

**027**

**Urine diversion toilet programme in a rural resettlement area**

**Sofala Province, Mozambique**

ECOSAN SYSTEM - APPLIED COMPONENTS	SOLID BIOWASTE	FAECES	URINE	GREYWATER	RAINWATER
COLLECTION		ecosan double vault drying separation latrines	with greywater in jerry cans	with urine in jerry cans	
TREATMENT		Storage and drying			
UTILISATION		Fertilization in agriculture	Direct fertilization together with greywater	Direct fertilization together with urine	

**1 General Data**

**Type of Project:**

Rural upgrade as a component of water supply and sanitation project

**Project Period:**

start of planning: 03/1999  
start of construction: 03/2001  
start of operation: 08/2001

**Project Scale:**

245 domestic latrines  
5 latrines for primary schools  
10 public latrines  
2 latrines for rural health post

**Address:**

Sofala province, Mozambique

**Planning Institution:**

Programme for rural Water Supply and Sanitation PAARSS, Mozambique

**Executing Institution:**

Department for Water and Sanitation, Provincial Directorate for Public works in the Sofala province Mozambique

**Supporting Agency:**

ADA – Austrian Development Cooperation



Figure 1: Public latrine, project area (source: PAARSS)

Eco-Sanitation is one part of this programme. Besides pit latrines as commonly “organized” sanitation practise open air defecation or the “flying latrine” – defecation in a plastic bag that is thrown away at night time – are very common. Eco-sanitation is mainly introduced in areas with dense population, high water table or rocky ground where pit latrines according to national guidelines are not permitted.

PAARSS entered in the planning and construction of a sustainable water supply and sanitation for 200 families and received additional funding for latrines for 475 families from UNICEF.



Figure 2: Public latrine with drying chambers (source: PAARSS)

**2 Objective of the project**

The ecosan technology with urine diversion toilets was introduced in the context of a sustainable integrated approach to safe water supply and sanitation in a resettlement area with high groundwater level.

**3 Location and general conditions**

PAARSS is a bilateral programme financed by the Austrian federal government and the province government of Sofala and is considered as one of the programs for Water Supply and Sanitation of major importance within the central region of Mozambique.

In 1997 the Sofala province was one of the poorest according to the Census of 1997. The population is mainly concentrated around 4 riverbeds and is vulnerable to the cyclical climate with droughts and floods. The devastating floods of 2000 caused an emergency situation where more than 4000 people were displaced in the Buzi district. The Austrian government offered the district government assistance in organization and construction of a resettlement area for 600 families.

commissioned by

ecosan program  
recycling oriented  
wastewater management  
and sanitation systems

Federal Ministry  
for Economic Cooperation  
and Development



Figure 3: Private latrine (source: PAARSS)

#### 4 Technologies applied

245 domestic ecosan latrines with an enclosed bathroom, 10 public ecosan toilets with bathing compartment, ecosan latrines for 5 schools and for 3 health posts were implemented. They were constructed as double vault latrines with collecting and drying chambers above ground and squatting platforms in closed buildings.

The model was designed in collaboration with the future users. The bathroom was added on their request. The technology is stable and robust, can be constructed with skilled local artisans and local material anywhere in Mozambique and does not contaminate the groundwater as it occurs with pit latrines.

#### 5 Type of reuse

In the introduction phase the reuse options of ecosan latrines have not been focused due to the main interest in hygienical sanitation. In the meanwhile reuse potentials have been introduced to the users.

In practise it has taken more than 4 years to fill up one chamber.



Figure 4: Collection chamber (source: PAARSS)

But when it was time for application of the contents the province was hit by a severe drought. Local agriculture extension workers from the district have been trained in application of the products. Now, in 2006, 50 families have started and prepared experimental fields with fertilization by dried faeces and urine / greywater mixture with these extension workers. This process is monitored and supervised by the Provincial Directorate for Agriculture and Rural Development, which is responsible for sanitation according to the ruling law.

The hygienic aspects of reuse are taken care of by local activists of the Mozambican Red Cross, also residents in the area, who were trained by PAARSS and a local consultant contracted for ecosan activities. They are trained to mobilize the future users during the construction phase and to pursue the utilization of the latrines for one year. Their participation is supported by minor subsidies.

In the district of Dondo urine and dried faeces collected in schools and in public market latrines at Nhamtanda are used on maize fields, tomatoes and horticulture. This process is not monitored by the programme.

#### 6 Further components

The programme collaborates with the Catholic University of Mozambique, Department of Medicine, in order to organize a health survey on yearly basis in Guara Guara and a control area within the same district. The regional laboratory together with a centre for development are mapping the latrines, hand pumps and wells in Guara Guara with GPS in order to map roots of contamination.

#### 7 Project History

After the flooding in the year 2000, 16 emergency latrines were built in the resettlement area using 210 l collection drums. Since people found it difficult to dig out pits they started to erect latrines on piled earth. This was the basis of introducing the ecosan concept to the people.

A local consultant was hired by PAARSS. Together with him an adaptation of ecosan latrines seen in Zimbabwe was developed with the users, built and tested. 10 local artisans were trained in constructing the toilets.

A community awareness program is conducted by a local theatre group, and the community radio station emits weekly programmes about water, hygiene and eco-sanitation. Consequently, discussing peoples' needs,

sanitation was considered even more important than electricity.



Figure 5: Education by a theatre group (source: PAARSS)

#### 8 Costs

Activity	Cost (US\$)	Beneficiaries (Persons)
200 family toilets	78,940 478 / family	1,200
10 public toilets	7,000 / 700 / toilet	2,000
Community Education	10,398.60	2,000
Consultancy	13,982	Project
Supervision	6,215.59	DAS / Project

The whole project budget was 117.000 US\$. Consultancy and project staff costs amounted to approx. 17% of this budget.

Due to the users' participation and constraints for cost limitation it was possible to construct twice as many latrines as originally planned.

#### 9 Operation and Maintenance

This double chamber urine diversion sky-loo works with one chamber at a time. When one chamber is full it is sealed and the other one is used. The full chamber will stay and dry for 6 months. Charcoal ash is added after toilet use to accelerate the drying process of the excreta.

The bathroom water doesn't affect the drying chambers since the greywater is canalized together with the urine, later on collected in a jerry can and directly used as fertilizer or decentralized drained into the ground if the beneficiary is not interested in using it.

Each family signs up a memorandum of understanding when soliciting a latrine. It is joint understanding that the families will contribute with labour and construction material. After receiving the

