

## **BIOSAND FILTERS PROJECT IN NYAKACH DISTRICT, KENYA.**

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### **BACKGROUND TO KENYA:**

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Kenya is one of the three East African countries. It is bordered by Somalia to the northeast, Ethiopia to the north, Sudan to the northwest, Uganda to the west, Tanzania to the south and the Indian Ocean running along the southeast border.

Kenya's population, estimated at about 39 million people, comprises over 40 ethnic groups. It is almost exclusively of African descent, although there are small but influential minorities of Asians, Indians and Europeans. At a population growth rate of 2.691% (2009 estimate) Kenya's ability to expand economically and provide needed educational and social services with minimum environmental degradation.

Kenyan official language is English, predominantly spoken in towns and institutions. About two-thirds of the population can speak Kiswahili (the national language) as a second language to their indigenous tribal languages (Luo – in the case of project area).

Kenya which boasts of being an economic hub in East Africa is hampered by corruption and reliance on primary agricultural goods whose production is heavily affected by climate change and marketing challenged by low pricing.

Most of the country's development projects are delivered through Structural Adjustment Programs predominantly supported by donor funds. Due to the government's failure to maintain reforms and curb corruption, donors and international financial institutions such as IMF have often (1997, 2002) suspended lending to support development projects. This has also lead to low investor confidence. As a result, many Kenyans still lack access to essential social and infrastructural services including access to clean and safe water by everyone.

Some of the current national water issues include: Water pollution from urban and industrial wastes; degradation of water quality from increased use of pesticides and fertilizers; water hyacinth infestation in Lake Victoria; soil erosion; desertification and deforestation reducing amount of water supply.

So far, many governmental, NGOs and multinational agencies have put concerted efforts to address poor access to clean and safe water in the urban settlements. Unfortunately, rural areas remain largely neglected by water policy and development objectives. The argument that cities, being nodes of rapid growth and concentration need more attention is tenable. However, there is no justification for continued neglect of the rural population in terms of the provision of adequate and efficient infrastructural and social services. In fact, an improvement in the quality of rural life can contribute immensely to a reduced rate rural-urban migration influenced by the bright-light hypothesis. This approach addresses the problem at its course; it is preventive rather than being prescriptive or remedial.

### **BACKGROUND TO THE PROJECTAREA:**

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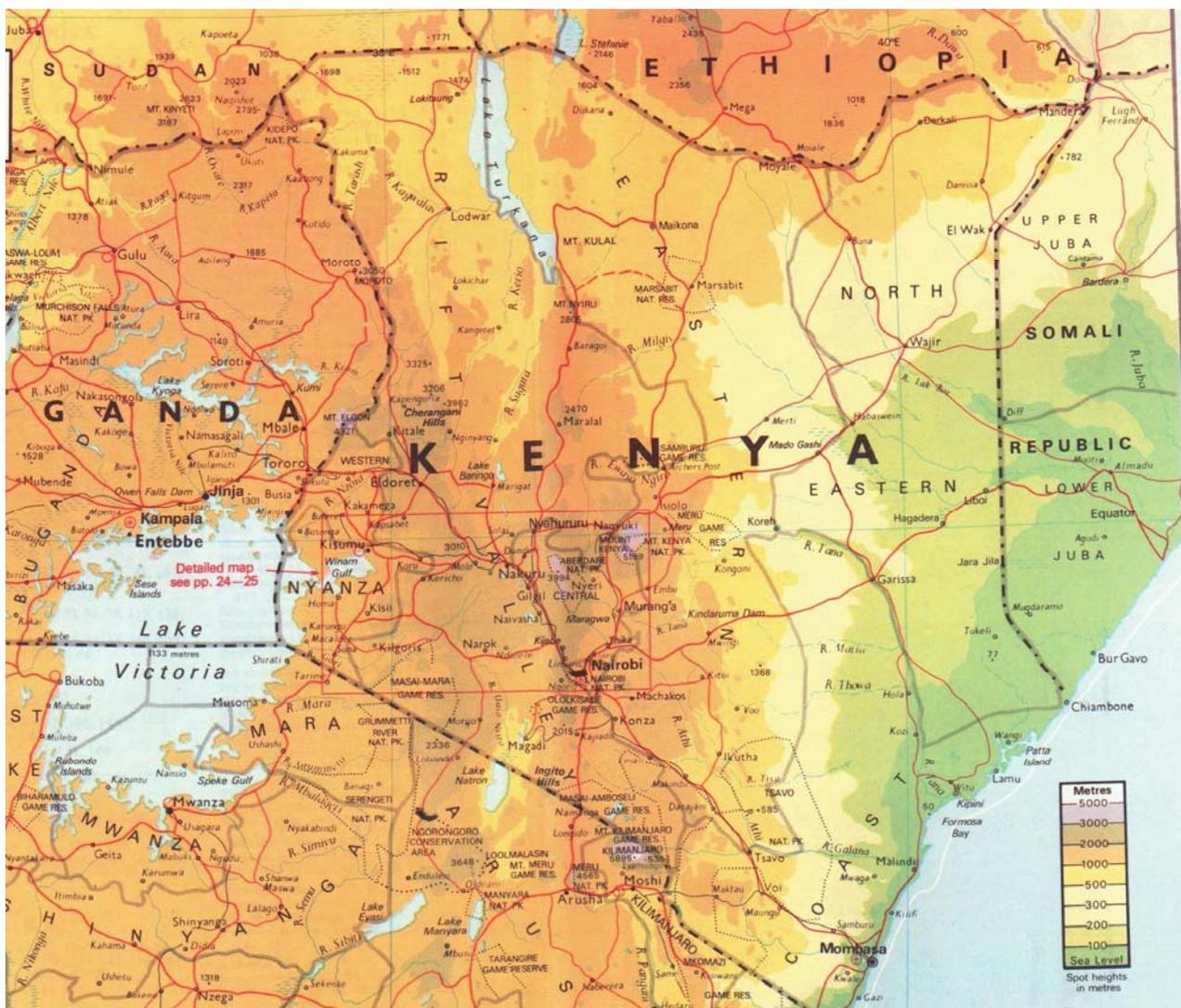
The country is divided into eight administrative boundaries (provinces). The project will be conducted in the western part of the country, in Nyanza province whose capital (Kisumu) is about

400 km from the country's capital- Nairobi. The project will take place in Nyando District; (within the newly created Nyakach district). This region is demarcated by 'Nyabondo' plateau to the South and 'Ahero' plains to the south; lying along the Kisumu – Oyugis Highway. The area is generally hot and humid, with average diurnal temperatures of 28 ° C. The area experiences two rainy seasons: long rains between March-May and short rains between September-October.

The area is bound by the world's second largest Lake Victoria and the Rift Valley highlands which creates a tropical micro-climate. The area is supplied with two major permanent rivers (Nyando and Sondu) with some few permanent underground springs and water ponds. Most of these sources dry up during the dry season making perennial water shortages an ongoing problem forcing residents to walk over long distances in such of clean water for daily needs.

Water quality is a concern to many of the locals in all seasons. The area (Nyando basin) is one of the two parts of Kenya adversely affected by annual floods during the long rainy seasons. The quality of water during rainy season is very poor due to siltation of all the major sources of water. There are very high incidences of water-borne diseases like cholera during rainy seasons.

### THE MAP OF KENYA:



## SCENARIO ANALYSIS:

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**Fig. 1:** An escarpment defining the edge of Nyabondo Plateau;

The areas along the escarpment have access to relatively clean water from permanent springs. However, the quality of the water has not been tested for existence of any pathogens.

The lower sections of the region get their water supply from ponds and rivers illustrated below.

**Fig. 2 and 3: Ponds**

As illustrated in the photo alongside, shallow ponds form the major sources of domestic water supply.

One has to walk through the water to access presumably clean water (making it dirtier in the process). In most cases, women wash their clothes and shower in the same water bodies (rivers, ponds and springs) where they fetch from.

Herders also bring water their



livestock in the same water sources. Even though the water is contaminated, most families do not have access to purification mechanisms that can guarantee the quality of the water they rely on heavily for their daily domestic needs. A number of households rely on natural process of decantation and manual filtration.



**Fig. 4: Defunct Cattle dip.**

Most of the cattle dips that were used for livestock treatment are no longer operational. Consequently, livestock are sprayed in the open further polluting the neighbouring water ponds. As can be observed in the photo alongside the pipe that was meant to supply treated water supplied by the government is no longer operational, denying the community clean and safe water for household use.



**Fig. 6: Health Situation:**

There is a very high prevalence of infectious diseases. Apart from HIV/AIDS, Malaria and T.B, food and water borne diseases such as bacterial and protozoan diarrhea, typhoid fever and schistosomiasis are a major cause of deaths in the area.

According to the hospital's public health officer many people succumb to these diseases without seeking medical attention due ignorance, and difficulties in accessing timely medical attention. At the time of visit, about half of the patients seen were suffering from water-borne and food related conditions. She observed that provision of clean drinking water and uncontaminated food would greatly help curb the epidemic.

At the time of visit, even the Hospital had no tapped treated water forcing the administration to rely on using solid water purifiers branded as 'water guard'.





**Fig. 5: Latrines**

Pit latrines are used for human waste management. Some of these latrines are located near water courses/along riverbanks posing the potential risk of having uncontrolled seepage in to the water. Other people often relieve themselves in open fields leaving their fecal matter susceptible to being washed down the water courses. Yet such water is rarely treated before human consumption.

### PROJECT ELEMENTS:

- **High level political support to sustainable development:** Kenya has signed a number of international environmental agreements on various issues such as Biodiversity conservation, Climate Change (Kyoto Protocol, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Wetlands).
- **Locally available labor:** 75% of the country's labour force is employed in the agricultural sector, the remaining 25% work in the industry and services sector. There is abundant supply of unskilled and semi-skilled labour that can be utilized through mutual agreements and capacity building. Apart from providing clean water to the community, the project is expected to make a contribution to addressing the country's unemployment rate which is currently standing at about 40%.
- **Environmental Investment:** There is a great opportunity for exploiting existing and new markets using an entrepreneurial oriented project.
- **Linkages with the local administration:** Mr. Otieno has a cordial working relationship with the Government through the Ministry of Youth Affairs and Sports. The Director of Youth Development fully supports the group's initiative.

- **Mode of transport;**

Human driven or donkey pulled carts, Bicycles, motorcycles and small pick-ups/trucks available on hire. I believe we shall be able to adopt the most convenient mode.

- **Supply of tools and hardware:**

Most of the tools and materials can be bought from the local hardware shops. I have looked at the images of the moulds that you attached and I am convinced that they could be made by the local artisans within the neighboring market centers. This would not only help reduce the cost of transportation, but would also ensure a quick rate of transfer of the technology within the local communities and provision of employment to the locals.

- **Community Health Workers:**

I had a brief discussion with the Nyando District Hospital's Public Health Officer to discuss the existing health and sanitation situation in the district. We also discussed how we could collaborate in improving the situation in the district through the Biosand Filters project. She was very excited about the project, seeing it as a good step towards helping the locals initiate preventive sanitary measures. She offered to discuss with the hospital's administrator and the doctor-in-charge to release some of the staff to support the project through quality assurance and training.

- **Support from the Local Provincial Administration:**

The recent changes in provincial boundaries saw the creation of a new district, Nyakach district from the Nyando District. This implies that the project will be initiated in Nyakach District which is expected to be administratively operative from May 2009.

During my visit, I was able to meet lower Nyakach Divisional Officer who agreed to support the project. With such support, we shall be able to work with other junior officers like local area chiefs. To formalize their support, I was required to present an official letter from my university supporting the project. I would be submitting my request to the university's administration to request for the support letter (incase you have some extra information that need to be considered while seeking for such support, kindly share with me so that I can include it in the application).

- **Housing and Storage:**

As we had discussed, we shall focus on making arrangements for family-hosting within the community as this not only reduce costs; but also enhances cultural exchange and foster healthy interactions which are essential prerequisites for the success of the project. The community is generally hospitable; thus, it wouldn't be difficult to find the families. While selecting these families I'll pay special attention to identifying religious leaders, local administration, and women group leaders. In this case, the benefactors of the moulds would be institutions (e.g. schools, churches) and groups (like women groups) as opposed to individual families.

My reasoning for this is that, these leaders are already entrusted with the responsibility of representing the public's interest. Their guests are easily regarded as community guests – a perception essential in creating strong community ties and a sense of project ownership. Many people usually feel free to explore the project in institutional settings as opposed to individual families. I think that it is also easier to integrate entrepreneurial model to the delivery of these moulds in an institutional setting as opposed to an individual home setting. In this system, personal business development will occur at the level of construction of the moulds. Such institutions/groups become centers of excellence/best practice as far as water treatment and management is concerned. Each household would be encouraged to transfer the project to their individual homes.

The idea of providing a secure work and storage area must be exhaustively exploited at the planning stage.

- **Long Term Issues:**

I have been thinking about the potential of sustaining the project. I have discussed with a gentleman: **Mr. Elly Ogwedhi Ochieng'** about his willingness to be fully involved in the project. He will assist in most of the project tasks by organizing various project logistics such as organizing for

acquisition of building materials and mobilizing various actors. He can also be trained to assist with the operation and maintenance as well the training of the beneficiaries.

I believe that Mr. Elly would be the best suited person to serve this role. Having known and worked with Elly from grade four to twelve, I am convinced that he has the attributes needed for the successful delivery of the project. Mr. Elly has amerced over two years experience of construction work working as a mason's aide. Besides, Mr. Elly had successfully completed driving courses and is in possession of a driving license: if need be he can readily assist in transportation with reduced costs or delays. Given his teaching experience (he is currently serving as an untrained teacher within the project area's neighbourhood), I believe that he has a good capacity to communicate and collaborate with the local community. However, the challenge is the fact that he will have to sacrifice his teaching contract from which he supports his young family (he has been married for less than six months).

Since I'll be concluding my undergraduate course work by Early July, I look forward to spending ample time within the community preparing for the project. I am keen on managing and overseeing the project (at least at the start up phases) and set a good precedent for extending the project to other areas. I believe that the best long-term model for sustaining the project would be innovative social entrepreneurial approaches. I look forward to developing these models through consultations with the local community actors.

The simple fact that the model is transferable and can be easily modeled makes it a suitable facility for emergency provision of water and sanitary services in the country. Crises often occur in the country, a recent case of which is the predicament of the victims of post-election violence and refugees, some of whom are still living in poorly serviced camps. With collaborations of other local and international humanitarian agencies, the project can be extended to reach out to these disadvantaged people as well.

### **Performance measures**

As much as this section is important, our focus shall be to measure performance but not to spend more time in measurement than accomplishing the project's goals.