



COUNTY GOVERNMENT OF KIRINYAGA

**Feasibility Study**  
**for**  
**Development of Fire Station Infrastructure**  
**in**  
**Kerugoya-Kutus Municipality**

OCTOBER 2020

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## KERUGOYA-KUTUS MUNICIPALITY FIRE STATION

### **A. Background**

The County Government of Kirinyaga (CGK) has received funding from the UKAID's Sustainable Urban Economic Development programme in the amount of about 600 million Kenya Shillings to finance the “Establishment of a rice husks factory and urban development. Out of the 600 million, 70 million has been set aside for the development of a fire station infrastructure for Kerugoya-Kutus Municipality. The project development objective is to support improvements to fire rescue and emergency responses in the Municipality through construction of a sustainable firefighting infrastructure and facilities.

### **A. ABOUT KIRINYAGA FIRE STATION DEPARTMENT**

The department serves a population of approximately 610,000 residents within its coverage area.

It provides a wide range of services to the community, which includes:

1. Fire suppression
2. Technical rescue
3. Hazardous materials response (awareness and operations)
4. Building, fire and life safety inspections
5. Community code enforcement
6. Education and fire prevention
7. Emergency management and disaster response
8. Training and education

### **B. OBJECTIVES FOR THIS FEASIBILITY STUDY (FS)**

Accordingly, the Kerugoya-Kutus Municipality developed a comprehensive plan for technical assistance in the firefighting sector, with the following two broad objectives:

- a) Provide a recommended integrated and sustainable fire and emergency response and management system for the Municipality; and
- b) Prepare a feasibility study for the most appropriate technology and innovations in construction of the fire station infrastructure for the Municipality of Kirinyaga.

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## **Location**

The existing Fire Station is located in Kerugoya town at behind the County Department of Public Works and Infrastructure offices. The site is predominantly covered by vegetation or building.

## **Layout**

The station is bordered by the Public Works offices. There are no independent designated parking spaces for the fire station equipment, for the staff, for the public and also for the handicapped. There is no pavement. No curbing is provided. There is a steep bituminous embankment separating the right of way from the fire

The existing structure is an iron sheet fire station with plywood and cardboard partitions.

## **Utilities**

Location of Water, sewer, gas and drainage are not visible and cannot be determined.

There is an urgent need for development of a new fire station for the Kerugoya-Kutus Municipality due to the regular fire accidents and road accident emergencies. In addition, the increased population and developments in the Kerugoya-Kutus Municipality is a considerable factor for the development of a new fire station. Based on our evaluation, the current fire station infrastructure at the Public Works department in Kerugoya is in a very poor condition and urgently need rehabilitation, upgrading and extension. Due to its original design and orientation on the site the facility has a very limited expansion capability. The facility as it relates to the Department's current needs is insufficiently sized in all three aspects of a fire station, Administrative Spaces, Apparatus Bay and Firefighters living quarters.

This depletion of spaces is not conducive to a standalone fire station and consequently it is impacting the Fire Department's operations and the internal response time to an emergency. The apparatus bay is insufficiently sized to accommodate all of the current Fire Department's vehicles, and the circulation space between the apparatus is minimal creating bottlenecks and safety hazards for responding firefighters.

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To date, this facility has adequately served Kirinyaga County. That said, technological advances in firefighting equipment, the expansion of the departments' services and the need to look toward additional staff in the future, the existing buildings limitations are currently, and will continue to limit the department's ability to carry out its mission. All are in conflict with the constraints of the facility.

The public are currently at risk if there be any serious fire emergencies either at the residential, commercial, educational or industrial facilities. Public health and the environment are seriously at risk. Due to this, any intervention in the fire management 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 emergency, health, development and safety goals. The on-hand Feasibility Studies elaborates on the measures which will ultimately improve the habitat and the environmental conditions in the project areas. By following the Terms of Reference for this assignment and the SUED Guidelines, the outputs of this study provide the technical, financial, environmental, and social assessments of identified Priority Projects at a level of detail as follows:

### **C. SUMMARY OF ANALYSIS**

This Report presents details of; -

- (i) the FS for the Kerugoya-Kutus Municipality fire station in its entirety, The wide range stakeholders' involvement in formulating an innovative sector strategy, and
- (ii) describes options for the identified Priority Projects and/or scenarios for project implementation of fire response sector investments, including measures for immediate implementation, as well as for capacity development.

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## **Brief Description of Current Situation**

The evaluation presented in this report is based on field observations, review of available fire fighting resources, and discussions with personnel from the facility.

### **Life Safety and Code Compliance**

- The existing facility does not have a fire suppression system.
- Exit signs are missing.
- There is no fire separation between the apparatus bays and the offices. This is true of the walls as well as the ceilings.
- There are numerous penetrations through rated walls, ceilings and floor assemblies that do not have the required fire stopping.

### **Fire Department Operational Issues**

- Overhead doors to the fire apparatus room are too narrow and too low for present equipment; it impedes the department in the procurement of future apparatus and it also hinders the deployment of supplemental support from this facility.
- The stations administrative spaces are greatly undersized and limited to the fire chief's office, and a diminutive office off of the apparatus bays office serving multiple duties.
- Currently, the facility is lacking all firefighter's living space amenities. Spaces such as dining area, kitchen, day room, locker rooms, fitness room and adequate dormitories are non-existent.
- The facility does not have a decontamination area. All contaminated equipment is hosed down within the apparatus bay.
- Current storage areas are tight, with storage overflow scattered throughout the facility occupying the kitchen, administration area and some in the sleeping bay.
- The station in its current configuration cannot accommodate the anticipated growth within the community and within the programmatic requirements of the fire station.
- Environmental aesthetic of the fire station is not appealing from all angles to the entrance.
- Currently, there is no separate area for gear storage. Gear is stored in the small available storage room.

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- No allocated parking bay available for the Fire Engine, Landrover and Water Boozer.
  - The existing kitchen is extremely small and insufficiently sized to accommodate the current staff.
  - The station has inadequate residential units for the fire fighters. The rooms present are tiny in space, lack several basic commodities of a housing and they are in a very bad civil and structural state. The number of the fire response units with the number of available housing does not match. This hinders the fire stations vision on extensive supply in machinery operation and general fire emergency responses.



Fig 1. The parking bay of the Fire Engine, landrover and Water boozer.



Fig 2. The current Fire Station Headquarters



Fig 3. The current Fire Station Administration area which also serves as day room,dining room,storage unit etc.



Fig 4. The current Fire Station accommodation area.



Fig 5. The current Fire Station storage area. The Kitchen also serves as a storage area.

#### **d). Water Supply in for Kirinyaga Fire station**

Kirinyaga Water and Sewerage Company (KIRIWASCO) is the only piped water supplier in Kerugoya-Kutus Municipality and its surrounding areas, including the project area comprising station majorly depends on this piped water at Samson's Corner to carry out its services which is a very big limiting factor when it comes to fire emergency responses. The Fire Engine has a capacity of 5,000 litres, The landrover has a capacity of 500 litres and the water boozer has a capacity of 10,000 litres.

### **D. RECOMMENDED PROJECT STRATEGIES**

Project have been identified to improve the urban environmental conditions health and safety in Kerugoya-Kutus Municipality.

- ✓ Identify land for the establishment of a fire station
- ✓ Develop fire station building infrastructures which include offices, fire engine sheds and garages and fire fighting staff houses.
- ✓ Provide Stand-by Power Distribution System and reliable water supply with low maintenance cost.
- ✓ Provide and Construct a Mega water reservoir or dig a borehole to enable a 24hr water supply to the fire engines to enable in combating fire emergencies without exception of providing large water storage tanks for both use in the offices, accommodation units and



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for the fire engines.

- ✓ Development of an operational emergency call center that operates 24/7. This will enable efficiency in fire emergency compartment at a very urgent time and call and at an early stage. This will save lives and property without forgetting preventing excessive carbon emissions to the environment.
- ✓ Provide a First aid and disaster management training center to train and sensitize the public and Educational institutions on fire safety, disaster management and prevention.
- ✓ Environmental sensitization in the full renovation and development of the fire station with prioritizing environmental beauty, through architecture and designs.

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 Operations & Maintenance.

### **Capacity Building Measures**

The envisioned sustainable and practical development of the fire station 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 fire service systems as well as
- (iii) integrated fire 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.

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## **PPP Opportunity for Fire Station Management**

It is expected that this Feasibility Study provides

- (i) primary impressions and assessments on residential, industrial, educational and business environments,
- (ii) an overview how current fire management 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 firefighting infrastructure investment projects in a sustainable manner.

## **E. TENTATIVE COST ESTIMATES**

The overall costs for the measures proposed in this PFS are provided in the Table below. For the Kerugoya-Kutus Municipality, a centralized fire station infrastructure is considered based on a thorough analysis of local conditions and opportunities and is presented in the table below.

**TABLE1: KERUGOYA-KUTUS MUNICIPALITY PROPOSED FIRE  
STATION INVESTMENT BUDGET PROPOSAL**

S/N	ACTIVITY	TIME FRAME		BUDGET (KSH)			
		Start date	End Date	KUSP	CGK	Other	Total
<b>A</b>	<b>MOVABLE ASSETS (13.46% of KUSP Total)</b>						
A1	Acquisition of office furniture	01 July	31 October	1,500,000.00	-	-	1,500,000.00
A2	Acquisition of project equipment & Operations	01 July	31 October	1,500,000.00	-	-	1,500,000.00
	<b><i>SUBTOTAL 1</i></b>			<b><i>3,000,000.00</i></b>	-	-	<b><i>3,000,000.00</i></b>
<b>B</b>	<b>INVESTMENT PREPARATION: planning, design, costing, and supervision (2.8% of KUSP Total)</b>						
BI	Construction of Fire Station	01 July	30 October	1,400,000.00	-	-	1,600,000.00
B2	Hydrant and a Bore hole	01 July	30 October	1,400,000.00	-	-	1,200,000.00
	<b><i>SUBTOTAL 2</i></b>			<b><i>2,800,000.00</i></b>	-	-	<b><i>2,800,000.00</i></b>
<b>C</b>	<b>PROJECT CONSTRUCTION COSTS (85.23% of KUSP Total)</b>						
C1	Construction of Fire Station	August 2019	June 2020	80,793,668.00	-	-	80,793,668.00
C2	Hydrant and a Bore hole	August 2019	June 2020	2,000,000.00	-	-	2,000,000.00
	<b><i>SUBTOTAL 3</i></b>			<b><i>82,793,668.00</i></b>	-	-	<b><i>82,793,668.00</i></b>
	<b>TOTAL</b>			<b>88,593,668.00</b>			<b>88,593,668.00</b>