



Project Information Document/ Integrated Safeguards Data Sheet (PID/ISDS)

Concept Stage | Date Prepared/Updated: 05-Oct-2018 | Report No: PIDISDSC24609



BASIC INFORMATION

A. Basic Project Data

Country Africa	Project ID P165749	Parent Project ID (if any)	Project Name Lake Tanganyika Environmental Management Project (P165749)
Region AFRICA	Estimated Appraisal Date Mar 12, 2019	Estimated Board Date May 31, 2019	Practice Area (Lead) Environment & Natural Resources
Financing Instrument Investment Project Financing	Borrower(s) Tanzania Ministry of Water and Irrigation, Burundi Ministry of Water, Environment, Land and Urban Planning, Zambia Ministry of National Development Planning, Ministry of Environment, Nature Conservation and Sustainable Development	Implementing Agency Lake Tanganyika Authority	

Proposed Development Objective(s)

To contribute to the establishment of sustainable integrated watershed and fisheries management in the Lake Tanganyika Basin, while strengthening regional and national institutional framework and capacity to manage natural resources.

PROJECT FINANCING DATA (US\$, Millions)

SUMMARY

Total Project Cost	117.50
Total Financing	117.50
of which IBRD/IDA	117.50
Financing Gap	0.00

DETAILS



World Bank Group Financing

International Development Association (IDA)	117.50
IDA Credit	117.50

Environmental Assessment Category

B - Partial Assessment

Concept Review Decision

Track II-The review did authorize the preparation to continue

Other Decision (as needed)

B. Introduction and Context

Regional Context

1. Lake Tanganyika is the second largest lake in the world, by volume holding 17% of the liquid freshwater on Earth. The Lake Tanganyika Basin (LTB) is estimated to house around 12 million people, about a million of whom are dependent on the roughly 200,000 tons of fish produced annually from the lake. The lake represents a unique and valuable natural resource for riparian countries and is a world-renown center of evolutionary diversification, hosting more than 250 endemic fish species. Lake Tanganyika is described as a ‘biodiversity hotspot’ because of its critical contribution to global biodiversity. The LTB also holds important terrestrial biodiversity and great ape populations, supporting substantial nature-based tourism industry.
2. The lake is shared by four countries – Burundi, Democratic Republic of the Congo (DRC), Tanzania and Zambia. The shoreline is 1,828 km, of which 43% belongs to DRC, 37% to Tanzania, 11% to Zambia and 9% to Burundi. Except for parts of the eastern and northern coast, Tanganyika is confined by the steep sides of the rift valley, the most prominent on its western edge reaching 2,000 meters above the shoreline. This factor limits the lake’s catchment area to approximately 231,000 *km*². Tanganyika’s catchment area is shared by five countries: Tanzania – 67%, DRC – 16%, Zambia – 7%, Burundi – 6%, and Rwanda – 4%. Rwanda is in the upper catchment draining into Tanganyika through the Ruzizi river. Tanganyika is located at an elevation of about 772 m above mean sea level in the Western part of the Great Rift Valley. With a length of 673 km, it is the longest lake in the world. It averages 50 km in width (72 km at its widest) and has surface area of 32,900 *km*². It is the world’s second deepest lake (1,471m). A map of the LTB is provided in Annex 1.
3. As the region’s population is growing, environmental pressures on the LTB ecosystem are building up. All Tanganyika ports face access issues due to draft limitations from accumulated sedimentation. A 2016 World Bank study¹ clearly demonstrated that the loss of draft experienced by vessels is “caused by massive siltation mainly

¹ Port Access in the Lake Tanganyika: Key Challenges and Recommendations, World Bank, 2016, <http://documents.worldbank.org/curated/en/579761517257429349/Port-access-in-the-Lake-Tanganyika-key-challenges-and-recommendations>



due to land and coastal erosion". Agricultural and pastoral activities have led to increased land cover loss, bank erosion, sedimentation, increased peak flows, decreased baseflow, and contamination of groundwater sources. Impacts include increased sewage dumping including communal septic systems from cities such as Kalemie, Uvira (DRC), Bujumbura (Burundi), and Kigoma (Tanzania). Many of the hotspots are currently concentrated in the northern portion of the watershed.

4. Overfishing, pollution and rising water temperatures have led to a drastic reduction in the fish stocks of the commercial fisheries in the pelagic zones of the lake. Subsistence fishing is exerting increasing pressure in the littoral fishing grounds adjacent to the main population zones in the north. Declines in catch have long been attributed to overfishing and lack of adequately enforced regulations. Recently, the problem of fishing overcapacity – excessive means to capture and handle allowable catch – has been determined by the riparians and led to the development of specific measures, which are not adequately enforced.
5. While the environmental situation across the lake and its basin continues to deteriorate, it should be noted that the vastness of Tanganyika, its mere physical dimensions help absorb and mitigate known environmental impacts to a certain degree. For example, the quality of water across the lake remains relatively good. Nevertheless, existing trends in deforestation, sedimentation, overfishing, pollution exacerbated by climate change impacts such flooding, soil erosion, and drought, if unattended will lead to an ever-increasing pace of the deterioration of environmental conditions and overall degradation of Tanganyika. The growing scarcity of fish resources will likely deepen the vulnerability of communities and growth in social tensions. At this stage, it is still possible to design and implement measures to improve the management of Tanganyika and its basin instead of delaying the action until the lake reaches the state when it requires rehabilitation. A preventive approach also helps to resolve problems while they are still manageable, and the resources required to this end are reasonable.
6. To address this portfolio of environmental and economic problems in LTB in a timely and cost-effective manner, the World Bank has launched a two-track approach focusing on connectivity and sustainability. While the Lake Tanganyika Transport Project (LTTP) works on the connectivity aspect, this Lake Tanganyika Environmental Management Project (LTEMP) simultaneously aims to resolve the sustainability gap in two major areas of environmental concern – watershed and fisheries management – and to strengthen regional dimension of Tanganyika's management by the riparians.

Sectoral and Institutional Context

7. The riparians recognize the importance of Tanganyika and challenges that it is facing. To address them jointly and on a regional basis, Burundi, DRC, Tanzania and Zambia signed the Convention on the Sustainable Management of Lake Tanganyika that entered in force in 2008. The Convention is built on the general principle of participation when "concerned and affected natural and legal persons and Lake Basin communities must be given the opportunity to participate, at the appropriate level, in decision-making and management processes". The Convention addresses several aspects of the lake's management relevant to LTEMP, including (a) sustainable fisheries management, (b) prevention of sedimentation, and (c) environmental impact assessment. The Lake Tanganyika Authority (LTA) is the implementing body of the Convention and consists of the Conference of Ministers, the Management Committee, and the Secretariat, based in Bujumbura.
8. In 2012, riparian countries developed a Strategic Action Program for the protection of biodiversity and the sustainable management of natural resources in LT and its basin. The strategy aimed to address problems in a systemic manner and identified six main priorities. These priorities are: (a) adaption and resilience to climate



change impacts, (b) sustainable fisheries, (c) sustainable land management, (d) protection, restoration and management of critical habitats, (e) control and prevention of biological invasions, and (f) reduced pollution and improved water quality. LTEMP focuses on two top priorities from the list: (i) sustainable land management or more specifically watershed management and (ii) sustainable fisheries – as the core areas of the project. In addition, project's nature, scope and activities will contribute to enhancing resilience of communities and ecosystem to climate change impacts.

Watershed degradation and lake sedimentation

9. Sedimentation due to soil erosion is an escalating problem across Tanganyika. This is most evident in the northern area where 100% of adjacent lands have been cleared of native vegetation, where urbanization and farming are the most intensive. Limited flat lands in the catchment compound the problem by dictating that farming occurs on steep slopes or narrow strips between the rift escarpment and the lake. Much of Tanganyika's coastline is high escarpment falling directly into the water. The lake ecosystem faces an array of challenges created mainly by increasing human populations and the changes in land use. Recent rapid population growth and intensified human activities, which have induced changes in land use patterns and deforestation in the LTB, have resulted in an increase in soil erosion and sediment loads transported by rivers into the lake. Rivers near the ports are the main source of sediments. The lack of proper maintenance dredging and sediment management is the main cause for the difficulties in accessing the ports due to shallow water depths.
10. Erosion is of the highest concern in medium size catchments (50-4,000 km²), where the sediment load is discharged into the Lake without the mitigating effects of major wetlands. The movement of sediments that are transported by currents within the lake can affect areas up to 10 km away from rivers. This brings higher than usual amounts of suspended matter into the lake threatening its biodiversity and reduces depth in nearby ports leading to disruption in navigation. Furthermore, as vegetative cover is removed, weathering processes increase, and soil nutrients are lost through runoff. This can lead to rapid and significant losses of soil fertility in the catchment prompting opening of new agriculture fronts into intact natural protective forest cover. The loss of topsoil in combination with tectonic and wind activities in the LTB often lead to landslides. This results in damage to buildings and loss of lives but also increased sedimentation, further exacerbating navigation problems and bringing other adverse effect on littoral fisheries. This littoral zone is most threatened by poorly managed coastal development. The transport of soil results in the reduction of water transparency and decrease of habitat quality with a detrimental effect on aquatic species diversity and their densities. The highest biodiversity is situated in those littoral zones.
11. Several severe hotspots of pollution, land cover degradation, gully and sheet erosion which have led to sedimentation hotspots and water quality decline have been identified. To some extent, the whole watershed is experiencing land degradation. Gully and sheet erosion is accelerating across the entire basin with multiple fingers spreading through the rural and urban landscape with harmful impact on drinking water quality, fisheries and port sedimentation (see map of forest cover loss in Annex 2). Soil erosion happens locally and is directly connected to local socio-economic and environmental management conditions. It also depends on the individual abilities of riparian states to resolve this problem. However, the effects of soil erosion have regional implications in the form of sedimentation and nutrient runoff which, in their own turn, affect transport, water quality, people's livelihoods, and fisheries – all having regional standing.
12. These interwoven challenges require regional and integrated solutions. However, institutions, information, and incentives are fragmented throughout the region, weakening the ability of governments and communities to



address them in a holistic manner. The sustainability of engineering and dredging solutions to erosion and sedimentation demands embracing an integrated watershed management approach and ensuring community engagement.

13. The main constraints that delay the resolution of these problems include: (1) unclear and overlapping mandates of institutions responsible for catchment management and insufficient technical capacity in these institutions; (2) incomplete or inadequate response such as overemphasis on civil engineering interventions without addressing water flows and sediment influx; (3) absent or weak land-use planning; (4) weak regulations, regulatory non-compliance and lack of enforcement contributing to growing negative impacts of open-access and overcapacity in fishing and externalities such as pollution; (5) weak community involvement in prevention and restoration activities; (6) insufficient attention to alternative livelihoods, and (7) lack of attention to transparent governance, anticorruption measures, and local participation.

Fishery issues

14. The fishery sector plays a significant role in social and economic development in the LTB by contributing to the economic and social wellbeing of people providing a supply of protein, income generation, employment, and food security. One-tenth of the 12 million people living in the LTB directly depend on fishery resources of the Lake, about 100,000 of them being fishermen. In some cases, estimated fishing-derived incomes in the artisanal sector rank well above estimated national working age population per capita annual income levels. Among post-harvest operators, strong gender-related discrepancy is widely apparent, with men earning at rates above national working age averages and women earning at rates well below.
15. Tanganyika fisheries face many threats including breeding ground loss and/or modification due to sedimentation and human encroachment, over-fishing in the littoral zone, use of illegal fishing gears and dynamite. Certain commercial fisheries have reported declines in catch per unit effort (CPUE) (an estimator of fish abundance) of close to 90%. Progressive CPUE decline and increased duration of fishing trips in the industrial fishery in southern waters indicate a decrease of the catchable stock, owing to uncontrolled growth of the industrial fishery sector. It has been reported that between 1995 and 2011, the total fish stock decreased by 25%.
16. Some researchers have also pointed to climate change influence exacerbating the loss of stocks by strengthening thermal stratification, which reduces the recycling of nutrients to surface waters². United States National Academy of Sciences researchers concluded that thermal stratification reduces the recycling of nutrients to surface waters. It is also suggested that declines in catch can be attributed to overfishing due to the lack of enforced regulations constituting a barrier to fisheries conservation and management. Other factors include (i) inadequate use of the scientific information in decision-making processes, (ii) weak transboundary legal and policy framework between the four riparian countries, and (iii) minimal scaling-up and application of best practices for integrated management of natural resources that balance conservation with sustainable land and water management.
17. Constraints to sustainable fisheries management on Tanganyika also include resource access issues, local participation, inadequate infrastructure and equity issues. Tanganyika fisheries basically operate under an open access regime: under broad conditions associated with national territorial partitions, everyone is free to fish. This leads to overexploited resources and declining returns for all participants, because it is characterized by a race to fish in which all participants strive to catch as much of the resource as they can before competitors. Rising

² Climate warming reduces fish production and benthic habitat in Lake Tanganyika, one of the most biodiverse freshwater ecosystems, PNAS, August 23, 2016, <http://www.pnas.org/content/113/34/9563>



population pressures within and without the lake basin are bound to exacerbate matters. Underdeveloped post-harvest infrastructure leads to significant post-harvest losses and waste – up to 30%³.

18. Local participation in management decision-making has been minimal, although existing legislation in some cases provides for consultation between administrators and local representatives of fisher interests, and even though fisher committees are reported to exist at various landing sites. Management approaches across the four national sectors of Tanganyika are established in the classic ‘top-down’ model, featuring a high degree of state control over all aspects of fisheries affairs.
19. Equity concerns include poor working conditions for ordinary fishing workers and arbitrary behavior of some employers. Tensions also exist in relations between traditional fishers and the industrial purse seine fishery. Purse seiners are widely blamed for declining catches in the Zambian sector, and overwhelming support exists for imposing restrictions on their operation. There is a sense that fishing companies are treated preferentially, at the expense of small-scale fisher interests.
20. The gender dimension of socio-economic inequality is expressed in terms of educational attainment and estimated income measures. Women seem to have little voice in public deliberations on fisheries issues considering their actual level of participation in Tanganyika fisheries as workers, processors, traders, and even occasionally as boat and gear owners. Women play a vital role in regional value chains, including in upstream production of goods and in downstream trade and retailing. Although fishing is predominantly carried out by men across Tanganyika, women are still actively involved in regional value chains, and almost all traders selling fish and agricultural products in the local markets at Mpulungu (Zambia) and Kasanga (Tanzania) are women. Women are extensively involved in market trade at port and border locations and are the main producers of agriculture goods, including dried fish, fresh vegetables, palm oil, and other goods traded with DRC. The same applies to Zambia’s small-scale trade at land borders: estimates indicate that, on average, up to 70-80% of the traders active in the business are women. The LTEMP will use the PROFOR publication on Gender and Forests⁴ that suggests designing activities and take actions aimed at (a) reaching women and other targeted groups, (b) ensuring that they benefit in a more equitable manner, and (c) ultimately empowering them.

Institutions, legislative frameworks and efforts to find solutions

21. The riparians identified the problem of fishing overcapacity as one of the main drivers of declining fish stocks. The Regional Plan of Action for the Management of Fishing Capacity in Lake Tanganyika of 2016 (RPOA-Capacity) informs that the fishing capacity has grown exponentially leading to declining stocks and increasing conflicts. According to the surveys between 1995 and 2011, the number of fishing vessels grew from 1,264 to 3,336, and the number of fishers increased from 13,192 to 28,212. The riparians adopted a set comprehensive measures addressing the problem of declining fish stock spanning from governance to alternative livelihoods to regional cooperation. Until now, however, due to the lack of funding, the plan still has not been implemented.
22. The Lake Tanganyika ecosystem needs to be managed as a unitary whole and management must be based on the regional basis. Mesh size restrictions on seining in one country will be of limited utility if the fishers or gear suppliers of an adjacent country are not subject to the same measures. Despite their participation in the FAO

³ A Study of the Lake Victoria/Tanganyika Fish Trade, The World Bank Group, July 2018.

⁴ Gender in Forest Landscape Projects – Actions and Indicators. February 2018.

<https://www.profor.info/sites/profor.info/files/In%20Brief%20Gender%20in%20Forest%20Landscape%20Projects-Actions%20and%20Indicators.pdf>



Committee on Inland Fisheries and Aquaculture of Africa (CIFAA), no provision exists in legislation of the riparians to guide resource use and conservation on an internationally shared basis.

23. All participant states are nominally committed to fisheries policies that emphasize socio-economic welfare objectives, consistent with the need to use resources in a sustainable, conservation-wise manner. However, the institutions meant to realize these objectives face budgetary problems. National fisheries departments and research agencies are chronically under-funded. Research agencies are unable to maintain credible scientific monitoring programs to act as technical advisors on sound management and conservation practices. Fisheries departments cannot afford adequate human and material resources for monitoring, control, and surveillance and provision of extension services. Fisheries monitoring and information processing capabilities at some of the lakeshore stations remain weak.
24. Existing legislation on fisheries is in many respects obsolete. Umbrella-type legislation that establishes broad regulatory powers for the LTA to exercise on the national basis needs to be supplemented with specific regulations to match the circumstances of Lake Tanganyika. Enforcement and compliance assurance are other major areas of legal deficiency. Fisheries regulations in all four lake states are often ignored in practice due to inconsistent and irregular enforcement. The problem circles back to the financial constraints for regional fisheries authorities.

Climate change and resilience

25. Research has shown that the fluctuation of the fish population in Lake Tanganyika is not solely attributable to overfishing but follows the natural warming and cooling cycles of the lake, and that the decline in fish stocks had started well before commercial fishing (1950s) in relation to the ongoing rise in surface water temperature that begun a 150 years ago. Lake Tanganyika's ecosystem is highly sensitive to climatic conditions and its productivity dependent on hydrodynamic states and climatic conditions particularly temperatures and wind. Temperatures in Lake Tanganyika's waters have increased by 0.2 C° at 1,000 m in depth, in part because of reduced cool marginal inflows, while water surface temperatures have increased by about 1.3 C°. The difference in density between much lighter surface water that holds oxygen and cold water that holds nutrients prevents the upwelling process that mixes the water to normal depths such that oxygen can no longer go as far down, and fish food does not come up, leading to dwindling fish population. Paleocological data also suggests that climate warming and intensifying stratification have been important in rapidly altering both benthic and pelagic components of the Lake Tanganyika ecosystem.
26. Given the current trends of warming, the lake stratification will get stronger and the productivity will continue to be affected. If the warming continues, and the fishing is not regulated, sustainability of the fisheries will be at risk. It is thus imperative to start thinking about alternative livelihoods for people in the region. Forecasts of both temperature and precipitation changes, in terms of means, extremes, variability, and climate adaptation interventions, are needed. It is necessary to assess how likely these changes are to impact the water balance of Lake Tanganyika and its basin, especially in terms of future lake water levels important for wetland management, fisheries, lake transport, and biodiversity. Much of the basin is already densely populated, and climatic changes may affect access to water resources, increase the likelihood of drought, and negatively affect agricultural productivity and livelihoods. Climate change has the potential to combine with these demographic changes to increase environmental pressures. Increasing climate resilience is an important step for the economy and environment of LTB.



Relationship to CPF

27. The project advances WBG's twin goals of ending extreme poverty and promoting shared prosperity. The project area is one of the poorest regions in East Africa, where rural poverty is pervasive and persistent. The project aims to improve sustainable management of transboundary and other natural resources and pollution control, contribute to livelihoods of the poor, and enhance community development in the LTB.
28. The LTEMP conforms to partnership strategies in participating countries through the enhancement of the sustainable management of key productive assets, as well as contributions to livelihoods of the poor and vulnerable.
- In **Tanzania**, the project is consistent with the Systematic Country Diagnostic (SCD) and draft Country Partnership Framework (CPF), particularly CPF Objective 1.3 "Natural resource management for equitable Growth."
 - In **Burundi**, the project aligns with Burundi's Systematic Country Diagnostic (SCD) 2017, which highlights the dependence of the economy on agricultural land productivity and the implications of land degradation and climate change on gross domestic product (GDP) growth, livelihoods, and overall development.
 - Similarly, in **DRC**, the project aligns with the Country Partnership Framework FY16-21 which highlights the need for improved management of natural resources and supporting climate change adaptation to increase sustainability and resilience under Objective four.
 - As stated in the recently adopted SCD, **Zambia** can sustainably achieve the World Bank's twin goals through the management of renewable natural resources while supporting the GRZ's economic diversification objective. This will require sustainable management of renewable natural resources such as forests, aquatic resources, wildlife, and biodiversity, which must be leveraged as important sources of livelihood, income, and safety nets for the rural poor.
29. LTEMP is directly aligned with Strategic Objectives of the World Bank's Regional Integration Strategy (2010) to (a) protect quality of regional and global commons and helping to find equitable solutions to global challenges and (b) improve quality of growth by supporting policy, regulatory, and institutional frameworks for sustainable environmental management and supporting sustainable private sector development through the improved management of Lake Tanganyika as a shared water resource, improving environmental and natural resource management and sustainability.
30. The WBG's Regional Integration program for FY18 – FY23⁵ (also the IDA18 and IDA19 periods) explicitly notes that infrastructure deficits continue to cripple long-term competitiveness of African economies. The WBG's Regional Integration program proposes four strategic priorities for FY18 – FY23 (also the IDA18 and IDA19 periods): (i) Generate economic dynamism along regional economic corridors; (ii) Develop functioning regional markets in four priority sectors; (iii) Scale-up access to quality public services and entrepreneurship through complementary regional solutions; (iv) Promote collective action. The LTEMP is consistent with priorities (i) and (iv) and places regional policy harmonization at the apex of the program.

⁵ The World Bank Group (2017) Supporting Africa's Transformation: Regional Integration and Cooperation Assistance Strategy for the period FY18-FY23, Washington D.C.



C. Proposed Development Objective(s)

31. The PDO is *to contribute to the establishment of sustainable integrated watershed and fisheries management in the Lake Tanganyika Basin, while strengthening institutional framework and capacity to manage natural resources.*
32. The PDO will be achieved through activities under the following components: (1) Strengthened institutional and regulatory framework and capacity for managing environmental issues of Lake Tanganyika, including watershed and fisheries; (2) Sustainable integrated watershed management, (3) Fisheries management and value chains, and (4) Project management, coordination and monitoring.

Key Results (From PCN)

Project beneficiaries and expected outcomes

33. The project's expected outcome is twofold: (1) contribute to riparian countries' advancement in establishing a capable and functional regional institutional and regulatory framework managing environmental issues of Tanganyika in coordinated and consistent manner, and (2) contribute to slowing down degradation trends in two selected areas of physical activities: watershed management and fisheries. In addition, effective models and good practices of the project will be replicated for the application beyond geographic and thematic areas of project activities.
34. Project beneficiaries will include communities increasingly affected by environmental impacts from unsustainable watershed management and pollution. Rural and urban community members, including women and children will benefit from integrated watershed management practices, improved fishing practices, climate and disaster risk mitigation tools and services, and new livelihood opportunities based on prudent, climate-smart natural resource management, and from specific actions to address the gender gaps to improve women's and/or men's empowerment. Local authorities will gain from strengthened institutions and capacity to manage, operate, and maintain interventions in a financially sustainable way to achieve both environmental improvement and poverty reduction. Civil society and private sector will gain from greater inclusion into natural resource management. Since LTEMP is designed to complement and enable LTTP by reducing sedimentation in the lake and securing, flooding of roads and waterways, communities will receive access to improved, more reliable and environmentally sound infrastructure, which in a broader context will create new economic opportunities.
35. The regional dimension of Tanganyika's management will benefit from improved policies and guidelines, collaborative mechanisms, enhanced capacity, continuous monitoring, oversight, outreach and communication programs. The LTA will strengthen its institutional capacity providing a more robust leadership in the implementation of the convention. In addition, LTA will emerge as a more sustainable and self-reliant actor.
36. Tanganyika is a regional and global commons. Finding solutions to the challenges that the lake and its basin experiences, and to restore and preserve its qualities corresponds to the interests of a broad audience well beyond the LTB. Already a lifeline asset to millions of people living in the catchment area, Tanganyika holds significant potential of creating additional benefits that the riparians can derive from it provided it is managed prudently, consistently, and equitably.

Key outcome indicators



37. The key outcome indicators are:

- Land area under sustainable land management practices (CRI) (ha)
- Fisheries management plans implemented (CRI) (count)
- Rehabilitated land areas which contributed to soil erosion and lake sedimentation (ha)
- Direct beneficiaries from improved watershed management and fisheries practices (number), of which women (percent)
- Regular meetings of the LTA Management Committee (Yes/No)

38. Project level indicators will be finalized in the Project Appraisal Document and are expected to include the following:

- Regional and national regulations, policies and/or standards adopted through the technical support of the project (Yes-No/number)
- Established joint permanent mechanisms to monitor fisheries and accumulate data on four basic parameters: physical, biological, statistical, and socio-economic (Yes-No)
- Share of targeted beneficiaries adopting climate-resilient land-linked practices (percentage)
- Population engaged in community-based mechanisms for integrated sustainable watershed and fisheries management (number segregated by country) of which women (percent)
- Permanent mechanism to regularly exchange knowledge on integrated sustainable watershed and fisheries management among affected communities (Yes-No for four countries)
- Strengthened capacity, expanded functions and enhanced standing of the LTA (Yes-No for three parameters)

D. Concept Description

39. LTEMP addresses the most pressing environmental challenges of Lake Tanganyika and its basin through the combination of regional action aimed at country-specific, locally determined concerns. The scope of this first phase of support however cannot address all of the issues and problems facing the lake and therefore long-term support for priority actions will be required. Environmental issues in the LTB are of regional nature, and their sustainable resolution requires concerted efforts of the riparians. The depletion of fish stock is the joint outcome of excessive and illegal fishing in all riparian countries. Similarly, sedimentation of the lake results from the lack of sound management of land and watersheds by all countries of the LTB. The project aims to advance harmonized environmental policies, strategies and regulatory frameworks of the riparians and to strengthen the coordination capacity at the regional, national and local levels to manage watershed and fisheries resources and to extend positive momentum to address other environmental issues. LTEMP intends to support environmental and ecosystem monitoring and reporting, promote new and innovative technologies and community driven approaches to sustainable ENRM, and to mainstream its activities into the ENRM programs of national governments and local authorities.

40. The focus of the LTEMP on watershed management and fisheries is explained by (i) the need to complement and enable LTTP aiming at the development of transportation infrastructure in and around Tanganyika and (ii) the utmost importance of sound and properly managed fisheries to the livelihoods of communities in the LTB. LTEMP is being designed to bring the riparians to a new level of management of Tanganyika resources. The implementation of the program aims to facilitate the transformation of the region into a vibrant ecological and socio-economic system preserving the environment, building resilience to climate change consequences, and offering communities broader development opportunities.



41. LTEMP pursues the following main objectives at the regional level: (i) strengthen regional land and watershed management to resolve the problem of land degradation, soil erosion and subsequent sedimentation; (ii) facilitate improved regional fisheries management; (iii) improve corresponding institutional frameworks and strengthen capacity. These objectives are expected to be achieved through a combination of activities addressing (a) immediate environmental concerns, (b) institutional and policy constraints, (c) insufficient capacity, and (d) lack of cohesion and focus in regional efforts.
42. LTEMP activities under this component will use a community-led, integrated landscape approach for sustainably managing land and water resources, similar to the World Bank financed Burundi Landscape Restoration and Resilience Project (BLRRP) currently under implementation. Managing natural resources in an integrated manner provides the basis for enhancing people's livelihoods, security, and resilience to climate variability and change. The approach builds on the multifaceted nature of the factors and players that have a stake in the LTB and therefore, the need for collaboration and partnership across key Government agencies – environment, water, natural resources, and agriculture – with donor development partners and service providers engaged in these core sectors and local communities.
43. To identify key priority provinces in Burundi, LTEMP has used the criteria used by BLRRP⁶: (i) most degraded land and high levels of soil erosion (contributing to the sedimentation of the Lake); (ii) higher incidence of poverty; (iii) greatest risk of floods and landslides; (iv) greatest potential to protect downstream infrastructure; (v) proximity to PAs; (vi) coverage by other ongoing projects; and (vii) visibility for demonstration purposes (proximity to major highway). Similar criteria will be used for the other riparian activities.
44. Seeking complementarity and impact multiplication, the project coordinates with the LTTP for Burundi and Tanzania, Burundi Landscape Restoration and Resilience Project, Burundi Infrastructure Resilience Emergency Project, Tanzania Water Sector Support Project, and Transforming Landscapes for Resilience and Development in Zambia (TRALARD), as well as the EU funded Transboundary Water Management for the Lake Tanganyika by the Belgian Development Agency. A complete list of relevant projects in and around Lake Tanganyika is in Annex 3. LTEMP also draws on the lessons from the joint management of the Lake Victoria environment and transport program, currently preparing its third phase. This includes limiting the kind of activities the project will support as well as focusing the areas of intervention to ensure impact.

Financing LTEMP

45. To see an appreciable impact on sedimentation hotspots and management of the fishery segment in Tanganyika and its catchment of this scale, the size of the proposed intervention in four countries is estimated at US\$117.5 million. LTEMP would be financed through a combination of IDA national and regional loans. It is expected that national IDA of Burundi and DRC would allocate US\$8.3 million while regional IDA would match with double this amount totaling the allocation for each country at US\$25.0 million. Zambian allocation from national IDA is expected to 10 million and from regional IDA – 20 million, in total 30 million. Tanzanian allocation from national IDA is expected to 12.5 million and from regional IDA – 25 million, in total 37.5 million. This amount needs to be confirmed through technical assessments and in dialogue with CMUs and country client counterparts.
46. Other sources of funding that the project team is pursuing might include grants from the Nordic Development Fund for preparation and implementation activities, 0.5 million Euro and 5 million Euro respectively.

⁶ Site selection processes involved the use of the Restoration Opportunities Assessment Methodology (ROAM), developed by IUCN/WRI, as the main instrument in identifying the level of land degradation and priority areas for interventions.



Project's structure

47. The project includes four components with tentatively allocated resources to be finalized during preparation:

Component 1: Strengthen institutional and regulatory framework and capacity for managing environmental issues of Lake Tanganyika with focus on watershed and fisheries management (USD15 million): Regionality is the most prominent, complex and promising component of the project. In the short- to medium-term perspective, the project addresses sedimentation and fisheries concerns through models that can be used for replication in other areas. However, LTEMP's overarching objective is to boost continuous regional interaction to stimulate a four-way engagement of the riparians and bring cohesion to legislative, monitoring, oversight and enforcement activities at the national and regional level. It is the integrated regional legislative and institutional framework as well as the approaches mainstreamed in the national legislations that can continuously address the array of environmental concerns in and around Lake Tanganyika during this project and beyond it.

1.1. *Improve regional and national institutional and regulatory frameworks.* This subcomponent will review the existing legislative and normative frameworks to determine the gaps and work out the approaches to their resolution. LTEMP will advance regulations and national planning on watershed management and development of harmonized fisheries and water quality monitoring. This will include modelling longer-term challenges, including induced impacts from continued environmental trends, population growth, climate change, and transport development.

1.2. *Facilitate collective action through ownership, engagement and commitment of the riparians.* This sub-component will aim at determining existing constraints to an effective resolution of environmental problems to further develop and implement steps to bring more cohesiveness to efforts of the riparians. LTEMP will support LTA efforts to intensify regional dialogue, stimulate constructive exchange of ideas and incentivize collective action to implement agreed measures.

1.3. *Strengthen institutional capacity and facilitate financial sustainability.* Activities under this sub-component will aim to improve capacity, enhance expertise and expand functionality of the LTA, including within its headquarters and in representations in the participant states. LTEMP will support the LTA in developing financial mechanisms for sustaining regional management, coordination, monitoring, oversight and enforcement mechanisms.

1.4. *Facilitate the development and enactment of regionally harmonized approaches to manage fisheries in sustainable manner.* This subcomponent will promote technical cooperation of the riparians to implement RPOA-Capacity and improve cooperation in collection and exchange of information regarding fishing capacity management among involved organizations. It will also support capacity development to implement and enforce regional regulations and national laws on Lake Tanganyika fisheries.

Component 2: Sustainable Landscape Management Practices (USD55 million). The project will restore degraded watersheds and improve land management in targeted degraded hotspot areas of the riparian countries. This will be done through landscape restoration and erosion control, and improved practices of crop production. The project will finance technical assistance, works, goods, and operational costs. In Burundi, LTEMP will intervene in Bubanza and Kayanza provinces because of their steep terrain, fragile soil, high demographic pressure, and overexploitation of the land from crop and livestock farming. It is one of the most dramatically vulnerable areas to rain-induced soil erosion. Intervention in this area is critical to stabilize the land, prevent further degradation, increase agriculture productivity and protect public and private infrastructure from landslides caused by heavy rain. From BLLRP estimates, intervention



in each province will cost about US\$16 million. The same selection criteria will be used for the other riparian countries.

2.1. Landscape Restoration and Erosion Control. LTEMP will construct terraces on degraded hillsides and strategically augment vegetation cover at critical points in the landscape to prevent soil erosion, increase soil moisture, and reduce surface runoff. This will entail a range of supporting activities such as biophysical treatment of gullies, tree planting, agroforestry, 'green manure' crops, fodder grass contour hedges, water harvesting, and selective soil fertility enhancements. This will entail a range of supporting activities such as biophysical treatment of gullies, tree planting, agroforestry, 'green manure' crops, fodder grass contour hedges, water harvesting structures such as check dams, sand dams, or earthen bunds and selective soil fertility enhancements. Taking a community-driven approach, the service providers will mobilize community/local labor for labor intensive activities to build the terraces and plant vegetation. The outcome is expected to contribute to reducing sedimentation rate in Tanganyika and flood risks, strengthen resilience to climate change risks, and enable recovery of agricultural lands.

2.2. Improved Crop Production Practices and Nutrition. Activities under this subcomponent will support farmer groups to protect the topsoil, recover soil fertility, and intensify crop production through sustainable land management practices, including year-round production of micronutrient-rich foods. This will include farmers' training and experience sharing, access to improved inputs (seeds and seedlings, including high nutritional varieties, tree crops, soil stabilizing grasses, and fodder crops) including by establishing community nurseries, and access to livestock as a critical source of manure.

Component 3: Fisheries management (USDS30 million) will advance the implementation of select elements of the Regional Plan of Action for the Management of Fishing Capacity in the Lake Tanganyika (RPOA-Capacity) and of the priorities determined jointly with the riparians through the facilitation of the resource assessment, harmonization of national approaches to fishing, and by supporting practical measures to establish sound and effective management of fishing industries, and by advancing regional monitoring and planning.

3.1. Investments in community fisheries management. This subcomponent will provide support to develop post-harvest infrastructure including fishing landing sites, sheltered processing areas, drying racks, storage sheds and cold storage rooms. LTEMP aims to support the establishment of the Beach Management Units to promote greater community and private sector participation in sustainable natural resources management. LTEMP will also assess alternative livelihood options, including aquaculture, to reduce pressure on lake fisheries.

3.2. Establish a system to monitor, collect and assess data on biological and socio-economic aspects of fisheries and use it for regional coordination and planning purposes. Contributing to the sustainability aspect, the system will monitor key basin parameters, model longer-term challenges, including induced impacts on fisheries from transport development, population growth, and climate change and develop measures to address issues in a long-term perspective and harmonize fisheries and water quality regulations. LTEMP places emphasis on the adoption of technologies to measure, monitor, and report on project impacts, including the application of environmentally sound remote sensing, drone, mobile phone and online apps, biotech, and water and energy saving technologies.

Component 4: Project management, coordination and monitoring (US12.5 million): This component will finance TA, works, goods, workshops, and operational costs to support the project's day-to-day implementation and management, including procurement, FM, environmental and social safeguards, and preparation of annual work plans and organization of audit reports. The component also includes the design and implementation of a communication strategy to report on the project results and to raise awareness about watershed management, land degradation, sedimentation, fisheries, climate change impacts, vulnerability, and adaptation. It also supports the M&E system to



report on the project's expected results (disaggregating by gender, where appropriate) and systematizes the project's lessons learned. The component also finances impact evaluation to assess project's impacts on specific elements such as adopted livelihoods.

SAFEGUARDS

A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

Lake Tanganyika is the second largest lake in the world, by volume holding around 17% of the liquid freshwater on Earth. The lake is shared by four countries – Burundi, Democratic Republic of the Congo (DRC), Tanzania and Zambia. The shoreline is 1828 km, of which 43% belongs to DRC, 37% to Tanzania, 11% to Zambia and 9% to Burundi. Except for parts of the eastern and northern coast, Tanganyika is confined by the steep sides of the rift valley, most prominent on its western edge which reaches 2,000 meters above the shoreline. The most important rivers that drain into the Lake are the Malagarasi River, the Ruzizi Reiver and the Kalambo River with the 215 meters Kalambo Falls.

The Lake Tanganyika Basin (LTB) is estimated to house around 12 million people, about a million of whom are dependent on the roughly 200,000 tons of fish produced annually from Tanganyika. The lake represents a unique and valuable natural resource for riparian countries and is a world-renown center of evolutionary diversification, hosting about 300 fish species, out of which more than 250 are condiered endemic. There are 68 snail species, of which 45 are endemic. In total the lake area is home to more than 2,000 animal and plant species of which about 600 are endemic. Tanganyika is described as a 'biodiversity hotspot' because of its critical contribution to global biodiversity. The LTB also holds important terrestrial biodiversity and great ape populations.

As region's population is growing, environmental pressures on the LTB ecosystem are building up. Ports on the Tanganyika Lake face access issues due to draft limitations from accumulated sedimentation from agricultural and pastoral activities. The lake is characterized by loss of habitate for fish and snails. Overfishing, pollution and rising water temperatures have led to a drastic reduction in the fish stocks of the commercial fisheries in the pelagic zones of the lake. Declines in catch have long been attributed to overfishing and lack of adequately enforced regulations.

LTEMP addresses two most prominent problems important to all riparians: sedimentation and fisheries. In addition, the design, scope and sum of expected activities aim to enhance the resilience to climate change impacts – another priority of the riparians.

B. Borrower's Institutional Capacity for Safeguard Policies

LTEMP implementation at the regional level is expected to be led by the LTA, whose mandate is to coordinate the implementation of the convention on Tanganyika management and to advance and represent the common interests of the riparians. The LTA coordinates and oversees the implementation of the Regional Integrated Management and Development Program, which focuses on the establishment of sustainable fisheries, catchment management, pollution control, climate change adaptations, and monitoring programs. In addition, the LTA coordinates the implementation, monitoring and evaluation of Regional Plan of Action for the Management of Fishing Capacity in Tanganyika. The LTA has national focal points in each of the riparian countries who ensure follow-up among the respective participating line ministries. The LTA needs capacity strengthening, especially in establishing a functional monitoring system, but also in communications, M&E, E&S, information and knowledge management. Besides enhancing the capacity of the LTA central unit in Bujumbura, it is desirable to expand the scope of activities of national branches from focal points to more functional representations.

At the national level, in Burundi the Ministry of Environment is the leading implementing agency to oversee local



government agencies. In the DRC, the Ministry of Environment, Nature Conservation and Sustainable Development (MECNDD) governs environmental policies and their compliance through its National Agency for the Environment (Agence Congolaise pour l’Environnement). The Agency is familiar with main safeguards instruments, as it ensures their assessment, validation and monitors implementation of safeguards measures, but still largely relies on donor and project funds to carry out field supervision duties. In Tanzania, the Ministry of Water, is the lead agency overseeing the Lake Tanganyika Basin Water Board. Ministry of National Development Planning is expected to work on the project for Zambia. Capacity at central and local levels needs to be strengthened by sectoral and fiduciary staff.

During the project preparation stage and prior to appraisal, the capacity and track record (performance) of LTA and all other lead implementation agencies (IAs) in providing oversight and implementation of safeguards measures will be assessed, with the aim of defining any project-level capacity gaps and recommending gap-filling measures that may be financed under the project.

C. Environmental and Social Safeguards Specialists on the Team

- Mary C.K. Bitekerezo, Social Specialist
- Edward Felix Dwumfour, Environmental Specialist
- Jane A. N. Kibbassa, Environmental Specialist
- Tito Joel Kodiaga, Environmental Specialist
- Peter F. B. A. Lafere, Social Specialist
- Grace Muhimpundu, Social Specialist
- Joelle Nkombela Mukungu, Environmental Specialist
- Njavwa Namposya Chilufya, Social Specialist
- Alexis Manirambona, Environmental Specialist

D. Policies that might apply

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	Lake Tanganyika is an ecologically diverse system with important habitats of flora and fauna in the Lake but also in the vast catchment area. The LTEMP is designed to address some pressing issues that directly affect the Lake: sedimentation due to the degraded lands, declining fish stock due to various factors including fishing industry overcapacity, and climate change impacts. Interventions will include creating sedimentation reduction and soil erosion retention infrastructure and relevant civil works that generally are not likely to lead to significant environmental and social impacts. It is a general expectation that implementation of the proposed project activities will have a positive effect on the integrity of the environment of Tanganyika and its basin. Given that the specific geographical locations of the sub-projects and the nature and scope of these sub-projects are not yet defined prior to appraisal, the framework approach has been recommended. In this regard, a



number of frameworks have been recommended, and these are: (i) environmental and social management framework (ESMF), (ii) resettlement policy framework (RPF), (iii) Chance Find Procedures (as part of the ESMF), (iv) Pest Management Plan (PMP), (v) and indigenous peoples policy framework (IPPF). Each participating country will prepare frameworks (i) to (iv). In addition to preparing these documents, DRC and Burundi will prepare an IPPF as there is strong belief that there are indigenous populations in Burundi and the DRC Province of Tanganyika and the Province of South Kivu, bordering the Lake. All these safeguards documents will be consulted upon and disclosed in country and the Bank's external website prior to appraisal. LTEMP will also draw from data, analysis and conclusions in the Strategic Environmental and Social Assessment prepared under the Lake Tanganyika Transport Program. For guidance on occupational health and safety matters related to specific activities, LTEMP will also refer to WBG's General EHS Guidelines as well as Specific EHS Guidelines that will be determined during preparation. Once spatial locations and the nature and scope of sub-projects are defined, the project will, using participatory and consultative processes, prepare site-specific safeguards instruments that would be reviewed by the Bank before disclosure in-country and at the Banks external website.

Performance Standards for Private Sector Activities OP/BP 4.03

No

Natural Habitats OP/BP 4.04

Yes

Lake Tanganyika is a globally important ecosystem and a recognized biodiversity hotspot, including as a habitat for endemic aquatic species. The precautionary approach is applied at this stage of project preparation, and caution will be taken to ensure that the project causes no significant conversion (loss) or degradation of critical natural habitats, directly or indirectly. The ESMF will include guidance on how to avoid, prevent and mitigate any potential significant adverse impacts on the Lake and any other critical natural habitats that may exist. The site-specific environmental and social impact assessment (ESIA) that will be prepared once the specific sites, nature and scope of sub-activities are known will address the potential impact of the project



		on forests and recommend appropriate mitigation measures.
Forests OP/BP 4.36	Yes	The policy on forest has been precautionarily triggered as LTEMP may affect the health and quality of riparian forests, rights and welfare of people and their level of dependence upon or interaction with forests. Also, the project may result in changes in the management, protection, or utilization of natural forests either publicly, privately, or communally owned. The ESMF will include guidance on how to avoid, prevent and mitigate any potential significant adverse impacts on the forested areas around the Lake. The site-specific ESIA that will be prepared once the specific spatial location, nature and scope of sub-activities are known will address the potential impact of the project on forests and recommend appropriate mitigation measures. The ESIA and ESMF will include the potential negative impacts on forests and the appropriate mitigation measures, and all these measures will be consistent with the Bank's policy and the Bank's general and specific EHS Guidelines.
Pest Management OP 4.09	Yes	The policy on pest management has been triggered as the project will involve activities that may directly or indirectly support the use of pesticides. At the framework level guidelines for the preparation of a Pest Management Plan (PMP) by each participating country, will be approved and disclosed in-country and at the WB external website prior to Appraisal.
Physical Cultural Resources OP/BP 4.11	Yes	The policy on physical cultural resources (PCR) has been triggered as a precaution, because LTEMP will be implemented across select areas in four countries and project activities that may include excavations, demolition, movement of earth, flooding, or other environmental changes may result in potential adverse impacts to PCR. At this stage of project preparation, the project will prepare a chance find procedure that will be included in the ESMF to provide a process for notifying national public bodies on heritage conservation in case of such occurrences. At the PAD stage, the environmental and social assessment will clarify and provide for how to avoid or mitigate adverse impacts on PCR during project implementation.
Indigenous Peoples OP/BP 4.10	Yes	The policy is triggered because there is strong belief that there are indigenous populations in Burundi and the DRC Province of Tanganyika and the Province of



		<p>South Kivu, bordering the Lake. In the past, there have been serious conflicts between IPs (Twa) and Bantous. In Burundi, the Batwa fisher community/ties living on the edge of the lake south of Bujumbura is recognized as being indigenous. At the PCN stage, it is recommended that a social assessment and IP screening should be done during preparation to determine the presence of vulnerable, marginalized, or indigenous people/ communities within the project boundaries and how these could be impacted by the project. Whether or not the majority of people in the project area are recognized as being indigenous, an indigenous peoples' policy framework (IPPF) would need to be developed for both countries. During implementation stage, the project will develop and implement separate indigenous peoples' plans (IPPs) for Burundi and DRC. Also, the project will set up a grievance redress mechanism in all participating countries to deal with project-related grievances.</p>
Involuntary Resettlement OP/BP 4.12	Yes	<p>The project may result in physical and economic displacement or access restrictions because of land acquisition. Livelihoods of people whose livelihoods depend on the Lake and its surrounding areas could be adversely impacted. As the exact locations, nature and scope of project interventions are not known at this stage, the participating countries will each prepare a Resettlement Policy Framework (RPF) and a separate Process Framework (PF). The RPFs will include guidance for potential compensation, in case communities/affected individuals incur losses due to project related activities.</p>
Safety of Dams OP/BP 4.37	Yes	<p>The policy on dam safety has been triggered as the project is likely to support the rehabilitation or construction of small water harvesting structures such as check dams, sand dams, or earthen bunds. These will be small dams as defined by Bank policy. The ESMF for the project will include generic safety guidelines for small dams. In compliance with the requirements of the operational policy, generic dam safety measures will be designed by qualified engineers and included in the design and implementation/rehabilitation of small dams.</p>
Projects on International Waterways OP/BP 7.50	Yes	<p>LTEMP will involve activities on the Tanganyika Lake shared by the four participating countries. The LTA shall notify the riparians of Lake Tanganyika about the project.</p>



Projects in Disputed Areas OP/BP 7.60	No	Project activities will not be undertaken in any disputed area/s.
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E. Safeguard Preparation Plan

Tentative target date for preparing the Appraisal Stage PID/ISDS

Feb 28, 2019

Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the Appraisal Stage PID/ISDS

The frameworks will be prepared for each country as mentioned in the OP/BP 4.01 section. Specifically, for each country ESMF, PMP, RPF, and PF will be prepared. PMP will be part of ESMF and PF will be a stand-alone document. SA and IPPF will be prepared for both DRC and Burundi.

CONTACT POINT

World Bank

Nathalie Weier Johnson, Raymond Sinsi Lumbuenamo
Senior Environmental Specialist

Borrower/Client/Recipient

Tanzania Ministry of Water and Irrigation
Omari Iddi Myanza
National Project Coordinator
omari.myanza@maji.go.tz

Burundi Ministry of Water, Environment, Land and Urban Planning
Liberat Nahimana
National Project Coordinator
nahimanaliberatfebr@yahoo.fr

Zambia Ministry of National Development Planning

Ministry of Environment, Nature Conservation and Sustainable Development



Implementing Agencies

Lake Tanganyika Authority
Jean-Marie Nibirantije
Executive Director
jeanmarie.nibirantije@lta-alt.org

FOR MORE INFORMATION CONTACT

The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 473-1000
Web: <http://www.worldbank.org/projects>

APPROVAL

Task Team Leader(s):	Nathalie Weier Johnson, Raymond Sinsi Lumbuenamo
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Approved By

Practice Manager/Manager:	Magda Lovei	09-Oct-2018
Country Director:	Paul Numba Um	15-Oct-2018