ongoing	Outcome Evaluation of Resource, Recovery and Reuse (RRR) work in Ghana and Sri Lanka	Ghana, Sri Lanka	WLE
WLE	1,2	New	Outcome Evaluation of WLE's work on restoring degraded landscapes in Ethiopia	Ethiopia	WLE
WLE	TBC	New	Outcome evaluation: two further topics to be confirmed	TBC	WLE
WLE	1	New	Assessment of the impact of Fadama package of intervention on resilience of participants versus non-participants under civil strife and conflict in northern Nigeria	northern Nigeria	World Bank
WLE	4	New	Pilot on index-based flood insurance in Indian state of Bihar, informs policy makers and development agencies for scaling	India	IWMI and WLE/CAFS

**Table 2C: Planned major new collaborations**

Collaborator	Brief Description of collaboration
<b>CGIAR Partners</b>	
Big Data	WLE FP1 (RDL): is using Big Data analytics approach to understand the drivers, determinants and source areas of water hyacinth in Lake Tana.
CCAFs	WLE FP1 (RDL): This year, the partnership with CCAFS will deliver a report on silvopastoral Nationally Appropriate Mitigation Actions role in climate change and land health in Latin America, as well as joint presentations at international events (e.g. UNFCCC CoP, 4 per 1000 initiative (4p1000)) on the potential of soils to contribute to climate change mitigation. We are seeking funding for a new WLE-CCAFs joint project on 'Piloting cost-effective methods for monitoring and evaluation of impacts of World Bank sustainable land management projects on soil carbon'.
FISH	WLE FP4 (VCR): will collaborate with FISH on the production of journal articles, policy brief, guidelines and associated awareness raising, for better incorporating fisheries within water resource management. This includes the development of joint concepts on the potential for incorporating fish production into community-managed small-scale irrigation infrastructure, and developing scalable lessons and management models that can feed into larger investments and policy.
FTA	WLE FP1 (RDL) joint WLE-FTA work will include a comparative study in Peru, Cameroon and Philippines on good practices for improving gender equality, social inclusion and livelihoods and ecological objectives through restoration. A draft special issue on gender and restoration will be produced through a WLE-FTA-PIM collaboration. WLE and FTA may begin work on joint development of an interactive web platform for mapping land degradation risks, and targeting and monitoring and monitoring land restoration interventions (to be confirmed).
GLDC	WLE FP2 (LWS) will conduct a study to collate global datasets from the drylands that allow an in-depth understanding of farm productivity and the opportunities to intervene with farm, community and policy level technologies/practices/advice. Studies from WLE supported work will feature in this data collection and WLE outcomes will help inform the potential interventions and approaches
PIM	WLE FP2 (LWS) will contribute to building the evidence base around shifting gender relations in watershed management in Nepal in the context of male outmigration, as joint grantees for the Feminization of Agriculture cross-CRP research funded by the CGIAR Collaborative Platform for Gender Research.
RTB	WLE FP5 (ESA): The Uganda case-study is being developed jointly with the CGIAR Research Program on Roots, Tubers and Bananas (RTB) cluster 5.2 on sustainable intensification of root, tuber and banana systems.

External partners	
Bill and Melinda Gates Foundation (BMGF)	WLE FP3 (RUL): IWMI is aiming to attain membership of the BMGF-led advisory consortium for Fecal Sludge Management in South Asia, which will serve municipalities in the sub-region, and would allow knowledge application for impact. FP1 (RDL) is working with BMGF on the development of two large new initiatives: Innovative Solutions for Decision Agriculture and Taking Agronomy to Scale.
Business and Engineering Schools	WLE FP3 (RUL) will work in 2019 with about 10 universities and schools to disseminate the RRR business models developed under WLE.
Catholic Relief Services (CRS) and Buffet Foundation	WLE FP1 (RDL): Under the CRS and Buffet Foundation's Agricultural Landscape Restoration Initiative program, CIAT is implementing water-smart agriculture programming at landscape scale in El Salvador to develop and demonstrate a model to revitalize smallholder rainfed agriculture and restore agricultural landscapes.
Climate Focus and Ministry of Environment, Peru	FP1 (RDL) has a new project (funded by BMU-ICI) on business models to address deforestation in Amazonian landscapes in Peru
FAO	WLE FP3 (RUL): will work with FAO in 2019 on i) a revised set of two normative FAO publications and (ii) a new set of cities using an adapted City region food systems (CRFS) methodology [to update the MUFPP Indicator Framework] for increased urban food resilience under climate change.
Federal Ministry of Economic Cooperation and Development (BMZ)	FP3 (RUL) with FP 1(RDL): IWMI, CIAT and ICRAF will begin work on a joint three-year project in support of soil rehabilitation through a) organic matter recovery, and b) energy recovery to reduce the pressure on firewood between refugees and host communities
Global Framework on Water Scarcity in Agriculture (WASAG) partnership	WLE FP2 (LWS): is leading two Working Groups in WASAG: one on water and nutrition with a planned paper commissioned by the UN System Standing Committee on Nutrition, and one on sustainable agricultural water use. Both working groups benefit from WLE insights and networks.
Makueni District Government	WLE FP1 (RDL): is developing a flagship restoration project in Makueni County, Kaiti Sub-county in Kenya, that will focus on different WLE components including sustainable intensification, water-use efficiency, migration, governance, gender and youth, and targeting and monitoring land restoration initiatives. This initiative also has linkages to FTA and PIM.

Punjab State Power Corporation Limited (PSPCL)	WLE FP4 (VCR): will advise the World Bank's Direct Benefit Transfer of Electricity (DBTE) to Agriculture program which is connected to PSPCL's 6 electricity feeders. This will reduce agricultural electricity consumption and water withdrawals.
Science for Nature and People Partnership (SNAPP) Working Group	WLE FP2 (LWS): is part of a collaborative research project, designed to assess the potential for green infrastructure to improve water flows with The Nature Conservancy, Conservation International, World Resources Institute, Stanford, UC Berkeley, Imperial College, and others.
Swedish University of Agricultural Sciences (SLU)	WLE FP2 (LWS): will build on its 2018 partnership with the Agriculture for Food Security Post 2105 (AGRIFOSE) program hosted by SLU on two synthesis reviews of 1. Small reservoirs in West Africa and 2. erosion in Ethiopia.
University of Cambridge	WLE FP 2 (LWS): TIGR <sup>2</sup> ESS (Transforming India's Green Revolution by Research and Empowerment for Sustainable food Supplies) is a major new GCRF initiative led by Cambridge and with the participation of several UK universities and Indian partners that looks at the sustainability of intensification in the parts of India where the initial green revolution technologies have not reached.
USAID - Gomal Zam Command Area Development (GZCAD)	WLE FP2 (LWS): works with GZCAD by developing natural resources and human capital to increase income and improve livelihoods through improve commercial agricultural practices. USAID is a significant development partner in this area of Pakistan.
USAID (Paramos & Forests Program)	WLE FP1 (RDL): CIAT will assist this program in designing and evaluating land use alternatives in Colombia that reduce greenhouse gas emissions from any high Andean ecosystems while improving water management in these ecosystems.
World Health Organization (WHO)	WLE FP3 (RUL): has been invited by WHO to take part in expert meetings to deepen our collaboration on the fight against vector borne diseases in Asia and Africa.



### 3. Financial Plan for the coming year, including use of W1/2

The 2019 CGIAR Finance Plan (FinPlan) indicates that the W1/W2 allocation to WLE is \$8.6m. Since this allocation depends on an increase in CGIAR funds in 2019, WLE will budget at 95% of the 2019 FinPlan allocation, \$8.2m. In 2018, WLE planned to spend \$7.6m. The final WLE allocation was \$8m, meaning that WLE will carry some funds into 2019. These funds will be deployed as follows:

- WLE's Sustainable Agricultural Intensification (SAI) Commission, under Flagship 5<sup>1</sup>, which will be supported by \$460k of carry-over from 2018, with a further \$250k from the 2019 budget. (WLE will also continue to invest some W1-W2 in Flagship 5, for the development of the decision support framework, including review of natural resources management tools and approaches, and the development and testing of bespoke frameworks and land management advice in case-study landscapes in Ethiopia and Uganda. Through action research with stakeholders, we will iteratively improve our framework, toolkits and knowledge brokering protocols).
- Additional funding arising from the additional allocation (under Strategic Research Fund in Table 3) of \$670k will be allocated by end of March 2019, based on strategic requirements of the program, process and projects to be approved by the WLE Independent Steering Committee and IWMI Board.

WLE will increase investment in MEL in 2019, building on initial outcome evaluations on resource reuse and recovery policy influence and land restoration in Ethiopia. Rather than have Gender, Youth and Inclusion (GYI) as stand-alone activities, our focus in 2019, will be to ensure that all Flagship goals and activities pay attention to the intertwine between ecological sustainability and equity. The GYI budget will support "out of the box", gender transformative initiatives / research with impact - across the flagships. Knowledge Management and Communications will focus on four strategic work streams (inclusivity, climate, synthesis and Ethiopia), including investments in reaching high impact media, bringing a human element to WLE success stories, and supporting researchers to reach their milestones. The program will continue with the website and materials refresh and improving the data portal, photo resources and capacity building.

In FP1, a new pilot project on land restoration has been designed in Makueni County, Kenya, pooling inputs across flagships and other CRPs. W1/2 funding will allow more effective delivery of bilateral projects towards achievement of outcomes, including support for targeting, monitoring and evaluation of land restoration interventions; advancing global networking and partnerships (Initiative 20x20, AFR100, Global Soil Partnership, 4p1000, United Nations Convention to Combat Desertification Science Policy Interface); soil health and soil carbon in Western Kenya; and, testing WLE's Decision Analysis Framework for Planning and Performance Measurement, jointly with FP5.

FP2 W1/W2 will be used to strengthen scientific evidence and build new knowledge built on its W1W2/bilateral portfolios; and to test tools and products that align scientific evidence for practitioners, policy makers and farmers; and outreach and engagement with key boundary partners. Investments in 2019 will include: review of farmer-led irrigation development opportunities; continued research on watersheds and gender; a synthesis in India on addressing sustainable intensification in watershed programs; and sustainable intensification assessment of ALWM scaling in Ethiopia: developing the evidence on potential impacts. The Flagship will develop communication materials on LWS outcomes in India and (watersheds; solar irrigation) and Zimbabwe (irrigation systems), and support collaboration initiatives on gender research across WLE.

In FP3, W1/2 funding will support outreach and networking with strategic partners on resource reuse and recovery (RRR) and co-funding of RRR advisory services in South Asia and East Africa. The FP will invest in

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<sup>1</sup> Noting that UK Department for International Development (DFID) W2 funds are not allocated to Flagship 5.

RRR publications summarizing results and lessons learnt across bilateral RUL projects as well as drafting RRR curricula, and the development of a decision support tool for the use of Fecal Sludge Management Business Models, based on past WLE research. WLE will also use its W1-2 to bring research to the ‘piloting and scaling’ cross-Flagship BMZ-supported project on supporting soil rehabilitation through organic matter and energy recovery in refugee communities in East Africa, to increase its potential impact.

FP 4 W1-2 funds will be strategically targeted to 1) upscaling of innovations in risk management (managed aquifer recharge and drought and flood risk management) and 2) the water-energy-food nexus (Sub-Saharan Africa wide solar irrigation potential assessment). Funds will gradually be phased out in areas such as the Ground Water Solutions Initiative for Policy and Practice, which is moving into a multi-partner implementation phase. Some W1/W2 funds will be used to strengthen collaboration with the FISH CRP.

**Table 3: Planned Budget**

*Figures in USD 000's*

	Known carry forward*	Planned budget				Comments on major changes
		W1/2	W3/ bilateral	Center fund	Total	
<b>FP1</b>		1,762	8,378	1,165	11,305	
<b>FP2</b>		1,580	8,206		9,786	
<b>FP3</b>		951	2,933		3,884	
<b>FP4</b>		1,395	1,916		3,311	Bilateral funding expected to increase later in the year
<b>FP5</b>	458	800	363		1,621	Includes the SAI Commission as well as decision support frameworks and piloting/ case studies. The Commission will also be supported by funds carried forward from 2018.
<b>WLE Strategic Research</b>	200	470			670	These funds will be allocated to research by the end of the first Quarter of 2019, based on strategic needs of the program. This funding will be reported on in the relevant Flagship(s) at the end of the year.
<b>Management &amp; Support</b>		1,242			1242	Management; Monitoring, Evaluation and Learning; and Communications, Engagement and Knowledge Management.
<b>Subtotal</b>		<b>8,200</b>			<b>31,819</b>	
<b>‘Stretch funding’</b>		400			400	These funds will not be allocated for use in 2019 unless there is an indication given by CGIAR that the FinPlan allocation is likely to be met. This is to avoid funding cuts to research
<b>CRP Total</b>		<b>8,600</b>	<b>21796</b>	<b>1,165</b>	<b>32,219</b>	

Notes:

- This budget includes confirmed bilateral, W3 and Center funding as of January 2018.
- Financial reporting for 2018 has not been completed. There is known carryover under the ‘strategic research’ and ‘additional funding’ lines, which has been included in the budget to provide additional support to the SAI Commission and to the fund for strategic research that will be agreed upon by end of March 2019.
- Gender-related funding is included in Flagship budgets
- As requested, we note that the bilateral contribution from WLE’s Core non-CGIAR partner, RUAF (FP3), will be \$180k in 2019.