



Fig. 1: Project location

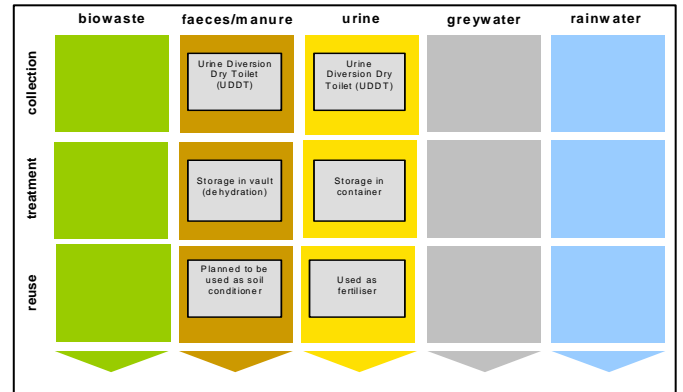


Fig. 2: Applied sanitation components in this project.

1 General data

Type of project:

New construction of pilot sanitation facilities at school compound

Project period:

Start of construction: June 2008

End of construction: July 2008

Start of operation: March 2009

Ongoing monitoring period planned for: 24 months

Project end: March 2010

Project scale:

Number of persons covered: 56

Total investment: € 1753

Address of project location:

P.O. Box 3013, Arusha, Tanzania

Planning institution:

ROSA Tanzania

Executing institution:

Arusha Municipal Council & University of Dar es Salaam

Supporting agency:

European Union



The work was carried out within the project ROSA (*Resource-Oriented Sanitation concepts for peri-urban areas in Africa*; Contract No. 037025-GOCE; duration: 1.10.2006 – 31.3.2010), a Specific Target REsearch Project (STREP) funded within the EU 6th Framework Programme, Sub-priority "Global Change and Ecosystems".

2 Objective and motivation of the project

The general objective of the project is to promote resource oriented sanitation concept in schools and the specific objectives of this project are to:

- Raise awareness of teachers on resource oriented sanitation concepts and to use this awareness as a basis for transferring the concept to students.
- Use the project for training of the community around and creating a rapid multiplying effect of the concept within the municipality.

The main expected impact of the project is to have a critical mass and wide spread adaptation of the concept.

3 Location and conditions

The project area (school) is located in one of the ROSA project pilot ward namely Daraja II. The school has a small land area of less than two hectares (19,600 m²) with pit latrines being 100% means of excreta management. The school has a total enrolment of 2,457 students who share 17 pits of latrine. Fifty-six (56) teachers share two pits. The idea was to give time for the teachers to understand the resource oriented concepts and especially the O&M part with their own facilities. Up scaling for the students toilets was left for future when the capacity has been built in the school.

4 Project history

The selection and implementation of UDDTs in Daraja II primary school was based on a baseline survey carried out by ROSA project and a series of stakeholder meetings (Fig. 3) to discuss sanitation challenges within the ward. Daraja II primary school was chosen as it was considered that it would bring impact to the students and also community around the school. Due to limitations of resources (finance) it was decided that demonstration units should be designed for only members of staff (56 teachers) in the school.



Fig. 3: Stakeholder meetings in Daraja II ward.

5 Technologies applied

Urine diverting dry toilet technology (UDDT) was chosen for this project. This is due to the fact that with this system the structure is permanent with the possibility of using the products from the toilet for local agriculture. Lack of smell and flies as a result of separating urine and faeces is a further advantage of this technology. Provision of two vaults for both genders (two double vault UDDTs) was aimed at giving time for the product to dry within vaults once is full and use the other vault for convenience purposes.

6 Design information

The design of UDDTs was made based EcoSan Club Manual. Four vaults were constructed (Fig. 4) in which two vaults were intended to be used by female teachers and the other two vaults for male teachers. Double vaults will allow alternating and pre-treatment to take place within the vault for convenient. Each vault has a size of 1 m³ and 1000L plastic tank (sim-tank brand) was placed adjacent to the stairs for urine collection. It is estimated that if the UDDTs are fully used it will take more about four weeks to fill the urine tank. Wash out valve has been provided at the bottom of tank, which will be used for emptying urine.

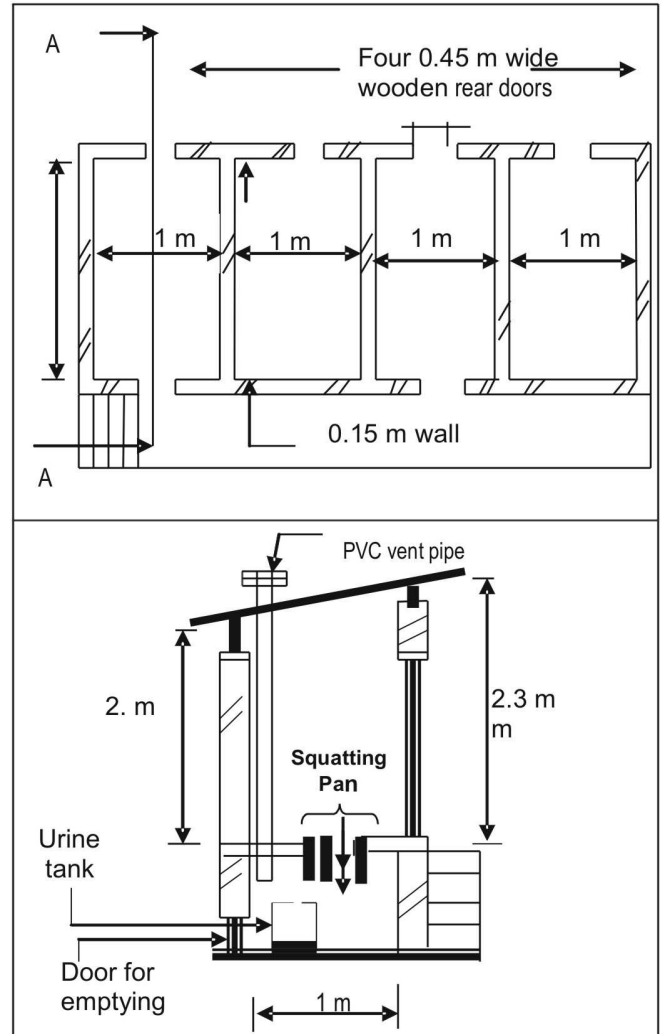


Fig. 4: Floor Plan and cross section of the double Vaults UDDT.

For the UDDTs, concrete blocks of 5 inches thickness were used as substructure and the super structure was also built using concrete blocks of the same size (Fig. 5). The squatting pans used were imported from Kenya and access to the vaults is facilitated through black painted timber panels. The unit has an ablution place for washers. Emptying is done through rear wooden door painted black for facilitation of pathogen destruction.



Fig. 5: Concrete block four vaults UDDT in Daraja II primary school, the plastic tank for urine collection can be seen on the left side of the toilet.

7 Type and level of reuse

Since the beginning of its operation urine from the UDDT has been using for fertilizing flowers around the school compounds (Fig. 6). This offers an opportunity for pupils in the school to learn how useful the products of UDDTs can be. It is expected that in future urine and faeces will be also applied in other areas of the municipality where urban agriculture is carried out.



Fig. 6: Flowers fertilized by urine from UDDT.

8 Further project components

Research on O&M of UDDTs: There has been a follow up by ROSA project to see what are the challenges and local constraints in operating this demonstration unit. Information on transportation and emptying operators has been collected. Through monitoring some interventions and experiences have been shared with various stakeholders including the Daraja II primary school.

9 Costs and economics

The costs for construction of the UDDTs in Daraja II primary school were fully covered by the ROSA project implementation funds. The toilets were built by the contractor at total costs of 1753 € (Table 1).

Table 1: Construction cost of 4 vaults UDDT of double vault UDDTs at Daraja II primary school.

S/No	Particulars	Costs (€*)
1	Construction of substructure	878
2	Construction of superstructure	875
Total		1753

* 1€ = 1600 Tshs

10 Operation and maintenance

There was a delay between the end of construction and commissioning of the unit due to some government protocol in commissioning of various projects. The school management wanted to make the occasion very official and be done during independent torch day which made the whole process very much delayed. To date, the operation and maintenance of the UDDTs in Daraja II primary school has been left to the school management after receiving minimum training on how to use the toilet and re-use the UDDT products. The headmaster has appointed one of the teachers (Ms Happiness) to be responsible for day-to-day function of toilet. She has to make sure that ashes and toilet papers are available and that general cleaning is done properly. The cleaning is done by students as part of their extra curricular (out side class) works as per school regulations.

There have been some problems in operating the unit due to pipes blockage that has been experienced once. ROSA project staff was called to unblock the system (Fig. 7).



Fig. 7: ROSA project staff unblocking urine pipes at Daraja II primary school UDDT.

11 Practical experience and lessons learnt

Much is expected to be done by ROSA project instead of school management: Since the unit was fully financed by ROSA project, the school management is expecting the Project to continue supporting even the O & M of the unit such as buying toilet papers and make a follow up of day to day function of the toilet. Effort has been made to reduce this attitude

UDDTs for a primary school Arusha, Tanzania - draft

Building UDDTs by using local masons trained is cheaper compared to those built by using contractors (double vaults built by contractors cost 877€ as compared to that by local masons which cost 410€). Known contractors normally offer services at high cost to earn good profit, which is contrary to local masons trained by ROSA project who do not have a company but good skills to do the work. The UDDTs for demonstration built by ROSA project followed government procurement procedure, which lead the cost to be very high. This is a lesson which local authority has to take seriously.

12 Sustainability assessment and long-term impacts

Table 1: Qualitative indication of sustainability of system.

A cross in the respective column shows assessment of the relative sustainability of project (+ means: strong point of project; o means: average strength for this aspect and – means: no emphasis on this aspect for this project).

Sustainability criteria	collection and transport			treatment			transport and reuse		
	+	o	-	+	o	-	+	o	-
health and hygiene	X			X			X		
environmental and natural resources	X			X			X		
technology and operation	X				X			X	
finance and economics	X				X		X		
socio-cultural and institutional	X			X			X		

Sustainability criteria for sanitation:

Health and hygiene include the risk of exposure to pathogens and hazardous substances and improvement of livelihood achieved by the application of a certain sanitation system.

Environment and natural resources involve the resources needed in the project as well as the degree of recycling and reuse practiced and the effects of these.

Technology and operation relate to the functionality and ease of constructing, operating and monitoring the entire system as well as its robustness and adaptability to existing systems.

Financial and economic issues include the capacity of households and communities to cover the costs for sanitation as well as the benefit, e.g. from fertilizer and the external impact on the economy.

Socio-cultural and institutional aspects refer to the socio-cultural acceptance and appropriateness of the system, perceptions, gender issues and compliance with legal and institutional frameworks.

For details on these criteria, please see the SuSanA Vision document "Towards more sustainable solutions" (www.susana.org).

13 Available documents and references

<http://rosa.boku.ac.at>

14 Institutions, organisations and contact persons

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Case study of SuSanA projects

Project name

SuSanA 2009

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