INTEGRATED WATER RESOURCES MANAGEMENT PROGRAMME FOR THE LAKE VICTORIA BASIN

Chapter 01

FORWORD

Dear reader,

The Lake Victoria Basin Commission (LVBC) is pleased to introduce the Integrated Water Resources Management (IWRM) Programme for the Lake Victoria Basin. The programme is based on a long-term cooperation between the LVBC and KfW Development Bank from Germany. This cooperation forms a corner stone for LVBC's efforts to address the challenges which the Lake Victoria Basin is currently facing in order to protect the lake and its water resources for the future benefit of the people living in the region.

The programme is implemented in close cooperation between the Partner States of the East African Community in order to ensure a shared programmatic approach, coordinated efforts and efficient execution of activities.

At LVBC we are looking forward to the implementation of this outstanding programme. You are kindly invited to find further information in this brochure and to participate actively in the joint efforts to manage water resources of the Basin in a sustainable way.

Sincerely,
Dr. Ally-Said Matano

chapter 02

BACKGROUND

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LAKE VICTORIA

Lake Victoria, with a surface area of approximately 68,870 km^2 is the second largest freshwater body in the world. It is a trans-boundary water resource shared by Kenya, Tanzania and Uganda. Rwanda and Burundi lie in the upper watershed that drains into the Lake. It is considered as one of the most important shared natural resources by the Partner States of the East African Community (EAC) which covers an area of around 1.8 million square kilometres.

The Lake is a major source of water and fisheries in the region. The socio-economic importance of Lake Victoria to the Eastern Africa region is associated with the fact that it is the largest inland water fishing sanctuary; a major inland water transport linkage for the East African Countries; a source of water for domestic, industrial and commercial purposes; a major reservoir for hydroelectric power generation; a major climate modulator in the region; and rich in biodiversity. Recognising the importance of the lake and its contribution to the region's economy, the EAC declared the Lake Basin as a regional economic growth zone.

Chapter 02

BACKGROUND

Lake Victoria Basin Commission (LVBC):

Cross-border Institution to coordinate sustainable development in the Basin

NO LIFE WITHOUT WATER

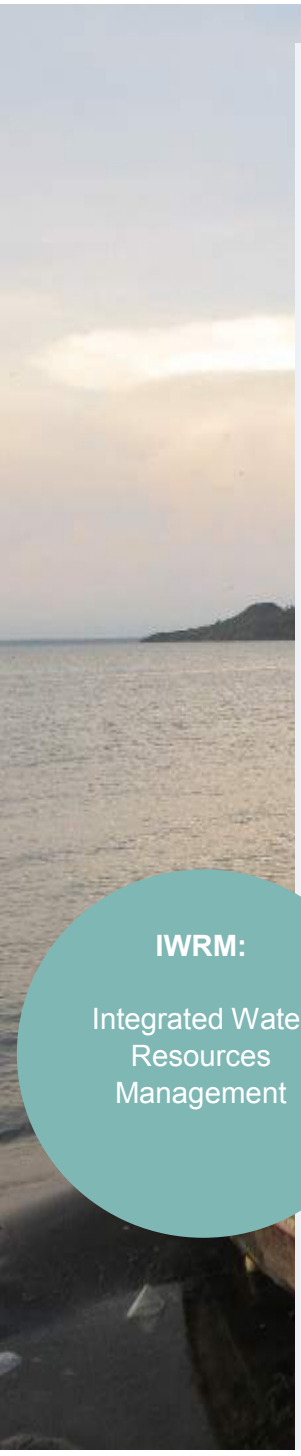
Lake Victoria is the most important freshwater storage reservoir in East Africa, with about 40 million people depending on its resources. Therefore, it is of utmost importance to counteract against the rapidly deteriorating water quality in the Lake Victoria Basin (LVB). Without ambitious efforts and an effective water management, the risks for food production, hampered economic activities and waterborne diseases will increase, potentially leading to conflicts, threatening peace and development in this region.

An IWRM-Programme as a systematic cross-border approach for the sustainable development, allocation and monitoring of the water resource Lake Victoria is urgently required. This IWRM Programme for the Lake Victoria Basin is defined as a "process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner, without compromising the sustainability of vital ecosystems".

The East African Community (EAC) has established the regional cross-border institution, the LVBC in order to coordinate sustainable development in the Basin. LVBC shall operate the hereafter so called IWRM Programme for the Lake Victoria Basin with High Priority Investments by coordinating and implementing projects and programmes within the EAC Partner States of Burundi, Kenya, Rwanda, Tanzania and Uganda to minimize the pollution of Lake Victoria.

Chapter 03

IWRM PROGRAMME



BACKGROUND OF THE PROGRAMME

LVBC is intensifying its efforts on IWRM, to address the urgent need for regional coordination among the Partner States. Intersectoral and transboundary coordination of IWRM activities is still a challenge. Regulation and their enforcement regarding water resources and ecosystems protection are partly on-going but the process is very long.

Transboundary issues make water management of LV challenging and sometimes delicate. Overfishing of the lake, siltation from erosion of deforested watersheds, species introduction, industrial pollution, pollution through municipal wastewater, lack of water storage and runoff from agricultural areas are amongst the most pressing issues in water management of the Basin. The high-density, fast-growing, young, rural and poor population will result in unsustainable pressure on the ecosystems, including deforestation, wetland degradation and soil erosion.

The degradation of these ecosystems also leads to poor water and soil productivity which ultimately results in degradations of neighbouring ecosystems. In addition, climate change and climate variability will negatively impact the access to and demand for water in the entire LVB.

Although many programmes have been implemented over the last years, the planning, design and construction of water supply systems, waste water treatment facilities and solid waste management do not keep up with population growth.

IWRM does not just look at the water requirements of the different sectors, it ensures that the necessary institutional and legal tools are in place to support integrated management, as well as ensuring the necessary management and economic tools, e.g. policies, incentives and permitting mechanisms, thereby creating an enabling environment. Policies and regulations to address the issues mentioned have been developed by EAC member states. However, these policies and regulations are still primarily sectoral and country based. In addition, a process towards regional coordination and integration is required to give real substance and scale to IWRM. Regional coordination on regulations would contribute to reaching the overall development goal of water related conflict resolution.

Data, models and tools are prerequisite to support IWRM. Despite significant national progress to improve data access and exchange regionally, environmental information is not readily shared. Improved

IWRM:

Integrated Water Resources Management

analysis and decision-making as well as cost effective use of relatively expensive data must spring from genuine cooperation and willingness to share digital data, particularly digital maps. LVBC offers a viable institutional base for effective information sharing.

LVBC is committed to develop IWRM for the Basin using a step-by-step approach. The short-term focus is put on the pressing and “no-regret” issue of sanitation. In the long term, the Programme should lead to a regional water framework management plan and a related regional priority investment plan.

OBJECTIVES OF THE IWRM PROGRAMME FOR THE LAKE VICTORIA BASIN

The overall objectives of the IWRM Programme for the Lake Victoria Basin are to contribute to the following goals:

The objective of the Programme is to ensure the availability and the quality of water resources through regional IWRM investments and related measures. In addition to an environmentally sound and economically viable management of the water resources, the measures shall contribute to regional cooperation and integration. The overall objectives are to contribute to the following goals:

- Improved access to water supply and sanitation for the people within the LVB;
- Protection of the water environment;
- Increased awareness and commitment regarding IWRM and improved capacities;
- Appropriate resilience against climate change.

The IWRM Programme for the Lake Victoria Basin is uniquely positioned as an open, and integrated umbrella Programme, targeted at the promotion of regional cooperation, partnership-building, institutional and capacity enhancement, and investments towards achieving the overarching goal of managing the Lake Basin as a regional public good, protection of the water environment, sustainable utilization of natural resources, and climate change resiliency. The Programme fully builds on the principles as set out in the LVBC Protocol and further reinforces the strong position of LVBC as regional IWRM Programme Coordinator, data and knowledge hub.

Chapter 04

IWRM NEEDS ASSESSMENT

01| LAKE VICTORIA IWRM NEEDS ASSESSMENT

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Needs assessment of the LVBC in its role as IWRM Programme Executing Agency as well as the elaboration of a IWRM Programme Operation Manual.

02| HIGH PRIORITY INVESTMENTS

Short listing of High Priority Investments (HPIs) according to predefined selection criteria and preparation of four respective feasibility studies.

03| IWRM DATABASE AND MODEL DEVELOPMENT

Specification for a computer based IWRM-model for the Lake Victoria Basin, consisting of modules to simulate the hydrological and economic impact for water intervention scenarios, with preparation of an IWRM database.

The analysis of the LVBC Protocol and EAC Treaty showed that the legal framework for anchoring transboundary IWRM is adequate. The Protocol also provides for 'equitable utilization' which is one of the most important customary rules for sharing water resources. Regarding the proposed KfW funded IWRM Programme for the Lake Victoria Basin, the Protocol supports the key roles of LVBC in project and programme preparation and implementation. It is evident that LVBC is mandated by the Protocol to coordinate programmes and other interventions with a focus on the regional components. The KfW Programme has an explicit regional focus.

LVBC has demonstrated that it is successful in fund raising; the strong institutional anchorage of LVBC and the concept of regional co-operation appeals to many Development Partners.

Currently, executed projects are the main way through which IWRM objectives are pursued. Because they are mainly implemented through national institutions, the current project results are insufficiently anchored and visible at the level of LVBC; the regional programmatic role of LVBC is still less developed.

Data collection and sharing from the Partner States is fragmented and not adequately structured, key monitoring systems are not operational. The LVB water quality database, the water resources information system (WRIS), is insufficient.

The key needs of LVBC for the establishment of the IWRM function are:

- The development of a programmatic approach towards IWRM, through which LVBC can start to deliver visible added value to Partner States in planning, programming, project identification, prioritization, selection and formulation.

- Capacity for programme management, related strategic & operational planning and coordination through the development of an IWRM Programme Coordination Unit (PCU).

- Optimized mobilization and utilization of funds from Development Partners and facilitated regional procurement and coordination of regional project implementation.

- The development of an LVB IWRM knowledge and data/information exchange hub for the region (including an improved Basin wide monitoring system).

- 5-year LVB IWRM strategy and annual IWRM Operational Plans and budget.

IWRM PROGRAMME FOR THE LAKE VICTORIA BASIN

The IWRM Programme for the LVB aims at one long term overarching goal through three components and 12 result areas.

Component 1

The 1st component is focused on enhancing the role of LVBC as IWRM Programme coordinating and managing institution, on enhancing the role of the stakeholders of the relevant IWRM institutions in the Partner States and on capacity development.

Component 2

The 2nd component is focused on the identification, selection and implementation of IWRM infrastructure investments in the LVB. LVBC's capacity to promote, identify and select priority projects will be developed. Partner countries will be supported in implementation.

Component 3

The 3rd component is focused on IWRM database and model development, strengthening the knowledge base and providing expert advice to Partner States and investors on key issues related to water use, transboundary river basins and water quality issues.

Through its PCU, the LVBC Secretariat is the IWRM Programme Manager. The PCU shall manage the project selection process, the procurement for regional projects, the contracting of consultants and works contractors, and the cooperation with the involved local institutions in project implementation and supervision.

The PCU is positioned under the LVBC Deputy Executive Secretary Projects & Programmes, as a capacity group that draws required resources from LVBC departments. The existing LVBC Programme Officers will provide expert services to the Unit. The current LVBC Water Resources Management Officer is responsible for the Unit.

A Programme Operational Manual has been prepared to support the main stakeholders in managing the investment component and the institutional component of the IWRM Programme. It lays down definitions and defines investment management and financial procedures including a clear assignment of tasks and responsibilities. The manual provides specific guidance on roles and responsibilities of institutions and officials in carrying out their duties in key areas of Programme implementation.

02| HIGH PRIORITY INVESTMENTS (HPI)

LVBC is committed to develop IWRM for the Basin using a step-by-step approach. For the short term a focus on the pressing and 'no-regret' issue of wastewater and sanitation has been chosen. The focus on pressing and 'no-regret' has been translated in the concept of High Priority Investments (HPI).

HPI

High Priority Investments

Based on a structured selection process, four projects were selected for a full feasibility study. A brief profile of the selected projects is provided below.

HPI 01: CONSTRUCTED WETLANDS IN THE NAKIVUBU CHANNEL, KAMPALA, UGANDA

HPI 02: WASTEWATER TREATMENT AND SEWERAGE IN MWANZA, TANZANIA

HPI 03: FAECAL SLUDGE TREATMENT IN KIGALI, RWANDA

HPI 04: KISUMU INFORMAL SETTLEMENT SANITATION, KENYA

HPI 01: CONSTRUCTED WETLANDS IN THE NAKIVUBU WETLANDS, KAMPALA, UGANDA

Kampala is Uganda's administrative and commercial capital city and is located in the Central region of Uganda along the shoreline of Lake Victoria.

The Nakivubo Wetland, located on the south-eastern side of Kampala, covers an estimated surface area of 5.29 km^2; and, its total catchment area is estimated to extend over 40 km^2.

Feeding the Wetland is Nakivubo River and its tributaries. Nakivubo Channel is a major open drainage channel that runs through the centre of the city of Kampala with an approximate length of 9 km and approximate catchment area of 50 km^2. It traverses through highly populated slum areas of Makerere Kivulu, three busy markets in the city centre and the Kampala industrial area. In dry weather, it has an estimated daily discharge of 50,000 to 60,000 m^3.

The HPI is to have a constructed wetland within the Nakivubo Wetland to improve the water quality of the channel and eventually act as a tertiary treatment for the new Wastewater Treatment Plant (WWTP) which is currently under construction.

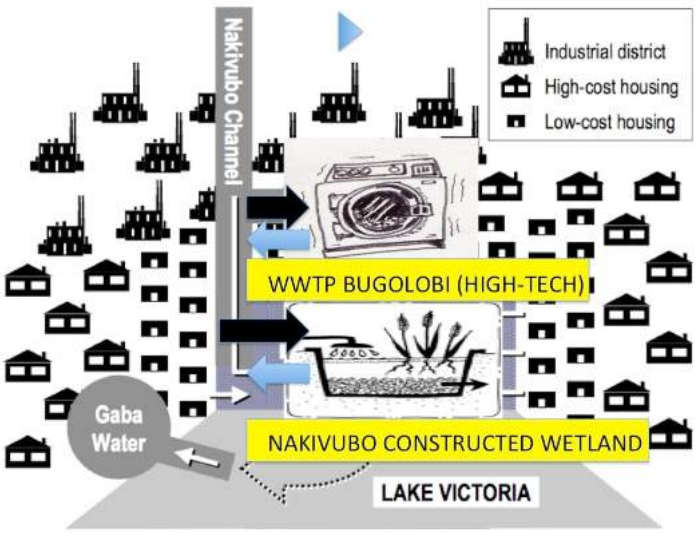
High priority justification

Discharge of domestic and industrial waste has resulted in contamination by toxic substances, rendering the Lake Victoria water unfit for human use if not treated. The Nakivubo Channel drains directly into the Inner Murchison Bay and carries with it run-off and wastewater especially from formal and informal settlements with limited sanitation facilities.

To restore the degraded Nakivubo swamp, through the reconstruction of the wetland for the tertiary treatment of the wastewater effluent and polluted storm water entering the swamp.
To improve the environmental sustainability of Inner Murchison Bay through reduction of pollution entering the lake through the channel.

More

https://www.nwsc.co.ug/
http://www.kcca.go.ug/



Water and Nature Initiative of IUCN - The World Conservation Union.

HPI 02: WASTEWATER TREATMENT AND SEWERAGE IN MWANZA, TANZANIA

The project area is Mwanza City, the second largest city in Tanzania. Mwanza is located in the north of Tanzania, directly along the shore of Lake Victoria.

The City of Mwanza wants to reduce the pollution load of Mwanza town currently discharged into the Lake Victoria. The rocky soils in Mwanza do not favour affordable on-site sanitation systems. The hilly topography favours the 'illegal' emptying of full pits during the rains. Therefore, Mwanza has chosen off-site sanitation as the preferred wastewater management system in the future, expecting the town will grow to 1.9 million inhabitants in 2035.

A Wastewater and Sanitation Master Plan is being prepared for the expansion of sewerage. The Master Plan foresees the operation of 3 Wastewater Treatment Plants: the existing WWTP Ilemela in the north, the planned WWTP Igoma in the east and the new WWTP in the south, proposed at Mkuyuni, along the railway track. High-density neighbouring areas are to be connected to the sewerage system by gravity to the WWTP Mkuyuni, thus improving sanitary conditions immediately.

The HPI aims at the implementation of the Mkuyuni Waste Water Stabilization Ponds to cater for Mwanza South, which is currently not served with a sewerage network.

Operation and maintenance of sewerage is expensive mainly due to high pumping costs (electricity) thus leading to high operational costs. Hence, it is recommended reducing these costs by focussing on the areas that can be served through gravity sewers. In total 7,400 households are to be connected. The capacity of the WWTP is 3,800 m^3/d.

High priority justification

Currently there is wastewater treatment in the northern part of the city. In future the capacity of the wastewater that can be treated there is limited; mainly due to hydraulic limitation of the current sewerage system. The Mkuyuni WWTP is close to the Lake, targets a highly dense area and has a high impact on the water quality.

More

http://mwauwasa.org/site/

HPI 03: FAECAL SLUDGE TREATMENT IN KIGALI, RWANDA

The capital of Rwanda, Kigali, hosts 1.2 million people, which is around 10% of the country's total population. Apart from some neighbourhood sewerage systems and decentralized communal wastewater treatment plants, the population uses on-site systems such as pit latrines and septic tanks. When full, pit latrines are usually closed and a new one is built. If there is insufficient space, pit latrines need to be emptied. When septic tanks are full of sludge, the contents are emptied by means of a vacuum truck. At present, the collected contents are dumped.

The current crude dumping of faecal sludge at the Nduba waste dump leads to unacceptable environmental pollution: air, ground- and service water, foul smell and hazards. Hence, it is recommended to cease dumping of faecal sludge at the Nduba waste dump and to replace crude dumping with environmentally sound treatment of collected faecal sludge. To this end, the HPI for a new Faecal Sludge Treatment Plan was developed. After treatment, the sludge shall be used for the production of fuel or compost.

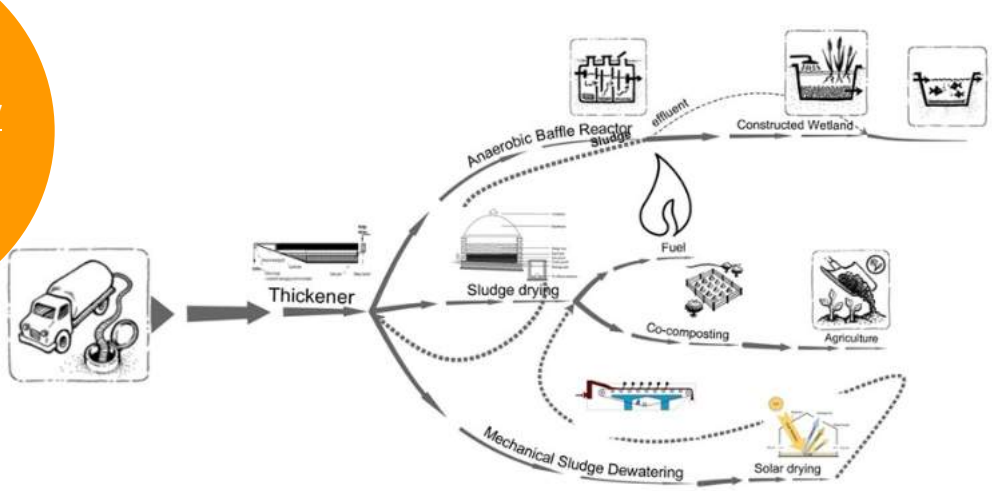
Since 1991 the City of Kigali is preparing plans to replace the on-site systems with an off-site system: sewerage followed by wastewater treatment. Up to now there is no funding for this costly system and the City of Kigali realises that it needs to take measures to facilitate the servicing of on-site systems and the treatment of the collected sludge.

High priority justification

The current crude dumping of faecal sludge at the Nduba waste dump leads to unacceptable environmental pollution: air, ground- and surface water, foul smell and hazards. It is recommended to replace the dumping of faecal sludge at the Nduba with environmentally sound treatment of collected septage and faecal sludge.

More

http://kigalicity.gov.rw/index.php?id=4
http://www.wasac.rw/



HPI 04: KISUMU INFORMAL SETTLEMENT SANITATION, KENYA

For Kisumu, the selected project area covers sanitation in informal settlements in Kisumu. The sanitation system is based on the principle of condominium sewerage.

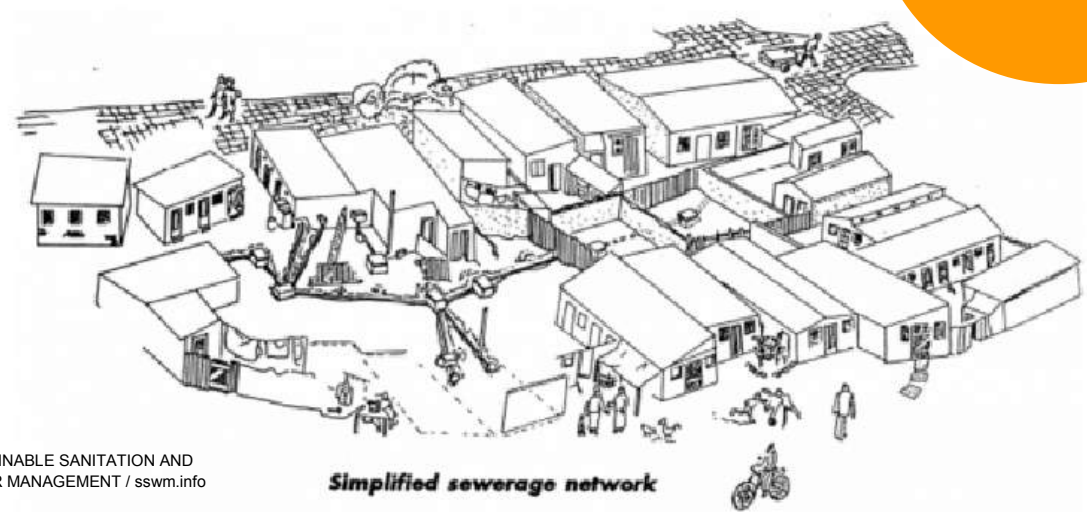
Condominium sewerage, also indicated as shallow sewers or simplified sewers, describe a sewerage network that is constructed using smaller diameter pipes laid at a shallower depth and at a flatter gradient than conventional sewers. The condominium sewerage allows for a more flexible design associated with lower costs and a higher number of connected households.

High priority justification

The sanitary conditions in the informal settlements in Kisumu are very poor: there are insufficient facilities and they are inadequate. Open sewers in Manyatta are discharging into Auji channel, a storm water drainage turned into an 'open sewer', which directly drains into Lake Victoria and therefore pollutes the Lake. The Obunga settlements discharge untreated sewage into the Kisat River channel which also drains into Lake Victoria. The channel and the rivers are major point sources of the Lake at the Winam Gulf.

More

http://www.lvswaterboard.go.ke/
http://kiwasco.co.ke/



Simplified sewerage network

3 | IWRM DATABASE AND MODEL DEVELOPMENT

LVBC will be responsible for operation and maintenance of a computer based GIS-database and IWRM model which shall simulate the impact of investments and other activities in all water sectors. The Consultancy has prepared technical specifications of both the IWRM database and the IWRM model.

The main purpose for the IWRM model is to enable LVBC in policy development such as the setting of water quality standards, monitoring and for accelerating implementation of measures in the countries based on valid data. With the model the impact of investment projects and other activities in water related sectors can be simulated, determining their cost-effectiveness and supporting prioritisation of investments.

1. Tool for prioritization of investments and measures for water quality improvement in the LVB.
2. Tool for policy development, through simulating the effects of policy measures and interventions in relation to the future development of the water quality.
3. Tool for use in knowledge development and as knowledge base.

The database should assist users in carrying out the needed pre-processing tasks for data quality assurance and to perform their monitoring tasks that are currently underdeveloped. Also, it should facilitate essential tasks like data export, mapping and reporting tasks, as the use of existing databases is currently limited due to absence of these functionalities. The model should focus on the basic needs identified during the project, thereby enabling the performance of basin wide water balance and mass balance calculations. The Nile Basin Decision Support System software is chosen as it is flexible enough for future expansion, and as capacity and experience are available.

Building on the needs assessment and lessons learned from previous models and database efforts it was found that in order to develop a successful IWRM database and model, except for software capabilities discussed above, mainly organizational and capacity conditions must be met in order to avoid failure of the database or model. Hence, the main focus shall be put on organisational and capacity development aspects.

It is recommended that the database has joint ownership of LVBC and the Partner States as in the future water management authorities may want to rely on it. A detailed description of key tasks including responsibilities for the setup and operation of IWRM database and model was elaborated.

Chapter 06

NEXT STEPS

NEXT STEPS

Based on the elaborated documentation and on provided commitments from LVBC as well as the owners of the HPIs, KfW has confirmed its willingness to finance the implementation of the HPIs and of the IWRM-database and model. The scope of the HPI in Mwanza was modified. The immediate next steps after the formalization of the Programme include the following:

- Establishing the IWRM function through staffing and equipping the IWRM PCU at LVBC, and aligning it with the LVBC organisation.
- Implementing the Results Based Management System in line with the overall LVBC Strategic Plan 2016-2021.
- Elaboration of the 5-year IWRM Programme for the Lake Victoria Basin strategy and the first Annual Plan 2017-18. This would include the communication strategy and program launching event.
- Elaboration of the project identification and selection guideline, on the basis of the initial setup as laid down in the Programme Operational Manual.
- Preparation of Basin monitoring strategy and stepping up IWRM data collection in cooperation with relevant institutions in the Partner States and development the IWRM data community.
- Developing the Regional Partnership strategy.
- Promoting and facilitating the identification, prioritization, and preparation of “bankable” IWRM infrastructure investment opportunities with existing and new project proponents.

It is recommended to support the above activities by a consultant’s team that should be recruited to support LVBC in its transformation to programme based operations.

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More
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