BAKOTEH DUMPSITE: A SOLUTION
SWANA Solid Waste Student Design Competition, 2021
Sustainable Environmental Solutions

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Introduction

- Reduce adverse social and environmental impact caused by Bakoteh open dump site.
- Locate and design new site for waste landfilling.
- Sustainable reuse of existing Bakoteh dumpsite land.
- Creation of Job opportunities.

Objectives

- Sustainable closure of existing Bakoteh dumpsite in Gambia
- Establishing an engineered landfill in Tambana region
- Proper planning and utilization of existing resources
- Finding cost-effective solution to fit developing country needs

Background

- A non-engineered dumping site.
- Causing health hazard as well as environmental degradation for the locals.

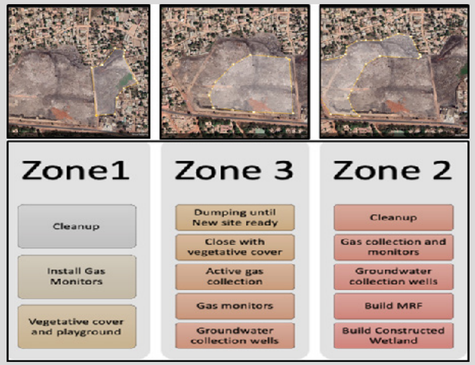
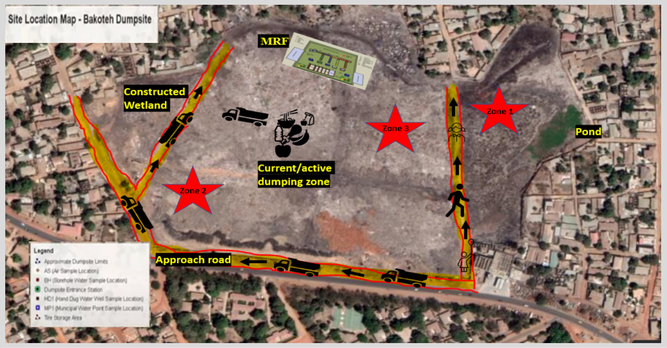
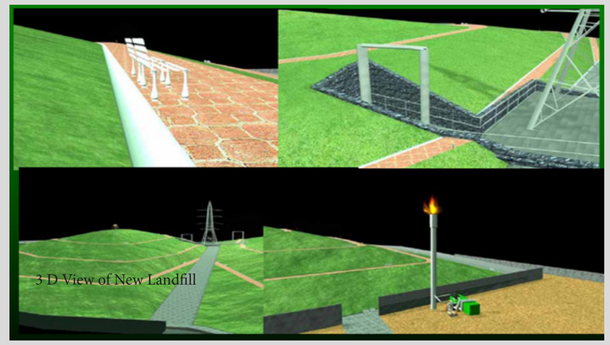


Fig 1. : Zone wise layout of existing Bakoteh Dumpsite

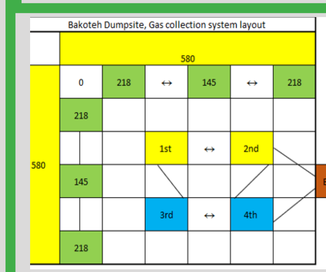
Project Layout (Closure of Bakoteh dumpsite & Design of Tambana Landfill)





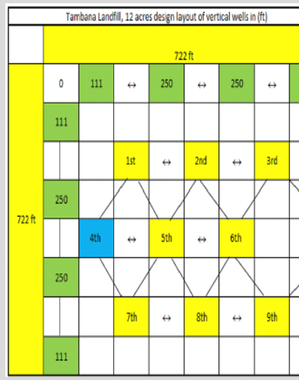
Design Considerations

Gas Collection



Active Gas collection system and a Gas monitoring system can be commissioned at the Bakoteh dumpsite

- Passive gas collection system is proposed at the Tambana landfill because it will be well designed with bottom liners and final cover system.
- It wil be easy to capture the build up pressure



The new Landfill will have 9 wells, designed based on the area available for the landfill.

Fig 2.: Gas collection design layout at Tambana Land-

Leachate Collection and Treatment

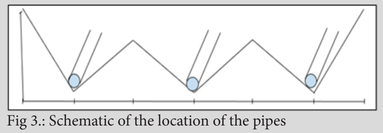


Fig 3.: Schematic of the location of the pipes

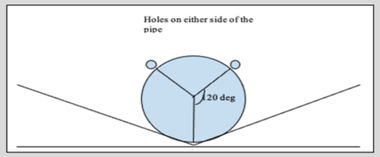


Fig 4.: Leachate Collection and Treatment

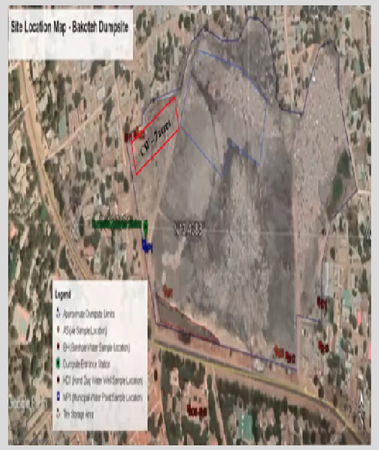
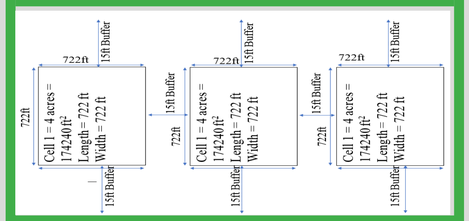


Fig 5.: Constructed Wetland at Bakoteh Dumpsite

Design of cells at Tambana



Final Cover System

- The final cover of a landfill is a multi-layered capping system
- It is designed to: Reduce infiltration, Minimize surface runoff, Resist erosion, Control gas migration, Reduce fire hazard etc.

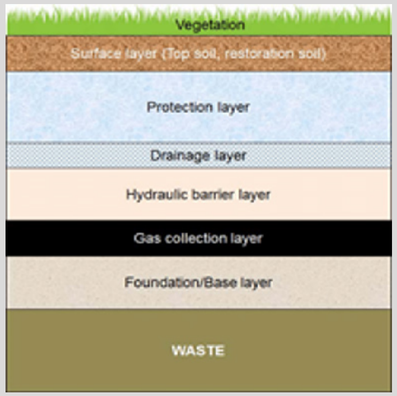
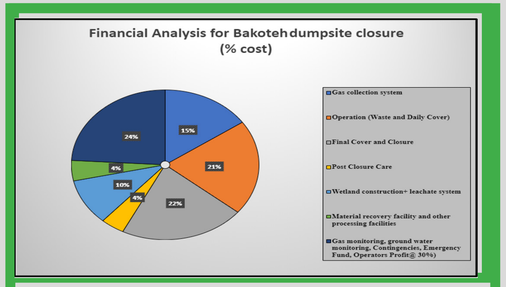


Fig 6.: Final Cover Design

Financial Analysis



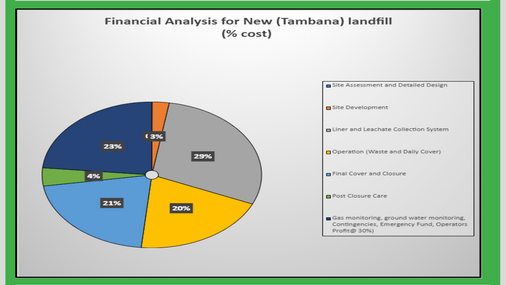


Fig 7.: Financial % for Bakoteh dumpsite closure and New Landfill site

Conclusion & Future Recommendations

- Waste reduction at source can be a better and sustainable option.
- Closure of Bakoteh and transfer of waste to new landfill should be priority.