



**COUNTY GOVERNMENT OF KILIFI**



**MUNICIPALITY OF MALINDI**

**Pre-Feasibility Study**

**for**

**Storm Water Drainage Infrastructure in**

**The Municipality of Malindi**

**FEBRUARY 2019**

## **A. Background**

The County Government of Kilifi (CGK) requested funding from the World Bank (WB) in the amount of US\$100 million to finance the “Construction of Storm Water Drainage facilities for the Municipality of Malindi”. The project development objective is to support improvements to storm water management in the Municipality through construction of a sustainable storm water drainage facilities.

The CGK and WB readiness criteria for inclusion of projects presented by the selected cities/Municipalities for funding under the World Bank supported project are:

- 1- Feasibility Study;
- 2- Environmental and Social Impact Assessment (ESIA) Study;
- 3- Land Acquisition plan and / or resettlement, if needed;
- 4- Sanitation Strategy for the Municipality (SSK)/Sector Master Plan.
- 5- The completion of performance indicators of project implementation for monitoring purposes.
- 6- The guarantee of the availability of land.
- 7- The completion of Project Management Unit (PMU) and Project Implementing Unit (PIU)
- 8- The completion of project management plan (Project Management Manual).
- 9- The preparation of the organization that will manage the drainage facilities.

Accordingly, the Municipality of Malindi developed a comprehensive plan for technical assistance in the storm water management sector, with the following two broad objectives:

- a) Provide a recommended integrated and sustainable storm water management system for the Municipality; and
- b) Prepare a pre-feasibility study for the most appropriate technology in construction of the storm water drainage facilities for the Municipality of Malindi.

## **B. OBJECTIVE OF WBDIA**

The objective of the World Bank Development Initiative for Africa (WBDIA) is to support prioritized urban infrastructure investments.

The elaboration of a Pre-Feasibility Study (PFS) for stormwater management (drainage network facilities) and investments as well as the development of innovative financing options for identified wastewater and drainage projects are the general objectives that form the base of the assignment carried out by the Municipality Environment and physical planning departments.

## **C. BRIEF INFORMATION OF PROJECT OBJECTIVES AND BACKGROUND**

### **(Specific Objectives)**

The People's Committee of Municipality of Malindi approved with Decision for the preparation of a Pre-Feasibility Study for "Drainage System Improvement Project for Malindi Municipality.

The objectives of this PFS are:

1. Elaboration for prioritized urban infrastructure investments in the area of domestic/industrial wastewater and storm water network facilities in the Municipality of Malindi, including a climate change adaptation (flood prevention) component in Malindi Municipality).
2. Support to develop/present Priority Projects regarding industrial/domestic wastewater treatment and drainage systems to the market and identify innovative financing options through the commercial, private sectors and/or international lending institutions.

An urgent need exists for improving the wastewater and storm water infrastructures for the Municipality of Malindi, which are suffering from regular floods due to a combination of frequent heavy rainfall. In addition, the aquatic ecosystems in the Municipality of Malindi are seriously degraded since untreated wastewater is discharged to the receiving water bodies. The very few drainage and wastewater facilities are in poor condition and urgently need rehabilitation, upgrading and extension. Public health and the environment are seriously at risk. Due to the complexity of

the problems, any intervention in the sanitation sector must aim at sustainably addressing the described problems by defining comprehensive, but also realistic objectives.

These studies are a continuation of the Municipalities effort to improve its sanitation situation. The on-hand PFS elaborates on the measures which will ultimately improve the habitat and the environmental conditions in the project areas. By following the Terms of Reference (ToR) for this assignment and the World Bank Guidelines, the outputs of this PFS provide the technical, financial, environmental, and social assessments of identified Priority Projects at a level of detail which is sufficient to progress in a subsequent Feasibility Study (FS).

### **Main conclusions and recommendations**

In this PFS two priority projects have been identified to improve the urban environmental conditions in Malindi Municipality.

The following improvements are proposed as priority projects:

- i. Construction of wastewater and drainage infrastructures in order to mitigate the significant gaps in health and living conditions for the growing population residing in the project areas, being presently close to more than 100,000 people. Total investment costs for the Municipality of Malindi being nearly 75 Million USD;
- ii. Improving the capacity and capabilities of the institutions responsible for development and operation of the infrastructure and climate change initiatives.

The Municipality of Malindi is a highly favorable area for prioritized drainage, sewerage and wastewater development. The proposed concept will provide for measures to ensure that the urban poor will have access to the infrastructure network.

The recommended infrastructure projects can be seen as future opportunities of formulating and implementing a pilot project of a modern wastewater management in Kilifi County.

It is assumed that a greater in-depth analysis, e.g. on viability of the identified Priority Projects, will be undertaken in a subsequent FS.

## **D. SUMMARY OF ANALYSIS**

This Final Report presents details of (i) the PFS for the Municipality of Malindi drainage in its entirety, (ii) the wide range stakeholders' involvement in formulating an innovative sector strategy, and (iii) describes options for the identified Priority Projects and/or scenarios for project implementation of drainage and wastewater sector investments, including measures for immediate implementation, as well as for capacity development.

An Inception Report, including the evidence-based situation as well as a gap analysis. The Inception Report summarized preliminary findings from initial data gathering, research and meetings held with the Project Funders, Municipality administration and related companies and agencies. The Inception Report also included an assessment of a variety of existing reports and the Kilifi County CIDP of 2018-2022.

It is strongly recommended that both previous reports are also considered in order to ensure that this investment report (main PFS report) is easily understood. The on hand report constitutes the final output of this PFS, in which urban infrastructure investments are proposed for the Municipality of Malindi, and describes which management development is suggested. The scope of analyses and

identified infrastructure project include (i) storm water drainage systems. The described management development includes capacity building in regard to (i) operation and maintenance (O&M),

(ii) administrative measures and (iii) cooperation between the different stakeholders that are involved in monitoring and development of the drainage.

### **Brief Description of Current Situation**

The proposed interventions are a reflection of the main urban environmental gaps for a projected population of over 120,000 residents and a 30% increase of wastewater flow due to tourism in the high season in Malindi. The main problem is pollution and insufficient drainage in the urban areas, caused by erratic discharge from storm to the environment, and pollution of the streets when the

storm water if flowing with both waste water and un managed solid waste in common systems (mixed systems).

Malindi CBD structure may be described as core-urban and in some parts still semi-urban. The area is rapidly developing, mainly along the main road leading from the inner town to Lamu road and around the existing estates and airport. It is a mixture of industrial sites, residential areas as well as urban agriculture.

Malindi is a major tourist centre catering mainly for both national and international tourists. The southern and southeastern coastline areas are allocated for further development, i.e. for resorts, hotels and hospitals. The north-western part of Malindi is still quite under developed, characterized by some informal settlements and urban agriculture. industrial zones are located in the Municipality along the main highway. The currently existing several companies possess of over 3,500 employees and produce mainly consumer goods.

The Municipality of Malindi fail to meet the physical infrastructure needs of rapidly growing neighborhoods. The storm water is directly discharged into the ground and water bodies and/or discharged into streams and small drains and flows finally untreated into the sea. The very basic urban drainage system consisting of combined drainage and sewerage systems heavily pollutes the urban/rural environment and triggers health related problems for some households.

Malindi, as being seen as a major (seasonal) tourist destination in Kenya, will benefit strongly from urgent improvements of its environment by minimizing pollution levels and by improving drainage.

In previous years, this area has been overlooked while planning for development projects. Finally, the municipal administration got aware that this issue needs to be addressed and developed respective concerns. Kilifi County CIDP does address the need to tackle growing urban poverty in the County; however, no plan exists on how to address the needs of these communities and areas through future development projects.

## **Water Supply in Malindi Municipality**

Malindi Water and Sewerage Company (MAWASCO) is the Municipality Water Company managing water supply services in Malindi and its surrounding areas, including the project area comprising Malindi Municipality. The large majority of the Municipality of Malindi is connected to the urban water supply system.

## **E. RECOMMENDED PRIORITY PROJECTS AND STRATEGIES**

Project have been identified to improve the urban environmental conditions in Malindi Municipality.

The first priority part of the project includes the construction of wastewater and drainage infrastructure in order to mitigate the significant gaps in health and living conditions for the growing population residing in the project areas, being presently over 100,000 people.

The second priority part for the Project to be sustainable aims at improving the capacity and capabilities of the institutions responsible for the development and operation of respective infrastructure as well as for climate change initiatives. This project is considered essential in order to meet the significant management challenges related to the sustainable development of the recommended infrastructure measures as well as demands related to growth rates in the two areas.

The development of the Project is in accordance with the Government of Kenya (GoK)'s key strategies and plans regarding environmental development, disaster mitigation and climate change measures. These strategies and plans are reflected in a merged effort by the two key departments in charge, namely (i) Department of Physical Planning and Urban development being in charge for any physical development within the Municipality, and (ii) Department of Natural Resources and Environment in regard to environmental management, in order to achieve a sustainable development.

The developed strategy is that the combined Priorities in the Project should be practical, achievable, measurable, sustainable and affordable. The strategy therefore focuses on urgent measures to be achieved, instead of covering the full demands for development. However, this

strategy is also intended to be a platform for long-term development in accordance with the actual realization of the elements of the new Master Plan. This will provide the flexibility to: -

- (i) maximize the expected value of infrastructure developments and
- (ii) to adapt to changes in plans decades later.

Even though the projects intrinsically are elements of sustainable social development, there are some pre-conditions for obtaining sustainability of the proposed infrastructures. It is not financially viable without a complete re-assessment of fees and funding of storm water management; however, in terms of cost recovery of capital investments and O&M.

### **Capacity Building Measures**

The envisioned sustainable and practical development of sanitation and environmental management is depending heavily on; -

- (i) technical innovation,
- (ii) appropriate performance criteria and
- (iii) careful consideration to maintain and improve environmental protection.

In this context, it is important to: -

- (i) to support the development of cooperation between the many key players that have to comment or permit initiatives not yet common practice in Kenya, and more importantly
- (ii) to develop feasible management of the storm water drainage systems as well as
- (iii) integrated environmental management and monitoring procedures to secure sustainability.

This requires high knowledge and experience being developed through capacity building supported by experts with a combination of international and national leverage.

### **PPP Opportunity for Storm water Management**



It is expected that this PFS provides

- (i) primary impressions and assessments on business environments,
- (ii) an overview how current stormwater sector policies, framework and regulations encourage Private Sector Partnerships (PPP), as well as
- (iii) a reflection of possible problems, bottlenecks and risks incorporated particularly with financing and tariffs for conducting urban stormwater infrastructure investment projects in a sustainable manner. It is difficult to establish adequate funding with the present stormwater and structure.

### **TENTATIVE COST ESTIMATES**

The overall costs for the measures proposed in this PFS are provided in the Table below. For the Municipality of Malindi, a centralized as well as a de-centralized drainage solution is considered based on a thorough analysis of local conditions and opportunities and is presented in the following of this PFS. The cost presented in the following include Capital Expenditure (CAPEX) as well as Operational Expenditure (OPEX) for the proposed infrastructures, broken down in CAPEX as well as OPEX for O&M.