



GEF/E/C.64/01/Rev.01
June 22, 2023

64th GEF Council Meeting
June 26 – 30, 2023
Brasilia, Brazil

Agenda Item 10

**EVALUATION OF THE GEF'S APPROACH AND INTERVENTIONS IN WATER
SECURITY**

(Prepared by the Independent Evaluation Office of the GEF)

ABBREVIATIONS

ADB	Asian Development Bank
AfDB	African Development Bank
AIDA	Artificial Intelligence for Development Analytics
COP	Conference of parties
CSO	Civil society organization
DIKTAS	Dinaric Karst transboundary aquifer system
EVA	Andean Vertical Ecosystems project
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FOLUR	Food systems, land use and restoration program
GBF	Kunming-Montreal Global Biodiversity Framework
GEF	Global Environment Facility
GET	GEF Trust Fund
GWSP	Global Water Security and Sanitation Partnership
IAP	Integrated approach pilot
IDB	Inter-American Development Bank
IEO	Independent Evaluation Office
IFAD	International Fund for Agricultural Development
IPLC	Indigenous peoples and local communities
IUCN	International Union for the Conservation of Nature
IWRM	Integrated water resource management
LDCF	Least Developed Countries Fund
NAP	National adaptation plan
NAPA	National adaptation program of action
NGO	Nongovernmental organization
NIC	National inter-ministerial committee
PES	Payment for ecosystem services
POP	Persistent organic pollutant
PRODZOC	Watershed Approach to Sustainable Coffee Production in Burundi project
SAP	Strategic Action Programme
SCCF	Special Climate Change Fund
SDG	Sustainable Development Goal
STAP	Scientific and Technical Advisory Panel
STAR	System for transparent allocation of resources
TDA	Transboundary Diagnostic Assessment
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO-IHP	United Nations Educational, Scientific and Cultural Organization Intergovernmental Hydrological Programme

UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
WOGP	Water and Ocean Governance Programme
WWF	World Wildlife Fund

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I. EXECUTIVE SUMMARY

1. The term “water security” encompasses access to freshwater resources and protection from water-related disasters. Freshwater resources are essential to humans and ecosystems, making protection of those resources a top priority for both human development and environmental conservation. Water security captures four dimensions of how society and ecosystems depend on water: i) drinking water and water for human well-being, ii) water for economic activities and development, iii) water for ecosystems, and iv) protection from water-related hazards and climate change (UNEP 2013). Water resources and, therefore, water security are under threat. Poor water management combined with growing demand and exacerbated by more common and intense water-related hazards (namely floods and droughts) in many parts of the world put increasing pressure on water resources. The links between water security and sustainable development are well integrated into the United Nations Sustainable Development Goals (SDGs)—especially through goal 6 to ensure availability and sustainable management of water and sanitation, but also through links with other goals including life on land, sustainable cities and communities, and good health and well-being.

2. As water security intersects with much of the work of the Global Environmental Facility (GEF), this evaluation serves to fill a gap in evaluative evidence as the first comprehensive evaluation on water security. It employs a mixed-methods approach to assessing how the GEF’s approach and interventions address water security across all the focal areas and understanding how and to what extent GEF interventions improve water security. Methods used include a portfolio review of completed and ongoing GEF projects that have an explicit focus on water security; five case studies focused on both transboundary water bodies and specific countries; an analysis of grievance cases dealing with unintended decreases in water security caused by projects; and interviews with stakeholders from communities, government, the private sector, civil society, GEF Agencies, and the GEF Secretariat.

3. To better understand and evaluate the ways in which the GEF could achieve water security outcomes, a theory of change was developed as part of this evaluation. In the absence of a specific GEF water security strategy, the evaluation developed a theory of change to evaluate how elements related to water security in the programming directions and water security–related activities within interventions could come together to improve water security in the areas in which the GEF works. The theory of change illustrates the factors undermining water security, the interventions through which the GEF could address these factors, and the potential outcomes that could improve water security directly or indirectly. The outcomes relate to improving the enabling environment for actors to improve water security, or lead directly to water security through increasing access to clean and sufficient water, or improve resilience to water-related hazards. Water security improvement often requires a physical change (although behavioral changes can also improve water security in certain cases)—people or ecosystems must be given access to more water, cleaner water, or have improved means to mitigate water hazards. However, such physical capacity improvement cannot be achieved in isolation: many factors are needed in the enabling environment to ensure that physical capacity improvements are placed in the most optimized location, adequate for a wide range of

stakeholder groups, and managed well to ensure their sustainability and provide the funding to make further adaptations and improvements in the future.

1. Conclusions

4. **Water security and its dimensions are critical to the environmental goals of all the GEF's focal areas.** Fresh water is an essential resource for all life on Earth and thus water security is a cross-cutting theme in all development and environment work, from securing access to clean water for humans, their livelihoods, and ecosystems to mitigating water-based natural hazards. This includes the GEF's work in achieving global environmental benefits, almost all of which rely on water security. Biodiverse ecosystems depend on fresh water (and some exist in fresh water), water resources are needed for farmers to help prevent land degradation, dangerous chemicals often reach populations through contaminated water supplies, many climate change mitigation actions are water-intensive, most climate change adaptation efforts involve water and mitigating water-based hazards, and many transboundary freshwater resources often cause disagreement among neighboring countries. Even though water security is not an explicit goal of the GEF, these connections to its programming mean it cannot be ignored.

5. **The GEF's focal area strategies, results framework, Agencies, and the Conventions it supports address water security through the lens of their particular environmental focus, instead of taking a holistic approach to the issue.** The scientific literature on improving water security through development interventions points to the need for an integrated approach that addresses the multiple uses of water in an area and brings together stakeholders of all significant users and actors. However, the GEF and its major stakeholders generally address the specific aspects of water security that directly relate to their area of interest. The GEF-8 results measurement framework reflects how water security is approached by the focal areas—the international waters indicator addresses water governance in transboundary situations, and the land degradation indicators include water resources as they relate to land management and restoration. The biodiversity, climate change, and chemicals and waste indicators do not explicitly address fresh water, which makes it difficult to track the GEF's performance on, for example, protecting inland water ecosystems specifically. The land degradation focal area strategies, the United Nations Convention to Combat Desertification (UNCCD) and Agencies with an expertise in agriculture tend to view water from the standpoint of providing access for agriculture and sustainable land management. The biodiversity focal area strategies, the United Nations Convention on Biodiversity (UNCBD), and the international environmental nongovernmental organization (NGO) GEF Agencies focus on water because it supports ecosystems and provides ecosystem services. The Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF) projects and the GEF adaptation strategy, along with the United Nations Framework Convention on Climate Change (UNFCCC) consider water security in the context of climate change. The international waters focal area strategies deals comprehensively with all dimensions of water security but mainly in the context of transboundary watersheds and aquifers. This piecemeal approach to water security also applies to national government ministries, which rarely have a mandate to look at water in a holistic

way—normally, they address water from the standpoint of the sector they focus on: energy, agriculture, or the environment, for example.

6. **A higher percentage of GEF projects with a prominent and explicit focus on water security are implemented in Africa, and mainly through the international waters and climate change adaptation focal areas or are multifocal.** Multifocal area projects had the highest share of the portfolio of projects found to have a significant focus on water security, followed closely by international waters and climate change adaptation projects through the LDCF and SCCF. Geographically, Africa was the most represented region in the portfolio. GEF projects with a significant focus on water security were found in many regions of the world with the least water security, especially the Sahel region, but had less coverage of some highly water-insecure countries in South Asia. Some other relatively more water-secure areas, such as the Balkans and South America, had many such projects.

7. **GEF projects with a significant focus on water security include activities that address stakeholders' water security priorities.** Water security was a key development priority in almost all case study countries, including in local communities where a lack of water or water-based hazards affected daily life and livelihoods. Stakeholders were generally pleased with GEF projects' relevance to their priorities, especially with projects that increased water access and storage, improved water resource monitoring, and improved coordination between neighboring countries. International waters was recognized as one of few funding sources for improving transboundary watershed management, but many stakeholders highlighted the need for international waters projects to include more on-the-ground, local activities. International waters projects, which tend to focus on the regional level, were less likely to involve local stakeholders in the design phase of the projects—which meant local stakeholders had limited knowledge of the projects before implementation.

8. **Coherence between GEF projects and other actors' water security activities was found to be difficult to achieve unless coordinated by national governments.** Completed evaluation case study projects often built on or had other donor initiatives later build on their work in project areas and countries. However, close coordination with other initiatives during implementation was rare, except among projects of the same program. Recently designed projects identified other water security–related donor activities in their geographical area but didn't often have detailed implementation coordination. Project and national government staff noted that coordinating ongoing projects to ensure collaboration is difficult, given the differing timelines and goals of funding organizations if there is no body charged with overseeing this coordination. This limited engagement extended to work with private sector: within the evaluation portfolio, only 18 percent of completed projects were found to have involved the private sector in implementation of water security activities, and among ongoing projects, 14 percent involved the private sector in the design phase.

9. **GEF projects are increasingly addressing gender aspects of water security but do not often address the water security of other vulnerable groups.** Completed projects reviewed by the evaluation had little focus on the ways in which water security differs for different genders—mostly gender was reflected as ensuring a certain percentage of women participated

in project activities. However, women in communities benefited directly from some completed projects that improved water security through improved access to water and water storage capacity. Ongoing projects planned to integrate gender much more thoroughly into project activities, through inclusion of women in water decision-making groups, targeting them for microloan programs, and reflecting gender within water policy and governance. This last aspect of how gender should be integrated into water policy, however, was less well understood and explained. Vulnerable groups such as indigenous peoples, refugees, and ethnic groups who had lower water security than other groups were not often a focus of GEF projects (unless they represented a majority of the population in the project areas).

10. The GEF's multi-focal area and integrated programs have primarily integrated water security through coastal marine protection, food security, and cities programs. The integrated programs also tended to view water through specific lenses—the food systems—focused program projects tend to approach water security similarly to the land degradation focal area (through the lens of water for agriculture and resilience to drought), while the cities impact program projects deal mostly with wastewater and hazard mitigation. Stakeholders noted that water security is often treated as a secondary focus within these programs, which some felt was a missed opportunity for the food security programs to mainstream themes such as upper watershed ecosystem service protection, control of pesticide and fertilizer runoff into aquatic ecosystems, and multiple-use water systems.

11. GEF projects with a focus on water security achieved improved water security either directly at the community level through physical investments in infrastructure or indirectly through designing water policies, knowledge, and stakeholder engagement. Land degradation and climate change adaptation projects focused on local interventions that improved the physical capacity of water systems, including through nature-based solutions. Such activities directly improved water access in local communities through providing solar water pumps or constructing small-scale irrigation systems. These activities increased community access to water during times when previously communities had little access to water and led to socioeconomic co-benefits of increased income (through increased agricultural production), improved nutrition (through diversified production), and resilience to climate change (through improved protection from soil erosion during floods and access to more reliable water sources during drought). Freshwater projects in international waters, in contrast, focused heavily on strengthening transboundary governance mechanisms and knowledge of water resources through the Transboundary Diagnostic Assessment/Strategic Action Programme (TDA/SAP) process, which involved improving stakeholder capacity and raising awareness at the national and transboundary levels. Some of these activities led to policy reform, such as laws to improve environmental impact assessments, but these political processes were often too long to be completed during project implementation. A few also tried to improve the coherence of water policy across ministries through the creation of interministerial committees. These interventions helped create a conducive enabling environment for future activities that would lead to improved water security (many of which are identified in SAP documents). Observed cases of GEF projects causing a decrease in water security were rare.

12. **Local activities to improve water security were well sustained in post-completion assessment of completed projects, while knowledge products and governance interventions were more likely to be sustained through subsequent donor interventions.** Once communities benefited directly from activities that improved their water infrastructure, they were committed to maintaining the infrastructure well past project completion. Solar pumps, irrigation systems, and coffee-washing treatment facilities were for the most part found to be well maintained and functioning years after project completion for as long as communities could perform maintenance cheaply and with local materials. This type of activity was often replicated within communities through demonstration effects as neighbors noticed their positive impact. Knowledge products such as technical reports, governance reforms, and capacity-building activities had mixed sustainability and relied more on follow-on projects. Freshwater transboundary basins often receive multiple international waters projects in phases and such continued support, when given without major delays between phases, keeps the momentum on these outcomes. Other donors were found to be active in areas of completed projects and in many cases continued working on similar water security–related topics.

13. **Scaling up of GEF project activities is still to be achieved at the level necessary to meet the water security challenges of recipient countries.** Though replication was observed in some cases, scaling up and broader adoption on the watershed or country scale were not common. Communities and governments noted that the scale of water security problems like insufficient access to water, water pollution, and floods and droughts is beyond what GEF projects have been able to address or catalyze solutions for. Evidence shows that several factors are key to upscaling, such as mainstreaming good practices through policy formation, disseminating knowledge and information, and prioritizing activities that create sustainable financial mechanisms beyond the lifetime of project interventions (GEF IEO 2020b). GEF projects with significant focus on water security achieve many of these factors to differing degrees. However, such projects do not often include activities to establish post-project financial mechanisms or improve access to finance.

2. Recommendations

14. Water security is integral to all of the GEF’s focal areas, given the essentiality of water to human life and ecosystem health. This evaluation highlighted several diverse GEF outcomes that improved water security or improved the enabling environment for achieving water security. Based on the findings and conclusions, this evaluation makes the following recommendations:

15. **The GEF Secretariat should ensure that aspects of water security that are key to each GEF focal area are represented in the results measurement framework and project and program design.** Explicit language related to freshwater resources should be added to some of the focal area indicators in the GEF-8 Results Measurement Framework to better highlight linkages with water security. This would encourage countries and Agencies to design projects across all focal areas that better consider the importance of water security and freshwater resources. Furthermore, design and theories of change for projects and programs with strong links with freshwater resources should integrate elements of water security to help improve

holistic integration of water security across GEF's portfolio. Considerations could also be given to integrating water security as a cross-cutting theme in relevant impact programs.

16. **The GEF Secretariat and Agencies should prioritize creation of sustainable financing mechanisms and other activities for scaling up interventions that successfully improve water security.** Many GEF projects incorporate some factors into project implementation that encourage scaling up of water security activities, such as international waters projects which develop water policy. However, more ambition for scaling up is needed to meet the water security needs of people and ecosystems. All projects that deal with water security should include sustainable financing and other activities to support scaling-up efforts, including projects that improve water security at the community level. International waters projects, in particular, should offer guidance that sustainable financing must be considered part of the preparation for the SAP implementation phase of the TDA/SAP process. Activities could include creating novel and innovative financial mechanisms in watersheds or aquifer areas, enhancing existing mechanisms, or partnering with the private sector and entities with expertise in financial inclusion. Addressing the issue of sustainable financing in the framework of the SAP implementation in various geographies of the world would also increase the likelihood of scaling up water security outcomes.

II. INTRODUCTION

1. The importance of water security for society and the environment

17. Fresh water is essential to all life of earth—for humans, animals, plants, and their surrounding societies and ecosystems. Access to water and sanitation is a United Nations (UN) recognized basic human right and is one necessity for well-being (UN University 2013). Poverty cannot be alleviated, nor wealth generated without management of freshwater resources (Grey and Sadoff 2007). Ecosystems are no different: plants and animals rely on a clean and available source of fresh water to live and thrive while also providing water-based ecosystem services to society.

18. **The term “water security” encompasses access to freshwater resources and protection from water-related disasters.** The term has varying definitions; this report uses the definition from the UN Environment Programme (UNEP 2013): “the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.” The UNEP definition supplies four main dimensions of water security:

- (a). Drinking water and human well-being: ensuring adequate supply of clean drinking water to meet basic human needs for drinking water and well-being,
- (b). Economic activities and development: ensuring adequate water supply for human livelihood activities including food and energy production,
- (c). Ecosystems: ensuring adequate water supply for plants and animals and the underlying ecosystem services provided by ecosystems, and
- (d). Water-related hazards and climate change: protecting society and ecosystems from disasters, namely flood and drought.

19. These dimensions are underpinned by four characteristics of a high level of water security: good governance and decision making, transboundary cooperation, peace and political stability, and financing. These characteristics underscore the challenge of achieving water security and the need for its emphasis on national and international agendas. The complexities associated with addressing water security, combined with the fact that water is seldom a priority item on national agendas over the long term, means that water security has been difficult to achieve in nearly all countries (Biswas and Tortajada 2022).

20. Access to freshwater resources is under threat. For the past 10 years, water-related risks have led the World Economic Forum’s global risk assessments for both likelihood and severity of impact (Cassin 2021). About half of the world’s population is currently subject to severe water scarcity for at least one month a year due to both environmental and societal barriers; at least 2.2 billion people lacked access to safe drinking water while 4.2 billion didn’t have safe

sanitation systems as of 2017. Water, or lack thereof, can be a killer too: droughts cause only 7 percent of disaster events worldwide, but 34 percent of disaster-related deaths and floods take lives and cause property damage (Caretta et al. 2022). The water cycle is being changed by multiple human activities, including population growth, agriculture, economic development, urbanization, and deforestation (UN Environment Programme 2019). These activities all compete for finite freshwater resources and, together with climate change, will cause an expected increase in global water demand of more than 50 percent by 2050 to meet all the needs of people, agriculture, and energy production (Cassin 2021). Unsurprisingly, access to freshwater is also related to conflict, especially in areas that have natural water scarcity. This is true at multiple scales, from local conflicts between herders and farmers over water resources to international conflicts over dam building, for example. Secure access to water and the services it provides is often a prerequisite for solving conflicts in such areas (UN University 2013).

21. Water is also the means through which most people will experience the impacts of climate change (UN University 2013, Cassin 2021). Climate change will intensify the hydrological cycle, bringing more severe rainfall events which will likely cause more severe flooding and longer dry spells, leading to more intense droughts. Higher temperatures are leading to glacial melt as well, which may increase water resources temporarily but then diminish them in areas that have long relied on them for water supplies (Caretta et al. 2022). Less predictable precipitation caused by climate change along with increased use is causing an emerging water storage crisis (Burke et al. 2023). In a future of 2°C warming, between 0.9 and 3.9 billion people will be at increased exposure to water stress (Caretta et al. 2022).

22. Recognizing their importance to development goals in general, freshwater resources play a key role in the UN sustainable development goals (SDGs). SDG goal 6 is to “ensure availability and sustainable management of water and sanitation for all” and has several subgoals including access to safe and affordable drinking water (goal 6.1), adequate sanitation and hygiene (6.2), improved water quality by reducing pollution (6.3), increased water use efficiency across sectors (6.4), integrated water resources management including in transboundary settings (6.5) and protecting water-related ecosystems (6.6)¹. Water’s pervasiveness means it also connects to many of the other SDGs. The High-level Panel on Water (HLPW 2018) found that five other SDGs were strongly related to water resources, nine were related, and three were indirectly related. For example, life on land (SDG 15), sustainable cities and communities (SDG 11), good health and well-being (SDG 3), and ending hunger (SDG 2) and poverty (SDG 1) all rely heavily on access to freshwater resources.

23. Despite the underlying and cross-cutting necessity of water, achieving SDG 6 has not been easy. As of 2021, the SDG was not on target to be met by 2030 and had the greatest capacity gap of all the 17 SDGs. Subgoal 6.5 was especially under-evaluated, as the UN found stakeholders had difficulty measuring the complex indicators used for the goal (UNEP 2021). Furthermore, certain indicators from the prior Millennium Development Goal related to access

¹ UN Sustainable Development Goals: [SDG Goal 6: Ensure availability and sustainable management of water and sanitation for all](#).

to safe drinking water may have been overestimated, because access to “improved” drinking water sources does not always correlate to access to high quality water (Bain et al. 2012).

24. **Water security depends on individual and community perceptions.** Although progress on improved water security is often measured at the regional or national scale, measuring household or individual perceptions of water security gives a more accurate picture of how it can vary among individuals in the same communities and between different socioeconomic and demographical groups (Young et al. 2019). Because water is so interconnected with well-being and a human’s sense of security, individuals living in close quarters may have different perceptions of their water security, such as between men and women or vulnerable and privileged groups. This perceived water security by individuals might not match objective measures of water security using more technical indicators, making water security particularly difficult to measure at scale. Nevertheless, the hydrological cycle is inherently global: ocean and air currents mean impacts in one region can have hydrological impacts elsewhere, thus affecting water security (Ellison et al. 2017). For example, large-scale deforestation of tropical forests could change precipitation patterns in other regions of the world (Lawrence and Vandecar 2015).

25. **A common good practice noted across the water security literature is that water security is best addressed in a holistic, integrated fashion across its dimensions.** The literature clearly recognizes fresh water as a cross-cutting theme that integrates several environmental themes, economic sectors and societies, and ecosystems. Indeed, water security is influenced by many factors, including population dynamics; urbanization; climate; soils; land use; institutions and governance; economic and behavioral aspects of water use; and technological advances and their adoption; among others (Biswas et al. 2022). Therefore, holistic and cross-sectoral approaches and systems perspectives that cut across social, economic, and environmental dimensions are preferred for water management over interventions that focus on only one sector or dimension (Miralles-Willhelm, Sanchez-Maldonado, and Munoz-Castillo 2022; Burke et al. 2023; Mishra et al. 2021). An evaluation of water supply and sanitation projects at the African Development Bank (AfDB) found that project sustainability can be improved by “considering large-scale, multipurpose and integrated water projects,” including integrating health, water supply, and sanitation into projects (AfDB 2015). An evaluation of the work of the International Fund for Agricultural Development (IFAD) in water conservation and management similarly noted that water projects must work beyond water supply itself to ensure an enabling legal framework, farm-to-market value chains, land tenure, non-farm sector promotion, and market development, all of which affect the sustainability of outcomes from water investments (IFAD 2014). The Food and Agriculture Organization of the United Nations (FAO) points out in its strategy on linking integrating water, sanitation, and hygiene (WASH) and irrigation interventions that especially after the COVID-19 pandemic highlighted the importance of clean water in providing sanitation, interdisciplinary solutions to multiple-use water systems are needed (Salman, Pek, and Ahmad 2020).

2. The importance of water security in the GEF

26. **Given the indispensability of water throughout society and ecosystems, aspects of water security play an integral role in all the GEF’s focal areas but are most directly addressed through the international waters focal area and the climate change adaptation funds.** The international waters focal area has the clearest links with water security, given that a significant proportion of its work is focused on improving management of transboundary freshwater bodies and their associated watersheds. The focal area works across all the four dimensions of water security and the management level, particularly if the area of concern is for a transboundary watershed. Such watersheds are common throughout the world—at least 150 countries include territory within one or more transboundary river basins and 592 transboundary aquifers have been identified (United Nations 2021). The GEF-managed climate change adaptation funds, the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF) also have important water security linkages. Given that some of the most significant impacts on climate change are the increase in propensity and severity of extreme events related to either a lack of water or too much water, an estimated 60 percent of adaptation activities are related to water—such as irrigation, rainwater harvesting, and soil moisture conservation (Caretta et al. 2022).

27. Other focal areas also intersect with water security to achieve their global environmental benefits (table 1). The land degradation focal area has a large focus on drought as it relates to desertification, which is often caused by poor agricultural practices in semi-arid and arid regions and exacerbated by climate change. Globally, agriculture accounts for 60–70 percent of water withdrawals (Caretta et al. 2022; Biswas et al. 2022). The focal area seeks to reduce and reverse land degradation which aggravates water scarcity, ecosystem degradation, and food insecurity, among others. In the biodiversity focal area, safeguarding water bodies is critical to maintaining biodiverse ecosystems, especially aquatic and riparian ecosystems. Much of the work of the chemicals and waste focal area aims to reduce the number of contaminants that find their way into the environment, including into water bodies and aquifers which are used by society for drinking water and other purposes. The climate change focal area focuses on mitigation, and many mitigation techniques, including carbon capture and storage, afforestation/reforestation, and biofuels require significant input of freshwater resources (Caretta et al. 2022, Miralles-Wilhelm 2022). One of the key goals of the climate change focal area is to promote nature-based solutions, particularly high-carbon ecosystems such as wetlands and forests. Many of the GEF-6 integrated approach pilots (IAPs), GEF-7 impact programs, and GEF-8 integrated programs, which integrate the various focal areas, relate to water security as well, especially those focusing on food security (because water is integral for agriculture) and sustainable cities (safeguarding urban water supply and protecting against extreme events).

Table 1. The most prominent logical intersections between GEF focal areas and the dimensions of water security

	Dimensions of water security				Notes
	Drinking, sanitation and hygiene	Economic activity	Ecosystems	Hazards and climate change	
BD					Biodiversity projects seek to safeguard the flow of water to biodiverse ecosystems and water-based ecosystem services provided to communities.
CW					Many chemicals and waste projects aim to prevent contaminants from entering water bodies.
CCM					Many mitigation strategies, such as carbon capture and afforestation, require water resources.
CCA					The LDCF and SCCF fund projects to reduce the impact of floods and droughts on both livelihoods and water supply systems.
IW					One of the main objectives of international waters is managing transboundary freshwater resources for all uses, and protecting these watersheds from water-based hazards.
LD					Land degradation projects are directly linked with reducing the impacts of drought and managing the use of water in agriculture, a critical rural livelihood.
IPs					Water plays a key role in the food security and cities impact programs or integrated approach pilots, with several child projects aiming to protect populations from floods and other disasters and safeguard clean water supplies.

28. The GEF IEO has touched upon water themes in various evaluations to date, including through its focal area (GEF IEO 2018a and GEF IEO 2018b) and regional studies (GEF IEO 2013) but has not conducted a comprehensive evaluation of water security across the entire GEF portfolio. This evaluation serves to fill that gap with the objectives of assessing how the GEF’s approach and interventions address water security across all the focal areas, and understanding how and to what extent GEF interventions improve water security.

III. METHODOLOGY

29. The evaluation applied a mixed-methods approach to answer the following questions:
- (a). To what extent have GEF interventions with an explicit focus on water security responded to beneficiaries' (communities, resource users, governments, river basin organizations, etc.) needs, policies and priorities relating to fresh water?
 - (b). In what ways and using what frameworks and strategies has the GEF addressed water security?
 - (c). How do the GEF's approach and activities related to water security interact with similar activities and initiatives at the country level?
 - (d). How do the GEF's approach and activities compare to a theory of change for improving water security derived from good practices among peer organizations and the larger international water community of practice?
 - (e). To what extent have GEF interventions been effective in improving water security within the global environmental benefits framework and as co-benefits while avoiding negative trade-offs?
 - (f). Have GEF projects focused on water security considered impacts on gender and all stakeholder groups, including the most vulnerable?
 - (g). To what extent are water security related GEF outcomes sustained or continued beyond the end of the implementation period?
30. A variety of quantitative and qualitative methods were used to evaluate the GEF's interventions in water security, as described in the evaluation's approach paper (included in Volume 2 of this report). To better understand the GEF's strategy in dealing with this issue, a document review was performed, including the programming directions and adaptation strategies laying out the overarching strategy of the GEF's approach to each replenishment, starting at GEF-4, and other focal area and Scientific and Technical Advisory Panel (STAP) documents relating to water security (GEF 2007, GEF 2010, GEF 2014, GEF 2018a, GEF 2018b, GEF 2022a, GEF 2022b, Granit et al. 2017, Henshaw 2021, Ratner 2018). Other guidance related to freshwater resources was reviewed as well, including international waters LEARN documentation. GEF Agency strategies relating to water were also reviewed. Additionally, 18 interviews were carried out with GEF Secretariat and GEF Agency staff who work on such strategic documents (a list of stakeholders is provided in the annexes). A theory of change was also constructed to understand the pathways through which the GEF addresses water security through its interventions, accompanied by a literature review of good practices and lessons learned from the water security international development community. The theory of change was vetted through several interviews with water security experts in academia and shared with the GEF Secretariat and GEF Agency members prior to interviews.

31. To better understand the integration of water security themes in GEF projects, a portfolio review was carried out. This first involved defining the portfolio, because the GEF does not designate projects as having a significant focus on water security. Given the pervasiveness of freshwater resources in all the GEF’s focal areas, water security is integrated to different levels in several GEF projects. However, because water security has been addressed to varying degrees in several GEF Independent Evaluation Office (IEO) thematic evaluations (GEF IEO 2022a, GEF IEO 2022b, GEF IEO 2023), this evaluation is focused on a targeted review of projects, identifying those projects with the greatest focus on water security. To define the evaluation portfolio, a keyword search of terms related to water security² was done on project titles, objectives, and component titles for all GEF, Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF) projects from GEF-4 onwards. Projects found to include such keywords were checked for relevance to at least one of the four water security dimensions presented in the ‘Introduction’ section. The resulting projects were deemed to have an explicit focus on water security, because they included keywords or concepts related to water security or its dimensions in their project title, project objective, or component title. The portfolio review was performed on a subset of projects concentrating on GEF-4 and GEF-5 projects with terminal evaluations reviewed by the GEF IEO (to evaluate water security results and outcomes). In addition, GEF-6 and GEF-7 projects that are ongoing were reviewed to evaluate integration of water security in the design of the most recent projects. In addition, projects identified using the United Nations Development Programme (UNDP) Artificial Intelligence for Development Analytics (AIDA) were also included in the sample.³ Keyword searches were also performed on food security and cities–related impact program project documents to better understand how integrated programs specifically integrate water security themes.

32. In addition to the portfolio review, five case studies were carried out to provide detailed evidence of how projects have integrated water security into their designs and achieved results. Case study selection was based on several criteria, including: (1) a mix of transboundary basins or aquifers and country-level case studies, (2) favoring areas with more GEF projects in the evaluation’s portfolio, especially areas with more completed projects but also a mix of completed and ongoing projects; and (3) prioritizing geographical, focal area, and trust fund (GEF trust fund, LDCF, and SCCF) diversity. The five selected case studies included three country-level and two transboundary case studies: (1) Burundi; (2) Bolivia; (3) the Dinaric-Karst Aquifer System (DIKTAS) in Albania, Bosnia-Herzegovina, and Montenegro; (4) the Mediterranean Sea Coast in Morocco and Tunisia; and (5) Sudan.⁴ In all, the case studies

² Keywords included “water,” “flood,” “drought,” “disaster,” “watershed,” “aquifer,” and “basin.” A manual review of the results was performed to further refine the portfolio. Additional GEF-7 projects were added that included funding from the water security–focused international waters focal area objective from that GEF replenishment. Dropped, cancelled, and project implementation review–rejected projects were removed.

³ The UNDP AIDA tool allows for a keyword search of entire midterm review and terminal evaluation documents of all GEF projects implemented by UNDP to date, rather than just searches of project titles, objectives, and component titles. It is publicly available [online](#). Additional projects found using AIDA were not included in the portfolio review.

⁴ Case study reports are available the [GEF IEO website](#) in the technical annexes.

covered 22 GEF projects. A transboundary river basin or in Asia was covered in a parallel evaluation, the GEF IEO Mekong Country Cluster Evaluation. Relevant findings from the Mekong evaluation are included in this report.

33. Within each case study, evaluators reviewed project documents for all projects within the evaluation portfolio in the case study area, along with any project publications available (a full list of case study projects is shown in annex 1). Case study visits to project sites were carried out in four of the five case studies,⁵ which also included virtual and in-person interviews with stakeholders: national and local government staff, GEF Agency and project staff, community organizations and members, private sector actors, civil society organizations such as nongovernmental organizations (NGOs), transboundary basin committee officials, and staff of other donor water security–related activities in the case study areas. Reports were written for all case studies and shared with stakeholders in each case study area and are included in Volume 2 of this evaluation report.

34. To help determine whether any projects have inadvertently decreased water security in the areas where they had impact, grievance cases were analyzed that have been reported through GEF Agency grievance mechanisms and reported to the GEF Secretariat. Evidence of decreased water security was also gathered through case study interviews and the portfolio review.

35. Geospatial tools were used for this evaluation first to analyze understand whether GEF projects with an explicit focus on water security are located in areas with the most severe water security challenges. A global dataset on water security was used for this analysis (Gain, Giupponi, and Wada 2016) and was compared against the locations of GEF projects in the evaluation portfolio. Additionally, global datasets on the Normalized Difference Vegetation Index (NDVI) from the Sentinel-2 multispectral instrument were used to determine the changes in vegetation cover following GEF project interventions in Bolivia (Copernicus 2022).

36. A review process was implemented from the start of the evaluation, including internal and external review of the approach paper and the evaluation report. A reference group was formed, with participation of representatives from the GEF Secretariat, GEF Agencies, the GEF Civil Society Organization Network, and the STAP.⁶

37. At the end of the data collection phase, a triangulation process was carried out in which the evidence collected from each method was mapped to each of the evaluation questions, to develop the findings, conclusions, and recommendations.

⁵ No site visits or interviews were carried out for the Sudan case study due to an operational pause of the World Bank during the evaluation data collection period. This prevented GEF IEO staff and consultants from traveling within Sudan or interviewing stakeholders involved in World Bank–implemented GEF projects in the evaluation portfolio.

⁶ Notes from the reference group meetings are available on the [GEF IEO website](#).

1. Limitations and mitigation measures

38. The evaluation encountered certain limitations. First, the process of identifying GEF projects in the GEF portal that contained elements of water security proved to be difficult, and the evaluation team focused on projects which highlight water security in their project titles, objectives, or component titles, thus concentrating on projects with a prominent and explicit focus on water security. Additionally, the UNDP AIDA tool helped broaden the document search. The evaluation team also looked for cases of adverse effects on water security in other ways, through examination of grievance cases, the portfolio review, and inquiring with country-level stakeholders.

39. Second, the evaluation's case studies were affected by security-related travel limitations. These delayed the Bolivia case study but were especially detrimental for the Sudan case study, where a World Bank operational pause prohibited the evaluation team from traveling outside Khartoum and interviewing stakeholders on the ground about World Bank-implemented projects. The team mitigated this issue by focusing the case study on UNDP-implemented projects and then conducting remote interviews via telephone with rural stakeholders.

IV. THE GEF'S PORTFOLIO AND STRATEGY RELATED TO WATER SECURITY

1. The evaluation portfolio

40. **Most of the GEF projects with a focus on water security were funded through international waters, climate change adaptation, or multi-focal area interventions.** The evaluation portfolio of projects with a prominent and explicit focus on water security totaled 283 projects—165 ongoing and 118 closed—of which 83 had reviewed terminal evaluations. The projects had total GEF funding of US\$1.56 billion from the start of GEF-4, representing almost 10 percent of total GEF funding from GEF-4 to GEF-7, with co-financing of \$13.42 billion.⁷ Of these 283 projects, two-thirds (67 percent) of GEF funding was part of the GEF Trust Fund and 27 percent was part of the two climate change adaptation trust funds (figure 1); the remainder were multi-trust fund projects). This shows a that significant portion of the water security focus in the GEF has been related to climate change adaptation. Multi-focal area projects had the largest share of GEF funding in the portfolio with almost one-third of total funding, but the international waters focal area had a higher total number of projects (85) and almost as much funding (29 percent).

⁷ The GEF projects were selected for inclusion into the evaluation portfolio during the approach paper phase in December 2021. The completed projects included must have had a verified terminal evaluation in the most recent terminal evaluation dataset from October 2021. All references to the evaluation portfolio are as of these dates and do not include ongoing projects or terminal evaluations of completed projects added to the GEF Portal afterwards.

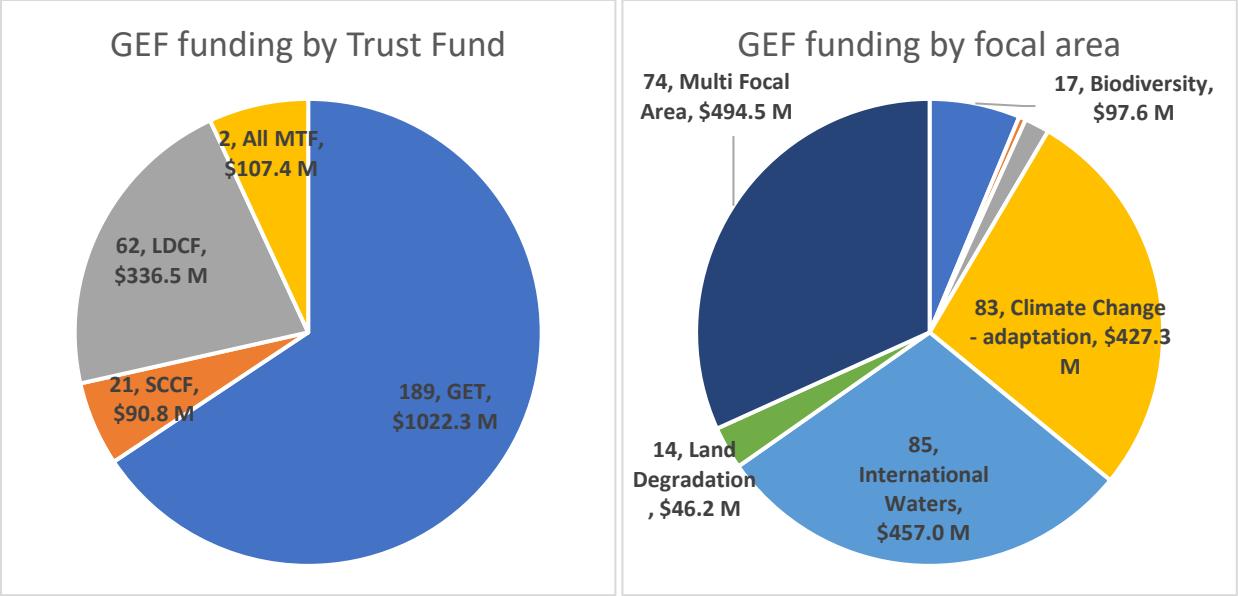
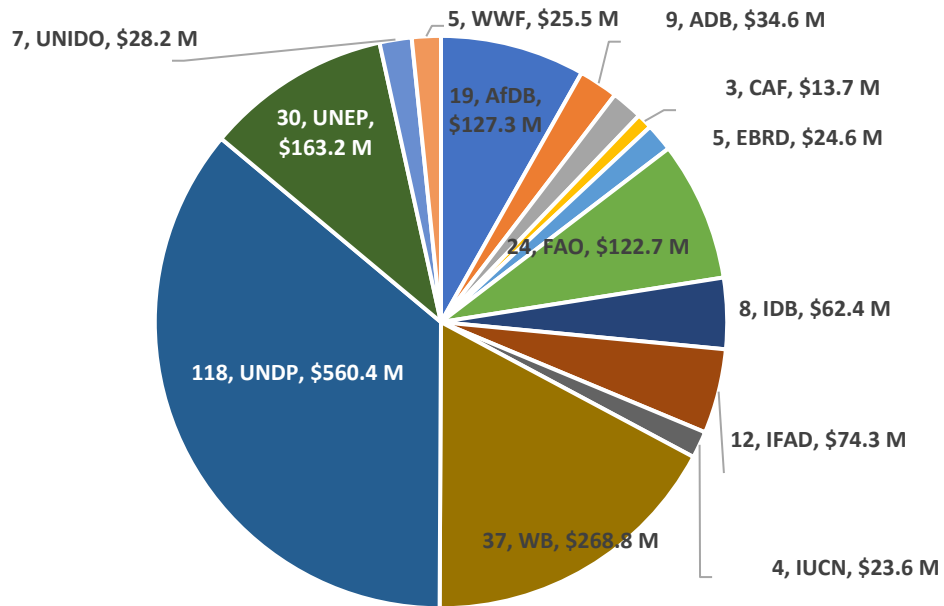


Figure 1. Share of evaluation portfolio GEF funding from each GEF-managed trust fund and focal area. Number of projects is listed first; amount of GEF financing listed last. Note: GET = GEF Trust Fund; LDCF = Least Developed Countries Fund; MTF = multi-trust fund; SCCF = Special Climate Change Fund.

41. **The most represented region in the evaluation portfolio was Africa.** In terms of geographical region, projects in Africa made up almost half of all GEF funding (44 percent) and 115 of the 283 projects (figure 2). Asia and Latin America had almost the same share of funding at 21 percent and 17 percent respectively, followed by Eastern Europe at 8 percent. Among Agencies, the three original GEF Agencies received the most GEF funding, with UNDP leading at almost 36 percent,⁸ the World Bank at 17 percent, and UNEP with 11 percent. AfDB was fourth, showing the focus on Africa as a region with 8 percent, followed by the FAO at nearly 8 percent.

⁸ UNDP's portfolio share is likely slightly overestimated due to the inclusion of additional projects found using the UNDP AIDA tool.

GEF funding by Agency



GEF funding by region

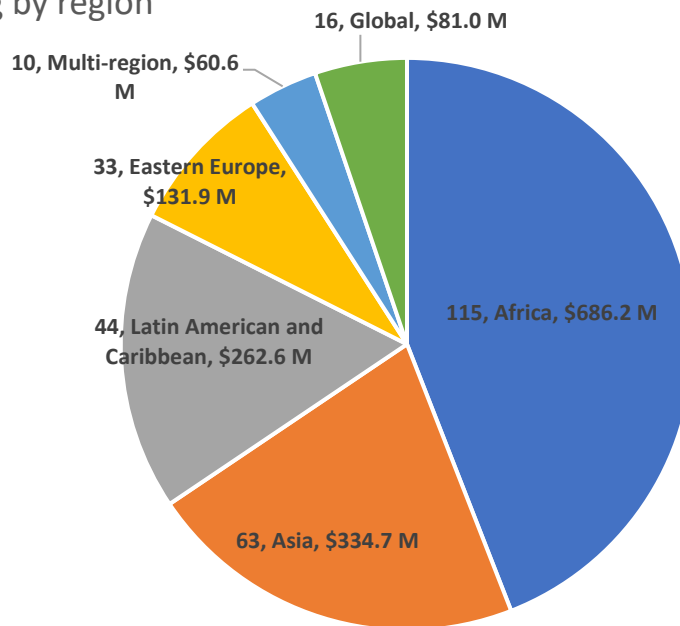


Figure 2. Share of evaluation portfolio by GEF Agency and geographical region. Number of projects is listed first; amount of GEF financing listed last.

2. Theory of change to evaluate GEF's interventions and outcomes related to water security

42. **To better understand and evaluate the ways in which the GEF could achieve water security outcomes, a theory of change was developed as part of this evaluation.** In the absence of a specific mandate to improve water security, the GEF's strategy for addressing water security has been integrated into its separate focal areas and their strategies, which are communicated mainly through its programming directions. To evaluate how elements of water security strategy in the programming directions and water security–related activities within interventions come together to improve water security in the areas in which the GEF works, the evaluation developed a theory of change. Based on the literature, expert views, and an analysis of GEF project activities linked to water security, the theory of change shows the different ways in which GEF interventions could potentially lead to water security benefits (figure 3). The theory of change illustrates the factors undermining water security, the interventions through which the GEF could address these factors, and the potential outcomes that could improve water security directly or indirectly through improving the enabling environment for water management and systems. The theory of change is designed as a circular process to account for feedback loops in which interventions can build upon outcomes from past work, make incremental improvements, scale up, or achieve outcomes in other geographical areas. Previous evaluations have noted that the GEF has a comparative advantage in not only supporting pilot projects but also in establishing enabling conditions for scaling up (GEF IEO 2020b).

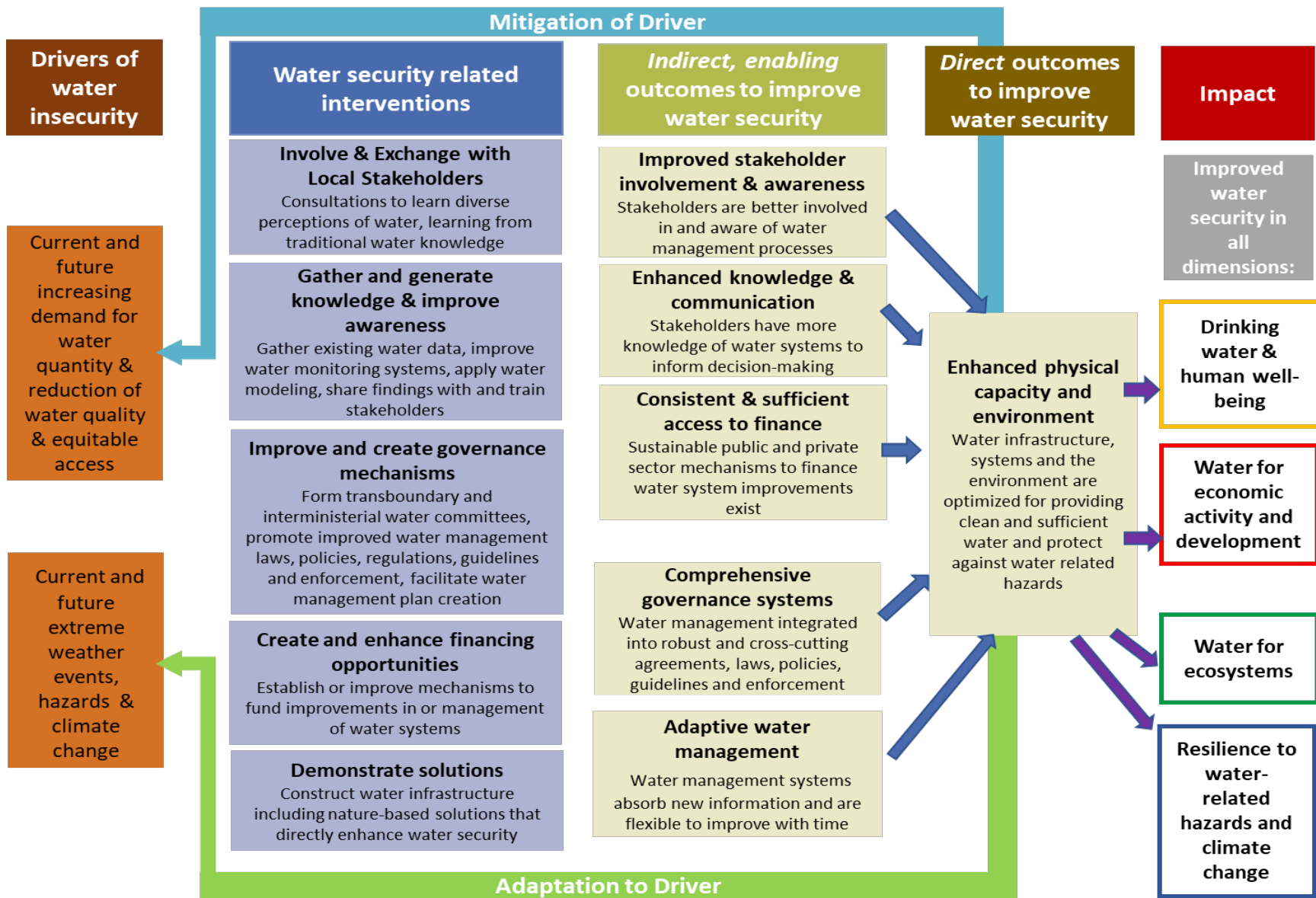


Figure 3. Simplified theory of change constructed for the evaluation to show the potential pathways through which the GEF could improve water security through its interventions.

43. **The theory of change highlights two major drivers of water insecurity: natural hazards and human use of water resources.** The factors that undermine water security relate to the limitation or uncertainty in the capacity to absorb, adapt, or transform to future changes to ensure access to sufficient water of adequate quality to meet environmental and human needs at the appropriate time. The first factor is focused on direct human intervention on water resources and relates to the other three dimensions of water insecurity—the current and future increasing demand for water (leading to overextraction), the reduction of water quality, and insufficient access to water. These are primarily to the effect of population growth and urbanization (domestic consumption and sanitation), industry, agriculture, and power generation, among others; and they are compounded by poor management of water resources between competing users, particularly in water-stressed areas (He et al. 2021). Specific issues undermining water security related to poor management include: limited funding to manage and improve water infrastructure (including natural infrastructure and nature-based solutions) (D'Arras 2022; World Bank 2020); poor water management, including lack of capacity to manage (Montalvo and Alaerts 2013), lack of policies and policy coherence across all the sectors that use water resources (Benson, Gain, and Rouillard 2015; Beekma et al. 2021), lack of technical knowledge (Viola et al. 2020); limited involvement of local and vulnerable stakeholders and limited use of their knowledge (Walker, Loucks, and Carr 2015; Akhmouch and Chavreul 2016; Voogd, de Vries, and Beunen 2021); and limited physical solutions for dealing with changing water needs (Anderson, 2015). The second factor relates to water-related hazards: mainly current and future extreme weather events, along with changes in rainfall patterns exacerbated by climate change and their resulting impacts in flooding and drought. These drivers cause many of the same environmental stresses that the GEF directly addresses—urbanization, deforestation, and other land use changes that cause land degradation, exacerbate climate change, and threaten biodiverse habitats, and generate pollution detrimental to human health.

44. **The types of interventions that the GEF can carry out to improve water security are often those it undertakes to achieve global environmental benefits.** The interventions through which the GEF could achieve water security would address some of the main challenges to improving water security, and could include engaging local stakeholders around water use; generating and sharing knowledge on how water resources are used and on monitoring natural systems; facilitating cross-sectoral cooperation on water and land use planning; improving water governance; improving financial mechanisms and opportunities to improve water infrastructure (both grey and green); and promoting change by demonstrating innovative solutions and technologies. These interventions are not outside the realm of GEF activities to address drivers of environmental degradation and achieve global environmental benefits; for example, local stakeholders are engaged around use of ecosystem services and protecting biodiversity, land use planning is necessary to prevent deforestation and land degradation, and cross-sectoral cooperation is critical for transboundary water management both in freshwater and marine areas.

45. **The theory of change highlights six major water security outcome groups for improving water security through GEF interventions.** The outcomes highlighted in the theory of change relate to improving the enabling environment for actors to improve water security,

or lead directly to water security through increasing access to clean and sufficient water, or improve resilience to water-related hazards. Water security improvement often requires a physical change (although behavioral changes can also improve water security in certain cases)—people or ecosystems must be given access to more water, cleaner water, or have improved means to mitigate water hazards. However, such physical capacity improvement cannot be achieved in isolation: many factors are needed in the enabling environment to ensure that physical capacity improvements are placed in the most optimized location, adequate for a wide range of stakeholder groups, and managed well to ensure their sustainability and provide the funding to make further adaptations and improvements in the future. The intervention areas included in the theory of change to address the drivers of water insecurity consider the scope and mission of the GEF to achieve global economic benefits. For example, the GEF would be unlikely to construct a large dam as part of one of its projects even if such a dam could improve water security for a certain population but would be more likely to finance tree planting or natural rehabilitation of riparian areas to mitigate flooding potential. The main outcomes observed in the GEF portfolio include:

- (a). **Improved stakeholder involvement and awareness:** this outcome ensures that representatives of all water users (especially the most vulnerable) are adequately involved in and aware of discussions on management and interventions that improve water security, and that their needs and cultural and spiritual connection with water resources are considered. This involvement enhances stakeholder knowledge and ownership of water issues, improves communication, alleviates conflict, and helps to determine the value of water in particular areas (Wehn et al 2020). It also ensures that water security is not improved for one group at the expense of others and shields against safeguards issues. More involved local stakeholders promote better local management of water systems, as such management is critical at the local level.
- (b). **Enhanced knowledge and communication:** improved knowledge of water resources (including local and traditional knowledge), hydrology, and the perceptions and use patterns of water in project areas underpins any intervention to improve water security. This involves gathering hydro-meteorological data for improved early warning systems and climate preparedness as well as improved water quality, quantity, and use monitoring to ensure better water resource management. Ultimately, the knowledge must be shared broadly across sectors so that it becomes useful for decision making, connecting it to the outcome on improved awareness. Without good knowledge of water resources across all key stakeholder groups, decisions and actions taken to improve water security can often be misguided or even harmful to water security. Local communities are also essential for water monitoring, which must be done on-site in many cases, including hydromet and citizen science monitoring (Mishra et al. 2021).
- (c). **Consistent and sufficient access to finance:** Financial investment in solutions to improve water security is necessary from the private and public sectors. Such solutions can take a variety of forms, such as new financial instruments with traditional lenders specific for water-related projects or disaster relief, funds to be

used for specific water security–related projects, certification schemes that allow products to be sold at a premium if good water practices are followed, and business plans for the private sector that are profitable and provide water security solutions. Examples include establishing watershed protection funds (including payment for ecosystem services), environmental bonds, and investment risk reduction mechanisms through Nature Trust Funds, among others. This outcome is also particularly important for sustaining water security improvements beyond interventions.

- (d). **Comprehensive governance systems:** good water management, which is essential for water security, begins with sound water governance (OECD 2022). This includes laws that protect and balance the rights and needs of different water users (especially the most vulnerable groups, but also the environment), guidelines that lay out responsibilities for key management actions and oversight, and trained and financed government agencies that manage water and enforce the law. Strong water governance is also transparent, addresses multisectoral interests (such as recognizing the water-food-energy nexus) and is harmonized with neighboring jurisdictions which share water resources. Water governance systems are a critical part of the enabling environment for ensuring that activities that improve water security are done in priority areas and are responsive to populations that need improved water security.
- (e). **Adaptive water management:** adaptive and flexible water management allows for changes in systems to respond to the constantly changing nature of climate change and to societal issues that have effects on water resources. (Claassen 2022). Adaptive laws and integrated sectoral decision structures can integrate new knowledge and information; updating and evolving are challenging but necessary for ensuring resilient water security.
- (f). **Enhanced physical capacity and the environment:** ultimately, knowledge, improved governance, and financing should result in physical improvements in infrastructure or environmental conditions that improve the delivery of water services to allow people and ecosystems better access to clean water and mitigate water-related hazards. These could include both “gray” infrastructure, such as built structures and “green” infrastructure, which utilizes nature and vegetation to improve water management. In many cases, local improvements in infrastructure are the main activities that directly improve water security and have a noticeable impact on communities. These activities could involve large-scale construction that is outside the GEF’s purview but could also include nature-based solutions, small-scale community water storage, and sustainable land management solutions to better manage water on agricultural land, early-warning systems to alert communities to hazards (intersecting with the knowledge and communications outcome), and the introduction of new technologies and solutions for water efficiency.

46. This theory of change serves as a framework for better understanding how the GEF is improving water security through its interventions. The outcomes from such interventions contribute directly or indirectly to enhanced water security. The following sections will assess

how well the GEF’s strategies and interventions related to water security integrate and achieve the potential outcomes detailed in the theory of change.

3. Water security in GEF strategy documents

47. **The usage of “water security” and related terms has increased in GEF programming directions over time.** GEF programming directions lay out the GEF’s strategy at the beginning of each of its four-year replenishments. Through a text analytics search of the term “water security” and other terms that suggest a discussion of specific dimensions of water security in the programming directions going back to GEF-4 (GEF-4 began in 2006), it is clear that water security is gaining importance in the GEF (figure 4). The usage of the term “water security” grows from almost absent in GEF-4 through GEF-6 to more than 10 mentions in programming directions for each of GEF-7 and GEF-8. Mentions of the most common water-related hazards, “flood” and “drought,” have steadily increased over time as has the broad term “freshwater,” which can often refer to a focus on freshwater ecosystems or management. “Wastewater” is used often in GEF-8, showing its importance in the upcoming Clean and Healthy Ocean impact program (although this program is mostly concerned with the impact of wastewater on marine ecosystems rather than freshwater resources). The only exception to the increasing mentions of water security–related terms is “integrated water resource management” (IWRM), which has steadily declined in use in programming directions. This could reflect a replacement of the term with “water security” or management of “freshwater resources.”

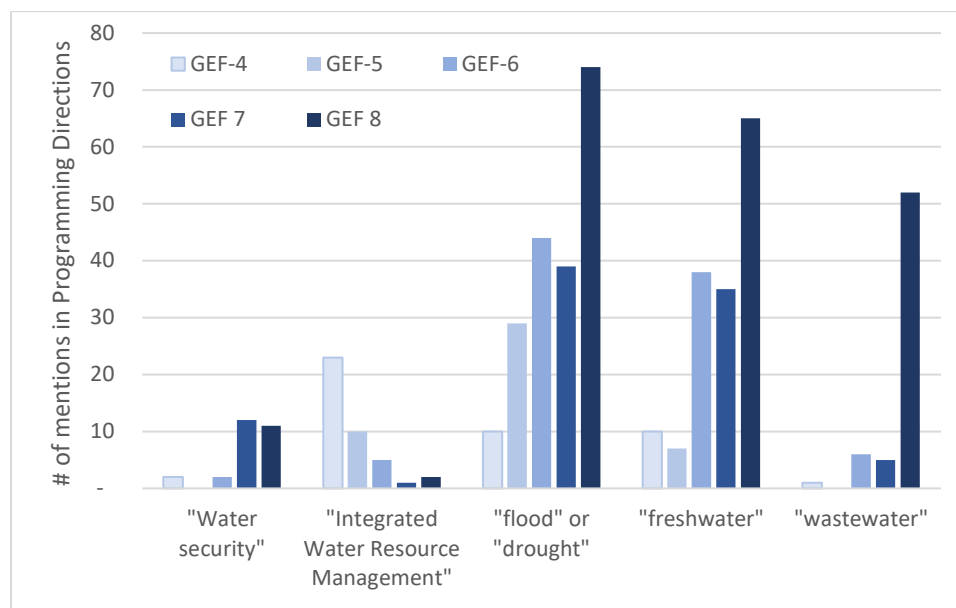


Figure 4. Appearance of water security term and related terms in GEF programming directions by GEF phase.

48. **International waters is the focal area that integrates water security into its strategy most holistically, while other focal areas generally concentrate on specific dimensions of water security.** Across the programming directions of different phases, the international waters focal area sections most often use the term “water security” and many related terms such as IWRM and “freshwater” while also mentioning more specific terms related to specific

dimensions of water security, including “flood” and “drought” (figure 5). Starting in GEF-7 and continuing into GEF-8, the work of this focal area in freshwater systems has been framed using “water security,” as one of its objectives is “enhancing water security in freshwater ecosystems” (GEF 2018a and GEF 2022a). International waters freshwater projects tend to focus on improving governance, building knowledge, and improving communication and collaboration between countries to enhance transboundary management of water resources. As with its marine projects, international waters has used a standard methodology across most of its freshwater projects since the beginning of the GEF: the Transboundary Diagnostic Assessment/Strategic Action Programme (TDA/SAP) process. However, previous GEF IEO evaluations have found marine areas tend to receive more funding than fresh water in international waters, and this is also the perception of GEF Agencies (GEF IEO 2018a). As the GEF-8 international waters programming directions point out, its main use of the TDA/SAP is to “strengthen governance of transboundary water systems to manage freshwater connectivity across borders,” and that setting transboundary priorities and SAPs are “vital in the process of identifying key issues that affect national water related stress and how to deal with these stressors through actions in multiple countries at the same time.” However, the directions also point out the need for integration of water security across other focal areas as “transboundary environmental and water security starts by strengthening management capacity at the most local level, which include land degradation management strategies, climate change impacts, adaptation, and generally increasing the land-based activities.”

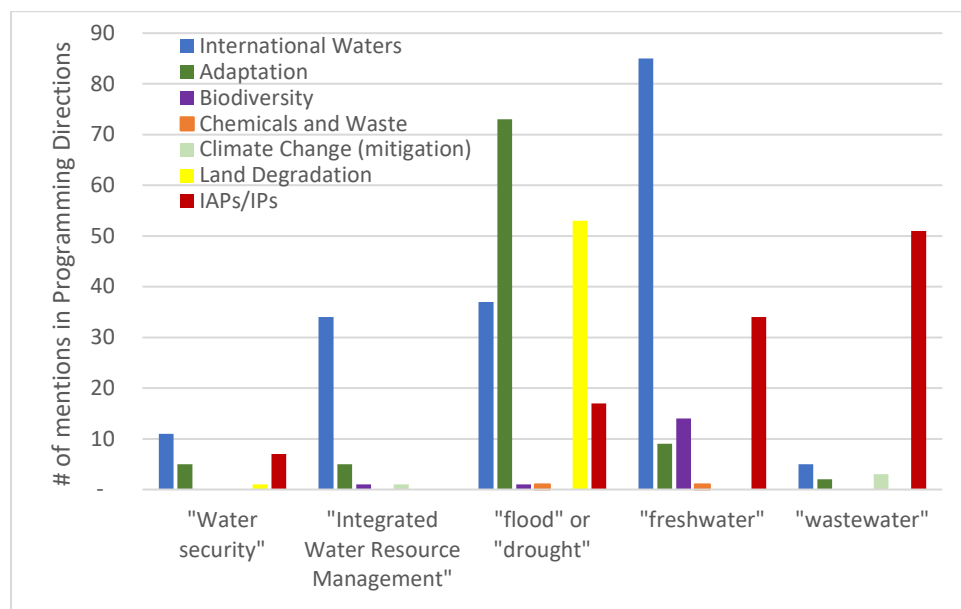


Figure 5. Appearance of water security and related terms in focal area sections of GEF programming directions from GEF-4 and later. IP = integrated or impact program, IAP = Integrated Approach Pilot

49. The GEF-8 programming directions demonstrate the many ways in which water security is addressed by GEF focal areas and integrated programs. Water security is a cross-cutting issue across the GEF focal areas, as demonstrated by the channels through which it integrates into key themes for every GEF focal area and integrated program in the GEF-8 programming directions (table 2). Water security is not always discussed explicitly in the

programming directions, but often it is implied as part of key topics. For example, ecosystem restoration, a key topic for several focal areas and integrated programs, needs water inputs and provides water-based ecosystem services as benefits through flood mitigation and soil retention. Additionally, the GEF, through an increased focus on integrated programs, is increasingly taking a landscape approach and a cross-cutting approach to environmental degradation, which makes integrating cross-cutting topics such as water security easier.

Table 2. Potential entry points and connections between GEF-8 focal area and integrated program programming directions (the list is not exhaustive).

Focal Area/ IP		GEF-8 entry points to water security (human well-being; ecosystems; economic; and hazards)
International Waters		Water security, transboundary watershed, and river basin and aquifer management and governance, knowledge management of water resources, integrated water resource management, flood early warning systems, wastewater treatment, non-point source pollution prevention, freshwater fisheries, freshwater ecosystems, ecosystem services, water conflict, ridge to reef/source to sea, water-food-energy nexus, nature-based solutions
Biodiversity		Ecosystem services, water for ecosystems, payment for ecosystem services, freshwater and riparian ecosystems and protected areas, ecosystem preservation, wetland protection
Climate Change (mitigation)		Hydropower, water efficiency, water-food-energy nexus, afforestation/reforestation, nature-based solutions
Land Degradation		Water scarcity, drought, desertification, drylands, ecosystem degradation, sustainable land management, watershed management, soil erosion and management, groundwater recharge, irrigation, water storage, water harvesting, water efficiency, water for agriculture, food security
Chemicals and waste		Chemical releases to water bodies, water pollution, water quality
Climate change adaptation		Flood and drought mitigation, disaster risk reduction and management, water sector improvement, water efficiency, early warning systems, water storage, water harvesting, irrigation
Integrated programs	Food systems	Watershed management, soil management, ecosystem services, water regulation, protection of source water, groundwater recharge, water for agriculture
	Ecosystem restoration	Wetland and peatland protection, watershed protection, riverine forest protection, freshwater ecosystems
	Sustainable cities	Flood management and mitigation, wastewater treatment, stormwater drainage management, nature-based solutions
	Critical forests	Water and nutrient cycling, freshwater ecosystems
	Circular solutions to plastic pollution	Wastewater, contamination control, water quality, source to sea
	Blue and Green Islands	Water scarcity and stress, water pollution, water sector efficiency and improvement
	Clean and healthy oceans	Wastewater treatment, source to sea, point and non-point source water pollution
	Net-zero accelerator	Nature-based solutions, wetlands, water-food-energy nexus
	Wildlife conservation	Protection of aquatic ecosystems, ecosystem services, water for ecosystems

	Elimination of hazardous chemicals	Wastewater treatment, water pollution
	Greening transportation infrastructure	Ecosystem protection, free-flowing rivers, non-point source pollution control

50. **The international waters focal area integrates all the four dimensions of water security, mainly through the lens of transboundary watershed management.** The GEF is the largest mechanism for multi-country collaboration on freshwater resources and thus fills a critical gap in international funding. Many stakeholders at both international organizations and national governments highlighted the GEF’s additionality and importance in this realm, because few other donors focus on improving transboundary governance of freshwater systems. As pointed out in its programming directions, international waters focuses on this high level of transboundary governance, seeking to improve collaboration and coordination between countries to better manage shared water resources and reduce conflicts related to all four dimensions of water security: water use for humans and for livelihoods, and also managing ecosystems and water-related disasters that are not confined to political boundaries (the GEF’s work in water security linked to conflicts and fragile areas is highlighted in box 1). In this way, the water security-related work done by international waters is framed as a “global” or transboundary environmental issue, whereas water security work done at the community or domestic level (such as community potable water or wastewater systems or watershed protection of watersheds entirely within one country) is viewed as achieving “local” benefits and ostensibly outside the purview of the international waters focal area, save for the use of demonstration projects at the local level in areas of transboundary significance.

Box 1: How water security links with environmental security and conflict reduction in the GEF

The GEF’s Scientific and Technical Advisory Panel (STAP) has noted that not only does the environment underpin human well-being and security, but environmental protection is more easily accomplished and sustainable if humans feel secure and conflict is reduced (Ratner 2018). Environmental security, as defined by the STAP, is “the role that the environment and natural resources can play in peace and security,” and provision of water as an ecosystem service forms a critical component of environmental security. Environmental degradation and climate change that have further limited access to water resources that are critical to human security are seen as a “risk multiplier”—making underlying conflicts between neighbors, local groups, and countries more likely to flare up.

Both the STAP and the GEF IEO have noted that international waters is the GEF focal area most focused on reducing water-related conflict at the transboundary level (Ratner 2018 and GEF IEO 2020a). Through 2019, 29 percent of country-level international waters projects were in countries affected by major armed conflicts, and 83 percent were in fragile areas. Examples include projects aimed to enhance transboundary coordination in the Jordan, Nile, and Sava rivers. GEF corporate and Agency stakeholders recognize this conflict reduction as a major socioeconomic co-benefit of the focal area that is not considered by most other financing mechanisms. However, stakeholders noted that working in such difficult areas can slow down international waters projects, because delicate political processes can be cumbersome and slow. As freshwater resources are more connected to human security, this creates more issues in freshwater projects than in marine projects. Additionally, the Transboundary Diagnostic Assessment/Strategic Action Programme process requires all riparian countries to show clear willingness to cooperate before receiving funding (though some international waters projects work on sub-basin approaches), which, stakeholders noted, means that projects in particularly needy but conflicted areas are almost impossible (examples include planned GEF projects that were ultimately abandoned in transboundary freshwater management between Afghanistan and Pakistan and China and India).

Beyond the international waters focal area, the GEF doesn’t address environmental security in an integrated manner (Ratner 2018). At the beginning of GEF-7, an environmental security impact program was proposed that would perform “preventative action that enhances environmental and water security at both national and regional levels,” focusing on enhancing global environmental benefits in areas where conflict could be exacerbated by natural resource scarcity (GEF 2017a). The program was eventually dropped from the final programming directions, likely due to having too strong a focus on political dimensions and a perception that it fell outside the GEF’s environmental focus. However, the GEF-7 programming directions do mention environmental security in many places, linked to the water-food-energy nexus highlighted in the international waters and climate change focal areas.

51. Efforts by the international waters focal area to involve other GEF focal areas in SAP implementation work has been difficult. The end of the TDA/SAP process, which is the flagship of the international waters focal area, involves implementing the strategic actions of the SAP. Often these actions, though they support transboundary management, are implemented at the national level and typically are beyond the general purview of international waters project activities, which focus on governance and collaboration. Often, the goal of SAP implementation projects in international waters is to encourage other donors and national governments to fund SAP activities or even involve other GEF focal area funding. However, the GEF IEO noted at the

end of GEF-6 that “attempts to capture and fully develop the huge potential for...joining forces of the GEF focal areas towards common objectives have been limited by obstacles on the road to integration such as the focal area silos, sectoral conventions and difficulties in aligning country priorities with regional objectives” (GEF IEO 2018a). Agency and national stakeholders noted these issues still exist today and, so far, the impact programs have not integrated SAP activities in nearby transboundary watersheds into their programming. The closest the GEF has come to creating an integrated program centered around water security as a theme was the dropped initiative for an environmental security impact program at the beginning of the GEF-7 replenishment (see box 1 for more information).

52. The land degradation focal area programming directions highlight two main aspects of water security: drought mitigation and water management in agriculture or restoration. In a previous GEF IEO land degradation focal area evaluation, it was noted that the focal area has shifted away from projects focused on water bodies toward “contextual factors” such as drought (GEF IEO 2018b). Discussion on sustainable land management in the programming directions notes the importance of water management and preventing soil erosion, all of which are key for on-the-ground activities and integration into land and water management plans done under the focal area; in some projects, such activities are even called sustainable land and water management. GEF-6 notes that watershed management is critical where “[sustainable land management] interventions can improve hydrological functions and services for agro-ecosystem productivity.” In GEF-8, “drought-smart land management” is highlighted through water efficiency in agriculture and provision of drought-resistant seeds and plants. However, some GEF Agencies and executing organizations noted that although the land degradation focal area has clear links to water security, it can be restrictive when trying to plan a project around water resource management—if the projects do not have a strong drought or land degradation component, they cannot fit under this focal area.

53. Other GEF Trust Fund focal areas also tend to address water security more narrowly, integrating some of the water security dimensions into their strategies. Programming directions for all the GEF focal areas except those for chemicals and waste discuss aspects of water security as important topics to achieving their global environmental benefits. The GEF-6 programming directions for the biodiversity focal area note the importance of protecting biodiverse natural ecosystems, given their importance in supplying ecosystem services such as regulating and purifying water supply, and that they will aim to create new protected areas to improve “inland water ecosystem representation within protected area systems.” Payment for ecosystem service schemes and “water bonds” are noted as potential financial mechanisms for protecting biodiversity. In the GEF-8 programming directions, the section on the climate change focal area discusses a focus on using renewable energy to power energy efficiency for water purification. It also, starting in GEF-6, notes the importance of the water-energy-food nexus as a cross-cutting framework. It does not, however, mention the need to manage water use in certain water-intensive mitigation activities such as afforestation/reforestation.

54. LDCF and SCCF work on climate change adaptation is closely aligned with the water security dimension of mitigating the impacts of natural hazards. As discussed earlier, a large portion of climate change adaptation work relates to mitigating the impact of water-related

extreme events, especially flood and drought. The LDCF and SCCF strategies, written in the GEF programming strategies on adaptation which align with the GEF replenishments, reflect this importance (GEF 2018b and GEF 2022b). The latest adaptation strategy points out that 55 percent of LDCF funding in least developed countries has supported the water sector, and 43 percent of funding has done so in the SCCF (GEF 2022b). Water is one of the major themes of the strategy, noting that “freshwater quality and quantity will be an important aspect of the GEF’s adaptation program via integrated water resources management interventions”, including support for water storage, conservation and access. Supporting National Adaptation Plans and Programs of Action (NAPs and NAPAs) are critical for the LDCF and SCCF and these plans often prioritize water through disaster risk management, climate information systems and early warning systems (GEF 2018b).

55. Within the GEF-8 Results Measurement Framework, water security is most represented through the global environmental benefit indicators linked with international waters and land degradation. As with the programming directions, the clearest connection with water security themes in the GEF-8 GEF results measurement framework is through the global environmental benefit most often achieved through international waters projects, “strengthening transboundary water management” (GEF 2022c). The core indicator “shared water ecosystems under new or improved cooperative management” makes clear reference to freshwater systems and projects. Among the global environmental benefits most often achieved through the land degradation focal area, “sustainably managing and restoring land” and its indicator “area of land and ecosystems under restoration,” there is reference to restoration practices that can include those on agricultural lands which “enhance soil and water conservation, erosion control and groundwater recharge,” all of which relate to several water security dimensions within the scope of their connection with agriculture. Restoration of wetlands, some of which are freshwater, is also included as a sub-indicator. Additionally, the indicator “area of landscapes under sustainable land management in production systems” aims for managing soil, water, and air “in a sustainable manner.”

56. There is no language related to protection of aquatic ecosystems within the biodiversity global environmental benefits or related to water contamination in the chemicals and waste global environmental benefits. The global environmental benefit most often achieved through the biodiversity focal area, “conserving and sustainably using biodiversity,” focuses on “terrestrial” and “marine” protected areas with no specific reference to inland water, riparian, or aquatic ecosystems. Additionally, although the GEF does have projects that address freshwater fisheries, within the results framework mentions of fisheries are all nested within indicators specifically addressing marine protected areas. Some GEF Agencies reported receiving funding for freshwater or aquatic ecosystem work with biodiversity funding, though they also noted it can be difficult to align such projects to the indicators needed. Research has shown that freshwater ecosystems are commonly secondary or unaddressed components of terrestrial protection work and such terrestrial protection frameworks can be inadequate for addressing freshwater ecosystem processes (Higgins et al. 2021). Additionally, as freshwater ecosystems depend on quality, quantity, and timing of water often governed by distant activities in the watershed, they are very difficult to protect and conserve. Consequently, even though some 15 percent of global inland waters are covered by protected areas (Bastin et al.

2018), they remain underrepresented in conservation (van Rees et al. 2020). The global environmental benefits most often achieved through the chemicals and waste focal area include indicators to measure “[persistent organic pollutants] to air reduced,” but do not include any indicators explicitly measuring release of chemicals of concern into water.

57. The GEF adaptation results framework includes several indicators that directly mention aspects of water security. Within the sub-indicators included in the GEF-8 adaptation results framework, it is clear that water security plays a big role in the LDCF’s and SCCF’s approach to climate change adaptation (GEF 2022b). Sub-indicators linked to water security include: number of direct beneficiaries from new or improved climate information services, including early-warning systems (which include water-based shocks such as flood and drought); area of fresh water, length of riverbank and stormwater drainage, number of irrigation or water structures and fishery or aquaculture ponds managed for climate resilience; and number of people trained or with awareness raised on hydromet and disaster risk management agencies. Of the nine main sectors that adaptation projects can cover, one of them is water resources management.

58. Stakeholders note a “gap” in the GEF’s ability to improve domestic water security holistically, given the specific dimensions of the focal areas. As discussed earlier in this section, international waters is the only focal area with a strategy that addresses water security holistically, but it does so only at the transboundary level. Other focal areas address specific dimensions of water security but rarely deal with all dimensions within interventions. Stakeholders noted that this can lead to difficulties in obtaining GEF funding for water security–focused interventions that are not part of a transboundary watershed or aquifer, such as protection of biodiversity for inland aquatic ecosystems, wastewater projects, or watershed protection (when not focused on mitigating the impacts of climate change). However, many note that other funders, such as multilateral banks or bilateral development agencies, do fund such interventions. Multi-focal area, multi-trust fund, and integrated programs are other potential ways in which countries could address water security in a more holistic manner.

59. Overall, GEF-8 focal areas’ strategies promote key opportunities to improve water security identified in the evaluation’s theory of change, though some are more emphasized than others. In general, the policy documents for GEF-8 address and promote the key opportunities identified for the GEF to improve water security through the theory of change (table 3). Although the discussion of such opportunities in the programming directions does not always mention their application in relation to water security, they still provide an indication of what type of opportunities each focal area focuses on. The GEF-8 programming directions include detailed discussions on activities to improve knowledge and build awareness, develop human capacity, demonstrate new solutions, and to include women in activities (with less discussion on other groups such as civil society, academia, and indigenous peoples). Improving governance and decision making is also a key activity discussed in the programming directions, though there is not much discussion of including a wider range of stakeholders in decision-making processes. Mentions of improving financing opportunities are discussed in relation to the private sector strategy.

Table 3. Overview of how each opportunity for improving water security from the evaluation's theory of change is addressed in the GEF-8 programming directions.

Intervention areas through which the GEF addresses water security	Discussion in the GEF-8 programming directions and adaptation strategy
Involve and exchange with local stakeholders	GEF-8 programming directions particularly emphasize the importance of including women, identifying gender needs, and promoting gender mainstreaming in projects. They also promote private sector involvement. Some focal areas and integrated programs specify involvement with stakeholders within their area of activities. For example, biodiversity highlights indigenous communities in particular, and the climate adaptation strategy includes youth, civil society organizations, and indigenous peoples and local communities.
Gather and generate knowledge and improve awareness	All focal areas and integrated programming policies capture and promote improved knowledge base and building awareness, and virtually all underscore the need for filling information gaps. Biodiversity and climate change also incorporate wording to improve knowledge and awareness. The international waters program has supported IW LEARN specifically for water projects. The climate adaptation strategy particularly highlights early warning and climate information systems.
Improve and create governance mechanisms	All the focal areas address governance and decision making around their specific area of focus. IW policies address the promotion of improved governance and decision making in transboundary water, though wording does not explicitly promote on stakeholder involvement in that area. Other focal areas also significantly address governance and decision-making.
Create and enhance financing opportunities	All focal areas promote development of financial instruments, including leveraging national-level funding and private capital through promotion of natural capital accounting, green procurement practices, financing tools, and blended finance to reduce risk for private sector investment. Focal areas and IPs tend to identify specific areas of financing which may be useful for their targeted approaches which involve the private sector. Climate change also highlights climate financing for women's organizations and indigenous peoples and local communities. The climate adaptation strategy targets nature funds for support.
Demonstrate solutions	Focal areas promote new solutions and technologies that can be applied to their specific area of focus, but these will not always have impact on water security. IW policies significantly address the demonstration of new solutions and new technologies, as the Food Systems impact program does for water conservation. Climate change and the climate adaptation strategy highlight nature-based solutions and climate change adaptation supports flood protection and irrigation infrastructure. Biodiversity promotes new production mechanisms which benefit ecosystems. All impact programs encourage innovation and cost-effective technologies that deliver multiple benefits.

4. Water security in the Integrated Programs

60. The GEF's multi-focal area and integrated programs have primarily integrated water security through coastal marine protection, food security, and cities programs. The GEF has

moved toward more integrated programming across its focal areas, allocating increasing funding to programs that use an integrated approach, from the GEF-6 integrated approach pilots to the GEF-7 and eight impact programs. The GEF-5 Ridge-to-Reef program (GEF ID 5395) implemented in small island developing states (SIDS) integrating biodiversity, international waters, and land degradation funding (and, to a lesser extent, climate change funding) was a multi-focal area program that integrated freshwater security themes with marine water protection by considering the connection between watershed management in upland watersheds of freshwater bodies and coastal marine ecosystems. This type of work, mostly focused on wastewater treatment to protect coastal marine ecosystems, is common in the international waters focal area as well. Once the integrated approach pilots and impact programs began in GEF-6, the programs related to environmental management of cities (GEF ID 9077 in GEF-6 and GEF ID 10391 in GEF-7) and food security (GEF ID 9070 in GEF-6 and GEF ID 10201 in GEF-7) have had the most integration of water security themes. The Cities impact program projects have focused on water security through flood prevention and wastewater treatment, while the Food Security impact program projects deal with water security as the land degradation focal area does—through the lens of agriculture and resilience to drought. The GEF-7 ‘Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes’ impact program (GEF ID 10206) also deals with water security from the standpoint of drought resilience for agriculture and focuses on biodiversity protection in arid landscapes.

61. Within the GEF-6 and GEF-7 Cities and Food Security impact programs, some child projects integrate water security topics more than others. In the Cities impact program, the Senegal integrated approach pilot child project (GEF ID 9123) aims to reduce flood risks in peri-urban regions of Dakar through mainstreaming of flood risk in urban planning. It is implemented by the World Bank, which is co-financing investments in stormwater drainage infrastructure. However, no other child projects from the GEF-6 Cities integrated approach pilots discuss water security themes as a focus. Water security themes are much more common in the GEF-7 Cities impact program child projects: at least 8 of the 10 child projects mention wastewater treatment or flood prevention topics. The India child project is one clear example (GEF ID 10484): it focuses on nature-based solutions, including restoration of a lake with riparian vegetation to increase its ability to soak up flood waters, sparing nearby urban areas inundation; the project has Asian Development Bank (ADB) co-financing for stormwater drainage infrastructure. The planned GEF-8 Cities impact program plans similar water-related activities to improve water and urban food systems primarily through multi-stakeholder land use planning and governance.

62. In the GEF-6 Food Security IAP, drought and water for agriculture are key topics, such as in the Kenya child project (GEF ID 9139) which aims to set up a “water fund” to obtain funding from public and private sources as a payment for ecosystem services (PES) scheme to perform agricultural watershed protection/SLM activities in the watershed where the city of Nairobi receives its water supply. In the Food Systems, Land Use and Restoration (FOLUR) GEF-7 impact program, the Uzbekistan child project (GEF ID 10601) focuses on planting heat- and drought-tolerant winter wheat varieties; and the Vietnam project (GEF ID 10245) supports watershed planning to bring fishermen and upstream aquaculture farmers together to discuss fertilizer runoff control. Agency stakeholders note that water security is a secondary focus of many

projects in these programs; they primarily focus on food security and land degradation–related global environmental benefits—so any water activities must be couched in those terms. The GEF-8 food systems impact program has a similar focus, planning to ensure access to clean water supplies, building sustainable farming systems through improving watershed management, and developing payment for environmental services schemes. The Ecosystem Restoration impact program, which has similar themes, is more focused on drought resilience and plans payment for environmental services schemes. Some stakeholders believe the lack of primary focus on water security in these food security programs is a missed opportunity to address the topic more holistically beyond simply conceiving it narrowly as an input for agriculture. For example, themes such as upper watershed ecosystem service protection, control of pesticide and fertilizer runoff into aquatic ecosystems, and multiple-use water systems could be mainstreamed across the programs.

5. Water security strategies of GEF Agencies

63. **GEF Agencies tend to view water security through the lens of their specific mandates and expertise.** Multilateral development banks generally approach the water agenda from a developmental perspective, emphasizing human well-being through water, sanitation, and hygiene (WASH), economic development (irrigation, power, transport, etc.); hazards and climate change (mitigating effects of extreme events). The environment is generally integrated from the perspective of how ecosystem services can be sustained to assist development objectives. Increasingly, however, strategies of the multilateral development banks are promoting environmental protection and conservation of ecosystems for environmental needs and objectives (table 4). For example, the ADB [Strategy 2030 Water Sector Directional Guide](#) is intended to “address water security challenges in the region” and includes the “water needs of the environment” alongside development objectives (ADB 2022). It also assesses “environmental security” as part of its water security diagnostic. However, a recent evaluation of ADB’s water sector work found that it is implemented in a “fragmented manner rather than the integrated fashion needed” to support member countries’ needs (ADB Independent Evaluation 2022). The World Bank, which houses the Global Water Security and Sanitation Partnership (GWSP), interacts with a broad range of water security topics through its global practices. The Water global practice and GWSP have created a comprehensive water security diagnostic framework and have conducted deep-dive diagnostics on water security in specific countries and regions, albeit with a focus on ensuring sufficient water for development needs. Other global practices focus on hydropower, wastewater, drought, and climate change adaptation. Similarly, the AfDB and the Inter-American Development Bank (IDB) deal with water security from a development perspective, through water and sanitation, drought and flood resilience, water supply and storage, and financial mechanisms for water infrastructure funding (table 4).

64. UN Agencies, like the GEF focal areas, have guidance and strategies in relation to specific dimensions and topics of water security that relate to their environmental focus or areas of expertise. For example, the International Fund for Agricultural Development (IFAD) and FAO tend to focus on water security as it relates to agriculture, as the GEF land degradation focal area and the food systems–related programs do. They focus on water efficiency in

agriculture and irrigation in rural areas, which tend to be in great demand from beneficiary countries (IFAD 2014 and FAO 2023). The FAO evaluation office found that FAO “lacks a coherent approach” on water resources management, which is detrimental to its role as the custodian of SDG 6.4 (FAO 2023). The United Nations Development Programme (UNDP), through its [Water and Ocean Governance Programme](#) (WOGP), primarily addresses sanitation and water supply, wastewater, flooding, and water scarcity. The United Nations Industrial Development Organization (UNIDO) focuses on wastewater and water efficiency and quality in industry. The United Nations Environmental Programme (UNEP), through its Freshwater Resources Strategy (2017–21), emphasizes “protecting, managing and restoring freshwater in support of human well-being and sustainable development.” However, UNEP created a more holistic definition of water security and targets WASH, water quality, and pollution control as well as IWRM.

65. Conservation International, the International Union for the Conservation of Nature (IUCN), and the World Wildlife Fund (WWF) tend to focus on water security in relation to conservation and protection of freshwater ecosystems; like the GEF biodiversity focal area they incorporate the approach that healthy ecosystems provide ecosystem services upon which many of the most marginalized and vulnerable communities depend. The WWF lists “water scarcity” as one of its key threats and notes that freshwater habitats are in worse condition globally than forests, grasslands, or coastal systems. It has been very active in advancing [Corporate Water Stewardship](#) to bring the private sector into IWRM. The IUCN identifies “[Freshwater and water security](#)” as a key theme and, under its [IUCN Nature 2030 Programme](#), has the objective to ensure that freshwater systems support and sustain biodiversity and human needs around the globe by 2030, and has a specific focus on transboundary water diplomacy.

Table 4. Overview of GEF Agency water security related strategies and priorities. GEF Agencies with at least 2% of water security evaluation portfolio are shown.

GEF Agency	Agency documents relating to Water Security	Main water security related areas of focus	Notes
Development Banks			
African Development Bank	<ul style="list-style-type: none"> • Water Strategy 2021 – 2025: Towards a Water Secure Africa 	Water and sanitation, agriculture, fisheries, and ecosystems	Emphasis and focus on overall poverty reduction.
Asian Development Bank	<ul style="list-style-type: none"> • Strategy 2030 Water Sector Directional Guide • Pacific Water Resilience Hub 	Water sector improvement, water and sanitation services, climate change adaptation, water for agriculture	the Asian Water Development Outlook (AWDO) quantifies water security at a country level.

Interamerican Development Bank	<ul style="list-style-type: none"> • Water Security in Latin America and the Caribbean Strategy and World Plan • Water and Sanitation Sector Framework Document 	Water and sanitation, climate change adaptation, financial instruments, wastewater	Includes focus on financial mechanisms such as Aquafund and water funds .
World Bank	<ul style="list-style-type: none"> • Water security diagnostic framework • A New Paradigm for Water Storage • The New Economics of Water Scarcity and Variability • Sink or Swim: Water Security for All • Internal position paper on transboundary waters 	Varied, including country level diagnostics, climate change adaptation, water storage/hydropower, supply, agriculture, wastewater	The Global Water Security and Sanitation Partnership trust fund (\$22 Billion portfolio) carries out analytical work related to water security.
United Nations Agencies			
Food and Agriculture Organization	<ul style="list-style-type: none"> • Strategic Framework 2022-2031 • Coping with water scarcity: and action framework for agriculture and food security 	Agriculture, monitoring, fisheries	“Custodian” of Sustainable Development Goal 6.4 Manages AQUASTAT global water information system.
International Fund for Agricultural Development	<ul style="list-style-type: none"> • Scaling Irrigation Systems • Water harvesting systems for smallholder producers, tips for selection and design 	Agriculture, especially irrigation, rural water supply	Decided against a separate water strategy but integrate into broader strategic documents.
United Nations Development Programme	<ul style="list-style-type: none"> • Community water security • Water and Ocean Governance Programme 	Transboundary watershed management, water and sanitation at community level	Manages GoAI WaSH programme and UNDP-SIWI Water Governance Facility
United Nations Environment Programme	<ul style="list-style-type: none"> • Freshwater Resources Strategy 2017-2021 	Freshwater ecosystems, water quality and pollution, climate change adaptation	Created widely used water security definition.
United Nations Industrial Development Organization		Wastewater, industry water efficiency and quality	Directly addresses water consumption and water pollution.

Environmental NGOs			
Conservation International	<ul style="list-style-type: none"> • Corporate Water Stewardship and the Case for Green Infrastructure • Implementing green-gray infrastructure • WASH in Watersheds program 	Nature-based solutions/green infrastructure, freshwater ecosystems; integrating ecosystem health with local community WASH.	

6. Water security in multilateral environmental conventions

66. **The key GEF-supported environmental conventions mostly address water security narrowly through their specific focuses, analogous to the approach taken by the respective GEF focal areas.** The UN Framework Convention on Climate Change (UNFCCC) acknowledges that “water and climate change are inextricably linked,” and in general, the convention approaches water security from the standpoint of adaptation and “loss and damages” due to extreme events (including through the breakthrough agreement to establish a loss and damage fund; UNFCCC 2022). It supports the development of NAPs that address water scarcity, flooding, and drought resilience. The report of the 27th Conference of Parties (FCCC-COP 27) in 2021 notes that of the nine reporting sectors, water and agriculture lead adaptation needs, with water distribution infrastructure, water harvesting, and irrigation being priorities (FCCC 2021). The report further calls for international development assistance to promote risk reduction and foster climate resilience, and the [“Early Warning for All Action Plan](#) was advanced at FCCC-COP 27 with the intent to increase early-warning services globally and better respond to disasters, including water-related disasters. More recently, at the UN 2023 Water Conference the UNFCCC promoted collaboration to address the water-climate nexus, and hosted [“Enhancing collaborative efforts toward knowledge and innovation for action in the water-climate nexus.”](#)

67. The UN Convention on Biological Diversity (UNCBD) acknowledges the link to water through sustaining water-related ecosystem services from rivers, lakes, and wetlands. The convention has strengthened its relevance to water security objectives through the goals and targets of the [Kunming-Montreal Global Biodiversity Framework](#) (GBF) as agreed upon at the 15th meeting of the Conference of Parties to the UNCBD (COP 15) (CBD 2022). Several targets of the GBF address biodiversity of freshwater ecosystems explicitly, including target 2, which aims to have 30 percent of degraded terrestrial, inland water, and marine and coastal ecosystems under effective restoration by 2030 and target 3, which aims to effectively conserve the same percent of the same areas, also by 2030. Target 11 also notes the goal to restore ecosystem functions and services “such as the regulation of air, water and climate, soil health...protection from natural hazards and disasters...” (CBD 2022).

68. The UN Convention to Combat Desertification (UNCCD) directly addresses water security through its focus on reducing land degradation and the effects of drought; and, in particular, through strategic objective 3 “to mitigate, adapt to, and manage the effects of drought in order to enhance resilience of vulnerable populations and ecosystems.” This was

emphasized in the most recent decisions of ICCD/COP 15, with the Results Framework for 2022–25 promoting actions to reduce the effects of drought, improve preparedness and resilience to droughts, and respond to the needs of vulnerable communities (UNCCD 2017). Following ICCD/COP 14, the UNCCD has developed a [Drought Toolbox](#) to help countries develop their drought mitigation plans; it emphasizes monitoring and early warning; vulnerability and risk assessment, and developing risk mitigation measures.

69. The Stockholm Convention on Persistent Organic Pollutants (POPs) was created to reduce “POPs which are transported through air, water and migratory species and accumulate in terrestrial and aquatic ecosystems” and is therefore fundamentally linked to water security objectives for improving water quality for humans and the aquatic ecosystem. POP-COPs have noted that the management of chemicals and waste is inextricably linked to the attainment of the 2030 Agenda for Sustainable Development and its objectives of cleaner air, water, and soil (POPs 2019). They also have underscored the importance of safe drinking water, especially for children, who are particularly vulnerable to toxins (POPs 2017). In recent COPs, increasing attention has been given to monitoring of sulfluramid and perfluorooctane sulfonic acid in soil, groundwater, and surface water. COP-9 in 2019 also specifically noted the alignment between strategies for the international waters and chemicals and waste focal areas in relation to marine plastics and microplastics, but did not highlight the relation to freshwater pollutants (POPs 2019).

70. The Minamata Convention on Mercury was created to “protect the human health and environment” from emissions and releases of mercury and mercury compounds. It promotes the most effective techniques to prevent or reduce emissions of mercury to air, water, and land. The decisions of the COP do not specifically address water or the aquatic environment; however, they are related to mitigating releases of mercury into the environment, which would result in improved water quality, a water security objective.

71. Other multilateral and regional frameworks and agreements include elements of water security. The Sendai Framework for Disaster Risk Reduction has a significant discussion on mitigating water-related natural disasters (United Nations Office for Disaster Risk Reduction 2015). As the GEF IEO has noted previously, the international waters focal area contributes to several fresh water–related frameworks and agreements through its programming as well, including the Convention on Non-Navigational Uses of International Watercourses, the Ramsar Convention on Wetlands of International Importance, and many regional agreements between countries to manage transboundary watersheds and aquifers (Merla 2002).

V. WATER SECURITY IN GEF INTERVENTIONS

1. Relevance: Meeting stakeholders’ water security priorities

72. **The GEF has more projects with a water security focus in some areas with especially low water security (Sahel region of Africa) than in others (South Asia).** Comparing the locations of GEF projects with a prominent and explicit focus on water security (those projects included in this evaluation’s portfolio) with a global index of water security from Gain et al.

(2016),⁹ the GEF has projects in almost all countries where water security is low and the need is the greatest (figure 6 and figure 7). The two regions that stand out for having the lowest water security are the Sahel region of Africa and South Asia. The GEF has many projects with a water security focus in Sahel countries and other dry eastern African countries with low water security, such as Chad, Mali, Sudan, Libya, Niger, and Burkina Faso. However, it is less well represented in South Asian countries with low water security, such as Afghanistan, Bangladesh, and India. Meanwhile, the GEF has a large number of water security–focused projects in the comparatively more water-secure regions of the Balkans and South America, though these regions do have some subnational areas that are more water insecure than others. Countries affected by fragile and conflict situations (FCS) tended to be more water insecure, which in some cases can affect the GEF’s ability to design and implement projects. In some cases, scarce natural resources, including water, can exacerbate conflict.

73. GEF projects that focused on water security met many of the water security needs of stakeholders. The portfolio review of completed GEF projects found that 44 percent of projects discussed host country water security strategies, plans, or laws in their project design documents. In contrast, 81 percent of ongoing projects discussed water strategies, showing an increase in consideration between GEF-4 through GEF-5 and GEF-6 through GEF-7 projects. Of the ongoing projects that discussed host country water strategies, almost half (48 percent) specifically described how their projects would address those strategies. In the countries where case studies were carried out, national government officials with knowledge of the projects generally agreed that the projects supported their strategies. Bolivia has a National Watershed Plan that intersects well with the international waters projects in the country, including the three major watersheds: Amazon, Plata, and the Titicaca-Desaguadero-Poopó-Salar de Coipasa highlands lakes system. In Morocco, the MedProgramme Water Security project’s work on integrated coastal zone planning, including an assessment of coastal aquifers, will support the country’s Coastal Law, which requires coastal management plans. Burundi’s Water Strategy and Action Plan includes measures on improving water quality and erosion control in key basins, including Lake Tanganyika, a major component of several ongoing case study projects in the country. Albania, Bosnia-Herzegovina, and Montenegro are all European Union (EU) candidate countries and have a priority of aligning their water laws to the EU Water Framework Directive. The Implementation of the SAP of the Dinaric Karst Aquifer System: Improving Groundwater Governance and Sustainability of Related Ecosystems project (GEF ID 9919; DIKTAS II) plans to support such alignment, which should be a co-benefit of aligning policies for management of the transboundary aquifer system.

⁹ Gain, Giupponi, and Wada (2016) include four indicators for their water security index: availability, accessibility to services, safety and quality, and management. Some countries had no data availability for certain indicators; for these, hot-deck imputation was used to replace values using a similar unit. Zonal statistics were used to calculate an average water security index value for each country.

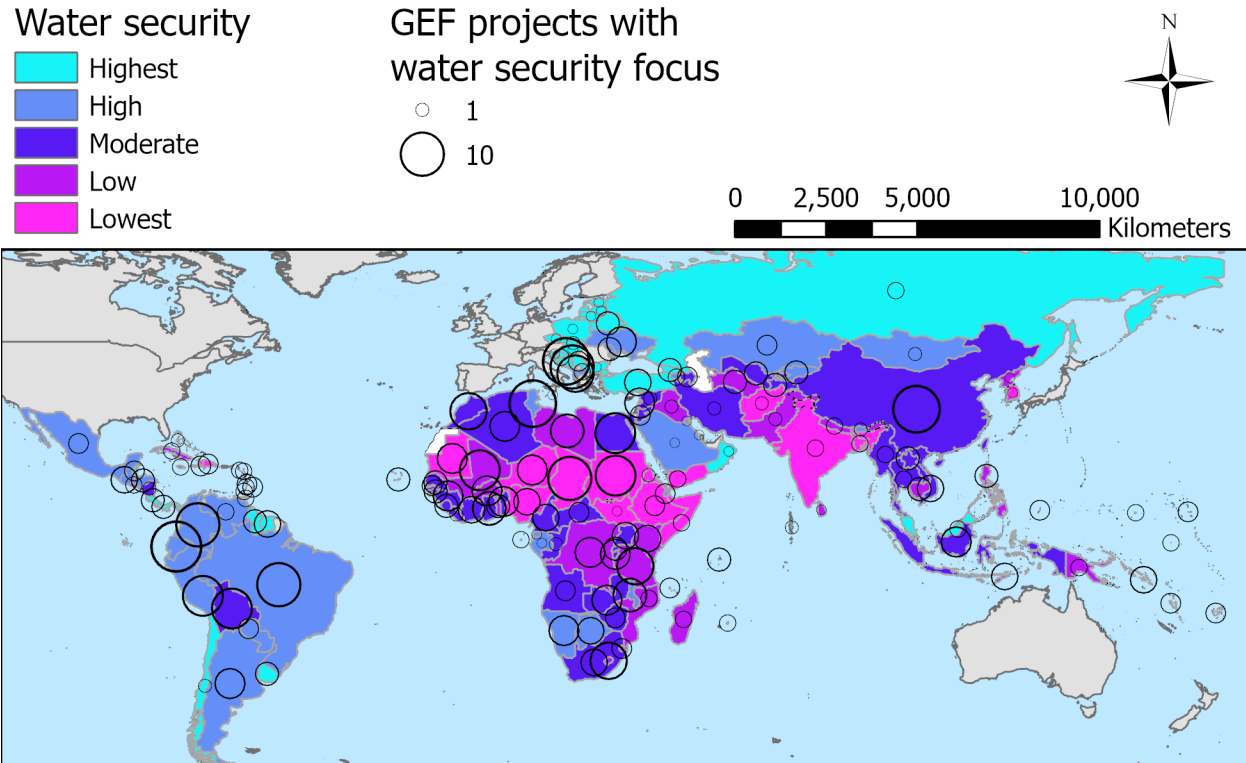


Figure 6. Map comparison of countries' water security index from Gain et al. (2016) compared with locations of GEF projects included in the evaluation's portfolio. Note: The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group or the GEF IEO, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

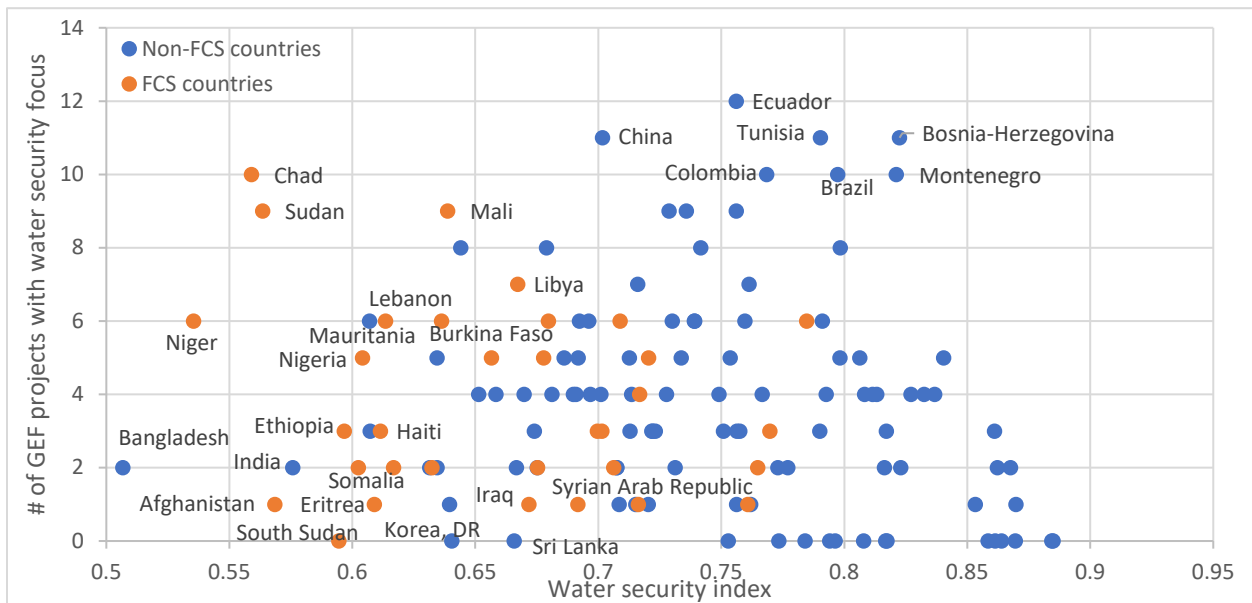


Figure 7. Graph comparison of GEF-eligible countries' water security index from Gain et al. (2016) compared with locations of GEF projects included in the evaluation's portfolio.

Note: a lower water security index implies worse water security. FCS = countries impacted by fragile and conflict affected situations. There are GEF projects in the evaluation portfolio that worked in the area of South Sudan before the country gained independence.

74. **At the country and local levels, water security was often seen as a major concern for society and ecosystems.** Water was at the top of the development agenda for all stakeholders in most of the countries visited for the case studies, from national governments down to community members. Communities, especially in arid or semi-arid areas such as Sudan, Morocco, and the Bolivian highlands, drew a stark connection between water availability and their ability to live and eat. They prioritized access to water for drinking and well-being as well as for agriculture. More humid (as well as semi-arid) countries, such as Burundi, prioritized preventing erosion and sedimentation which caused dangerous flooding and affected their agricultural productivity. At the local and national scale, governments prioritized management of these same concerns. In many countries such as Albania, Bosnia-Herzegovina, Montenegro, Morocco, and Tunisia, monitoring, especially of groundwater, was a key concern, given the scarcity of data on aquifers. For local organizations, NGOs, and civil society, preservation of riparian and freshwater aquatic ecosystems was also mentioned as a priority in many case study areas. Transboundary management and data sharing were also noted by governments as key, especially in the DIKTAS countries, which share many watersheds and aquifers with their neighbors; and in Sudan, which shares the Nile River and transboundary aquifers with several neighbors in an arid region.

75. **Within communities, stakeholders greatly appreciated any projects that increased their access to and ability to store fresh water.** In Bolivia, community members were especially grateful for small-scale irrigation networks and water harvesting infrastructure installed by the Conservation and Sustainable use of Biodiversity and Land in Andean Vertical Ecosystems project (GEF ID 3831; known as the EVAs project for its acronym in Spanish). In Sudan, rural communities were most appreciative of solar water pumps installed by the Implementing NAPA Priority Interventions to Build Resilience in the Agriculture and Water Sectors to the Adverse Impacts of Climate Change project (GEF ID 3430), which allowed them to irrigate in dry periods and cost less than diesel pumps (the project did install some diesel pumps as well).

76. **Stakeholders expressed a desire for more concrete, on-the-ground activities by international waters projects.** In the countries visited, stakeholders at all levels noted the importance of international waters projects' work to improve transboundary collaboration, data sharing, and management. However, it was commonly mentioned that they hoped for more concrete activities to follow up on the strategy- and governance-heavy TDA/SAP process. This was especially true in transboundary areas that have already had several international waters projects, such as Bosnia-Herzegovina, Montenegro (two projects on DIKTAS and others on transboundary rivers), Bolivia (in the Plata River basin), Morocco, and Tunisia (several Mediterranean Sea programs). Climate change adaptation and land degradation case study projects were more well-known at the local level, in part because they involved more local on-the-ground activities.

77. **GEF projects often raise awareness on emerging water security issues, shifting government priorities.** The case studies highlighted that GEF projects raised awareness for water security-related issues that stakeholders had not previously considered high priorities. This was true in Sudan and Burundi, where the Mainstreaming Groundwater Considerations into the Integrated Management of the Nile River Basin project (GEF ID 3321) introduced to

many stakeholders the importance of monitoring groundwater resources and their effect on surface water availability. Surface water was a much greater priority at the time of the project's implementation for key water stakeholders such as the Nile Basin Initiative, whereas now the idea of conjunctive groundwater-surface water management is a priority theme. The Protection and Sustainable Use of the Dinaric Karst Aquifer System project (GEF ID 3690; DIKTAS I) also brought governments' attention to the importance of the karstic groundwater ecosystem, where water pollution infiltrating into groundwater in one country can contaminate springs used for drinking water in another. Equally, in Burundi the Watershed Approach to Sustainable Coffee Production in Burundi (GEF ID 4631; PROZOC) brought attention to the importance of treating water used in coffee washing, leading to broader adoption of the process in the country's coffee sector.

78. International waters projects' focus on monitoring and data sharing was appreciated in almost all case study countries, especially on data-poor topics such as groundwater or areas where disagreements can occur. In the DIKTAS region, governments noted that data on groundwater was usually out of date and scarce, so planned pilot monitoring networks proposed in the upcoming DIKTAS II project were especially anticipated. Equally, the pilots of the MedProgramme's Mediterranean Coastal Zones: Managing the Water-Food-Energy and Ecosystems NEXUS project (GEF ID 9685) were designed to demonstrate technology such as minimizing water use in renewable energy, water flow-predicting artificial intelligence and sensors, and other tools for water monitoring.

79. **Within national governments, water is often split among the jurisdictions of several ministries, many of whom have limited knowledge of the GEF.** Based on our findings from the case studies, the GEF focal points tended to be in within environmental ministries or departments (except in Bolivia, which recently named the Ministry of Development Planning as the GEF focal point, and Morocco, where the focal point is within the Sustainable Development Secretariat). These ministries tended not to have major jurisdiction over water other than its intersections with environment and sometimes struggled to involve water ministries in GEF projects. Ministries that dealt more with water tended to focus on it from their ministries' lens (similarly to GEF Agencies), such as hydropower and energy production (especially in the DIKTAS countries), agriculture, or potable water and water treatment, while environmental flows and water for ecosystems was not a high priority. They tended to look for large water infrastructure support from development partners, such as improving hydropower, wastewater treatment, or large-scale irrigation.

2. Coherence of GEF projects with related initiatives

80. **Beyond supporting transboundary water policy coherence, some international waters projects aim to improve water policy coherence across ministries within countries.** One of the main goals of international waters is to align water policy across countries to improve transboundary management; however, some projects go further and try to improve water policy coherence among ministries and levels of government within countries. The most prominent example in the case studies is the DIKTAS project. The DIKTAS I project set up national interministerial committees (NICs) that included several members of different ministries to help align water policies within the countries as well as between countries. The

project terminal evaluation noted that the NICs were one of the success stories of the project, though they were vulnerable to government staff turnover (a common issue cited across case study meetings as leading to poor institutional memory of GEF knowledge products) and delays in meetings. This combined with a long gap in GEF project funding has meant that the NICs have mostly stopped meeting, though Albania created the Water Resources Management Agency in the interim to lead cross-cutting water management in the country. The DIKTAS II project plans to coordinate and work with the NICs again.

81. Projects in the evaluation portfolio successfully identified other water security–related initiatives at project design but rarely had close collaboration with such initiatives during implementation. In the portfolio review of completed projects with a prominent focus on water security, 17 percent of projects were found to have interacted with another donor-funded initiative. Sixty-three percent of ongoing projects discussed or listed other initiatives in the region dealing with water security, and of those, 39 percent described specific plans for collaboration. As mentioned previously, completed case study projects often built on or had other donor initiatives later build on their work in project areas and countries. However, close coordination with other initiatives during implementation was rare, except among projects of the same program. In Sudan, Sudanese research institutes noted they had water-related initiatives going on at the same time and in the same areas as the NAPA project but were unaware of the project and did not collaborate with them. Similarly, the United Nations Children’s Fund has work in the same areas as the ongoing Nile Groundwater case study project but reported no collaboration. The Bolivia EVAs project planned to coordinate closely with the IDB-funded Direct Support for the Creation of Rural Agricultural Initiatives project which was working on similar issues and geographies but focused directly on agricultural production (IDB implemented the EVAs project too). However, the terminal evaluation notes that such collaboration did not ultimately occur. The MedProgramme child projects, however, have clear plans for collaboration. The Water Security and NEXUS child projects are both working in the Tangiers-Tetouan-Al Hoceima coastal region where the projects, which are just beginning implementation, are already coordinating stakeholder engagement activities and activity planning.

82. National government officials and GEF focal points were found to be best placed to perform the difficult task of coordinating water security–related activities within their countries. Project and national government staff noted that coordinating ongoing projects to ensure collaboration is difficult, given the differing timelines and goals of funding organizations if there is no body charged with overseeing this coordination. Case study countries where national governments took the lead on this task, rather than projects themselves, resulted in the best coordination. In Bolivia, the Ministry of Development Planning has become the GEF focal point and sees its mandate as coordinating development projects across all sectors and ensuring that they support the country’s Economic and Social Development Plan. They monitor development projects across several ministries, including the Ministry of Environment and Water and the Ministry of Foreign Relations, which lead most GEF projects. In Morocco, the Ministry of Water requested that UNESCO-IHP, the executing agency for the Water Security MedProgramme child project, revise the planned assessment of the Rkhiss-Nekor aquifer to exclude a hydrogeological characterization as this had already been done by a previous French

Development Agency–funded project. Montenegrin officials similarly pointed out to the project that a previous GEF program (the MedPartnership, GEF ID 2600) had created a management plan for the Buna-Bojana River area, and thus that the Water Security project should not replicate this plan as part of its work on the coastal aquifer in the same geography.

3. Stakeholder engagement, women, indigenous peoples, and other vulnerable groups

83. Vulnerable and marginalized groups, including women, often have low water security. Cultural norms in many parts of the world mean that different genders interact differently with water. In many countries, women take the role of collecting water, making often long trips (especially in water-scarce areas) to obtain water for household activities. Studies have shown that this role for women makes them more at risk not only from a personal safety standpoint but also for exposure to contaminated water and of sustaining musculoskeletal trauma along (Pouramin, Nagabhatia, and Miletto 2020). Vulnerable groups, including women and indigenous peoples in some areas, are often the most water insecure due to limited access to water resources and the first to face the water-related consequences of climate change (UNDP 2021). This can be due to poverty in general and its manifestations—living in flood-prone areas or near contaminated water and less access to secure and clean water supply. Indigenous peoples often have traditional and long-term knowledge of water resources in their area, making them a key resource for better understanding of water security in their local areas, as recognized in the evaluation’s theory of change.

84. International waters projects generally limit stakeholder engagement in project design to 1–2 national government representatives per country. The evaluation portfolio review showed that 59 percent of ongoing projects with a focus on water security discussed how stakeholders were engaged in project design, usually through stakeholder workshops, interviews, or focus groups, to discuss potential project activities. The most common local stakeholders included in the design phase were local authorities/government (47 percent), local communities (27 percent), and NGOs (23 percent). Most international waters projects included in the case studies, in contrast to projects within focal areas within the System for Transparent Allocation of Resources (STAR; biodiversity, climate change, and land degradation), were prepared by Agencies rather than by national governments. Once Agencies had ideas for projects, they approached national government entities for review and approval. The design processes were led by Agencies, who sent drafts of design documents to national government stakeholders in 1–2 ministries (usually foreign affairs ministries or ministries housing GEF focal points) and invited them to workshops to prepare the project. Local stakeholders were rarely involved in design, and most local stakeholders interviewed for case studies were unaware of upcoming international waters projects, even when pilot projects were focused on their region (such as the Buna-Bojana delta region on the border of Albania-Montenegro, a focus of the MedProgramme child project “Mediterranean Coastal Zones Climate Resilience Water Security and Habitat Protection,” GEF ID 9687, and the DIKTAS II project). International waters projects in case studies that did include local pilot activities generally involved local stakeholders once implementation began, however.

85. Local communities were found to be more involved in the design of land degradation and climate change adaptation projects. The upcoming Landscape restoration for increase resilience in urban and peri-urban areas of Bujumbura project (GEF ID 10099, funded by the LDCF) held community meetings in the design phase, while the design team for the Programme to Sustainably Manage and Restore Land and Biodiversity in the Guadalquivir Basin (GEF ID 10627, land degradation focal area funded) contracted a local NGO (PROMETA) in the design phase to carry out focus group discussions with local communities to learn their priorities related to water access and agriculture. These projects are much more focused on water security issues at the local level, and geographical areas of focus tend to be identified during design, so the necessity to involve local actors early on is greater than for international waters projects.

86. Gender considerations were not commonly addressed in completed projects that focused on water security, but they are much more prominent in ongoing projects. Within the evaluation portfolio, 49 percent of completed projects were found to have included women's groups or women individually. Inclusion varied from ensuring that women represented a certain percentage of beneficiaries, or stakeholders capacitated to working specifically with women's groups. For example, the Mainstreaming Sustainable Land and Water Management Practices project in Jordan (GEF ID 2631) supported women's savings and credit groups through training sessions on sustainable land management activities. However, activities specifically targeting women or considering how water security differed according to gender was rare in completed case study projects. The TDA and SAP documents created by the DIKTAS I project, for example, do not address gender aspects of water management in the region. The Bolivia EVAs project, the Burundi PROZOC project, and the Sudan NAPA project were shown to be very beneficial to women in the communities where they worked—women interviewed in these communities reported benefitting through improved diet and more consistent food supply from improved water access. The EVAs and PROZOC projects did not target women specifically through their interventions, however. In Sudan, women benefitted from targeted microfinance schemes from the NAPA project; these were highly appreciated by interviewees. These completed projects were designed prior to the implementation of the GEF's latest Policy on Gender Equality, which mandates that all GEF projects elaborate a gender analysis and action plan or equivalent prior to CEO Endorsement (GEF 2017b), although the previous 2011 Gender Mainstreaming Policy was active.

87. In ongoing projects (many of which were designed after the new policy came into effectiveness), 56 percent did a gender analysis in the design phase and 38 percent planned one for implementation, while 56 percent had a gender action plan in design and 27 percent planned one for implementation. 37 percent of ongoing projects mentioned how water security interacted with gender in their project areas in design documents. In ongoing case study projects, common ways of integrating gender included ensuring a certain percentage of beneficiaries were women (sex disaggregated indicators), ensuring inclusion of women in water decision-making bodies (at the national and local level), training on gender dimensions of water issues, and targeting women for microfinance opportunities. For example, the Enabling Implementation of the Regional SAP for the Rational and Equitable Management of the Nubian Sandstone Aquifer System (NSAS) (GEF ID 9165) plans a "Water and Gender" training course in

all involved countries to strengthen local capacity in gender analysis and sex-disaggregated data collection (the Nubian aquifer area includes the Darfur region of Sudan, where water is scarce and women walk long distances to obtain it), the MedProgramme Water Security project will ensure a gender balance in consultation workshops, and the Bolivia Guadalquivir Basin project plans to target women specifically for a small agrobusiness loan competition.

88. Several ongoing projects struggled to articulate exactly how gender would be integrated into water policy. Most project staff interviewed during the case studies were very aware of the gender inclusion plans their projects would perform generally, noting the existence or plan for gender analyses and action plans, but had trouble describing exactly what actions the projects would take to incorporate gender into specific activities and policies. Similarly, design documents did not include many details as to how gender would be integrated into planned policy improvements. Some projects aimed to hire specific consultants or project staff to ensure gender integration across the projects. The DIKTAS II project plans to develop “supportive policy and legislative frameworks” to “ensure that the gender perspective is successfully incorporated into national and international water governance, policy and activities” but does not mention exactly what a “gender perspective” in water policy would look like, focusing instead on ensuring gender representation in activities. In the MedProgramme, a methodology for a coastal climate risk assessment is planned to be conducted with gender aspects which will then lead to mainstreaming of gender into coastal zone management plans (as part of the Water Security child project). It was not clear, however, exactly what aspects of gender will be included in the assessments and how such gender aspects would then become part of the management plans.

89. Water security of vulnerable populations was not a common theme with some notable exceptions. Only 4 percent of completed projects were found to include indigenous groups in implementation (generally as beneficiaries) while 11 percent involved youth or youth groups. In ongoing projects, 2 percent of projects involved indigenous groups in project design. In the completed Adaptation of Nicaragua's Water Supplies to Climate Change project in Nicaragua (GEF ID 4492), members of the Chorotega ethnic community formed part of the group that received compensation as part of a payment for ecosystem services program for water source protection. The Enhancing Conjunctive Management of Surface and Groundwater Resources in Selected Transboundary Aquifers: Case Study for Selected Shared Groundwater Bodies in the Nile Basin project (GEF ID 9912) has engaged with multiple Batwa communities to potentially perform pilot activities in their region. The Bolivia EVAs project worked entirely in Quechua and Aymara communities, helping to draft land use management bylaws for the local Ayllus, or traditional government structures. Most other projects did not specifically focus on indigenous peoples or other groups with the lowest water security. Local stakeholders in Albania and Montenegro noted that Roma migrant communities tend to live in flood-prone regions and have lower water security than other groups, but they are not specifically targeted by the DIKTAS projects. In Sudan, refugees from regional conflict were highly water insecure, but GEF projects do not work specifically with refugees. The Implementation of the Strategic Action Programme to Ensure Integrated and Sustainable Management of the Transboundary Water Resources of the Amazon River Basin Considering Climate Variability and Change project (GEF ID 9770) notes that it “doesn’t directly target indigenous peoples” despite the large

presence of such groups in the Amazon basin, but that they will still benefit from educational, cultural, and early-warning system activities.

90. **Limited private sector engagement was seen in the project portfolio.** As a public good, water offers limited possibilities for involving private sector actors in development projects to improve water security (ADB Independent Evaluation 2022). However, the private sector is a major water user and there is a clear role for the private sector in enhancing water security through improving resilience against water risks, providing water services, and involvement in multi-stakeholder water management (Winrock International 2017). Within the evaluation portfolio, only 18 percent of completed projects were found to have involved the private sector in implementation of water security activities, and among ongoing projects, 14 percent involved the private sector in the design phase. A common way of involving the private sector during implementation was inviting representatives to workshops on integrated water management or other water management topics. A more involved approach was to include companies that created water infrastructure as suppliers the Implementing Integrated Water Resource and Wastewater Management in Atlantic and Indian Ocean SIDS project (GEF ID 2706) project engaged companies to import and construct water efficiency equipment such as sensor tap systems and dual-flush valves for rainwater harvesting systems. The Sudan NAPA project also engaged a company to provide solar water pumps to communities. Projects dealing with wastewater treatment often involved private sector waste operators too, such as in the Shanghai Agricultural and Non-Point Pollution Reduction project (GEF ID 3223).

4. Impacts of GEF Interventions on water security

91. **Across the portfolio of GEF projects with a focus on water security, the most commonly addressed dimension of water security was that for ecosystems.** Across all reviewed completed and ongoing projects, 68 percent included language in their design documents addressing water for ecosystems while about 40 percent addressed water-related natural hazards and water for human consumption or well-being. Results varied by focal area: the climate change focal area (including LDCF and SCCF) addressed hazards the most, and biodiversity and international waters addressed ecosystems the most (figure 8).

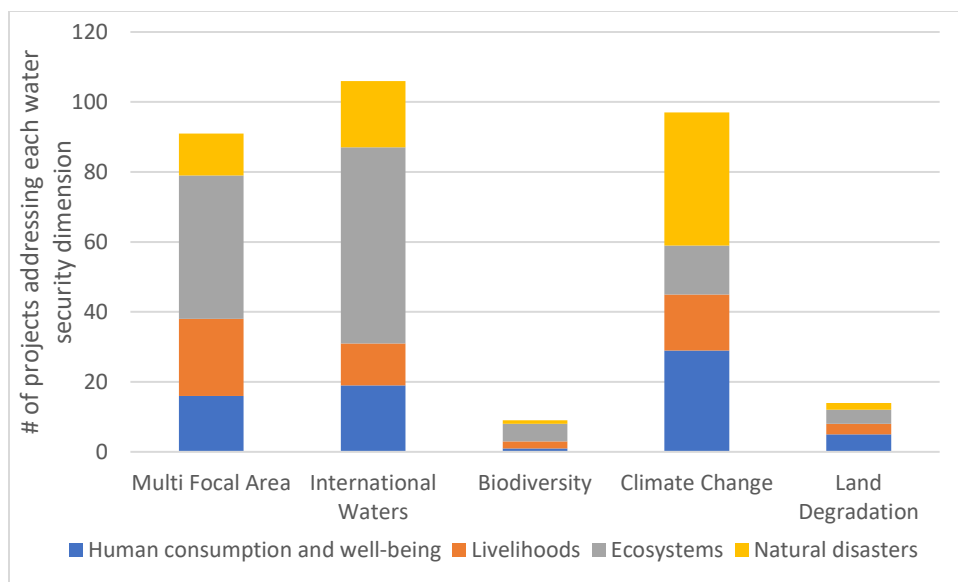


Figure 8 Number of reviewed projects with significant focus on water security that addressed each water security dimension.

92. **The most common intended outcomes were those related to improved knowledge and communication, increased physical capacity, and increased stakeholder engagement and awareness.** Of the GEF-4 and GEF-5 completed projects and GEF-6 and GEF-7 projects included in the evaluation’s portfolio review, the most common water security outcomes targeted were within ‘knowledge & communication’ (96 percent of projects included outcomes in this group), ‘optimized physical capacity of water systems and environment’ (76 percent), and ‘greater stakeholder involvement & awareness building’ (68 percent) outcome areas of the theory of change presented earlier in the evaluation (figure 9). The least considered outcomes were ‘active adaptive management’ (3 percent) and ‘consistent & sufficient access to finance’ (21 percent). Ongoing projects were more balanced in terms of the types of water security outcomes they included: 31 percent of ongoing projects included water security outcomes related to access to financing versus 7 percent of completed projects and inclusion of expected governance outcomes rose from 43 percent to 58 percent between completed and ongoing projects.

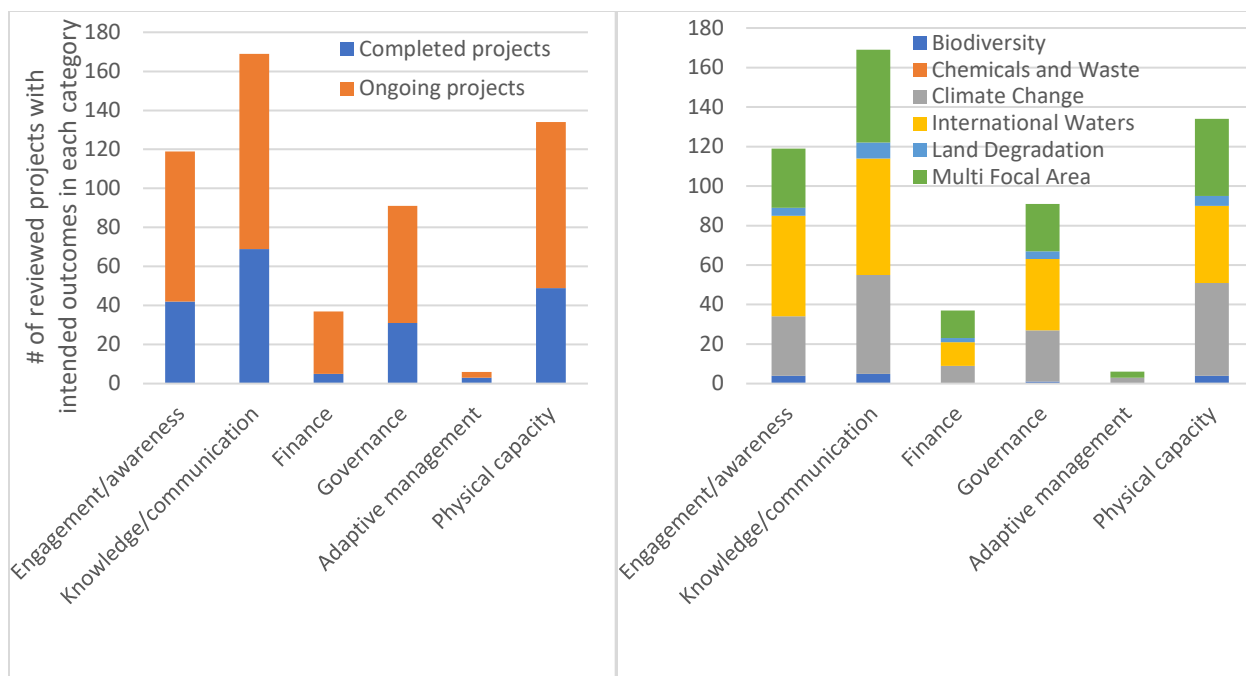


Figure 9. Number of reviewed projects with intended outcomes in each of the water security outcome groups in the evaluation's theory of change, classified by ongoing vs. completed projects and by projects of each GEF focal area. N = 176 projects, 104 ongoing and 72 completed.

93. **Climate change, land degradation, and multi-focal area projects with significant water security focus include more on-the-ground activities to improve the physical capacity of water systems and the environment, and directly improved the water security of community members.** Within the portfolio review, 92 percent of climate change projects (most of which were climate change adaptation) led to improved physical capacity of water systems or the of environment's capacity to support water security, the most of any focal area. Examples of common activities in climate change adaptation projects include introduction of agricultural technologies with improved water efficiency, installation of groundwater pumps, water harvesting infrastructure installed, and revegetation of wetland or riverbanks. This was likely driven by the high number of LDCF and SCCF adaptation projects that have a local focus. Multi-focal and land degradation projects also had a high number of outcomes focused on increased physical capacity (76 percent and 75 percent). Such activities in land degradation are generally related to sustainable land management activities such as small-scale irrigation technology, agroforestry, and improved soil management to reduce erosion and flooding. Multi-focal area projects tend to have a mixture of the types of activities found in all focal areas.

94. Direct water security improvements were observed in several communities. For example, in the Sudan NAPA project, community members noted that solar water pumps increased their access to water, especially during dry months, increasing their agricultural production and improving their food security. Similar outcomes were seen in the Bolivia EVAs project, where installation of small-scale irrigation and water harvesting activities led to increased agricultural yield during periods of drought. In the Burundi PRODZOC project, water security improvements were less verifiable due to lack of water quality monitoring data, but anecdotal evidence from community members suggested that coffee washing water treatment

was more common (although not all treatment processes continued to be done) after the project and that downstream water quality was improved. Community members, including women, were very positive about these local activities designed to increase the physical capacity of water systems and storage, noting tangible improvements in their access to water and ability to use it for their livelihoods. Other evaluations of GEF Agency support of irrigation and water storage activities also showed that such activities were highly regarded by communities (FAO 2023). Other activities, such as tree planting, were also appreciated by communities but their water security benefits were less clear. Communities benefitting from the Bolivia EVAs project noted that the tree plantations should help to reduce mudslides and erosion and increase groundwater recharge, but lack of water and erosion monitoring makes these benefits hard to verify. Other projects that were able to achieve community-level water security improvements were the multi-focal area Institutional Strengthening and Coherence for Integrated Natural Resources Management project in Iran (GEF ID 2732), which installed solar water heaters and constructed a community irrigation system and the biodiversity-funded Integrated Ecosystem and Water Resources Management in the Baiyangdian Basin project in China (GEF ID 2766) which, through co-financing with ADB, increased wastewater treatment capacity and improved domestic water supply through pipe installation and maintenance.

95. Direct improvements in water security also led to socioeconomic co-benefits in some cases. For both the Sudan NAPA and Bolivia EVAs projects, community members noted increased incomes from being able to sell higher volumes of their more diversified and larger agricultural harvest at market, better health through a more nutritious, diversified vegetable diet, and resilience to increased drought, since better water storage and access allowed water supply during times of scarcity. A previous land degradation focal area study evaluation from the GEF IEO also found that community-level water security improvements led to socioeconomic co-benefits—the Sustainable Land Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector project (GEF ID 3471) installed gravity sprinklers and check dams to improve water availability and prevent erosion; the evaluation found that project beneficiaries were less likely to migrate to urban areas, because they had more income-generating activities and access to water resources (GEF IEO 2018b). Other projects (including many international waters projects) focused on conflict mitigation as a co-benefit, including the Promoting Climate-Resilient Water Management and Agricultural Practices project in Cambodia (GEF ID 3404), which had an outcome to reduce conflict risks related to water shortages through the use of “mediative mechanisms.”

96. Findings on sustainability were similar to the overall GEF portfolio and higher when direct water security was improved for communities. Across the entire evaluation portfolio of completed projects, the average likelihood of sustainability ratings from terminal evaluations was not significantly different from the overall GEF portfolio.¹⁰ However, activities that increased access to and storage of water for communities were found to be well sustained, from site visits and community member interviews (figure 10). In the Burundi PROZOC project, the Batwa community that was displaced from a protected area during the project indicated

¹⁰ Likelihood of sustainability ratings are on a four-point scale: 4=Likely; 3=Moderately likely; 2= moderately unlikely; 1=unlikely; blank=unable to assess or not rated

they were pleased with their community water tap installed by the project and that the water system was still functioning well after five years, albeit with a small leak repaired with tire inner tubes (constructed houses, however, were found to have significant cracks that the community had attempted to repair). Coffee washing settling basins, used for water treatment, were still functioning and used, though lime was not always added to the treatment as recommended, due to the expense. In communities involved in the Sudan NAPA project, community members given solar water pumps reported that they were still functioning, while communities given diesel pumps reported that high diesel prices had prevented their use for at least the past two years. In the Bolivia EVAs project communities, small-scale irrigation schemes that were visited were universally still in good condition, with communities working to maintain them with local supplies and skills. Most of the communities have established irrigation system groups to manage the systems and repair if needed. However, an ongoing drought meant that some systems were temporarily out of operation or operating at a limited capacity. Tree planting was less sustainable; in Sudan, trees were planted that need large water inputs, and for this reason communities have not been able to maintain them. In Bolivia, trees planted in generally poor, steep, and arid soils above communities had grown in some cases but in others were still the size of saplings or had been damaged by livestock grazing or fire.



Figure 10. Photos showing sustainability of GEF project activities relating to water security. Top photos show an intact geomembrane and tree plantation installed by the Bolivia EVAs project in Walkeri and Chekene communities in 2016-17. Lower photos show coffee washing infiltration ditch and treatment tanks installed by the Burundi PROZOC project in Mwiro and Burunga communities in 2015-17.

97. Activities that improved water security at the community level were replicated after project completion but not enough to meet the vast scale of water security issues. The Sudan NAPA project introduced a system in which community members paid in monthly installments for the pumps provided by the project, and these installments were then used to purchase more pumps for other families, leading to a continual increase in the number of pumps in the communities. In the communities impacted by the EVAs project in Bolivia, some neighbors who saw the impact of geomembrane-lined ponds used for small-scale irrigation projects purchased and constructed others with the help of a local NGO (PRODII) after the project's completion. Others continued planting trees in upper watershed locations using seedlings provided by nurseries which were scaled up or established by the project and which continued to function after project completion. In Burundi, treatment of water from coffee washing stations which the PROZOC project supported has been subsequently supported by other donors and programs and now has become a requirement to be able to receive an "environmental certificate" for coffee operations. However, in most case study countries, communities and local governments noted that the vast scale of water security issues overwhelmed the comparably small interventions done by the GEF and other donors. This was especially true at the watershed scale. For example, in Bolivia, tree planting interventions done by the EVAs project and on a limited pilot scale by the Sustainable Management of the Water Resources of the La Plata Basin with Respect to the Effects of Climate Variability and Change project (GEF ID 2095, known as the Foundational La Plata Basin project) were at the largest about five hectares in size. Such small plantings are likely to have little impact in preventing erosion, flood, and mudslide damage during extreme events in the large semi-arid watersheds where they were done. Similarly in Burundi, GEF interventions to control erosion have been shown to be effective (such as in the Community Disaster Risk Management project; GEF ID 4990), but they are conducted on relatively small plots in comparison to large basins with high densities of agriculture such as the Lake Tanganyika and Kivu basins (targeted by ongoing case study projects including Biodiversity Conservation, Sustainable Land Management and Enhanced Water Security in Lake Tanganyika basin (GEF ID 10388), Landscape Restoration for Increase Resilience in Urban and Peri-urban Areas of Bujumbura (GEF ID 10099), and Lake Kivu and Rusizi River Basin Water Quality Management Project (GEF ID 10566). In Sudan and Bolivia, community members involved in the NAPA and EVAs projects expressed great interest in more interventions that scaled up the water access and storage activities carried out by those projects, noting that many neighbors and many more communities around them had not received benefits from the projects and were just as water insecure, if not more so.

98. International waters projects promote water security through activities that lead to improved water governance, increased knowledge and communications, and capacity development. This focal area had the highest percentage of projects focused on enhancing stakeholder engagement & awareness (60 projects representing 85 percent of the reviewed international waters projects) and improved governance (60 percent) while multi-focal projects were focused most on improving access to finance (27 percent). International waters completed projects focus heavily on activities to improve governance, coordination, and communication between riparian countries of transboundary watersheds and aquifers, enhance knowledge through increased monitoring or information-gathering exercises, and develop the capacity of governments to address water issues. The knowledge gathering was

usually succinctly reported in TDA documents which form the basis of transboundary agreements to address regional water challenges. None of the four entirely international waters-funded completed case study projects undertook on-the-ground activities to directly improve communities' water security. One of the two multifocal completed projects that included some international waters funding did—the Foundational La Plata Basin project, and of the 21 international waters projects in the completed project portfolio review, 10 were found to have activities that increased physical capacity of water systems. The DIKTAS I project, for example, focused on gathering and harmonizing preexisting data from different countries on the aquifer system and bringing technical officials from the different countries together to discuss and share data. It completed a TDA and abbreviated SAP document but did not carry out any local pilot activities. The Regional Coordination on Improved Water Resources Management and Capacity Building Horizontal Adaptable Programmatic Programme (GEF ID 3978; part of the Sustainable MED program and known by its acronym ReGoKo) created operating procedures for regional environmental and sustainable development observatories to perform environmental and water monitoring; its fellow child project, Sustainable Governance and Knowledge Generation (GEF ID 4001), carried out climate change modeling and flood forecasting along with capacity-building workshops. The completed Nile Groundwater Management project (a mid-sized project spread across nine countries) carried out capacity-building work in Burundi and Sudan that raised the knowledge and awareness of groundwater issues in those two countries. The Foundational La Plata Basin project (a multi-focal area project), while mostly focused on knowledge building and governance issues as well, included a pilot activity in the Pilcomayo watershed, a sub-watershed shared by Bolivia, Argentina, and Paraguay in the larger La Plata Basin. This pilot activity aimed to reduce sedimentation and improve management of mine tailings in the Bolivian upper watershed. Ultimately, it focused on monitoring and management at the local level, designing a water quality monitoring network and priority activities to improve water quality for the Cotagaita river watershed (a tributary of the Pilcomayo River).

99. Ongoing international waters projects, while more diverse in their activities, also focus on improving water governance and knowledge and capacity building at the local level. The Nubian Aquifer project plans to support SAP implementation, the phase of the TDA/SAP process which requires on-the-ground investments to achieve prioritized actions for transboundary watershed management. The plan is to do so through legal, policy, and institutional reforms. Similarly, the DIKTAS II project focuses on measures to harmonize country laws and regulations around groundwater measurement and use. Its local activities are intended to set up pilot monitoring networks in transboundary aquifers. The Advancing IWRM Across the Kura River Basin through Implementation of the Transboundary Agreed Actions and National Plans project (GEF ID 6962) plans to enhance knowledge of water resources through capacity building with government officials to implement river basin management plans and enforcement of laws and regulations for water resource protection. Multi-focal projects that address SAP implementation with funding from international waters and other focal areas tend to mix local and higher-level activities. For example, the ongoing Lake Tanganyika project, which includes international waters, biodiversity, and land degradation funding, plans to assist in the establishment of community-based fisheries co-management areas and encourage more sustainable land management activities (including soil erosion control and drip irrigation

systems) along with activities to improve coordination and information sharing at the transnational government level.

100. Stakeholders greatly appreciate the results of international waters on achieving transboundary cooperation and governance, which can take a long time to be realized.

Agency and national government stakeholders appreciate this focal area as one of the only funding mechanisms for addressing management of transboundary freshwater resources. In many cases, they note that cooperation was improved significantly by international waters projects, even if such achievements didn't occur during the lifetimes of the projects themselves. Indeed, political processes for approving TDAs and SAPs are long and often difficult to squeeze into the timelines of GEF projects which, in retrospect, can make these international waters projects overambitious. Often, GEF projects do not include activities related to political advocacy for passing laws they helped draft or for approving TDAs and SAPs. In the DIKTAS I project, the SAP document was completed by the end of the project but it was not approved by the country governments as originally targeted. It took concerted effort after project completion by the UN Educational, Scientific and Cultural Organization Intergovernmental Hydrological Programme (UNESCO-IHP), the executing agency for the project, to lobby governments to approve the document (a necessary step to unlock further GEF financing for a follow-on project). In Morocco, the ReGoKo project developed an environmental and water information platform that was not completed by the end of the project but was completed after project's end and is now operational. A decree drafted for the institutionalization of an environmental observatory in Tunisia was not approved by government during implementation and is still not approved, although it is still being negotiated.

101. Specific knowledge products created by international waters projects were not always sustained but follow-on projects and other donor projects sustained momentum for improved watershed management.

Some project products that used water data to help decision-making processes or inform stakeholders were not well used after project completion. In the completed Nile Groundwater Management project, it was found that the Nile Basin Initiative had no knowledge of the modeling outputs of the project, and that Sudanese officials didn't have the software license to run the models that the project had trained stakeholders on. In Burundi, officials noted the outputs were not translated into French and were thus of limited use to them. The Bolivian government and the local Cotagaita government had little knowledge of many of the knowledge products and reports generated by the Foundational La Plata Basin project, including an integrated water balance study, a management plan for the Yrenda–Toba–Tarijeño Aquifer System, a database and strategy of land degradation actions, and a water quality management plan for the Cotagaita watershed. The data-gathering and harmonization exercise done by the DIKTAS I project was originally available publicly in a geospatial platform on the project's website, but the website is no longer functioning. However, individuals in technical institutions in all three case study countries continue to use and benefit from the data.

102. Despite this limited sustainability of the knowledge products, follow on projects have carried momentum forward in many cases. In the Cotagaita watershed in Bolivia, the Integrated Watershed Management project of the Swiss development organization HELVETAS carried out

erosion control, water quality monitoring, and water governance activities until 2022, ensuring that the work of the Foundational Plata Basin project to reduce sedimentation and improve water quality in the region was sustained until its closure (although Cotagaita officials noted that now they have no assistance from donors on these issues). A local mining cooperative (TASNA) self-financed a tailings treatment plant with the help of HELVETAS on technical design. In the DIKTAS region, other GEF projects, especially the Extended Drin River Basin project (GEF ID 4483) utilized the data from the DIKTAS I project and continued to implement groundwater quality monitoring stations (the upcoming DIKTAS II project will further sustain the project's outcomes). For the Sustainable MED Regional Coordination project, the drought indicators developed were continued to be developed into a drought composite index through a later project funded by the United States Agency for International Development.

103. The dependence on follow-on projects for sustainability can lead to lost momentum if there is a large gap in GEF funding or if funding is slow to be approved. When the DIKTAS I project was completed in 2015, country stakeholders noted significant momentum and excitement for the next phase of the project. However, due to the delay in SAP approval combined with delayed GEF and GEF Agency approval and design processes (partially due to the COVID-19 pandemic and enhanced auditing procedures) the DIKTAS II project has yet to begin. Stakeholders noted that some of the momentum generated by the first phase in terms of intergovernmental collaboration and communication has been lost in the interim, and many of the professionals involved in the first phase have retired or left their positions. Another transboundary aquifer that encountered delays between international waters project phases is the Nubian aquifer, where the first GEF project focused on the aquifer, the Formulation of an Action Programme for the Integrated Management of the Shared Nubian Aquifer was completed in 2012; the Nubian Aquifer examined in the case study is still in the design phase. The project has had major delays and might be dropped by the original Agency (UNDP), in which case project stakeholders are hoping to find another Agency to implement it.

104. Scaling up successful water security outcomes was limited by a lack of activities to improve access to finance or create financial mechanisms. As noted earlier in this section, GEF projects with a focus on water security did not achieve improved access to finance or financial mechanisms for funding activities to improve water security. Previous GEF IEO evaluations have also found that developing sustainable financing mechanisms has been a limitation (GEF IEO 2020b). This was confirmed by site visits where only a few projects showed clear examples of activities designed to create mechanisms for continuing the funding of water access and storage activities. The Bolivia EVAs project, for example, did not contribute to developing any financial mechanism to ensure continued building of small-scale irrigation or other sustainable land management activities in its communities, and similar government programs were struggling to meet the needs of their population. The Sudan NAPA project and the Burundi PROZOC projects did include some financing activities—the rotating cycle of saving and paying for solar pumps in Sudan and limited access to a coffee premium through improved treatment of coffee washing wastewater. However, these were confined to particular villages and did not scale up beyond the village level. One exception is the new Guadalquivir Basin project in southern Bolivia, where a key component of the project is to scale up a nascent “water fund” in the city of Tarija, funded by the region’s water utility and an NGO (with aspirations to diversify

its funding base to private companies such as wine producers and municipal governments). The fund, similar to other water funds championed by The Nature Conservancy around the world (Calvache, Benítez, and Ramos 2012; and included in some other GEF projects such as the Kenya child project of the GEF-6 Food Security integrated approach pilot), is to invest in watershed management activities to protect against erosion and provide irrigation to small-scale farmers. Financial mechanisms were not observed to be a major component in international waters projects, although some exceptions were observed, such as the MedProgramme’s Mediterranean Pollution Hot Spots Investment Project (GEF ID 9717), which plans to develop technical and financial studies for wastewater treatment plant investment in Tunisia.

105. International waters projects were not found to have many activities focused on creating financial mechanisms to carry out SAP activities. The ReGoKo project originally had plans to identify investment opportunities for “priority environmental actions” but this activity was not carried out; instead, it was changed to knowledge dissemination activities. The Foundational La Plata Basin project also did not achieve any sustainable financing outcomes, nor has its follow-on project, Preparing the Ground for the Implementation of the La Plata Basin Strategic Action Plan (GEF ID 10035), which is close to completing implementation. Stakeholders in the basin expressed hope that future GEF projects focusing on the La Plata River would help identify and create financial mechanisms to address water security issues beyond further international waters projects. Some ongoing projects do have elements of financial mechanisms; for example, the Amazon River Basin project hopes to develop incentive-based financing mechanisms and the Transboundary Cooperation for the conservation, Sustainable Development and Integrated Management of the Pantanal - Upper Paraguay River Basin project (GEF ID 10554) aims to create a sustainable financing strategy to support SAP implementation (the Pantanal project is implemented by IDB, a multilateral development bank with financing expertise). The multi-focal area Lake Tanganyika project (which includes international waters funding) also includes an activity to establish a Conservation Trust Fund to mobilize funding for SAP implementation. International waters projects are increasingly addressing SAP-related process: in GEF-7, 81 percent of projects financed entirely by international waters (included in the GEF database at the time of this evaluation) included activities related to creating, approving, or implementing SAPs, compared to 70 percent in GEF-4.

106. Given that international waters focuses on transboundary governance processes, knowledge, and communication, stakeholders noted that countries generally must look for financing from other GEF focal areas or other sources to carry out activities prioritized in the SAP. Sometimes, projects can combine GEF funding to do “soft” water resource management, governance, or stakeholder engagement work with “hard” funding or loans from multilateral or regional development banks (most of which are GEF Agencies) to construct water infrastructure. The GEF Cities integrated programs show examples of this model, such as the World Bank–implemented GEF-6 Cities integrated approach pilot in Senegal and the ADB–implemented GEF-7 Cities impact program’s India projects, which both have significant co-financing from the development banks to construct stormwater drainage. Previous GEF IEO

evaluations have found that this type of partnership between GEF and financial Agencies can be a mechanism for scaling up activities (GEF IEO 2020b).

107. **Among reviewed completed projects with a focus on water security, more than half of all outcomes linked to achieving water security were fully achieved.** Across all outcomes related to water security in the evaluation portfolio, 58 percent were fully achieved and only 8 percent were not achieved at all (figure 11). Among the more common outcome groups, outcomes that created stronger governance systems were the most likely to be fully achieved (61 percent) and outcomes to achieve greater stakeholder engagement were the least likely (56 percent). About the same number of projects in the portfolio were rated satisfactory or higher as compared to the overall GEF portfolio (76 percent versus 80 percent). There was no statistically significant difference between the average of terminal evaluation outcome ratings for completed projects in the evaluation portfolio and the average of the entire GEF portfolio from GEF-4 onward (4.08 versus 4.26 on a six-point scale).¹¹

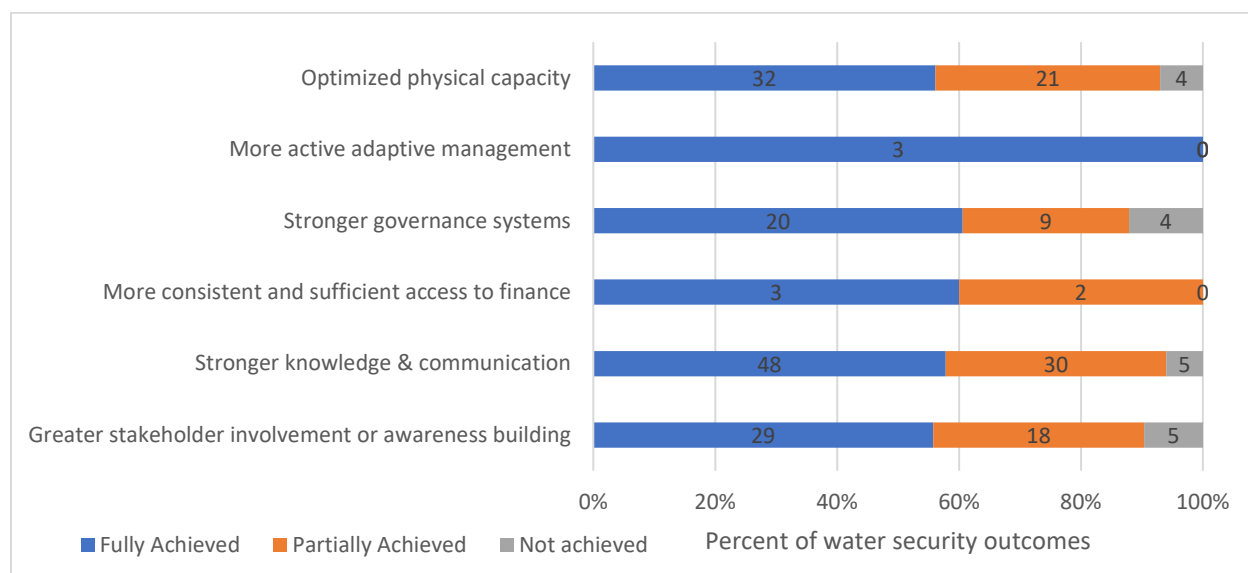


Figure 11. Percent of water security related outcomes that were fully achieved, partially achieved and not achieved for each water security outcome group according to the evaluation's theory of change. N = 233 water security related outcomes across 72 completed projects. Number of outcomes shown in bars.

5. Unintended adverse impacts of GEF interventions in water security

108. **There are few instances where GEF project activities have resulted in a decrease in water security.** Of the reviewed completed projects with significant focus on water security, 4 percent (three projects) were found to have caused a potential decrease in water security for a certain population due to their activities. Of the 16 reviewed safeguards-related grievance cases that have been reported to the GEF's Conflict Resolution Commissioner (there were

¹¹ Outcome ratings are on a six-point scale: 6=highly satisfactory; 5=satisfactory; 4=moderately satisfactory; 3=moderately unsatisfactory; 2=unsatisfactory; 1=highly unsatisfactory; blank=unable to assess or not rated.

additional cases related to fiduciary matters)¹², two were related to water security. One additional case was noted in the GEF IEO's OPS-7 evaluation.

109. **Cases of adverse impact on water security were mostly related to reduction in water availability, reactions to new water related policies, and displacement of people and property.** In the Sustainable Land Management for Increased Productivity in Armenia project (GEF ID 8005), a complaint was filed claiming that water infrastructure (either improvement of existing irrigation schemes or construction of a rural water supply project) constructed using non-GEF resources (from a co-financer) resulted in reduction of a neighboring community's access to water. GEF IEO (2022) noted another water supply issue in the Community-based Land Management (GEF ID 1877) project in Guinea, where a community was displaced due to forest degradation in a protected area. Once they were established in their new location, it became clear there was less water availability, and agriculture could only be done six months of the year. In Armenia, the project did recognize the risk of "environmental impact of works and activities in the programme area" and hoped to minimize it by carrying out environmental impact assessments. The investigation into the complaint found no evidence that the project caused a decrease in water availability. In Guinea, it appeared that the project did not carry out any studies on water availability in the new location prior to the community displacement (GEF IEO 2022c).

110. Other Agency and project stakeholders noted that the difficulty and expense of hydrological monitoring can limit understanding of how project activities such as small-scale irrigation and planting of water-intensive crops affect water availability in nearby areas. At least two case study projects discussed the potential for this type of impact in their design documents. The MedProgramme Water Security child project notes that its IWRM and coastal aquifer work could alter water quantity, but that they expect these alterations to be positive to surrounding populations, not negative. The Guadalquivir Basin project in Bolivia recognized that irrigation systems the project installs or restores could have "adverse effects" in other parts of the basin, which they hope to mitigate through water availability "tracking" throughout the basin. GEF projects that do afforestation or reforestation could have such impacts as well, especially if non-native trees are planted. Such water demand is recognized as a potential limiting factor for climate change mitigation (Hoek van Dijke et al. 2022 and Cassin 2021). In the Bolivia EVAs project, stakeholders noted that they encouraged planting of native species, but water-intensive, non-native eucalyptus plantations were observed. As mentioned previously, the green belt of trees planted by the Sudan NAPA project was not well sustained due to lack of water to irrigate the planted trees. In other projects, stakeholders observed that introduction of water-intensive crop species such as avocado could have detrimental impacts on water availability (but a lack of detailed hydrological monitoring prevents verification).

111. Two other cases were related to water policy introduced or supported by GEF projects. In the Lakes Edward and Albert Integrated Fisheries and Water Resources Management project (GEF ID 5674), a complaint was filed stating that project-supported enforcement of fishing regulations in freshwater lakes has led to "heavy-handed attacks on fisherfolk (including

¹² Cases reported to the GEF Conflict Resolution Commissioner are available for review on the [GEF website](#).

shootings to death).” The investigation into this issue is ongoing. The project’s design documents do mention that the area has a lot of conflict and plan a “conflict-sensitive” approach, but only list political conflict as a major risk for the project. In the Adapting Water Resource Management in Comoros to Increase Capacity to Cope with Climate Change project (GEF ID 3857), the terminal evaluation noted that that poorer residents might have difficulty paying for the increased price of water tariffs that was supported by the project, though subsidies are planned.

112. Other water security issues noted included displacement of business infrastructure by a newly created wetland during the Huai River Basin Marine Pollution Reduction project in China (GEF ID 4092) and the failure of a project-promoted irrigation technology in the local context of the Irrigation Technology Pilot Project to face Climate Change Impact in Jordan (GEF ID 4036). In China, the terminal evaluation states that the “construction of the wetlands required a change in land use”, and that this “land use change entailed relocation of seven small-sized enterprises that leased the land for their businesses, and also affected some power lines and fish ponds.”¹³ In Jordan, the technology had to be replaced by a suite of other technologies identified by local stakeholders, delaying implementation by two years.

VI. CONCLUSIONS AND RECOMMENDATIONS

6. Conclusions

113. **Water security and its dimensions are critical to the environmental goals of all the GEF’s focal areas.** Fresh water is an essential resource for all life on Earth and thus water security is a cross-cutting theme in all development and environment work, from securing access to clean water for humans, their livelihoods, and ecosystems to mitigating water-based natural hazards. This includes the GEF’s work in achieving global environmental benefits, almost all of which rely on water security. Biodiverse ecosystems depend on fresh water (and some exist in fresh water), water resources are needed for farmers to help prevent land degradation, dangerous chemicals often reach populations through contaminated water supplies, many climate change mitigation actions are water-intensive, most climate change adaptation efforts involve water and mitigating water-based hazards, and many transboundary freshwater resources often cause disagreement among neighboring countries. Even though water security is not an explicit goal of the GEF, these connections to its programming mean it cannot be ignored.

114. **The GEF’s focal area strategies, results framework, Agencies, and the Conventions it supports address water security through the lens of their particular environmental focus, instead of taking a holistic approach to the issue.** The scientific literature on improving water security through development interventions points to the need for an integrated approach that addresses the multiple uses of water in an area and brings together stakeholders of all significant users and actors. However, the GEF and its major stakeholders generally address the specific aspects of water security that directly relate to their area of interest. The GEF-8 results

¹³ The terminal evaluation for the Huai River project can be found on the [World Bank website](#).

measurement framework reflects how water security is approached by the focal areas—the international waters indicator addresses water governance in transboundary situations, and the land degradation indicators include water resources as they relate to land management and restoration. The biodiversity, climate change, and chemicals and waste indicators do not explicitly address fresh water, which makes it difficult to track the GEF’s performance on, for example, protecting inland water ecosystems specifically. The land degradation focal area strategies, the United Nations Convention to Combat Desertification (UNCCD) and Agencies with an expertise in agriculture tend to view water from the standpoint of providing access for agriculture and sustainable land management. The biodiversity focal area strategies, the United Nations Convention on Biodiversity (UNCBD), and the international environmental nongovernmental organization (NGO) GEF Agencies focus on water because it supports ecosystems and provides ecosystem services. The Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF) projects and the GEF adaptation strategy, along with the United Nations Framework Convention on Climate Change (UNFCCC) consider water security in the context of climate change. The international waters focal area strategies deals comprehensively with all dimensions of water security but mainly in the context of transboundary watersheds and aquifers. This piecemeal approach to water security also applies to national government ministries, which rarely have a mandate to look at water in a holistic way—normally, they address water from the standpoint of the sector they focus on: energy, agriculture, or the environment, for example.

115. A higher percentage of GEF projects with a prominent and explicit focus on water security are implemented in Africa, and mainly through the international waters and climate change adaptation focal areas or are multifocal. Multifocal area projects had the highest share of the portfolio of projects found to have a significant focus on water security, followed closely by international waters and climate change adaptation projects through the LDCF and SCCF. Geographically, Africa was the most represented region in the portfolio. GEF projects with a significant focus on water security were found in many regions of the world with the least water security, especially the Sahel region, but had less coverage of some highly water-insecure countries in South Asia. Some other relatively more water-secure areas, such as the Balkans and South America, had many such projects.

116. GEF projects with a significant focus on water security include activities that address stakeholders’ water security priorities. Water security was a key development priority in almost all case study countries, including in local communities where a lack of water or water-based hazards affected daily life and livelihoods. Stakeholders were generally pleased with GEF projects’ relevance to their priorities, especially with projects that increased water access and storage, improved water resource monitoring, and improved coordination between neighboring countries. International waters was recognized as one of few funding sources for improving transboundary watershed management, but many stakeholders highlighted the need for international waters projects to include more on-the-ground, local activities. International waters projects, which tend to focus on the regional level, were less likely to involve local stakeholders in the design phase of the projects—which meant local stakeholders had limited knowledge of the projects before implementation.

117. Coherence between GEF projects and other actors' water security activities was found to be difficult to achieve unless coordinated by national governments. Completed evaluation case study projects often built on or had other donor initiatives later build on their work in project areas and countries. However, close coordination with other initiatives during implementation was rare, except among projects of the same program. Recently designed projects identified other water security–related donor activities in their geographical area but didn't often have detailed implementation coordination. Project and national government staff noted that coordinating ongoing projects to ensure collaboration is difficult, given the differing timelines and goals of funding organizations if there is no body charged with overseeing this coordination. This limited engagement extended to work with private sector: within the evaluation portfolio, only 18 percent of completed projects were found to have involved the private sector in implementation of water security activities, and among ongoing projects, 14 percent involved the private sector in the design phase.

118. GEF projects are increasingly addressing gender aspects of water security but do not often address the water security of other vulnerable groups. Completed projects reviewed by the evaluation had little focus on the ways in which water security differs for different genders—mostly gender was reflected as ensuring a certain percentage of women participated in project activities. However, women in communities benefited directly from some completed projects that improved water security through improved access to water and water storage capacity. Ongoing projects planned to integrate gender much more thoroughly into project activities, through inclusion of women in water decision-making groups, targeting them for microloan programs, and reflecting gender within water policy and governance. This last aspect of how gender should be integrated into water policy, however, was less well understood and explained. Vulnerable groups such as indigenous peoples, refugees, and ethnic groups who had lower water security than other groups were not often a focus of GEF projects (unless they represented a majority of the population in the project areas).

119. The GEF's multi-focal area and integrated programs have primarily integrated water security through coastal marine protection, food security, and cities programs. The integrated programs also tended to view water through specific lenses—the food systems–focused program projects tend to approach water security similarly to the land degradation focal area (through the lens of water for agriculture and resilience to drought), while the cities impact program projects deal mostly with wastewater and hazard mitigation. Stakeholders noted that water security is often treated as a secondary focus within these programs, which some felt was a missed opportunity for the food security programs to mainstream themes such as upper watershed ecosystem service protection, control of pesticide and fertilizer runoff into aquatic ecosystems, and multiple-use water systems. The GEF-8 Ecosystem Restoration impact program is more focused on drought resilience and plans payment for environmental services schemes.

120. GEF projects with a focus on water security achieved improved water security either directly at the community level through physical investments in infrastructure or indirectly through designing water policies, knowledge, and stakeholder engagement. Land degradation and climate change adaptation projects focused on local interventions that improved the physical capacity of water systems, including through nature-based solutions. Such activities

directly improved water access in local communities through providing solar water pumps or constructing small-scale irrigation systems. These activities increased community access to water during times when previously communities had little access to water and led to socioeconomic co-benefits of increased income (through increased agricultural production), improved nutrition (through diversified production), and resilience to climate change (through improved protection from soil erosion during floods and access to more reliable water sources during drought). Freshwater projects in international waters, in contrast, focused heavily on strengthening transboundary governance mechanisms and knowledge of water resources through the Transboundary Diagnostic Assessment/Strategic Action Programme (TDA/SAP) process, which involved improving stakeholder capacity and raising awareness at the national and transboundary levels. Some of these activities led to policy reform, such as laws to improve environmental impact assessments, but these political processes were often too long to be completed during project implementation. A few also tried to improve the coherence of water policy across ministries through the creation of interministerial committees. These interventions helped create a conducive enabling environment for future activities that would lead to improved water security (many of which are identified in SAP documents). Observed cases of GEF projects causing a decrease in water security were rare.

121. Local activities to improve water security were well sustained in post-completion assessment of completed projects, while knowledge products and governance interventions were more likely to be sustained through subsequent donor interventions. Once communities benefited directly from activities that improved their water infrastructure, they were committed to maintaining the infrastructure well past project completion. Solar pumps, irrigation systems, and coffee-washing treatment facilities were for the most part found to be well maintained and functioning years after project completion for as long as communities could perform maintenance cheaply and with local materials. This type of activity was often replicated within communities through demonstration effects as neighbors noticed their positive impact. Knowledge products such as technical reports, governance reforms, and capacity-building activities had mixed sustainability and relied more on follow-on projects. Freshwater transboundary basins often receive multiple international waters projects in phases and such continued support, when given without major delays between phases, keeps the momentum on these outcomes. Other donors were found to be active in areas of completed projects and in many cases continued working on similar water security–related topics.

122. Scaling up of GEF project activities is still to be achieved at the level necessary to meet the water security challenges of recipient countries. Though replication was observed in some cases, scaling up and broader adoption on the watershed or country scale were not common. Communities and governments noted that the scale of water security problems like insufficient access to water, water pollution, and floods and droughts is beyond what GEF projects have been able to address or catalyze solutions for. Evidence shows that several factors are key to upscaling, such as mainstreaming good practices through policy formation, disseminating knowledge and information, and prioritizing activities that create sustainable financial mechanisms beyond the lifetime of project interventions (GEF IEO 2020b). GEF projects with significant focus on water security achieve many of these factors to differing degrees. However,

such projects do not often include activities to establish post-project financial mechanisms or improve access to finance.

7. Recommendations

123. Water security is integral to all of the GEF's focal areas, given the essentiality of water to human life and ecosystem health. This evaluation highlighted several diverse GEF outcomes that improved water security or improved the enabling environment for achieving water security. Based on the findings and conclusions, this evaluation makes the following recommendations:

124. **The GEF Secretariat should ensure that aspects of water security that are key to each GEF focal area are represented in the results measurement framework and project and program design.** Explicit language related to freshwater resources should be added to some of the focal area indicators in the GEF-8 Results Measurement Framework to better highlight linkages with water security. This would encourage countries and Agencies to design projects across all focal areas that better consider the importance of water security and freshwater resources. Furthermore, design and theories of change for projects and programs with strong links with freshwater resources should integrate elements of water security to help improve holistic integration of water security across GEF's portfolio. Considerations could also be given to integrating water security as a cross-cutting theme in relevant impact programs.

125. **The GEF Secretariat and Agencies should prioritize creation of sustainable financing mechanisms and other activities for scaling up interventions that successfully improve water security.** Many GEF projects incorporate some factors into project implementation that encourage scaling up of water security activities, such as international waters projects which develop water policy. However, more ambition for scaling up is needed to meet the water security needs of people and ecosystems. All projects that deal with water security should include sustainable financing and other activities to support scaling-up efforts, including projects that improve water security at the community level. International waters projects, in particular, should offer guidance that sustainable financing must be considered part of the preparation for the SAP implementation phase of the TDA/SAP process. Activities could include creating novel and innovative financial mechanisms in watersheds or aquifer areas, enhancing existing mechanisms, or partnering with the private sector and entities with expertise in financial inclusion. Addressing the issue of sustainable financing in the framework of the SAP implementation in various geographies of the world would also increase the likelihood of scaling up water security outcomes.

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VIII. ANNEXES

1. Case study projects

GEF Project ID	GEF Phase	Portfolio								Project Title	Lead Agency Name	Cntry Name List	Focal Area	Fund	Proj Type	GEF financing (\$ millions)	Co-financing (\$ millions)
2095	GEF - 4	Completed							x	Sustainable Management of the Water Resources of the la Plata Basin with Respect to the Effects of Climate Variability and Change	United Nations Environment Programme	Argentina,Bolivia,Brazil,Paraguay,Uruguay,Regional	Multi Focal Area	GET	FSP	10.73	51.03
3321	GEF - 4	Completed		x					x	Mainstreaming Groundwater Considerations into the Integrated Management of the Nile River Basin	United Nations Development Programme	Burundi,Congo,Egypt,Ethiopia,Kenya,Rwanda,Sudan,Tanzania,Uganda,Regional	International Waters	GET	MSP	1.00	2.89
3398	GEF - 4	Completed							x	SIP: Eastern Nile Transboundary Watershed Management in Support of ENSAP Implementation	The World Bank	Egypt,Ethiopia,Sudan,Regional	Multi Focal Area	GET	FSP	8.70	26.70
3430	GEF - 4	Completed							x	Implementing NAPA Priority Interventions to Build Resilience in the Agriculture and Water Sectors to the Adverse Impacts of Climate Change	United Nations Development Programme	Sudan	Climate Change	LDC F	FSP	3.30	3.50
3690	GEF - 4	Completed	x							Protection and Sustainable Use of the Dinaric Karst Aquifer System	United Nations Development Programme	Albania,Bosnia-Herzegovina,Croatia,Montenegro,Regional	International Waters	GET	FSP	2.16	3.40
3831	GEF - 4	Completed							x	Conservation and Sustainable use of Biodiversity and Land in Andean Vertical Ecosystems	Inter-American Development Bank	Bolivia	Multi Focal Area	GET	FSP	6.00	8.05
3978	GEF - 4	Completed				x				MED: Regional Coordination on Improved Water Resources Management and Capacity Building	The World Bank	Jordan,Lebanon,Morocco,Tunisia,Regional	International Waters	GET	FSP	5.64	13.87

GEF Project ID	GEF Phase	Portfolio								Project Title	Lead Agency Name	Cntry Name List	Focal Area	Fund	Proj Type	GEF financing (\$ millions)	Co-financing (\$ millions)
										Horizontal Adaptable Programmatic Programme (H-APL)(TA)							
4001	GEF - 4	Completed							x	MED: Sustainable Governance and Knowledge Generation	The World Bank	Albania,Algeria,Bosnia-Herzegovina,Egypt,Lebanon,Libya,Montenegro,Morocco,North Macedonia,Serbia,Syria,Tunisia,Turkey,Global	International Waters	GET	FSP	3.00	4.40
4631	GEF - 5	Completed							x	Watershed Approach to Sustainable Coffee Production in Burundi	The World Bank	Burundi	Multi Focal Area	GET	FSP	4.20	20.80
9165	GEF - 6	Ongoing								Enabling Implementation of the Regional SAP for the Rational and Equitable Management of the Nubian Sandstone Aquifer System (NSAS)	United Nations Development Programme	Chad,Egypt,Libya,Sudan,Regional	International Waters	GET	FSP	3.99	17.73
9575	GEF - 6	Ongoing							x	Sudan Sustainable Natural Resources Management Project- Additional Financing	The World Bank	Sudan	Multi Focal Area	GET	FSP	5.50	27.50
9685	GEF - 6	Ongoing							x	Mediterranean Coastal Zones: Managing the Water-Food-Energy and Ecosystems NEXUS	United Nations Environment Programme	Albania,Bosnia-Herzegovina,Egypt,Lebanon,Libya,Montenegro,Morocco,Tunisia,Regional	International Waters	GET	FSP	3.50	11.31
9687	GEF - 6	Ongoing							x	Mediterranean Coastal Zones Climate Resilience Water Security and Habitat Protection	United Nations Environment Programme	Albania,Algeria,Bosnia-Herzegovina,Egypt,Lebanon,Libya,Montenegro,Morocco,Tunisia,Regional	International Waters	GET	FSP	7.00	143.27

GEF Project ID	GEF Phase	Portfolio								Project Title	Lead Agency Name	Cntry Name List	Focal Area	Fund	Proj Type	GEF financing (\$ millions)	Co-financing (\$ millions)
9691	GEF - 6	Ongoing								Financing Advanced Environmental Technologies in the Mediterranean Sea Region for Water Systems and Clean Coasts (EnviTeCC)	European Bank for Reconstruction and Development	Albania,Bosnia-Herzegovina,Egypt,Lebanon,Montenegro,Morocco,Tunisia,Turkey,Regional	Multi Focal Area	GET	FSP	8.75	90.00
9717	GEF - 6	Ongoing								Mediterranean Pollution Hot Spots Investment Project	United Nations Environment Programme	Albania,Algeria,Bosnia-Herzegovina,Egypt,Lebanon,Libya,Montenegro,Morocco,Tunisia,Regional	International Waters	GET	FSP	5.00	546.45
9770	GEF - 6	Ongoing							x	Implementation of the Strategic Action Programme to Ensure Integrated and Sustainable Management of the Transboundary Water Resources of the Amazon River Basin Considering Climate Variability and Change	United Nations Environment Programme	Bolivia,Brazil,Colombia,Ecuador,Guyana,Peru,Suriname,Venezuela,Regional	Multi Focal Area	GET	FSP	11.74	144.36
9912	GEF - 6	Ongoing								Enhancing Conjunctive Management of Surface and Groundwater Resources in Selected Transboundary Aquifers: Case Study for Selected Shared Groundwater Bodies in the Nile Basin	United Nations Development Programme	Burundi,Ethiopia,Kenya,Rwanda,Sudan,Tanzania,Uganda,Regional	International Waters	GET	FSP	5.33	25.85
9919	GEF - 6	Ongoing								Implementation of the SAP of the Dinaric Karst Aquifer System: Improving Groundwater Governance and Sustainability of Related Ecosystems	United Nations Development Programme	Albania,Bosnia-Herzegovina,Croatia,Montenegro,Regional	International Waters	GET	FSP	5.15	15.05
10035	GEF - 6	Ongoing								Preparing the Ground for the Implementation of the La Plata Basin Strategic Action Program	Development Bank of Latin America	Argentina,Bolivia,Brazil,Paraguay,Uruguay,Regional	International Waters	GET	MSP	2.00	2.95
10083	GEF - 7	Ongoing							x	Sustainable Natural Resources Management Project - AF	The World Bank	Sudan	Multi Focal Area	GET, LDC	FSP	5.94	17.60

GEF Project ID	GEF Phase	Portfolio								Project Title	Lead Agency Name	Cntry Name List	Focal Area	Fund	Proj Type	GEF financing (\$ millions)	Co-financing (\$ millions)
														F,MTF			
10099	GEF - 7	Ongoing		x						Landscape restoration for increase resilience in urban and peri-urban areas of Bujumbura	United Nations Development Programme	Burundi	Climate Change	LDCF	FSP	8.93	16.02
10388	GEF - 7	Ongoing		x						Biodiversity conservation, sustainable land management and enhanced water security in Lake Tanganyika basin	United Nations Environment Programme	Africa,Burundi,Congo DR,Tanzania,Zambia,Regional	Multi Focal Area	GET	FSP	14.60	60.77
10520	GEF - 7	Ongoing					x			Enhancing sustainability of the Transboundary Cambodia - Mekong River Delta Aquifer	Food and Agriculture Organization	Cambodia,Viet Nam,Regional	International Waters	GET	FSP	15.00	66.00
10554	GEF - 7	Ongoing						x		Transboundary cooperation for the conservation, sustainable development and integrated management of the Pantanal - Upper Paraguay River Basin	Inter-American Development Bank	Bolivia,Brazil,Paraguay,Regional	International Waters	GET	FSP	8.19	128.57
10566	GEF - 7	Ongoing		x						Lake Kivu and Rusizi River Basin Water Quality Management Project	African Development Bank	Burundi,Congo DR,Rwanda,Regional	International Waters	GET	FSP	5.74	26.15
10627	GEF - 7	Ongoing						x		Programme to sustainably manage and restore land and biodiversity in the Guadalquivir Basin	Food and Agriculture Organization	Bolivia	Land Degradation	GET	MSP	1.56	21.55

2. List of stakeholders interviewed

Name	Organization	Country
Astrid Hillers	GEF Secretariat	United States
Aloke Barnwall	GEF Secretariat	United States
Taylor Henshaw	GEF Secretariat	United States
Juliana Marcal	University of Bath	United Kingdom
Thanti Octavianti	University of West England	United Kingdom
Aaron Wolf	University of Oregon	United States
Carl Bruch	Environmental Law Institute	United States
Elizabeth Koch	Environmental Law Institute	United States
Andrew Hudson	UNDP	United States
Lorenzo Galbiati	FAO	Italy
Louise Whiting	FAO	Thailand
Sinikinesh Beyene Jimma	UNEP	Kenya
Alessio Giardino	ADB	Philippines
Tarek Kotb	IFAD	Italy
Christina Leb	World Bank	United States
Eileen Burke	World Bank	United States
Virginia Gorsevski	STAP	United States
Blake Ratner	STAP	United States
Julie Bourns	Nature Conservancy	United States
Silvia Benitez	Nature Conservancy	Ecuador
Allison Aldous	Nature Conservancy	United States
Sui Chian Phang	Nature Conservancy	United States
Fred Kihara	Nature Conservancy	Kenya
Colin Apse	Nature Conservancy	United States
Ajet Zaga	Ulqin Municipal Water Supply and Sewerage Enterprise	Albania
Alba Zhorj	Albania Water Resources Management Authority	Albania
Arben Pambuku	Freelance consultant	Albania
Arben Musai	Albania Agency of Water Supply, Sewerage and Waste Management	Albania
Arduen Karagjozi	Albania Water Resources Management Authority	Albania
Armand Lamaj	Albania Agency of Water Supply, Sewerage and Waste Management	Albania
Arta Dollani	Albania National Environmental Agency	Albania
Aurora Dibra	Shkoder University	Albania
Elvir Zecevic	Ulqin Business Association NGO	Albania
Enkeleda Shkurta	Albania National Environmental Agency	Albania
Erand Cmicija	Shkoder University	Albania
Etleva Demiri	Albania Water Regulatory Authority	Albania

Fuad Haxhibeti	Ulqin Municipal Water Supply and Sewerage Enterprise	Albania
Jula Simoni	Albania National Agency of Protected Areas	Albania
Majlinda Konci	Albania Water Regulatory Authority	Albania
Naim Hoxha	Ulqin Municipal Water Supply and Sewerage Enterprise	Albania
Nermin Shkurta	VIS Albania NGO	Albania
Pavlin Polia	Theth Tourist Operators Association	Albania
Rajmonda Decina	Shkoder University	Albania
Rovena Metoja	Albania Water Resources Management Authority	Albania
Sead Sadiku	Regional Water Administrative Office	Albania
Sofjan Jaupaj	Ministry of Tourism and Environment	Albania
Sonila Marku	Albania Geological Survey	Albania
Suzana Golemi	Shkoder University	Albania
Vehbi Gruda	Shkoder Prefecture	Albania
Xhelal Hoxha	Hapi I Gjelber NGO	Albania
Alma Imamovic	Ministry of Agriculture, Water Management and Forestry, Federation of Bosnia-Herzegovina	Bosnia and Herzegovina
Amila Ibrulj	Sava River Watershed Agency, Federation of BiH	Bosnia and Herzegovina
Biljana Rajić	Ministry of Foreign Trade and Economical Relations	Bosnia and Herzegovina
Branko Colic	Water Utility Vode Srpske	Bosnia and Herzegovina
Damir Mrdjen	Neretva Watershed Utility	Bosnia and Herzegovina
Dragana Divkovic	Ministry of Agriculture, Water Management and Forestry, Federation of Bosnia-Herzegovina	Bosnia and Herzegovina
Gorana Bašević	Ministry of Foreign Trade and Economical Relations	Bosnia and Herzegovina
Gordan Miselic	HET water-energy enterprise	Bosnia and Herzegovina
Marinko Vranic	Ministry of Agriculture, Republika Srpska	Bosnia and Herzegovina
Mubina Isovica	VRELO NGO	Bosnia and Herzegovina
Rada Milisav	Ministry of Foreign Trade and Economical Relations	Bosnia and Herzegovina
Senad Oprasic	Ministry of Foreign Trade and Economical Relations	Bosnia and Herzegovina

Sinisa Sesum	UNESCO	Bosnia and Herzegovina
Tanja Rogac	Water Utility Vode Srpske	Bosnia and Herzegovina
Vedran Furtula	HET water-energy enterprise	Bosnia and Herzegovina
Zdravko Mrkonja	VRELO NGO	Bosnia and Herzegovina
Zeljko Zubac	Hydropower plant Dabar	Bosnia and Herzegovina
Petra Remeta	World Wildlife Fund	Croatia
Zoran Mateljak	World Wildlife Fund (former)	Croatia
Alice Aureli	UNESCO	France
Jose Martin Bourdes	UNESCO	France
Aurelien Dumont	UNESCO	France
Olfat Hamdan	UNEP	Greece
Azra Vukovic	Green Home NGO	Montenegro
Dragan Radojevic	Head of Department for Hydrogeology and Geotechnics in Geological Survey of Montenegro	Montenegro
Hasan Hadziablahovic	Tuzi Municipality	Montenegro
Ismete Gjoka	Tuzi Municipality	Montenegro
Ivana Stojanovic	Ministry of Ecology, Spatial Planning and Urbanisms	Montenegro
Ljubisa Pavicevic	Ministry of Ecology, Spatial Planning and Urbanism	Montenegro
Momcilo Blagojevic	Former Acting General Director in Water Management Directorate	Montenegro
Nikola Vukotic	EPCG Montenegrin Hydropower Production Company	Montenegro
Novak Cadjenovic	GWP Med	Montenegro
Neno Kukuric	UN IHP IGRAC	Netherlands
Vladimir Mamaev	UNDP	Turkey
Juan Carlos Alurralde	CIC Plata	Argentina
Silvia Rafaeli	CIC Plata	Argentina
Fernando Cisneros	OTCA	Argentina
Major Grover Monasterio	Ministry of Defense	Bolivia
Eduardo Duran	Ministry of Environment and Water	Bolivia
Gustavo Rey Ortiz	Ministry of Environment and Water	Bolivia
Rafael Murillo	Ministry of Environment and Water	Bolivia
Marissa Castro	Ministry of Foreign Relations, Directorate of International Waters	Bolivia
Pancovro Aguilar	Ahusellos	Bolivia
Rivarda Mamami	Ahusellos	Bolivia
Maxmo Cuizaya Marcani	Allu Sicoya	Bolivia
Raul Charque Copa	Allu Sicoya	Bolivia

Epifania Gaspar Nina	Allyu Chayantana	Bolivia
Elizabeth Colquechuima	Allyu Chullpa	Bolivia
Josefina Ticona	Allyu Chullpa	Bolivia
Maximo Quisara	Allyu Chullpa	Bolivia
Adalid Cahon	Allyu Chulpa	Bolivia
Benedicta Yergocaracara	Allyu Chulpa	Bolivia
Bocilio Challoga	Allyu Chulpa	Bolivia
Daniel Condori Vasquez	Allyu Chulpa	Bolivia
Edgar Navarro Cavcava	Allyu Chulpa	Bolivia
Edson Ticona Mitma	Allyu Chulpa	Bolivia
Elizabeth Urquieta Mitma	Allyu Chulpa	Bolivia
Emeliana Policarpio	Allyu Chulpa	Bolivia
Felicio Opono Leyua	Allyu Chulpa	Bolivia
Jutona Cepeda	Allyu Chulpa	Bolivia
Leoncio Mitma Alejo	Allyu Chulpa	Bolivia
Limber Ticona Bernal	Allyu Chulpa	Bolivia
Lorenzo Ticona	Allyu Chulpa	Bolivia
Maxima Mitma Jorge	Allyu Chulpa	Bolivia
Migelona Choque	Allyu Chulpa	Bolivia
Nieves Choque	Allyu Chulpa	Bolivia
Orlando Zicona	Allyu Chulpa	Bolivia
Oscar Ticona	Allyu Chulpa	Bolivia
Paulina Jachallo Mitma	Allyu Chulpa	Bolivia
Raul Monaleo	Allyu Chulpa	Bolivia
Silvia Choque Maraza	Allyu Chulpa	Bolivia
Sumersindo Condori	Allyu Chulpa	Bolivia
Eleuterio Guarachi	Allyu Jucumani	Bolivia
Reina Patty	Allyu Jucumani	Bolivia
Sofia Guarachi	Allyu Jucumani	Bolivia
Adrian Fiesta Pascual	Allyu Layme	Bolivia
Isidro Fiesta Cuellar	Allyu Layme	Bolivia
Remigio Fiesta	Allyu Layme	Bolivia
Vicente Berrios Quispe	Allyu Panacachi	Bolivia
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