



Demonstrating and upscaling an innovative sanitation value chain for the (peri) urban low income areas in Nakuru County, Kenya

Most (peri) urban low income areas (LIAs) of Nakuru County are poorly planned and sanitation infrastructure is inadequate. The access to improved sanitation facilities is low, with 46% for Nakuru Town and 53% for Nakuru County (Maji Data, 2012). Out of the existing toilets, 51% are unimproved pit latrines. Due to the sandy soils in Nakuru town, pit latrines contaminate ground water through faecal sludge and urine that percolate to the ground water table.

Wide application of sewers in LIAs is not realistic in the coming decade because of high costs. On the other hand, on site solutions (pit latrines, ecosan) are much dependent on the interest of individual users for removal of faecal sludge and urine from their surroundings which may lead to groundwater pollution and public health risk. Hence, demonstrating an innovative and sustainable (in economic and ecological terms) sanitation value based approach is considered key to promote a breakthrough in sanitation improvement acceleration in Nakuru and other parts of Kenya.

The **Nakuru Water and Sanitation Services Company (NAWASSCO)** implements the project with **Vitens Evides International (VEI)** as lead partner and support of **SNV Netherlands Development Organisation, Umande Trust** and the **Nakuru County Government**.

Project objectives

The overall objective of the action also known as the Nakuru County Sanitation Programme (NCSP) is to demonstrate and implement a commercially viable sanitation value chain, benefiting residents of unsewered (peri-)urban low income areas in Nakuru County.

More specifically, the action has the following (specific) objectives:

1. Increase hygiene awareness and sanitation coverage in Nakuru Town;
2. Establish collection facilities and transport services for hygienic and sustainable capture and removal of human waste from the LIAs;
3. Controlled and certified production and sales of human waste products on a large scale.

Key milestones and results

Hygiene awareness and toilet construction

Up to now the programme has reached over 230,00 people with hygiene awareness messages through different channels including mass communication using radio messaging, Global hand washing days and World toilet days, house-to-house visits by trained community health volunteers and hand washing campaigns in both public and private primary schools.

Households: Over 8,100 toilets have been constructed in and/or rehabilitated in Nakuru Town's Low Income Areas in partnership with households, plot owners and the County government.



Figure 2: Fahari Loo Household Toilet



School Sanitation:

Safe and dignified toilet blocks with water connection for hand washing have been constructed in 26 public primary schools with



Figure 1: New Toilet Facilities at a Public Primary School in Nakuru over 18,000 pupils benefitting.

County Estates: In partnership with the County Housing Department 280 toilet facilities have been renovated at the LIA county estates (Kaloleni and Kivumbini). These facilities were over 40 years old and sludge was overflowing into the estate areas.



Figure 3: Rehabilitated County Estate Toilet Facilities

Collection and transportation system



Working closely with the Public Health Office and County Government, NCSP developed an innovative safe and hygienic emptying and transport of faecal sludge suitable for LIAs. The Gulper technology has been tested, pit-emptier associations are engaged and a Primary

Collection Point (PCP) designed that will facilitate safe disposal of the sludge in LIAs. The sludge will then be transported to the waste water treatment plant. Together with the Public Health Office, manual emptiers have been trained on safety compliance, health compliance, environmental compliance and basic business knowledge. After the trainings, the manual emptiers are licenced and vaccinated by Public Health.

Production of faecal matter and urine products

The programme through NAWASSCO engaged local social enterprises and

Egerton University to design production processes. Two types of products have been developed and tested: bio-fertilisers



and biomass-fuels-briquettes made partly from human waste and sawdust. Carbonised round shaped briquettes were chosen and currently the production is being up-scaled.

Bio-fertilisers: (Vermi-) compost and Struvite

Compost is an eco-friendly natural fertiliser product prepared from biodegradable organic wastes (obtained from Nakuru's main market) and human waste.

Vermi-compost is produced by the consumption of organic matter by earthworms which speed up decomposition and provide a nutrient rich end product.

Struvite is a high quality phosphorus fertiliser. It has many fertilising properties of urine with several advantages: reduced volume and weight, easily stored in a compact form and it is easy to handle, transport and apply.



Figure 5: Cabbage Grown using Bio-fertiliser

Data obtained from research of bio-fertilisers has been analysed and used to support both scientific and popular publications.

Bio-mass fuels: Briquettes and fuel-pellets

The fuels are made out of dried or carbonised faecal matter. Other organic wastes like saw-dust, banana stocks and market waste can be added to increase the calorific value and volume of the products. Faecal matter, starch or molasses can be used as a binder. Biomass-



fuels can be developed to suit the diverse range of cook stoves available, from the traditional cook stoves to improved cook stoves (ICS) like the gasifier stoves which are designed to reduce fuel consumption and curb smoke emissions. NCSP is currently updating the business plan demonstrating commercial viability and scale-able businesses.

Figure 4: Carbonised Round Shaped Briquettes Drying Demonstration of use of excreta products

The developed carbonised round shaped faecal matter briquettes product have been tested and certified. The product certification by Kenya Bureau of Standards (KEBS) has been obtained. Currently, a brand and logo is being developed. The production site has been approved by the National Environment Management Authority (NEMA) and granted an Environmental Impact Assessment Licence to NAWASSCO to build and operate a plant for production of faecal matter products

Institutional embedding

To facilitate a smooth transition of activities and functions within the operating structures of the implementing partner (NAWASSCO). The WSP has set up an Onsite Sanitation Steering Committee to oversee the entrenching of the project interventions within NAWASSCO to ensure sustainability.

The Steering Committee will focus on four (4) thematic areas:

- **Operationalisation of the Onsite Sanitation Unit.** This theme is further subdivided into Production Site and Faecal Sludge Management components.
- **Financial Operation of the Onsite Unit and its proposed activities** (business plan; sanitation levy)
- **Partnership Brokering and External Support**
- **Communication and Visibility** (internal and external; branding and marketing of products and services)

Target Population

The project benefits residents of (peri) urban LIAs of Nakuru County.

Contract value and financing

The total contract value amounts to 4.2 million euro of which 2.5 million euro is ACP-EU Water facility co-financing.

Duration of the contract

Five years (1 January 2013 – 31 August 2018)

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