



**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR THE
REHABILITATION OF KAIBOCHE EARTH DAM PROJECT
CHIAKARIGA WARD THARAKA SOUTH SUB COUNTY
THARAKA NITHI COUNTY**



Project site before intervention

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1.0 Background information

Kaiboche Earth dam is located at Chiakariga ward of Tharaka Nithi County at GPS Coordinates, S 0.290618, and E37.923973. The dam was constructed with assistance from Mount Kenya East Pilot project by the community several years ago. The dammed water was targeted to cater for the livestock within the area. There are no reliable sources of water within the vicinity which provided the rationale for the dam location.

The need to rehabilitate the dam was occasioned by siltation that has greatly reduced the dam storage capacity to almost 2,000 M³. In the process of rehabilitation of the dam several activities are going to be undertaken, among them:

1. Evaluation of the dam structural integrity and survey
2. Excavation and removal of the soil
3. Fencing to secure the dam
4. Reinforcement of the earth dam walls and compaction

1.1 Project description

The Project includes the Rehabilitation of Kaiboche dam

- (a) Desiltation of the reservoir and spillway
- (b) Rehabilitation of pipeline, cattle trough and communal water Kiosk

1.2 Justification of the project

Chiakariga location is characterized by chronic water shortage which is a common phenomenon in the sub county and in most ASAL areas in the country. After each rainy season, the surface runoff drains into the seasonal streams and rivers and very little of it is retained or conserved for either livestock or domestic use. During dry season, family members search for water to far distances for their livestock and domestic use. Most of the community members are faced with severe water shortages for both human and livestock consumption due to the drying up of water sources. As a result, people have to travel for between 5km-10km in search for water during the dry period.

The project proposes to address the water shortage and food insecurity in Chiakariga location, Chiakariga ward of Tharaka south sub county by rehabilitating the Kaiboche Earth Dam.

2.0 Anticipated Environmental impacts

Anticipated Positive impacts include

- Reliable source of water for the community(livestock and domestic)
- Saving time for other economic activities
- Have a tree nursery
- Catchment protection

Negative impacts and the mitigation measures

- Water borne disease Malaria
- Dust raised during the excavation spreading and compaction
- Soil compaction by the heavy machinery
- Danger of drowning for both human and livestock
- Loss of vegetation cover
- Ownership conflict (social impact)
- Vandalism of project property
- Flooding
- Dam siltation
- Noise during construction
- Waste management

Mitigation measures

- Community sensitization and awareness creation on control and prevention of water borne diseases
- Fencing off the earth dam to minimize the chances of loss of human life and livestock by drowning
- Establishment of a tree nursery with indigenous, exotic and fruit trees to provide seedling for establishment and conservation of the water catchment area and distribution to farmer both the target group members and to other farmers.
- To avoid compaction of the soil in the area around the dam the machine movement should limited to the confines of the excavation area
- Construction of a silt trap to protect the dam from silting
- The design of the spillway of the dam should ensure the water flow back to its original course
- Provision of ear mufflers, nasal and mouth mask to protect those excavating the dam from dust and fumes inhalation
- Planting of trees around the boundary of the dam to protect the wall from collapsing
- Acquiring and signing all the necessary legal documents with the community and the relevant authorities

3.0 Environmental and Social Management Plan (ESMP)

The proposed activities will impact on the environment in different ways and that's why it is important to develop an ESMP to guide the process of implementation. This ESMP was developed in consultation with the community members of the group

Environmental and Social Management Plan (ESMP)

Issue	Impact	Mitigation	Responsibility	Timeframe	Cost (Kshs)
Public health	Increased incidences of vector borne diseases like malaria due to water stagnation at the dam	<ul style="list-style-type: none"> Health education on malaria prevention e.g. use of nets Introduce fish into the dam to feed on mosquito larvae(<i>gambusia</i>) 	<ul style="list-style-type: none"> County government through KCSAP 	During the project operational phase	100,000
Pollution	Air Quality	<ul style="list-style-type: none"> During excavation dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site No open burning of waste material at the site There will be no excessive idling of vehicles and machinery at site 	<ul style="list-style-type: none"> Contractor 	During project implementation period	50,000
	Water Quality	<ul style="list-style-type: none"> Establish appropriate erosion and sediment control measures to prevent excessive water turbidity Control the invasion of algae – introduce appropriate fish species Nile tilapia Avoid oil spills 	<ul style="list-style-type: none"> Contractor County government 	During implementation period and after	50,000
	Waste management	<ul style="list-style-type: none"> Waste collection and disposal accordance with waste management regulations Maintain records of waste collected and disposed. Whenever feasible the contractor will reuse and recycle appropriate and 	<ul style="list-style-type: none"> Contractor 	During implementation period	20,000

		viaible materials.			
Safety	Noise	<ul style="list-style-type: none"> Excavation and traffic noise will be limited to restricted times During operations the engine covers of generators, air compressors and other powered mechanical equipment shall be closed. 	<ul style="list-style-type: none"> Contractor 	During implementati on period	20,000
	Exposure to accidents and falls – workers and public traffic	<ul style="list-style-type: none"> Fence off the dam area Restrict access to authorised persons only Place warning signs on risky areas 	<ul style="list-style-type: none"> Community Contractor 	During implementati on period and after	100,000
Soil erosion	Dam siltation	<ul style="list-style-type: none"> Construct a siltation pan on the inlet path Regularly scoop off the sand from the sedimentation pan Stabilise the dam walls with grass Ensure the dams walls are well compacted Install water and soil conservation structures in the dam catchment area and water ways 	<ul style="list-style-type: none"> Community Contractor 	During implementati on period and after.	50,000
Flooding	Loss of life and property	<ul style="list-style-type: none"> Construct a well-designed spill way Ensure there is no settlement downstream on the flow path Enforce dam building standards to ensure integrity of the dam walls 	<ul style="list-style-type: none"> Contractor Community 	Construction	100,000
Vegetatio n cover	Loss of vegetation cover	<ul style="list-style-type: none"> Plant trees around the dam Have a tree nursery for the community Have soil and water conservation structures to control soil erosion 	<ul style="list-style-type: none"> Community 	Construction and operation phase	50,000

Ownership and sustainability	Asset ownership conflict	<ul style="list-style-type: none"> • Public participation • Memorandum understanding with the community • Have cohesive project management committee 	<ul style="list-style-type: none"> • Proponent • community 	Construction and operation phase	10,000
Security of the property	Vandalism of property	<ul style="list-style-type: none"> • Surveillance • fencing 	<ul style="list-style-type: none"> • contractor and community 	Construction and operation phase	100,000

Conclusion

The analysis of the impacts and mitigation measures of Kaiboche earth dam as detailed above indicates that the project will have minimal impacts on the environment since it's a small project. The environmental and social management plan has to be adhered to.