

INDEPENDENT EVALUATION DIVISION
OFFICE OF EVALUATION AND INTERNAL OVERSIGHT

INDEPENDENT TERMINAL EVALUATION

GLOBAL

INTEGRATED SOLUTIONS FOR WATER, ENERGY AND LAND (ISWEL)

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Abbreviations and acronyms

Abbreviation	Meaning
AMFs	Assessment Modelling Frameworks
CCM	Climate change mitigation
CRS	Centre for Systems Solutions
ET	Evaluation Team
GEF	Global Environment Facility
GHE	Global Hotspot Explorer
GHG	Greenhouse Gases
ICIMOD	The International Centre for Integrated Mountain Development
IIASA	International Institute for Applied Systems Analysis
IPCC	Intergovernmental Panel on Climate Change
IRB	Indus River Basin
ISID	inclusive sustainable industrial development
ISWEL	Integrated Solutions for Water Energy and Land
IW	International Waters
M&E	Monitoring and Evaluation
PIR	Project Implementation Reports
PRF	Project Results Framework
PSC	Project Steering Committee
RCPs	Representative Concentration Pathways
SDG	Sustainable Development Goal
SIDS	Small Island Developing States
SMART	specific, measurable, attainable, reachable and timebound
SSPs	Shared Socioeconomic Pathways
TE	Terminal Evaluation
TER	Terminal Evaluation Report
TOC	Theory of change
UNIDO	United Nations Industrial Development Organisation
WEL	Water, energy and land
YSSP	Young Scientists Summer Program
ZAMCOM	Zambezi Watercourse Commission
ZRB	Zambezi River Basin

Glossary of evaluation-related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be assessed.
Effect	Intended or unintended change due directly or indirectly to an intervention.
Effectiveness	The extent to which the development objectives of an intervention were or are expected to be achieved.
Efficiency	A measure of how economically inputs (through activities) are converted into outputs.
Impact	Positive and negative, intended and non-intended, directly and indirectly, long term effects produced by a development intervention.
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention.
Intervention	An external action to assist a national effort to achieve specific development goals.
Lessons learned	Generalizations based on evaluation experiences that abstract from specific to broader circumstances.
Logframe or Project Results Framework (logical framework approach)	Management tool used to guide the planning, implementation and evaluation of an intervention. System based on MBO (management by objectives) also called RBM (results-based management) principles.
Outcomes	The achieved or likely effects of an intervention's outputs.
Outputs	The products in terms of physical and human capacities that result from an intervention
Relevance	The extent to which the objectives of an intervention are consistent with the requirements of the end-users, government and donor's policies.
Risks	Factors, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives.
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed.
Target groups	The specific individuals or organizations for whose benefit an intervention is undertaken.

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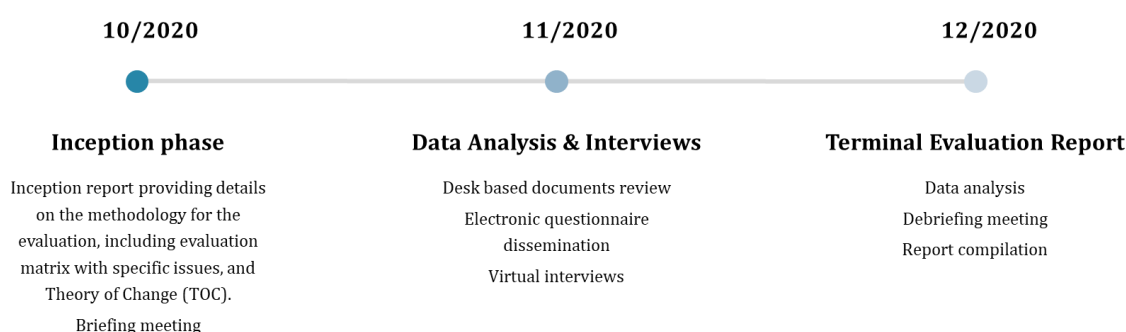
Executive Summary

Evaluation purpose and methodology

The overarching purpose of this Terminal Evaluation (TE) is to help UNIDO improve performance and results of ongoing and future programmes and projects. This evaluation pursues two main objectives:

- To evaluate the “Integrated Solutions for Water, Energy and Land” (ISWEL) project performance in terms of its relevance, effectiveness, sustainability and progress to impact, including the assessment of the Global Hotspots Explorer (GHE) and its added value; and
- To develop a series of findings, lessons learned and recommendations for follow-up activities.

The TE, carried out between October and December 2020, reviewed the ISWEL project design, implementation approach and project objectives and targets achievement at the regional and global levels. It covers the whole duration of the project (01/11/2016 - 31/12/2020) and provides recommendations for follow-up activities. The steps followed are:



The ISWEL Project Context

Water, energy and land (WEL) resources tend to be managed, studied, and assessed within sector-specific “silos”, including within research, government, and business institutions. However, there are many interactions amongst them: energy and water are used for irrigation in agricultural activities, water is used for hydropower generation, water is used for cooling in power plants, etc. and, in many cases, solutions designed for one sector may not yield benefits for the others, and thus understanding the relationships between WEL dimensions becomes relevant. This, combined with the future expected growing demands for the different resources, calls for the adoption of integrated nexus assessment approaches.

The project “Integrated Solutions for Water, Energy, and Land” is financed by the Global Environmental Facility, co-funded and executed by IIASA and implemented by UNIDO. The proposed project was designed to:

- Develop a systems analysis framework for assessing solutions to the water-energy-land nexus challenges;
- Identify regional nexus solutions in the context of global and regional developments;
- Build local capacities and knowledge management, comprising the foundation for a knowledge and capacity network on nexus decision support;

The project will establish a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food and ecosystem security in selected regions. Furthermore, this project will enable advancement of an integrated assessment of nexus challenges for the purpose of providing strategic advice to policy makers and developing agencies.

This framework was applied in both regional (transboundary) and global contexts to help stakeholders to better understand the:

- (1) Trade-offs and synergies among strategies to address nexus challenges;
- (2) Benefits of coordinated versus sector-specific approaches;
- (3) Solution portfolios that consider uncertainties in future socioeconomic, technological and climatic trends;
- (4) location and evolution of nexus hotspots under global change.

This approach will assess the benefits of coordinated action across sectors to help regional stakeholders to identify mutually beneficial strategies for concurrently meeting future energy, water and land resource needs while remaining within a “joint, just and safe operating space”.

Key Findings of the Evaluation

Project Design and Project Results Framework (PRF)

The project components, as formulated in the Project Document, are sound, appropriate and consistent with the stated project objective. The quantitative goals (targets as defined in the PRF) and main objective are well defined. The project was able to fulfil its scientific research goal with the production of not only one but three scientific models (one global, two regional) that are intended to aid stakeholders to better understand the interlinkages between the different WEL nexus dimensions and climate change, under the “integrated analysis” lens. The methodology that was envisaged at project design stage (i.e. interactive and participatory methods) to engage stakeholders from a variety of fields (researchers, governments, private sector, students, academia, etc.) in the different stages of project execution proved to be appropriate.

The funding, the institutional and the implementation arrangements are valid and relevant. The GEF-IIASA-UNIDO arrangement worked well and helped the project achieved the desired results.

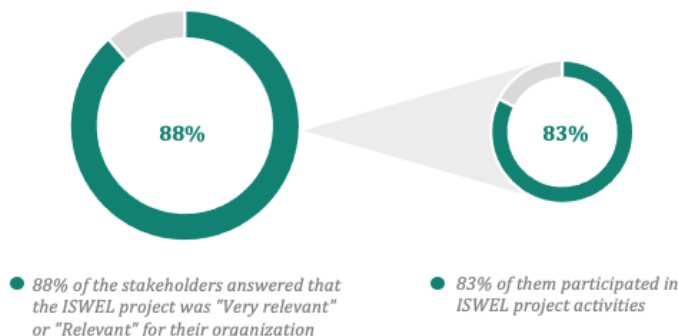
The project included Monitoring & Evaluation activities with an adequate budget. Risks were clearly identified, assessed and rated, with their associated mitigation measures, and are still adequate.

The PRF is overall appropriate. It has an adequate structure and the intervention logic clearly reflects the project objectives and activities. The expected outputs/deliverables are aligned with it and are considered realistic, although a bit ambitious, for the project timeframe. Specific, Measurable, Attainable, Reachable and Timebound (SMART) indicators are used, and associated assumptions identified. Nonetheless, gender-related indicators and targets were not included, and some other targets are unclear.

Project Performance

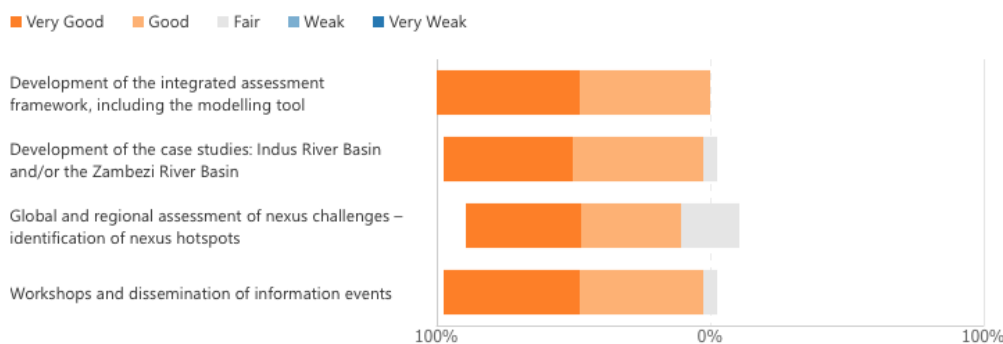
Relevance:

The ISWEL Project is highly relevant for the assessment of nexus issues and the achievement of SDGs at global, regional and local levels. It is a good technical proposal to start solving the issue of inadequate methods for nexus assessments. It is consistent with GEF focal areas / operational programme strategies of UNIDO’s mandate and action plan. The models developed are sophisticated online tools but remain user-friendly and have been made available as open source, to facilitate their adoption for immediate use by planners and researchers throughout the world.



Effectiveness:

Overall, the project was highly effective in the implementation of its activities. The ISWEL project not only delivered all of the expected outcomes and outputs, but even surpassed them, through the production of additional ones: the three regional policy tools: Nexus game, scenario tool, nexus strategic tool; at least 1 additional exercise on nexus strategic simulation game per basin; 3 modelling tools instead of 1 (one global, two regional); 2 policy briefs (basins); 3 videos describing stakeholders engagement activities; final webinar of the project, the participatory scenario



guidelines and the accompanying video and trained 7 postgraduate students.

Efficiency:

Project efficiency was very high. Activities/outputs were completed mostly on time, within budget and with good quality and scientific accuracy. The project even went beyond expectations in terms of the activities and outputs delivered. In fact, several additional activities and outputs were also completed within the project timeline and within the same budget. Project partners implemented all their activities as planned. The financial resources for the project were available as planned and on time for its execution. As to financing, all planned co-funding for the project was disbursed as planned and on time for execution.

Sustainability of benefits:

Sustainability actions have been integrated in project activities, such as creating open-source nexus models (global and regional), building capacity of stakeholders for their development and use, and on the “integrated thinking and approach” to tackle nexus issues; and implementing the Young Scientists Summer Program (YSSP).

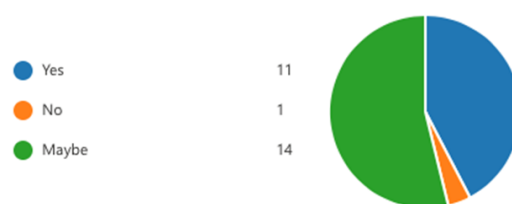
We find this project is unique and innovative: it is a scientific project that brings together and supports the analysis of strategies within different areas of action of both the donor and the implementing agency. It does so by providing an integrated thinking approach and tools that enable a holistic assessment across sectors and nexus dimensions to ultimately support the evaluation of strategies for achieving the SDGs. The donor will apply them to project portfolio development and implementation; IIASA moved to a more integrated way of working (technical groups are working collaboratively) and is devising its strategy going forward under this approach; several people in UNIDO demonstrated interest in applying the tools to support Programmes implementation; and other stakeholders stated that the project improved their knowledge and skills to tackle nexus issues.

Cross-cutting performance criteria

Gender mainstreaming:

Although no gender specific activities, indicators, targets or baseline were included at design stage, the topic was taken into consideration during implementation in: the Project Steering Committee and project team composition; the YSSP female participation selection processes; the monitoring of female participants in workshops, capacity building and trainings; and the topic was addressed in the open discussions to develop the Case Studies for each basin.

Do you think the ISWEL project has contributed or will contribute to gender?



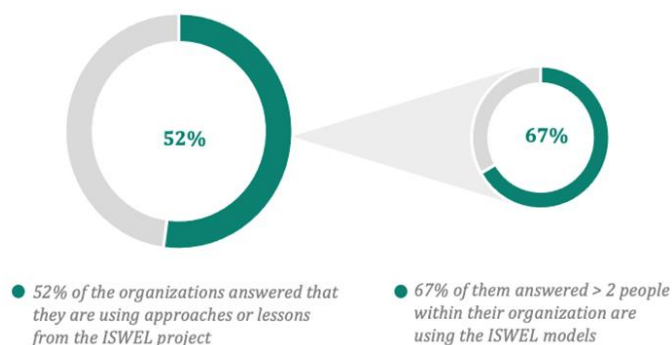
Progress to Impact

Behavioural change:

The project provided access to many global and regional tools that combined with the series of stakeholders’ engagement and knowledge exchange activities meant that the project contributed to mainstreaming nexus issues into the policy agenda. It has improved the coordination of national and transboundary nexus planning processes, even under different regional contexts. It also improved information and knowledge exchange by sharing experiences and reduced the gap between researchers and practitioners in the field. The project contributes to inclusive and sustainable industrial development in its 3 main areas: it is economically competitive, environmentally sound and socially inclusive.

Broader adoption:

The ISWEL project produced a series of tools that have been used across different sectors, for different purposes. The integrated thinking, development approach and tools were mainstreamed at different levels by the partners, beneficiaries and stakeholders. The integrated thinking approach and the tools developed by the project are versatile enough to be replicated in multiple river basins across the world, to manage and coordinate planning across regions on other nexus areas (from large regions integrating several river basins to small river basins) or even to assess the



implications and impact of a given intervention. The tools also facilitate the analysis of specific issues because the models can be easily tailored to analyse non-WEL issues.

Performance of Partners

The ISWEL project was very successful in the establishment of key partnerships to achieve its objectives at regional and national levels in the target basins, and to ensure that the ISWEL approach and tools continue to be used after the project finishes.

Conclusions and Recommendations

Conclusions:

C1. The ISWEL Project is an innovative “first of its kind” scientific research project that contributed to improving the global understanding of water, energy and land nexus interactions at different scales in addition to providing an interactive online tool (the GHE) and open source information to support that.

The project correctly addresses the identified challenge of the inadequate modelling tools for addressing WEL issues and identifying potential synergies and benefits of implementing integrated policies. The ISWEL project is a unique research project that provides an integrated thinking approach and a tool (GHE) that enables a holistic assessment across sectors and nexus dimensions to ultimately support the identification and evaluation of strategies for achieving the SDGs. The project achieved that at several levels: global, regional and national:

- At global level the project developed: a scientific integrated global assessment framework to explore and answer key questions regarding global nexus challenges and identify potential solutions to meet the SDGs; and developed the GHE where people can identify areas of confluence of nexus pressures.
- At regional level, the project:
 - Supported the riparian countries of the IRB and ZRB to develop scenarios and 2 case studies
 - Developed policy tools (nexus game, scenario tool and nexus strategic tool) that facilitated the stakeholders engagement process and activities. These innovative policy tools made: (i) the complex science behind the project easy to understand, promoted discussion, exchange of knowledge and information among stakeholders; (ii) built capacity; (iii) were a good way to define the different scenarios to be assessed by the regional models.
 - Fostered transboundary cooperation and collaboration to identify and address common issues in the basins. This is particularly evident in the Indus, since stakeholders highlighted the fact that this was “the first time they were able to sit together at the same table to discuss potential solutions to their challenges”.
 - Created greater understanding on what the models can do and how they can be used for policy making.

The scientific body of knowledge and information generated by the project has been acknowledged by the publications of more than a dozen high impact papers (classified as Q1) in scientific journals, by publications featured in the *IPCC Special Reports on Global Warming of 1.5°C* and *Climate Change and Land* as well as in media articles in *Nature* and the *New York Times*.

C2. Through the integrated assessment modelling framework and the successful stakeholders’ engagement activities implemented, the ISWEL project promoted and encouraged transboundary cooperation and curiosity for WEL topics, which is beneficial for sustaining its legacy and for a wider adoption of the framework.

The project increased the stakeholders’ ability to plan considering nexus dimensions in an integrated way, especially when applied to transboundary planning processes across regions. The stakeholders that participated in the workshops were able to exchange their views and opinions as well as nexus information and knowledge. This contributed to their ability to find solutions together for their common issues in a constructive environment led by the project.

In fact, the developed integrated framework is already being used to inform decision-making by project partners and stakeholders:

- Guides GEF investment strategies and portfolio development, in a more holistic and integrative way.
- IIASA changed the way they worked (teams' integration) and ISWEL was a catalyst for the implementation of IIASA's strategy going forward.
- UNIDO is already making use of the approach to support Programmes' implementation addressing nexus dimensions.
- Contributes to Countries' knowledge and skills to devise strategies for their sustainable basin development (the models are being used by Pakistan and India and the integrated thinking promoted by the project was used in the development of the Strategic Plan for the Zambezi Watercourse).
- The models were developed as open source integrated nexus tools (everyone can use them and contribute to their improvement), fostering adoption and interest at global scale.
- Most students that participated in the YSSP are working in the nexus field.
- Institutions that were engaged in using the model have continued to do so and have identified several basins & issues to apply it.
- IIASA has received several demonstrations of interest to use the model by a number of partners / stakeholders.

Nonetheless, now it needs to be replicated – upscaled so that integrated planning of nexus solutions is more widely adopted and applied at global scale. As expressed by interested stakeholders, financial support and resources are needed to extend the use of the framework and tools. This is particularly relevant when it comes to capacity building and training to upgrade both institutional and individual capacities to use the developed tools.

The ISWEL project is the first step in the journey to improved WEL nexus understanding for strategic policy planning and coordinated transboundary action and has demonstrated how nexus thinking can be mainstreamed into policy agenda, but more remains to be done:

- Expand the analysis (improve/add to the models and explore new contexts)
- Build capacity and ownership from the bottom-up.
- Continue to support the organizations from Indus and Zambezi in the use of tools by providing training and capacity development and through the development of case studies.
- Create knowledge hubs of institutions that have the capacity to use and improve the tools, and that can help with the capacity building and policy development support processes.

C3. The Project was very effective in establishing partnerships that were key to ensure project success. Also, the project demonstrated that partnerships should be carefully built with key organisations as they have strengths and weaknesses that should be taken into account for the needs of the project.

Management and implementation were very efficient and effective and key for driving this project towards achievement and go beyond its objectives. Cooperation between GEF-IIASA-UNIDO was highlighted several times as a great success for this project during the interviews. The involvement and commitment of the PSC from the start, was strategic to guide the project in the right direction and encourage IIASA to go beyond the expectations. Regional level partnerships with regional institutions were not the exception. Those were fundamental for the development of the case studies and support the development of the regional policy tools with real data and adapted to the regions. This is true for both for the Zambezi and the Indus regions. The partnership with ZAMCOM was crucial to secure an organised coordination of the events with the eight Riparian States. However, as ZAMCOM worked mainly with Government Institutions, which are non-research people, they were not able to contribute as much as the Indus region for the development of the model and, at the end of the project, although very keen, no government institution was able to use it (they would require more training). In the Indus basin, as there was no basin

organization, most of the work was carried out at national level with key stakeholders (e.g. LUMS in Pakistan, TERI in India), and a third party was involved – ICIMOD – to convene the Indus Riparian countries for the workshops. As the organizations involved at national level were mainly research institutions, they were able to contribute a lot for the development of the Indus model and at the end of the project the model was adopted and used for planning in both Pakistan and India. However, the identification and convening effort from the project team was higher than the one needed in the Zambezi basin (thanks to the presence of ZAMCOM) and did not involve as many higher government institutions as in the Zambezi one, but more research and sectoral ministry level ones.

Recommendations:

R1. The ISWEL project was the first step of the journey towards addressing the nexus issues and the SDGs in an integrated way and, although it has achieved a lot, there is still a need to continue “testing” the approach in another basins around the world and conducting research on its adaptability to the stakeholders needs. Therefore, a follow-up phase is recommended.

A new phase of the ISWEL project should consider the following:

(ii) Have a strong focus on building strategic partnerships, providing capacity building on WEL issues and training on the developed tools to facilitate ownership and knowledge transfer.

- a. Partnerships should be built at various levels: government level (top government agencies and ministries acting on the WEL field), universities/scientific & research institutions, practitioners acting on the field (including private sector), within the UN system through regional programmes and joint research (e.g. energy, agriculture, forestry areas). These partnerships will be crucial to answer to stakeholders needs, framework additions/improvements, its successful implementation, as well as to ensure that ownership is built from the bottom-up, and consequently, the sustainability of the action is ensured.
- b. Focused and targeted training is needed to ensure that the stakeholders interested in using the frameworks (for their own assessment) can do so, efficiently and effectively. This will ensure the uptake and use of the developed tools and its adoption in the future to come. The training should be tailored to the capacities of the target audience and should consider: (i) discussing about WEL issues and challenges and on the importance of using integrated approaches to address them; (ii) informing on the available tools that can be used to assess ways to address those challenges and support planning policy development/improvement.
- c. Create regional/local knowledge hubs with research/knowledge organisations that have the capacity to use and improve the tools and also build capacity and provide training as needed.

(iii) Continue to have a scientific/model development focus, to further improve the models by adding more functionalities such as:

- a. expand assessment parameters – expand the environmental/biodiversity aspect; include gender equality indicators and resilience aspects (including COVID-19) and modules to assess different crops and their impacts.
- b. include dashboards for analysis of different scenarios / scenarios pathways.
- c. include functionality to carry out monitoring of programmes/projects over time and at the same time calibrate the models with real-time data; etc.
- d. reducing model complexity and providing a good user experience.

(iv) Scale up the developed tools to other regions and continue to support their use in the Indus and Zambezi regions. This will be important to ensure continuity of the actions and its legacy sustainability and to mainstream the nexus issues into the policy agenda more widely on those specific regions.

(v) Implement investment projects and use the tools in their selection and start building the monitoring framework to track their impacts. This will show the potential of using the developed tool in the implementation of investment projects.

The follow up project should be executed as well by GEF, UNIDO and IIASA and these institutions already demonstrated interest in developing it. In the follow-up project, IIASA would lead the research/scientific components and UNIDO would focus on implementation supervision and partnership building through its network of existing international partners, as well as its field network of regional and country offices). Other partners that have demonstrated interest to cooperate in a follow up project are: International Water Management Institute (IWMI) that could be a good partner for introducing this work into other regions through its 13 offices across the world and in the identification of partners for the establishment of the local knowledge hubs; regional institutions working on nexus issues such as the SADC, ZAMCOM, ICIMOD, river basin organizations; and institutions from the riparian countries. UNIDO should reach out to the UN System to seek their interest in the development and implementation of such a project (for example, the World Bank and UNEP already demonstrated their interest in the framework).

R2. UNIDO should use the TOC method for the design, implementation and evaluation of programmes/projects intended to support change in their context. TOCs are a good flexible tool and methodology to map out the logical sequence of a project or programme from inputs to outcomes, strengthened by the critical thinking about the contextual conditions that may influence the initiative, the motivations and contributions of stakeholders and other actors and the assumptions about how and why that sequence of changes might come about. When doing so they should integrate the following key elements: (i) context for the initiative, including political, environmental and social conditions and other actors able to influence change; (ii) the change or long term expected impacts that the project/programme seeks to support; (iii) the sequence/process of change that is anticipated in order to create the conditions for the desired impact; (iv) assumptions about how these changes might happen, as a check on whether the activities and outputs are appropriate to influence change; and (v) the diagram that captures the outcomes of the discussion.

R3. When working with key institutions it is recommended to identify more than one contact person to ensure continuity and mainstreaming of the project outputs into an institution's agenda. In this way, any potential staff changes in the institution that could prevent the project from suffering unnecessary implementation delays would be avoided.

R4. UNIDO should consider applying the tools developed within ISWEL to adopt a more integrated working approach internally and for portfolio development and implementation. The developed framework (integrative thinking, approach and tools) can be used at several levels:

- Can support the development of projects and programmes that address nexus issues. In fact, UNIDO is now developing projects that integrate two (2) or more nexus dimensions. The ISWEL project enables UNIDO to position themselves in the right direction to drive the development of nexus projects.
- Can be used by several and across departments: Digitalization, Technology and Agribusiness; Environmental and Energy; External Relations and Policy Research; and Programmes, Partnerships and Field coordination.
- Can guide the development of the project portfolio as well as the assessment of project's impacts. The developed framework has the potential to be used throughout the design, implementation and monitoring stages of UNIDO programmes and projects portfolio. At the design stage, it has an important role to play – as it could help define the indicators and select sectors/countries/regions to focus on. At the implementation level, it can also be used for M&E by updating data sets. There was a clear interest demonstrated by UNIDO employees in the GHE and in using it for their projects.

Project Ratings¹

Evaluation Criteria		Sub-Criterion Ratings	Criterion Ratings	Overall Project Rating
A. Progress towards Impacts		HS	HS	HS
B. Design and Project Results Framework		S	S	
C. Project Performance	C1. Relevance	HS	HS	
	C2. Effectiveness	HS		
	C3. Efficiency	HS		
	C4. Sustainability of benefits	HS		
D. Cross-cutting performance criteria	D1. Gender mainstreaming	S	S	
	D2. M&E design and implementation	HS		
	D3. Results-Based Management (RBM)	S		
E. Performance of Partners	E1. UNIDO	HS	HS	
	E2. IIASA	HS		
	E3. PSC	HS		
	E4. National Counterparts	S		
	E5. Donor	HS		

¹ Code used in the rating assessment: Highly satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U), Highly Unsatisfactory (HU).

Tabular overview of Key Findings – Conclusions – Recommendations

Category / Topic	Key Findings	Conclusions	Recommendations
Project design, institutional arrangements and overall implementation framework	<p>Project activities, outcomes, outputs are well organised and are adequate to address the problem and objective. The PRF reflects the intervention's logical path and includes SMART indicators and targets, except for gender mainstreaming monitoring.</p> <p>Budget is adequate and was disbursed on time. In fact, the project delivered extra products within the same budget and human resources.</p> <p>Project partners implemented all their activities as planned. The ISWEL project was very successful in the establishment of key partnerships to achieve its objectives at regional and national levels in the target basins, and to ensure that the ISWEL approach and tools continue to be used after the project finishes.</p>	C3	<p>R2</p> <p>R3</p> <p>R4</p>
Scientific relevance, knowledge creation and innovativeness	<p>The ISWEL Project is highly relevant for the assessment of nexus issues and the achievement of SDGs at global, regional and local levels. It is a good technical proposal to start solving the issue of inadequate methods for nexus assessments. It is consistent with GEF focal areas / operational programme strategies of UNIDO's mandate and action plan.</p> <p>The models developed are sophisticated online tools but remain user-friendly and have been made available as open source, to facilitate their adoption for immediate use by planners and researchers throughout the world.</p> <p>Good quality and scientific accuracy were present throughout implementation with the issuance of 15 high impact Q1 papers, many other scientific publications and participation in conferences.</p>	C1	R1
Capacity building and knowledge transfer; training and behavioural change to encourage transboundary cooperation, adoption of the models and ensure ownership of the action and sustainability over time	<p>The project is a first step towards moving from “silo thinking” to “integrated thinking” and has improved the coordination of national and transboundary nexus planning processes and information exchange among the Riparian countries and stakeholders.</p> <p>Sustainability actions have been integrated in project activities, such as creating open-source nexus models (global and regional), building capacity of stakeholders for their development and use, and on the “integrated thinking and approach” to tackle nexus issues; and implementing the Young Scientists Summer Program (YSSP).</p> <p>The integrated thinking, development approach and tools are being adopted by the project partners (GEF, UNIDO, IIASA) and some stakeholders are applying it in their work.</p> <p>Stakeholders have stated that further capacity building and training is necessary to fully understand and adopt the tools (especially in the Zambezi region)</p>	C2	R1

1. Part 1 - Introduction

This terminal evaluation assesses a GEF-funded research project of a global scope entitled “Integrated Solutions for Water, Energy and Land” (or ISWEL). The project is a collaboration between IIASA (in full), the UNIDO and the GEF and aims to develop new tools for assessing the nexus between water, energy and land as a main concern in ensuring the achievement the Sustainable Development Goals. The project was operational for about 4 years in total and covered two important river basins: the Indus river basin and the Zambezi river basin.

1.1 Evaluation objectives and scope

The project is an unusual one for UNIDO in that it addresses an issue that affects not only UNIDO’s technical cooperation programme portfolio but applies on a global scale to provide integrated solutions to help policymakers and practitioners to better address the synergies and potential contradictions inherent in designing development interventions in water, energy and land. This evaluation is designed to assess the extent to which the project achieved its twin objectives of developing new tools for integrated solution as well as demonstrating (testing) their utility in two basins mentioned above.

The evaluation’s objective is **to help UNIDO improve performance and results of ongoing and future programmes and projects**. This Terminal Evaluation (TE) pursues two main objectives:

- To evaluate the project’s performance in terms of its relevance, effectiveness, sustainability and progress to impact, including the assessment of the Global Hotspots Explorer (GHE) and its added value (the **accountability** objective); and
- To develop a series of findings, lessons learned and recommendations for follow-up activities (the **learning** objective).

These were elaborated further into more detailed evaluation questions that guided the assessment process (see Annex 4: Primary data collection instruments).

The TE covers the whole duration of the project from its starting date in 1 November 2016 to its completion date of 31 December 2020.

1.2 The project context

The project “Integrated Solutions for Water, Energy, and Land” is financed by the Global Environmental Facility, co-funded and executed by IIASA and implemented by UNIDO. The proposed project was designed to:

- Develop a systems analysis framework for assessing solutions to the water-energy-land nexus challenges;
- Identify regional nexus solutions in the context of global and regional developments;
- Build local capacities and knowledge management, comprising the foundation for a knowledge and capacity network on nexus decision support;

The project will establish a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food and ecosystem security in selected regions. Furthermore, this project will enable advancement of an integrated assessment of nexus challenges for the purpose of providing strategic advice to policy makers and developing agencies.

Based on the vast experience accumulated by IIASA and UNIDO together with their partners and collaborators through decades of regional and global analyses focused on various drivers and economic sectors, this project will develop and demonstrate a next generation systems analysis framework capable of exploring and identifying synergistic technical and policy solutions to environmental and human development challenges related to the water, energy and land nexus.

This framework was applied in both regional (transboundary) and global contexts to help stakeholders to better understand the:

- (1) Trade-offs and synergies among strategies to address nexus challenges;
- (2) Benefits of coordinated versus sector-specific approaches;
- (3) Solution portfolios that consider uncertainties in future socioeconomic, technological and climatic trends;
- (4) location and evolution of nexus hotspots under global change.

This approach will assess the benefits of coordinated action across sectors to help regional stakeholders to identify mutually beneficial strategies for concurrently meeting future energy, water and land resource needs while remaining within a “joint, just and safe operating space”.

The systems analysis framework was tested and refined within the context of two case study regions characterized by hydro-climatic complexity, multiple energy, water and land use challenges and rapid demographic, socioeconomic and climatic change. In each region, stakeholders were involved in scoping relevant nexus challenges and solutions, helping to refine the systems analysis framework, with the ultimate future aim of translating insights into policy guidelines and investment strategies that are relevant to governments, development agencies and resource managers. In addition, stakeholders’ interactions and collaborations, as well as capacity building workshops and the scientific exchange program were conducted and intended to build the foundation for knowledge and capacity networks within each case study region. While a stakeholder-informed approach was used for the case studies, an approach using globally comprehensive data and tools was employed for exploring nexus solutions in the context of global developments and solutions (e.g. international trade) and to identify nexus hotspots globally. The systems analysis framework developed through ISWEL will be used to provide strategic advice to the GEF on how to leverage the findings of this project to inform its future programming directions and funding strategy.

A wide set of transboundary basins was initially considered before selecting the two basins for the case studies: The Indus River Basin and the Zambezi River Basin. These transboundary regions were selected after consultation with experts and stakeholders and upon careful assessment of the following criteria:

- (1) rapid change of drivers and impacts;
- (2) data availability and quality;
- (3) local capacity and interest;
- (4) diversity of nexus challenges;
- (5) transferability and universality;
- (6) complementarity and diversity of basins; and
- (7) novelty and value added.

The Indus region is the breadbasket for more than 250 million people; yet is already facing water scarcity and groundwater overexploitation. With expected population growth, urbanization and substantial climate change impacts, especially in relation to glacier melt, the future management of water, energy and land resources will become increasingly challenging and will benefit from a nexus approach that can assess the trade-offs among regional options, such as increased irrigation efficiency, cropland expansion and hydropower development. Agricultural pollution and overexploitation of water resources will also pose a threat to aquatic ecosystems and biodiversity, especially in the delta. Moreover, there are growing water conflicts between Pakistan and Afghanistan as proposed hydropower projects in Afghanistan will impact downstream water availability in Pakistan. Although many sectoral studies have been conducted within the Indus Basin, there have not been any integrated nexus assessments of land, water and energy dimensions. Stakeholders that have shown interest in nexus challenges within the Indus are the World Bank, the Asian Development Bank (ADB), the International Center for Integrated Mountain Development (ICIMOD), the International Water Management Institute (IWMI), various government ministries within riparian countries and academic researchers from the Centre for Water Informatics and Technology at Lahore University of Management Sciences (LUMS) as well as Massachusetts Institute of technology (MIT) in the United States.

The Zambezi basin is heterogeneous in terms of climate (e.g. it has large seasonal and intra-annual variation in precipitation), income distribution and economic development. Conflicts among the eight riparian countries, rapid population growth and the need to expand and improve access to water, food and modern energy suggests that this region will face serious challenges in implementing sustainable development goals and solutions. The region also faces environmental challenges related to mining, deforestation and soil degradation. Although the basin has significant potential for renewable energy and increased irrigation, large investments will be required for improving water and energy infrastructure to meet future resource demands. However, financial capacity remains low and thus a nexus approach will be needed to identify cost-effective and efficient strategies for meeting multiple development goals simultaneously. Several studies examining the water-energy-land nexus have been conducted in or around the Zambezi River Basin. However, few studies have addressed all three sectors, and none have applied an integrated assessment tool that can explicitly evaluate the trade-offs and synergies among sectors. Some of the key stakeholders within the region are the Southern African Development Community (SADC), the Zambezi Watercourse Commission (ZAMCOM), the World Bank, the African Development Bank, the International Union for the Conservation of Nature (IUCN), the Infrastructure Consortium for Africa (ICA), the International Water Management Institute (IWMI), and the International Water Association (IWA).

Although some socioeconomic and environmental drivers are expected to be similar in the Indus and Zambezi Basins, some drivers are distinctly different. As a result, the basins provided complementary, yet diverse insights into regionally distinct nexus challenges and solutions. Furthermore, neither basin were heavily studied at the time this project started implementation, which means that the project was able to provide substantial added value to regional resource managers, policy makers and planners. It is envisaged to create a solid basis for replication and scaling up of the project globally.

The Evaluation Team (ET) summarised the project’s **expected results of the project/programme** as follows:

- **Systems Analysis Framework development:** This framework assesses different pathways, describing several stakeholder-informed regional scenarios, in order to explore solutions for achieving multiple development and environmental goals.
- **Connecting Stakeholders:** The project creates opportunities for stakeholders from a wide array of institutions and sectors to meet and discuss nexus challenges, trade-offs and solutions, improve mutual understanding and remove barriers for future cooperation.
- **Hotspots assessment:** A multi-sectorial vulnerability hotspots assessment, which identifies the global impacts of different socioeconomic and hydro-climatic scenarios and assesses nexus solutions to address cross-sectorial challenges (this was further developed during project implementation into an online visualization tool: Global Hotspots Explorer (GHE)).
- **Regional capacity network:** Foundation of a regional knowledge and capacity network for systems analysis and nexus decision support, through a scientist exchange programme in the context of IIASA’s Young Scientists Summer Program (YSSP) fostering next-generation research expertise, where participants from the basin case studies have the opportunity to get familiar with the regional modelling tools.

These expected results were to be achieved through the production of 12 outputs (see Project Results Framework (PRF) in Annex 1: Project Results Framework). Table below provides an overview of key project information and

Figure 1 summarised the project’s timeline and approval dates.

Table 1: Project Factsheet

Project title:	Integrated Solutions for Water, Energy, and Land
UNIDO ID	140312
GEF project ID	6993
Region	East-South Africa and Central-South Asia
Country	Global
Planned implementation start date	February 2015
Planned implementation end date	December 2019*
Actual implementation start date	1 st November 2016
Actual implementation end date	31 st December 2020
Implementing agency	UNIDO
Government coordinating agency	LUMS and TERI (Indus River Basin), ZAMCOM (Zambezi River Basin)
Executing partner	International Institute for Applied Systems Analysis (IIASA)
Donor(s):	Global Environmental Facility
GEF grant (USD)	USD 1,900,000
UNIDO input (USD)	USD 450,000
Co-financing at CEO Endorsement, as applicable Co-financing at CEO Endorsement, as applicable Co-financing at CEO Endorsement, as applicable (USD)	USD 1,900,000
Total project cost Total project cost Total project cost (USD) excl. support costs and PPG, incl. project management costs	USD 3,800,000

Source: Project document

*Note: the project was originally planned to be implemented in a 3-year time frame and was delayed by one year due to a request to postpone the implementation of the last activity of the project and the arrival of the COVID-19 pandemic.

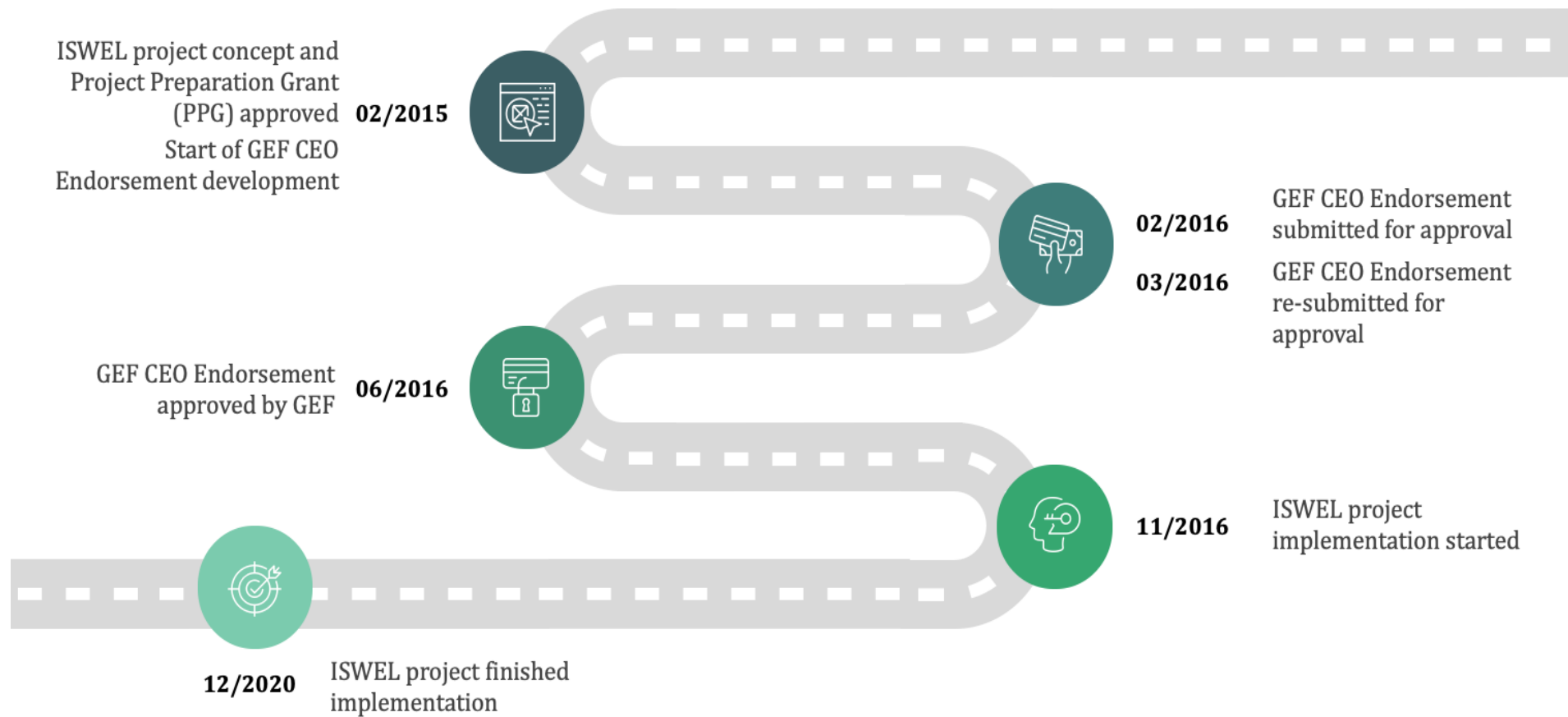


Figure 1: ISWEL project development/implementation timeline

1.3 Evaluation methodology

This TE complies with both UNIDO's Evaluation Policy² and the UNIDO Guidelines for the Technical Cooperation Programme and Project Cycle³ and Evaluation Manual⁴. The policy and manual establish the criteria, questions and methods that should be applied during UNIDO evaluations. Since this is a GEF financed project, the TE also considered the GEF Guidelines for GEF Agencies in Conducting Terminal Evaluations, the GEF Monitoring and Evaluation Policy and the GEF Minimum Fiduciary Standards for GEF Implementing and Executing Agencies. UNIDO's Evaluation Policy (i) assures accountability, (ii) supports management, and (iii) drives learning and evaluation.

The TE used a mixed methods approach using an online questionnaire and focus group sessions to collect data on stakeholders' perceptions of the project's activities and complementing this with an extensive review of project documentation. An evaluation matrix provided guiding questions to determine findings and extract both lessons and recommendations for the stakeholders. The analysis, however, is based on an assessment of six (6) evaluation criteria, namely:

1. Design and relevance of the project – analysis of the relevance of the ISWEL Project against regional and national (countries of the basins) priorities
2. Effectiveness – analysis of the ISWEL Project against the achievement and probability of reaching the final results (if not fully achieved)
3. Efficiency – analysis of the balance between impact and financial resources
4. Project impact and results – identification of direct results obtained from the implementation of the ISWEL project and expected longer-term impacts
5. Sustainability – analysis and identification of the permanence potential and increase of the positive impacts of the ISWEL Project after its completion
6. Gender mainstreaming – analysis of how the ISWEL Project includes gender issues in its implementation. The ISWEL project has the Gender Marker set as 1 (thus the project is expected to have some/limited expected contribution to Gender)

1.3.1 Theory of Change of the ISWEL project

In assessing the project, the evaluation team reconstructed a Theory of Change (TOC) to guide the assessment of the project's causal pathways as identified at project design. TOCs are commonly used by evaluators to determine the rationale behind a development intervention. They chart out how the outcomes that an intervention aims to achieve contribute to its longer-term impacts and the main assumptions behind the intervention's approach. Figure 2 depicts the TOC for the ISWEL Project.

The project logic adopted at project design emphasized the need for (sophisticated) analytical tools to explore and explain the challenges for planning interventions in the water-energy-land nexus. From the start, it was envisioned that stakeholders in national or regional institutions were to be actively involved in the development and testing of new analytical tools both to try the tools themselves but also to improve the skills and capabilities of national personnel, while raising their awareness of the existence of these tools. During project implementation, it became clear that there was a need to develop tailored tools to facilitate communication of complex scientific information to regional stakeholders and enable discussions amongst them, in order to build the regional basin scenarios. Thus, although capacity building activities were an integral part of the project at design stage, they became the cornerstone to conduct the research process.

In the reconstructed TOC (see Figure 2), it is evident that the project was designed to address a global development challenge⁵ that would have significant ramifications, mostly for planners and researchers. The challenge is

² https://www.unido.org/sites/default/files/files/2018-06/Evaluation_Policy_DGB-2018-08.pdf

³ UNIDO. (2006). Director-General's Administrative Instruction No. 17/Rev.1: Guidelines for the Technical Cooperation Programme and Project Cycle (DGAI.17/Rev.1, 24 August 2006)

⁴ <https://www.unido.org/sites/default/files/files/2018-04/Evaluation%20Manual%20e-book.pdf>

⁵ It is not a typical UNIDO intervention aimed at improving access to technology or developing capacities for upgrading industrial-scale or SME production systems.

expressed as “inadequate modelling tools for assessing the potential synergies and benefits of integrated policies that simultaneously address energy, water, food, urbanization and ecosystem security development”.

The ET identified three outcomes:

- Increased ability to plan considering nexus dimensions in an integrated way
- Improved coordinated national and transboundary planning processes across regions and river basins
- Improved exchange of nexus information and knowledge (social and research)

The intermediate results are:

- Scenarios describing uncertainties in future trends and drivers; global nexus modelling tools
- Global assessment of multi-sectoral hotspots and transformational pathways
- Two case studies (Indus and Zambezi basins)
- Network for Integrated Solutions; capacity building on the nexus-modelling tool; GEF-IIASA-UNIDO Summary for policymakers

This enabled the ET to map plausible causal pathways for sustainable impact, providing some insights on how these outcomes could be further developed both for research and industrial development considerations (e.g. the role of infrastructure development in alleviating (or exacerbating) resource challenges).

The TOC also enabled the ET to assess the project’s results beyond its actual activities and deliverables, assessing thus, the significance of the collective effects of the intermediate results in the medium-term. The evaluation report uses the TOC to assess and present the project’s overall performance.

ISWEL THEORY OF CHANGE

PROBLEM

Inadequate modelling tools for assessing the potential synergies and benefits of integrated policies that address simultaneously energy, water, food, urbanisation and ecosystem security developments.

RISKS:

- Information and capacity constraints (security risks and political instability) in the regions selected to develop case studies
- Limited time to fully understand and incorporate political and historical realities
- Stakeholders lack of commitment
- Increasingly severe climate at the global level

ASSUMPTIONS:

- Governments collaborate in nexus planning mechanisms
- Adequate analytical capability for implementation of solutions
- Adequate resources to implement solutions across river basins
- Alignment with donor requirements and international standards

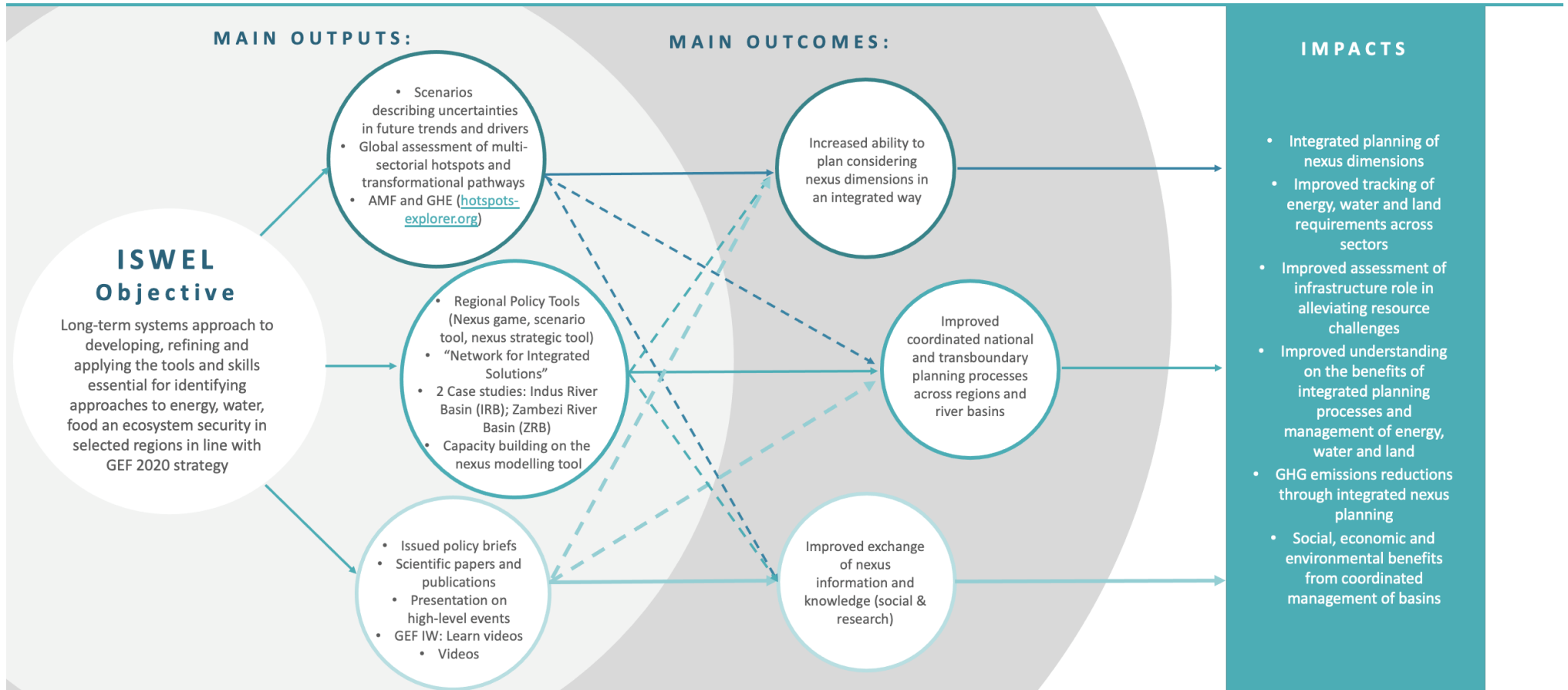


Figure 2: Theory of Change, ISWEL Project

1.3.2 Evaluation tools

The TE was conducted through the application of theory-based evaluation methods (quantitative and qualitative) and made use of the following tools:

- **Theory of Change** (described previously in 1.3.1): that identified how the ISWEL project aimed at establishing a long-term system approach to developing, refining and applying the tools, and skills essential for identifying integrated approaches to energy, water, food and ecosystems security in selected regions in line with GEF 2020 strategy. This was important to specify causal pathways between the project deliverables and the envisaged impacts as stated in the Project Document. The TOC also enabled the ET to build the impact evaluation matrix and identify appropriate indicators to carry out the evaluation.
- **Evaluation Matrix:** based on the TOC and the ISWEL PRF, an Evaluation Matrix with SMART indicators was established by the ET and used as a basis to elicit information for the evaluation. The Evaluation Matrix addresses several evaluation criteria: project design and relevance; efficiency; effectiveness; progress to impact; sustainability and cross-cutting issues such as gender mainstreaming. The ISWEL project activities are then evaluated and graded against these criteria.
- **Project Document Implementation Matrix:** developed to substantiate the evaluation of the criteria "Progress to Impact". This matrix built using the ISWEL Project Document PRF (attached in Annex 1: Project Results Framework), was used to track if there was qualitative and quantitative evidence on the progress towards the overall goal of the project, as per the project document (i.e. tracking the progress of the achievement of all the outcomes/outputs).
- **An online questionnaire** to get a general overview on ISWEL project actions on the ground as well as to collect feedback on what to improve and possible follow-up activities (see Annex 4: Primary data collection instruments).
- **Interviews:** Individual and focus group interviews were held with key stakeholders via teleconference or similar communication means.
- **Desk review:** A comprehensive desk/literature review was conducted to analyse all relevant documentation, such as, progress reports, meeting minutes, etc. among other (the list of documents is in Annex 2: List of documents revised during the TE). In addition to documents, the ISWEL Project website (<https://www.iswel.org/>), the details of the project in UNIDO's website and IIASA's website were also revised.
- **UNIDO ratings:** All UNIDO project evaluations are required to rate a series of evaluation and project criteria against a six-point Likert scale, ranging from 'highly unsatisfactory' to 'highly satisfactory'⁶.

1.3.3 Key stakeholders

The following groups and/or representatives of these groups were identified as key evaluation stakeholders (see list in Annex 3: List of consulted stakeholders):

- **UNIDO:** Including the Project Management Unit responsible for the day-to-day delivery of the project, and other senior management or staff involved in the project.
- **Delivery partners:** IIASA, as Executing Agency.
- **Project Steering Committee (PSC) members**
- **Donors:** The GEF.
- **Beneficiaries / participants:** students involved through the IIASA Young Scientists Summer Programme (YSSP), also individuals and groups that participated in training facilitated by the project, the riparian countries of the two basins represented by government agencies.
- **Others:** Including institutions that have a direct interest in current and future developments in water-energy-land nexus projects.

The project stakeholders were consulted through: (i) an online questionnaire distributed to 97 stakeholders of 41 organizations; and (ii) 12 focus groups and individual interviews. The ET received answers to the electronic questionnaire from 26 stakeholders (27% stakeholders response rate) that belong to 22 different organizations

⁶ See page 24, UNIDO Evaluation Manual, 2018.

(54% organization response rate). The interviews were carried out to most of the key stakeholders involved in the project development and implementation (GEF-IIASA-UNIDO and the PSC) and stakeholders involved in the case studies in the Indus and Zambezi regions. The results of the questionnaire can be found in Annex 5: Statistical analysis of survey data.

1.4 Limitations of the evaluation

This TE faced the following limitations:

- This TE has also been impacted by the COVID-19 pandemic, since travel restrictions meant that in-person interviews were impossible. Thus, the entire evaluation is done remotely, a desk-based, on-line exercise.
- Due to the reduced timeframe for this evaluation, it was not possible to interview all key stakeholders despite all the efforts made to engage them and flexibility offered by the ET.

2. Part 2 - The Project's contribution to development results

2.1 Effectiveness and impact

This section looks at both the effectiveness of project implementation and its potential for replication (including future improvement of the tools developed). This analysis is based on the TOC, complemented by our review of documents and the information gathered through the online questionnaire and interviews (see Annex 6: Details on project progress towards impacts).

2.1.1 Achieved Results and Overall Effectiveness

TOC Outcome 1 - Increased ability to plan, considering the nexus dimensions in an integrated way

Under this outcome, the project generated results well beyond the planned scope. The ET considers it, therefore, to have been highly effective in producing the expected outputs, but also in expanding their outreach by making key tools available for open sourcing globally. During implementation, it became evident the necessity of having a set of tools for capacity building to effectively engage stakeholders under a truly participatory approach to conduct the process of developing analytical tools.

The research focused on **developing scenarios that would take into account uncertainties about future trends and drivers at a global scale**. This involved the developing and processing both quantitative and spatially explicit projections on global climate (e.g. temperature, precipitation) and socio-economic drivers (e.g. population, economy, GDP, land use) from a variety of development pathways. Tools developed by the Intergovernmental Panel on Climate Change (IPCC), namely the Representative Concentration Pathways (RCPs) and the Shared Socioeconomic Pathways (SSPs) were used as the quantitative projections (scenarios) to describe contrasting and plausible future climate and socioeconomic mega-trends. This analysis helped to assess the biophysical (land productivity), hydroclimate (water availability and variability) and resource implications at a global scale.

In both regions (Indus and Zambezi), the SSPs and RCPs were defined during “Scenario Workshops” where the modelers and the stakeholders worked together. This enabled the joint identification of the future desired pathways in each basin, with the added advantage that regional drivers, possible solutions and improved datasets could be considered. This participatory process approach allowed for knowledge and ideas exchange amongst the participants and regionally relevant scenarios could be co-developed or co-designed. The scenario building process lasted the three meetings that took place in the Indus case and the two meetings in Zambezi. The first meeting was devoted to identifying current challenges and identifying relevant stakeholders that were going to be involved in the scenario hands-on co-development. The second meeting dove into the development of the visions and pathways and the last meeting was conducted to validate the modelled scenarios based on the narratives

(qualitative visions and pathways) developed during the second one. In Zambezi, the third meeting did not take place due to COVID19.⁷

The **regional assessment** of nexus challenges and solutions was aimed at identifying tangible strategies for improving regional decision-making across sectors and borders. The identified strategies for the two selected regions, was carried out through the development of **two case studies: the Indus River Basin (IRB) and the Zambezi River Basin (ZRB)**. The case studies were developed to understand the sectorial trade-offs, synergies and solutions for addressing nexus challenges. They formed the basis for capacity building activities and knowledge transfer.

In the **Indus region**, the project conducted two meetings: one in Pakistan and one in India, where stakeholders were able to discuss priority issues and challenges (summary reports of these meetings are publicly available in the ISWEL Project website). In **Zambezi**, a stakeholders' workshop helped identify energy, water and agricultural challenges in the basin (summary report of this meeting is publicly available in the ISWEL Project website). These workshops facilitated the development of 3 contrasting visions and development pathways for each basin based on the stakeholders' preferences. The findings of those meetings are summarized in a Policy Brief, addressed to policymakers with name "Between 1.5°C and 2°C – the big impacts of half a degree" (December 2018), which is publicly available.

An assessment of global nexus hotspots and transformation pathways (multi-sectorial vulnerability hotspots under different socioeconomic and hydro-climatic scenarios) was undertaken using the GHE tool, with two purposes: (i) identify multi-sectorial vulnerability hotspots and how these hotspots may evolve under different socio-economic and hydro-climate scenarios; and (ii) explore nexus dynamics and how these might impact global transformation pathways as a result of implementing various response strategies.

In total, three modelling tools were developed:

- The AMF (global model)
- The NEST tool (regional model for Indus)
- The Zambezi Nexus tool (regional model for Zambezi)

An Integrated Global Assessment Framework (AMF)

The project developed an integrated global modelling assessment framework, to explore and answer key questions regarding global nexus challenges and potential solutions to meet the SDGs. This framework represents and connects the biophysics and economics of water, energy and land systems. It is integrated by four models that, by working together, intend to address the water, energy and land nexus challenges in an integrative way. The four models are:

- the Hydrologic Community Water Model (CwatM)
- the Hydro-economic Model (ECHO)
- the Energy-economic Model (MESSAGE*ix*) and
- the Agro-economic Model (GLOBIOM)

How these models are connected and what are the main exchanging inform flows is summarized in Figure 3.

⁷ Indus Workshops: 1) March 2018 (Lahore and Delhi), 2) May 2018 (Vienna), and 3) August 2019 (Kathmandu). Zambezi Workshops: 1) September 2017 (Lusaka), 2) July 2018 (Harare).

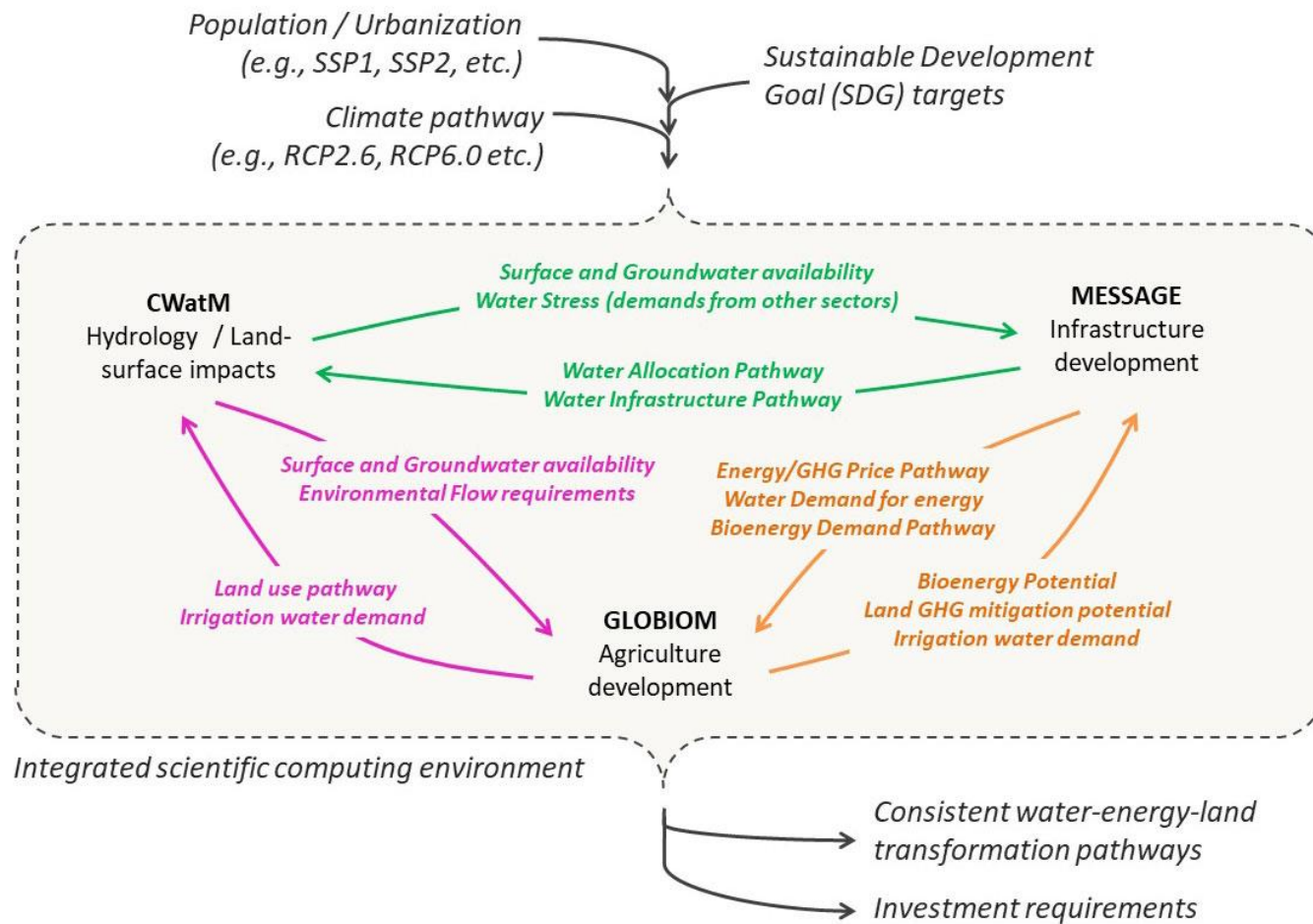


Figure 3: The four models that integrate the integrated assessment framework and how the work together as an integrated assessment tool (www.iswel.org)

By integrating a fifth model that addresses water quality, the MARINA model, the final **Assessment Modelling Framework (AMF) was developed by the project**. Therefore, the AMF represents and connects the biophysics and economics of WEL systems, and is composed of five models that are, dependent on the actual use case, combined in different ways: The Hydrological Community Water Model (CWatM), the water quality model (MARINA), the hydro-economic model (ECHO), the energy-economic model MESSAGEix and the agro-economic model GLOBIOM. Two of the models describing the water system (CWatM, and ECHO) were newly developed within this project. The MARINA model, originally developed by Wageningen University and Research, was updated to improve the temporal and spatial representation of nutrient loads within the basins. MESSAGEix and GLOBIOM were developed previously and coupled in the course of past projects but were upgraded to improve the representation of sectoral interlinkages, in particular by adding a representation of the water sector, and to enhance their spatial resolution.

They help assess the future trends of 14 SDGs and climate-induced challenges linked to water, energy and land nexus sectors. The overall goal underpinning the development of this AMF is that it is flexible (*i.e.*, models can be plugged in -or out- depending on the questions to be addressed), scalable (*i.e.*, applicable at multiple scales), and transferable (*i.e.*, applicable to different locations).

A Visualisation Tool for the AMF Results: The Global Hotspots Explorer (GHE)⁸

For nexus vulnerabilities at the global scale, a global hotspots assessment examined global exposure and vulnerability to climate and development risks under different scenarios across the water, energy and land sectors. Novelties include both the number of impact indicators used that incorporate multiple climate and socioeconomic scenarios, and for using new socio-economic projections of income distribution and inequality. Subsequently, the global hotspot work was expanded to assess the multi-sectoral risks and vulnerabilities in 200 countries and 275 major river basins. This work is showcased on the GHE website, www.hotspots-explorer.org, where visitors can interactively explore the spatial data and other features of the project. The tool is an open-source software that allows users to explore how multi-sector risks change with higher (or lower) levels of global mean temperature. The GHE represents the results from the global AMF models working as a visualization tool. One can also “test” to what extent infrastructure and other development interventions can exacerbate risks or expose opportunities, thus helping in the identification of areas of confluence of nexus pressures).

Regional Modelling Tools – The NEST tool and Zambezi Nexus Tool

It is important to note that the development of two specific regional models was not originally contemplated in the project, and thus constitute additional outputs of the ISWEL project.

Two regional modelling tools – the **NEST tool** for Indus and the **Zambezi Nexus Tool** were developed, derived from the global AMF and adapted to the specific conditions and challenges of both regions.

The NEST tool: Fully integrated modelling framework

The NEST tool integrates multi-scale WEL resource optimization with distributed hydrological modelling. It uses the CWatM and a WEL resource supply planning model implemented through MESSAGEix, both capturing the historical period and a future time horizon.

⁸ The expansion to assess the multi-sectoral risks and vulnerability exposure in 200 countries and 275 major river basins across the world was not originally envisaged at project design stage.

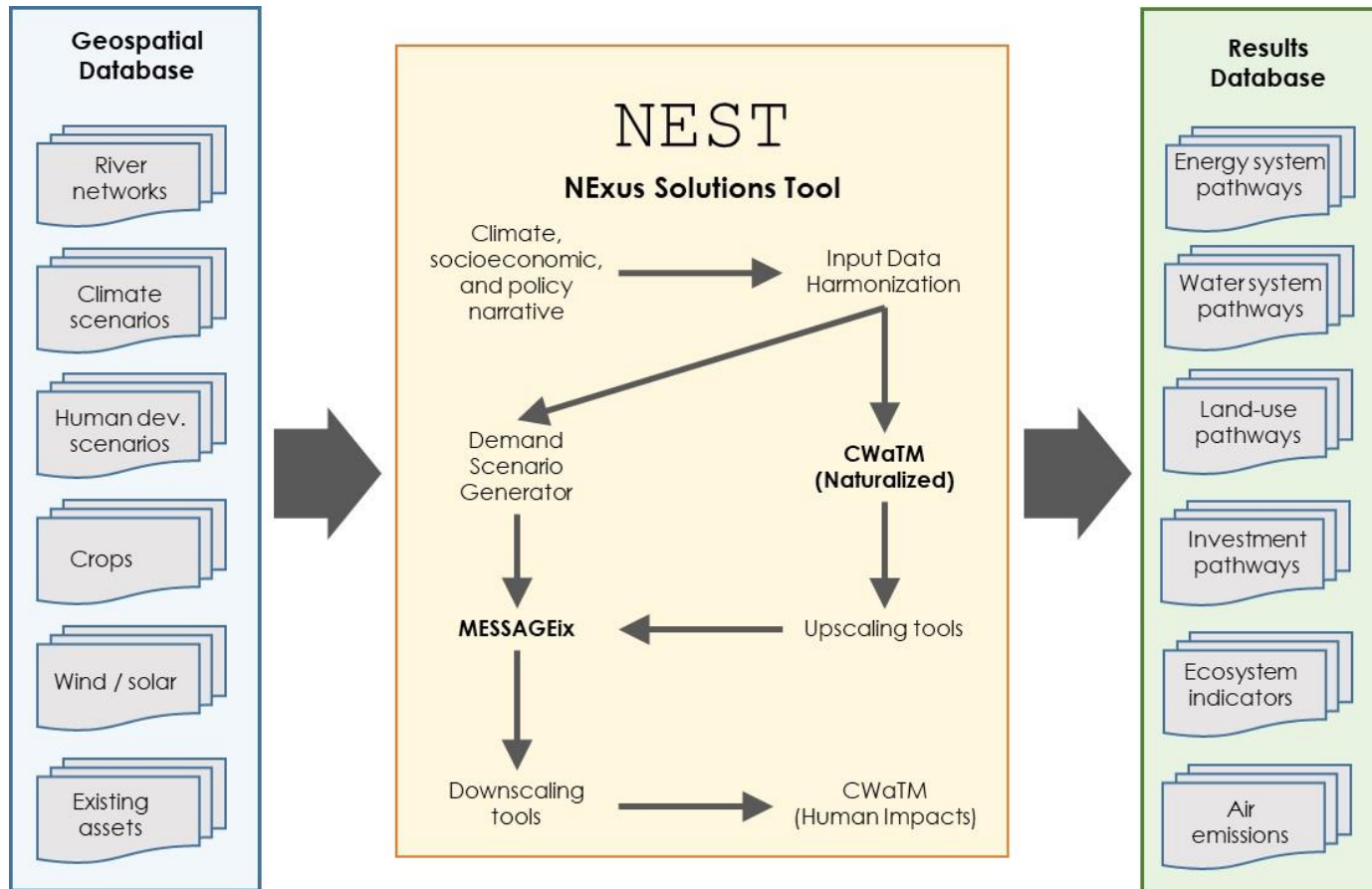


Figure 4: The NEST tool for the Indus region (www.iswel.org)

Zambezi Nexus tool: Coupled modelling framework

The Zambezi Nexus tool soft-linked the four models –CwatM, ECHO, GLOBIOM and MARINA. All models are (soft) linked; so that relevant output of one model is used as input into the other model. The advantage of this coupled approach is that individual models can be plug in and out depending on the research needs and assessments they want to carry out. Also, this soft coupling also ensures that individual models maintain its full complexity and modelling capabilities.

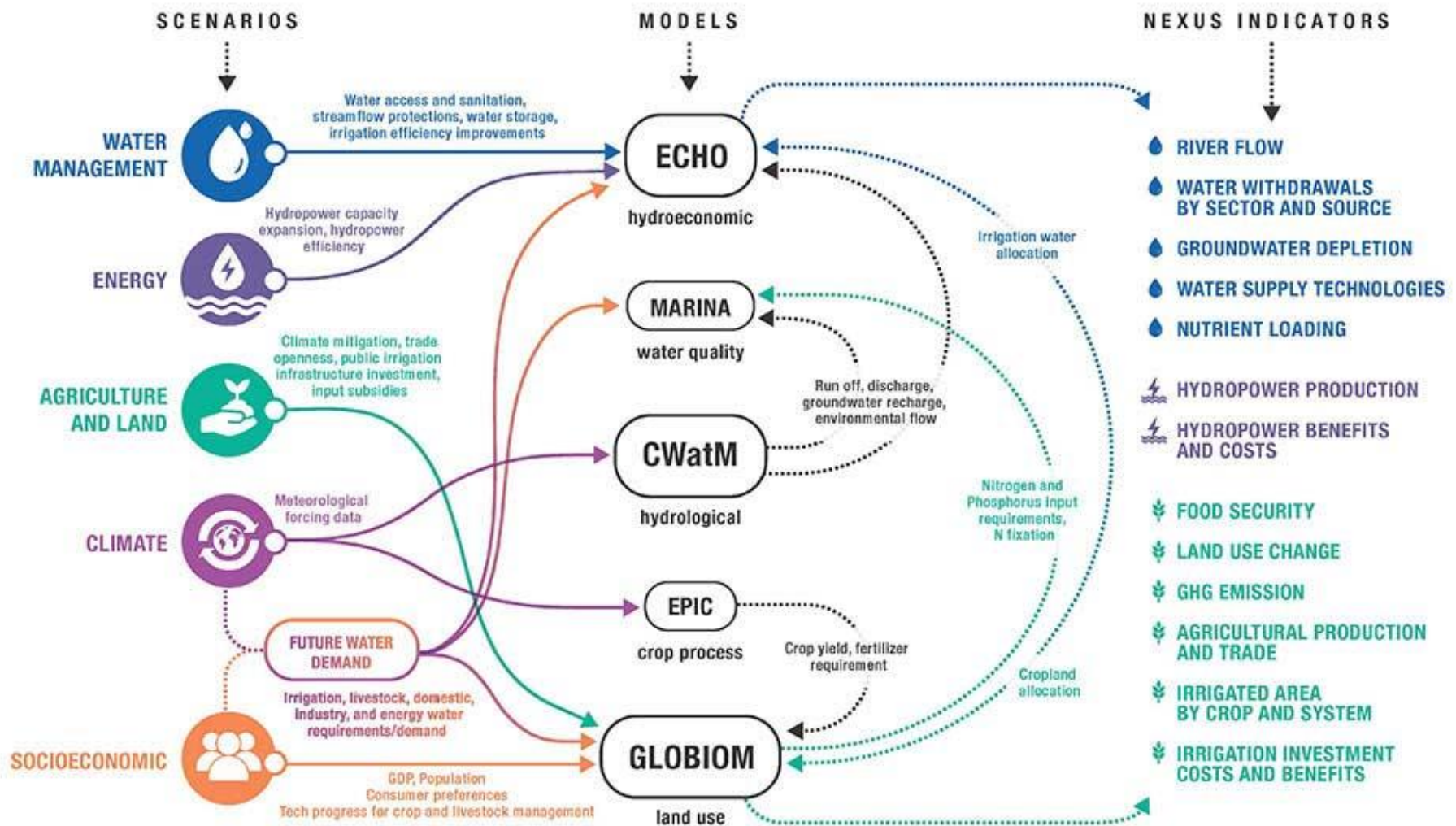


Figure 5: the Zambezi nexus modelling framework (www.iswel.org)

Additional Outputs and Outcomes not originally contemplated:

- Expansion of the global hotspot assessment to cover 200 countries and 275 major river basins.
- Two (2) Regional models: NEST tool and the Zambezi Nexus Tool
- Visualisation tool for the AMF results: the GHE

TOC Outcome 2: Improved coordinated national and transboundary planning processes across regions and river basins

Under this outcome, the project was effective in generating global and regional connections that integrate the network for integrated solutions as well as started to build capacity on the integrated approach to addressing nexus issues and the developed models. The project developed effective and innovative tools to engage stakeholders and enable them to better understand complex scientific concepts as well as working with those concepts in a collaborative way.

As part of the integrated global assessment framework, a set of innovative policy tools were developed to support stakeholder engagement and consultation processes in each region. Three additional tools were developed for this purpose, allowing regional stakeholders to participate in scenario setting and enabling an objective dialogue about transboundary challenges across national frontiers:

- **Nexus game** – a gaming exercise that provides unique insight into challenges of water management for energy and food production, and simultaneously sustaining environmental flow. The Nexus Game was developed by IIASA and the Centre for Systems Solutions (CRS) and used in training for WEL nexus management.
- **Scenario tool** – a participatory hands-on process to co-develop future basin visions and associated pathways with stakeholders.
- **Nexus strategic tool** – engages participants in a hands-on exercise on joint planning of nexus options, replicating the real challenges and opportunities in each basin and using real data.

These participatory tools have successfully contributed to get the different actors together and encourage them to discuss the challenges in their basins and agree on future desired scenarios. Some of these tools are being further developed by IIASA and the deliverables includes a guideline to conduct the participatory scenario planning process online.

A foundation for a regional and global knowledge and capacity network was established with the stakeholder's engagement activities undertaken in the two basins. The complexity of nexus issues required a novel stakeholder engagement approach that is not only forward-looking, but also reflexive and inclusive. The project team engaged basin institutions to identify capacity needs and priorities to support the nexus management. In the Zambezi basin, the main partner was ZAMCOM, and its network of national basin stakeholders, which include national government and non-government decision makers from the eight riparian countries. In the Indus basin, due to the absence of a formal basin-wide institution, efforts were focused on supporting and engaging with existing processes such as the Indus Basin Knowledge Forum⁹

Stakeholders meetings and/or workshops have been organised and facilitated by the project, and the team also participated or was invited to other meetings and conferences to present the project's evolution and progress.

- **For Indus:** two national consultations (one in India and one in Pakistan, in March 2018), one Scenario workshop (in Austria, May 2018), and one final workshop (Kathmandu, Nepal, August 2019).
- **For Zambezi:** one stakeholders' meeting (Mozambique, February 2017), one stakeholders' consultation (Lusaka, September 2017), attended two (2) additional meetings invited by the Zambezi Watercourse Commission (ZAMCOM) (Harare, February 2018 and Lilongwe, October 2018), and one Zambezi Scenario

⁹ The Indus Basin Knowledge Forum is an initiative led by the International Center for Mountain Development (ICIMOD), the International Water Management Institute (IWMI), and the World Bank. This Forum is intended to support the knowledge exchange across experts and relevant stakeholders from the Indus basin to tackle the most pressing water development challenges and use science as a vehicle to promote cooperation and mutual understanding. IIASA since 2018 is actively supporting and sponsoring this Forum through the ISWEL project.

Workshop (Harare, July 2018). The second workshop in Zambezi region was not conducted because it was originally planned for the end of 2019, then postponed for January 2020, then organised for 24th-26th March 2020 but around mid-March 2020 the COVID-19 pandemic struck the region and it had to be cancelled. **The ET has decided not to penalise the team for not conducting this workshop since the dates were arranged and the workshop was going to take place (in fact the Agenda of the workshop was agreed and is included as annex in the last progress report) but the COVID-19 pandemic lockdown and travelling restrictions prevented it from happening.**

- **One (1) virtual Project Results Final workshop took place in December 10th, 2020** to disseminate the findings of the project, inviting stakeholders from the regional environments (i.e. from Indus and Zambezi) and a wider audience from the international scene. This was an additional project output.

Regional capacity for nexus assessment and solutions identification improved through conduction of several capacity building activities. The project team organized a one-day training back to back with the basin meeting held in Vienna in May 2018 for the Indus region and a second capacity building workshop for the Indus region was conducted in August 2019 as part of the III Stakeholder Meeting Validation Results & Capacity Development event in Kathmandu. In ZRB region, the IIASA-led stakeholder meeting took place in Harare in 9-11 July 2018 and consisted of a 2-day Scenario Workshop and 1-day training on Scenario processes.

Also, IIASA hosted during the summer of 2018 and 2019 students/researchers from different universities coming from both regions. Three (3) scientists from Indus did research at IIASA during summer 2018 and one (1) during summer 2019, totalling thus four (4) from the Indus region. Two (2) scientists from Zambezi region were hosted by IIASA between June-August 2019. A Brazilian student was hosted during 2019 to learn about this project and transfer the knowledge to Brazil. **Therefore, a total of 7 people was hosted to pursue research on their respective basins.** This type of in-depth capacity building model with which IIASA has experience, aims at ensuring that those researchers will continue to develop and champion the tools in their regions.

Basin stakeholders' engagement processes were conducted throughout the 4 years of project execution. Applying a strong participatory and integrated approach (using games and policy tools to support knowledge exchange and co-creation) that effectively and really involved stakeholders of the basins was crucial to set the basis for the creation of a collaborative network of professionals and institutions that not only supported the development of the project itself, but also started to generate a "sense of ownership" in those stakeholders enabling them to stay connected and move forward to address their regional WEL issues. One important conclusion of having applied this type of approach for engaging stakeholders is that they (the stakeholders) recognised the value of establishing partnerships and cooperating amongst them to support the finding of sustainable development pathways for their basins.

The great majority of the stakeholders and organisations involved in ISWEL are embracing nexus approaches and are better connecting themselves both across sectors and countries. Evidence of this is for example the interest of ISWEL-related and new stakeholders (i.e. not previously involved in ISWEL) from the Southern Africa region to participate in a follow-up phase of this project. In addition, the government of India is adopting the tools to apply them in smaller basing across India i.e. transferring the knowledge and creating connections and awareness at national scale. Nevertheless, although this project has been able to set the foundation for a network of stakeholders interested in continuing the work in WEL nexus topics, it is still necessary for most of them (if not all) to count with the financial support of the international community and additional knowledge transfer and capacity building.

Additional Outputs and Outcomes not originally contemplated at project design:

- The three regional policy tools: Nexus game, scenario tool, nexus strategic tool
- On capacity building, at least 1 additional exercise on nexus strategic simulation game per basin was conducted during the workshops, and the training of 7 students at IIASA Headquarters
- 2 additional policy briefs, one per basin (Drafts added as Annex in the last progress report of the project)
- The three videos describing the stakeholder engagement activities which support the dissemination of the work to a range of audiences showing the workshop conduction in Indus and Zambezi, available in the ISWEL Project website
- The participatory scenario guidelines and the accompanying video which are to be made available at the project website and IIASA's web

TOC Outcome 3: Improved exchange of nexus information and knowledge (social and research)

Most of the evidence related to this outcome was built upon the use of the tools developed throughout this project implementation period. A thorough body of scientific information was generated and made publicly available. Some of the information that was generated was developed in cooperation with basin stakeholders and are made available to the global community. Therefore, anyone with an internet connection is able to access first-quality scientific research information, nexus modelling tools and data, guidebooks and capacity building guidelines to explore the WEL nexus topics.

The ISWEL project finished with an extensive collection of open-access scientific outputs aimed to accelerate the pace of nexus research and increase availability of first-quality scientific knowledge and tools for engaging stakeholders, including¹⁰:

- guidelines to nexus scenario development processes and participatory supporting tools;
- numerous open-access scientific papers, documenting model formulation, scenarios and results;
- two interactive nexus data Scenario Explorers, that host data from the global and basins assessments;
- the Global Hotspots Explorer, with data exploration and download;
- open-source model code and documentation on Github for key IIASA models used in the project.

Many dissemination papers and publications (30 in total, including 15 scientific Q1 journal articles) were compiled by the ISWEL project team in addition to the creation of open source nexus tools which are accessible to anyone. The project team presented at approximately 60 scientific meetings and participated in over 20 high level panels and/or side events at which ISWEL activities were a key topic of discussion.

For example, the resulting assessments and research were published in scientific recognised publications, e.g. Environmental Research Letters in May 2018, in the IPCC SR1.5 Special Collection and BRACE 1.5°C: Climate Change Impacts of 1.5°C and 2.0°C Warming special issue and the IPCC Special Report on Climate Change and Land – and also in magazines, such as the New York Times and Nature. The assessment conducted is also expected to be included in the IPCC WG3 6th Assessment report and featured in the World bank Climate Change Knowledge Portal and in the Global Centre on Adaptation. In addition to those, two additional Policy Briefs addressing each basin specific contexts were developed, and their drafts included as Annex IV and Annex V in the Progress Report for the 2019-2020 period.

Additional Outputs and Outcomes not originally contemplated at project design:

- The publication of several additional scientific papers

Overall, the project **was highly effective in the implementation of its activities**. The ISWEL project not only delivered all of the expected outcomes and outputs, but even surpassed them, through the production of additional ones. Moreover, all stakeholders consulted during this TE, rated the activities/results delivered by the project as “Very Good” or “Good” as it can be seen in Figure 6.

¹⁰ Open access websites:

ISWEL project website <https://www.iswel.org/>

Global Biosphere Management Model <https://iiasa.github.io/GLOBIOM/>

Community Water Model source code and documentation <https://cwatm.iiasa.ac.at/>

Nexus Solutions Tool source code and documentation <https://github.com/iiasa/NEST>

MESSAGEix source code and documentation <https://docs.messageix.org/>

Global Hotspots Explorer www.hotspots-explorer.org

Global Hotspots Scenario Explorer <https://data.ene.iiasa.ac.at/hotspots>

Nexus basins Scenario Explorer <https://data.ene.iiasa.ac.at/nexus-basins>

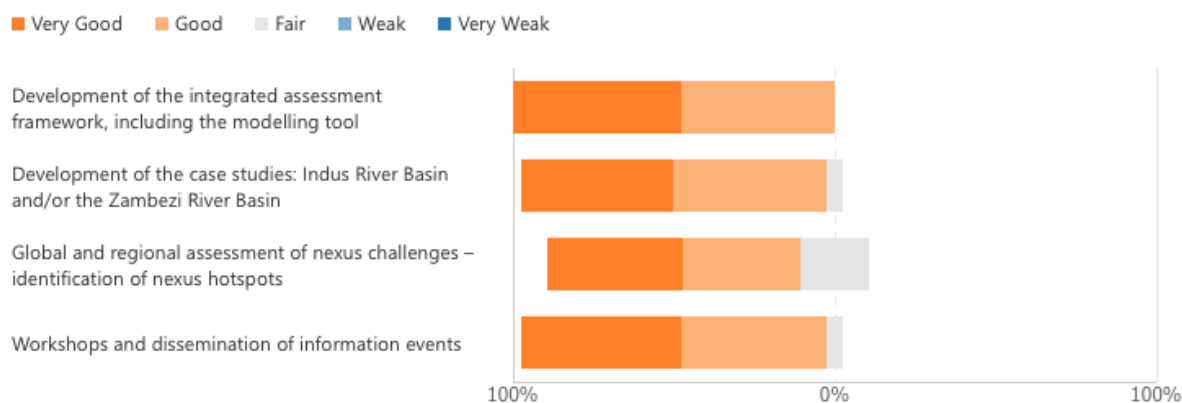


Figure 6: Stakeholders' rating for the ISWEL project activities

The overall rating of the ISWEL project effectiveness is Highly Satisfactory (HS).

2.2 Progress Towards Impact

2.2.1 Access to Information and Online Tools (open source)

Prior to this project, although the interactions between energy, water and land resources were well known, they were managed, studied and assessed within sector-specific silos (including within research, government and business institutions) without consideration of potentially conflicting strategies being developed in other sectors of disciplines or at other management scales. As indicated in the TOC, the main project challenge was inadequacy of existing modelling tools for assessing the potential synergies and benefits of integrated policies that simultaneously address energy, water, food, urbanisation and ecosystem security developments. The ISWEL project intends to propel adoption of this approach through the development of tools (see Figure 7) and making them freely available to developing countries and the rest of the world, with the ultimate goal of improving capacities to support sustainable management of water, energy and land, through the development of a truly integrated nexus approach. See Figure 7 below describing the developed tools.

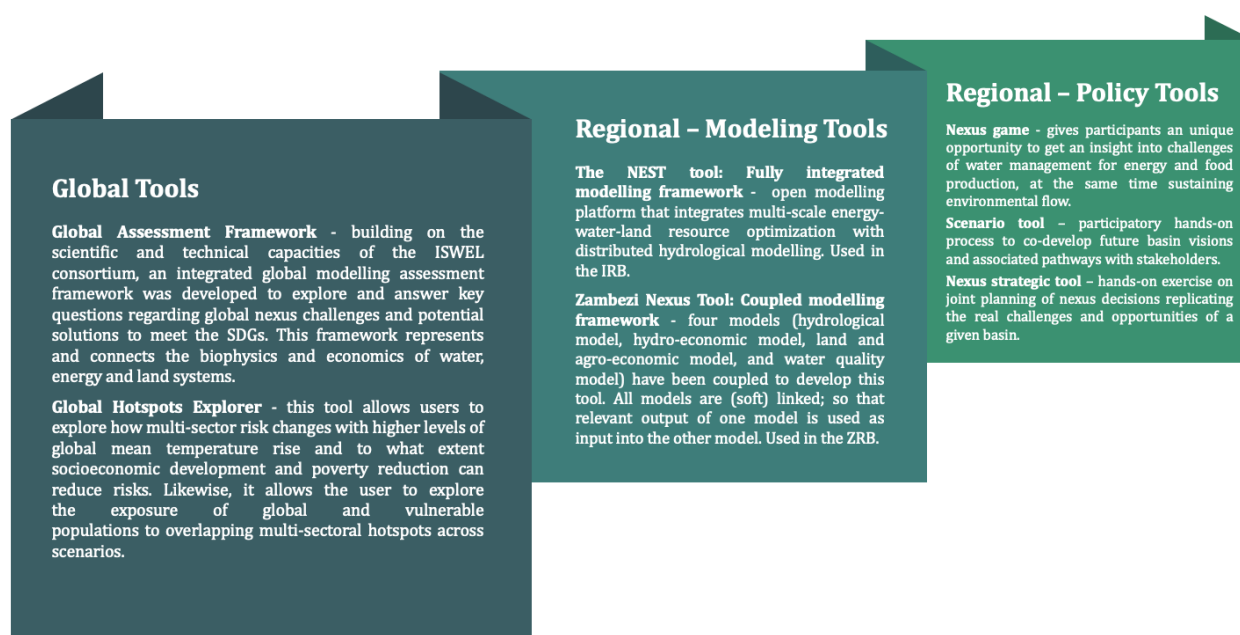


Figure 7: Tools developed in the ISWEL project

2.2.2 Behavioural Change

Access to the above-mentioned tools combined with the series of stakeholder's engagement and knowledge exchange activities meant that the project contributed to mainstreaming nexus issues into the policy agenda. It:

- **Increased the ability of planners in the two basins to plan in an integrated way** because they could develop scenarios describing uncertainties about future trends and drivers across nexus dimensions. Their having open source global and regional modelling and policy tools enabled better communications between the multiple sectoral stakeholders involved in planning processes (ministries, regional organisations, research institutions and practitioners);

"The ISWEL Project contributed to improve management of Water Energy and Food around the Zambezi River Basin in Mozambique" (Mozambique stakeholder)

"The ISWEL Project brings attention to need for harmonised planning and management of water, energy and land" (Malawi stakeholder)

- **Improved the coordination of national and transboundary planning processes** across regions and river basins by using the developed tools in two very different river basins – the Indus and Zambezi– that followed different approaches – a national approach and a regional approach, respectively – and face different nexus and political challenges.

"The ISWEL Project provided tools and platforms for strategic planning processes" (Zambia stakeholder)

- **Improved exchange of nexus information and knowledge (social & research):**
 - Different government representatives, researchers and practitioners across sectors sat together at the same table to analyse and discuss nexus implications/challenges at basin level. In fact, it allowed information and knowledge exchange for the first time between countries such as India and Pakistan on basin challenges.

"ISWEL helped in capacity building and creating more awareness about the regional nexus concerns and challenges" (India stakeholder)

 - Drove scientific advancement by developing open source global and regional modelling tools that integrate water, energy and land issues.

"ISWEL increased capacity of our graduate students and researchers to use integrated modelling tools for WEF nexus." (Pakistan stakeholder)

 - Helped to start reducing the gap between researchers/scientific models/information and practitioners in the field. On the one hand, (1) it helped researchers to think outside the box and come up with ways to improve their models and its usability to facilitate the analysis of real issues on the ground, and (2) challenged researchers to find a good way to communicate and discuss complex subjects, such as nexus challenges and issues, and the models to address them. On the other hand, it helped policy makers and practitioners to understand how the tools developed within the project can be used in their work.

The project contributes to inclusive and sustainable industrial development in its 3 main areas: **it is economically competitive, environmentally sound and socially inclusive.**

The AMF: At a global level, the project provided an integrated thinking approach that enables a holistic assessment across sectors and nexus dimensions. The approach is also effective in supporting the assessment of possible strategies for achieving Agenda 2030. The project carried out an analysis focused on understanding the required investments, potential trade-offs and pathways (including some solutions) to achieving multiple SDGs. It also considered the (multi)sectoral implications of climate change mitigation and adaption policies. For example, the AMF was applied to demonstrate the benefits of attaining **SDG12** (ensure sustainable consumption and production patterns) through minimizing the cost of implementing clean water and renewable energy goals consistent with **SDG6** (ensure availability and sustainable management of water and sanitation for all), **SDG7** (Ensure access to affordable, reliable, sustainable and modern energy for all), **SDG9** (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), **SDG13** (take urgent action to combat climate change and its impacts) and **SDG15** (protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

- It is potentially **economically competitive** as the tools are expected to support international organizations and donors to identify investment risks and opportunities, support global and regional

policy making, and more widely contribute to the scientific debate on sustainable development pathways. This will enable the identification of where efforts should be placed to yield the most cost-efficient-impact results, at the international, regional and national levels.

- It is **environmentally sound**, as the project identified hotspots vulnerable to climate change and development risks. The project not only developed the tools, but also demonstrated its use in different regions with different challenges, thus proving that it can be used to assess such varied and interconnected dimensions in different contexts.
- The project is **socially inclusive** at several levels:
 - In its execution and the use of the developed framework – including varied type of stakeholders interested and acting in the field. International development organisations have participated in the development of the project and in the facilitation of stakeholders' events and can use the tools to identify their project portfolio going further as well as to design and monitor programme/projects in the field. Educational and research institutions have contributed to develop/improve the models and have and are using them to raise awareness, build capacity and support policy decision makers. Government institutions and practitioners acting in the diverse nexus fields, that can use the model to inform the development of their activities (policy, planning decisions, programme/project development).
 - In the model itself –the models assess the potential exposure of global and vulnerable population to multisectoral risks. They do that by investigating how multi-sector risk changes with high levels of global warming and to what extent climate mitigation, socioeconomic development and poverty reduction can reduce the risks¹¹. In practical terms, the models identify risks and areas more exposed to those – hotspots – by combining the severity of climate change and subsequent hazards with the population's spatial distribution (exposure) and their vulnerability and capacity to prepare for and manage changing risks. Thus, within the definition of a scenario, the users not only select the severity of the climate change risk (changes in Global Mean Temperature of 1.5 °C, 2°C or 3°C above pre-industrial conditions) but also the combination of the socioeconomic projections of population and those 'vulnerable to poverty' from three Shared Socioeconomic Pathways (SSPs 1-3, income <USD10/day).

Several benefits for national stakeholders. In response to the question: “how the ISWEL project contributed to the different organisations” involved in the project, the following emerged:

- Scientific development as it helped advance the knowledge frontier on integrated approaches. Through the project IIASA integrated and connected different tools and knowledge they had in house and made them available to address pressing questions at different scales (global, regional and national).
- Helped organisations in identifying their strategies and project portfolio going further.
- Provided (innovative) tools and platforms for strategic planning processes.
- Helped to reduce the gap in the communications between scientist/researchers and stakeholders involved in planning processes – built a bridge between science and practitioners on the field.
- Developed ready-to-use tools that can be adapted by different organisations at different levels for varied analyses.
- Raised awareness on regional nexus challenges and solutions, the need for harmonised planning and management of WEL and promoted integrated thinking.
- Strengthened the capacity of multi-sectoral stakeholders to constructively engage with each other and negotiate solutions on transboundary issues.
- Improved integrated management/policy development of nexus issues in the IRB and ZRB.
- Propelled transboundary and cross-sectoral collaboration and cooperation amongst stakeholders in the regions¹².

¹¹ Edward Byers *et al* 2018 *Environ. Res. Lett.* **13** 055012

¹² 22 out of the 26 stakeholders that answered to the online questionnaire referred that the project fostered communication and cooperation amongst the riparian states and the remaining 4 answered maybe.

The following figure (Figure 8) shows what the most important ISWEL project accomplishments were in the opinion of the stakeholders who answered this question in the online survey. The modelling tools, the integrated thinking approach, the awareness raising on the nexus challenges, and support to strategic planning processes were identified by as the most relevant.

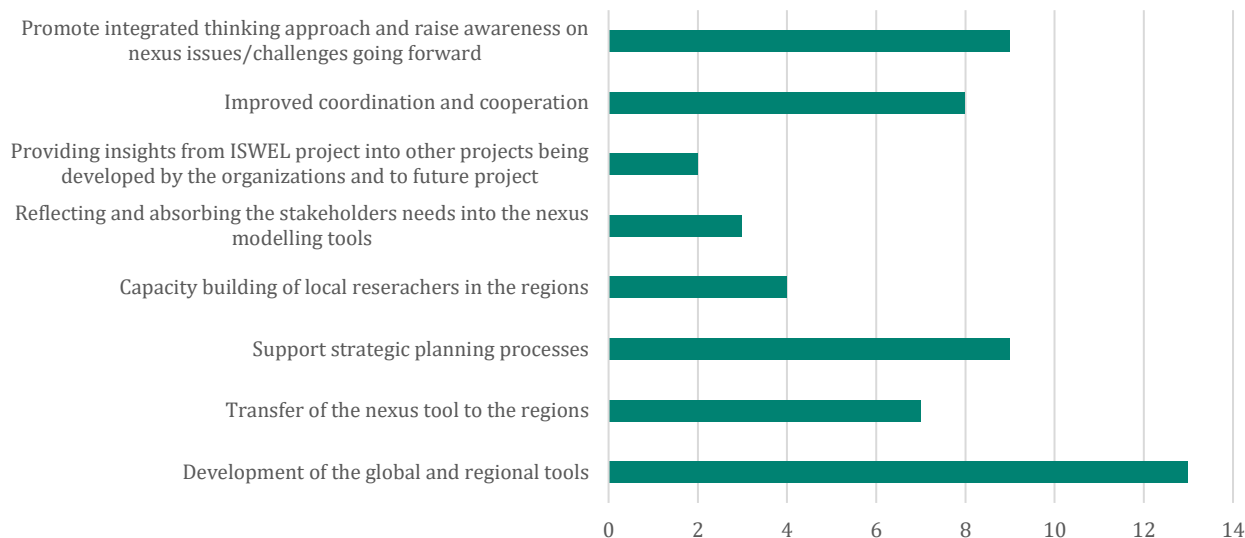


Figure 8: Stakeholders views on the most important accomplishments of the ISWEL project

2.2.3 Broader adoption

The ISWEL project produced a series of tools that have been used across different sectors, for different purposes.

The **integrated thinking, development approach and tools developed by ISWEL were mainstreamed/replicated at several levels.** Reports and information produced by the project were featured and disseminated in different ways (academia, high level panels etc.) and formats (scientific publications, policy briefs, online (webpage) and videos) by all project stakeholders:

- By the donor, the framework developed by the ISWEL project is to be used to inform the development of GEF strategies and project portfolio development and implementation going forward. Tools developed within the project started to be used in focal area meetings and are to be brought into other meetings within GEF in the future. For example, the GEF have expressed interest in using the Global Hotspots Explorer to screen for risks in their project development phase and the GEF International Waters focal area may similarly use the basin-level hotspots assessment to inform their Transboundary Diagnostic Analysis (TDA¹³).
- By the implementing partner, UNIDO, who has developed and is now implementing a nexus project in a Small Island Developing State (SIDS). Also, UNIDO is starting to take on board nexus approaches in project identification and design and project managers are considering using the nexus modelling tool in the design and implementation of their projects. In fact, in the say was as the GEF did, UNIDO have expressed interest in using the Global Hotspots Explorer to screen for risks in their project development phase.
- By the executing partners, IIASA, as it changed the way in which they work. ISWEL was a catalyst for the formulation of the institution's strategy going forward.
- By the beneficiary countries, in communication and policy assessment processes at basin level in ZRB and IRB case studies:
 - **Indus Basin stakeholders:** the model opened communications between the different states that share the basin (including countries with political challenges). The NEST model is being used in Pakistan to conduct nexus assessments, whereas in India, the Ministry of Environment with support from The Celestial Earth is using it to assess and address water issues in smaller basins

¹³ TDA is a diagnostic assessment of transboundary development and environmental problems supported by stakeholder engagement process that builds trust and identifies solutions through a Strategic Action Programme.

across India. In addition to this, Indus basin researchers took ownership of the tool and have presented it at international forums.

- Zambezi Basin: the integrated thinking approach promoted by the ISWEL project was used to develop the Strategic Plan for the Zambezi Watercourse, which will benefit the 8 riparian countries. The Plan is defined as, “.....a development plan comprising a planning tool and process for the identification, categorisation and prioritisation of projects and programmes for the efficient management and sustainable development of the Zambezi Watercourse”¹⁴ (ZAMCOM).

In fact, survey results show that 52% of the organizations (12 out of the 23 organizations) are using the approaches and lessons from the project, and of these, 67% (8 out of the 12 organizations) have more than 2 people using the ISWEL models. It is also clear from the survey that all the 23 organizations are using or may use the ISWEL framework and tools in future (see Figure 9).

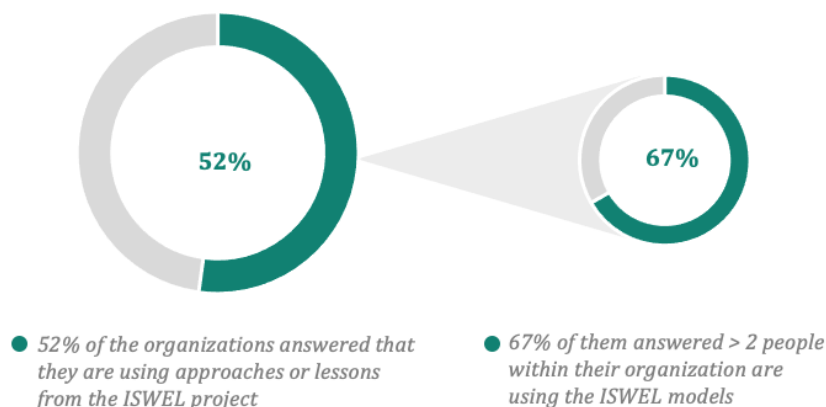


Figure 9: Responses to the use of the approaches or lessons from the ISWEL project and the ones that have more than 2 people in house using the ISWEL models

Still in terms of replication, the initial hotspot identification work carried out by the project was expanded to assess the multi-sectoral risks and vulnerabilities in 200 countries and 275 major river basins across the world, and this work was made widely available through an online platform – the GHE - that can be used by any interested stakeholders in their assessments.

The integrated thinking approach and the tools developed by the project are versatile enough to be replicated in multiple river basins across the world, to manage and coordinate planning across regions on other nexus areas (from large regions integrating several river basins to small river basins) or even to assess the implications and impact of a given intervention. The tools also facilitate the analysis of specific issues because the models can be easily tailored to analyse non-WEL issues. UNIDO and the World Bank already demonstrated interest in applying the tools in other geographical contexts.

For the broader adoption of the results and tools, there is a need to:

- a) expand the analysis (improve/add to the developed models and tools and explore different scenarios);
- b) widely build capacity and provide training at national levels, building ownership of the tools from the bottom up; and
- c) create knowledge hubs that can use them and contribute to improve the existing tools. Effective and efficient partnerships and funding are also needed to carry out these actions.

Considering that the ISWEL project was the first step in the long journey of developing the integrated assessment models with a view to providing strategic advice to policy makers and practitioners, the **progress to impact is considered Highly Satisfactory (HS)**.

¹⁴ <http://www.zambezicommission.org/programmes-activities/zambezi-basin-strategic-planning-and-development-zsp>

3. Part 3 - Project's quality and performance

3.1 Project design and project results framework

The ISWEL Project Document (i.e. the Project Document for the CEO Endorsement application, GEF Project ID 6993) was prepared based on the results of an extensive scoping study conducted to review the state-of-art in nexus assessments, including identification of limitations and gaps associated with existing assessments and opportunities for future research in the field. In addition, an informal consultative expert meeting was convened between GEF, IIASA and UNIDO (30 October 2015) where the results of the mentioned scoping study were discussed along with other topics: partnership design, project documentation that was prepared and the identification of case studies.

The main objective of the ISWEL project was “to establish a long-term systems approach to developing, refining and applying tools and skills essential for identifying approaches to energy, water, food and ecosystem security in selected regions in line with GEF 2020 strategy”. Three components were identified in the project document, namely:

- Component 1 – Development of a systems analysis framework for assessing solutions to nexus challenges
- Component 2 – Exploring nexus solutions at global and regional scales
- Component 3 – Capacity building and knowledge management: building the foundation for a knowledge ad capacity network on nexus decision support

Thus, the project aimed at solving a research-driven global challenge and concentrated on addressing clearly identified knowledge gaps. They are a series of steps needed to collect various types of climate change data, including a step where stakeholders need to be approached to “test” the “validity” of both the process and its modelling tools. Thus, they cannot be considered to represent causal pathways as would be required for a typical development intervention. This alternative design proved to be ideal for the project and had no impact on the quality of project results.

The project components, as formulated in the Project Document, are sound, appropriate and consistent with the stated project objective. The quantitative goals (targets as defined in the PRF) and main objective are well defined. The project was able to fulfil its scientific research goal with the production of not only one but three scientific models (one global, two regional) that are intended to aid stakeholders to better understand the interlinkages between the different WEL nexus dimensions and climate change, under the “integrated analysis” lens. This has the final goal of providing better quality information to take more appropriate decisions at policymaking. Moreover, it was not only the aim of the ISWEL project to generate a high-quality scientific product (proved by the fact that 30 scientific publications were made, 15 of them as Q1 scientific papers) but also to translate that into tools and publications that can be understood by different audiences, such as for example the Policy Briefs, which explain key scientific facts in a manner that is useful for policymakers.

The methodology that was envisaged at project design stage (i.e. interactive and participatory methods) to engage stakeholders from a variety of fields (researchers, governments, private sector, students, academia, etc.) in the different stages of project execution proved to be appropriate since stakeholders were able to actively participate in the development of the tools and share their views, expectations, analysis, knowledge and concerns with the project team. This enabled the project team to develop tools that actually take into account stakeholders’ opinions. The “nexus game” was relevant to activate interaction among the stakeholders themselves enabling them to sit down at a table to discuss common challenges attaining their basins and together finding possible solutions.

In addition, the project envisaged at design stage the involvement of young scientist during project execution. This type of working methodology is not new for IIASA since they usually involve young scientists pursuing PhDs in their research projects to train them. In the ISWEL project, students from the Indus and the Zambezi regions were involved and trained at IIASA’s headquarters in Austria with the aim of transferring knowledge and providing tools for them to continue their studies on the WEL nexus topic once they went back home.

Risks considered at design stage in the Project Document, such as, (i) information and capacity constraints, (ii) security and political instability, (iii) limited time to fully understand and incorporate political and historical realities, and (iv) lack of commitment from stakeholders were clearly identified, assessed, rated and mitigation measures were appointed to mitigate/overcome them. The identified risks at project document stage were and are still adequate.

The project design in terms of institutional and implementation arrangements is valid and relevant. This project is the first step towards an integrated assessment of WEL nexus challenges, easing the challenge of providing (WEL nexus) coherent strategic advice to policy makers and practitioners. The design contemplated to engage different types of stakeholders:

- UNIDO as implementing agency
- IIASA as executing agency
- GEF as donor
- A group of experts that composed the Project Steering Committee, which was a key piece in providing suggestions and guiding the project execution throughout all the 4 years
- Experts/researchers of the regional scene, who were consulted during workshops or meetings to gather their views and confirm the project was aligned to local needs.
- Regional stakeholders including governments representatives¹⁵, regional development commissions and organisations¹⁶, industry, NGOs, other

“One of the most important accomplishments of the ISWEL Project is to ensure the good quality of water resources management around the World in collaboration with the Academia and other stakeholders” (Mozambique stakeholder)

ISWEL was designed as a scientific research project, and even though UNIDO was the project’s Implementing Agency, the entire budget was allocated to the Executing Agency (IIASA) under a single subcontract for project execution and implementation. UNIDO just kept enough resources to conduct the Independent Terminal Evaluation of the project. But UNIDO was also member of the PSC and participated actively in project oversight. Thus, in terms of implementation arrangements, there was some overlap of responsibilities between UNIDO and IIASA, which was resolved at the start of the project thanks to the good communication and adaptability of the project partners.

The GEF-IIASA-UNIDO arrangement worked well and helped the project achieved the desired results. That in combination with approaching and relying on regional stakeholders such as for example on ZAMCOM to engage and represent the 8 riparian states and on LUMS from Pakistan and TERI from India on the scientific development of the tools proved to be a good approach. Therefore, it can be concluded that apart from having GEF-IIASA-UNIDO to coordinate implementation and execution, it was key to have local bodies to engage local stakeholders and local research bodies to support on the scientific work.

The project design included a Monitoring and Evaluation plan and its associated budget, which is discussed in Section 5.1.

The PRF includes an adequate structure, outcomes and outputs, as well as specific, measurable, attainable, achievable and timebound (SMART) indicators. It also describes the assumptions but not the risks. The PRF:

- Was designed in such a way that the outputs were the actual project deliverables (tools, assessment frameworks, reports, summary for policy makers etc) or workshops/seminars attendance metrics, and thus there was no need to present a baseline for these indicators.
- Contains a list of assumptions – at output level – which seem realistic and would allow achievement of the outputs.
- Contains adequate, effective and reliable sources of verification.
- Contains specific and appropriate indicators to measure the expected outputs. In terms of quantity, quality they also seem overall appropriate.

Nonetheless:

- **Gender-related indicators were missing in the PRF.** The Project Document states that (although it was not possible to generate gender disaggregated scenarios for lack of data) gender equality would be promoted through participation of qualified female candidates wherever possible and appropriate, in

¹⁵ Department of Water Resources in the Ministry of Forestry and Natural Resources, Malawi / Regional Water Administration of the Zambezi, Mozambique / Department of Water and Sanitation- Botswana / Zimbabwe National Water Authority -ZINWA / Ministry of energy and water, Afghanistan / INRH Angola

¹⁶ Zambezi Watercourse Commission

stakeholder consultation activities, capacity building, training programs and the Young Scientists Summer Programme. Because of this, no targets were set for gender participation.

- **Some targets should have been set in a clearer way.** This happened in activity 3.1.1 where the indicator is “Expert advisory meetings (yes/no)”, and the target is “Number of informal expert advisory meetings conducted”; the target should have been an actual number (1, 2, 3lc...) indicating how many meetings the team was aiming at conducting throughout a selected time frame (e.g. per year or project lifetime).

The ET rates Design and PRF as **Satisfactory (S)**.

3.2. Relevance

This project has a significant global relevance in its development of modelling tools for analysing WEL nexus challenges which touch on a wide range of development challenges: how to minimize environmental impacts of socio-economic activities of most rural farmers, SMEs, and planners in developing countries. The models developed are sophisticated online tools but remain user-friendly and have been made available as open source, to facilitate their adoption for immediate use by planners and researchers throughout the world.

Because of their comprehensive approach, the models are likely to make a significant contribution to the achievement of the SDGs at global, regional, and local levels by making it possible to plan in an integrated manner that provides for truly ecologically sustainable industrial development. It is, in the view of the evaluators, highly innovative and is the first of its kind to develop scientific modelling components in close consultation with real-world policymakers. It is also innovative in that it addresses a global challenge, giving it a relevance that goes far beyond the project’s own sphere of influence.

The project is aligned with the international frameworks (such as the SDGs, Sendai, Paris Agreement) as well as plans, visions, strategies, knowledge, and data at regional and national level, in particular, in the definition of the models used in the regional assessments. The project is relevant for the achievement of the SDGs: the framework analyses nexus issues and challenges in the context of the SDGs (including SDG 1 (poverty), 2 (hunger), 6 (water), 7 (energy), and 13 (climate)) by means of identifying trade-offs and potential synergies in reaching them; and contributing to driving policy, strategy and investment towards the biggest impact in terms of achieving the SDGs. This allows international development agencies and countries to better define their investment portfolio, prioritize projects and establish strategic roadmaps. At national and regional level, the project is relevant to assess and define regional and national policies and identify investment projects in the WEL field.

In conclusion, as shown in Figure 10, when asked about the project’s relevance, the majority (88%) of respondents classified it as “Very relevant” or “Relevant” project, and of those, 83% were engaged in project activities. Thus, stakeholders’ opinions match the ET’s perception with regards to the relevance criterion.

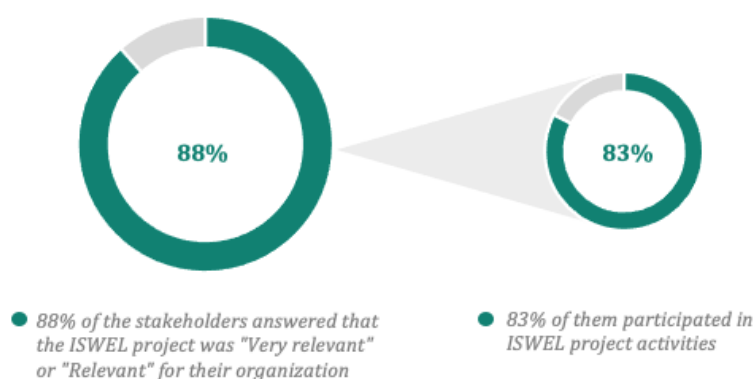


Figure 10: Stakeholders views on the relevance of the ISWEL project and its connection to the participation on the ISWEL project activities

3.2.1. Relevance to GEF priorities

This project is relevant to GEF.

It is aligned with the GEF 2020 strategy since the project:

- (i) focuses on the water-energy-land nexus in the context of major global challenges such as urbanization, environmental pressure, and equitable and sustainable futures; and

- (ii) developed a framework which enables the identification of integrated investment strategies and approaches for achieving the needed transformational outcomes (across nexus areas and SDGs).

It reflects all five GEF 2020 strategic priorities, namely:

- (a) address the drivers of environmental degradation.
- (b) deliver integrated solutions.
- (c) enhance resilience and adaptation.
- (d) ensure complementarity and synergies, especially in climate finance and
- (e) focus on choosing one influencing model, with a special emphasis on (b) and (e).

The ET notes that the ISWEL framework will be used by GEF in a more holistic and integrated way for assessing and establishing its strategy and portfolio going forward. Therefore, the models developed by this project will support decision-making at GEF.

Furthermore, the project is also fully in line with two GEF focal areas:

- Climate change mitigation (CCM) – as it identifies mitigation strategies that are compatible with other SDGs, especially those related to the long-term management of water, energy and land resources.
- International waters (IW) – as the project activities specifically support countries to jointly manage their transboundary surface water basins and does so by promoting collective management of transboundary water systems – ZRB and IRB as example case studies.

3.2.2. Relevance to UNIDO priorities

The project is in full line with UNIDO's mission, "to promote and accelerate inclusive sustainable industrial development (ISID) in Member States"¹⁷, and the framework contributes to its four (4) strategic priorities as defined in the *UNIDO's Medium-term Programme Framework 2008-2021 – from strategy to action*¹⁸: (a) advancing economic competitiveness; (ii) safeguarding the environment; (iii) creating shared prosperity; and (iv) strengthening knowledge and institutions. In fact, as for GEF, the ISWEL project not only contributes as a project to the implementation of UNIDO's mission but can also be adopted by UNIDO to work under an integrated thinking approach to ease the discussion about nexus issues across different departments, and to better identify (screen) projects, select appropriate indicators at design stage to enable better performance monitoring, evaluation and reporting of those projects.

The overall project relevance is rated **Highly Satisfactory (HS)**.

3.3. Efficiency

Efficiency considers several aspects of the project:

- (i) cost of the project and value for money;
- (ii) mobilization of co-finance;
- (iii) use of inputs (if more results could have achieved with the same inputs – human resources, financial) and
- (iv) production of results, outputs and outcomes in a timely manner and if those were of good quality and accuracy.

Nearly all project components' deliverables were:

¹⁷ <https://www.unido.org/who-we-are/unido-brief>

¹⁸ https://www.unido.org/sites/default/files/files/2019-01/MTPF_Brochure_23-06-2017.pdf

- Completed mostly on time¹⁹ (as defined per the project team and as in the annual work plans) with a few exceptions that were associated to delays in workshops' organisation.
- Completed within budget, as all expected deliverables/activities were produced/implemented with the budget defined at the project design stage (and the project even delivered more than what was expected).
- Of good quality and scientific accuracy. Proved by the fact that two institutions of the Indus region (LUMS and the Indian Ministry of Environment, Forestry & Climate Change) are using the NEST Tool developed within the ISWEL project; and the project published 15 high impact peer review research papers on recognised scientific journals (e.g. classified as Q1 – top 25% impactful papers, and in IPCC Special Report on Global Warming of 1.5°C), apart from being captured in other publications such as the magazine Nature and in the New York Times.

The ET's opinion is that the project even went beyond expectations in terms of the activities and outputs delivered. In fact, several additional activities and outputs were also completed within the project timeline and within the same budget, as referred to in the effectiveness Section 2.1.

This project had three sources of funding: grant contribution from GEF (50% of the total project value) and the in-kind contribution from IIASA (corresponds to 38% of the budget), as shown in Figure 11. In fact, the level of in-kind co-finance by IIASA has exceeded the planned amount by USD1.3 million. UNIDO contributed to 12% of the budget primarily for monitoring and evaluation activities, the independent TE and travelling expenses.

The donor contribution served to support partially the development of the tools produced in the ISWEL project and to cover for the stakeholders' engagement activities (travel, venues, etc).

Efficiency is rated **Highly Satisfactory (HS)**.

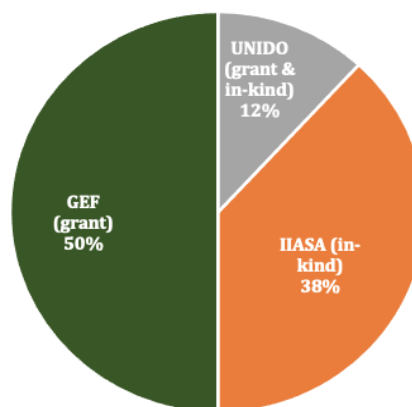


Figure 11- ISWEL financial resources

3.4. Sustainability

The sustainability analysis assesses the likelihood that key stakeholders can sustain the benefits yielded by this project after it has been completed.

Sustainability actions have been integrated into the project design and implementation, through:

- **The development of GHE as an open-source tool.** The GHE was developed as an open-source tool to encourage its generalised use and adoption worldwide and at regional and local levels. This not only tries to foster its use after the end of the project but also aims to motivate research groups and practitioners to jointly collaborate in its development and improvement.
- **The development of specific open source river basin models for the Indus and Zambezi basins**, that can be used by the different riparian states as well as by watercourses commissions/organisations. This showed how the global tool could be further developed for a regional and/or national analysis, according to the different needs of the regions and/or countries (respectively). It is important to refer that in the case of India and Pakistan, the model developed for the Indus region has been adopted and is being used (without financial support from the ISWEL project). In Pakistan, LUMS is using the model to advise the Government on planning issues and in India a team was established within the Ministry of Environment

¹⁹ The GEF CEO Endorsement Project Document was approved in June 2016. The project went into an Inception Phase between July 2016 until end of October 2016 and started its actual implementation in November 2016. Project implementation was expected to be completed by the end of 2019. Nonetheless, the project was extended twice: the first extension at the end of 2019 to run until June 2020 to respond to ZAMCOM's request to postpone the 3rd Zambezi Workshop to 24-25 March 2020 (in Maputo, Mozambique) due to the institutional changes that were taking place in ZAMCOM. But COVID-19 pandemic broke out and travel restrictions led to a second extension until 31 December 2020. Then the workshop was proposed to be done virtually and, unfortunately, it was not possible to reach a consensus with ZAMCOM regarding the "virtual approach" and in the end the workshop was cancelled. All these issues were out of the control of the project, but extensions were justified by the significance of the Workshop to the project's results both in terms of research outcomes and capacity building.

to use the model for internal planning on the biodiversity area. The experience in Zambezi was different since, for this region to be able to adopt and use the model, there is a need to build further capacity and provide training on the tool and its use.

- **Building capacity of stakeholders in the development and use of the regional models** as well as on the “integrated thinking and approach” necessary to tackle nexus issues.
- **Stakeholder’s consultation activities/meetings** which were intended for the collaborative development of the regional models.
- **The scientific exchange programmes (YSSP).**

We find **this project is unique and innovative**: it is a scientific project that brings together and supports the analysis of strategies within different areas of action of both the donor and the implementing agency. It does so by providing an integrated thinking approach and tools that enable a holistic assessment across sectors and nexus dimensions to ultimately support the evaluation of strategies for achieving the SDGs. GEF intends to use the integrated nexus framework to inform the development of GEF strategies for addressing drivers of environmental degradation through integrated approaches across GEF focal areas as a means to increase GEF’s sustainability impact. GEF has also used the Policy Tool in focal groups meetings. The project developed the framework and demonstrated its use in different regions with different challenges, thus proving that it can be used to assess such varied and interconnected dimensions in different contexts.

Through the ISWEL project implementation, the integrated thinking, development approach and tools, were not only seen as important means to guide GEF strategies and portfolio development and implementation going forward but also its benefits were felt by IIASA, UNIDO and the stakeholders involved and will probably inform their working strategy and direction going forward, and thus likely sustained beyond the ISWEL project:

- **It changed the way in which IIASA worked and was a catalyst for the implementation of IIASA’s strategy going forward.** At the start of the project, IIASA was a “non-nexus” organisation as it had three (3) different groups working in water, energy and agriculture. Through the ISWEL project, the three teams within IIASA were brought together and they are now working in an integrated way; they learnt how to work together on nexus issues and nexus dimensions dynamics; provided IIASA an opportunity to see how the models that they develop can be used to inform policies and identify/analyse policy impact (passing from research into practice). In fact, the ISWEL project was a catalyst to fuse some of the existing research groups within IIASA and was an inspiration that is guiding the strategy of the research group going further: pursue the assessment of nexus issues through an open source platform working together with other research groups, policy makers and practitioners in the development and improvement of useful and easy to use research tools.
- **For UNIDO, it can support the implementation of their programmes, considering a more integrative way of working, and specially concerning activities that recognise nexus dimensions.** The ISWEL framework (integrated thinking approach and models):
 - Is important as UNIDO is looking into develop projects/programmes that integrate more than one nexus dimension.
 - Can be used by several teams and across departments: Digitalization, Technology and Agribusiness; Environmental and Energy; External Relations and Policy Research; and Programmes, Partnerships and Field coordination.
 - Can guide the development of the project portfolio as well as the assessment of projects’ impacts. The developed framework has the potential to be used throughout the design, implementation and monitoring stages of UNIDO programmes and projects portfolio. At the design stage, it has an important role to play – as it could help define the indicators and select sectors/countries/regions to focus on. At the implementation stage, it can also be used for M&E by updating data sets. There was a clear interest demonstrated by UNIDO employees in the GHE²⁰ and in using it for their projects. Also, it was referred by some of the consulted stakeholders, that the tools and approach of the ISWEL project can be used to promote close cooperation between UNIDO departments and shift from the “silo-thinking” approach to a more “integrated approach” not only in programme/project development and implementation but also in the organization itself. In fact,

²⁰ The nexus Hotspot Explorer tool developed within ISWEL was presented to UNIDO employees across several departments in a Webinar that took place in October 2020.

UNIDO is already pursuing the development of some nexus projects (e.g. Sustainable Energy Access to manage Water Resources: Addressing the Energy-Water Nexus in Cabo Verde).

- **For the beneficiary countries involved in the project, the project contributed to their knowledge and skills development.** It has widened their vision about this systematic and integrated approach concept and provided information, analytical skills, knowledge and tools, that were used on the ISWEL project, which they can use in other projects developed by them in the future or for planning purposes at national or regional level. They claim to be more aware now about the interlinkages of the different nexus dimensions and how actions taken locally can have an impact also at regional level.

Sustainability, if assessed having into account the nature of the project and the fact that it is a start in the assessment of nexus issues, is rated **Highly Satisfactory**.

3.5. Gender mainstreaming

At the design stage, and more specifically in the ISWEL Project Document, it was referred that the project would be in line with the **UNIDO Policy on Gender Equality and the Empowerment of Women**, adopted in 2009 and revised in 2015, **UNIDO's Gender Equality and Empowerment of Women Strategy 2016-2019**, as well as with the **Lima Declaration** adopted in 2013, to ensure that men and women equally benefit from the ISWEL project and that in order to ensure that gender inequalities in activities and outcomes were minimised, gender dimensions were going to be considered where applicable throughout the entire project implementation. It was additionally referred to in the Project Document, that efforts would be made to be inclusive and to promote the participation of qualified female candidates, wherever possible and appropriate, in stakeholder consultation activities, capacity building efforts, training programs and the scientific exchange program.

Nonetheless, **no gender specific activities, targets, baseline or indicators were put forward** for this project at the design stage. In spite of the previous, the ET was able to identify during ISWEL project implementation (from the Progress Reports and Interviews) that some activities did consider gender approaches and encouraged the participation of women:

- Gender dimensions were taken into consideration in the selection processes for the:
 - PSC members: The ToRs for the selection of the PSC referred that gender balance was one of the criteria to be taken into consideration. Two (2) out of six (6) appointed PSC members were women (33%); and
 - Special attention was put in the selection process of the interns for the YSSP regarding gender balance. The programme included 3 women and 4 men (43% female participation).
- PSC meetings counted with 26% women participation (PSC members + project & research team members).
- Gender was taken into consideration in the stakeholders' consultation process. Whenever there was a workshop, the ISWEL team would always make an effort to encourage women participation by inviting them to share their views and thoughts. The ISWEL consultation activities counted with 21% women participation (from a total of 352 participants 73 were women):
 - 20% women participated in workshops; and
 - 23% women participated in capacity development trainings.
- Gender dimensions and the need to address those were identified and openly discussed in development of the case studies – ZRB and IRB. In fact, the lack of an inclusive approach that includes gender, was highlighted as a constraint for fostering a cross-sectoral cooperation and nexus approach in the Zambezi Basin. In the 2nd Zambezi Stakeholders Meeting and Scenario Workshop, the topic on strengthening gender equality and social inclusion in basin-wide planning was discussed.
- On the other hand, the ISWEL project addresses collectively water, energy and land issues and proposed an integrated approach to solving those issues. This has an intrinsic benefit for women (and children) of the basins since they are in general the ones responsible for fetching water and also suffer disproportionately from indoor air pollution due to lack of clean cooking and electricity access. Therefore, any positive impact that this analysis may bring on how the WEL dimensions are managed will eventually yield potential benefits for the women (and children) too.

Also, from the online questionnaire, it is the opinion of the stakeholders that the ISWEL project has contributed or will contribute to gender equality: out of the 26 responses, 11 answered yes and 14 maybe. Only one (1) answered no.

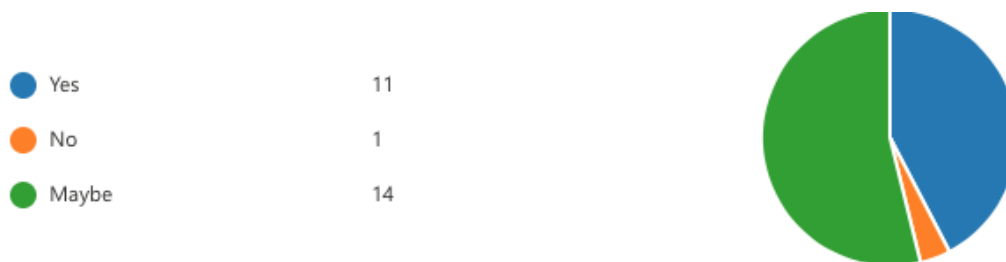


Figure 12: Stakeholders views on the contribution of the ISWEL project to gender equality

From the ET analysis on the participation of women and men on the realisation of the ISWEL project activities GEF-IIASA-UNIDO management & research team, it was found that the team counted with 41 people out of which 9 were women (22% of women participation).

Although the project did not have a gender focus, more could have been done on gender, such as monitoring and reporting with more detail how gender was considered or could have been considered in the case studies; keep track on the participation of women and men on the different activities promoted by the project and report on those. In addition, gender indicators should have been established at the design stage.

Gender is considered **Satisfactory**.

4. Part 4 - Performance of partners

The ISWEL project was designed as a joint effort of GEF-IIASA-UNIDO in consultation with regional and national counterparts. To provide guidance on the implementation of the project and ensure that the ISWEL project would meet the highest standards in both scientific merit and policy relevance, a PSC was formed comprising representatives of GEF, IIASA and UNIDO plus three well-known experts active in the fields related to the project's goals and mission.

4.1 UNIDO

UNIDO was the Implementing Agency of this project. It was responsible for: (i) participating in the PSC meetings; (ii) participating in some of the project activities, namely workshops and forums, drafting the Joint GEF-IIASA-UNIDO Summary for Policy Makers; (iii) reporting to GEF on the progress of the project implementation; and (iv) responsible for contracting the Independent Evaluator for carrying out the project TE and facilitate the evaluation process by providing all documents and necessary information.

UNIDO has performed all its tasks and even went beyond them. It was recognised by the project partners (IIASA, GEF and PSC members) that UNIDO was key in the delivery of the project. The UNIDO Project Manager (PM), was not only a supervisor, he became a team member. Apart from undertaking his tasks as PM, he was always available to provide assistance on what was needed: participating in the formal and informal meetings to discuss the direction of travel and deliverables/outputs of the project, have a key role in identifying and contacting national and regional stakeholders for the stakeholders' engagement activities; be present in almost all the project workshops; keep close and continuous contact with IIASA and the GEF.

It is important to highlight that the way in which the project was set up at design stage, this is, as a big contract arrangement between UNIDO and IIASA for the project execution and implementation, generated some overlap of responsibilities between the two agencies (IIASA was the Executing Agency for the ISWEL Project). Although UNIDO was the implementing partner, and to the eyes of the donor, the ultimate responsible for the project implementation, IIASA was the one in fact responsible for the execution and implementation of the project activities. It could be argued that, to avoid that overlap, both agencies could have stick to their strengths in the project, meaning UNIDO remaining with the overall management and supervision of the project implementation and IIASA with the coordination and execution of the technical/scientific tasks. Nonetheless, due to the good communication and adaptability of both parties, this issue did not impact the project development and implementation.

UNIDO performance is considered **Highly Satisfactory**.

4.2. IIASA

IIASA was the Executing Agency of the ISWEL project. It was responsible for: (i) day to day management of the project (ii) responsible for the overall development and implementation of the project activities, including the execution of the research tasks (including both global and regional perspectives), execution of the case studies, stakeholder's consultation strategy and activities etc; (iii) liaise and coordinate efforts among the several departments at IIASA to ensure the seamless execution of the project; and (iv) participate in the PSC meetings.

IIASA has performed all its activities effectively and efficiently and has shown a great capability to rise and answer positively to implementation challenges. IIASA is a research institution very well recognised in its field. During the project implementation, they had to adapt to a new way of working in order to deliver the project. IIASA was used to work on research in its specific fields (energy, water, agriculture/ecosystems etc) and in this project they had to work collaboratively among departments and in an integrated way too; they also had to work directly with stakeholders which added a new degree of complexity to which they were not that used to. In fact, all stakeholders referred that IIASA:

- work was excellent from the scientific point of view;
- always stayed on top of everything regarding project-development - it was very dedicated and always addressed issues and challenges that arouse;
- it came up with innovative ways of establishing connections with non-research stakeholders and use easy to understand ways of explaining the complex nexus issues and the models that it developed (e.g. the board game that it created to support the scenario building);

IIASA in itself has contributed with a lot of in-kind resources for the development of the project and was fully dedicated to it during its implementation. It is in fact of the ET opinion that without IIASA and its dedication, the project would not have been as successful as it was.

IIASA also excelled in creativity and the way it developed tools to facilitate exchange of information and communicate with stakeholders on the field. The game, that was created to foster dialogues and discussions among stakeholders to facilitate the identification of scenarios, pathways and the development of the model, was seen as "genius", as it worked extremely well and really involved people on the ground in the process of scenario development, without scaring them off with the computer models. In fact, it was referred by several stakeholders that the interactions during the workshops worked much better than what was expected.

However, there was the unintended challenge of the overlapping between IIASA and UNIDO on the activities' implementation monitoring, and the fact that IIASA was not used to the usual reporting procedures of UNIDO and GEF, which was embedded in the project design. Nonetheless, the ability of IIASA to ask for support from UNIDO and GEF, and their availability and commitment towards the project, mitigated this challenge and the actual project implementation was not compromised or affected.

IIASA performance is considered **Highly Satisfactory**.

4.3. Project Steering Committee

The PSC, composed of IIASA, GEF, UNIDO, and three members with broad competences in the WEL field (Oxford University, IPCC and TERI), was responsible for commenting on the policy relevance, budgetary and scientific content of the project. During the project, the PSC members were formally engaged in physical annual meetings as well as in virtual meetings, as needed. Bilateral meetings with specific members of the PSC were carried out as needed throughout the project to discuss specific topics related to its implementation.

It has been recognised by everyone involved in the project coordination and execution, that the PSC was very committed since its design stage, and that this level of commitment is not often seen. The concept and design of the ISWEL project was carried out by some of the PSC members. During its implementation all PSC members were very engaged – always available when needed and keen to participate and even people that changed jobs continued to be part of the PSC. The PSC was also demanding and have challenged IIASA team to go further than what was anticipated at the project design stage. Everyone in the PSC was convinced of the importance and possible outreach of the project and committed to it, and that was quite visible to the ET when they interviewed the PSC members.

PSC performance is considered **Highly Satisfactory**.

4.4. National counterparts

The national counterparts, namely the stakeholders involved in the development of the IRB and the ZRB case studies, were engaged in several activities of the project, namely: development of the modelling tool for their specific basins; participating in capacity building workshops/forums; identification and engagement with regional and national stakeholders; participation in the TE through interviews. Both case studies were different in context (i.e. due to intrinsic differences between the two basins' realities) and engaged different stakeholders with different capabilities: the IRB case study developed a model that was mainly used by universities/research centres at national level in Pakistan, India, China and Afghanistan; and the ZRB developed a model in cooperation with a regional organisation – ZAMCOM – that took care of convening the different representatives from the riparian states together around the development of the model and case study.

In the case of the IRB, the project worked with several institutions at national level:

- Pakistan: several institutions were involved in the project, examples are LUMS, Ministry of Planning, Government of Punjab, Water & Power Development Authority, Pakistan Centre for Advanced Studies in Water, Punjab Irrigation Department, UIB Network, Pakistan Council for Research in Water Resources (PCRWR) between others.
 - LUMS was a key stakeholder from Pakistan case study that acted as local facilitator for the project, organising meetings/workshops, establishing contacts with stakeholders; participated in progress meetings in Vienna and Nepal; contributed to the development of the tool by facilitating data and by having a PhD student and graduate students working on it (there were also some students that went to IIASA). LUMS was very engaged and cooperated very well during the ISWEL project. Proof is that the tools developed in the project were adopted and are being used by the students and are also being used to advise the government on planning decisions. In fact, the Government has plans to continue to work with the tool and with IIASA. Moreover, LUMS also contributed to the TE through an interview and through filling in the e-questionnaire.
 - The other Pakistan stakeholders took part on the project's capacity building workshops and forums for the development of the regional scenarios. In general, all stakeholders were very engaged in the activities and interested in the project and its outputs. Some of these stakeholders collaborated with the TE by filling in the e-questionnaire, where they highlighted the importance of the ISWEL project as well as the tools developed, although they referred that there is a need for more capacity building.
- India: several institutions participated in the project from India, namely TERI, TERI School of Advanced Studies, Indian Institute of Technology (IIT) Kharagpur, The Celestial Earth, Punjab Commissioner Agriculture, India National Institute of Hydrology, University of Kashmir, National Institution for transforming India (NITI). These stakeholders participated in the project's capacity building workshops and forums for the development of the scenarios, and in general, all were very engaged in the activities and interested in the project and its outputs. **TERI** was a key partner from India, and it was very involved in the project, in the capacity building activities, development of the model as well as in guiding the project direction as it was part of the PSC. Also, as a result of the project, the India's Ministry of Environment, Forestry & Climate Change started a project together with The Celestial Earth that is using the nexus tools for internal planning and conflict resolution– assessing small water basins across Indian states²¹ –, which is a concrete result of the degree of cooperation achieved in the countries.
- Several stakeholders from Afghanistan (Ministry of Agriculture, Irrigation and Livestock (MAIL), Ministry of Energy and Water (MEW), Environmental Conservation Specialist Organization of Afghanistan (ECSOA)) and China (National Climate Centre and Chinese Academy of Sciences, Xingjiang Institute of Ecology and Geography) participated in project's capacity building workshops and forums for the development of the scenarios, and in general, all were engaged in the activities and interested in the project and its outputs, except for China who did not send a representative for the last workshop. Some of these also contributed to the TE by providing feedback on the project through the e-questionnaire.

²¹ According to information provided to the ET, this project now came to a stall due to the COVID-19 pandemic and changes in the governance structure of the Ministry.

- Nepal: The International Centre for Integrated Mountain Development (ICIMOD), attended and hosted the ISWEL capacity building workshop and side events on their premises. Everyone enjoyed ICIMOD participation and were happy with the organisation and hosting of the events.

The project was unique in the way it promoted cooperation between the Indus riparian countries, more specifically Pakistan and India. Before the ISWEL project there was no cooperation or coordinated effort between India and Pakistan to look into transboundary issues (basins – water sharing water quality -; air pollution). The ISWEL project gave Pakistani and Indian researchers the opportunity to meet and discuss their collective concerns and individual issues attaining the Indus River basin during the ISWEL project events/workshops. The tool provided the opportunity to join Pakistani and Indian researchers bridging a gap through science. Also, the opportunity offered by the project to have China and Afghanistan together with Pakistan and China, was also highlighted as very positive, as that has been the only opportunity for the four countries to sit at the same table and discuss common issues of the basin.

In the case of the ZRB, the project worked with an accredited body – ZAMCOM – able to coordinate efforts at regional level, as this case study involved the eight (8) riparian states of the Zambezi River Basin: Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia and Zimbabwe. The cooperation:

- with ZAMCOM worked well until there was a change in the organization’s management (around March 2019): the first stakeholders meetings, workshops/forums to present the project and develop the model were carried out according to the original plan, data was collected to refine the model and the case study was developed during 2017 and 2018. With the change in the management of ZAMCOM, there was a shift on the priorities of the organisation (the Council of Ministers requested ZAMCOM to focus on the development of their Zambezi Strategic Plan) and cooperation with ZAMCOM became somehow difficult / non-existent despite the efforts put forward by UNIDO and IIASA to communicate and engage with them. This affected the conduction of the last workshop that was planned for the region (had to be postponed more than once and was arranged for March 2019), which had to be ultimately cancelled due to COVID-19. ZAMCOM contributed to the TE through filling out the online questionnaire.
- with the riparian states, mainly during the workshops/forums was good; they were very engaged in the activities and interested in the project and its outputs. During the ET, several riparian states answered to the e-questionnaire as well as were interviewed. They all see the high importance and value of the project and the tools developed and they highlighted the need for more capacity building to be able to use the tool.

It is important to refer that the level of engagement of the stakeholders in the two basins were quite different, while in the Indus basins some of the counterparts really engaged in the use of the model, in the Zambezi region, that did not happen, as there is a need to provide more capacity building so that the model can be actually used and adopted. This also has to do with the fact that in the Indus region, the institutions engaged are universities/research institutes that are clearly more used to using this type of tools, while in the Zambezi region there were in general government representatives involved apart from ZAMCOM (which is not a research institute).

Overall, national counterparts’ performance is considered **Satisfactory**.

4.5. Donor

The donor, GEF, was very proactive and very involved in the project design and execution. This project was the first of its kind, a scientific project transversal to several GEF focal areas, that addressed the SDGs in an integrated way and that shows how science can be used to support policy development with a practical implementation component at global, regional and national level.

In fact, it is the opinion of stakeholders that in this particular project, GEF went beyond the expectations. The ISWEL project was designed following a suggestion from GEF about the benefits that having a tool with a scientific basis would bring, to identify where to invest and where projects would be more valuable (have more environmental and social benefits). During the implementation of the project GEF was very engaged: it was part of the PSC, participated in all PSC meetings and when necessary in bilateral meetings; attended some stakeholders events, etc. The GEF manager even went further and used some of the ISWEL tools – the stakeholders’ participatory approach with the game – to some International Waters meetings in the region and she plans to bring it to their global GEF meetings – to show how the tool can be used to address the SDGs. GEF provided the project funding on time for the project and contributed to the development of this TE as PSC member.

Moreover, together with UNIDO, GEF also started the development of another Nexus project for SIDS – GEF/UNIDO Sustainable Energy Access to Manage Water Resources: Addressing the Energy Water Nexus in Cabo Verde (GEF ID: 9812)²² that started its implementation in March 2019.

Donor performance is considered **Highly Satisfactory**.

4.6. Establishment of partnerships

The ISWEL project was very successful in the establishment of partnerships to achieve its objectives at different levels, especially in the Indus region:

- **Management and implementation partnership** (between GEF, IIASA, UNIDO and other partners in the PSC) **was very efficient and effective**, and it was key for driving this project to achieve and even go beyond its objectives. It was in fact highlighted in several interviews that the reorganisation of IIASA and the way they positively responded to the demands posed by the PSC, the commitment and involvement of UNIDO and the enthusiasm and challenging nature of the people in the PSC was also something unique and not often seen. The cooperation between GEF-IIASA-UNIDO was highlighted several times as a great success for this project during the interviews that the ET carried out.
- **Partnerships with institutional stakeholders, especially in the Indus**. The partnerships established for the Indus basin were very successful for the development and adoption of the models at national level, specifically for India and Pakistan, with TERI and LUMS respectively, and also promoted and successfully achieved cooperation between countries with political differences that do not usually work together.

When looking into the **efficiency of the project regarding the establishment of partnerships** to continue to use the approach and tools, it is the opinion of the ET that the project was very successful, especially taking into account the amount of work and the complexity of the work carried out in this project and that the tools were ready to be used more towards the end of the project. The integrated framework, including the integrated thinking approach, models and the stakeholder engagement tools are being used:

- by graduate students and PhD students at LUMS in Pakistan;
- by the Ministry of Environment in India in the analysis of smaller river basins across Indian states;
- by GEF in their focal group and global meetings;
- by UNIDO/GEF on a project in the SIDS and on other projects that are also addressing more than one nexus;
- IIASA in the way they are now working, developing and implementing projects;
- by ZAMCOM in the development of the Zambezi Strategic Plan²³; and
- by some of the Zambezi riparian countries, that are disseminating the knowledge and importance of considering nexus issues at the planning and implementation stage.

Overall, partner performance and establishment of partnerships is considered **Highly Satisfactory**.

²² Source: <https://www.thegef.org/project/sustainable-energy-access-manage-water-resources-addressing-energy-water-nexus>; and <https://open.unido.org/projects/CV/projects/170001>

²³ The model was not used in the preparation of the plan as it was not yet ready by the time the plan was developed, but the approach and integrated thinking was. In fact, in the interviews that the ET carried out, it was referred that integrated thinking approach was used on the plan.

5. Part 5 - Factors facilitating or limiting the achievement of results

5.1. Monitoring & Evaluation

The M&E system used during the implementation of the ISWEL project was the one set up in the ISWEL Project Document. The M&E activities and the expected reports were already compiled at the time this TE took place.

M&E were considered at the project design stage and constituted the fourth project component having specific objectives, outputs and an adequate allocated budget²⁴ (see Table 2).

In addition, the ISWEL Project Document detailed specific and measurable indicators to be used to monitor the project implementation performance. The M&E activities of the project followed the principles, criteria and minimum requirements set out in the GEF Monitoring and Evaluation Policy²⁵ and corresponding guidelines. Monitoring activities were carried out in time as per project plan and reporting on progress of activities was carried through Project Reports.

Table 2: M&E activities/outputs at design stage

Main M&E Activities / Outputs as per ISWEL ProDoc	Amended M&E Activities / Outputs ²⁶	Target	Budget	Engaged Parties
Measurement of Means of Verification for Project Progress and Performance Project Implementation Reports (PIR) to -EF - 3 annual PIRs ²⁷	-	3 Annual PIRs	USD10,000*	UNIDO
Semi-annual progress reports	Semi-annual progress updates 4 Annual Progress Reports from IIASA	4 Annual Progress Reports	-	IIASA
Project Terminal Report	Project Terminal Report to be submitted by end of 2020 with project extension	1 Project Terminal Report	USD10,000*	IIASA & UNIDO
Independent Terminal Evaluation (TE) ²⁸	To be submitted by January 2021 with project extension	1 TE & 1 TER	USD35,000	Independent Evaluator, IIASA, UNIDO, UNIDO Evaluation Division

Note: * Excluding project team staff time

The following table (Table 3) evaluates the implementation of the M&E activities/outputs as per the M&E plan and its amendments throughout time. As it can be seen, overall, the M&E activities/outputs were implemented on time

²⁴ M&E budget was considered adequate since:

- the budget allocated for drafting the project Progress Reports & Terminal Report excluded the project team staff time;
- the budget allocated for the TE is in line with the budgets normally allocated for terminal evaluations of GEF projects of the same scale.

²⁵ GEF Evaluation Policy, June 2019, http://www.gefio.org/sites/default/files/ieo/evaluations/files/gef-me-policy-2019_2.pdf

²⁶ Most of these amendments are associated with the extension of the project. The amendment related to the change of the semi-annual progress reporting to semi-annual progress updates and execution of annual progress reports, was an information amendment to the M&E system carried out – a change detected in between the ISWEL Project Document and the Contractual obligations between IIASA and UNIDO.

²⁷ As per the UNIDO, the PIRs should cover at least one full year of activity, thus with the project starting in Nov 2016, the first PIR instead of being submitted in July 2017, was only submitted in July 2018, covering the period from the start of the project in beginning of Nov 2016 to end of June 2018.

²⁸ In the ISWEL Project Document the Project Terminal Evaluation was called the Project Final Evaluation (PFE).

and in accordance to the workplan. All Project Reports that the ET had access to seem complete, accurate and fit for purpose.

Table 3: Implementation of M&E activities/outputs

Main M&E Activities / Outputs	Target / Time	Where these activities/outputs carried out/achieved on time?	Where these activities/outputs carried out/achieved complete and accurate?
Measurement of Means of Verification for Project Progress and Performance Annual PIRs submitted to F by UNIDO	3 PIRs covering the project implementation period Time: 1 per year	● 3 PIRs were produced and submitted to GEF. The first PIR covered the period from Nov. 2016 to Jun. 2018, the second PIR covered the Jul. 2018 – Jun. 2019 period and the third PIR covered the Jul. 2019- Jun. 2020 period. They were submitted on time and covered the entire implementation period of the project, from Nov. 2016 to end of Jun. 2020 ²⁹ .	● The submitted PIRs were complete and accurate and carried out using GEF template.
Semi-annual progress updates Annual Progress Reports compiled by IIASA	Semi-annual progress updates 4 Annual Progress Reports	● Project updates were provided by IIASA informally to UNIDO, on an ad-hoc basis and also project progress was discussed during the PSC meetings, which were carried out normally in between Annual Progress Reports. ● There was an Inception Report developed at the start of the project and 4 Progress Reports covering the period between beginning of Nov 2016 to end of Nov 2020. ¾ of the Progress Reports were submitted on time. The report covering the third year of implementation (2019) was finished during the period of the TE and covered the activities of 2019 and almost all of 2020. The reason for the delay was associated to the postponing of the last Zambezi workshop, because the team wanted to integrate the results of that into the report.	● The annual Progress Reports were overall complete and accurate. They reported in all activities/outputs of the project through the use of the indicators set on the PRF; risks and risk management strategy, project management, work plan etc.
Project Terminal Report	1 Project Terminal Report Time: End of the ISWEL project	● Project Terminal Report was developed and submitted on time at project end date (December 2020).	● The Project Terminal Report is complete and accurately reflects and summarises project achievements at global and regional scales as well as provides overview for sustaining project legacy.
Independent Terminal Evaluation (TE) ³⁰	1 TE & TER Time: 3 months after conclusion of the ISWEL project	● Carried out between Oct 2020 until first week of Jan. 2021. ● Final TER to be submitted by first week of Jan. 2021.	- Not Assessed as this is the current report.

Note: * Excluding project team staff time

The risks indicated in the ISWEL Project Document were monitored and evaluated throughout project implementation, and a Risk Mitigation Strategy (risk management mechanism) was put in place to address the two medium-size risks of the ISWEL project (related to stakeholders' participation).

²⁹ The rest of the implementation of the project is covered by the Project Terminal Report.

³⁰ In the ISWEL Project Document the Project Terminal Evaluation was called the Project Final Evaluation (PFE).

Rating of the M&E assessment is **Highly Satisfactory**.

5.1 Results-Based Management (RBM)

5.1.1 Results-Based work planning

The ISWEL CEO Endorsement ProDoc was approved for implementation in June 2016 by GEF, and the project entered a start-up phase for five (5) months and started its actual implementation in November 2016. The project was expected to run for 3 years and finish its implementation by end of 2019. Nonetheless, the project implementation was extended until end of 2020 so that the pending activity of the project, i.e. the final workshop on the ZRB case study, could take place. Unfortunately, the activity could not be implemented due to (1) ZAMCOM's difficulties to arrange a suitable date after changes in their management and the shift of the organisation's priorities, (2) the arrival of the COVID-19 pandemic in March 2020 which forced the event to be cancelled and (3) the fact that it was not possible to agree on carrying out the event by virtual means (online).

A workplan was put in place at the start of the project – in the Inception Report – and was revised and updated at least annually based on the actual project implementation progress, as evidenced from the ISWEL Progress Reports. The PRF (activities, milestones, indicators, targets), and its amendments, was used in the assessment of project's implementation in the ISWEL Progress Reports.

5.1.2 Results-Based monitoring and evaluation

The M&E plan specified in the project document was the one used throughout the implementation of the project. The system was however adapted: the project started to develop annual Progress Reports instead of six-month progress reports; the deadlines for the project outputs/products were revised and updated on the Progress Reports and consequently the workplan for the project was also updated, at least until the end of 2018 (as per the documents supplied to the ET).

The project management and overall coordination mechanism seemed to be efficient and effective. However, from the design of the project, there was an overlap between the roles of UNIDO and IIASA, as IIASA was appointed to undertake both executing and implementing tasks of the project. The project might have had benefited if a clearer distinction between UNIDO and IIASA responsibilities had been made; with UNIDO managing the overall implementation of the project (of which the agency was responsible for according to GEF) and IIASA taking care of the research activities execution, as per each one's strengths and fields of action.

5.1.3 Results-Based reporting

The project demonstrated that it used a flexible and adapted management and implementation approach and tried to rapidly and effectively adapt to unforeseen changes or risks. According to information made available to the ET and based on feedback collected from the stakeholders, the project adapted its activities when necessary to respond to:

- PSC observations and suggestions – when the PSC advised on the development of a less rigid Global Hotspots Explorer Tool and the adoption of multiple indicators, the project team adapted the development of the tool to take that into consideration.
- Requests from beneficiaries – after ZAMCOM's management structure changed, priorities of the organization also changed and therefore ZAMCOM requested the ISWEL project to postpone the final workshop of the Zambezi case study from the end of 2019 to the beginning of 2020, for which the 24-25 March 2020 was the selected date. The ISWEL project duration was consequently extended beyond the end of 2019 to allow for the implementation of that specific project activity (that entered in stand-by when the COVID-19 pandemic started and eventually had to be cancelled);
- COVID-19 Pandemic – this pandemic that arrived at Europe and Africa in the beginning of 2020, in March 2020, impacted the conduction of the final workshop in the Zambezi, as explained. The project tried to overcome this hurdle and prepared all materials necessary to carry out a virtual workshop, but unfortunately it was not possible to arrange it with ZAMCOM.

The information on project performance and results achieved was shared with the PSC through its annual meetings, and guidance and suggestions on the depth/content of the activities were discussed / proposed by the PSC and taken into account by the ISWEL project. As per the interviews carried out, the implementation approach used on the project, with the PSC leading the direction of the project activities, was key to achieve the global results of the project – such as, the level of detail of the GHE tool.

The UNIDO HQ-based management, coordination, monitoring, quality control and technical inputs have been efficient, timely and effective. The UNIDO HQ has performed all its assigned activities in the project, held the necessary meetings with IIASA and partners, always participated in the PSC meetings, and engaged with

stakeholders for the organisation of the activities as needed (although this last activity was not part of its assigned tasks). The UNIDO-HQ also maintained the donor (GEF) informed and updated about project performance and activities as necessary: through telephone calls and submission of the three (3) PIRs³¹.

Rating for the RBM is **Satisfactory**.

5.2 Overarching Assessment and Rating Table

The following table summarises the ET assessment and results.

Table 4: Summary of the ET assessment of ISWEL Project implementation and ratings

Evaluation Criterion	Rating	Comments
A. Progress towards Impact	HS	<p>The ISWEL project is a very innovative and unique project, it is a scientific project developed to support planning decision on nexus issues through the use of an integrated framework. The project is really the first step towards moving from “silo thinking” to “integrated thinking” and it really contributes to mainstreaming nexus issues and SDGs into the policy agenda. It enhanced the coordination of national and transboundary planning processes considering nexus dimensions in an integrated way, even between countries with political sensitivities. It improved the exchange of nexus information and knowledge (social & research) by enabling basin stakeholders to share their experiences, providing open source global and regional modelling tools, reducing the gap between researchers/scientific models/information and practitioners in the field.</p> <p>The project encourages change at the agencies that coordinated/implemented it (GEF, IIASA, UNIDO) and at the Beneficiaries (countries) level (models being used by Pakistan and India, integrated thinking used in the execution of the Zambezi Strategic Plan). Other agencies, such as the World Bank, UNEP etc also showed interest in using the developed tools.</p>
B. Design and Project Results Framework	S	<p>The project is appropriate to address the lack of adequate modelling tools for assessing the potential synergies and benefits of integrated policies that address nexus challenges simultaneously. The design is consistent with the global and regional priorities as well as with donor priorities.</p> <p>Components/activities contemplated in the ISWEL Project Document are sound, appropriate and consistent with the project objectives, and overall, the quantitative targets and main objective were well defined. Risks were clearly identified, assessed, rated and mitigation measures were appointed to mitigate/overcome them.</p> <p>The project design in terms of institutional and implementation arrangements is valid and relevant. Although there was an overlap of responsibilities between UNIDO and IIASA, this was solved thanks to the good communication and adaptability of the project partners and did not impact the project outputs and deliverables.</p> <p>In terms of PRF, there is a coherent logic between the objectives, outcomes, outputs and activities. The expected outputs/deliverables of the project are considered realistic.</p> <p>Overall, the PRF is appropriate. It has an adequate structure, outcomes and outputs, SMART indicators, and identification of the assumptions, although it did not include risks. Moreover, it did not consider gender-related indicators and targets; and some targets should have been set in a clearer way.</p>
C. Project Performance		
C1. Relevance	HS	<p>ISWEL is highly relevant for the assessment of nexus issues and the achievement of the SDG at global, regional and local levels. It is a good technical proposal to start solving the issue of inadequate methods to assess potential synergies and benefits of integrated policies that address simultaneously all the nexus dimensions.</p> <p>It is consistent with the focal areas/operational program strategies of GEF and with UNIDO’s mandate and plan of action.</p>
C2. Effectiveness	HS	<p>The project was highly effective in the implementation of its activities. The ISWEL project not only delivered on all of the expected outcomes and outputs (except the last</p>

³¹ ISWEL Project Report I, II and III can be found on the GEF/ISWEL project webpage: <https://www.thegef.org/project/integrated-solutions-energy-water-energy-and-land>

Evaluation Criterion	Rating	Comments
		Zambezi workshop due to factors out of the control of the project team), but even surpassed them, through the production of additional ones. All stakeholders were very happy with the project results.
C3. Efficiency	HS	The ISWEL project efficiency was very high. Although the ISWEL project was implemented in 4 years instead of 3, the project activities/outputs were completed mostly on time, within budget and with good quality and scientific accuracy (Many Q1 papers were issued – Top 25% impactful papers). In fact, with the same budget the project implemented additional activities and outputs. The project partners implemented all their activities as planned, and financial resources for the project were available as planned and on time for its execution.
C4. Sustainability of benefits	HS	Sustainability actions were integrated in the project design and implementation, since: all developed integrated nexus models (GHE, IRB and ZRB models) are open and thus everyone can use them and/or contribute to its development; stakeholder capacity was built in the development and use of the integrated framework (integrated thinking, approach and tools); and through the scientific exchange programme. The integrated thinking, development approach and tools, are being used/will be used to address issues related to nexus dimensions, guide and inform strategy development going forward (for GEF, IIASA, UNIDO and stakeholders involved in the project).
D. Cross-cutting performance criteria		
D1. Gender mainstreaming	S	No gender specific activities, targets, baseline or indicators were put forward for this project at the design stage. However, gender was taken into consideration during the project implementation: (i) in the selection of the PSC and the candidates for the YSSP; (ii) selection of the project team; (iii) by discussing gender issues in the case study development; and (iv) in the project itself as project addresses collectively water, energy and land issues and proposed an integrated approach to solving those issues and this has an intrinsic benefit for women (and children) of the basins.
D2. M&E design and implementation	HS	The M&E system was well designed and implemented. Most of the M&E activities and reports (Annual Progress Reports, UNIDO-GEF Project Implementation Reports) were developed on time (except of the 4 th Progress Report) and were complete and accurate. Risks were monitored and evaluated throughout project implementation and a Risk Mitigation Strategy was put in place at the start of the project.
D3. Results-Based Management (RBM)	S	The project management and overall coordination mechanism seemed to be efficient and effective, despite the management issue identified and sorted at the start of the project. A workplan was established at the start of the project and continuously updated throughout the project implementation. The project used a flexible and adaptable management and implementation approach and tried to rapidly and effectively adapt to unforeseen changes or risks (PSC observations & suggestions; requests from beneficiaries; and COVID-19 pandemic).
E. Performance of Partners		
E1. UNIDO	HS	UNIDO has performed all its task and went beyond them. It was recognised by the project partners that UNIDO was key in the delivery of the project. There was some overlap of responsibilities between UNIDO and IIASA at the beginning but due to the good communication and adaptability of both parties, this issue was solved and did not impact the project development and implementation.
E2. IIASA	HS	IIASA performed all its activities effectively and efficiently and has shown a great capability to rise and answer positively to implementation challenges. IIASA has contributed with a lot of in-kind resources for the development of the project and was fully dedicated to it.
E3. PSC	HS	The PSC was very committed since ISWEL design stage, and this degree of commitment is not often seen: (i) PSC members were always available when needed and keen to participate; (ii) the PSC was demanding and has challenged IIASA to go further than what was anticipated at design stage; (iii) everyone in the PSC was convinced of the importance and possible outreach of the project.
E4. National Counterparts	S	Different level of engagement of the stakeholders in the two basins was found. In the Indus basin, stakeholders were very engaged in the use of the model; in the Zambezi basin, that did not happen, as there is a need to build more capacity. All stakeholders see

Evaluation Criterion	Rating	Comments
		<p>the high importance and value of the project and the tools developed. They were also very engaged in the workshops/forums and interested in the project and its results.</p> <p>The ISWEL Project was unique in the way it promoted cooperation between the riparian countries, especially in the Indus countries, where for the first time the riparian countries came together to discuss transboundary issues.</p>
E5. Donor	HS	GEF was very proactive and involved in the project design and execution. It is the opinion of stakeholders that in this particular project, " <i>GEF went beyond the expectations</i> ". GEF provided the project funding on time and contributed to the development of this TE.
OVERALL ASSESSMENT	HS	In summary the ET found the ISWEL project overall Highly Satisfactory .

Colour code used in the rating assessment:

Score	Definition	Category
6	Highly satisfactory (HS)	SATISFACTORY
5	Satisfactory (S)	
4	Moderately Satisfactory (MS)	
3	Moderately Unsatisfactory (MU)	UNSATISFACTORY
2	Unsatisfactory (U)	
1	Highly Unsatisfactory (HU)	

6. Part 6 - Conclusions, recommendations & lessons learned

6.1. Conclusions

C1. The ISWEL Project is an innovative “first of its kind” scientific research project that contributed to improving the global understanding of water, energy and land nexus interactions at different scales in addition to providing an interactive online tool (the GHE) and open source information to support that.

The project correctly addresses the identified challenge of the inadequate modelling tools for addressing WEL issues and identifying potential synergies and benefits of implementing integrated policies. The ISWEL project is a unique research project that provides an integrated thinking approach and a tool (GHE) that enables a holistic assessment across sectors and nexus dimensions to ultimately support the identification and evaluation of strategies for achieving the SDGs. The project achieved that at several levels: global, regional and national:

- At global level the project developed: a scientific integrated global assessment framework to explore and answer key questions regarding global nexus challenges and identify potential solutions to meet the SDGs; and developed the GHE where people can identify areas of confluence of nexus pressures.
- At regional level, the project:
 - Supported the riparian countries of the IRB and ZRB to develop scenarios and 2 case studies
 - Developed policy tools (nexus game, scenario tool and nexus strategic tool) that facilitated the stakeholders engagement process and activities. These innovative policy tools made: (i) the complex science behind the project easy to understand, promoted discussion, exchange of knowledge and information among stakeholders; (ii) built capacity; (iii) were a good way to define the different scenarios to be assessed by the regional models.
 - Fostered transboundary cooperation and collaboration to identify and address common issues in the basins. This is particularly evident in the Indus, since stakeholders highlighted the fact that this was “the first time they were able to sit together at the same table to discuss potential solutions to their challenges”.
 - Created greater understanding on what the models can do and how they can be used for policy making.

The scientific body of knowledge and information generated by the project has been acknowledged by the publications of more than a dozen high impact papers (classified as Q1) in scientific journals, by publications featured in the *IPCC Special Reports on Global Warming of 1.5°C* and *Climate Change and Land* as well as in media articles in *Nature* and the *New York Times*.

C2. Through the integrated assessment modelling framework and the successful stakeholders’ engagement activities implemented, the ISWEL project promoted and encouraged transboundary cooperation and curiosity for WEL topics, which is beneficial for sustaining its legacy and for a wider adoption of the framework.

The project increased the stakeholders’ ability to plan considering nexus dimensions in an integrated way, especially when applied to transboundary planning processes across regions. The stakeholders that participated in the workshops were able to exchange their views and opinions as well as nexus information and knowledge. This contributed to their ability to find solutions together for their common issues in a constructive environment led by the project.

In fact, the developed integrated framework is already being used to inform decision-making by project partners and stakeholders:

- Guides GEF investment strategies and portfolio development, in a more holistic and integrative way.
- IIASA changed the way they worked (teams’ integration) and ISWEL was a catalyst for the implementation of IIASA’s strategy going forward.
- UNIDO is already making use of the approach to support Programmes’ implementation addressing nexus dimensions.
- Contributes to Countries’ knowledge and skills to devise strategies for their sustainable basin development (the models are being used by Pakistan and India and the integrated thinking promoted by the project was used in the development of the Strategic Plan for the Zambezi Watercourse).

- The models were developed as open source integrated nexus tools (everyone can use them and contribute to their improvement), fostering adoption and interest at global scale.
- Most students that participated in the YSSP are working in the nexus field.
- Institutions that were engaged in using the model have continued to do so and have identified several basins & issues to apply it.
- IIASA has received several demonstrations of interest to use the model by a number of partners / stakeholders.

Nonetheless, now it needs to be replicated – upscaled so that integrated planning of nexus solutions is more widely adopted and applied at global scale. As expressed by interested stakeholders, financial support and resources are needed to extend the use of the framework and tools. This is particularly relevant when it comes to capacity building and training to upgrade both institutional and individual capacities to use the developed tools.

The ISWEL project is the first step in the journey to improved WEL nexus understanding for strategic policy planning and coordinated transboundary action and has demonstrated how nexus thinking can be mainstreamed into policy agenda, but more remains to be done:

- Expand the analysis (improve/add to the models and explore new contexts)
- Build capacity and ownership from the bottom-up.
- Continue to support the organizations from Indus and Zambezi in the use of tools by providing training and capacity development and through the development of case studies.
- Create knowledge hubs of institutions that have the capacity to use and improve the tools, and that can help with the capacity building and policy development support processes.

C3. The Project was very effective in establishing partnerships that were key to ensure project success. Also, the project demonstrated that partnerships should be carefully built with key organisations as they have strengths and weaknesses that should be taken into account for the needs of the project.

Management and implementation were very efficient and effective and key for driving this project towards achievement and go beyond its objectives. Cooperation between GEF-IIASA-UNIDO was highlighted several times as a great success for this project during the interviews. The involvement and commitment of the PSC from the start, was strategic to guide the project in the right direction and encourage IIASA to go beyond the expectations. Regional level partnerships with regional institutions were not the exception. Those were fundamental for the development of the case studies and support the development of the regional policy tools with real data and adapted to the regions. This is true for both for the Zambezi and the Indus regions. The partnership with ZAMCOM was crucial to secure an organised coordination of the events with the eight Riparian States. However, as ZAMCOM worked mainly with Government Institutions, which are non-research people, they were not able to contribute as much as the Indus region for the development of the model and, at the end of the project, although very keen, no government institution was able to use it (they would require more training). In the Indus basin, as there was no basin organization, most of the work was carried out at national level with key stakeholders (e.g. LUMS in Pakistan, TERI in India), and a third party was involved – ICIMOD – to convene the Indus Riparian countries for the workshops. As the organizations involved at national level were mainly research institutions, they were able to contribute a lot for the development of the Indus model and at the end of the project the model was adopted and used for planning in both Pakistan and India. However, the identification and convening effort from the project team was higher than the one needed in the Zambezi basin (thanks to the presence of ZAMCOM) and did not involve as many higher government institutions as in the Zambezi one, but more research and sectoral ministry level ones.

6.2. Recommendations

R1. The ISWEL project was the first step of the journey towards addressing the nexus issues and the SDGs in an integrated way and, although it has achieved a lot, there is still a need to continue “testing” the approach in another basins around the world and conducting research on its adaptability to the stakeholders needs. Therefore, a follow-up phase is recommended.

A new phase of the ISWEL project should consider the following:

- (i) **Have a strong focus on building strategic partnerships, providing capacity building on WEL issues and training on the developed tools to facilitate ownership and knowledge transfer.**

- a. Partnerships should be built at various levels: government level (top government agencies and ministries acting on the WEL field), universities/scientific & research institutions, practitioners acting on the field (including private sector), within the UN system through regional programmes and joint research (e.g. energy, agriculture, forestry areas). These partnerships will be crucial to answer to stakeholders needs, framework additions/improvements, its successful implementation, as well as to ensure that ownership is built from the bottom-up, and consequently, the sustainability of the action is ensured.
 - b. Focused and targeted training is needed to ensure that the stakeholders interested in using the frameworks (for their own assessment) can do so, efficiently and effectively. This will ensure the uptake and use of the developed tools and its adoption in the future to come. The training should be tailored to the capacities of the target audience and should consider: (i) discussing about WEL issues and challenges and on the importance of using integrated approaches to address them; (ii) informing on the available tools that can be used to assess ways to address those challenges and support planning policy development/improvement.
 - c. Create regional/local knowledge hubs with research/knowledge organisations that have the capacity to use and improve the tools and also build capacity and provide training as needed.
- (ii) **Continue to have a scientific/model development focus**, to further improve the models by adding more functionalities such as:
- d. expand assessment parameters – expand the environmental/biodiversity aspect; include gender equality indicators and resilience aspects (including COVID-19) and modules to assess different crops and their impacts.
 - e. include dashboards for analysis of different scenarios / scenarios pathways.
 - f. include functionality to carry out monitoring of programmes/projects over time and at the same time calibrate the models with real-time data; etc.
 - g. reducing model complexity and providing a good user experience.
- (iii) **Scale up the developed tools to other regions and continue to support their use in the Indus and Zambezi regions.** This will be important to ensure continuity of the actions and its legacy sustainability and to mainstream the nexus issues into the policy agenda more widely on those specific regions.
- (iv) **Implement investment projects** and use the tools in their selection and start building the monitoring framework to track their impacts. This will show the potential of using the developed tool in the implementation of investment projects.

The follow up project should be executed as well by GEF, UNIDO and IIASA and these institutions already demonstrated interest in developing it. In the follow-up project, IIASA would lead the research/scientific components and UNIDO would focus on implementation supervision and partnership building through its network of existing international partners, as well as its field network of regional and country offices). Other partners that have demonstrated interest to cooperate in a follow up project are: International Water Management Institute (IWMI) that could be a good partner for introducing this work into other regions through its 13 offices across the world and in the identification of partners for the establishment of the local knowledge hubs; regional institutions working on nexus issues such as the SADC, ZAMCOM, ICIMOD, river basin organizations; and institutions from the riparian countries. UNIDO should reach out to the UN System to seek their interest in the development and implementation of such a project (for example, the World Bank and UNEP already demonstrated their interest in the framework).

R2. UNIDO should use the TOC method for the design, implementation and evaluation of programmes/projects intended to support change in their context. TOCs are a good flexible tool and methodology to map out the logical sequence of a project or programme from inputs to outcomes, strengthened by the critical thinking about the contextual conditions that may influence the initiative, the motivations and contributions of stakeholders and other actors and the assumptions about how and why that sequence of changes might come about. When doing so they should integrate the following key elements: (i) context for the initiative, including political, environmental and social conditions and other actors able to influence change; (ii) the change or long term expected impacts that the project/programme seeks to support; (iii) the sequence/process of change that is anticipated in order to create the conditions for the desired impact; (iv) assumptions about how these changes might happen, as a check on whether the activities and outputs are appropriate to influence change; and (v) the diagram that captures the outcomes of the discussion.

R3. When working with key institutions it is recommended to identify more than one contact person to ensure continuity and mainstreaming of the project outputs into an institution's agenda. In this way, any potential staff changes in the institution that could prevent the project from suffering unnecessary implementation delays would be avoided.

R4. UNIDO should consider applying the tools developed within ISWEL to adopt a more integrated working approach internally and for portfolio development and implementation. The developed framework (integrative thinking, approach and tools) can be used at several levels:

- Can support the development of projects and programmes that address nexus issues. In fact, UNIDO is now developing projects that integrate two (2) or more nexus dimensions. The ISWEL project enables UNIDO to position themselves in the right direction to drive the development of nexus projects.
- Can be used by several and across departments: Digitalization, Technology and Agribusiness; Environmental and Energy; External Relations and Policy Research; and Programmes, Partnerships and Field coordination.
- Can guide the development of the project portfolio as well as the assessment of project's impacts. The developed framework has the potential to be used throughout the design, implementation and monitoring stages of UNIDO programmes and projects portfolio. At the design stage, it has an important role to play – as it could help define the indicators and select sectors/countries/regions to focus on. At the implementation level, it can also be used for M&E by updating data sets. There was a clear interest demonstrated by UNIDO employees in the GHE and in using it for their projects.

6.3. Lessons Learned

L1. Lessons learned from project design, implementation and evaluation.

- **Attribution of responsibilities of project implementation and execution should be done having into account on one hand the project objectives and expected outputs/outcomes and on the other hand the strengths of each partner.** Like this, good, efficient and effective partnerships can be built that are crucial to ensure the good implementation of any project. The ISWEL was a scientific/research project and having a research agency responsible for the execution of the project made sense.
- **Allocation of tasks regarding management, administration, M&E, execution and implementation of activities need to be clear** from project design stage to avoid overlapping of responsibilities or doubling efforts. These should be defined having into consideration the desired project impacts and the strengths of the different parties involved.
- **Good communication and adaptability of implementing/coordinating partners** is key for ensuring the success of delivering a project. It is important that during project the partners maintain a good and straightforward communication so that issues/challenges can be identified and addressed promptly without impacting the achievement of the project outputs and outcomes.
- **PRF must be thoroughly developed** because this is the tool against which the project performance is assessed in terms of achievement of outputs and outcomes, and thus if an indicator or target is missing or is not well formulated, it may be not correctly tracked or not tracked at all. It is important to make sure to: include gender and other cross-cutting indicators, as applicable, as well as to make sure indicators are SMART and be clear on the baselines and the targets.
- **The TOC is a good tool that provides clarity about the intervention logic and should be used in programme/project design, implementation, and evaluation.** In the ISWEL project the reconstructed TOC developed for the TE was especially useful to better understand the programme logic and identify how project designers intended to achieve project results. The TOC is both:
 - An on-going **process** to aid discussion-based analysis and learning that produces insights to support programme design strategy, implementation, evaluation and impact assessment, and
 - A **product**: diagrams and narratives which can be updated at regular intervals and used for communications.

The TOC creates a strong framework for organising programme design, thus aiding implementation, evaluation and learning. The TOC:

- Identifies strategies and impact pathways in multiple contexts and locations.
- Links activities to changes at different levels: international, regional, national, subnational and community.
- Can link multiple projects to a higher TOC, and thus can be useful to assess the contribution of the different projects to a given programme and/or the contribution of programmes to wider organisational strategies.
- Can be used as a foundation for monitoring and evaluation planning.
- Can be used to identify trade-offs and negative unintended consequences. As well as risks and assumptions.
- **There is a need to keep the cooperation between GEF-IIASA-UNIDO (and even expand that to regional and national partners) for the development and implementation of a follow up project** with a bigger focus on expanding the use of the framework through capacity building, training, knowledge transfer and the creation of knowledge hubs, so to build ownership of the developed tools from the bottom up. They are in a good position as: (i) now they have a big part of the scientific work developed that they can use for other basins and contexts worldwide as well as improve it moving forward (ii) they are very well equipped with the policy tools to promote cooperation on these assessment with the stakeholders/practitioners on the field, and they have already some experience in doing that (iii) they proved to be a strong fit and worked well together on implementing the ISWEL project (iv) they have the necessary connections to establish the necessary partnerships and request for funding for such a project.

L2. Lessons learnt from the implementation of the ISWEL project:

- **Scientific Research was a good vehicle to promote cooperation among countries.** Science “built a bridge” between stakeholders giving them the opportunity to discuss common issues attaining their countries. This was especially relevant in the development of the IRB case study, in which countries with politically sensitivities came together to discuss nexus issues.
- **Capacity building needs sufficient time** to enable stakeholders to digest all the information provided and be able to absorb all the knowledge intended to be transferred. This is also crucial to ensure the legacy of the project is sustained going forward.

Partnerships are crucial for the implementation in terms of enjoying economies of scale and finding the best “entry points”. Also, a combination of different type and level of partnerships is crucial to ensure project adoption and legacy. The project demonstrated that partnerships formed in different ways had its advantages and disadvantages.

- **When working with key institutions having more than one contact person would have ensured project continuity and mainstreaming it into the institutions’ agenda.**
- **Capacity building and knowledge transfer are fundamental** for the sustainability of the action and usability of the tools developed by the ISWEL Project. This project is the first step toward the long journey of addressing WEL nexus and SDG in an integrated way, and capacity and knowledge are key to ensure that the developed framework can be widely used and adopted.
- **The ISWEL framework can be used by donors, implementing and executing agencies in moving from a “silo-thinking approach” to a “integrative approach” way of working and in the establishment of their project portfolio moving forward.** In fact, the framework can be used and applied within UNIDO, GEF and by several government and non-government institutions working in the WEL nexus dimensions or working towards the achievement of the SDGs. The project not only proved that it is possible to use modelling and non-modelling tools to promote discussion and analysis of planning decisions on WEL and SDGs in an integrated way by developing the tools and applying it to several contexts, but also showed how those can be integrated in the day-to-day operation of organisations working in these fields and how they can be used to guide strategy formulation going forward.

L3. Lessons learnt regarding the sustainability of the action.

- **The framework can be an asset for UNIDO in the: (i) establishment of the nexus thinking approach and (ii) in the way it can be applied to other things that UNIDO does including programming at non-scientific level, research department, etc.** This is especially important taking into account that the organization is increasing its work on nexus projects and aims to promote

cooperation and the application of integrative approaches in terms of portfolio and project implementation across departments.

- **There are so many ways in which the developed tools can be applied:** (i) it can be used by several departments; (ii) across departments; and (iii) at different levels (global, regional and national levels).
- **Offering an open source tool facilitates ownership and knowledge transfer at all levels.** Anyone can take the tools and use them for their local, regional or global analysis.

L4. Lesson from COVID-19 pandemic. There is a lot more that can be done using virtual means. Consider a combined virtual plus in-person approach for activities implementation to reduce project impact in terms of: time invested in organising events and in travelling, money spent, carbon footprint. Virtual communications cannot fully replace crucial face-to-face interactions and meetings, but it is a good means to complement them.

Annex 1: Project Results Framework

Project Objective: The project will establish a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food, and ecosystem security in selected regions in line with the GEF 2020 strategy.				
	Indicators	Targets	Means of Verification	Assumptions
Component 1. Development of a systems analysis framework for assessing solutions to nexus challenges				
<i>Outcome 1.1. Development of scenarios describing uncertainties in future trends and drivers</i>				
Output 1.1.1 Stakeholder-informed scenario co-design for capturing uncertainties in future trends and drivers	<ul style="list-style-type: none"> Number of stakeholder-informed regional change pathways Number of stakeholders Number of informed 'solution' and 'policy' scenarios Number of stakeholder consultations 	<ul style="list-style-type: none"> At least two stakeholder-informed regional change pathways per case study At least eight stakeholder informed 'solution' and 'policy' scenarios One stakeholder consultation in each case study 	<ul style="list-style-type: none"> Document summarizing the stakeholder-informed regional change pathways Document summarizing the stakeholder-informed 'solution' and 'policy' scenarios Agenda, minutes, and presentations from stakeholder consultation posted to project website 	<ul style="list-style-type: none"> Good attendance at stakeholder consultations and interest in the development of regional change pathways Interest in regional stakeholder meetings to discuss scenario design and nexus challenges
<i>Outcome 1.2 Method and tool development</i>				
Output 1.2.1 Nexus modelling tool developed and presented with preliminary results: Tool will illuminate trade-offs among sectors and explore solutions for achieving multiple development and environmental objectives	<ul style="list-style-type: none"> Nexus modelling tool developed (yes/no) Number of presentations of nexus modelling tool and preliminary results 	<ul style="list-style-type: none"> A completed nexus modelling tool Two presentations of the nexus modelling tool and preliminary assumptions and results (one in each region) 	<ul style="list-style-type: none"> Preliminary results based on model runs presented at stakeholder meetings (ppt) Minutes from regional stakeholder meetings and demonstration (ppt) available on project website 	<ul style="list-style-type: none"> Model development is not delayed by unforeseen technical challenges; required data are available and accessible Model development is not delayed by unforeseen technical challenges; required data are available and accessible
Component 2. Exploring nexus solutions at global and regional scales				
<i>Outcome 2.1 Regional assessment of nexus challenges and solutions: Understanding of sectorial trade-offs, synergies, and solutions for meeting nexus challenges improved among regional stakeholders</i>				
Output 2.1.1 Tangible strategies for improving regional decision-making across sectors and borders identified for two selected regions	<ul style="list-style-type: none"> Identification and documentation of key regional insights (yes/no) 	<ul style="list-style-type: none"> Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM) 	<ul style="list-style-type: none"> SPM available on project website 	<ul style="list-style-type: none"> Regional model development is successful and yields clear insights regarding trade-offs, synergies, and solutions for regional nexus challenges

Project Objective: The project will establish a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food, and ecosystem security in selected regions in line with the GEF 2020 strategy.				
	Indicators	Targets	Means of Verification	Assumptions
<i>Outcome 2.2 Global nexus hotspots and transformation pathways: multi-sectorial vulnerability hotspots under different socioeconomic and hydro-climatic scenarios identified</i>				
Output 2.2.1 Global assessment of multi-sectorial hotspots and transformation pathways	<ul style="list-style-type: none"> Global assessment of multi-sectorial hotspots and transformation pathways (yes/no) Identification and documentation of knowledge and data gaps (yes/no) 	<ul style="list-style-type: none"> Documentation and communication of key insights from global assessment in publications and SPM Inclusion of knowledge and data gaps in SPM 	<ul style="list-style-type: none"> Scientific publications and white papers completed; SPM available on project website 	<ul style="list-style-type: none"> Global model development is successful and yields clear insights into global nexus hotspots and sustainable transformation pathways Global and regional model development is successful and yields insights regarding knowledge and data gaps
Component 3. Capacity Building and Knowledge Management: Building the foundation for a knowledge and capacity network on nexus decision support				
<i>Outcome 3.1 A foundation of a regional and global knowledge and capacity network established</i>				
Output 3.1.1 Establishment of connections and interactions among stakeholders from a wide array of institutions, sectors and countries; including expert advisory meetings	<ul style="list-style-type: none"> Number of stakeholder meetings per case study region Expert advisory meetings (yes/no) 	<ul style="list-style-type: none"> Three total stakeholder meetings in each case study region (includes consultation on study design) (~one per year) Number of informal expert advisory meetings conducted 	<ul style="list-style-type: none"> Minutes and participants list from stakeholder meetings Summary from advisory meeting 	<ul style="list-style-type: none"> Interest in regional stakeholder meetings from a wide array of institutions and sectors; willingness of stakeholders to interact; progress on project to enable stakeholder feedback
<i>Outcome 3.2 Capacity building: Regional capacity for nexus assessment and solution identification improved</i>				
Output 3.2.1 Capacity building for systems analysis and nexus decision support established through:				
3.2.1.a Two capacity building workshops per case study region, held concurrently with stakeholder meetings	<ul style="list-style-type: none"> Number of capacity building workshops 	<ul style="list-style-type: none"> Two capacity building workshops per case study region 	<ul style="list-style-type: none"> Minutes and presentations from capacity building workshops posted on project website 	<ul style="list-style-type: none"> Interest and engagement from regional scientists and practitioners
3.2.1.b Exchange of scientists/experts with partner academic institutions, ministries and/or multilateral organizations	<ul style="list-style-type: none"> Number of scientists/experts exchanged 	<ul style="list-style-type: none"> At least one scientist/expert per case study region 	<ul style="list-style-type: none"> Report by exchange scientist on their research and contribution to the project 	<ul style="list-style-type: none"> Interest from regional and IIASA scientists; sufficient quality of scientists
<i>Outcome 3.3 Knowledge dissemination: Infrastructure established to disseminate findings of the project</i>				

Project Objective: The project will establish a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food, and ecosystem security in selected regions in line with the GEF 2020 strategy.

	Indicators	Targets	Means of Verification	Assumptions
Output 3.3.1 Dissemination of project outcomes through publications, events, and data sharing through:				
3.3.1.a Participation in high-level panels, conferences, and events	<ul style="list-style-type: none"> Number of presentations at high level events 	<ul style="list-style-type: none"> Presentations at a minimum of three high level events per year 	<ul style="list-style-type: none"> Links to event agendas and/or presentations posted on project website 	<ul style="list-style-type: none"> External interest in project, model, and insights
3.3.1.b Online database for sharing of scenario results	<ul style="list-style-type: none"> Development of online database (yes/no) 	<ul style="list-style-type: none"> Online database accessible and populated with scenario results 	<ul style="list-style-type: none"> Link to online database on project website 	<ul style="list-style-type: none"> Successful implementation of model and generation of scenario results
3.3.1.c Two experience notes shared via IW:Learn	<ul style="list-style-type: none"> Number of experience notes shared 	<ul style="list-style-type: none"> One experience note per case study completed 	<ul style="list-style-type: none"> Link to experience notes on IW:Learn website 	<ul style="list-style-type: none"> Material available for drafting of experience notes
3.3.1.d Joint GEF-IIASA-UNIDO Summary for policymakers describing project insights and outcomes	<ul style="list-style-type: none"> Development of a Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM) (yes/no) 	<ul style="list-style-type: none"> Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM) 	<ul style="list-style-type: none"> SPM available on project website 	<ul style="list-style-type: none"> All components of model development are successful and yield valuable insights for inclusion in the SPM
3.3.1.e Scientific publications in high-impact journals and white papers	<ul style="list-style-type: none"> Number of publications 	<ul style="list-style-type: none"> At least eight scientific publications and/or white papers submitted over the life of the project 	<ul style="list-style-type: none"> Links to scientific publications and white papers on project website 	<ul style="list-style-type: none"> All components of model development are successful and yield insights worthy of scientific publication

Annex 2: List of documents revised during the TE

Consulted Documents & Websites
001_Global UNIDO 6993 CEO App Resubmission signed.pdf
002_6993_ISWEL_First_Progress_Report.pdf
003_6993_ISWEL_Second_Progress_Report_2017.pdf
004_6993_ISWEL_Third_Progress_Report_2018.pdf
005_6993_Policy Brief.pdf
006_Zambezi Scenario Workshop.mp4
007_ZAMCOM Brief Video.mp4
008_ANNEX A Project Results Framework
009_Global-Hotspots-Explorer-report (003).docx
010_Inception Report Submission for the Integrated Solutions Project_Nov2016.pdf
011_environmental and social screening checklist_ GEF id 6993.pdf
012_ANNEX A Project Results Framework.docx
013_ Annex E_Scoping_Study.pdf
014_Annex F_Expert_meeting_docs.pdf
015_Annex G_Annotated_Bibliography.pdf
016_Annex H_Stakeholder_Organizations1.xlsx
017_Annex I_PSC_TOR.pdf
018_Annex J_Workplan.pdf
019_Annex K_Budget_June2.pdf
020_gef-me-policy-2019_2.pdf
021_ExpendituresNOv2020.pdf
022_IIASA Co-financing letter_GEF ID 6993.pdf
023_UNIDO co-financing letter_GEF 6993.pdf
024_Gantt Chart ISWEL updated 2020.xlsx
025_PSC Annual Meeting Minutes: <ul style="list-style-type: none"> 2016: <ul style="list-style-type: none"> • 025_1 Agenda_PSC Skype Consultation_13 Dec 2016.pdf • 025_2 Kick off meeting 13 December 2016-PSC recommendations.docx 2017: <ul style="list-style-type: none"> • 025_3 AGENDA Conference Call_21April2017 AMENDED.pdf • 025_4 Minutes 2 Conference Call PSC 21 April 2017v2.docx 2018: <ul style="list-style-type: none"> • 025_5 PSC Meeting 17-18 April Draft agenda v6.docx • 025_6 Summary of comments.docx 2019: <ul style="list-style-type: none"> • 025_7 AGENDA PSC meeting 6-7 May 2019 final.pdf

Consulted Documents & Websites
<ul style="list-style-type: none"> 025_8 PSC meeting 6-7 minutes.docx <p>2020:</p> <ul style="list-style-type: none"> 025_9 AGENDA Conference Call_10 February 2020.pdf 025_10 Minutes Annual Project Steering Committee Telecall ISWEL 10 February 2020v2.docx
026_Stakeholder-Meeting-I-Indus.pdf
027_Stakeholder-Meeting-II-Indus.pdf
028_I-Stakeholder-Meeting-ZAMBEZI.pdf
029_II-Stakeholder-Meeting-ZAMBEZI.pdf
030_16-143 - UNIDO-IIASA Contract_signed.pdf
<p>UNIDO-GEF Project Implementation Reports (PIR):</p> <ul style="list-style-type: none"> 031_6993_PIR Template_FY19.pdf 032_6993_PIR_FY20_.pdf 033_6993_2018_PIR_UNIDO.pdf
<p>034_IIASA Financial Information:</p> <ul style="list-style-type: none"> 03401_16-143 - Financial Statements_2016_s.pdf 03402_16-143 - First Invoice_signed_V02.pdf 03403_16-143 - First Invoice.pdf 03404_16-143 - IIASA_ProjNr140312_Financial Statements_2017_s.pdf 03405_16-143 - Invoice_3_s.s.pdf 03406_16-143 - Invoice_4_s.pdf 03407_16-143 - Invoice_5_s.pdf 03406_16-143 - Invoice_4_s.pdf 03407_16-143 - Invoice_5_s.pdf 03408_16-143 - Request Bank Change_s.pdf 03409_16-143 - Second Invoice_signed.pdf 03410_16-143 Bawag April_2019.pdf 003411_16-143 UN march2017.pdf 003412_16-143 UNIDO - Mar.png 003413_16-143_ContractRecordUSD1845000.pdf 003414_16-143_ExcerptLedgerRA2378_receivedfromUNIDO.pdf 003415_16-143_mergedContractBudget_202personmonths.pdf 003416_IIASA_ProjNr140312_Financial Statements_2018_s.pdf 03417_RE_14031_Integrated Solutions for Water, Energy, and Land (ISWEL)_ - Terminal Independent Evaluation .eml
<p>035_Scientific papers:</p> <p>Global:</p> <ul style="list-style-type: none"> 0351_Byers_2018_Global hotspots and vulnerability assessment.pdf 0352_Gidden et al 2018 Automated emissions harmonization for use in Integrated Assessment Models.pdf 0353_Greve et al 2018 global water scarcity and uncertainty.pdf 0354_Hunt 2020 Global potential usage of seasonal pumped hydropower storage.pdf

Consulted Documents & Websites
<ul style="list-style-type: none"> • 0355_Jonshon et al 2019. Integrated Solutions for the Water-Energy-Land Nexus.pdf • 0356_Mayor 2020 Historical Economies of Scale and Learning Effects for Desalinatizaion.pdf • 0357_Parkinson et al 2018.Balancing clean water-climate change mitigation trade-offs.pdf • 0358_Pastor et al. - 2019 - The global nexus of food trade water sustaining environmental flows by 2050.pdf • 0359_Tang2019basinandlocalscalewaterqualitymodelingtowardsenhancingwaterqualitymanagementworldwide.pdf
Regional and Basins:
<ul style="list-style-type: none"> • 03510 Burek et al 2018 Development of a high resolution hydrological model.pdf • 03511 Kahil_et_al-2018-Water_Resources_Research.pdf • 03512 Vinca 2020 Indus NEst tool.pdf • 03513 Wada Co-designing Indus future scenarios.pdf • 03514 Wang et al. - 2019 - Increasing nitrogen export to sea A scenario analysis for the Indus River.pdf • 03515 Indus Basin Scenarios Acceptance letter for publication in Nature Sustainability.msg
036_Mission Report Kathmandu.pdf
037_ISWEL 4th Progress Report 2020 withAnnexes.pdf
038 Project Overview Willaarts.pptx
039_Amendment No. 1 - UNIDO PEA No. 3000040169_countersigned.pdf
040_agenda-of-the-5th-regional-workshop-for-gef-iw-projects-and-partners-in-africa.pdf
040_Extension of the GEF-UNIDO Project "Integrated Solutions for Water, Energy, and Land" GEF ID 6993 .eml
041_ PSC minutes extra calls: <ul style="list-style-type: none"> • 0411_AGENDA PSC Conference Call_21April2017.pdf • 0412_IS-WEL_PSC_call_MINUTES_2016-12-13.pdf • 0413_ISWEL_PSC Telecall 1 Feb 2019.pdf • 0414_Minutes 1 Feb 2019 PSC telecall.docx • 0415_Minutes 2 Conference Call PSC 21 April 2017v2.docx • 0416 Summary notes PSC telecall 13 December 2016.docx
042_RE/ Minutes and action points from today's meeting.eml
043_ISWEL - Final-Report_v4
Websites: <ul style="list-style-type: none"> • IIASA website page on the project: https://iiasa.ac.at/web/home/research/iswel/ISWEL.html • ISWEL project flyer: https://iiasa.ac.at/web/home/research/iswel/Flyer.pdf • ISWEL Project website: https://www.iswel.org/ • Global Hotspots Explorer: https://hotspots-explorer.org

Annex 3: List of consulted stakeholders

- The online questionnaire was sent to a total of 97 stakeholders' e-mails (already discounting those that bounced back or were undeliverable), covering a total of 41 organisations or institutions. The online questionnaire was responded by 22 organisations or institutions.
- A total of 25 people were interviewed.
- The following two tables below show the names and organisations interviewed and the organizations that have answered to the questionnaire.

Interviewed Organizations

Stakeholders (Organisation and Name)		Position / Observations
UNIDO (Implementing Agency)	Tareq Emtairah	Director of Energy
	Alois Mhlanga	Chief, Climate Technology and Innovation Division
	Robert Novak	Industrial Development Officer (also interviewed as member of the PSC)
	Anais Barisani	Project Associate
IIASA (Executing Agency)	Albert van Jaarsveld	Director General and CEO
	Simon Langan	Currently: Director, Digital Innovation and Country Manager, Sri Lanka, IWMI Former: Director Water Program/ Water Futures and Solutions at IIASA
	Yoshihide Wada	Acting Program Director - Water/Water Security
	Barbara Willaarts	Research Scholar - Water/Water Security, Ecosystems Services and Management / Project Manager of ISWEL Project at IIASA
	Edward Byers	Research Scholar - Energy
	Petr Havlik	ERD Center Head and Acting Program Director Ecosystems Services and Management
	Keywan Riahi	Program Director - Energy
	Piotr Magnuszewski	Research Scholar - Risk and Resilience, Water/Water Security
Project Steering Committee Members	Astrid Hillers	GEF Project Manager at the GEF Secretariat (USA)
	David Grey	Visiting Professor of Water Policy, School of Geography and Environment, University of Oxford, UK; and Honorary Visiting Professor, Department of Politics, University of Exeter, UK
	Youba Sokona	Special advisor on sustainable development, the South Centre, Switzerland / Vice-chair IPCC
	Nebojsa Nakicenovic	Emeritus Research Scholar - Transitions To New Technologies former Deputy Director General/CEO of IIASA, and former tenured Professor of Energy Economics at Vienna University of Technology (TU Wien)
	Leena Srivastava	Deputy Director General for Science Directorate - DDG For Science of IIASA Former Vice Chancellor of the TERI School of Advanced Studies
Representative of Angola (Riparian Country of ZRB)	Bela Julieta Bango Chindumbo	Instituto Nacional de Recursos Hídricos (INRH)

Representative of Mozambique (Riparian Country of ZRB)	Nelson Alexandre Miranda	Administração Regional de Águas do Zambeze (ARA)
Representative of Namibia (Riparian Country of ZRB)	Cletius Mubita	Deputy director for regional Planning Namibia / Deputy Director @ Zambezi Regional Council
Representative of Zambia (Riparian Country of ZRB)	Innocent Chomba	Ministry of Water Development, Sanitation and Environmental Protection
Representative of Pakistan (Riparian Country of IRB)	Abubakr Muhammad	Professor at the Lahore University of Management Sciences (LUMS)
Representative of India (Riparian Country of IRB)	Nithyanandam Yogeswaran	Assistant Professor at TERI School of Advance Studies
Representative of India (Riparian Country of IRB)	Simi Thambi	National Project Coordinator at UN Environment Programme formerly worked at NITI Aayog (Government of India)
Representative of India (Riparian Country of IRB)	Anindya Bhattacharya	Executive Director of The Celestial Earth & Expert Consultant at NITI Aayog (Government of India)

Organizations that have answered to the online questionnaire

Name of the Organizations	Country
IIASA	Austria
International Water Management Institute (IWMI)	Sri Lanka
Regional Administration of Water Center	Mozambique
Department of Water Resources in the Ministry of Forestry and Natural Resources	Malawi
Instituto nacional de Recursos Hídricos	Angola
World Wide Fund for Nature - WWF Zambia	Zambia
Zambezi Watercourse Commission (ZAMCOM)	Zimbabwe
The Celestial Earth	India
UNIDO	Austria
SADC Secretariat	Botswana
Indian Institute of Technology Kharagpur	India
UET Peshawar, Pakistan	Pakistan
University of Zimbabwe	Zimbabwe
Lahore University of Management Sciences	Pakistan
Department of Water and Sanitation- Botswana	Botswana
Department of Water Resources Development	Zambia
Simi	India
The Energy and Resources Institute (TERI)	India
Zimbabwe National Water Authority -ZINWA	Zimbabwe
COPPE/IIASA	Brazil
Ministry of Energy and Water	Afghanistan

Annex 4: Primary data collection instruments

Microsoft Forms

05/01/2021, 15:52

Online questionnaire about the GEF-UNIDO-IIASA ISWEL Project Implementation

The project "Integrated Solutions for Water, Energy, and Land" (ISWEL) financed by the Global Environment Facility (GEF), is being executed by IIASA and implemented by UNIDO. The proposed project includes:

- Development of a systems analysis framework for assessing solutions to the water-energy-land nexus challenges;
- Regional nexus solutions in the context of global developments;
- Capacity building and knowledge management, comprising the foundation for a knowledge and capacity network on nexus decision support;
- Monitoring and Evaluation.

The project aims at establishing a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food and ecosystem security in selected regions.

Furthermore, this project aims at enabling advancement of an integrated assessment of nexus challenges for the purpose of providing strategic advice to policy makers and developing agencies.

ITP Energised has been contracted by UNIDO to carry out the Terminal Evaluation of the ISWEL project. If you are being contacted, it is because you have been directly or indirectly involved in the development and implementation of the mentioned project. The estimated time to fill out this survey is 15 minutes. Thank you in advance for your answer.

* Required

1. Name of the organisation: *

2. Location: *

3. What type of organisation are you working for? (please select only one of the categories below) *

- International organisation
 - Regional organisation
 - National government
 - Technical or Scientific Institution/University, Research Institute
 - NGO/CSO
 - Private company
 - Independent
 -
- Other

4. What has been your organisation's role in the project?

- Executing Agency
- Executing Partner
- Beneficiary
- Stakeholders
-
- Other

5. In your opinion, how well are you informed about the ISWEL project and its activities? 1 star is "poorly informed" and 5 stars is "very well informed".



6. How did you learn about the ISWEL project?

- Social media / internet
- Workshop / Conference
- Word of mouth
-
- Other

7. Where you aware of the "nexus challenges" before participating in the ISWEL project?

- Yes
- No
- I am not sure

8. In your opinion, how relevant was the ISWEL project for your organisation / region? (please select only one of the categories below)

- Very relevant
- Relevant
- Relatively relevant
- Not relevant

9. How did the ISWEL project contribute to your organisation? *

10. In your opinion, do you think that the project has propelled transboundary and cross-sectoral collaboration and cooperation among stakeholders of the region?

- Yes
- No
- Maybe

11. Were you engaged in the activities of the project?

- Yes
- No

12. If yes, how would you rate them?

	Very Good	Good	Fair	Weak	Very Weak
Development of the integrated assessment framework, including the modelling tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Development of the case studies: Indus River Basin and/or the Zambezi River Basin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Global and regional assessment of nexus challenges – identification of nexus hotspots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Workshops and dissemination of information events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. If you have participated in ISWEL workshops and dissemination events, how would you rate the quality of the workshop(s)? (select only one option)

- Very good
- Good
- Weak
- Very weak
- I have not participated

14. Do you think that the ISWEL project has contributed or will contribute to gender equality?

- Yes
- No
- Maybe

15. What were the nexus challenges that your organisation/country faced in terms of policy development and nexus relationship analysis prior to the development of the ISWEL project?

16. In what way did the project help your organisation address those challenges?

17. What were the most important lessons your organization has learned through the development and use of the framework developed under the ISWEL project?

18. How many people in your organisation are using the ISWEL nexus tool?

- <2 people
- 2 - 5 people
- >5 people

19. Has your organization/department applied any approaches or lessons that came from the ISWEL project to other aspects of your operations?

- Yes
- No

20. Will your organisation continue to use the ISWEL framework and tools in the future?

- Yes
- No
- Maybe

21. What have been the most important accomplishments in the ISWEL project in general?

22. Can you tell us if you have any other suggestions about where the ISWEL tools and model could be applied, similarly to the case studies developed?

23. What do you think that could be further integrated within the developed tools to improve them further? What would you do differently in the ISWEL project?

24. Please add here any other comments you may have:

Annex 5: Statistical analysis of survey data

Microsoft Forms

05/01/2021, 15:53

Forms

Online questionnaire about the G... - Saved

?

CR

Online questionnaire about the GEF-UNIDO-IIASA ISWEL Project Implementation

26

Responses

114:54

Average time to complete

Closed

Status

1. Name of the organisation:

26

Responses

Latest Responses

"TERI School of Advanced Studies "

"ministry of energy and water"

"COPPE/IIASA"

2. Location:

26

Responses

Latest Responses

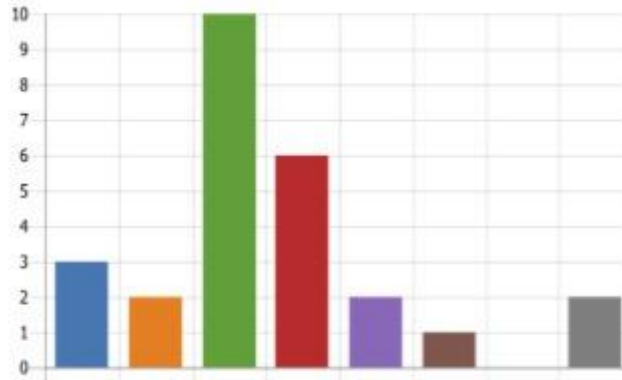
"Delhi, India"

"Kabul_ Afghanistan"

"Brazil/Austria"

3. What type of organisation are you working for? (please select only one of the categories below)

● International organisation	3
● Regional organisation	2
● National government	10
● Technical or Scientific Instituti..	6
● NGO/CSO	2
● Private company	1
● Independent	0
● Other	2



4. What has been your organisation's role in the project?

● Executing Agency	2
● Executing Partner	6
● Beneficiary	3
● Stakeholders	12
● Other	3



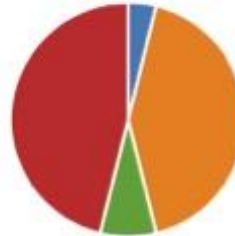
5. In your opinion, how well are you informed about the ISWEL project and its activities? 1 star is "poorly informed" and 5 stars is "very well informed".

25
Responses

★★★★☆
3.88 Average Rating

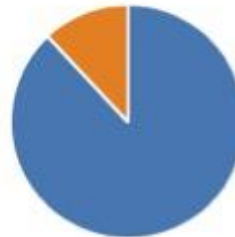
6. How did you learn about the ISWEL project?

● Social media / internet	1
● Workshop / Conference	11
● Word of mouth	2
● Other	12



7. Where you aware of the "nexus challenges" before participating in the ISWEL project?

● Yes	22
● No	3
● I am not sure	0



8. In your opinion, how relevant was the ISWEL project for your organisation / region?
(please select only one of the categories below)

● Very relevant	17
● Relevant	6
● Relatively relevant	2
● Not relevant	1



9. How did the ISWEL project contribute to your organisation?

26
Responses

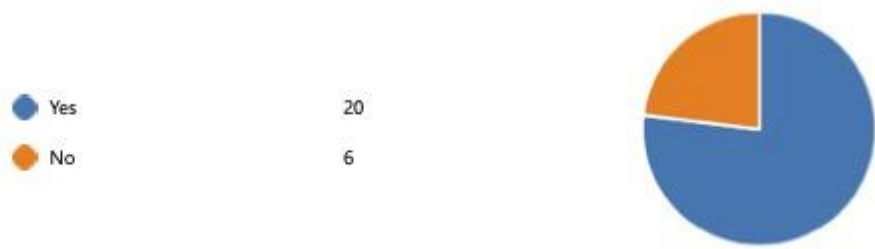
Latest Responses

"Helped to build capacity on the topic"
"ISWEL project is the relevant project for our organization bec..."
"I believe it provided knowledge about the ISWEL region, incre..."

10. In your opinion, do you think that the project has propelled transboundary and cross-sectoral collaboration and cooperation among stakeholders of the region?



11. Were you engaged in the activities of the project?



12. If yes, how would you rate them?

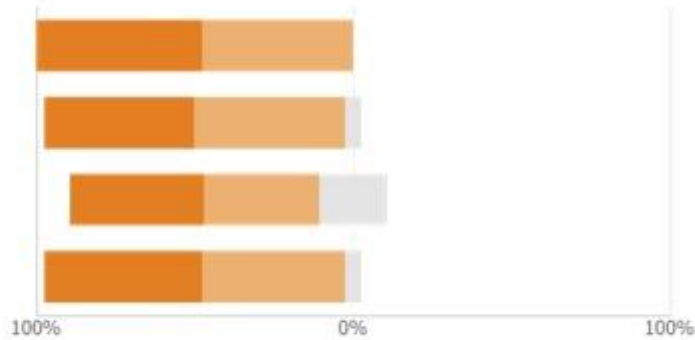
Very Good Good Fair Weak Very Weak

Development of the integrated assessment framework, including the modelling tool

Development of the case studies: Indus River Basin and/or the Zambezi River Basin

Global and regional assessment of nexus challenges – identification of nexus hotspots

Workshops and dissemination of information events



13. If you have participated in ISWEL workshops and dissemination events, how would you rate the quality of the workshop(s)? (select only one option)

- Very good 16
- Good 7
- Weak 0
- Very weak 0
- I have not participated 3



14. Do you think that the ISWEL project has contributed or will contribute to gender equality?



15. What were the nexus challenges that your organisation/country faced in terms of policy development and nexus relationship analysis prior to the development of the ISWEL project?

20
Responses

Latest Responses

"Our big problem in our country is security problem due that w..."

16. In what way did the project help your organisation address those challenges?

23
Responses

Latest Responses

*"Provided new idea, working on joint project proposal."
"ISWEL project can help us in capacity building in policy devel...
"The project helps the organisation to focus on dealing with nex..."*

17. What were the most important lessons your organization has learned through the development and use of the framework developed under the ISWEL project?

20
Responses

Latest Responses

*"Necessity for integrated approach"
"Our organization Used different methods of ISWEL project Sp..."*

18. How many people in your organisation are using the ISWEL nexus tool?



19. Has your organization/department applied any approaches or lessons that came from the ISWEL project to other aspects of your operations?



20. Will your organisation continue to use the ISWEL framework and tools in the future?



21. What have been the most important accomplishments in the ISWEL project in general?

22
Responses

Latest Responses

"A good attempt to model the existing situation and the near f...
"In general ISWEL project is good in water allocation and ener...

22. Can you tell us if you have any other suggestions about where the ISWEL tools and model could be applied, similarly to the case studies developed?

20
Responses

Latest Responses

- "Better engagement with stakeholders and capacity building"*
- "We used from ISWEL project models in water allocation sectio..."*
- "I believe the ISWEL tools can be applied in many different reg..."*

23. What do you think that could be further integrated within the developed tools to improve them further? What would you do differently in the ISWEL project?

19
Responses

Latest Responses

- "Real time data, and flexible scenarios suitable for such a fragil..."*
- "In this case you have to make large or immense your study a..."*
- "There are always new aspects that must be incorporated, spe..."*

24. Please add here any other comments you may have:

15
Responses

Latest Responses

- "More research on this topic needs to be conducted in the cou..."*
- "I would like to make numerous your capacity building progra..."*
- "The challenge is to reach the policymakers and make them to..."*

Annex 6: Details on project progress towards impacts

Table 5: Project outcomes /impacts, outputs, performance indicators and results

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
Component 1: Development of a systems analysis framework for assessing solutions to nexus challenges				
Outcome 1.1. Development of scenarios describing uncertainties in future trends and drivers	1.1.1 Stakeholder-informed scenario co-design for capturing uncertainties in future trends and drivers	I: Number of stakeholder-informed regional change pathways T: At least two stakeholder-informed regional change pathways per case study	<p>Achieved 100%</p> <p>Three (3) scenario narratives describing future visions and regional change pathways per basin (004_third progress report) were developed. The minimum needed was 2 per basin and this report confirms 3 per basin were developed. Details of these pathways can be found in the Summary reports of the Scenario Workshops conducted in each basin (027_Stakeholder-Meeting-II-Indus and 029_II-Stakeholder-Meeting-ZAMBEZI).</p> <p>For the Indus region, it was conducted a basin workshop in Vienna in May-June 2018 with approximately 100 participants drawn from the riparian countries as well as wider international participants from research, NGO and funder/donor organizations. The participants were able to identify main water-energy-land nexus challenges and were able co-develop 3 alternative basin visions and pathways (stakeholder driven scenarios). For Zambezi region since January 2018 IIASA team has co-organized one stakeholder meeting and participated in two meetings convened by Zambezi Watercourse Commission (ZAMCOM). The IIASA-led stakeholder meeting took place in Harare in 9-11 July 2018 and consisted of a 2-day Scenario Workshop and 1-day training on Scenario processes. The scenario workshop brought together 28 participants from 21 different organizations (federal government, donors, NGOs) and 7 riparian countries, representing all three sectors. The main outcomes of this meeting have translated into: 1) 3 different shared future visions and pathways for the basin, 2) greater understanding on the countries sectoral and nexus challenges and priorities, 3) a pre-agreement with ZAMCOM in which the resulting scenarios will be used to feed into the development of the Zambezi Strategic Development Plan (ZSDP) – which unfortunately did not materialized due to changes in ZAMCOM planning. To strengthen the partnership with ZAMCOM, ISWEL team also joined two important meetings in the course of 2018: 1) a coordination meeting early February in Harare intended to align and finding synergies among organizations leading nexus-related projects, and 2) the III Zambezi Basin Stakeholder Forum, that took place in Lilongwe on 8-9 October 2018.</p>	Fully achieved 100%
		I: Number of stakeholders informed 'solution' and 'policy' scenarios	<p>Achieved 100%</p> <p>The identification of these scenarios was part of the process that led to the modelling of the pathways for each of the basins. In the last progress report (037_ISWEL 4th Progress Report 2020</p>	

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
		<p>T: At least eight stakeholder informed 'solution' and 'policy' scenarios</p>	<p>withAnnexes.pdf), in Table 4 (page 30) it is possible to see there are 8 solutions / policies assumptions for each sector / area under the BAU, the SDG, or the SDG-Coop scenarios. Similarly, for the Zambezi, in Table 5 (page 37) it is possible to read 15 assumptions on policy or solutions for each scenario modelled i.e. for the BAU, the Economy (ECN), or the Environment (ENV) scenario.</p>	
		<p>I: Number of stakeholder consultations</p> <p>T: One stakeholder consultation in each case study</p>	<p>Achieved 100%</p> <p>Case study Zambezi River Basin: Since January 2018 IIASA team has co-organized one stakeholder meeting and participated in two meetings convened by Zambezi Watercourse Commission (ZAMCOM). The IIASA-led stakeholder meeting took place in Harare in 9-11 July 2018 and consisted of a 2-day Scenario Workshop and 1-day training on Scenario processes (004_third progress report). Stakeholder consultation results can be found in the summary report of the event: 028_I-Stakeholder-Meeting-ZAMBEZI)</p> <p>Case study Indus River Basin: In the Indus, the project team has organized 3 meetings in the course of 2018: two national consultation meetings (Delhi, India and Lahore, Pakistan, March 2018), and one Stakeholder Meeting Scenario Workshop & Capacity Development (Vienna, May 2018) (004_third progress report and Summary reports of the event in 026_Stakeholder-Meeting-I-Indus). Thus, in Indus they did 2 consultations in total (one for India and one for Pakistan).</p>	
<p>Outcome 1.2. Method and tool development</p>	<p>1.2.1 Nexus modelling tool developed and presented with preliminary results: Tool will illuminate trade-offs among sectors and explore solutions for achieving multiple development and environmental objectives</p>	<p>I: Nexus modelling tool developed (yes/no)</p> <p>T: A completed nexus modelling tool</p>	<p>Yes. Achieved 100% (or even surpassed)</p> <p>In the 004_third progress report they state that 3 modelling tools were developed: One global tool and two basin assessment nexus tools (one for IRB and one for ZRB). The detailed description of the tools is in the ISWEL Project website here: https://www.iswel.org/results/tools/</p> <p>As per the Third Progress Report of the project, the project team has completed the development of an analysis modelling framework (AMF) to generate evidence-based information on WEL nexus opportunities and constrains. This AMF represents and connects the biophysics and economics of WEL systems, and it is composed of five models that are, dependent on the actual use case, combined in different ways: The Hydrological Community Water Model (CWatM), the water quality model (MARINA), the hydro-economic model (ECHO), the energy-economic model MESSAGEix and the agro-economic model GLOBIOM. Two of the models describing the water system (CWatM, and ECHO) have been newly developed within this project. Likewise, MARINA model, which was originally developed by Wageningen University and Research, has been updated to improve the temporal and spatial representation of nutrient loads within the basins. MESSAGEix and GLOBIOM were developed previously and coupled in the course of past projects, but have being upgraded to improve the representation of sectorial interlinkages, in particular by adding a representation of the water sector, and to enhance their spatial resolution (IIASA, 2018). As per the last progress report, the overall goal underpinning the development of this AMF is that it is flexible (i.e., models can be plugged in</p>	<p>Fully achieved 100%</p>

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
			<p>depending on the) questions to be addressed), scalable (i.e., applicable at multiple scales), and transferable (i.e., applicable to different locations). A number of open-access publications and model source code relating to these models have been published too.</p> <p>Also, as part of the Indus assessment, the modelling team completed the regional representation of the nexus in the AMF and populated the models through use of the required databases. In the Zambezi, efforts during the year 2018 have also been focused in completing the basin AMF and continuing the engagement activities started in 2017. Based on the challenges and priority needs collected from the stakeholder meetings (see outcome 1.1), the Zambezi AMF has been developed using five models (CWATM, MARINA, ECHO, MESSAGE-Access, and GLOBIOM), and populated with the available regional and global data.</p>	
		<p>I: Number of presentations of nexus modelling tool and preliminary results</p> <p>T: Two presentations of the nexus modelling tool and preliminary assumptions and results (one in each region)</p>	<p>Achieved 100%</p> <p>The tool has been presented in the Vienna Forum and the Kathmandu Forum for the IRB, and in the Harare (July) Forum for the ZRB. Due to COVID-19 restrictions, one presentation about the project took place on December 10th, 2020 in the form of a dissemination webinar addressing IRB and ZRB stakeholders, in addition to a wider international audience. This final presentation is the most complete of all and shows all the characteristics and features of the tools.</p>	
Component 2: Exploring nexus solutions at global and regional scales				
<p>Outcome 2.1 Regional assessment of nexus challenges and solutions: Understanding of sectorial trade-offs, synergies, and solutions for meeting nexus challenges improved</p>	<p>2.1.1 Tangible strategies for improving regional decision-making across sectors and borders identified for two selected regions</p>	<p>I: Identification and documentation of key regional insights (yes/no)</p> <p>T: Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM)</p>	<p>Achieved 100% (or even surpassed)</p> <p>Summary of key sectoral transboundary challenges for each basin were identified and classified in energy, water and agricultural challenges. Full description of these can be found in the Summaries for the stakeholders meeting conducted in each basin (Summary Report I Stakeholder Meeting. March 2018, Indus; and Summary Report I Stakeholder Meeting. November 2017, Zambezi).</p> <p>A Summary of the discussions held is included in the Summary Report I Stakeholder Meeting. March 2018. This report summarises the main sectoral and nexus challenges that riparian countries are facing and have been grouped around three main sectors to provide an overall picture for the basin: Energy challenges; Water challenges; and Agricultural challenges. In Zambezi region, the summary of the discussions held, and the results of the process are summarised in the Summary Report I Stakeholder Meeting. November 2017. The ISWEL team was invited to participate in the second Zambezi Basin Stakeholder Forum, held in Lusaka on 24-25 September 2017 and the last session before the wrap-up was allocated for presenting the ISWEL project. A discussion exercise in</p>	<p>Fully achieved 100%</p>

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
among regional stakeholders			<p>groups was conducted and sectoral challenges and prioritization of nexus challenges was done across the water, energy, and land sectors. The second stakeholder workshop (Harare, July 2018) also helped to confirm the issues, which were classified in Energy challenges, Water challenges and Agricultural challenges.</p> <p>The policy brief document (005_6993 Policy Brief) is available and it can also be found in ISWEL Project website https://www.iswel.org/results/publications-presentations/</p> <p>Apart from the general policy brief, two (2) additional policy briefs, one for each basin, are being drafted and will be issued.</p>	
<p>Outcome 2.2 Global nexus hotspots and transformation pathways: multi-sectorial vulnerability hotspots under different socioeconomic and hydro-climatic scenarios identified</p>	<p>2.2.1 Global assessment of multi-sectorial hotspots and transformation pathways</p>	<p>I: Global assessment of multi-sectorial hotspots and transformation pathways (yes/no)</p> <p>T: Documentation and communication of key insights from global assessment in publications and Summary for Policy Makers</p>	<p>Yes. Achieved 100%.</p> <p>The “Global Hotspot Explorer” has been launched, and the Global Hotspot Explorer report which is in the Annex II of the last progress report, was also issued.</p> <p>Global hotspot work has been expanded to assess the multi-sectoral risks and vulnerability exposure of the 275 major river basins across the world. In addition, the Scenario Workshops conducted in both basins have facilitated the development of 3 contrasting visions and development pathways for each basin and based on the stakeholder preferences. Particularly, in Indus, the outcomes of the Scenario Workshop consisted of:</p> <ol style="list-style-type: none"> 1. Three visions for the Indus basin, differentiated by the value preferences of the stakeholders, composed of spatial representation of development as well as sectoral challenges, and a range of potential solutions (technological but also behavioural, and policy related). 2. A timeline describing the different steps at which solutions and challenges will have to be implemented/addressed. <p>Additional information can be found in Summary Report II Stakeholder Meeting Indus, June 2018.</p> <p>In Zambezi basin, the 2-day workshop outcomes translated into:</p> <ol style="list-style-type: none"> 1. Development of 3 visions and pathways to desirable futures for the Zambezi 2. Enhanced and shared understanding across riparian countries participants and the ISWEL team national challenges and implications of different investments in the basin and their consequences cascading through the WEL sectors <p>Additional information can be found in Summary Report II Stakeholder Meeting Zambezi, July 2018.</p>	<p>Fully achieved 100%</p>

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
			<p>The Summary for Policy Makers “Between 1.5°C and 2°C – the big impacts of half a degree” disseminates information and knowledge about the impact that an increase of global mean temperature would have on population, different regions of the world and where it would be more severe (hotspots). It specifically analyses and addresses the information gap related to understanding the different impacts that may exist if temperature increases 1.5° or 2.0°, i.e. impacts associated to half a degree difference in increase.</p> <p>Evidence can be found in the following documents:</p> <ul style="list-style-type: none"> • The Summary reports of the Scenario Workshops for each basin • Papers and publications from IIASA: there are 26 high impact papers and publications made by IIASA, 15 of which are Q1 papers (25% most impactful papers). This fact highlights the great scientific research work and effort made by the ISWEL project and the significant contribution to knowledge creation and dissemination. • The Summary for Policy Makers is also available in the ISWEL Project website. <p>Apart from the general policy brief, two (2) additional policy briefs, one for each basin, are being drafted and will be issued.</p>	
		<p>I: Identification and documentation of knowledge and data gaps (yes/no)</p> <p>T: Inclusion of knowledge and data gaps in Summary for Policy Makers</p>	<p>Yes. Achieved 100%</p> <p>The Summary for Policy Makers disseminates information and knowledge about the impact that an increase of global mean temperature would have on population, different regions of the world and where it would be more severe (hotspots). It specifically analyses and addresses the information gap related to understanding the different impacts that may exist if temperature increases 1.5° or 2.0°.</p>	
Component 3: Capacity Building and Knowledge Management: Building the foundation for a knowledge and capacity network on nexus decision support				
<p>Outcome 3.1 A foundation of a regional and global knowledge and capacity network established</p>	<p>3.1.1 Establishment of connections and interactions among stakeholders from a wide array of institutions, sectors and countries;</p>	<p>I: Number of stakeholder meetings per case study region</p> <p>T: Three total stakeholder meetings in each case study region (includes consultation on study design) (~one per year)</p>	<p>In Indus River Basin region (according to ISWEL Project website and to the Progress reports and Workshop summary reports):</p> <ol style="list-style-type: none"> 1. 1 (one) national consultation meeting in Delhi, India, March 2018. Attendees: 4 IIASA Staff, 23 participants, from 13 different organizations. 2. 1 (one) national consultation meeting in Lahore, Pakistan, March 2018. Attendees: 4 IIASA Staff, 1 UNIDO Staff, 34 participants from 15 different organizations. 3. One (1) Indus Scenario Workshop & III Indus Basin Forum (Vienna and Laxenburg, May-June 2018). Attendees: 8 IIASA staff, 3 members of the PSC, 40 participants for two days followed immediately by a wider stakeholder workshop with approximately 100 participants drawn from the riparian countries and other organisations (24 in total). 	<p>Fully Achieved 100%</p>

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
	including expert advisory meetings		<p>4. One (1) Indus Final Workshop & IV Indus Basin Forum, August 2019, Kathmandu, Nepal.</p> <p>5. One (1) virtual webinar to show the Final Results of the project in December 10th, 2020 (due to COVID-19).</p> <p>The purpose of the two first country consultations was to strengthen and build partnerships with national organizations from the two countries and, given the political sensitivities, identify in a neutral environment what are the country perspectives on the sectoral and transboundary challenges. Therefore, two key partnerships have been established for the implementation of the project: with Lahore University of Management Sciences LUMS (Pakistan) and The Energy Resources Institute TERI (India).</p> <p>IIASA in partnership with ICIMOD, the IWMI and the World Bank convened two interlinked events from May 29th through June 2nd 2018 in Vienna and Laxenburg: a Scenario Workshop on "Developing Visions and Future Pathways for the Indus Basin" and the Third Indus Basin Knowledge Forum, whose theme for the 2018 year was "Managing Systems Under Stress: Science for Solutions in the Indus Basin". These meetings have contributed to connect and build partnerships with a wide range of stakeholder organizations in the basin, in addition to contributing to achieving outcome 1.1 and 2.1 as described before by identifying main water-energy-land nexus challenges; and co-developing 3 alternative basin visions and pathways (stakeholder driven scenarios).</p> <p>In Zambezi River Basin region (according to ISWEL Project website and to the Progress reports and Workshop summary reports):</p> <p>6. 1 (one) stakeholders' meeting to build partnerships with regional and riparian organisations. As a result of the discussions with ZAMCOM, the ISWEL team was invited to participate in the second Zambezi Basin Stakeholder Forum. This was held during a ZAMTEC meeting in February 2017 in Tete, Mozambique.</p> <p>7. One (1) stakeholders' consultation during the Second Zambezi Basin Stakeholder Forum "Benefits of Co-operation and Basin-wide Planning in the Management and Development of Shared Water Resources" took place between 25-26 September 2017 at the Intercontinental Hotel Lusaka. It was organized by ZAMCOM and attended by 120 participants, representing more than 40 regional and riparian organizations. The last session before the wrap-up was allocated for presenting the ISWEL project. All participants sat in 10 roundtables, and each table had between 7-9 persons (i.e. about 70-90 attendees). A discussion exercise took place to identify challenges and opportunities for fostering a cross-sectoral cooperation and nexus approach in the Zambezi Basin.</p> <p>8. Attended two (2) additional meetings invited by ZAMCOM:</p> <ul style="list-style-type: none"> ○ One coordination meeting in Harare on 5 February 2018 with the intention to align current efforts and build on the work done across projects to support the Zambezi Strategic Development Plan (ZSDP) and the Zambezi Water Resources 	

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
			<p>Information System (ZAMWIS). Attendees: 1 IIASA Staff, and at least 4 other organisations. Outcome included a pre-agreement between IIASA and ZAMCOM.</p> <ul style="list-style-type: none"> o Participation in the III Basin Stakeholder Forum “Water, Energy, Land Nexus for Socioeconomic development in the Zambezi Basin” to provide a brief about project progress and development. Took place in Lilongwe 8-9 October 2018. Attended by 1 IIASA Staff. IIASA was here invited to attend the bi-annual ZAMCOM Technical Committee meeting on November 22nd in Harare to present the scenario approach and preliminary results of the exercise developed during the scenario workshop of July (see below) but finally they did not attend this meeting. <p>9. One (1) Zambezi Scenario Workshop, in Harare, in July 2018. The purpose of this workshop was to build on the first meeting bringing together experts and stakeholders from the eight riparian countries, to jointly discuss desirable futures and pathways for the Zambezi basin and its riparian countries with regards to water, energy, and land. The meeting was co-organized with ZAMCOM and was attended by 6 IIASA staff, and the UNIDO project Manager, and by 24 stakeholders from seven riparian countries (Tanzania was not represented). Including other international organisations plus riparian countries’ governments and institutions, a total of 21 were present.</p> <p>10. One (1) virtual webinar to show the Final Results of the project in December 10th, 2020 (due to COVID-19).</p>	
		<p>I: Expert advisory meetings (yes/no)</p> <p>T: Number of informal expert advisory meetings conducted</p>	<p>Yes. 100% Achieved.</p> <p>There were informal advisory meetings conducted throughout the project implementation period. These meetings were held simultaneously to the workshops that were conducted during the project. Taking advantage of the presence of experts during the workshops, the team requested for their views about the project. There were apart from those meetings, numerous telephone calls and ideas exchange between the ISWEL team researchers and scientists or expert advisors.</p>	
<p>Outcome 3.2 Capacity building: Regional capacity for nexus assessment and solution</p>	<p>3.2.1 Capacity building for systems analysis and nexus decision support established through:</p>	<p>I: Number of capacity building workshops</p> <p>T: Two capacity building workshops per case study region</p>	<p>95% Achieved</p> <p>As informed in the progress reports, the workshops’ reports and the ISWEL Project website the following capacity building workshops were conducted:</p> <p>In Indus River Basin region:</p> <ul style="list-style-type: none"> • One capacity building workshop was conducted back to back with the Indus Scenario Workshop & III Indus Basin Forum, in Vienna, May 2018. This one-day training was on integrated assessment tools. 	<p>Fully Achieved</p> <p>97.5%</p>

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
identification improved	3.2.1.a Two capacity building workshops per case study region, held concurrently with stakeholder meetings 3.2.1.b Exchange of scientists/experts with partner academic institutions, ministries and/or multilateral organizations		<ul style="list-style-type: none"> • One capacity building workshop was conducted alongside the Indus Final Workshop & IV Indus Basin Forum, August 2019, Kathmandu. In Zambezi River Basin region: <ul style="list-style-type: none"> • One capacity building workshop during the II Stakeholder Meeting Scenario Workshop & Capacity Development event that took place in Harare, 9-11 July 2018. It consisted of a 2-day Scenario Workshop and 1-day training on Scenario processes. The training was attended by 11 International Master students from Zimbabwe University and was intended to provide them with an overview on different approaches for scenario planning process and some skills to support the IIASA team during the stakeholder scenario workshop. This was the only capacity building workshop that was undertaken for the ZRB. • Following the previous event, the project team began planning the third and final workshop, initially foreseen for March 2019. During those months, the new Executive Secretary of ZAMCOM, Mr Michael Mutale, was appointed, who communicated the project team that the meeting had to be re-scheduled given that they were in the process of reviewing the Zambezi Strategic Development Plan as per the request of the Council of Ministers from the riparian countries. As a result, the team was informed that most of activities, including the workshop had to be postponed to early 2020. The meeting was scheduled for 24-25 March 2020 in Maputo, but due to the COVID-19 outbreak in Europe in early March, the project team was forced to adopt a precautionary principle and cancelled the meeting. The concept note and agenda were agreed (see Annex VIII to the Last Progress Report). Subsequently, a proposal to develop an online policy simulation exercise was suggested, however ZAMCOM indicated that the situation in the riparian countries was not suitable to organize such an event, and the project team finally decided in October 2020 to cancel the meeting as there was no feasible alternative to postpone the organization within the timeline of the project (<i>text extracted from the Last progress report, pages 60-61</i>). <p>The project team has agreed with UNIDO to replace the workshop with a number of dissemination activities, to showcase the results of the Zambezi assessment. This will be a public online dissemination event, where along with the Zambezi works, it will introduce the other components of the project, namely, the Indus work and the Global Hotspot Explorer. This event will target all project beneficiaries, including but not limited to Zambezi stakeholders. The concept note for this webinar is also attached in the last progress report.</p>	
		I: Number of scientists/experts exchanged	100% Achieved, and surpassed In Indus River Basin region: Three (3) Young Summer Scientists from Pakistan, India and China were hosted by IIASA during the summer between June and August 2018, these were 2 men and 1 woman . One was from LUMS and	

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
		<p>T: At least one scientist/expert per case study region</p>	<p>to support the wider dissemination and outreach of the YSSP contribution to the Indus nexus assessment, IIASA sponsored his participation at the European Geoscientific Union conference in April 2019. Ongoing development of the Indus model continues with another Pakistani researcher (man), currently employed at IIASA (since 2019). Therefore, a total of four (4) people was involved from the Indus.</p> <p>A fifth student from Brazil was hosted by IIASA to transfer knowledge and tools to his home country.</p> <p>In Zambezi River Basin region:</p> <p>Two (2) Young Summer Scientists from Zambia (Mirriam Makungwe) and Zimbabwe (Fortune Nyatsanza) were hosted by IIASA between June-August 2019. Both were women.</p> <p>Therefore, a total of 7 students were hosted by IIASA to conduct their research, 43% female.</p>	
<p>Outcome 3.3 Knowledge dissemination: Infrastructure established to disseminate findings of the project</p>	<p>Output 3.3.1 Dissemination of project outcomes through publications, events, and data sharing through:</p> <p>3.3.1.a Participation in high-level panels, conferences, and events</p>	<p>I: Number of presentations at high level events</p> <p>T: Presentations at a minimum of three high level events per year</p>	<p>100% Achieved</p> <p>2017: Participation in 20 scientific conferences and 5 high level panels, mentioned in 003_Second progress report (year 1 of the project).</p> <p>2018: Attendance to 16 conferences and 6 high level panels/side events, in 004_third progress report (year 2 of implementation).</p> <p>2019: Participation in over 20 Scientific conferences and 8 High Level Panels/Research to policy Meetings (in accordance to last progress report).</p>	<p>Fully Achieved 100%</p>
	<p>3.3.1.b Online database for sharing of scenario results</p>	<p>I: Development of online database (yes/no)</p> <p>T: Online database accessible and populated with scenario results</p>	<p>100% Achieved</p> <p>The online databases for Basins and Global Hotspots work is available at the following links: https://data.ene.iiasa.ac.at/hotspots</p> <p>This scenario explorers host results from extended modelling and analytical work that was undertaken in both basins and the global hotspots work. A Registration is needed in order to have access to the database of the basins.</p>	
	<p>3.3.1.c Two experience notes shared via IW: Learn</p> <p>3.3.1.d Joint GEF-IIASA-UNIDO</p>	<p>I: Number of experience notes shared</p> <p>T: One experience note per case study completed</p>	<p>100% Achieved</p> <p>The project team was invited by the IW:Learn (International Waters Learning Exchange & Resource Network) to share the two experiences (the two case studies). GEF IW Experience Notes are short case studies on specific project experiences that may be of interest to other projects in the portfolio to replicate. They cover a range of topics related to project management, stakeholder involvement,</p>	

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
	<p>Summary for policymakers describing project insights and outcomes</p> <p>3.3.1.e Scientific publications in high-impact journals and white papers</p>	<p>I: Development of a Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM) (yes/no)</p> <p>T: Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM)</p> <p>I: Number of publications</p> <p>T: At least eight scientific publications and/or white papers submitted over the life of the project</p>	<p>technical issues, demonstration projects, and more (see https://iwlearn.net/documents/experience-notes).</p> <p>Instead of doing “experience notes” in a written document format, the project did two videos to present the experiences for an edX MOOC on Transboundary water resources.</p> <p>The link to the IW:LEARN events where the team participated are:</p> <ul style="list-style-type: none"> 5th Targeted Regional Workshop for GEF International Waters Projects and Partners in Africa (May 2019): https://iwlearn.net/events/workshops/5th-targeted-regional-workshop-for-gef-iw-projects-in-africa. The Agenda for the workshop shows the participation of IIASA (accessible via the link and also in as reviewed document number 040_agenda-of-the-5th-regional-workshop-for-gef-iw-projects-and-partners-in-africa). <p>The team participated in the 9th Biennial International Waters Conference organized by GEF in Marrakesh (November 2018) through a number of activities, including running the nexus simulation game and an overview presentation about the ISWEL project. Link to event site: https://iwlearn.net/events/conferences/iwc9-2018 The International Waters Conference included as well a Film Festival, where the “Managing Systems Under Stress: Science for Solutions in the Indus Basin” video was shown.</p> <p>Achieved 100%, and surpassed</p> <p>1 policy brief developed and available online in ISWEL Project website under the name ““Between 1.5°C and 2°C – the big impacts of half a degree” December 2018.</p> <p>Plus 2 more policy briefs developed one for each basin whose drafts are included in the last progress report of the ISWEL Project.</p> <p>Achieved 100%, and surpassed</p> <p>In accordance to the information that has been revised, there are 15 scientific papers associated to the ISWEL project:</p> <ul style="list-style-type: none"> Global papers: 9 (nine) scientific papers published Regional/Basin papers: 6 (six) scientific papers published (1 accepted for publication and in editorial process) <p>In addition to these, the project has been referred to in other publications, for example:</p>	

Strategic Outcomes / impacts	Outputs	Indicators and Targets by end of 2020	Achievement until 31/12/2020	Progress achieved / indicator
			<ul style="list-style-type: none"> The global hotspot assessment carried out has been featured in the IPCC Special Report on Global Warming of 1.5°C, that can be found here: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter3_Low_Res.pdf The hotspots assessment was published in the fully open access journal <i>Environmental Research Letters</i> in May 2018 “Global exposure and vulnerability to multi-sector development and climate change hotspots” Link: https://iopscience.iop.org/article/10.1088/1748-9326/aabf45 	

Progress achieved: Not achieved (0-19%); Partially Achieved (20-49%); Moderately Achieved (50-64%); Mostly Achieved (65-89%); Fully Achieved (90-100%)

Annex 7: Terms of reference



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE

Independent terminal evaluation
Integrated Solutions for Energy, Water, and Land
UNIDO Project No.: 140312

SEPTEMBER 2020

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I. Project background and overview

1. Project factsheet

Project title	Integrated Solutions for Water, Energy, and Land
UNIDO ID	140312
GEF project ID	6993
Region	East-South Africa and Central-South Asia
Country	Global
Planned implementation start date	February 2015
Planned implementation end date	December 2019
Actual implementation start date	1 st February 2015
Actual implementation end date	31 st December 2020
Implementing agency	United Nations Industrial Development Organization (UNIDO)
Government coordinating agency	
Executing partner	International Institute for Applied Systems Analysis (IIASA)
Donor(s):	Global Environmental Facility
GEF grant (US\$)	US\$ 1,900,000
UNIDO input (US\$)	US\$ 450,000
Co-financing at CEO Endorsement, as applicable (US\$)	US\$ 1,900,000
Total project cost (US\$) excluding support costs and PPG, including project management costs	US\$ 3,800,000

(Source: Project document)³²

2. Project context

The project “Integrated Solutions for Water, Energy, and Land” is financed by the Global Environmental Facility, executed by IIASA and implemented by UNIDO.

The proposed project includes:

- Development of a systems analysis framework for assessing solutions to the water-energy-land nexus challenges;
- Regional nexus solutions in the context of global developments;
- Capacity building and knowledge management, comprising the foundation for a knowledge and capacity network on nexus decision support;
- Monitoring and Evaluation.

The project will establish a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food and ecosystem security in selected regions. Furthermore, this project will enable advancement of an integrated assessment of nexus challenges for the purpose of providing strategic advice to policy makers and developing agencies.

³² Project information data throughout these TOR are to be verified during the inception phase.

Based on the vast experience accumulated by IIASA and UNIDO together with their partners and collaborators through decades of regional and global analyses focused on various drivers and economic sectors, this project will develop and demonstrate a next generation systems analysis framework capable of exploring and identifying synergistic technical and policy solutions to environmental and human development challenges related to the water, energy and land nexus.

This framework will be applied in both regional and global contexts to help stakeholders to better understand:

- (1) Trade-offs and synergies among strategies to address nexus challenges;
- (2) the benefits of coordinated versus sector-specific approaches;
- (3) solution portfolios that consider uncertainties in future socioeconomic, technological and climatic trends;
- (4) and the location and evolution of nexus hotspots under global change.

This approach will assess the benefits of coordinated action across sectors to help regional stakeholders to identify mutually beneficial strategies for concurrently meeting future energy, water and land resource need while remaining within a “joint, just and safe operating space”.

The systems analysis framework will be tested and refined within the context of two case study regions characterized by hydro-climatic complexity, multiple energy, water and land use challenges and rapid demographic, socioeconomic and climatic change. In each region, stakeholder will be involved in scoping relevant nexus challenges and solutions, helping to refine the systems analysis framework, and translating insights to policy guidelines and investment strategies that are relevant to governments, development agencies and resource managers. In addition, stakeholder interactions and collaborations, as well as capacity building workshops and a scientific exchange program, will build the foundation for knowledge and capacity networks within each case study region. While a stakeholder-informed approach will be used for the case studies, an approach using globally-comprehensive data and tools will be employed for exploring nexus solutions in the context of global developments and solutions (e.g. international trade) and to identify nexus hotspots globally. The systems analysis framework will be used to provide strategic advice to the GEF on how to leverage the findings of this project to inform its future programming directions and funding strategy.

A wide set of transboundary basins was initially considered before selecting the two basins for the case studies: The Indus and Zambezi River Basins. These transboundary regions were selected after consultation with experts and stakeholders and upon careful assessment of the following criteria:

- (1) rapid change of drivers and impacts;
- (2) data availability and quality;
- (3) local capacity and interest;
- (4) diversity of nexus challenges;
- (5) transferability and universality;
- (6) complementarity and diversity of basins; and
- (7) novelty and value added.

The Indus region is the breadbasket for more than 250 million people, yet is already facing water scarcity and groundwater overexploitation. With expected population growth, urbanization and substantial climate change impacts, especially in relation to glacier melt, the future management of water, energy and land resources will become increasingly challenging and will benefit from a nexus approach that can assess the trade-offs among regional options, such as increased irrigation efficiency, cropland expansion and hydropower development. Agricultural pollution and overexploitation of water resources will also pose a threat to aquatic ecosystems and biodiversity, especially in the delta. Moreover, there are growing water conflicts between Pakistan and Afghanistan as proposed hydropower projects in Afghanistan will impact downstream water availability in Pakistan. Although many sectoral studies have been conducted within the Indus Basin, there have not been any integrate nexus assessments of land, water and energy. Stakeholders that have shown interest in nexus challenges within the Indus are the World Bank, the Asian Development Bank (ADB), the International Center for Integrated Mountain Development (ICIMOD), the International Water Management Institute (IWMI), various government ministries within riparian countries and academic researchers from the Centre for

Water Informatics and Technology at Lahore University of Management Sciences (LUMS) as well as Massachusetts Institute of Technology (MIT) in the United States.

The Zambezi basin is heterogeneous in terms of climate (e.g. it has large seasonal and intra-annual variation in precipitation), income distribution and economic development. Conflicts among the eight riparian countries, rapid population growth and the need to expand and improve access to water, food and modern energy suggests that this region will face serious challenges in implementing sustainable development goals and solutions. The region also faces environmental challenges related to mining, deforestation and soil degradation. Although the basin has significant potential for renewable energy and increased irrigation, large investments will be required for improving water and energy infrastructure to meet future resource demands. However, financial capacity remains low and thus a nexus approach will be needed to identify cost-effective and efficient strategies for meeting multiple development goals simultaneously. Several studies examining the water-energy-land nexus have been conducted in or around the Zambezi Basin. However, few studies have addressed all three sectors and none have applied an integrated assessment tool that can explicitly evaluate the trade-offs and synergies among sectors. Some of the key stakeholder within the region are the Southern African Development Community (SADC), the Zambezi Watercourse Commission (ZAMCOM), the World Bank, the African Development Bank, the International Union for the Conservation of Nature (IUCN), the Infrastructure Consortium for Africa (ICA), the International Water Management Institute (IWMI), and the International Water Association (IWA).

Although some socioeconomic and environmental drivers are expected to be similar in the Indus and Zambezi Basins, some drivers will be distinctly different. As a result, the basins will provide complementary, yet diverse insights into regionally-distinct nexus challenges and solutions. Furthermore, neither basin is heavily studied, which means that the project will be able to provide substantial added value to regional resource managers, policy makers and planners.

It is envisaged to create a solid basis for replication and scaling up of the project globally.

Project implementation started in February 2015 and the initial project end date is planned in December 2019. The actual implementation end date will be requested has been extended to 31st December 2020.

The project document foresees regular monitoring and a terminal evaluation (TE).

3. Project objective

The key objective of the proposed project is laying the foundations for developing integrated approaches to identify evidence-based policy and investment strategies that will inform decision making across the water, energy and land nexus through the development of a systems assessment framework. On a global scale the conduction of a hotspot's assessment will enable the exploration of multisector vulnerability hotspot regions. In order to provide tangible strategies for improving regional decision making the framework will be tested and improved in close cooperation with basin stakeholders.

The following **project components** have been developed, in addition to project management, to achieve the project objectives:

Project Component 1: Development of a systems analysis framework for assessing solutions to nexus challenges

A next-generation systems analysis framework has been developed that it capable of exploring a wide range of potential strategies for concurrently managing water, energy and land resources under global change. This was accomplished by developing several global change pathways in consultation with regional stakeholders in order to explore how strategies change under uncertainties about future drivers and developments. In addition, existing and new sectorial modeling tools have been developed and integrated into a new nexus analytical framework. This involved the development of new methods for linking tools across sectors and scales to enable integrated assessment of the water-energy-land nexus at sub-national and global scales.

Activity 1.1. Future trends and drivers systematically explored

Activity 1.2. Method & tool development

Project Component 2: Regional nexus solutions in the context of global developments

The systems analysis framework developed in Component 1 was used to investigate nexus challenges and strategic advice at both global and regional levels. The global and regional assessments has been aligned to enable exploration across scales and to facilitate identification of global and regional nexus hotspots as well as strategies for improving regional decision-making across sectors and national boundaries. The global assessment has been used to capture how nexus challenges are distributed over the planet and to provide insight into important interaction and solutions that transcend basin and national boundaries.

Activity 2.1 Understanding of sectorial trade-offs, synergies and solutions for meeting nexus challenges improved among regional stakeholders

Activity 2.2 Multi-sectorial vulnerability hotspots under different socioeconomic and hydro-climatic scenarios identified

Project Component 3: Capacity building and knowledge management: Building the foundation for a knowledge and capacity network on nexus decision support

The third component of the project built the basis or knowledge and capacity 'Network for Integrated Solutions in Low Latitudes', including consultative meetings and exchange programs with premier scientific institutions in the case study regions. The objective of the 'Network for Integrated Solutions' was to start building the foundation for systems analytic capacity at existing scientific institutions in low latitude regions, so that they can become local centers of nexus decision support. Within this project, the main objective is to identify the "Network institutions", establish the connections, and facilitate interactions among stakeholders from a wide array of institutions within each case study region. Project partners, the expert advisory board, and early stakeholder meetings can helped identify the best local institutions and individual to lead these knowledge hubs. The foundation for knowledge and capacity network is built on three pillars: (1) stakeholder engagement; (2) capacity building; and (3) knowledge dissemination.

Activity 3.1 A foundation of a regional and global knowledge and capacity network

Activity 3.2 Capacity building: Regional capacity for nexus assessment and solution identification improved

Activity 3.3 Knowledge dissemination: Infrastructure established to disseminate findings of the project

Project Component 4: Monitoring and evaluation performed.

A comprehensive M&E framework will be used to assess the project's impact on established a long-term systems approach to develop, refining and applying the tools and skills essential for identifying integrated approaches to the management of energy, water and land resources in selected regions in line with the GEF 2020 strategy. The overall objective of the monitoring and evaluation process is to ensure successful and quality implementation of the project by:

- i) Tracking and reviewing the executions of project activities and actual accomplishments;
- ii) Monitoring the project processes so that the project team can take early corrective action if performance deviates significantly from original plans;
- iii) Adjusting and updating project strategy and the implementation plan to reflect possible changes of the ground, results achieved and corrective actions taken; and
- iv) Ensuring linkages and harmonisation of project activities with that of other related projects at national, regional and global levels.

Tracking of project milestones and accomplishments has been conducted by IIASA and reported in brief semi-annual progress reports. These reports are available for official use and were

submitted by IIASA to UNIDO, which will share their reports with the GEF. The UNIDO project manager is responsible for overseeing and tracking overall project milestones and progress towards the attainment of the agreed project outputs. IIASA is responsible for providing brief progress reports on a semi-annual basis.

The Project will undergo an independent Final Evaluation (FEV) that will focus on the delivery of the project's results as initially planned (and as corrected if any such correction took place during the project). It will examine the project's performance with respect to the planning and adaptive management requirements of both UNIDO and GEF (The GEF Monitoring and Evaluation Policy 2010) and it will determine progress made toward the achievement of the project's outputs and outcomes. The TOR for this evaluation will be prepared by the UNIDO Project Manager based on guidance from the UNIDO Office for Independent Evaluation (ODG/EVA). The FEV will also provide recommendations for follow-up activities and requires a management response.

The following are, in brief, some of the expected results of the project/program:

- **Systems Analysis Framework development:** This framework assessed different pathways, describing several stakeholder-informed regional scenarios, in order to explore solutions for achieving multiple develop and environmental goals
- **Connecting Stakeholders:** The project creates opportunities for stakeholders from a wide array of institutions and sectors to meet and discuss nexus challenges, trade-offs and solutions, improve mutual understanding and remove barriers for future cooperation.
- **Hotspots assessment:** An important outcome of the project is a multi-sectorial vulnerability hotspots explorer, which identifies the global impacts of different socioeconomic and hydro-climatic scenarios and assesses nexus solutions to address cross-sectorial challenges
- **Regional capacity network:** The project enables the foundation of a regional knowledge and capacity network for systems analysis and nexus decision support, through a scientist exchange program in the context of the Young Scientists Summer Program fostering next-generation research expertise, where participants from the basin case studies had the opportunity to get familiar with the regional modeling tools.

4. Project implementation arrangements

The project is funded by the GEF and UNIDO is responsible for the overall implementation of the project. IIASA as the executing agency is responsible for the day-to-day project management. Both organizations will share in the writing of the Joint GEF-IIASA-UNIDO Summary for Policymakers at the conclusion of the project.

The project aims to build the foundation of knowledge and capacity for integrated solutions across energy, water, food and ecosystems, which are relevant to all GEF focal areas, particularly Climate Change Mitigation, International Waters, Land Degradation and Sustainable Forest management.

The project will link into relevant ongoing UNIDO and IIASA projects and processes globally. For example, IIASA and UNIDO work closely with SE4ALL, UN-Energy, UN-Water, the World Water Council, the International Water Association, the Austrian Development Agency, the US Water Partnership, USAID and a large number of research institutes and planning agencies through the Water Futures and Solutions Initiative (WFaS).

Finally, the project has synergies with two research networks associated with Future Earth: The Sustainable Water Future Program (SWFP) and the Sustainable Development Solutions Network (SDSN). The latter is collaborating with IIASA, the Stockholm Resilience Centre, the Earth Institute at Columbia University and the Alpbach-Laxenburg Group on a new initiative entitled The World in 2050. This project intends to develop integrated assessment tools for identifying synergistic solutions for meeting multiple SDGs while remaining within planetary boundaries. Given that the water-energy-land nexus encompasses at least three SDGs it is expected that this project and the resulting nexus assessment framework will play a central role in The World in 2050.

Project Steering Committee (PSC)

The success of this project hinges on proper coordination of the interventions under this project with other ongoing activities at the national level. Accordingly, a Project Steering Committee was established to provide strategic guidance to the project and ensure coordination of the project with other initiatives as well as provide cohesive leadership to the project. The PSC consisted of one male or female representative respectively from IIASA, the Oxford University, IPCC, The Energy and Resource Institute (TERI), GEF and UNIDO. The purpose of the PSC is to provide strategic guidance of the project while minimising overlap with other development projects, and to maximize the input and participation of project counterparts, as well as coordinating these inputs.

Project Management Unit (PMU)

The Project Management Unit consists of two members from IIASA, Ms. Barbara Willaarts and Mr. Simon Langan (until mid-2019) and thereafter Mr. Yoshihide Wada.

5. Budget information

Table 1. Financing plan summary

Description	Project Preparation (US\$)	Project (US\$)	Total (US\$)
Financing (GEF)		1,900,000	1,900,000
Co-Financing (UNIDO, IIASA)		1,900,000	1,900,000
Total (€)		3,800,000	3,800,000

Source: Project document

Table 2. Financing plan summary – project component breakdown

Project outcomes	Donor(s) (US\$)	Co-financing (US\$)	Total (US\$)
1. Component 1	890,000	890,000	1,780,000
2. Component 2	450,000	450,000	900,000
3. Component 3	355,000	355,000	710,000
4. Component 4	55,000	55,000	110,000
Project Management Cost (PMC)	150,000	150,000	300,000
Total (in USD)	1,900,000	1,900,000	3,800,000

Source: Project document

Table 3. Co-financing source breakdown

Name of co-financier (source)	Classification	Type (cash and/or in-kind)	Total (in US\$)
UNIDO (GEF)	Implementing Agency	Cash	75,000
UNIDO (GEF)	Implementing Agency	In-kind	375,000
IIASA (others)	Executing Partner Agency	In-kind	1,450,000
Total co-financing (US\$)			1,900,000

Source: Project document

Table 4. UNIDO budget execution³³ (Grant No.: 2000003317)

Items of Expenditure	2016 (€)	2017 (€)	2018 (€)	2019 (€)	Total Exp. (€)
Contractual Services (€)					
Equipment (€)	-	-	-		-
International Meetings (€)	-	-	-		-
Local travel (€)	-	-			
Natl. Consult./Staff (€)	-	-	-		-

³³ Disbursement: Expenditure, incl. commitment

Items of Expenditure	2016 (€)	2017 (€)	2018 (€)	2019 (€)	Total Exp. (€)
Intl. Consult./Staff (€)	-	-	-		-
Other Direct Costs (€)	-	-			
Premises (€)	-	-	-		-
Staff and Intern (€)	-				
Staff Travel (€)	-	-			
Train/Fellowship/Study (€)	-	-	-		-
Grand Total (€)					

Source: UNIDO. ERP database as of [23/10/2018]

II. Scope and purpose of the evaluation

The purpose of the evaluation is to independently assess the project to help UNIDO improve performance and results of ongoing and future programs and projects. The terminal evaluation (TE) will cover the whole duration of the project from its starting date in to the estimated completion date in 31/12/2020.

The evaluation has two specific objectives:

- (i) Assess the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress to impact; and
- (ii) Develop a series of findings, lessons and recommendations for enhancing the design of new and implementation of ongoing projects by UNIDO.

III. Evaluation approach and methodology

The TE will be conducted in accordance with the UNIDO Evaluation Policy³⁴ and the UNIDO Guidelines for the Technical Cooperation Project and Project Cycle³⁵. In addition, the GEF Guidelines for GEF Agencies in Conducting Terminal Evaluations, the GEF Monitoring and Evaluation Policy and the GEF Minimum Fiduciary Standards for GEF Implementing and Executing Agencies.

The evaluation will be carried out as an independent in-depth evaluation using a participatory approach whereby all key parties associated with the project will be informed and consulted throughout the evaluation. The evaluation team leader will liaise with the UNIDO Independent Evaluation Division (ODG/EIO/IED) on the conduct of the evaluation and methodological issues. The evaluation will use a theory of change approach and mixed methods to collect data and information from a range of sources and informants. It will pay attention to triangulating the data and information collected before forming its assessment. This is essential to ensure an evidence-based and credible evaluation, with robust analytical underpinning.

The theory of change will identify causal and transformational pathways from the project outputs to outcomes and longer-term impacts, and drivers as well as barriers to achieve them. The learning from this analysis will be useful to feed into the design of the future projects so that the management team can effectively manage them based on results.

1. Data collection methods

Following are the main instruments for data collection:

- (a) **Desk and literature review** of documents related to the project, including but not limited to:
 - The original project document, monitoring reports (such as progress and financial reports, mid-term review report, output reports, back-to-office mission report(s), end-of-contract report(s) and relevant correspondence.
 - Notes from the meetings of committees involved in the project.

³⁴ UNIDO. (2015). Director General's Bulletin: Evaluation Policy (UNIDO/DGB/(M).98/Rev.1)

³⁵ UNIDO. (2006). Director-General's Administrative Instruction No. 17/Rev.1: Guidelines for the Technical Cooperation Programme and Project Cycle (DGAI.17/Rev.1, 24 August 2006)

- (b) **Stakeholder consultations** will be conducted through structured and semi-structured interviews and focus group discussion. Key stakeholders to be interviewed include:
- UNIDO Management and staff involved in the project; and
 - Representatives of donors, counterparts and stakeholders.

2. Evaluation key questions and criteria

The key evaluation questions are the following:

- (b) What are the key drivers and barriers to achieve the long-term objectives? To what extent has the project helped put in place the conditions likely to address the drivers, overcome barriers and contribute to the long-term objectives?
- (c) How well has the project performed? Has the project done the right things? Has the project done things right, with good value for money?
- (d) What have been the project's key results (outputs, outcome and impact)? To what extent have the expected results been achieved or are likely to be achieved? To what extent the achieved results will sustain after the completion of the project?
- (e) Did the project succeed in advising regional and global stakeholder on resource management strategies and cross-sectoral solutions and investment shifts through the systems analysis framework?
- (f) Did the project succeed in fostering transboundary and cross-sectoral basin stakeholder cooperation and in founding a capacity and knowledge network?
- (g) What lessons can be drawn from the successful and unsuccessful practices in designing, implementing and managing the project?

The evaluation will assess the likelihood of sustainability of the project results after the project completion. The assessment will identify key risks (e.g. in terms of financial, socio-political, institutional and environmental risks) and explain how these risks may affect the continuation of results after the project ends. Table 6 below provides the key evaluation criteria to be assessed by the evaluation. The details questions to assess each evaluation criterion are in annex 2.

Table 6. Project evaluation criteria

#	Evaluation criteria	Mandatory rating
A	Impact	Yes
B	Project design	Yes
1	• Overall design	Yes
2	• Logframe	Yes
C	Project performance	Yes
1	• Relevance	Yes
2	• Effectiveness	Yes
3	• Efficiency	Yes
4	• Sustainability of benefits	Yes
D	Cross-cutting performance criteria	
1	• Gender mainstreaming	Yes
2	• M&E: ✓ M&E design ✓ M&E implementation	Yes
3	• Results-based Management (RBM)	Yes
E	Performance of partners	
1	• UNIDO	Yes
2	• National counterparts	Yes
3	• Donor	Yes
F	Overall assessment	Yes

Performance of partners

The assessment of performance of partners will **include** the quality of implementation and execution of the GEF Agencies and project executing entities (EAs) in discharging their expected roles and responsibilities. The assessment will take into account the following:

- Quality of Implementation, e.g. the extent to which the agency delivered effectively, with focus on elements that were controllable from the given GEF Agency's perspective and how well risks were identified and managed.
- Quality of Execution, e.g. the appropriate use of funds, procurement and contracting of goods and services.

3. Rating system

In line with the practice adopted by many development agencies, the UNIDO Independent Evaluation Division uses a six-point rating system, where 6 is the highest score (highly satisfactory) and 1 is the lowest (highly unsatisfactory).

Table 7. Project rating criteria

Score		Definition	Category
6	Highly satisfactory	Level of achievement clearly exceeds expectations and there is no shortcoming.	SATISFACTORY
5	Satisfactory	Level of achievement meets expectations (indicatively, over 80-95 per cent) and there is no or minor shortcoming.	
4	Moderately satisfactory	Level of achievement more or less meets expectations (indicatively, 60 to 80 per cent) and there are some shortcomings.	
3	Moderately unsatisfactory	Level of achievement is somewhat lower than expected (indicatively, less than 60 per cent) and there are significant shortcomings.	UNSATISFACTORY
2	Unsatisfactory	Level of achievement is substantially lower than expected and there are major shortcomings.	
1	Highly unsatisfactory	Level of achievement is negligible and there are severe shortcomings.	

IV. Evaluation process

The evaluation will be conducted from September 2020 to December 2020. The evaluation will be implemented in four phases which are not strictly sequential, but in many cases iterative, conducted in parallel and partly overlapping:

- ✓ Inception phase: The evaluation team will prepare the inception report providing details on the methodology for the evaluation and include an evaluation matrix with specific issues for the evaluation; the specific site visits will be determined during the inception phase, taking into consideration the findings and recommendations of the mid-term review.
- ✓ Desk review and data analysis;
- ✓ Interviews, survey and literature review;
- ✓ Data analysis and report writing.

V. Time schedule and deliverables

The evaluation is scheduled to take place from September 2020 to December 2020.

Due to the circumstances under the current COVID-19 pandemic no evaluation field mission is planned.

The tentative timelines are provided in Table 8.

After the evaluation field mission, the evaluation team leader will visit UNIDO HQ for debriefing and presentation of the preliminary findings of the terminal evaluation. The draft TE report will be submitted 4 to 6 weeks after the end of the mission. The draft TE report is to be shared with the UNIDO PM, UNIDO Independent Evaluation Division, the UNIDO GEF Coordinator and GEF OFP and other stakeholders for receipt of comments. The TE leader is expected to revise the draft TE report based on the comments received, edit the language and form and submit the final version of the TE report in accordance with UNIDO ODG/EIO/EID standards.

Table 8. Tentative timelines

Timelines	Tasks
September 2020	Desk review and writing of inception report
Early October 2020	Briefing with UNIDO project manager and the project team based in Vienna through Skype
Mid November 2020	Debriefing with UNIDO project manager and the project team based in Vienna through Skype Preparation of first draft evaluation report
End of November 2020	Internal peer review of the report by UNIDO's Independent Evaluation Division and other stakeholder comments to draft evaluation report
Mid- December2020	Final evaluation report

VI. Evaluation team composition

The evaluation team will be composed of one international evaluation consultant with relevant strong experience and skills on evaluation management and conduct together with expertise and experience in innovative clean energy technologies. The consultant will be contracted by UNIDO.

The tasks of the evaluation consultant are specified in the job description annexed to these terms of reference.

According to UNIDO Evaluation Policy, members of the evaluation team must not have been directly involved in the design and/or implementation of the project under evaluation.

The UNIDO Project Manager and the project team in South Africa will support the evaluation team.

An evaluation manager from UNIDO Independent Evaluation Division will provide technical backstopping to the evaluation team and ensure the quality of the evaluation. The UNIDO Project Manager and national project teams will act as resourced persons and provide support to the evaluation team and the evaluation manager.

VII. Quality assurance

All UNIDO evaluations are subject to quality assessments by UNIDO Independent Evaluation Division. Quality assurance and control is exercised in different ways throughout the evaluation process (briefing of consultants on methodology and process of UNIDO Independent Evaluation Division, providing inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations, review of inception report and evaluation report).

The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality, attached as annex 5. UNIDO's Independent Evaluation Division should ensure that the evaluation report is useful for UNIDO in terms of organizational learning (recommendations and lessons learned) and is compliant with UNIDO's evaluation policy and these terms of reference. The draft and final evaluation report are reviewed by UNIDO Independent Evaluation Division, which will issue and circulate it within UNIDO together with a management response sheet, as well as submit to relevant stakeholders as required.

Annex 1: Project results framework

Project Objective: The project will establish a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food, and eco-system security in selected regions in line with the GEF 2020 strategy.				
	Indicators	Targets	Means of Verification	Assumptions
Component 1. Development of a systems analysis framework for assessing solutions to nexus challenges				
<i>Outcome 1.1. Future trends and drivers systematically explored</i>				
Output 1.1.1 Stakeholder-informed regional scenario design for exploring nexus challenges, drivers and solutions	<ul style="list-style-type: none"> Number of stakeholder-informed regional scenarios Number of stakeholder consultations 	<ul style="list-style-type: none"> At least two stakeholder-informed regional scenarios per case study region One stakeholder consultation in each study region 	<ul style="list-style-type: none"> Document summarizing the stakeholder-informed scenarios Agenda, minutes, and presentations from stakeholder consultation posted to project website 	<ul style="list-style-type: none"> Good attendance at stakeholder consultations and interest in the development of regional scenarios; data availability and access to implement the scenarios Interest in regional stakeholder meetings to discuss scenario design and nexus challenges
<i>Outcome 1.2 Method and tool developed</i>				
Output 1.2.1 Nexus modeling tool developed and presented with preliminary results: Tool will illuminate trade-offs among sectors and explore solutions for achieving multiple development and environmental objectives	<ul style="list-style-type: none"> Nexus modeling tool developed (yes/no) Number of presentations of nexus modeling tool and preliminary results 	<ul style="list-style-type: none"> A completed nexus modeling tool Two presentations of the nexus modeling tool and preliminary assumptions and results (one in each region) 	<ul style="list-style-type: none"> Preliminary results based on model runs presented at stakeholder meetings (ppt) Minutes from regional stakeholder meetings and demonstration (ppt) available on project website 	<ul style="list-style-type: none"> Model development is not delayed by unforeseen technical challenges; required data are available and accessible Model development is not delayed by unforeseen technical challenges; required data are available and accessible
Component 2. Regional nexus solutions in the context of global developments				
<i>Outcome 2.1 Regional assessment of nexus challenges and solutions : Understanding of sectorial trade-offs, synergies, and solutions for meeting nexus challenges improved among regional stakeholders</i>				
Output 2.1.1 Tangible strategies for improving regional decision-making across sectors identified for two selected regions	Identification and documentation of key regional insights (yes/no)	Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM)	SPM available on project website	Regional model development is successful and yields clear insights regarding trade-offs, synergies, and solutions for regional nexus challenges

<i>Outcome 2.2 Global nexus hotspots and transformation pathways: multi-sectorial vulnerability hotspots under different socioeconomic and hydro-climatic scenarios identified</i>				
Output 2.2.1 Global assessment of multi-sectorial hotspots and transformation pathways	<ul style="list-style-type: none"> Global assessment of multi-sectorial hotspots and transformation pathways (yes/no) Identification and documentation of knowledge and data gaps (yes/no) 	<ul style="list-style-type: none"> Documentation and communication of key insights from global assessment in publications and SPM Inclusion of knowledge and data gaps in SPM 	<ul style="list-style-type: none"> Scientific publications and white papers completed; SPM available on project website SPM available on project website 	<ul style="list-style-type: none"> Global model development is successful and yields clear insights into global nexus hotspots and sustainable transformation pathways Global and regional model development is successful and yields insights regarding knowledge and data gaps
Component 3. Capacity Building and Knowledge Management: Building the foundation for a knowledge and capacity network on nexus decision support				
<i>Outcome 3.1 A foundation of a regional and global knowledge and capacity network established</i>				
Output 3.1.1 Establishment of connections and interactions among stakeholders from a wide array of institutions and sectors, including formation of an advisory board	<ul style="list-style-type: none"> Number of stakeholder meetings per case study region Advisory Board formed (yes/no) 	<ul style="list-style-type: none"> Three total stakeholder meetings in each case study region (includes consultation on study design) (~one per year) Form an advisory board 	<ul style="list-style-type: none"> Minutes and participant lists from stakeholder meetings List of Advisory Board members and minutes from advisory board consultations 	Interest in regional stakeholder meetings from a wide array of institutions and sectors; willingness of stakeholders to interact; progress on project to enable stakeholder feedback
<i>Outcome 3.2 Capacity building: Regional capacity for nexus assessment and solution identification improved</i>				
Output 3.2.1 Foundation of a regional knowledge and capacity network for systems analysis and nexus decision support established through:				
3.2.1.a Two capacity building workshops per case study region, held concurrently with stakeholder meetings	Number of capacity building workshops	Two capacity building workshops per case study region	Minutes and presentations from capacity building workshops posted on project website	Interest and engagement from regional scientists and practitioners
3.2.1.b Exchange of scientists with partner academic institutions	Number of scientists exchanged	At least one scientist per case study region	Report by exchange scientist on their research and contribution to the project	Interest from regional and IIASA scientists; sufficient quality of scientists
<i>Outcome 3.3 Knowledge dissemination: Infrastructure established to disseminate findings of the project</i>				
Output 3.3.1 Dissemination of project outcomes through publications, events, and data sharing through:				

3.3.1.a Participation in high-level panels, conferences, and events	Number of presentations and events at high level events	Presentations at a minimum of three high level events per year	Links to event agendas and/or presentations posted on project website	External interest in project, model, and insights
3.3.1.b Online database for sharing of scenario results	Development of online database (yes/no)	Online database accessible and populated with scenario results	Link to online database on project website	Successful implementation of model and generation of scenario results
3.3.1.c Online lecture series on nexus topics	Development of an online lecture series (yes/no)	Lecture series available online	Link to online lecture series on project website	Lectures given by project scientists and partners videotaped and suitable as an online lecture
3.3.1.d Two experience notes shared via IW:Learn	Number of experience notes shared	One experience note per case study completed	Link to experience notes on IW:Learn website	Material available for drafting of experience notes
3.3.1.e Joint GEF-IIASA-UNIDO Summary for policymakers describing project insights and outcomes	Development of a Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM) (yes/no)	Joint GEF-IIASA-UNIDO Summary for Policymakers (SPM)	SPM available on project website	All components of model development are successful and yield valuable insights for inclusion in the SPM
3.3.1.f Scientific publications in high-impact journals and white papers	Number of publications	At least eight scientific publications and/or white papers submitted over the life of the project	Links to scientific publications and white papers on project website	All components of model development are successful and yield insights worthy of scientific publication

Annex 3: Evaluation Team - Terms of Reference

JOB DESCRIPTION



for the execution of activities under the UNIDO project “Integrated Solutions for Water, Energy, and Land”

21 September 2020

1. Background and objective of proposed work and services

The United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability. The mission of UNIDO, as described in the Lima Declaration adopted at the fifteenth session of the UNIDO General Conference in 2013, is to promote and accelerate inclusive and sustainable industrial development (ISID) in Member States. The relevance of ISID as an integrated approach to all three pillars of sustainable development is recognized by the 2030 Agenda for Sustainable Development and the related Sustainable Development Goals (SDGs), which will frame United Nations and country efforts towards sustainable development in the next fifteen years. UNIDO’s mandate is fully recognized in SDG-9, which calls to “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”. The relevance of ISID, however, applies in greater or lesser extent to all SDGs. Accordingly, the Organization’s programmatic focus is structured in four strategic priorities: Creating shared prosperity; Advancing economic competitiveness; Safeguarding the environment; and Strengthening knowledge and institutions.

Each of these programmatic fields of activity contains a number of individual programmes, which are implemented in a holistic manner to achieve effective outcomes and impacts through UNIDO’s four enabling functions: (i) technical cooperation; (ii) analytical and research functions and policy advisory services; (iii) normative functions and standards and quality-related activities; and (iv) convening and partnerships for knowledge transfer, networking and industrial cooperation. Such core functions are carried out in Departments/Offices in its Headquarters, Regional Offices and Hubs and Country Offices.

The UNIDO Independent Evaluation Division (ODG/EIO/IED) is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides information about result and practices that feed into the programmatic and strategic decision-making processes. Evaluation is an assessment, as systematic and impartial as possible, of a programme, a project or a theme. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. The UNIDO Independent Evaluation Division is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

PROJECT CONTEXT

The project “Integrated Solutions for Water, Energy, and Land” is financed by the Global Environmental Facility, executed by IIASA and implemented by UNIDO.

The proposed project includes:

- Development of a systems analysis framework for assessing solutions to the water-energy-land nexus challenges;
- Regional nexus solutions in the context of global developments;
- Capacity building and knowledge management, comprising the foundation for a knowledge and capacity network on nexus decision support;
- Monitoring and Evaluation.

The project will establish a long-term systems approach to developing, refining and applying the tools and skills essential for identifying integrated approaches to energy, water, food and ecosystem security in selected regions. Furthermore, this project will enable advancement of an integrated assessment of nexus challenges for the purpose of providing strategic advice to policy makers and developing agencies.

Based on the vast experience accumulated by IIASA and UNIDO together with their partners and collaborators through decades of regional and global analyses focused on various drivers and economic sectors, this project will develop and demonstrate a next generation systems analysis framework capable of exploring and identifying synergistic technical and policy solutions to environmental and human development challenges related to the water, energy and land nexus.

2. Scope of work

The contractor will conduct the terminal evaluation of this project in accordance with the Terms of Reference (TOR) and will perform, inter alia, the following main tasks:

Activities	Concrete/ Measurable Outputs to be achieved	Working Days
<p>Desk review From the long-term economic-environmental policy perspective, review project documentation and relevant regional studies on the Indus and Zambezi basins to:</p> <ul style="list-style-type: none"> • Determine key data to be collected in the field and adjust the key data collection instruments accordingly; • Assess the adequacy of legislative and regulatory framework relevant to the project's activities; • Assess the adequacy of partnerships at institutional, national and global levels. • Assess progress-to-impact 36 dimensions of the research project. • Assess the global Hotspots Explorer and its added value, that was developed in the course of the project 	<ul style="list-style-type: none"> • A list of evaluation questions; questionnaires /interview guide; logic models adjusted to ensure understanding in the national context • Stakeholders to be interviewed and focus groups (if deemed necessary). • Types and number of surveys • Assessment of the adequacy of the legislative and regulatory framework • Assessment of project partnerships • Assessment of global Hotspots Explorer 	6 days
<p>Inception Report Prepare an inception report which:</p> <ul style="list-style-type: none"> • Sets out the specific evaluation questions; • Specifies the methods to be used and data analysis to be conducted; • Specifies how and when field data will be collected; • Outlines the evaluation theory of change; and • Provides work schedule for the entire evaluation 	Inception report submitted to the evaluation manager	3 days
<p>Briefing meeting Briefing with the UNIDO Independent Evaluation Division, project managers and other key stakeholders at UNIDO HQ.</p>	<ul style="list-style-type: none"> • Presentation of the Inception Report • Detailed evaluation schedule with proposed schedule for interviews (incl. list of stakeholders to be interviewed) submitted to 	1 day

36 See evaluation criteria for a definition of progress-to-impact

Activities	Concrete/ Measurable Outputs to be achieved	Working Days
	evaluation and project manager	
Stakeholders consultation Consult field project stakeholders, partners and beneficiaries to verify and complete preliminary evaluation findings from desk review and assess the institutional capacities of the recipient country/ region.	<ul style="list-style-type: none"> Evaluation/debriefing presentation on the carried out stakeholders consultation process and results 	5 days
Debriefing meeting Present preliminary findings, recommendations and lessons learnt to project stakeholders at UNIDO HQ for factual validation and comments Conduct HQ interviews and obtain additional data as required	<ul style="list-style-type: none"> Power point presentation Feedback from stakeholders obtained and discussed Additional meetings held as required 	1 days
Draft evaluation report Prepare the draft evaluation report, in accordance with the evaluation TOR Submit draft evaluation report to the evaluation manager for feedback and comments	<ul style="list-style-type: none"> Draft evaluation report submitted to evaluation manager for review and comments 	7 days
Final evaluation report and detailed recommendations Revise the draft evaluation report based on comments and suggestions received through the evaluation manager; edit the language and finalize the evaluation report according to UNIDO standards Prepare detailed recommendations for follow-up activities	<ul style="list-style-type: none"> Final evaluation report submitted to evaluation manager (including two-page executive summary) Detailed recommendations for follow up activities 	7 days
	TOTAL	30 days

3. **Budget:** The capital contribution will be market-based and shall be in the maximum amount of US\$ 24,000 over a period of two and a half (2.5) months.

4. General time schedule/deliverables

ITPE LTD executes the agreed activities over a period of two and a half (2.5) months, starting from the date of effectiveness of the contract and receipt of funding. ITPE LTD will provide all deliverables in digital form. All reports submitted by ITPE LTD shall include supporting documents, such as relevant maps, tables and graphs with sources along with bibliography cited clearly. The reports will include a zip-file including all generated reports, products and photos during that time. All reports should be submitted in electronic format and in English. All supporting documents should be submitted in English (if available).

In case of unforeseen delays, UNIDO and ITPE LTD can agree on an extension of the duration (without budget increase). Should any delay occur or unexpected circumstance arises, ITPE LTD should notify UNIDO Independent Evaluation Division in writing in a timely manner.

5. Language requirements

Team members must have a good command of English in both speaking and writing.

6. Personnel in the Field

Competencies of the team

- Analytical thinking; planning, organizing and problem-solving abilities
- Proven ability to lead and coordinate multidisciplinary teams;

- Ability to quickly grasp and synthesize inputs from a range of disciplines;
- Ability to communicate effectively in order to transfer complex and technical information to technical and general audiences;
- Skills in achieving results through persuading, influencing and working with others;
- Skills in facilitating meetings effectively and efficiently and to resolve conflicts as they arise;
- Excellent interpersonal and communication skills and sensitivity to cultural, socio-economic and political differences.

Education of the team

- Advanced university degree in economics, engineering or renewable energy or other relevant discipline.

Experience of the team

A minimum of 8 years practical Experience in the field of environment and energy, including evaluation of development cooperation in developing countries and social safeguards and gender is an asset. Exposure to the needs, conditions and problems in developing countries. Familiarity with the institutional context of the project is desirable.

7. Absence of conflict of interest

According to UNIDO rules, the sub-contractor must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The contractor will be requested to sign a declaration that none of the above situations exists and that the contractor will not seek assignments with the manager/s in charge of the project before the completion of the contract with the UNIDO Independent Evaluation Division.