

# The ROSA project – A new approach to sustainable sanitation in Eastern African cities



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University of Natural Resources  
and Applied Life Sciences, Vienna  
Department of  
Water, Atmosphere, and Environment

## Presenter:

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Water Pollution Control

6th IWA World Water Congress  
9 September 2008, Vienna, Austria

## **Content**

- The ROSA project
- Activities and status of the work in the pilot-cities
- Summary and Outlook



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# ROSA



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

Contract No. 037025

a Specific Target REsearch Project  
funded within the EU 6th Framework Programme  
Sub-priority "Global Change and Ecosystems"

1.10.2006 – 30.9.2009 (31.3.2010)

## What makes the ROSA sanitation system a success?



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- People like the system and use it
- System continuous to run after project funding ends
- Institutional sustainability
- Environmental sustainability
- Pilot runs on its own and is adaptable/replicable in the local/national context
- Pilot capable of scaling up
- Affordable

# What is sanitation for ROSA?



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## Primary targets

- Excreta management
- Greywater
- Domestic solid waste

## Secondary targets

- Storm water management
- Animal waste
- Industrial wastewater

# Project objectives

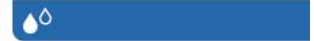


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- to promote resource-oriented sanitation concepts as a route to sustainable sanitation and to fulfil the UN MDGs,
- to implement resource-oriented sanitation concepts in four model cities in East Africa (Arbaminch, Ethiopia; Nakuru, Kenya; Arusha, Tanzania; and Kitgum, Uganda),
- to research the gaps for the implementation of resource-oriented sanitation concepts in peri-urban areas, and
- to develop a generally applicable adaptable framework for the development of Strategic Sanitation and Waste Plans (SSWPs)



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# Project objectives

## Promote resource-oriented sanitation concepts

- Wastewater contains among other things
  - Pathogens
  - Organic matter
  - Nutrients
  - ➔ Danger for health and environment
  
- Goals of sanitation
  1. elimination of pathogens
  2. prevention of environmental pollution
  - 3. recycling of nutrients and water (waste as resource!)**



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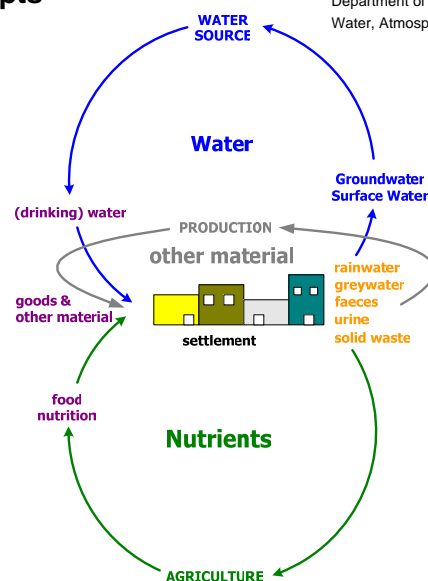
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# Project objectives

## Promote resource-oriented sanitation concepts

Resource-oriented sanitation:

- wastewater is a resource and not waste
- closing water, nutrient, material, energy cycles on a local scale
- resource and reuse oriented
- single technologies are only means to an end
  
- sanitation and waste
- liquid and solid waste



# Project objectives

## Implementation in 4 pilot-cities in East Africa

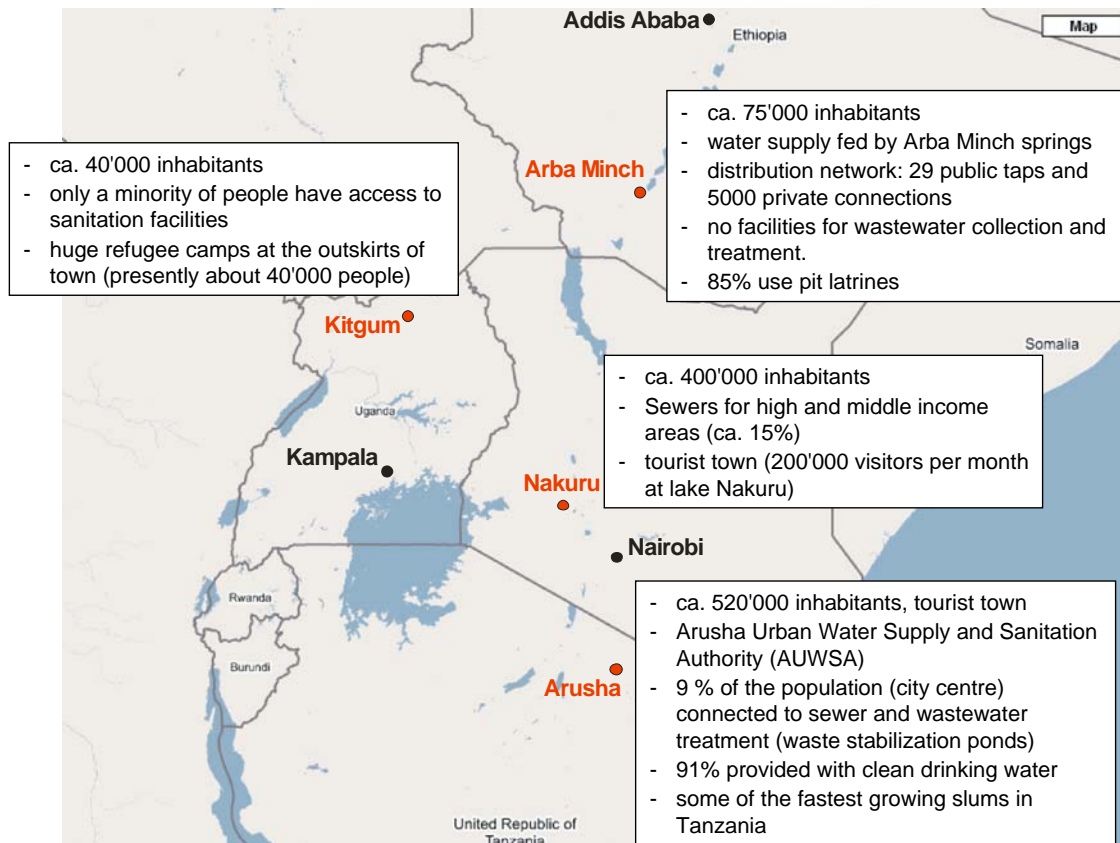


### General characteristics of the model pilot-cities:

- Lack of sanitation and waste management
- High population growths

### Local project consortia

- starting with local university, municipality and a European partner
- involving local people, stakeholders, NGOs and CBOs from the very beginning
- creating local ownership



# Project objectives

## Research topics



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- focussed on applied research for implementation of resource-oriented sanitation concepts in peri-urban areas
- main research topic
  - an implementation study of the updated WHO-guidelines for use of waste and excreta in agriculture (released in September 2006) in peri-urban areas
- detailed research topics will be defined by the local partners in the following areas:
  - the development of operation and management strategies
  - the development of local structures for financing of sanitation
  - the development of decentralized (household) solutions for greywater treatment in arid and semi-arid areas
  - the integration of resource-oriented sanitation into local settlement structures

# Project consortium

## Overview



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1. BOKU - University of Natural Resources and Applied Life Sciences Vienna, Austria (Co-ordinator)
2. Hamburg University of Technology, Germany
3. EcoSan Club, Austria
4. WASTE - Advisors on Urban Environment and Development, The Netherlands
5. London School of Hygiene and Tropical Medicine, United Kingdom

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6. Makerere University, Department of Civil Engineering, Uganda
7. University of Dar es Salaam, Department of Water Resources Engineering, Tanzania
8. Egerton University, Department of Water and Environmental Engineering, Kenya
9. Arbaminch University, Ethiopia

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10. Kitgum Town Council, Uganda
11. Arusha City Council, Tanzania
12. Municipal Council of Nakuru, Kenya
13. Arbaminch Water Supply and Sewerage Enterprise, Ethiopia

# Arba Minch, Ethiopia



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# Nakuru, Kenya



# Arusha, Tanzania



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# Kitgum, Uganda



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© 2006-8 ROSA Kitgum

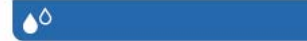




# Capacity building, awareness creation ...



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## ROSA PROJECT

**Anyim me yot kum ki be kabeđu ma orumu wa tye i gwoko yugi ki pii makyol. Projekti me ROSA kakyel ki KTC obi tiyo i coyo ki dongo pulan atii.**  
The future of health and environment lies in improved waste management.  
ROSA project will liaise with KTC in developing strategic plans.

**2008**

January							February							March						
SUN	6	13	20	27	SUN	3	10	17	24	SUN	30	2	9	16	23					
MON	7	14	21	28	MON	4	11	18	25	MON	31	3	10	17	24					
TUE	1	8	15	22	TUE	5	12	19	26	TUE	4	11	18	25						
WED	2	9	16	23	WED	6	13	20	27	WED	5	12	19	26						
THU	3	10	17	24	THU	7	14	21	28	THU	6	13	20	27						
FRI	4	11	18	25	FRI	1	8	15	22	FRI	7	14	21	28						
SAT	5	12	19	26	SAT	2	9	16	23	SAT	1	8	15	22	29					

April							May							June						
SUN	6	13	20	27	SUN	4	11	18	25	SUN	1	8	15	22	29					
MON	7	14	21	28	MON	5	12	19	26	MON	2	9	16	23	30					
TUE	1	8	15	22	TUE	6	13	20	27	TUE	3	10	17	24						
WED	2	9	16	23	WED	7	14	21	28	WED	4	11	18	25						
THU	3	10	17	24	THU	1	8	15	22	THU	5	12	19	26						
FRI	4	11	18	25	FRI	2	9	16	23	FRI	6	13	20	27						
SAT	5	12	19	26	SAT	3	10	17	24	SAT	7	14	21	28						

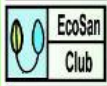
## ROSA PROJECT

**Lonyo me anyim pa litinu wa ocung i minigi kabeđu ma orumu wa maleng.**  
The prosperity of our children depends on our provision of a healthy and clean environment.

**2008**

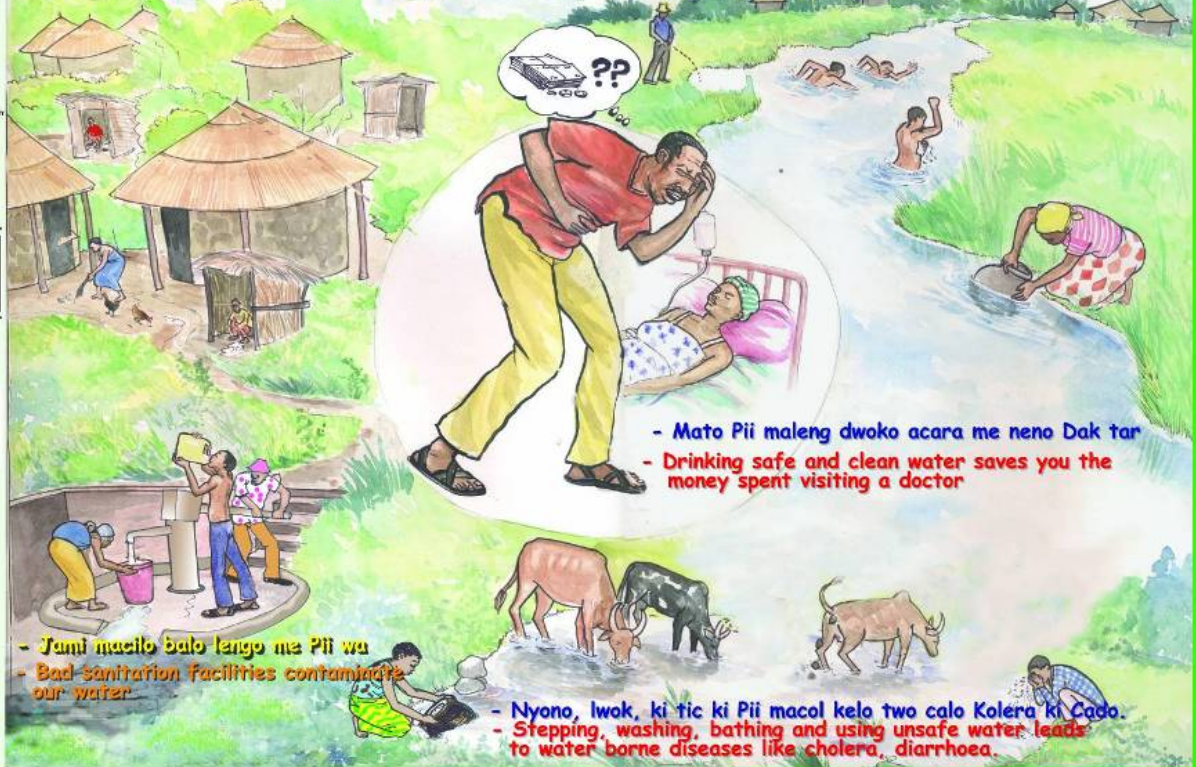
July							August							September						
SUN	6	13	20	27	SUN	31	3	10	17	24	SUN	7	14	21	28					
MON	7	14	21	28	MON	4	11	18	25	MON	1	8	15	22	29					
TUE	1	8	15	22	TUE	5	12	19	26	TUE	2	9	16	23	30					
WED	2	9	16	23	WED	6	13	20	27	WED	3	10	17	24						
THU	3	10	17	24	THU	7	14	21	28	THU	4	11	18	25						
FRI	4	11	18	25	FRI	1	8	15	22	FRI	5	12	19	26						
SAT	5	12	19	26	SAT	2	9	16	23	SAT	6	13	20	27						

October							November							December						
SUN	5	12	19	26	SUN	30	2	9	16	23	SUN	7	14	21	28					
MON	6	13	20	27	MON	3	10	17	24	MON	1	8	15	22	29					
TUE	7	14	21	28	TUE	4	11	18	25	TUE	2	9	16	23	30					
WED	1	8	15	22	WED	5	12	19	26	WED	3	10	17	24	31					
THU	2	9	16	23	THU	6	13	20	27	THU	4	11	18	25						
FRI	3	10	17	24	FRI	7	14	21	28	FRI	5	12	19	26						
SAT	4	11	18	25	SAT	1	8	15	22	SAT	6	13	20	27						



European Union

# KIT MA LENGO BALE KWEDE SOURCES OF CONTAMINATION



- Mato Pii maleng dwoko acara me neno Dak tar  
- Drinking safe and clean water saves you the money spent visiting a doctor

- Jami macilo bala lengo me Pii wa  
- Bad sanitation facilities contaminate our water

- Nyono, lwok, ki tic ki Pii macol kelo two calo Kolera ki Cado.  
- Stepping, washing, bathing and using unsafe water leads to water borne diseases like cholera, diarrhoea.

Design & Print: Facts Publications 0712700431, 0782 102309



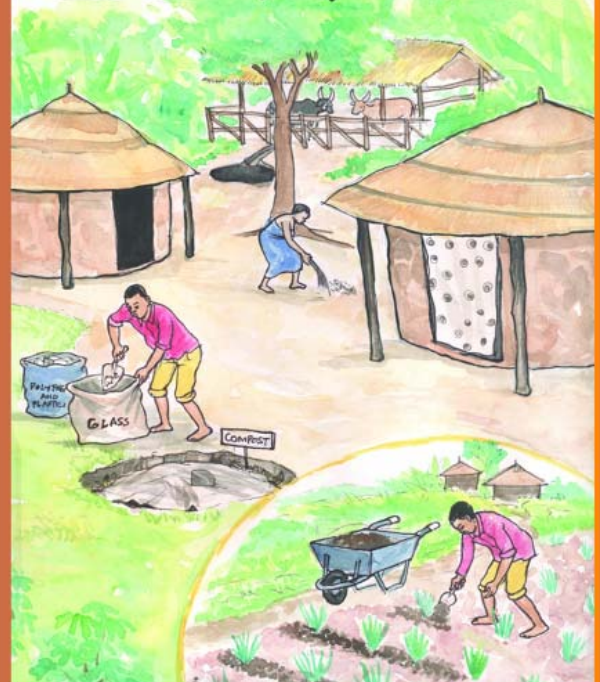
European Union

# TIM MARACU BAD PRACTICES



Onyo yugi ata ata medo kero me nongo two oyot  
Poor rubbish management habits increase the risks of falling sick.

# TIM MABECU GOOD PRACTICES

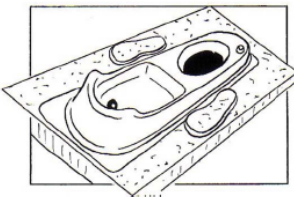


-Gwoko yugi , calo pokone Ki gwokone maber medo cek pa cam ma wapito ipoto  
-Gwoko yugi , Pii marac ka maber aye yot kumwadok lonyowa  
- Good rubbish management habits like separating and composting increases crop production.  
- Proper waste management our Health our Wealth.

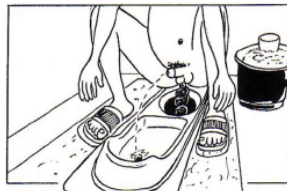
Design & Print: Facts Publications 0712700431, 0782 102309

## How to use the toilet

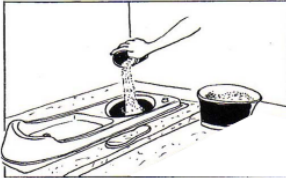
The separation of urine and faeces for ...  
... the use without water  
... production of fertilizer



For urinating only please use the urinals outside



Use the toilet like this



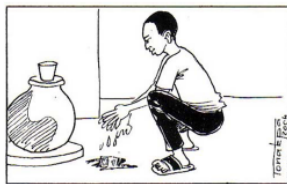
After the use add ash or sawdust from the depot



Don't pour water into the toilet



Don't throw any garbage into the toilet



Wash your hands after the use!

**Recommendations for the storage of urine:**

- Direct use after collection or a short storage time is acceptable on the single household level
- For larger systems, urine should be stored before application for preferably longer than one month for fodder crops and six months for food crops
- Urine can be stored in bottles or plastic containers as they are used for water collection provided they are well capped and the ammonia is not allowed to escape

**Nutrients in urine:**

The average concentrations of nitrogen, phosphorus, potassium and sulphur in one litre of urine are as follows:

4 - 5 g N / l
0.5 - 1 g P / l
1.5 - 2 g K / l
1.5 - 2 g S / l

It can therefore replace mineral fertilizers such as urea and DAP.

Depending on the crop, the maximum application can be approx. 120 kg nitrogen (N) per hectare and year. Thus, an amount of 2.5 - 3 l urine per square meter can maximum be used for fertilisation.

**Urine is recommended for example for:**

maize, tomatoes, tef, beans, pepper, eggplant, cotton, fruit trees, etc.

In general urine can be used as fertilizer for all plants with a high demand of nitrogen.



**Further uses of urine in agriculture:**

- Urine as an "activator" for compost
- Urine as a medium for fermentation of plant residues



For further information refer to World Health Organisation (2009): "Guidelines for the Safe Use of Wastewater, Excreta and Greywater".

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**Use of urine for growing crops**



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

**Natural Compost**  
የተገኘውን ማዕከል ለማድረግ ጥላቻውን በጥንቃቄ ለማሰባሰብ ማድረግ ይገባል። ለዚህ ማዕከል ለማግኘት ጥላቻውን በጥንቃቄ ለማሰባሰብ ማድረግ ይገባል።

**ROSA**  
Resource Oriented Sanitation

## What is special about ROSA?



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- ➔ Having the municipalities as consortium partners is an important step towards sustainable implementation of sanitation concepts.
- ➔ In all pilot cities ROSA is the first project in this field where the municipalities work with their local universities
- ➔ About 8-10 local people work for ROSA in each town – local teams have the lead, European partners are advisers
- ➔ The municipality and the university formed the core group of a wider local network in which ROSA invites authorities, NGOs, Community Based Organisation (CBOs), etc. working in the field sanitation to participate.
- ➔ Research in ROSA is demand driven and defined by the local African partners when challenges are identified.

## Project implementation

### Time schedule

#### → Year 1

- Assessment and baseline study
- Development of a Strategic Sanitation & Waste Plan (SSWP) for the whole municipality (living document that will be updated 3 times during the project)

#### → Year 2

- Decision on the implementation in a selected area of the municipality
- Implementation

#### → Year 3

- Operation and monitoring
- Evaluation and adaptation

## Other achievements

### ASKNet: The African Sanitation Knowledge Network



mission

→ *enhance the ability of academics and professionals across the disciplines to contribute to the mainstreaming and up-scaling of sustainable sanitation in Sub-Saharan Africa, to the benefit of livelihoods, health, and the environment.*

→ 1st member meeting: 10-13 Dec 2008, Vilanculos, Mozambique

→ see <http://www.asknet-office.net/>

A joint activity of UNESCO-IHE, EcoSanRes, the ISSUE programme and ROSA.

## Summary and outlook



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- municipalities as consortium partners as an important towards sustainability
- capacity building
- focussed on applied research for implementation of resource-oriented sanitation concepts in peri-urban areas
  - main research topic: implementation study of the updated WHO-guidelines for use of waste and excreta in agriculture
  - detailed other research defined by the local partners
- currently implementation is going on in all cities and operation and management strategies are being developed
- development of a framework (SSWPs) based on the experiences

### Contact

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