



Lake Kivu and Rusizi River Basin Water Quality Management Project

Part I: Project Information

GEF ID

Project Type

FSP

Type of Trust Fund

GET

CBIT/NGI

CBIT

NGI

Project Title

Lake Kivu and Rusizi River Basin Water Quality Management Project

Countries

Regional

Agency(ies)

AfDB

Other Executing Partner(s)

Lake Kivu and River Rusizi Basin Authority (ABAKIR)

Executing Partner Type

Others

GEF Focal Area

International Waters

Taxonomy

Land Degradation, Climate Change Adaptation, Climate Change, Biomes, Mainstreaming, Biodiversity, Protected Areas and Landscapes, Focal Areas, Community Based Natural Resource Mngt, Productive Landscapes, Certification -National Standards, Lakes, Rivers, Sustainable Land Management, Integrated and Cross-sectoral approach, Community-Based Natural Resource Management, Climate information, Innovation, Disaster risk management, Private sector, United Nations Framework Convention on Climate Change, Enabling Activities, International Waters, Freshwater, River Basin, Lake Basin, Pollution, Nutrient pollution from all sectors except wastewater, Strategic Action Plan Implementation, Transboundary Diagnostic Analysis, Chemicals and Waste, Sound Management of chemicals and waste, Best Available Technology / Best Environmental Practices, Mercury, Artisanal and Scale Gold Mining, Stakeholders, Capacity, Knowledge and Research

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 0

Climate Change Adaptation

Climate Change Adaptation 0

Duration

60 In Months

Agency Fee(\$)

544,927

Submission Date

3/23/2020

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
IW-3-6	GET	5,736,073	12,000,000
	Total Project Cost (\$)	5,736,073	12,000,000

B. Indicative Project description summary

Project Objective

To improve water quality, environmental and economic services and practices of lake Kivu through improved transboundary cooperation

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Enhancing regional and national cooperation	Technical Assistance	Outcome 1.1: Strengthened collective management of Lake Kivu and River Rusizi Basin through institutional, policy, and legal reforms	Output 1.1.1: ABAKIR institutional capacity development Output 1.1.2: Strategic plan development and adoption	GET	1,200,000	2,400,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 2 : Improving water quality management	Technical Assistance	Outcome 2.1: Water quality improved and further pollution minimised.	<p data-bbox="860 331 1173 467">Output 2.1.1: Adoption of legal framework for reducing point and non-point sources of pollution</p> <p data-bbox="860 555 1155 770">Output 2.1.2: Community-based water quality monitoring pilot program implementation in 3 sites (Burundi, DR Congo, Rwanda)</p> <p data-bbox="860 914 1173 1019">Output 2.1.3: Laboratory for the lake water quality monitoring set up</p>	GET	1,300,000	3,128,571

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 3: Providing catalytic investments in the water-food-energy nexus	Investment	Outcome 3.1: Investment and incentive measures that address water security both in terms of quality and quantity/availability promoted	<p>Output 3.1.1: Incentive for private sector to leverage investment</p> <p>Output 3.1.2: On-the-ground investments for watershed management</p> <p>Output 3.1.4: BAT/BEP adopted to reduce chemicals at source</p>	GET	2,472,927	5,200,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 4: M&E and Knowledge management	Technical Assistance	Outcome 4.1: Assessments conducted to supplement TDA and SAP, and better guide decision-making.	Output 4.1.1: Capacity building for effective environmental monitoring. Output 4.1.2: Best practice guidelines and guiding principles for environmental monitoring are disseminated.	GET	490,000	700,000
		Outcome 4.2: Effective M&E, learning and exchange at all levels underpin implementation	Output 4.2.1: Participatory M&E system is established. Output 4.2.2: Knowledge Management strategy prepared and implemented. implemented.			
Sub Total (\$)					5,462,927	11,428,571
Project Management Cost (PMC)						
				GET	273,146	571,429

Project Management Cost (PMC)

Sub Total(\$)

273,146

571,429

Total Project Cost(\$)

5,736,073

12,000,000

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
GEF Agency	AfDB (African Development Fund)	Grant	Investment mobilized	5,000,000
GEF Agency	AfDB (Africa Water Facility)	Grant	Investment mobilized	2,000,000
Donor Agency	GIZ	Grant	Investment mobilized	2,000,000
Government	Government of Rwanda	In-kind	Recurrent expenditures	1,000,000
Government	Government of DRC	In-kind	Recurrent expenditures	1,000,000
Government	Government of Burundi	In-kind	Recurrent expenditures	1,000,000
			Total Project Cost(\$)	12,000,000

Describe how any "Investment Mobilized" was identified

"Investment mobilized" for this project was identified based on baseline operations funded by the African Development Bank (Africa Water Facility and African Development Fund) under preparation and to be implemented in the Lake Kivu-Ruzizi Basin which are expected to be co-financed by GEF resources.

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
AfDB	GET	Regional	International Waters	International Waters	5,736,073	544,927	6,281,000
Total GEF Resources(\$)					5,736,073	544,927	6,281,000

E. Project Preparation Grant (PPG)

PPG Required

PPG Amount (\$)

150,000

PPG Agency Fee (\$)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
AfDB	GET	Regional	International Waters	International Waters	150,000	14,250	164,250
Total Project Costs(\$)					150,000	14,250	164,250

Core Indicators**Indicator 3 Area of land restored**

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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0.00	0.00	0.00	0.00
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Indicator 3.1 Area of degraded agricultural land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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Indicator 3.2 Area of Forest and Forest Land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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Indicator 3.3 Area of natural grass and shrublands restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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Indicator 3.4 Area of wetlands (incl. estuaries, mangroves) restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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0.00			
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Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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3000.00	0.00	0.00	0.00
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Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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1,500.00			
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Indicator 4.2 Area of landscapes that meets national or international third party certification that incorporates biodiversity considerations (hectares)

Ha (Expected at PIF)

Ha (Expected at CEO Endorsement)

Ha (Achieved at MTR)

Ha (Achieved at TE)

0.00

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)

Ha (Expected at CEO Endorsement)

Ha (Achieved at MTR)

Ha (Achieved at TE)

1,500.00

Indicator 4.4 Area of High Conservation Value Forest (HCVF) loss avoided

Ha (Expected at PIF)

Ha (Expected at CEO Endorsement)

Ha (Achieved at MTR)

Ha (Achieved at TE)

0.00

Documents (Please upload document(s) that justifies the HCVF)

Title

Submitted

Indicator 7 Number of shared water ecosystems (fresh or marine) under new or improved cooperative management

Number (Expected at PIF)

Number (Expected at CEO Endorsement)

Number (Achieved at MTR)

Number (Achieved at TE)

Shared water Ecosystem

Kivu

Count

1

0

0

0

Indicator 7.1 Level of Transboundary Diagnostic Analysis and Strategic Action Program (TDA/SAP) formulation and implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem

Rating (Expected at PIF)

Rating (Expected at CEO Endorsement)

Rating (Achieved at MTR)

Rating (Achieved at TE)

Kivu

1



Select SWE

Indicator 7.2 Level of Regional Legal Agreements and Regional management institution(s) (RMI) to support its implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem

Rating (Expected at PIF)

Rating (Expected at CEO Endorsement)

Rating (Achieved at MTR)

Rating (Achieved at TE)

Kivu

4



Select SWE

Part II. Project Justification

1a. Project Description

Geography and ecology of Lake Kivu



The picture above shows the structure of Lake Kivu. The lake is a transboundary fresh water that lies on the border between the Democratic Republic of the Congo and Rwanda. Together with the Ruzizi River Basin, Lake Kivu is a sub-basin of the Lake Tanganyika Basin which is itself a sub-Basin of the Congo River Basin. Lake Kivu has a surface area of 2,370 km², a shoreline of 860 km, a length of 97 km and width of 48 km, an average depth of 240 m, a maximum depth of 485 m, water volume of 500 km³, a water residence period of 193 years, and a basin of 5,097 km². Rwanda and Democratic Most of the water input is through rainfall (3.3 km³/year), numerous small rivers (2.0 km³/year), and

ground water (1.3 km³/year), and water loss is through evaporation (3.6 km³/year) and the Ruzizi River into Lake Tanganyika (3.0 km³/year). The area receives long rainy periods from February to May and short rains from October to December, and the lake's surface temperature varies between 22 and 24°C.

The basin is characterised by a great range of vegetation cover from grasses interspersed with trees, deciduous forest, savannah mosaics and woodland in some areas, and a high susceptibility to changes in land use. The region has experienced in the past decade political instability, refugee migration and civil war, large-scale land clearance to satisfy energy demand, construction and timber harvesting from neighbouring countries and from within, and most especially for agricultural purpose (Majaliwa et al., 2009); exacerbating therefore soil erosion and pollution related loadings into the fresh surface waters and lake Kivu in particular (Jorgensen et al., 2004).

The Lake Kivu-Ruzizi basin is uniquely valuable, rich in biodiversity, and a catalyst for economic growth with high potential to improve the quality of life in Lake Basin communities. The basin is also very important for biodiversity and for ecosystem services that they provide and covers parts of at least 15 Key Biodiversity Areas (KBAs) of which 12 are terrestrial and 3 freshwater KBAs, hosting 55 Red-Listed species. The Virunga National Park, a World Heritage site, is located on the DR Congo side of the basin.

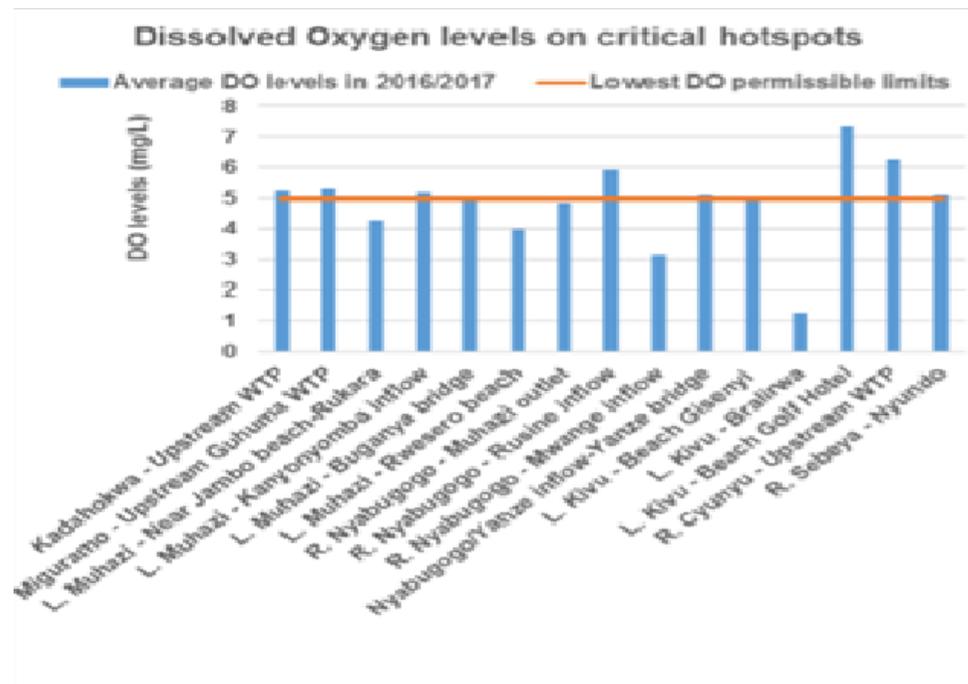
Environmental problems

Lake Kivu basin is among the most fragile and highly sensitive ecosystems in the region. The lake is being affected by atmospheric pollution, sedimentary, anthropogenic and climate change threats (Bootsma et al., 1999; Hecky et al., 2006). In the southern part of the Lake the demographic pressure and associated anthropogenic activities coupled with the micro-catchment topography contribute to increased degradation of land and water resources. The excessive growth of human populations in the Lake Kivu basin, land use, urbanisation, deforestation, intensive agriculture and climate warming prompt changes in the water quality of the lake. The major sources of nitrogen and phosphorus appears to be rivers and the atmosphere. The increase in sediment and nutrients loading pose a threat to biodiversity. Karamage (2016) argues that deforestation and natural grassland conversion to agricultural land use constitute a major threat to soil and water conservation and postulate that mean erosion rates approximate 41 t·ha⁻¹·year⁻¹ for settlement, 31 t·ha⁻¹·year⁻¹ for cropland, 28t·ha⁻¹·year⁻¹ for forest land, and 20t·ha⁻¹·year⁻¹ for grassland.

Although the cause-effect inter-relationship of soil and water pollution is generally recognised, there is a paucity of data on the magnitude of the phenomenon in the Lake Kivu Basin, the link to current land-use/cover and its management, the contribution of point and non-point source and atmospheric deposition to the current observable load (Majaliwa et al., 2009).

The quality of the water of Lake Kivu is declining

The proliferation of towns and cities and factories along Lake Kivu with an increase in population is adding to the waste and garbage increases along and in Lake Kivu, include both effluents and non-degradable packaging (plastics). For example, the towns of Goma, Bukavu, Bralima, the Pharmakina, the Cimenki and Genki in the DR Congo feed tons of plant wastes (shoes, water bottles, bags, plastic bottles, etc.) as well as discharge partially treated and untreated wastewater into the lake. Mining activities also continue to pollute the rivers throughout the region. Since the waters of Lake Kivu flow into Lake Tanganyika through the Ruzizi River, the upstream waters exert great influence on the biodiversity of Lake Tanganyika. The pollution and biodegradation happening on Lake Kivu and the Ruzizi River affects Lake Tanganyika biodiversity (plant and animal) and therefore the lives and economics of the local population, estimated to be around ten million people.



Wronski et al (2015) assessed the biological water quality and biodiversity of Rwandan rivers draining into Lake Kivu using benthic macroinvertebrates as indicator organisms. Their results showed that the discharge of industrial waste water in the rivers, notably Burehe River, resulted in an alarming deterioration of water quality. They accordingly recommended that long-term water quality monitoring be instituted in Rwanda using a combination of physicochemical, bacteriological and biomonitoring data. The Rwanda Water And Forestry Authority (RWFA), in its ANNUAL WATER STATUS REPORT 2016-2017 reported that dissolved oxygen (DO) levels in most catchments draining into

Lake Kivu were below permissible limits at almost all points sampled which indicates deterioration water quality by oxygen consuming pollutants. The above shows that at least 60% of sampled sites in the basin had DO levels below recommended levels. The same report showed that in Rusizi catchment electrical conductivity (EC) levels for the sites located at the exit of Lake Kivu crossed highest permissible limits. Whilst the monitoring work being done in Rwanda is commendable, the same cannot be said about the other two riparian states, Burundi and the DR Congo. As a result, the progress made on the Rwanda side will be offset against the lack of effort on the other side of Lake Kivu if no joint monitoring programme is developed and implemented for the entire basin.

Atmospheric depositions

One source of pollution in the basin region is acid rain emanating from volcanic activity. Mount Nyiragongo is an active stratovolcano in the DR Congo, about 20 km north of Lake Kivu. Nyiragongo and nearby Nyamuragira are together responsible for 40% of Africa's historical volcanic eruptions. Nyiragongo's lava lake is sometimes recognised as the most voluminous known lava lake in recent history. The lava lake generates permanent volcanic clouds which then mix with rain water making it toxic. Combined with anthropogenic activities this makes the basin waters hazardous to both human life and bio-diversity. Hence water quality monitoring is critical to help in making decisions that safeguard this fragile ecosystem.

Anthropogenic activities pollution in Lake Kivu

Wood, 1986 and Thomas et al., 1992 report that land use is an important factor controlling the magnitude of terrestrial pollution from soil erosion and soil nutrient losses in the Lake Kivu Basin. Mkwunye et al., 1996 further argue that inappropriate allocation of land utilisation types is one of the major causes of soil erosion related water pollution.

Pollution from agriculture: Annual crops, such as maize that increase susceptibility of an area to erosion, are in many cases grown on very steep slopes. Unfortunately, cultivation on very steep slope is more often coupled with poor land management, such as lack of erosion control structures, overgrazing, and burning (Lal, 1988b; El-Swaify 1982, 1994; AID, 1988; Meybeck et al., 1989; Pimental et al., 1993; Bhusham et al., 1994; Zake et al., 1995).

Point Source Pollution from Artisanal Gold Mining: Mercury use by artisanal gold miners is widespread, especially, in the province of South Kivu in the DRC. Piles of tailings, most of which contain mercury, are directly washed into rivers resulting in siltation and water pollution problems. The practice poses health risks for miners themselves and the communities dependent on the watersheds for livelihoods, especially women and children.

Municipal and Industrial effluent: Bacteriological and chemical contamination from insufficiently treated, improperly treated or even untreated domestic and industrial wastewater from the rapidly growing urban settlements on the lakeshores adds toxic chemicals, BOD, and effluent to the lake. Furthermore, the large urban settlements in particular result in unsustainable garbage accumulation, including non-degradable plastic packaging which eventually finds its way into the lake waters.

Watershed Degradation in Lake Kivu Basin

It is recognised in similar ecosystems in the world, that agriculture is the major contributor of sediment and nutrient load (Raymond, 1984; Neely and Baker, 1989; Strebel et al., 1989; Power and Schepers, 1989; Lehman, 1993; Rekolainen, 1993; Calamari et al., 1994). Boostman and Heckey (1993) observed that nutrient load increases were associated with increased burning and soil erosion, emphasizing the role played by the land-use systems and management in the deterioration of the quality of the water bodies and their tributaries (Cole et al., 1993; Peierls et al., 1991; Field-Juma et al., 1995). Johnes (1996) concluded and stated that a portion of runoff and sediment generated from different land-uses including croplands always ends up in drainage networks.

With respect to Lake Kivu Basin Majaliwa, et al., 2009 and Tenywa et al., 2010 reported that soil degradation due to poor management had reached catastrophic proportions on agricultural lands in East and Central Africa and particularly eastern D. R Congo and Rwanda. Literature studies by Smith et al.; 1987 and Sharpley et al.; 1991 further suggested that the impact of land use on water quality in the lake and its tributary rivers was real and increasing. The increasing sediment and nutrients loading pose also a severe threat to biodiversity (Halbwachs, et al. ,2002) and the stability of the Lake basin (Cohen et al., 1993; Cohen, 1995, Donohue et al., 2003).

The Lake Kivu basin is undergoing severe habitat fragmentation and deforestation. Settlements and agriculture fields in the watersheds are made available at the cost of clearing forests that also has survival impacts on lake and river systems. Deforestation and soil degradation in the upper parts of the Lake Kivu watersheds are reducing agricultural productivity and negatively affecting farmers' livelihoods. The basin is exposed to severe overall mean soil erosion risk of 30 t/ha/yr due to both natural factors (abundant tropical precipitation and steep slopes) and anthropogenic activities without prior appropriate conservation practices. Nutrients loading is linked to the rapid growth of population, improper application of agrochemicals in farming, deforestation and severe soil erosion within the basin. Currently, there is a lack of systematic monitoring and important gaps in the scientific understanding of both water quantity and quality problems in the basin.

The erosion rates are not sustainable. Way back in 1995, GTZ (now GIZ) postulated that the economic cost of off-site and on-site soil erosion-associated degradation is always very high such that major agricultural non-point contributing areas and other soil erosion hot spot areas have to be identified and urgent control measures put in place. If this is not done small holder's capacity to increase food production and alleviate poverty will be undermined leading to a vicious cycle of increasing poverty and land degradation. At the PPG stage further assessment of the quality of the water at representative points of the lake will be conducted and will serve as baseline for the M&E of the project.

Explosion risk due to trapped methane and carbon dioxide

Lake Kivu is one of the three known exploding lakes due to its content in carbon dioxide and methane. Pasche et al (2011), quoting a study on the lake status at the time, suggested that the CH₄ concentrations in the lake have increased by up to 15% in the last 30 years and that accumulation at this rate could lead to catastrophic outgassing by 2100. Muvunja et al (2010), on the other hand, concluded that the primary production of CH₄ in Lake Kivu is sustained by external nutrient inputs produced from degrading organic materials and by internal loading due to upwelling caused by sub-aquatic sources. Measurements since the 1970s indicate that methane produced from organic materials has increased, saturating 40% of the Lake. It is estimated that the lake contains 300 cubic kilometres of carbon dioxide and 60 cubic kilometres of methane that have bubbled into the Kivu from volcanic vents. The gases are trapped in layers 80 metres below the lake's surface by the intense water pressures there. Geological or volcanic events could disturb these waters and release the gases.

One such threat is caused by exploratory drilling, especially for oil. Up to now however, there has been seismic exploration surveys using shock waves in Lake Kivu. In 2014, such a survey in Rwanda concluded that the basin was favourable for oil and gas exploration. Subsequently, the DR Congo and Rwanda signed a five-year joint exploration agreement for oil under Lake Kivu in 2017. If exploration proceeds to drilling it could lead to rapid upwelling of deep water containing CH₄ and CO₂ leading to an explosion. Furthermore, oil extraction runs the risk of contamination which would affect people who depend on the lake for their livelihoods. Fortunately, the government of Rwanda suspended oil explorations in 2018.

However, even in the absence of human induced disturbances, Cotel (1999) postulates that with the expected demographic pressure and its associated loading increment coupled with punctual volcanic induced impacts, Lake Kivu is likely to rapidly reach a critical status, increasing the risk of a catastrophic explosion of the deadly gases which could be triggered by lava flows, earthquakes, landslides, storms or industrial waste. That explosion poses an existential threat to close to two million people who live within the lake environs and their livestock. Such an occurrence would be devastating, as was demonstrated on 21 August 1986 at Lake Nyos in Cameroon, in West Africa. The lake waters were saturated with carbon dioxide and a major disturbance - most probably a landslide - caused a huge cloud of carbon dioxide to bubble up from its depths and to pour down the valleys that lead from the crater lake. Some 1,700 people were suffocated to death. A similar limnic eruption had occurred at Lake Monoun in 1984, also in Cameroon, causing the death of 37 people living nearby. An explosion in Lake Kivu is believed to be potentially several orders of magnitude higher.

Reducing the concentration of gases in such lakes could, theoretically, reduce the risk of a deadly eruption. Indeed, this is the option that the government of Rwanda and global energy companies, ContourGlobal and Gasmeth Energy, have opted for and are currently tapping Lake Kivu's methane to produce electricity for the Rwanda national grid. The approach adopted for extracting the gas builds on the work started by the French scientist, Michel Halbwachs, at Lake Monoun and Lake Nyos in 1990 using siphons to degas the waters of these lakes in a controlled manner. After three more pipes were installed at Lake Monoun in 2003, 2006 and 2011 with UNDP support, equilibrium was established and the lake declared safe.

However, scientists have warned that tampering with the lake's gases also carries a risk of triggering a disaster. In the absence of a comprehensive monitoring program, these opposing postulations will remain unvalidated making it more difficult to reach agreement on corrective actions in the basin. Meanwhile, the positive economic benefits of exploiting the oil and gas resources of the lake will likely encourage the riparian states to allow their extraction before an evidence based plan and informed regulation is put in place.

Climate change affects the ecosystem services of the lake

Climate change is affecting the ecologic and economic ecosystem services of the lake. Rainfall is projected to increase by over 200 mm/year and dry season temperatures by more than 2°C by 2060. The Lake Tanganyika Authority Strategic Plan of 2011 notes that as the Kivu/Rusizi basins are fringed by rugged mountains rising to over 3,000 m a.b.s.l; and steep slopes with degraded vegetation and bare soils, an increase in the intensity, quantity and frequency of rainfall on exposed soils will accelerate erosion and sedimentation with occasional landslides. This will increase the water turbidity, lower dissolved oxygen levels, and reduce hydropower output, irrigation efficiency, soil fertility and fish productivity. Vulnerability assessment as well as indication of adequate adaption measures will be conducted.

Based on the Second National Communication (2009) to the UNFCCC, precipitations will increase by 0.3 to 7.5% by 2050, and between 0.8 and 11.4% by 2100. Temperatures are expected to increase by 1.72 to 2.08°C by 2050, and between 2.69 and 3.22°C by 2100. There are no recent climate projections at the national scale. The most recent prediction was made at the regional scale in 2015 for the Congo Basin. Based on this assessment, the temperature will increase by 1.5 to 6°C. The results for precipitations are less clear with changes ranging from a decrease by 10% to an increase by 30%. It also seems that the number of dry periods during the rainy season will increase. The rainfall patterns through the year will therefore be significantly disturbed with sporadic rainfall. Extreme climate events are expected to be more frequent. Similar conclusions are reached by the World Bank based on the data from the Intergovernmental Panel on Climate Change (IPCC) fifth Assessment Report.

Livelihoods and gender considerations

The gender issue in the basin is reflected in deep inequalities in terms of access to health, education, employment, land and other factors relating to capital (during succession or concerning inheritance). In the three countries, education is affected at all levels by a shortage of qualified teachers, appropriate teaching aids and facilities. Fairly wide disparities exist between Rwanda and Burundi on the one hand, and South Kivu, on the other, where schooling conditions are precarious for many children. The epidemiological profile of Rwanda, Burundi and South Kivu remains dominated by communicable diseases that account for an average of 90% of the reasons for medical consultations in health facilities. The most common diseases are malaria, acute respiratory infections, diarrhoeal diseases, HIV/AIDS and tuberculosis. Women in the basin bear the brunt of these social challenges.

Positively however, the three countries are taking steps to address gender issues. The State of Gender Equality in Rwanda monitoring report (2019) notes that a legal and conducive policy environment in Rwanda has greatly contributed to the realization of gender equality and empowerment of women across different sectors. Several policies have been formulated and are being implemented, prime among them the Constitution of Rwanda (2003) which provides for the minimum 30% quota for women in all decision-making organs. Though the participation of women still lags that of men, it has been steadily improving. By 2018, women employment in agriculture stood at 39.5%, in industry at 18.8% and in services at 41.7%.

The Constitution of Burundi also enshrines the rights of women by requiring 30% representation of women in the parliament and government. Furthermore, the government's 2012 Poverty Reduction Strategy Paper went beyond previous iterations to ensure that women were part of consultations and that their concerns were reflected in the final paper. However, the USAID/Burundi Gender Analysis Final Report of 2017 found that in agricultural value chains in Burundi, women play a critical role, dominating land preparation, planting, cultivation and harvest and accounting for 62 percent of the work hours yet they have weak access to productive inputs, including training on new agricultural technologies, formal credit, and participation and leadership roles.

Despite a constitution that provides that "the State shall have the duty to ensure the elimination of all forms of discrimination against women and ensure the respect and promotion of their rights" the gender situation in the DRC remains dire. Mbambi et al (2010) reported persistence gender imbalances in all the domains of economic, social, cultural and political development. The insecurity in the country has resulted in 61.2% of Congolese women living below the poverty threshold against 51.3% for men. Gender-

based violence, particularly domestic violence on women and young girls is reported to be prevalent and opportunities for women remain severely depressed. For example, women only constitute 2,8% of state waged employment/activities against 12% of men.

Riparian country briefs

Two of the riparian states, Burundi and the DR Congo, are classified as medium-intensity conflict countries by the World Bank. All countries are highly dependent on international aid.

Burundi

Burundi does not border Lake Kivu but is downstream of the Rusizi river as it flows to Lake Tanganyika. The total land area for the country is 25,680 Km² and its population is estimated at 11,8 million in 2020. Moreover, agriculture, which is the main source of employment (nearly 80% of the population), does not generate enough income and contributes only 40% of GDP. Access to water and sanitation remains very low and less than 5% of the population has access to electricity (including 52.1% of urban households and 2% of rural households).

DR Congo

The DR Congo is known for its dense tropical forests, which represent 47% of tropical African forests as well as its fauna and flora diversity. However, population growth and urbanism have led to the degradation of natural ecosystems. The province of South-Kivu has one the highest population densities in DRC. The land in South-Kivu, the province that hosts Lake Kivu, is very degraded because of slash and burn agriculture, overgrazing, bushfires, forest exploitation for fuelwood, and land clearing for urbanisation. This results in soil exposure to erosion, landslides and rock falls. Land degradation is particularly severe in the territories of Kabaré and Walungu that face high demographic pressure due to their proximity to Bukavu. Their mountainous relief also make them particularly prone to erosion. Forests in particular are found throughout these territories but have become very fragmented. Strong anthropogenic pressure has led to severe forest degradation. For example, the presence of refugees from Rwanda and Burundi since 1994 has led to uncontrolled deforestation for fuelwood, and transformation of forest, pastoral and agricultural land into camps resulting in the degradation of these resources. Nowadays, forest exploitation is mainly undertaken manually. There is no industrial exploitation in the province. Agricultural activities and population density have been identified by the civil society as the major causes of deforestation and forest degradation.

Despite the country's richness in natural resources, there is a high level of poverty within rural communities. The population in DRC has increased from 29,000,000 people in 1980 to 60,200,000 people in 2006 and is expected to further increase to 120,304,000 people by 2030. South-Kivu is one of the provinces with the highest population density in DRC. In 2015, the size of the population in South-Kivu was estimated to be 6,500,000 people¹⁷ with a population density of 99.5 people/km². The highest population densities are found in the territories of Kalehe (i.e. 928,888 people), Bukavu city (i.e. 876,917 people), Walungu (i.e. 865,257 people) and Kabaré (i.e. 784,387 people). In this province, poverty affects 80% of the households and the unemployment rate is higher than the national average. 54% of rural households are food insecure.

Rwanda

Rwanda is geographically a small country with a surface area of approximately 26,338 km². The population was estimated at 11.8 million with a growth rate of 3.3% and average household size of 4.3 in 2012. In that year 71% of private households were headed by males and 29% by females, about 32% of household heads have no education, 55% have attended primary school and 8% have attended secondary whilst 83% of household heads are employed, 2% are unemployed and 15% are inactive. (Institute of Statistics of Rwanda (NISR), 2014). Rwanda also hosts close to 175,000 Congolese and Burundian refugees and asylum seekers, of whom 79 percent reside in camps and the remaining 21 percent are urban refugees. In 2018, Rwanda had a GDP of USD of 8,5 billion and a per capita income of USD 787 (STATISTICAL YEARBOOK 2019). The country's relief is hilly, with average altitude of 1700 meters. The country is dependent on agriculture but only 52% of the country is considered arable which leads to high demographic pressure. Agriculture employs more than 80% of the population. Land holdings are very small with more than 60% of households cultivating less than 0.7ha, about 50% cultivating less than 0.5ha and more than 25% cultivating less than 0.2ha. Rwanda is classified as a water scarce economy with high erosion challenges, losing more than 14 million tons of humus and top layers of soil per year. The country remains at risk of natural and human-caused shocks such as destructive weather events caused by climate change, including droughts, floods and landslides, and environmental degradation and economic crises that impede socio-economic progress.

Barriers that need to be addressed

There are three main barriers to sustainable exploitation and management of the basin resources.

Barrier 1: Inadequate basin wide governance mechanisms

The three countries sharing Lake Kivu basin and Rusizi River, with support from the European Union, established the Lake Kivu and River Rusizi Basin Authority (ABAKIR) in 2012. ABAKIR is still an embryonic institution formally established and resourced at the national level but is yet to be devolved to the local level for it to be an effective catalyst for transboundary collaboration with strengthened basin-wide governance, institutional arrangements and broad stakeholder involvement. While the Agreement establishing ABAKIR has legal status, and leaves open a central role for the ABAKIR in relation to management of basin resources, it does not yet have the operational capacity needed to perform its mandate effectively, particularly beyond the water sector, and also for the complex work of formulating and implementing universally agreed TDA and SAP. The institution needs to develop into a catalyst for transboundary collaboration. Developing an agreed, shared vision is at the forefront of the number of issues that need to be addressed to position ABAKIR as this catalyst. Whilst significant emphasis is being placed on inter-country collaboration, especially through the GIZ implemented project, ABAKIR still needs to develop further its operational capacity. At the moment its operational effectiveness is hampered by a lack of adequate technical skills among the riparian member states which in turn impedes basin institutions from carrying out their joint functions effectively. There are also differences in technical capacity for national water level agencies that need to be resolved and policies that need to be harmonised.

Barrier 2: Weak operational capacity to increase water quality monitoring and management

Policies, while in existence, are poorly harmonized and implemented. The regulatory framework in many of the region's countries is inadequate and weakly enforced due to overlapping institutional responsibilities, governance problems, insufficient funds and lack of technical capacity. Institutional weaknesses also lead to the inability to enforce the existing legislation for addressing pollution from anthropogenic activities.

The LKMP illustrates such institutional weakness. At its creation in 2008 the mandate of LKMP was to ensure that methane gas extraction is done in a safe and sustainable way. Thus it had a very narrow focus. The monitoring was done at three stages - near plant monitoring, whole lake monitoring and on plant monitoring – and did not extend to the basin rivers and other non-lake water points. The program therefore did not tackle pollution sources, in origin and type, beyond the gas extraction facilities. Another weakness/gap of the LKMP was that by not monitoring areas beyond the lake it excluded communities from direct involvement in the monitoring of lake water quality. This narrow focus resulted in suppressed investments in watershed based indicator type measurement instruments and did not allow for the development of an all-inclusive and comprehensive water quality information system serving users, decision makers and the wider community.

Underpinning all the requirements for sustainable management of lake and basin resources is the need for reliable data for institutions to be able to make well informed and evidence based decisions. Currently, data and information systems (physical, technical, socioeconomic) relating to water resources in terms of quantity, quality, accessibility, dissemination, and use remains inadequate throughout the basin. Little is known about the trends in water quality because monitoring of water and sediment quality in the lake and in its watershed has not been systematic. In the few cases that monitoring has been done, it has been either for scientific purposes, e.g., the concentration of CH₄ and CO₂ in the lake or, if broad, has been systematically done by one country, Rwanda. Without sufficient broad based data collection and inclusive information sharing, technical understanding of the water resources related challenges will remain limited, as will the possibility of exploring solutions. Data collection and processing is therefore the most critical requirement in the basin at this stage of its development.

Barrier 3: Insufficient incentives and investments

The Overseas Development Institute (ODI) (2002) and UN-Water (2008) cite the limited availability of financing to address the additional transaction costs of regional approaches as a barrier to transboundary cooperation. They further state that access to financing is often the weakest point of Lake Basin management in developing countries.

A key feature of water resources management in the Lake Kivu basin is that all the riparian countries are dependent on international aid. Investment in the water sector have traditionally been sponsored by development partners and NGOs thus limiting the viability of initiatives to the funding cycle of the donor project. The LKMP, is one such project which made impressive progress when external funding was available but is struggling to stay afloat since the funding came to an end. The projects initiated by the riparian countries under the PREDIR, such as the SDAR, have stalled because of lack of funding. The private sector has focussed, understandably so, on those initiatives that guarantee some level of financial return. The communities, on their part, have largely been considered irrelevant in respect of the management of basin resources. This is so despite the fact that

they are the main beneficiaries of those resources for their livelihoods and are not entirely innocent of transgressions in pursuance of those livelihoods especially with respect to the use of chemical fertilisers and pesticides in agriculture.

Policy baseline

The global environment

SDG Target 6.5 of Agenda 2030 sets out a new global ambition: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate. This will be measure by indicator 6.5.1: Degree of integrated water resources management implementation, and indicator 6.5.2: Proportion of transboundary basin area with an operational arrangement for water cooperation.

AfDB guidelines

In 2015, the Bank, through its President Akinwumi Adesina, outlined five priority areas that the Bank will focus on to advance Africa's transformative agenda up to 2025. The priority areas are summarised as to Light up and power Africa, Feed Africa, Integrate Africa, Industrialize Africa, and Improve the quality of life for the people of Africa. A key feature of this bank policy is the focus on monitoring and disseminating information/data on the performance of countries in the High Fives priority areas. The proposed project builds on this data management approach by specifically applying it to water quality monitoring for RMCs. It thus supports, albeit indirectly, all the five priority areas.

Specifically, in its Policy For Integrated Water Resources Management, the Bank in 2000, observed that “even when policies exist, they are often inadequate, and water legislation is in many cases poorly developed. This particularly applies to water quality issues, where hardly any legislation exists. Usually there is no clear institutional responsibility for water quality management. This situation can only be improved by developing an appropriate institutional and legal framework. This should take into account customary law and traditional practices”. The Bank proceeded to recommend that “ Knowledge of available resources, of their quality and variability over time and the state of other physical and socioeconomic conditions are a fundamental prerequisite of sound planning and design of sustainable, economically efficient water projects. It is therefore essential to establish a mechanism for acquiring data, and knowledge of the water system at all institutional levels”. The GEF project seeks to build on this assertion.

Country frameworks

Burundi: The environmental law governs water quality issues in the country. The country passed Decree No. 100/22/ of 7 October 2010 on the implementation of measures of the Environmental Code in relation to the Environmental Impact Assessment Procedure, and Law No. 1/01 establishing the Environmental Code in Burundi. These two legislative pieces lay down basic rules for environmental management and protection against all forms of degradation with the objective to safeguard and promote the rational use of natural resources, combat various forms of pollution and nuisances and improve the population's living conditions while respecting the balance of ecosystems.

Burundi has also identified sustainable land management, including rehabilitation of degraded areas and protection of critical ecosystems, including wetlands and buffer zones around lakes, as key priorities. In line with this policy the country has ascended to international conventions including the National Biodiversity Strategy and Action Plan (NBSAP) in 2000 reviewed in 2009 a National Action Plan for Adaptation to Climate Change (NAPA) in 2007 and the Second National Communication to the UNFCCC in 2010.

The country has followed up its ratification of international agreements with specific national plans including the Investment and Financing Strategy of the National Plan on the Fight Against Land Degradation, the National Plan for Investment in Agriculture (PNIA) 2012 – 2017, the Sub-Sector Strategy on Marshland Development and Watershed Protection and Study on the Cost of Inaction Against Land Degradation in Burundi. These plans are consistent with, and complementary to, the objectives of the proposed project.

The government is attempting to improve the water quality in the country. Since 2000, the government has adopted laws targeting sanitation services and also introduced a new regulatory framework to aid the improvement of water quality in Burundi. However, there currently is no water quality monitoring program for the country.

The DR Congo: Water quality issues fall under the environmental law of the country. The country passed Law No. 11/009 of 09 July 2011, establishing fundamental principles of environmental protection; Ministerial Decree 013/2005 of March 2005 supplementing Decree 037/2004 of June 2004 on the establishment, organization and operation of structures intervening in the environmental and social assessment of the PMURR; (ii) Decree 043/2006 of 8 December 2006 containing provisions relating to the obligation to carry out the environmental and social assessment of projects in DRC; (iii) Decree 044/2006 of December 2006 on the establishment, organization and functioning of the GEEC, amended by Decrees 005/2007 of 30/01/2007 and 008/2007 of 03/04/2007.

Though there are no specific water quality projects in the DR Congo several national policies are related to water quality monitoring. The Second National Program for Environment, Forests, Water and Biodiversity (PNEFEB2), 2013 to 2023 focuses on environment protection and sustainable management of natural resources to maintain ecological, economic, social and cultural systems relying on them. Its key actions include “Regeneration, reforestation, forestation and agroforestry” and “environment monitoring, climate change mitigation and valuation of environmental services”.

The National Plan for Agricultural Investment (PNIA), 2013 to 2020 supports the growth of the agricultural sector to reduce poverty levels and unemployment, and increase food security. It provides the national planning framework for national and international funds in the agricultural and rural development sector and coordinates the on-going and planned programs and projects in the sector. The plan aims to reduce the vulnerability of the agricultural sector to climate change by promoting the integrated management of soil fertility, establishing resilient agroforestry systems, improving watershed management including the implementation of erosion control interventions, and support the REDD+ process. Supported projects include natural regeneration of forests, tree planting on slopes against erosion and siltation of water bodies, implement community forests, and promote private and community-based reforestation activities.

The National Strategic Plan for Development, vision for DRC by 2050: 2016–2050 also targets environment protection, sustainable development, and access to water and sanitation with the environmental to establish a balance between the exploitation of natural resources and ecosystems protection, and to restore the environment in degraded areas.

The National Strategy and Action Plan on Climate Change 2016-2020 promotes the integration of climate change into socio-economic development within all the sectors affected by climate change – such as agriculture, forests and energy – to improve community livelihoods and reduce CO2 emissions by 17% by 2030. The strategy advocates for a multi-sectoral approach to climate change mitigation involving all relevant public and private actors, implementing interventions for climate change mitigation and adaptation, strengthening the development of innovations, research, and implementing existing and new technologies, and developing a financial strategy.

Though water quality is an issue of concern in the DR Congo, there currently is no program for water monitoring. The World Bank notes that the DR Congo's water supply and sanitation sector is characterized by several overlapping and conflicting institutional jurisdictions which lead to paralysis. However, government reforms initiated with the support of international development partners in 2006, especially the German GIZ water reform project, have resulted a comprehensive Water Code. Under the Code Integrated Water Resource Management (IWRM) has been adopted with the aim to reconcile the interests of the different stakeholders in the water sector. Key concepts of the Code include a land zoning system to ensure protection of strategic drinking water resources and their watersheds, user pays principle, polluter pays principle, precautionary principle, subsidiary principle and public dialogue and consultation.

Rwanda: As in the other riparian states water quality issues are governed by the environmental law of the country. The country passed the Organic Law No. 04/2005 of 8 April 2005 determining the modalities of protection, conservation and promotion of the environment in Rwanda. It followed this up with the Ministerial Decree 003/2008 of 15/08/2008 on the requirements and procedures for environmental impact assessments and Ministerial Decree 004/2008 of 15/08/2008 establishing the list of works, activities and projects subject to environmental impact assessment.

Rwanda is also a signatory to a number of international treaties such as the Convention on Biological Diversity (ratified May 1995), the United Nations Framework Convention on Climate Change (UNFCCC), ratified August 1998 and the UN Convention on Combating Desertification (UNCCD). The country has developed national strategies for each convention, viz: The National Biodiversity Strategy and Action Plan (NBSAP) - 2003 and the National Plan of Action (NAPA) for climate change adaptation, 2006, and National Action Plan for the UNCCD. In addition to the conventions, the government of Rwanda complies with international agreements related to food and nutrition security such as the 2030 Agenda, World Health Assembly targets and the Paris Agreement and the Sendai Framework for Disaster Risk Reduction, which focus on climate change adaptation, risk mitigation and resilience-building as well as the Convention on the Elimination of all Forms of Discrimination against Women.

The national plans, notably the Vision 2020 and Vision 2050 development plans and the Government's 2017– 2024 National Strategy for Transformation (NST) embrace the SDGs and focus on social transformation, economic transformation and transformational governance. The plans specifically target poverty reduction, promoting resilience and eradicating malnutrition, support for the smallholder farmer sector and consolidating good governance and justice as building blocks for equitable and sustainable national development. These are all goals commensurate with the objectives of the proposed project. Furthermore, the LKMP, for which this project seeks to strengthen and upscale was spearheaded, and confined to, the Rwanda side of Lake Kivu. With respect to water quality monitoring, Rwanda has undertaken comprehensive water quality monitoring studies as recently as 2019 and has a policy for regular monitoring in place. The latest experience is presented as a baseline for the proposed project.

Donor Involvement: Donors are heavily involved in the water sectors of the three riparian states. The Development Assistance Committee (DAC) countries provide the bulk of the aid. The riparian states have received varying amounts of aid from Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States, and Commission of the European Communities.

For Burundi donor contributions to the WSS sector have been increasing since 2005. The AfDB supported an \$18 million project to assess water and sanitation resources throughout the country as well as decentralization. The German Government financed a \$12.8 million project to increase water access in three provinces. The World Bank supported a Multi-Sectoral Water and Electricity Infrastructure Project for US\$50 million. Other donors active in Burundi's WSS sector include the Belgian government, European Union, Austrian Cooperation, and the United Nations Children's Fund (UNICEF).

For the DR Congo a multi-donor humanitarian fund, the "DRC Pooled Fund" has been set up to coordinate aid efforts. In 2018 International donors pledged US\$528 million to support the delivery of urgently needed humanitarian aid to millions of people in the country. Lead donors have included the United Nations agencies, the European Union, the French, Germany and Dutch governments. The AfDB, WB and USAID have particularly active in the country's WSS sector with the USAID allocating an estimated \$10.6 million to the sector in 2017 alone.

Rwanda regularly receives financial support from Germany, Britain, the World Bank, the European Union and the AfDB. According to the World Bank the country received USD 43 million in 2017. USAID has by far been the biggest aid provider for Rwanda increasing its support from about \$48 million in 2004 to over \$128 million in 2016. The support has targeted a multiplicity of sectors including health (AIDS relief and malaria), food security initiative as well as the Global Climate Change (GCC) programming. USAID supports an integrated program that improves the sustainable management of water in Rwanda. The program builds local capacity to monitor and manage water resources and helps develop water and sanitation services to the public, with a focus on the rural poor. It has positive benefits for health, food security and resilience to climate change among vulnerable populations.

Regional Institutional baseline

A number of regional initiatives, all with the objective of improving regional cooperation and coordinating of activities, are on-going in the basin. These institutions generally suffer from inadequate financing and capacity issues which in turn humpers them from reaching their stated goals.

The Great Lakes Economic Community (CEPGL): The CEPGL was established in 1976 by Burundi, the Democratic Republic of Congo (DRC) and Rwanda to promote peace, security and economic development through regional cooperation. The objectives of the CEPGL as outlined in Article 2 of the Constituent Treaty are: i) Ensure first and foremost the security of the Member States and their populations so that there is no element that disturbs the order and tranquillity of their respective borders; ii) Design, define and promote the creation and development of activities of common interest, iii) Promote and intensify trade and the movement of people and goods.

The long-term vision of the CEPGL aligns with the long-term national visions and national strategies to combat poverty in the medium term, developed by member states. By 2035, this vision states: "*A Solidarity Community operating in an environment of peace and security with an emerging economy by 2035.*" All development initiatives in the Lake Kivu Ruzizi basin are therefore guided by this vision and derive their legal basis from the CEPGL treaty.

Lake Kivu and River Rusizi Basin Authority (ABAKIR): The three countries sharing Lake Kivu basin and Rusizi River, with support from the European Union, established a river basin management authority in 2012 to ensure that the water resources of the basin are well protected and managed for effective benefits. The interim secretariat for ABAKIR is based in Kigali, Rwanda. The goal of ABAKIR is to ensure that the water resources of the basin are well protected and managed for effective benefits. The interim secretariat for ABAKIR is based in Kigali, Rwanda. Among the main objectives of ABAKIR are: 1) Develop, adopt, implement and enforce appropriate legal, administrative and technical measures to protect and preserve the Basin's ecosystems in particular the natural areas protected either by national regulations or by international conventions. 2) Prevent or refrain from taking or authorizing any decision liable to cause damage to the quality of the water resource and the environment, and take all necessary measures to protect them. 3) Take any useful measure to maintain and protect the installations, facilities and other structures that have an impact on the water resource of the Basin. 4) Take as a priority all appropriate legal, administrative and technical measures to prevent any cause of erosion. 5) Ensure enforcement of legal, administrative and other measures requiring an assessment of impacts on the water resource of any proposed project in the Basin. And 6) Ensure proper enforcement of all conditions pertaining to water usage licenses imposed to protect this resource.

Regional Integrated Development Programme for the Ruzizi (PREDIR): The Great Lakes Economic Community (CEPGL) launched the Regional Integrated Development Programme for the Ruzizi (PREDIR) which in turn integrates into the Regional Economic Programme (PER). CEPGL received a donation from the African Development Bank through the African Water Facility (AWF) to finance the development of PREDIR. The development of the SDAR is the main component of PREDIR, and consists of the formulation of a medium- and long-term planning tool and implementation studies for priority development infrastructure for the Ruzizi plain. Whilst the PREDIR gives a broad overview of the issues to be tackled in the basin, national governments' plans for the Ruzizi plain clearly focus on irrigation development leaving other sectors with little chance of drawing government facilitated financing.

Project baseline

Several projects have been identified, and are in various stages of implementation, in the Kivu-Rusizi basin. They range from hydropower development, through joint irrigation schemes to country specific environment and conservation projects.

Regional projects

Ruzizi Plain Planning Master Scheme (SDAR): The development of the SDAR is the main component of PREDIR, and consists of the formulation of a medium- and long-term planning tool and implementation studies for priority development infrastructure for the Ruzizi plain. The SDAR specifically contains: i) A Master Scheme for Integrated and Sustainable Development across the Plain in the three member countries of the CEPGL to lead to development guidelines the plain spread over a 20 to 30-year horizon; ii) A Strategic Environmental and Social Study (ESSS) of all sectors involved By the Master Plan; iii) Feasibility/PSA-level studies of a priority development tranche irrigation perimeter under rehabilitation or creation for an area of 20,000 ha; iv) APD-level studies covering an area of 10,000 ha; and v) The organization of a round table of donors of the Ruzizi Plain. The SDAR identifies the most relevant actions, to be implemented, in line with regional and national strategic axes, but also in response to the expectations of local

actors. These actions are summarised under five components: (1) Creation and rehabilitation of hydro-agricultural developments. (2) Sustainable development of water and natural resources, (3) Sustainable and Inclusive Socio-Economic Development, (4) Preserving the environment and developing ecosystem resilience to climate change, and (5) Institutional Development and Capacity Building.

CRAG II: Building the Climate Change Resilience in the Lake Kivu and Rusizi River Catchments:

<https://www.birdlife.org/africa/projects/crag-ii-building-climate-change-resilience-lake-kivu-and-rusizi-river-catchments>

The project was implemented between April 2014 and March 2017. The goal of the project was to help to understand, and respond to, increased environmental pressures from climate change, and to create and expand incentives to conserve biodiversity and ecosystem services in the South Kivu and Rusizi River catchments. The project was carried out in the three countries of the Lake Kivu-Rusizi basin and was led by BirdLife International working with the Wildlife Conservation Society (WCS), BirdLife Partners Association Burundaise pour la protection de la Nature (ABN) in Burundi and Association pour la Conservation de la Nature au Rwanda (ACNR) in Rwanda, and Horizon Nature, an NGO working in Eastern DRC. The project defined CRAGs as landscape units with a minimum altitudinal range of 1,000 meters, and are characterized by climate resilient biodiversity and ecosystem service values. The minimum altitudinal range is set to allow for upward shifts in distribution and for intervention options to increase resilience. The CRAG approach brings together a variety of conservation approaches and activities, such as integrated water management; ecosystem-based adaptation to climate change; soil erosion, pollution and forest management; and community livelihoods, which have impact across a landscape gradient in ways that directly benefit human wellbeing and biodiversity values. The CRAGS concept provides a planning tool that focuses on the most climate-sensitive parts of landscapes and that can integrate the management of biodiversity and human needs in the face of climate change. The idea behind CRAGs is to help national and regional planners to reduce harmful, and enhance beneficial impacts from climate change.

The KivuWatt Project:

<https://www.power-technology.com/projects/kivuwatt-project-lake-kivu-kibuye/>

This is an energy project that involves the construction of an integrated methane gas extraction facility and independent power plant in two phases in Lake Kivu. The project will mitigate the dangers associated with the release of CH₄ and CO₂ from the lake, and provide an environment-friendly and sustainable source of power generation. It will decrease the country's use of diesel to generate electricity, reduce the electricity cost, and enable the country to achieve its target of reaching 563MW of installed power capacity by 2017. The project will extract methane from Lake Kivu to generate electricity. Construction works for the 25MW phase one of the methane gas-fired power plant began in August 2011 and the start-up and commissioning were initiated in June 2015 and opened in 2016. Construction on phase two, which will add an additional 75MW, is expected to start after six months after the full-commissioning of phase one. The project is being implemented by KivuWatt, a subsidiary of ContourGlobal. A \$91.5m loan for phase one was provided by Emerging Africa Infrastructure Fund (EAIF, \$25m), FMO (the entrepreneurial development bank of the Netherlands, \$31.5m), the African Development Bank (\$25m) and the Belgian Development Bank (\$10m).

Support to the Integrated Management of Water Resources of Lake Kivu and Ruzizi River

<https://www.water-energy-food.org/resources/resources-detail/project-support-to-the-integrated-management-of-water-resources-of-lake-kivu-and-ruzizi-river/>

This is a 2 year (01/2019 – 12/2020) financed by the European Union Delegation in Rwanda and the Germany Government (BMZ – Federal German Ministry for Economic Cooperation and Development) to the tune of Euro 2.5 million. GIZ was commissioned to implement the project with ABAKIR. The project aims to improve the hydrological and operational management of Lake Kivu and Ruzizi River. The specific objectives are (i) development of a strategic action plan, based on a baseline study for the Lake Kivu and Ruzizi River basin, and (2) operationalization of an integrated water resource management mechanism for Lake Kivu and Ruzizi River.

The project results are summarised as (i) a strategic action plan for the sustainable management of Lake Kivu and Ruzizi River Basin is developed, (ii) the Nexus Perspective is included in the regional IWRM planning, (iii) the sustainable and Nexus-oriented management of the Lake Kivu and Ruzizi River Basin relating to water quality and available quantity of water has improved. (iv) availability of plans and inventory (v) essential bases for the operationalization of the structure in charge of integrated water resources management in the basin (vi) availability of all corresponding documents as input for policy makers in the region, (vii) regional recognition of effective ownership of integrated water resources management by a structure with the essential managerial skills and tools.

Lake Kivu Monitoring Programme (LKMP): The LKMP has been operational since 2006. Its main objective is to ensure that methane gas extraction is done in a safe and sustainable way. It is the designated body to monitor the ecological impact of industrial developments of Lake Kivu gas resources in Rwanda. In 2008, when the first pilot plant of methane gas extraction started its operations in Lake Kivu, the Ministry of Infrastructure (MININFRA) created a unit in charge of monitoring the impacts of methane gas extraction on the Lake, known as (LKMP). From the beginning, it was supported by the government of Rwanda and various donors to carry out its tasks. In 2012, the unit moved from the Ministry to a new organization called Energy and Water Sanitation Authority (EWSA). Since 2014 it is embedded in its successor, the Rwanda Energy Group (REG)/ Energy Development Corporation Limited (EDCL).

The LKMP has been financed by the Netherlands from August 2013 up to June 2019, with a budget of Euros 8.9 million. The project has 2 impacts, 6 outcomes and 6 outputs with limited duration. However, the activities of the program has to be sustainable and become an autonomous authority operating in all the riparian countries under, or affiliated to, ABAKIR. The program is therefore currently seeking funds to continue with, and expand, its monitoring programs and advisory work.

IWRM Programme Rwanda: The Rwanda Water and Forestry Authority (RWFA) has commissioned baseline study in 2019 aiming at establishing water quality baseline of some selected 36 water bodies in the country. The study was conducted at the nine level one catchments. A set of sixteen (16) parameters were selected for this monitoring activity for each sampling site. These are: Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO), Potential in Hydrogen (pH), Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Turbidity, Chloride (Cl-), Sulfate (SO₄²⁻), Nitrate (NO₃⁻), Total nitrogen (TN), Total Phosphorus (TP), Total Dissolved Inorganic Nitrogen (DIN), Total Dissolved Inorganic Phosphorous (DIP), Faecal coliform (F.C) and Escherichia coli (E.coli). The study results illustrated that the main causes of surface water quality in the country are related to the sedimentation /siltation of water bodies mainly due to soil erosion as well as the microbiological contamination that can be linked to poor sanitation systems and practices. The study recommended further and regular studies.

The proposed alternative scenario with a brief description of expected outcomes and components of the project:

Timely and reliable statistics are considered essential for evidence based policy and decision-making and for better support to policy implementation, monitoring progress and evaluation of outcomes and impacts of development initiatives such as the Sustainable Development Goals (SDGs), AU Agenda 2063, EAC Vision 2050, First National Strategy for Transformation (NST1), and Sector Strategic Plans (SSPs). These initiatives have accordingly resulted in an unprecedented increase in demand for statistics as policy makers and other stakeholders seek information on national development.

The project builds on the Great Lakes Economic Community (CEPGL) goal to promote peace, security and economic development through regional cooperation. The project seeks to strengthen the capacity Lake Kivu and River Rusizi Basin Authority (ABAKIR) in managing the water resources and preserving the biodiversity in the basin. Specifically, the project will improve institutional operations, enhancing water quality monitoring capacity and promote catalytic investment in the water-food-energy nexus. The main innovation in the project is the involvement of the private sector and communities in the monitoring of water quality for regional decision making.

The project objective is “To improve water quality, environmental and economic services of lake Kivu through improved transboundary cooperation”. The main components are (1) enhanced regional and national cooperation, (2) improving water quality management and (3) improved water security in the Lake-Kivu Rusizi basin.

Component 1: Enhancing regional and national cooperation

The main objective of this component is to help the riparian member states identify and put in place mechanisms for resolving the main causes and impacts of poor regional cooperation in the management of Lake Kivu-Rusizi basin at local, national and regional levels. The component addresses the barrier of “inadequate basin wide governance mechanisms”. It seeks to support ABAKIR realise its objective “*develop, adopt, implement and enforce appropriate legal, administrative and technical measures to protect and preserve the Basin’s ecosystems in particular the natural areas protected either by national regulations or by international conventions*”.

The activities under this component will ensure that the regional program for transboundary management of the Lake Kivu Basin resources Sustainable Land, Water, and Fisheries resources management approaches are mainstreamed in the national policies and programs. Through this component, the project will bring together key sector players to deliberate, and make resolutions on, the socio-economic, political and institutional context within which the challenges of regional cooperation in the management of basin resources occur. Key outputs from these deliberations will include, but will not be limited to, basin wide agreements, regional cooperation institutional arrangements, common monitoring standards and possibly harmonisation of the different national policy frameworks. To achieve these goals, regional workshops for national institutions will be organised and supported. Key institutions will include National Environmental Management Authorities, Water, Land, and Fisheries Management Departments, Research Institutions and District Environmental Units. ABAKIR is expected, and will be supported, to coordinate all collaborative activities by organising the meetings and providing secretariat services.

Output 1.1.1: ABAKIR institutional capacity development

Key project deliverables will include:

Regional and basin wide agreements on basin key issues are drafted and signed.

Regional and national information sharing protocol agreed.

Institutional arrangements that support the operations of ABAKIR are agreed, adopted and embedded in national structures.

Common environmental standards for water, air, and fish quality agreed along with common levels of enforcement.

Output 1.1.2: Strategic plan development and adoption

To ensure political oversight and support the following actions will be supported with the view to produce a road map for mainstreaming the regional strategy in the national policy, legislations, and regulations governing land, water, and fisheries resources in the basin.

National Inter-ministerial committees established in all the riparian states.

Ministerial agreed action programs are drafted and endorsed by all riparian states. These are to be officially signed by relevant riparian ministers in readiness for implementation.

Basin wide resource management plans are discussed, agreed and adopted by all three riparian state governments.

A joint basin wide watershed management strategy for water quality is developed and adopted.

Component 2: Improving water quality management

The main objective of this component is to assess and eventually control the extent of pollution loading into Lake Kivu. The component addresses the barrier of “weak legal framework and incentive to increase water quality monitoring in the basin”. The component supports ABAKIR’s objective to “*Prevent or refrain from taking or authorizing any decision liable to cause damage to the quality of the water resource and the environment, and take all necessary measures to protect them*”.

The monitoring program will estimate both point and non-point pollution loads in the basin. The generated nutrient loads in point sources derived from domestic, industries and business activities will be estimated respectively using population, production and basic units. These are divided into two categories: one discharged into the drainage system and the other removed by treatment facilities. Point source runoff nutrient loads will be estimated regularly in the field. In addition, water quality parameters will be measured at different location of the river. Wet and dry deposition of P, K and N will be estimated using field measurements. Atmospheric deposition collectors will be installed at four sites in the basin. In addition, regional data will be collected interpolated and validated using data collected from the four sites. ArcSWAT model will be calibrated and validated using

field information, and simulation will then be run to identify the micro-catchment hot spot areas. To “ground-truth” any remotely sensed data a community based monitoring program will be rolled out thus ensuring that the community in the basin are engaged directly in monitoring activities.

The results from the monitoring program will be shared with a broad audience. Mass media focussing on local FM radios, televisions, brochures, leaflets, posters, newsletters etc., will be used to air public educational programs on the state of the Lake and its constituent rivers. In addition, policy level dissemination will target scientific publications, regional stakeholder seminars and preparation of policy briefs.

In an endeavour to promote gender equality most community based activities shall specifically target the participation of women. The best way to achieve this shall be elaborated at the PPG stage.

Output 2.1.1: Adoption of legal framework for reducing point and non-point sources of pollution

The following activities will be undertaken:

Regional and national information sharing protocol agreed.

Stakeholder education and participation and in on Lake Basin resource management plans (including water quality management plan).

A draft code of good agricultural practices in the basin is prepared and agreed by member states.

Output 2.1.2: Community-based water quality monitoring pilot program implementation in 3 sites (one each for Burundi, DR Congo, Rwanda)

The first task will be land suitability mapping and spatial planning to identify point and non-point pollution hotspots. For identified and agreed hotspots the following will be undertaken:

Community-based land use and water quality monitoring plans are developed.

Catchment and sub-catchments management plans are developed and implemented.

Satellite communication system established and data/information shared among countries, ABAKIR, and the public.

Output 2.1.3: Laboratory for the lake water quality monitoring set up

The existing laboratories for the LKMP will be rehabilitated, re-equipped and revitalised. The key actions will cover:

Technical Assistance to support Human Resource Capacity Development,

Provision of key research laboratory equipment and consumables.

Provision of logistic equipment include field vehicles and research boat for the LKMP.

A water quality monitoring fund is established.

Component 3: Providing catalytic investments in the water-food-energy nexus

The main objective of this component is to demonstrate and incentivise the adaptation of climate smart approaches in the lake basin operations and livelihoods. It aims to address the barrier of insufficient investments and seeks to capitalize on low hanging fruits that can trigger the adoption and upscaling of environmentally friendly approaches to watershed management targeting water quality. The component addresses the ABAKIR objective to *“take any useful measure to maintain and protect the installations, facilities and other structures that have an impact on the water resource of the Basin”*.

This component will target restoration of degraded basin areas as well as minimise further deterioration by promoting “reduce, re-use and recycle” principles. The private sector and communities will be engaged to play leading roles in addressing the environmental, as well as climate change induced, challenges in the basin.

Output 3.1.1: Incentive for private sector to leverage investment

The project will support the assessments and studies that can result in investments in environmental conservation and protection. Key activities will include:

Assessment and recommendations for sewerage treatment systems in major towns on the Lake Kivu shores.

Defining a jointly agreed quantitative pollution reduction targets for the whole lake starting with the prioritized hotspot areas.

Promotion of Cleaner Production Technologies and Sustainable Consumption for industrial effluent.

Constructed wetlands as demonstration sites at selected industries and municipal systems in agreed hot spot areas.

Output 3.1.2: On-the-ground investments for watershed management

Community based action on water and land management will be carried out in agreed “hot spot” catchments. Key activities will include:

District level disaster risk mitigation and management plans are developed (considering the threats posed by methane explosion and landslides due to excessive rainfall).

District and community levels capacity and knowledge for planning and implementing sustainable watershed management intervention are developed.

Participatory land management plans are developed and implemented by communities in the targeted catchments and micro-catchments.

Micro-projects on soil and water conservation, water source rehabilitation and improvements in communities’ access to water are piloted.

Rangelands rehabilitation, afforestation and reforestation, energy saving technologies are implemented for selected areas.

Ecological sanitation toilets are constructed for vulnerable communities to reduce non-point sources of pollution in near-shore areas.

A plastic collection and recycling program is instituted along the entire lake shore.

Output 3.1.43BAT/BEP adopted to reduce chemicals at source

The best available technologies (BAT) and best environmental practices (BEP) of pollution reduction and control measures will be promoted and demonstration in “hot spot” catchments through demonstration pilots that address environmental health risks associated with chemicals and waste pollution. Key natural habitats with significant biodiversity protected. Key activities will include:

A basin wide approach for technological transfer of globally proven BAT/BEP initiatives for targeted chemicals and wastes is agreed.

Dependence on POPS and other agro-chemicals is reduced through integrated production, pest and pollution management

Farming populations and communities adopt BAT/BEP to reduce chemical and nutrient discharges.

Agricultural land area using resource conservation technologies is increased.

Promotion of cleaner production and management of mercury waste from artisanal gold mining.

Component 4: M&E and Knowledge management

The component aims to establish an effective basin wide M&E and KM system on water quality that improves information and data sharing for evidence based decision making. A basin-level participatory M&E system will be designed under the project and managed by ABAKIR. The M&E system will focus on water quality information sharing at local, national and basin levels but will also include environmental and hydro-meteorological monitoring and will be linked to wider regional monitoring networks.

Outcome 4.1: Assessments conducted to supplement TDA and SAP, and better guide decision-making.

The project will build on the outcomes of the TDA and SAP processes and agreements in relation to water quality monitoring.

Output 4.1.1 Capacity building for effective environmental monitoring

The project will seek to build institutional capacity for effective environmental monitoring to guide better decision-making in water quality management, erosion control, pollution reduction, and protection of valuable flora and fauna. The project Key activities will include:

Documentation of regional experiences in water quality monitoring

Selective lesson learning visits to similar regional initiatives such as in Lakes Victoria and Tanganyika

Compilation of successful regional environmental monitoring experiences/practices.

4.1.2 Best practice guidelines and guiding principles for environmental monitoring are disseminated

The activities under this output will seek to improve the knowledge base of key sector players by providing relevant and appropriate water quality monitoring and management guidelines. These will include, but will not be limited to:

Environmental impact assessments guidelines

Water quality assessment guides

Biological and chemical monitoring guides

Environmental flow requirements

Outcome 4.2: Effective M&E, learning and exchange at all levels underpin implementation

An all-inclusive monitoring system is designed and implemented. Key players will be riparian government agencies, local government institutions, educational institutions (including local schools) and specially trained community groups in the sub-catchments.

Output 4.2.1: Participatory M&E system is established.

The system will provide systematic information on progress in meeting outcome and output targets for the project and monitor basin strategy implementation objectives. Key activities will focus on setting up the infrastructure and institutional arrangements for information sharing and will include:

An MoU for water quality monitoring is signed between the three riparian states and a Joint Technical Committee established

A data sharing protocol is designed and agreed by riparian governments.

Set up an early warning system

4.2.2 Knowledge Management strategy prepared and implemented.

This output will focus on information sharing and contribution to IW experience learning (IWLEARN related activities). key activities will include:

Design and development of KM strategy for information sharing and dissemination.

Support for participation in IW-global and regional conferences/meetings

Establishment of ABAKIR water quality monitoring project website.

Support to basin wide regional workshops on the status of water quality in the Lake Kivu basin.

Support to publication of water quality related journal papers and policy briefs on Lake Kivu.

4) alignment with GEF focal area and/or Impact Program strategies;

The main focal area

The proposed project supports the GEF International Water Focal Area goal – “*To support transboundary cooperation in shared marine and freshwater ecosystems*” and falls primarily under objective III which seeks to – “*Enhance water security in freshwater ecosystems*”.

The main entry points are:

IW-3-5 Enhance water security in freshwater ecosystems through advance information exchange and early warning

IW-3-6 Enhance water security in freshwater ecosystems through enhanced regional and national cooperation on shared freshwater surface and groundwater basins.

IW-3-7 Enhance water security in freshwater ecosystems through investments in water, food, energy and environment security.

The key priority areas are:

Common, participatory fact-finding and agreement on cooperative opportunities and shared constraints and a vision for a shared future (such as via the formulation of a common TDA/SAPs),

Processes to formulate and formalize cooperative legal and institutional frameworks, and

Identify and leverage resources for investments addressing SAP identified priorities.

The project will address the multifaceted threats to transboundary freshwater ecosystems by strengthening multinational cooperation and capacitating a regional basin organisations, ABAKIR. It also supports and furthers the regional economic integration agenda by aligning with the goals of CEPGL. These two regional institutions will be assisted to harness, coordinate and channel hitherto individual national political and economic interests into a common vision and strategy for basin wide development. The public and private sector strengths will be harnessed for effective environmental management and resource protection.

The proposed project is fully consistent with the long term goal of the IW focal area and enhances basin wide integrated water resources management (IWRM) as well as strengthens the water-food-energy Nexus initiatives in the basin. By satisfying these developmental objectives, the GEF project will help strengthen multi-state cooperation in the Lake Kivu basin. In addition, the project's focus on comprehensive water quality monitoring will offer the basin stakeholders a baseline upon which to anchor their strategic planning for all subsequent basin initiatives. This is because water quality data provides an integrated indicator covering all activities in the basin without being confined to any specific sector. The project will strengthen multi-stakeholder, multi-sector cooperation, monitoring, knowledge, capacity building, and enabling frameworks that will eventually bring sustainability. The project will be instrumental in catalysing national policy processes, regional harmonisation, stimulating essential infrastructure investments and safeguarding long term engagement strategies at the local, national and regional levels.

Finally, noting that other initiatives, notably the GIZ project, have already laid the groundwork for transboundary cooperation by initiating the development of a SAP for the Lake Kivu basin, the proposed project is focussing on implementation of the regionally agreed national and regional-level action to ensure the health of the shared water bodies, and by default their valuable services, are sustainably managed and maintained in pristine, or near pristine, condition.

Complementarity with other GEF focal areas

The project adopts an ecosystems approach and has complementarity with other GEF Focal Areas, specifically Chemicals and Waste, Climate Change, Land Degradation and Biodiversity. Through the water quality monitoring component, the project addresses the Biodiversity focal area goal to “mainstream biodiversity across sectors as well as landscapes and seascapes” by aiming “to build the capacity of countries to identify, measure, and value natural capital, including biodiversity, and to integrate the understanding of this value into decision making and policy instruments”.

The project strongly links to the GEF CW elements and addresses two specific focal areas; (i) - Strengthen the sound management of industrial chemicals and their waste through better control, and reduction and/or elimination (CW-1-1) and, (ii) Strengthen the sound management of agricultural chemicals and their wastes, through better control, and reduction and/or elimination (CW-1-2).

The project will support the enabling environment for managing harmful chemicals and waste, the management of mercury waste from gold mining in the and the Agricultural chemical and waste pollution control in the Lake Kivu — Rusizi Basin.

Furthermore, it is hoped that the improved monitoring, and adoption of the results in decision making within the basin, will result in reduced pollution to the basin water bodies. Thus, the project addresses the Chemicals and Waste focal area Enabling Activities by assisting the riparian countries in designing Integrated National Planning for MEAs and SDGs particularly targeting the management and disposal of industrial and agriculture chemicals.

Through demonstration pilots in the catchments the project “provides the opportunity for an integrated approach to foster climate smart agriculture and sustainable land management while also increasing the prospects for food security for smallholders and communities that are dependent on farming for their livelihoods” and therefore addresses the CC focal area “The Food Systems, Land Use, and Restoration Impact Program”. Equally, the objective of the Land Degradation focal of “supporting on-the-ground implementation of SLM to achieve LDN” will be realized through demonstrating “arresting and reversing land degradation by involving smallholder farmers and local communities and facilitating a mutually beneficial engagement with the private sector”.

Incremental cost reasoning

5) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing;

Without GEF’s intervention, the observed trend of increasing uses and users of Lake Kivu waters with harmful effects on their qualities will continue, within a framework of community governance that is still embryonic and incomplete. The Lake Kivu is seen more as an economic asset, rather than as a pressured ecosystem that needs to be protected.

Indeed, the Great Lakes region has been marked during the past decade by numerous violent conflicts and great political instability. This has had many negative consequences, including increased poverty and increased pressure on natural resources, including the basins of transboundary rivers. Fortunately, we are witnessing a lull and a desire for reconstruction supported by numerous international institutions in various fields. This is how, from a political point of view, we are witnessing the revival of the Economic Community of the Great Lakes Countries (CEPGL) in order to strengthen peace and ensure the economic integration of the countries of this sub-region and the creation of Lake Kivu and River Rusizi Basin Authority (ABAKIR). specifically dedicated to the sustainable management of the lake. It is in this context of reconstruction that the CEPGL has benefited from the support of many partners including the AFDB, in particular for the preparation of the Regional Ruzizi Development Program (PREDIR). It is essentially an economic development project for which priority projects have been identified including in the field of environmental protection. Many of these projects, notably agricultural, use the waters of Lake Kivu. More specifically at Lake Kivu, many investments have been made, notably in the field of gas extraction.

Without GEF’s intervention, Lake Kivu would not be considered a common good that riparian countries must co-manage in a sustainable manner. The Lake will continue to be seen as only a source of economic opportunity at the cost of environmental degradation and habitat loss. Biodiversity will continue to decline as their habitat and main source of freshwater is polluted, and unsustainably managed. Worse, the millions of inhabitants in the Lake Kivu Basin will become more and more prone to waterborne illness.

With the intervention of the GEF, the Lake Kivu will be managed as a global common good and a particular attention will be paid to the management of the water quality to serve as a ground for improving the ecosystem services of the lake for the benefit of the multiple users and actors involved in its management. This is why the GEF will support through ABAKIR the establishment of a concerted governance framework at the scale of the Lake Kivu basin between the riparian countries. The GEF will consolidate the achievements of the LKMP and extend it to the basin scale while enlarging it with an information system on the state of the waters of the lake. The GEF will promote a community based monitoring and management approach of the lake, in particular with the active participation of grassroots communities, especially those whose activities affect water quality. The GEF will also support the establishment of a catalytic and incentive financial mechanism to attract investments that contribute to the sustainable management of the lake's ecosystems by piloting, and therefore demonstrating, approaches and technologies that have been proven elsewhere but still have not received traction in the Lake Kivu basin.

Project Outcomes	Baseline and Gaps	GEF Alternative Scenario	Additional cost (US\$)
Component 1: Enhancing regional and national cooperation	Supported projects are either sector specific (hydropower) or country specific. The regional projects are broad in scope (PREDIR, GIZ, etc). Whilst they serve the purpose of bringing riparian stakeholders together they may not achieve the goal of strengthening ABAKIR as a regional institution for driving the basin development agenda.	The proposed project aims to address institutional, policy and legal issues that impede cooperation by bringing relevant national institutions to deliberate and come with documented agreements on the way forward. The project seeks to escalate the current initiatives from general consensus building to formally agreed implementation mechanisms.	1,200,000
Component 2 : Improving water quality management	<p>The current baselines focus on environmental or biodiversity related initiatives for specified sites including Gas Extraction Facilities and fragile ecosystems considered at risk. The initiatives are also country specific, not fully inclusive and not regionally coordinated. They are therefore limited in their basin wide impact. They are also project specific and not sustainable beyond the individual projects funding them.</p> <p>There are also sustainability challenges with the current arrangement (LKMP) which was embedded institutionally in one country (Rwanda) and dependent exclusively on external funding.</p>	<p>Developing a basin wide water quality monitoring system provides an integrated and comprehensive indicator for the health of the basin waters. The approach also means the lessons from one country (Rwanda) are shared with the other riparian states. A fully basin wide program will eventually compel riparian states to contribute to the O&M of the joint monitoring system and infrastructure.</p> <p>Bringing more players into monitoring, especially the communities, ensures that the discussion on lake health is escalated and policing responsibilities are devolved to include the local levels.</p>	1,300,000

Project Outcomes	Baseline and Gaps	GEF Alternative Scenario	Additional cost (US\$)
Component 3: Providing catalytic investments in the water-food-energy nexus	<p>Apart from CH4 gas extraction, the participation of the private sector is limited in current conservation efforts. The sector therefore is not taking full responsibility for mitigation and adaptation efforts.</p> <p>The current efforts also either disregard environmental pollution or focus on rehabilitation as opposed to tackling pollution at source.</p>	The proposed project seeks to raise awareness among private, public and community players on the environmental damage being caused to the basin water resources by both economic and livelihood activities and encourage these same players to define solutions to reduce, minimize or eliminate that damage.	2,472,927
Component 4: M&E and Knowledge management	<p>A basin wide participatory M&E system does not currently exist in the Lake Kivu basin for most on-going projects.</p> <p>The lessons from similar basin initiatives have not been mainstream in Lake Kivu projects nor has ABAKIR been accorded the opportunity to learn from such initiatives.</p>	The project presents a first attempt to develop a comprehensive M&E that will hopefully outlast the project as it involves all riparian players. It also provides an opportunity for lesson learning through visits and contact with similar initiatives in the east and southern African regions. An opportunity to create basin specific best practices is also proposed.	490,000

Global environmental benefits

6) global environmental benefits (GEFTF) and/or adaptation benefits (LDCAF/SCCF); and

To deliver global environmental Benefits (GEBs), the GEF should engage with stakeholders to synchronize national and regional concerns, incentives and benefits. The understanding of both national incentives for cooperation and issues of national ownership in the context of regional cooperation is critical for the generation of long term impacts. The project assumption is that by improving the quality of the water and by promoting inter-country cooperation and joint management of the basin as a global common good through strengthening existing institutions and systems global environmental benefits, as defined by the IW Focal Area Strategy, will accrue to the basin in its entirety and foster the integrity of basin ecosystems and of the services they provide locally, nationally and regionally.

Lake Kivu is home to around 28 fish species, half of which are cichlids found only in Lake Kivu. Four species have been introduced to the lake. Lake Kivu is the home of four species of freshwater crab, including two non-endemics (*Potamonautes lirrangensis* and *P. mutandensis*) and two endemics (*P. bourgaultae* and *P. idjwiensis*). Around 142 species of plants, 80 species of birds, 52 species of invertebrates, six species of mammals, six species of reptiles, and five species of amphibians are found in the lake and its basin. The area around the lake is made up of broad-leaved (semi) deciduous evergreen forests/woodland. Some species such as marsh mongoose (*Atilax paludinosus*), water birds, and snakes such as rhinoceros viper (*Bitis nasicornis*) and forest cobra (*Naja melanoleuca*) are considered endangered and are listed on the IUCN red list.

7) innovation, sustainability and potential for scaling up.

Project innovativeness relates to its truly integrated, cross-sectoral, inclusive and participatory nature. First, the project aims to promote private sector engagement to increase cleaner production mechanisms by directly involving them in a common quality monitoring program. By bringing multiple stakeholders together in the monitoring program, and providing a mechanism for openly sharing water quality data, the project builds trust. The common platform enables different interests, including those of the private sector, to be openly debated and reconciled with environmental concerns and national developmental goals. Such openness makes it difficult for private sector players to hide sensitive information while at the same time it encourages them to invest in mitigation actions. This applies equally to the energy companies extracting methane for energy production as for the other firms responsible for industrial effluent from factories in the towns bordering the lake.

Second, the community water quality monitoring program is a key innovation in the African context in that focus for environmental management is shifted from access to, and use of, resources to their protection and preservation. Furthermore, embedding the regional project activities in both the national and local government institutional frameworks will facilitate effective implementation and mainstreaming long after the funded phase of the project is concluded. By allowing the key stakeholders to define the course of action, participate in the data collection and dissemination, the project is promoting ownership by beneficiaries and better dispersal of lessons learned.

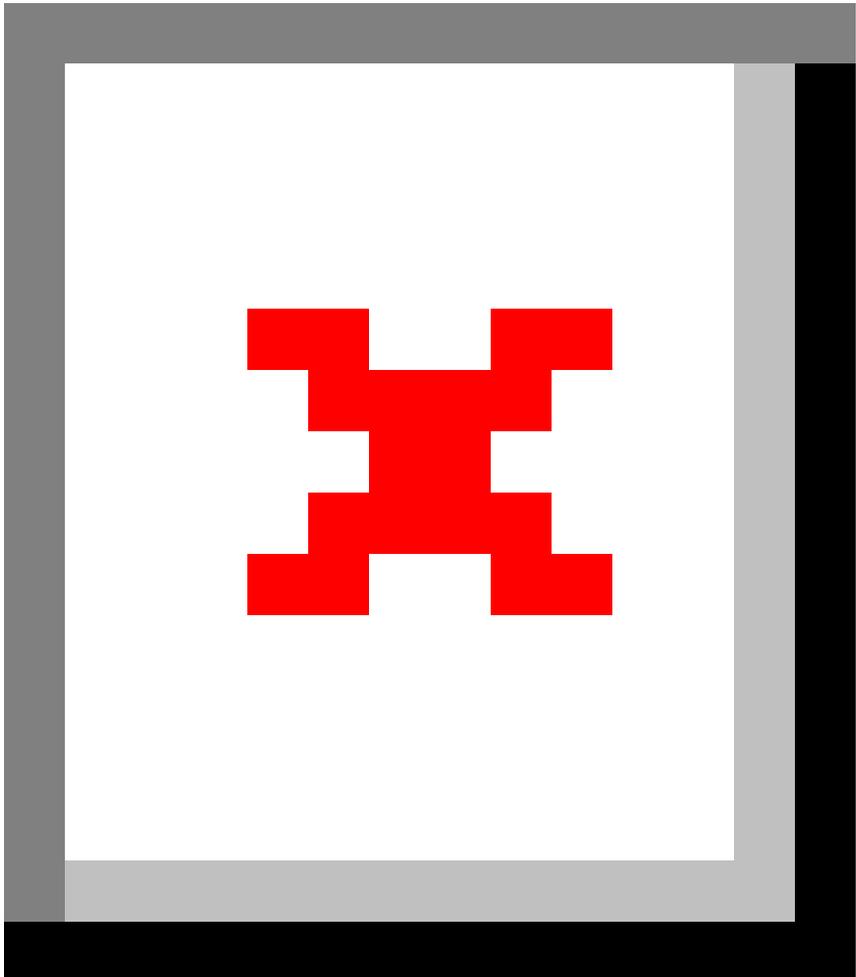
Lastly, the Lake Kivu area has experienced social and political upheaval over the years, the project by fostering cooperation between hitherto adversary countries and communities is helping to bring peace to the region. The innovation here is to use non-traditional conflict resolution mechanisms to address both existing and potential conflicts. Thus the potential impact of the project goes beyond just management of water and environmental resources.

With respect to sustainability, the focus on capacity building at both institutional and community level will not only establish the infrastructure and systems for cooperation, but will also generate lasting knowledge that can be utilized for future replication in other parts of the Great Lakes region. Particularly, as the Lake Kivu is hydrologically linked to the larger Lake Tanganyika, any benefits accruing to lake Kivu will have a positive impact on Lake Tanganyika downstream.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.





2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities Yes

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

The project will save both biodiversity and humans as well as help arrest land degradation. The beneficiaries and main stakeholders of the project will primarily be the communities of the Lake Kivu-Rusizi Basin, the population of which is estimated at 2 million people. There will also be direct beneficiaries downstream in the Lake Tanganyika basin, bringing the total number of beneficiaries to over 10 million.

The institutional stakeholders comprise the ABAKIR itself, the three national governments, district and local authorities of the basin, community groups (including women and youth), and NGOs (international, national). At the national level, energy authorities, service providers, private sector, and the different consumers will be significant stakeholders of the larger investments of the baseline.

The Shared Vision development process will strive for broad-based stakeholder engagement, including the central and local governments, private sector and CSOs as well as the different communities within the basin. A comprehensive dialogue process will be designed to ensure no one is left behind. The values and principles underlying the visioning process will include: full stakeholder involvement in consultations and dialogue; people centered and private sector driven economic growth and effective cooperation between various stakeholders in the Basin; social justice and equity; gender considerations and responsiveness.

Some specific stakeholders to be involved in components will be determined during the PPG stage. These will include: ABAKIR; LKMP, Ministries of Water and Agriculture of both countries; District Councils; Regional Forestry Offices; District Agricultural and Land Husbandry Departments; agricultural universities (for monitoring yields and inputs, etc.), Community based organizations (including gender and youth), and international partners (e.g. International and national NGOs). The table below summarises some of the key stakeholders.

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

Institution/Organism	Description/interest/Role	Engagement
Regional		
ABAKIR	This is an inter-governmental organisation. The convention and the status of THE ABAKIR were signed On 04 November 2014 in Kinshasa. The headquarters of the transitional structure of ABAKIR is Rubavu in Rwanda in the CEPGL building. ABAKIR is the Basin Authority for Lake Kivu.	ABAKIR is the executing agency for the proposed GEF project. The agency acts as convenor for riparian member institutions and the custodian of basin wide agreements of common interest.
Burundi		
The Ministry of Water, Environment, Land and Urban Planning	This Ministry's prerogatives include the design and implementation of national regional development and environmental policy, especially through the definition and implementation of appropriate policies for land planning, natural resources protection and conservation: water, air, forests, wildlife and plant species.	The Ministry has a Directorate-General of Land Management and Environment, which is subdivided into four Departments including the Tourism and Environment Department. The latter is responsible for monitoring and reviewing environmental impact assessments.
The Ministry of Agriculture and Livestock	It develops sectoral policies, strategies, programs and action plans aimed at boosting the agricultural sector of Burundi through the Directorate of Fertilization and Protection of Soils (DFPS), Directorate for the Promotion of Seeds and Plants (DPSP), and Directorate of Plants Protection (DPV)), technical and regulatory oriented structures in charge of the National Policy on agricultural inputs (fertilization, protection of plants and seed/seedlings).	Lead on the discussion and recommendations on non-point pollution sources and use of POPs in agriculture. The ministry also plays a role in ESIA's.

Institution/Organism	Description/interest/Role	Engagement
The Water and Electric Authority (REGIDESCO)	This is arm of government tasked with improving water quality in the country.	Leads the discussion on water quality standards in Burundi.
DR Congo		
The Ministry of Environment, Nature Conservation and Tourism (MECNT)	Its responsibility are to: (i) prepare environmental hygiene standards; (ii) monitor implementation of environmental impact assessments; (iii) control industrial pollution and environmental sanitation.	In the case of ESIAs, the ministry is responsible for granting any project a Certificate of Environmental Acceptability without which no project can be implemented. The ministry will advise on environmental procedures.
Rwanda		
The Lake Kivu Monitoring Program (LKMP)	The LKMP a government program that has been operational since 2006. Its main objective is to ensure that methane gas extraction is done in a safe and sustainable way.	It is the designated body to monitor the ecological impact of industrial developments of Lake Kivu gas resources in Rwanda. It experience is important in formulating and operating sustainable monitoring systems.
Ministry of Natural Resources (MINIRENA)	The main responsibility of the is to: (i) prepare and carry out the monitoring and evaluation of policies and strategies as well as environmental protection; (ii) prepare draft laws and establish standards and practices to ensure rational and effective management of land, the environment, water, forests and mines, and evaluate their implementation.	Provides cross-cutting guidance in natural resources management.
The Rwanda Environment Management Authority (REMA)	Has a legal mandate to organize and carry out the environmental monitoring recommended by the ESIA	Leads policy and guidelines harmonisation.
The Rwanda Development Board (RDB)	Is responsible for approving ESIA reports.	The agency will advise on environmental procedures for Rwanda.

Institution/Organism	Description/interest/Role	Engagement
Rwanda Standards Board (RSB)	Is a public National Standards Body established by the Government of Rwanda, whose mandate is to develop and publish National Standards, carry out research in the areas of standardisation, and to disseminate information on standards, technical regulations related to standards	Helps to define the water quality standards to be followed in the lake waters building on its experience with the LKMP and GEFs.
Local authorities		
Districts and urban settlements	Pollution control and regulation at local level	Support to the monitoring program.
Private Sector		
Gasmeth Energy	Private company. Gas Energy Facility	Catalytic investment and material support to the monitoring program. Also bring in global know how.
ContourGlobal	Private company. Gas Energy Facility	
Non-governmental organisations		
FAO	FAO has been working with governments and other UN Agencies / NGO's, local Communities and Civil Society to promote agricultural production and strive to ensure food security in the Rwanda	Its support focuses on emergency relief and rehabilitation, capacity building and technical assistance, food security and poverty alleviation as well as policy support.
UNDP	Works with the riparian governments and other development partners to build institutional capacity and sustainable development.	Plays a coordinating role with all UN Agencies operating in the riparian states.
Civil Society organisations		
SEPD (Synergie des Ecologistes pour la Paix et le Développement)	A platform of ten environmental and human rights organizations in North Kivu, DR Congo	Expressed fear about the consequences of gas extraction and oil exploration in the lake. Advocates the RDC-RWANDA civil society be actively involved in any environment/social impact assessment to be undertaken before the implementation of oil/gas projects in Lake Kivu. Will lead in the engagement of communities.

Institution/Organism	Description/interest/Role	Engagement
Wildlife Conservation Society (WCS)	BirdLife Partners Association including Burundaise pour la protection de la Nature (ABN) in Burundi and Association pour la Conservation de la Nature au Rwanda (ACNR) in Rwanda, and Horizon Nature, an NGO working in Eastern DRC.	Focus on conservation and biodiversity preservation in the basin area. Will share “cutting edge” knowledge on conservation and monitoring.
The 10,000 women program	Is a worldwide initiative that provides business and management education to underserved female entrepreneurs in developing and emerging markets with the aim to drive greater shared economic growth and stronger healthcare, education and prosperity in the communities where it operates.	Rwanda is one country that is benefiting from this program and its experiences can be replicated in the other riparian countries.

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

The IW project will promote gender mainstreaming from the earliest stages of the project cycle. Noting that major national HIV/AIDs and STD control programmes have been rolled out very early in DRC and also exist in the neighbouring countries of Rwanda and Burundi, a preliminary gender and social analysis, building on these initiatives, will be undertaken as part of the PPG and a set of suitable gender sensitive indicators developed to measure progress throughout the project, so that results are tracked accordingly. The gender analysis will be incorporated into the project design and will define more specifically how gender considerations will be taken into account. Investments will be designed to take differentiated roles, as well as government efforts, into consideration. Needs assessment will be done at the project development phase and be used to define the roles of women and men early on. The knowledge and active involvement of women and youth can make the project more resilient and adaptive to changes, especially in highly vulnerable areas, and increase success rates for the project both in terms of socio-economic and environmental indicators.

Since gender considerations are critical to sustaining development outcomes of investments in shared water systems specific gender promotion activities will be designed for the proposed pilots. These will include, but will not be limited to: producing and analysing gender-disaggregated data throughout project implementation; strengthening the position of women's groups in agricultural production and processing, and in project committees; facilitating

women's access to factors of production; promoting gender-sensitive infrastructure (e.g. irrigation facilities); ensuring equal access by men and women to information, capacity building trainings and awareness campaigns; and gender mainstreaming within institutional capacity building activities.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes

closing gender gaps in access to and control over natural resources; Yes

improving women's participation and decision-making; and/or Yes

generating socio-economic benefits or services for women. Yes

Will the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

There are two private companies that have been tasked with developing and producing methane from Lake Kivu in a safe, efficient and environmentally sound manner thereby reducing environmental hazards posed by the methane concentrations in the lake. The exploitation of the gas reserves is therefore a de-facto baseline project for the proposed IW project, especially against the background of the methane explosion threat explained earlier. A way has to be found to mainstream GEF environmental principles into the on-going work even if its driving motive is not entirely for environmental conservation but profit.

Gasmeth Energy: This is Gas Exploitation Facility set up to distribute compressed natural gas (CNG) throughout the East African region. Gasmeth are an SPV of companies who have complimentary strengths in the Rwandan energy and Petrochemicals sector. They bring together Technical, Financial, Managerial and Operational strengths to take on the challenge of designing an exclusive, sole risk project to safely extract, process and distribute Rwanda's untapped gas resources. The SPV has signed a 25-year concession

agreement with the government of Rwanda for extracting up to 40MMscf/d of Natural gas from Lake Kivu in Rwanda. The project will constructed an offshore gas extraction facility along with onshore gas processing and compression plants for creation of Compressed Natural Gas (CNG).

ContourGlobal: ContourGlobal plc is a power generation business listed on the London Stock Exchange. The company specialises in developing custom solutions from local resources. The company has established a gas exploitation project in Rwanda, KivuWatt, focused on extracting methane from the lake to generate electricity that will expand household access to power, lower costs, and reduce the environmental hazard posed by the gas explosion. The first phase of the project will produce 26 MW of electricity for the local grid. The next phase of the project is planned to produce 75 MW to create a total capacity of over 100 MW for Rwanda (<https://www.contourglobal.com/innovative-technologies>). The KivuWatt project is the only gas/water extraction project currently operating in the world and is anticipated that the innovative methane extraction approaches being piloted in Lake Kivu will be extended to lakes with similar environmental hazards throughout the world.

Small to medium enterprises: Smaller private sector players will be engaged in the project in re-use and recycle activities targeting both solid and liquid waste as well as plastics.

5. Risks

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

The following following main risks have been identified for the project.

Type	Risk	Risk Level	Mitigation measure
Managerial	The weak organisational capacity of ABAKIR makes it difficult to organise regional meetings and prepare agreements.	High	The project will help establish and fund a Project Implementation Unit within ABAKIR which will be handed over at the end of the project.
Financial	The riparian states and ABAKIR have no resources to implement project activities.	High	The request for grant finance is to mitigate this risk. In addition the project will help ABAKIR establish a fund for water quality monitoring to which the private sector and other donors will contribute. Applying the polluter pays principle will help augment financial resources.
	The private sector is not forthcoming with requisite funding to support environmental monitoring.	Medium	The project thrust is also to strengthen regional standards and regulations that compel companies to take responsibility for pollution by applying the polluter-pays principle.

Technical	Deficient technical and institutional capacity for sustainable water quality monitoring and management in the riparian country institutions.	Medium	The project will finance priority capacity-building activities at the regional, national and local levels.
Social	Local population gives higher priority to short-term livelihoods activities than to support for water quality monitoring efforts.	Medium	The project will include incentives for local communities to incorporate water quality objectives into livelihood activities coupled with appropriate information dissemination.
Political	Lack of sustained political commitment to collaboration and joint water quality monitoring program.	Medium	The project will be executed through ABAKIR working through existing national institutions to spread benefits, costs and basin wide responsibilities.

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

The project will be executed by ABAKIR, who will be the main institutional beneficiary, and will build on, and improve, the water quality monitoring program started under the LKMP. It will seek to bring relevant stakeholders and government agencies responsible for water quality monitoring in the three riparian states. The AfDB will be the implementing agency. It is envisaged that a Project Steering Committee (PSC) comprising ministerial representatives, at the director level or above, from the riparian states, ABAKIR, the AfDB, the African Water Facility (AWF) selected representatives from both multi-lateral and bi-lateral agencies operating in the three riparian states, selected NGOs and CBOs will be established to oversee the implementation of the project. The exact institutional arrangements to achieve joint monitoring will be worked out in detail at the PPG stage. The AWF and the AfDB-GEF Unit will jointly manage implementation of the PPG.

The project will link with ongoing initiatives and other partners operating in the Lake Kivu-Rusizi Basin by learning from lessons and building on achievements, thus supplying additional knowledge and tools on adaptive ecosystem-based transboundary management. During the PPG phase, in-depth consultations will be undertaken with identified organizations (including ABO, IUCN) to establish potential partnerships and modalities for linking collaborative initiatives so that continued progress is made.

The GEF IW project will also be informed by lessons learned from the implementation of a number of projects supported by the AfDB, the World Bank and other donors in the COMESA and SADC regions. These projects include the Nile-Basin Initiative, The Lake Tanganyika project, The Lake Victoria Project, the Shared Watercourse Support Project for the Buzi, Ruvuma and Save River Basins and the SADC Open and Distance Learning Capacity Building Project.

In addition to the broader experiences outlined above, the project will seek to build on, and complement, the outcomes of the projects implemented in the riparian countries and in the wider Lake Tanganyika basin. Other than the GIZ project (presented elsewhere) on which the proposed project directly builds, these are summarised below.

Human Resettlement and Environmental Protection (MINITERE) and the Ministry of Agriculture, Livestock and Forestry (MINAGRI). This was a world Bank led GEF multifocal project executed by three ministries in Rwanda being the Ministry of Lands. It was a three phased project spanning a period of 14 years starting in 2001 and ending in 2014 with a budget of US\$ 141 million. The government of Rwanda contributed US\$ 500,000 in kind whilst the WB co-financing focused on the Rural Sector Support Programme (RSSP) as the project baseline. The GEF financing aimed to promote conservation and sustainable use of natural resources in critical upland watersheds and wetlands of international significance in Rwanda by promoting integrated approaches to the management of critical ecosystems. The expected outcome was that such actions would in turn increase opportunities for improving rural livelihoods on a sustainable basis while, at the same time, rehabilitating and conserving the natural resource base.

Reducing Vulnerability to Climate Change by Establishing Early Warning and Disaster Preparedness Systems and Support for Integrated Watershed Management in flood prone areas.

This is a GEF LDCF supported project implemented in Rwanda jointly by the UNEP and UNDP with Ministry of Natural Resources as the executing agency. A total of USD 7,041,000 was allocated to the project which was initiated in 2008. The overall objective of the project was to reduce the vulnerability of the Gishwati ecosystems and its associated Nile-Congo crest watersheds, and the people that derive their livelihoods from it, to increased floods and droughts due to climate change. The project components were (i) Climate Risk Assessment and Forecasting, (ii) Climate change adaptation planning and response strategies, (iii) Demonstrations of adaptation practices in the Nile-Congo crest watersheds and Gishwati ecosystem, and (iv) Knowledge Management, Public Awareness and dissemination of lessons learned and best practices.

The main outputs include (i) Enhanced early warning system which allows for climate change predictions, (ii) Data coordination network is established through inter-agency coordination mechanism for hydro-meteorological information, (iii) Disaster response plans are prepared and capacity to implement them is developed, (iv) Science/Policy exchange forum is established through interchange platform between hydro-climatic network and policy makers, (v) Land use management practices adjusted for anticipated climate change risks, (vi) Capacity development program for communities formulated based a CC adaptation capacity needs assessment, and (vii) Platform for national learning and sustainability established.

Watershed Approach to Sustainable Coffee Production in Burundi

This GEF project was led by the WB and executed by The Ministry of Water, Environment, Land Management, and Urbanization in Burundi starting in 2011. It covered the focal areas Land Degradation and Biodiversity for a total budget of US\$21,5 million. The main components were (i) Biodiversity friendly sustainable coffee production in priority watershed, (ii) Sustainable coffee processing and watershed management, and (iii) Biodiversity Friendly and Sustainable coffee marketing and certification along coffee value chain. The GEF financing supported the following outputs (i) Program on shade-grown coffee and integrated pest management implemented, (ii) Regulations making mandatory the preparation of municipal land-use plans prepared, (iii) Payment for environmental services program introduced in forest lands, (iv) Management plan for new Protected Areas completed and implementation started (in priority wetlands), (v) Sustainable coffee certification program developed, i.e. organic , fair trade, biodiversity friendly, certification of

origin, (vi) Market study for the potential of coffee to access niche markets and diversification strategies completed, and (vii) Capacity-building program for coffee cooperatives and private sector completed.

The Restoration Initiative, DRC child project: Improved management and restoration of agro-sylvo-pastoral resources in the pilot province of South-Kivu

FAO implemented this project in the Dr Congo through the Ministry of Environment, Nature Conservation and Sustainable Development (MEDD) for a total budget of US\$ 15,981,530 and a GEF allocation of US\$ 3,600,000. The project was multifocal and targeted GEF focal areas of Land Degradation, Climate Change Mitigation, Biodiversity and Sustainable Forest Management.

Developing Detailed Regional and National Project Proposals and Financing Mechanisms to Implement the Lake Tanganyika Strategic Action Programme.

This was a regional project supported by the GEF in the wider Lake Tanganyika basin in which the riparian countries for Lake Kivu basin participated. The project was building on an earlier project entitled, “Pollution Control and Other Measures to Protect Biodiversity in Lake Tanganyika” which was implemented from July 1995 to July 2000 for a total budget of US\$ 10 million. The beneficiary countries were Burundi, the DR Congo, Tanzania and Zambia. As a follow-on program, the project helped the riparian states prepare a SAP and the TDA, as well as a draft Convention – The Convention on the Sustainable Management of Lake Tanganyika. This project was implemented from 2001 to 2005 as an international waters project led by the UNDP and executed by UNOPS for a total budget of US\$ 595,000 and co-financing of US\$ 73,000 from the AfDB.

Regional Lake Tanganyika water management project

The ‘Lake Tanganyika Water Management’ project aims to sustainably improve the management and control of the cross-border waters of Lake Tanganyika. This 4-year project is entrusted to Enabel and is financed by the European Union as part of a regional programme. The preservation of the quality of water resources of Lake Tanganyika is indeed of key importance for the region’s future, both for maintaining biodiversity and the region’s social and economic development. A transnational approach is required to achieve this. The project aims to support the Lake Tanganyika Authority (ALT), a regional group including Burundi, the Democratic Republic of the Congo, Tanzania and Zambia, in its mandate and duties to promote the protection and good management of water resources of the Lake and its tributaries. The project will be based in Bujumbura (Burundi), but it will target, via pilot projects, a lakeside city in each of the four countries concerned. Rwanda is also involved in this project because it borders the Ruzizi River, which eventually flows into Lake Tanganyika. The pilot projects comprise specific urban pollution reduction actions (liquid and/or solid waste). To strengthen the ALT’s role, the project will develop lake water quality control and monitoring tools, will put in place a series of pilot actions to reflect and share experiences and in some cases replicate similar actions in the project’s target cities and along the Lake and will strengthen the capacity of the ALT in its coordinating and supporting role for water resources management actors.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

The project is consistent with regional and national priorities. The three countries came together to form the The Great Lakes Economic Community (CEPGL) to promote peace, security and economic development through regional cooperation. As individual countries they have policies and plans that seek to safeguard the environment and improve the welfare of their citizens.

Programs of the Economic Community of the Great Lakes Countries (ECGLC)

The ECGLC has several projects targeting different sectors in which the constituent members have common interests.

Regional integration: The CEPGL launched the Regional Economic Programme (PER) with financial support from the AfDB through the African Water Facility (AWF) to finance the Regional Integrated Development Programme for the Ruzizi (PREDIR) as described earlier. All developments in the basin are guided by the PREDIR of which the flagship project is the Ruzizi Plain Planning Master Scheme (SDAR). Under its Component 4 – “Preserving the environment and developing ecosystem resilience to climate change” the SDAR has a Sub-component for strengthening the monitoring of water resources. The proposed project directly contributes to three actions of this sub-component, namely (i) Action 4.1: Strengthening the water resource monitoring system, (ii) Action 4.2: Rehabilitation and extension of the hydrological and meteorological network in the Ruzizi plain, and (iii) Action 4.3: Strengthening control of water pollution and other prevalent diseases.

Energy: The ECGLC formed the Energy of the Great Lakes Countries (EGL), an entity responsible for tripartite energy cooperation within the institution. Through the EGL the three countries have submitted a request to the African Development Bank (AfDB) Group to finance preparatory activities for the implementation of Ruzizi Hydropower Plant Project IV. The Bank has raised EUR 8 million in the form of a grant from the European Union’s Africa Investment Platform (EU/AIP). Ruzizi IV is one of the priority energy infrastructure projects identified by EGL, ECGLC and the Economic Community of Central African States (ECCAS). A pre-feasibility study was conducted in 2010 on Ruzizi Project IV. As envisaged today, the Ruzizi IV hydropower plant will have a capacity of 287 MW that will enable it to fully tap the available hydropower potential of 500 MW on Ruzizi River where two power plants are already in operation, Ruzizi I (29.8 MW) and Ruzizi II (43,8 MW), and another is being constructed, Ruzizi III (147 MW), with Bank support. Needless to say water quality monitoring, in combination with hydrological monitoring, is a pre-requisite for the effective operation of such investments.

Joint basin management: The ECGLC established Lake Kivu and River Rusizi Basin Authority (ABAKIR) with support from the European Union (EU) as described earlier. The main objective of ABAKIR supported by this project is stated as: *“Prevent or refrain from taking or authorizing any decision liable to cause damage to the quality of the water resource and the environment, and take all necessary measures to protect them.”*

National level policies and plans. The riparian countries individually have policies and plans that support regional cooperation, protection of the environment and improvement of livelihoods for which the proposed project is a natural fit.

Burundi: The National Water Master Plan (PDNE) has defined the country's current priorities as: (i) rehabilitation of drinking water supply systems which could considerably increase access to this commodity; (ii) construction of new systems in areas with the most significant shortage so as to reduce regional disparities (iii) integrated management of the country's water resources through integrated multipurpose information systems; (iv) improved hygiene and sanitation; and (v) encouraging the private sector to invest in the sector to ensure its sustainability. Furthermore, the country has since 2010 been working to better manage its watersheds in order to protect water sources and increase available supply for domestic purposes, through the development of an Integrated Water Resources Management (IWRM) plan.

DR Congo: Against the backdrop of recurrent internal conflict the country has not developed a consistent strategy for water resources management. However, the National Strategic Development Plan (2017–2021) has the goal that 65% of the population has access to a safely managed water supply and 45% to safely managed sanitation. In support of this goal the country passed a National Water Law in 2015. The new law based on IWRM principles and the management of water resources at the river basin scale as well as lays the foundation for new reforms and sector policies. The law calls for a dedicated Water Ministry, with an independent regulator for water and sanitation services and shifts responsibility for infrastructure to the provincial level whilst allowing for private sector participation in water services.

Rwanda: The National Policy & Strategy for Water Supply and Sanitation Services acknowledges the runoff impact of unmanaged storm water on people and environment noting that missing or badly maintained infrastructure causes erosion of usable land, increases flooding, and endangers private and public infrastructure. The policy recognises that combined with poor liquid and solid waste collection in urban settlements, runoff carries pollutants such as hydrocarbons, heavy metals, bacteria, sediment, pesticides and fertilizers into streams or groundwater threatening environmental health. Objective 7 of the policy seeks to “Enhance storm water management to mitigate impacts on properties, infrastructure, human health and the environment.” The key activities advocated under this objective include (i) build the institutional and regulatory framework for cooperation and support in storm water management, (ii) minimize the pollution of water resources, (iii) clarification of responsibilities for preventive and emergency actions, (iv) the harmonization of laws and regulations, (v) the identification of management gaps, and (vi) the initiation of joint planning and coordination mechanisms.

8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Knowledge management, information sharing and best practice exchange will be important elements and will be included as project outcomes and outputs. Knowledge products and communication materials produced by the project, including training tools and publications documenting best practices, will be widely shared to stakeholders through the project and/or partner information avenues. The project will produce knowledge products on key innovations developed and implemented, such as community based water quality management and transboundary cooperation in the water sector. An M&E system (gender sensitive) will also be set up along with a communication plan to enhance the knowledge management aspect. Project experiences and lessons from joint management, public participation and environmental education on transboundary waters will be promoted in cooperation with GEF IW:Learn website and its networks, possibly even associated events, where the project and its results can be presented. Furthermore, the project can be featured on AWF, NEPAD, and AfDB communication tools. Stakeholder consultations will include regular information exchange.

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Mr. Emmanuel Ndorimana	Permanent Secretary	Ministry of Environment, Agriculture and Livestock	3/20/2020
Mr. Godefroid Ndaukila Muhinya	Directeur-Chef de Service de la Direction de Developpement Durable	Ministere del'Environnement et Developpement Durable	3/20/2020
Eng. Coletha U. RUHAMYA	Director General	Rwanda Environment Management Authority (REMA)	3/20/2020

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

