



Resource-Oriented Sanitation concepts
for peri-urban areas in Africa



Implementation of the ROSA Project: The Nakuru Experience



Presentation made at ECOSAN
VISION Workshop – Red Court
hotel Nairobi - Kenya



27th September 2010

ROSA

Resource-Oriented Sanitation concepts for peri-urban areas in Africa

- ▣ to **promote** resource-oriented sanitation concepts as a route to sustainable sanitation and to fulfil the UN MDGs
- ▣ to **research** the gaps for the implementation of resource-oriented sanitation concepts in peri-urban areas
- ▣ to **develop** a generally applicable adaptable framework for the development of **participatory** Strategic Sanitation & Waste Plans (**SSWPs**)
- ▣ to **implement** resource-oriented sanitation concepts in four pilot cities in Eastern Africa (Arba Minch, Ethiopia; Nakuru, Kenya; Arusha, Tanzania; and Kitgum, Uganda)
- ▣ to **establish** and maintain a local network for resource-oriented sanitation in Eastern Africa

ROSA team members in a local meeting. ROSA EU Partner to Nakuru in attendance



TEAM'S ACTIVITIES IN NAKURU

- ROSA conducted a Baseline Survey covering the entire municipality between March and August, 2007.
- Training of Trainers (ToT) and stakeholders workshops
- Research is on-going in WHO guidelines, O&M and Settlement Structures Grey water and on Financing of sanitation
- Piloting and Implementation
- Social marketing and awareness
- Collaboration with our partners for up scaling of ecological systems
- Participation in local and international study tours

NAKURU MUNICIPALITY

- ▣ Is the third largest town in Kenya after Nairobi and Mombasa
- ▣ It is an agro-based industrial town and the capital city of Rift Valley Province
- ▣ It lies 160Km North west of Nairobi
- ▣ Started as a railway station in 1905
- ▣ It gained Municipality status in 1952
- ▣ Situated on an altitude of 1859 m above sea level
- ▣ Covers an area of 290 Sq Km. 188 sq km is in the National park and 102 is the urban area

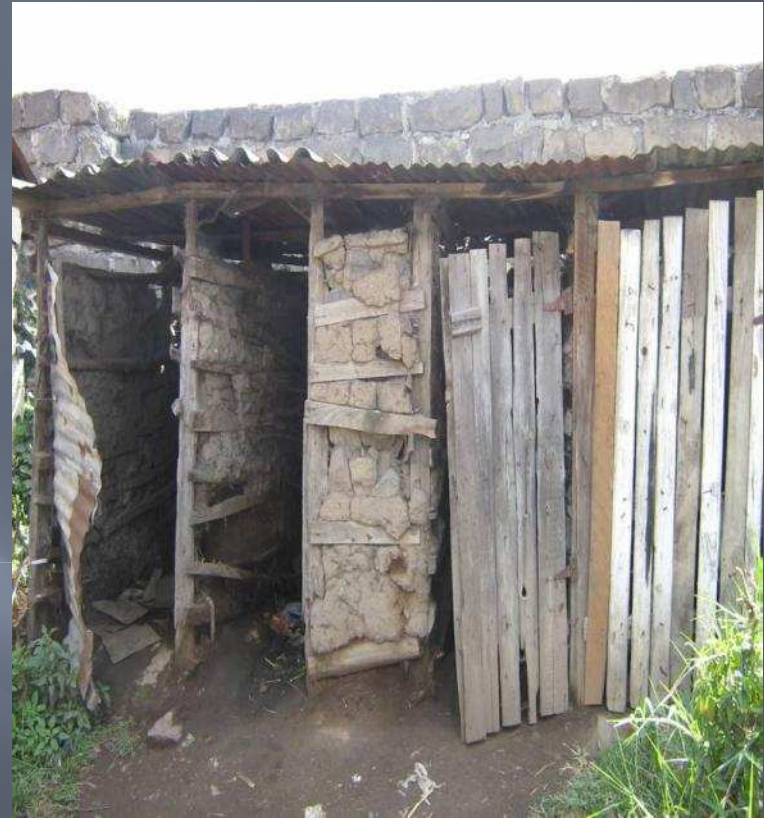
Sanitation situation in Nakuru

- ▣ Disposal of domestic human waste done through sewer reticulation, septic tanks, cesspools and pit latrines.
- ▣ Only 13km² out of 240km² served by sewerage network.
- ▣ 11% use septic tanks, **85%** of households use pit latrines.
- ▣ Two sewerage treatment plants with a total capacity of 16,200m³/day.
- ▣ Only 50% (8000 m³/day) of their capacity is utilized.
- ▣ Council collects 30% of solid waste , private waste collectors 30% leaving 40% un accounted.

Existing sanitation facilities at the implementation site



Collapsing pit latrine



Abandoned pit latrine

Challenges

- ▣ Grey water disposed off into open drainage
- ▣ Residents in peri-urban areas rely on pit latrines.
- ▣ Latrines prone to collapsing due to weak soils
- ▣ Pit latrines fill up very fast due to shallowness & communal use.
- ▣ Lack of space to put up new ones expose the residents to serious health risks.
- ▣ Ground water prone to contamination from pit latrines through seepage.

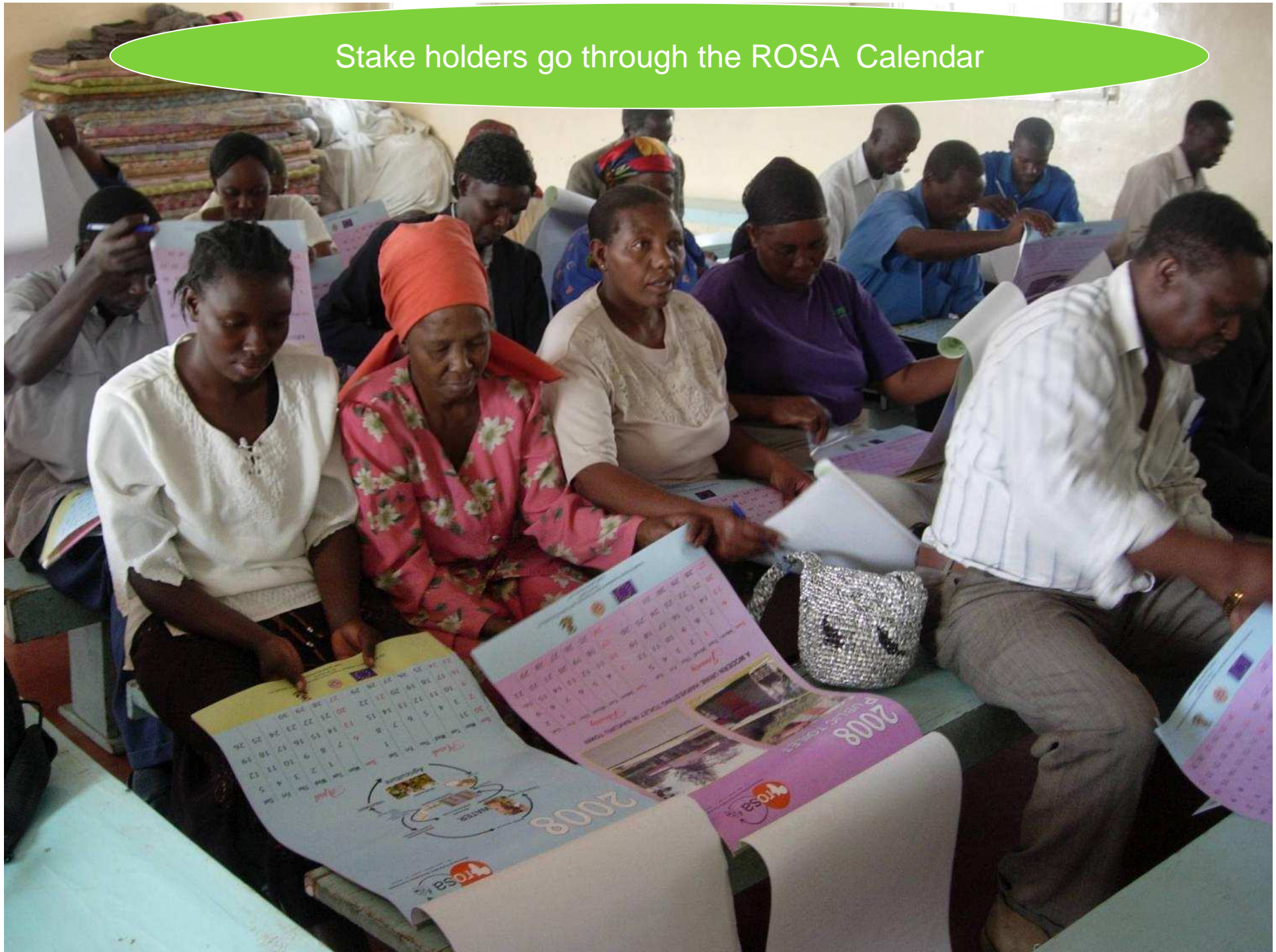
WATER SUPPLY

- ▣ Source of water boreholes and surface water.
- ▣ Water service provider is NAWASSCO.
- ▣ Quality is maintained through continuous monitoring
- ▣ Daily water demand = $75,000\text{m}^3$, the supply = $35,000\text{m}^3$
- ▣ 47% of the inhabitants have piped water
- ▣ Water distribution is poor.
 - No piped water in Peri-urban areas (water kiosks)
 - Reliable supply in medium & high income areas
- ▣ High water cost in peri-urban areas (x10)



Stakeholders' meeting

Stake holders go through the ROSA Calendar





***Councilors follow the induction Workshop details
in the seminar room***



Participation of stakeholders

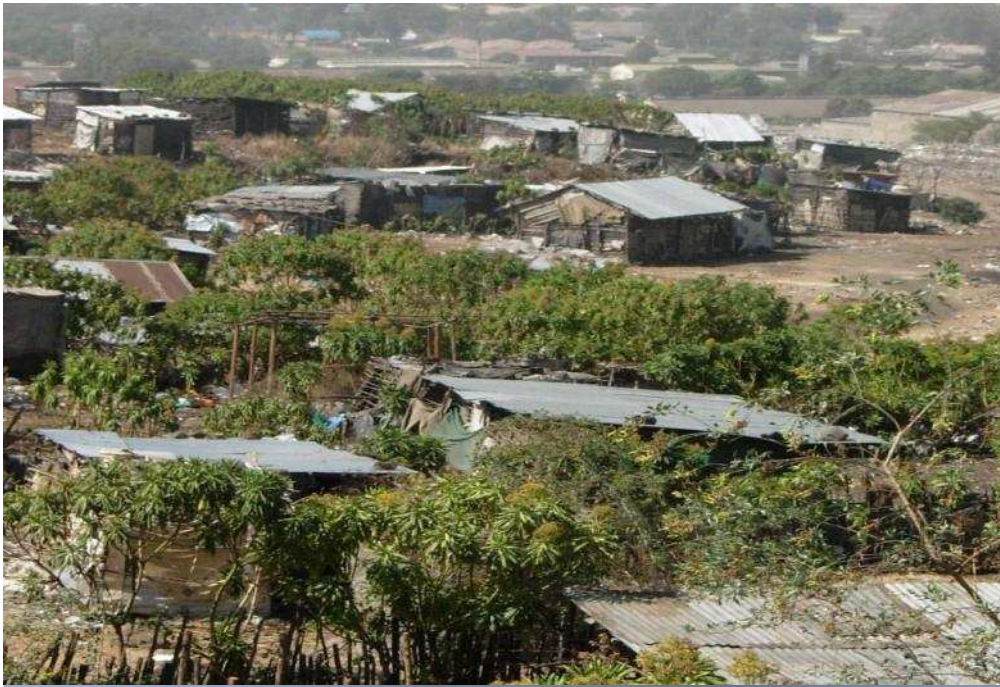


Site Assessment & Analysis



Characteristics of settlement structures in Implementation site

- ▣ Unplanned settlement structures.
- ▣ Temporary, semi and permanent structures.
- ▣ Congestions of structures.
- ▣ Poor accessibility.
- ▣ Provision of sanitation facilities limited.
- ▣ High number of inhabitants per household.



Pictures showing characteristics of the Implementation site -Hilton



An existing (pit) sanitation facility



A ROSA UDDT constructed ecosan facility



Commissioning of a facility/ Stakeholders participation



Crater View Sch Implementation



ROSA Piloted UDDT's
facilities at the school

Urinal piloted at Crater View Sec. School



Girls' urinals piloted by
ROSA at Crater View Sec
School

Boys' urinals made of
ceramic



Boys' urinals made of locally
available materials

- ▣ - Grey water treatment systems (Lakeview residential plot, Crater View Secondary School & Hilton residential plot)



Grey water generation points



Grey water treatment system



Challenges of neglected system by beneficiary



Inside of a UDDT piloted by ROSA at the household level



A hand washing facility



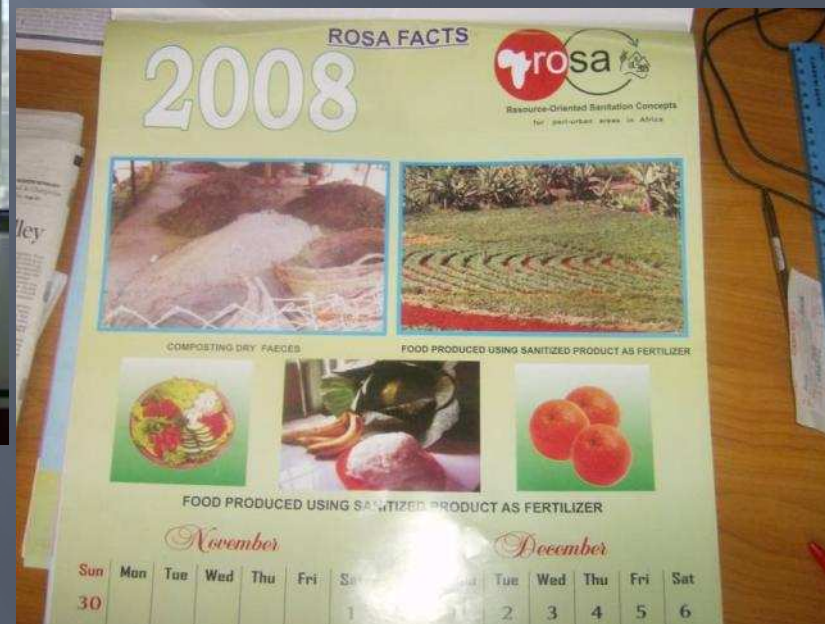
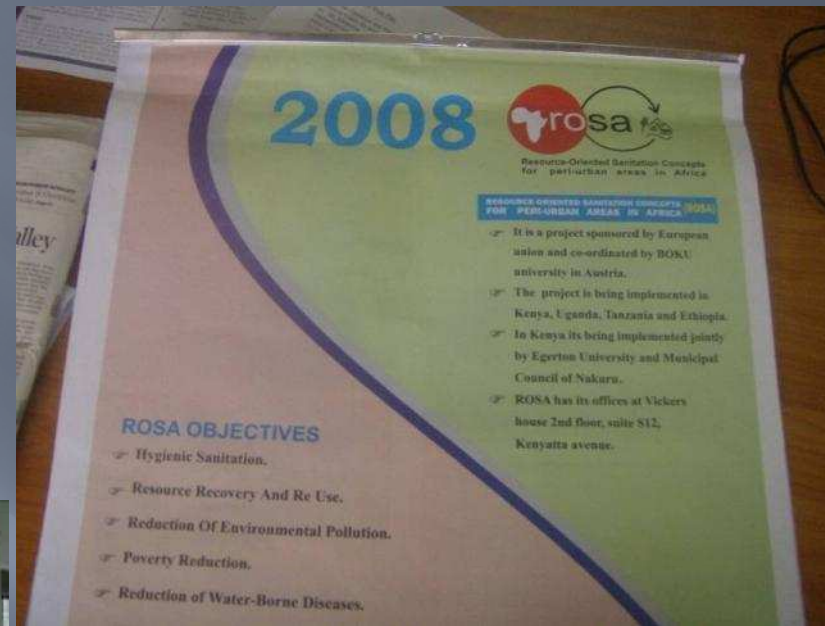


**This Sanitation facility developed by ROSA
a project by
Egerton University and MCN
Funded by European Union was officially opened by:
MR. JOHN GICACI, 22nd December, 200...
Treasurer Municipal Council of Nakuru.**

Municipal treasurer assessing ROSA piloted facilities before commissioning them

Development of the IEC materials

- ❑ Brochure developed
- ❑ Posters developed
- ❑ Calendars developed & used in awareness creation



More IEC materials



Model UD toilet with super structure



Posters and UD toilet models and banners



Exchange visit by international partners (Steffen Blume of GTZ) and locals

Stakeholders Workshop and group discussions



Awareness creation and social Marketing of Sustainable Sanitation (EcoSan)



Crater View secondary school

Mainly Landlords have been targeted in these trainings since the are mandated to construct sanitation facilities in their plots

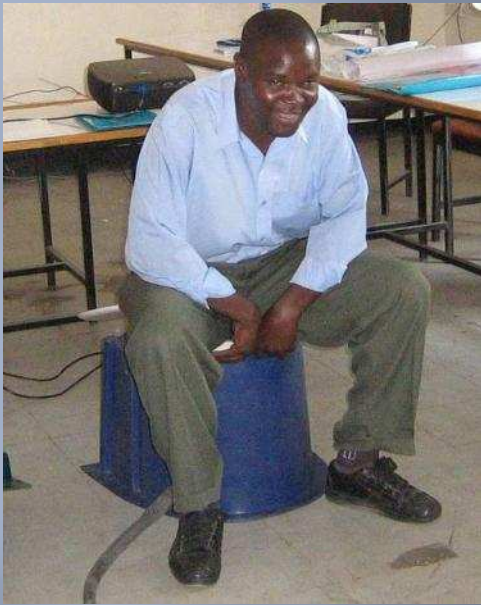


Landlords conducting a study tour of the Ecosan pilot sites in London/Hilton



Landlords in a brainstorming session after the tour

Demonstrations



Clinton Foundation support at Egerton Primary School



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Urine Diversion Dry Toilet (UDDT)
Developed by Faculty of Engineering & Technology
and Funded by Clinton Foundation (USA)

Officially opened by

Prof. Alfred Kibor

Director of Research

Egerton University

7th May 2010



Research activities

Researchers collecting samples for analysis



General outcome

- ▣ Water supply is inadequate and expensive in low income areas
- ▣ Pit latrines commonly used
- ▣ Sanitation inadequate
- ▣ More than 20 people sharing
- ▣ No hand washing after visiting toilet
- ▣ Some resident are aware of ROSA or reuse of excreta
- ▣ Willingness to experiment if no flies and no smell
- ▣ However Flush toilets were preferred by most respondents

Dissemination of some ROSA findings in International Conferences

The team has attended and participated in a number of conferences some of which are:

- Sustainable Sanitation Alliance (SuSanA) Conference, 16th-17th February, 2008 at Durban, South Africa
- Moi University 4th Annual International Conference, 29th July-2nd August, 2008 at Moi University Eldoret
- Study tour with the IPGL Students by the ROSA staff on 25th September, 2008
- Egerton University 3rd Annual Research week and International Conference, 16th - 18th September, 2008.
- 34TH WEDC International Conference May 18th-22nd 2009

▣ **34th WEDC (Water, Engineering & Development Centre) International Conference, 18th – 22nd May 2009 (7 papers presented by ROSA)**

-Assessment Of Wastewater Quality For Use In Crop Production –Case Studies Of Egerton University And Nakuru Wastewater Stabilization Ponds. (*Dr. Steve Omondi & Veronica Kimani*)

-The Linkage Between Settlement Profile And Choice Of Sanitation System In Peri-urban Areas: A Case Study Of Nakuru Municipality. (*Yvonne Moseki & Sammy N. Kimani*)

- Challenges Of Sustainable Financing Of Sanitation In Nakuru Municipality, Kenya. (*Kennedy Odhiambo & Dr. Benedict Mutua*)
- Norms, Attitudes And Gender Perspectives In Ecological Sanitation. (*Agnes Mugure & Dr. Benedict Mutua*)
- Characterization Of Greywater From Urban And Peri-urban Areas Of Nakuru Municipality, Kenya. (*James Raude, Dr. Benedict Mutua & Prof. Chemelil*)
- Sanitation Challenges In Learning Institutions: The Case Of Nakuru Municipality Kenya. (*Raphael M. Gacheiya & Dr. Benedict Mutua*)
- Operation And Maintenance Strategies For Resource Oriented Sanitation Systems In Nakuru, Kenya. (*Edward Muchiri & Elke Müllegger*)

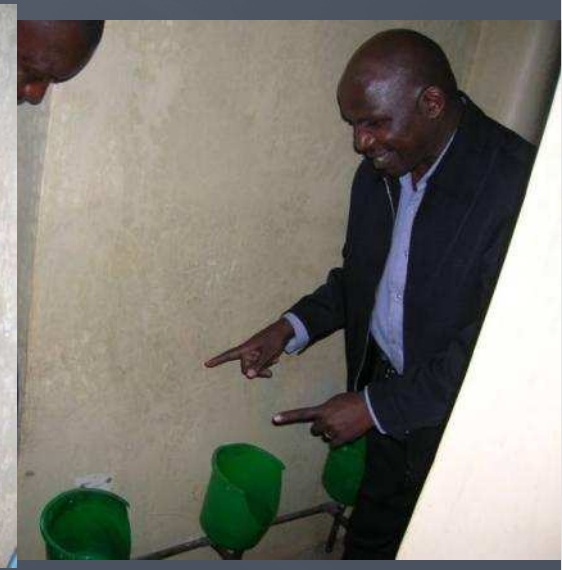
Research Gaps

- ❑ **Financial Sustainability** of ROSA systems is very important otherwise the systems will collapse once the project is terminated
- ❑ **Social marketing strategies** need to be developed
- ❑ **Settlement specific options** need to be developed
- ❑ of the treated excreta still lacks in some extent at the community level
- ❑ **knowledge of safety** Awareness campaigns, training users and involving the private sector in operation and maintenance of dry sanitation facilities
- ❑ **Capacity Development**
- ❑ ROSA proposes the need for **quantification** of the impact of private sector involvement in **collection, transport** and **treatment** dry faeces and urine from any proposed dry sanitation facility

Monitoring & Evaluation



Filled up Faeces collection container



Greywater treatment system



Challenges faced by ROSA

- ▣ Transport: The implementation area is quite challenging and the project doesn't have a vehicle
- ▣ Perception on waste (human excreta) as a resource.
- ▣ cultural & religious beliefs on handling human waste.
- ▣ Slow and bureaucratic procurement procedures at the Municipal council is partly to blame for the slow speed of implementation.
- ▣ The need for further awareness creation on sustainable sanitation in Nakuru and to spread out to other regions. Limitation of funds & the project is coming to an end (March 2010)
- ▣ Fluctuation in the cost of construction materials due the high inflation rates has also affected the implementation

Solid waste generation in Nakuru-



Collaborations

- ▣ Practical Action who are overseeing the up scaling of ecosan facilities based on the experience of ROSA piloted facilities.
- ▣ Integrated Lake Basin Management (ILBM). A consultative meeting expected to take place on 17th and 18th of September 2009 at Egerton University & ROSA office.
- ▣ Implementation of the “My School Loo Project “ for schools. A mutual agreement between GTO & ROSA
- ▣ AskNet & SuSanA-ROSA oversaw the **translation of the SuSanA vision document from English to Swahili**
- ▣ ROSA work in sister countries-Ethiopia, Uganda & Tanzania is ongoing.
- ▣ More landlords are still visiting the facility for learning purposes and there after make decisions to construct UD toilets. This has led to an increase in the number of those landlords for seeking loans to finance their sanitation (**6 more are under construction**)

Acknowledgement

- ▣ Resource-Oriented Sanitation concepts for peri-urban areas in Africa (ROSA) project; Contract No. 037025-GOCE; duration: 1.10.2006 – 30.4.2010), a Specific Target REsearch Project (STREP) funded within the EU **6th** Framework Programme, Sub-priority "Global Change and Ecosystems". The ROSA team is grateful for the support.

Thank you for listening



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