



**“No. 1 goes in Front,  
No. 2 in the Back”**

## **Report of the 3<sup>rd</sup> International EcoSan Conference**

**Durban, 23.5.-27.5.2005**



**Report written by**

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## 2 Introduction

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The 3rd International Conference on Ecological Sanitation from 23.5. - 26.5.2005 took place in the International Congress Centre Durban, South-Africa. The conference was mainly organised by CSIR, with Aussie Austin as the person in charge, where 240 people from 27 nations participated. On the 27.5.2005 a post-conference seminar on agricultural and horticultural aspects of Ecological Sanitation was offered, organised by Sida through EcoSanRes in cooperation with CSIR.

Crucial questions were the possible impact of Ecological Sanitation to achieve the Millennium Development Goals and the progress on that way, development and implementation of technical solutions as well as awareness rising and dissemination of the EcoSan approach.

The MDG goal to halve the proportion of people without access to adequate sanitation by 2015 and at the same time to offer ecologically friendly and sustainable sanitation systems, EcoSan project have to be broached more emphatically on political and institutional level up to now. Durban can serve as a successful example, since the eThekweni-town council has implemented more than 20.000 dry toilet systems from 1997 up to 2005. Additionally to the urine diverting toilet, a 200 l water tank were given to the participating households which will be filled once a day from the town council for free.

In the opening session it was stated out clearly that worldwide especially small EcoSan projects have a certain successful impact. But currently more emphases have to be given for up scaling in existing and developing congested urban areas and mega cities.

The Conference was mainly organised in two parallel sessions but without a clear thematic focus. Thereafter the report summarises the main issues of the individual sessions, pointing out details of single interesting issues.

## 3 The EcoSan Conference

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### 3.1 Monday 23.05.2005

#### Opening Session

After the official opening of Aussie Austin, the major of Durban emphasized in his speech the importance of sustainable concepts as main focus of his work. Till 2010 all 3 Mio. inhabitants of Durban shall have access to sanitation systems, mainly dry toilets.

Afterwards the Deputy Minister of Science and Technology of South Africa was pointing out the particular importance of Durban as example for the successful implementation of sustainable sanitation systems and hence as suitable venue for this conference.

#### Session 1

Christine Werner from GTZ gave an overview about the progress in the implementation of the "10 Recommendations for Action", which have been formulated 2 years ago at the 2<sup>nd</sup> EcoSan Conference in Lübeck, Germany.

Susmita Shakhhar presented Indian's experiences with EcoSan. She stressed that the main obstacle in implementation is the rejection of reusing human excreta as fertiliser in the people's home gardens.

Yadira Codero from El Salvador emphasised the importance of alternative sanitation concepts in the curriculum of academic education, since in most Universities only the conventional water- and wastewater concepts are taught globally. From 1992 till 1994 about 50.200 dry toilets were constructed in El Salvador, which gave the country the role of a precursor. However the idea had only a limited success, due to a lack of transformation of knowledge.

## Session 2

Almaz Terefe was speaking in “Empowerment of women and combating poverty through recycling” about her experiences from Ethiopia and the particular importance of a gender sensitive approach especially in the planning- and decision maker level.

Neil McLeod was talking about the efforts of the eThekweni-administration to supply about 200.000 families in Durban, originally without any toilet facilities, with sanitary infrastructure. He was criticised that in South-Africa the nutritious urine is drained into the soil without collection and reuse.

### Street Theater: eThekweni Water Services drama group

A drama group, working with the eThekweni water authority, was performing a short and funny demonstration about the proper use of dry toilets, waterless urinals and the value of reusing the collected products.



Picture 1: eThekweni Street Theatre

## Session 3

Thor Axel Stenström presented the „WHO Guidelines for the safe reuse of human excreta and greywater“, which will be published by end of 2005/beginning of 2006. These guidelines will possibly be the basis for necessary laws and regulations regarding the reuse of urine and faeces in agriculture.

Arno Rosmarin, who is chairing the EcoSan Research Group, reported from a project in China and the development of a dry toilet using a toilet tank for pouring ash, soil or sawdust on the faecal material. He emphasised the importance of such a development for promotion of dry toilets, which are still lacking prestige and comfort.

### 3.2 Tuesday 24.5.2005

#### Parallel session 4A and 4B

Fabiola Garduños' presentation in Session 4A focused on the role of design and architecture in Ecological Sanitation systems. She pointed out the importance of a user-friendly ecological design which is aesthetically pleasing, adaptable to the economic status of the users and meets socio-cultural demands. The theoretical background was illustrated by examples from Mexico.

Session 4B started with an interesting speech from Anne Richert Stintzing about urine reuse in agriculture on municipal level. The results of a project were presented which had the purpose to establish a system for reuse of urine from Kullön, a housing area with 750 people in Vaxholm, Sweden.

Alberto Ysunza-Ogazón presented environmental alternatives to sanitation and food sovereignty in Oaxaca, Mexico. The presented study was aiming to evaluate the impacts of dry toilets regarding health impacts, use, maintenance and recycling of excreta as well as perceptions of the management of human manure.

Constance Windberg presented her ongoing PhDs “Linking Ecological Sanitation and urban agriculture in Sub-Saharan Africa”. First finding from a socio-economic and socio-cultural survey in the south-western region of Uganda showed the impact of dry toilets among the population.

### Parallel session 5A and 5B

The speech of Gertrude Matsebe in Session 5A with the title “Is this a solution?” was verifying the impacts of urine diverting toilets in various regions in South-Africa. The main finding of the study was, that constructing dry toilets is not enough to help solving sanitation problems. For a successful implementation process the involvement of the local council, community participation, the integration of service providers, training and post project support are crucial.

Elke Müllegger presented the case study “Sanitation for a rural school in Uganda – a successful implementation process”. The importance to combine hardware with software in an implementation process is responsible for the sustainable improvement of the sanitation situation in “Kalungu Girls Secondary School”.

Picture 2: Demonstration urine diverting toilet at “Kalungu Girls Secondary School”, Uganda.



In Session 5B Elisabeth Kvarnström was speaking about “Swedish farmers’ attitudes to reuse of digestion residues from anaerobic digestion and source-diverted urine”. The establishment of quality control systems is seen as an extremely important factor for the acceptance of Swedish farmers to reuse digestion residues and urine as fertiliser.

### Parallel session 6A and 6B

In Session 6A Christine Werner presented “The EcoSan source book, toolbox and data sheets” which are currently developed by GTZ, aiming to fill the information gap of decision makers, practitioners and other stakeholders in terms of planning and implementation of EcoSan systems.

Björn Vinnerås’ speech in session 6B has its main focus on the “Fate of faecal pathogens and indicator bacteria in urea treatment”. The evaluation showed that storage is the most simple treatment method, but the biowaste has to be stabilised before in order to avoid odour, flies and rodents. Urea treatment seems to be the most efficient and safest compared with storage and biological treatment, regarding re-growth of pathogenic bacteria in a short term interval.

“Guidelines for the safe use of urine and faeces in Ecological Sanitation systems” were presented by Caroline Schönning, which were published under the EcoSanRes programme. The guidelines provide general recommendations for treatment and the safe use of human excreta for fertilising purposes.

### Parallel session 7A and 7B

Ina Jurga started session 7A with “Mainstreaming Dewats systems within the EcoSan concept in Wenjiang, Sichuan Province, China”. She presented the finding of a project with the goal to increase environmental soundness and economic efficiency of the decentralised wastewater treatment systems (Dewats) typically built in Sichuan Province.

In session 7B Petter D. Jenssen presented “An urban ecological sanitation pilot study in humid tropical climat”. The Hui Sing garden pilot system of Kuching, Malaysia consists of blackwater and greywater management facilities aimed to develop a system for the majority of Kuching City.

### 3.3 Wednesday 25.5.2005

#### Parallel session 8A and 8B

Session 8A comprised the presentation “Introducing a closed loop option from management of human waste in Kampala, Uganda”. Kiribakka Vincent introduced the KCC pilot project for promoting Ecological Sanitation in Kampala, with a special focus on the promotion of re-use in agriculture.

#### Parallel session 9A and 9B

Juan Carlos Calizaya was presenting “The Integrated micro system of alternative sanitation Ecodess, a tool for Ecological Sanitation management in Lima, Peru” in Session 9A. He introduced Ecodess – ecology and development with sustainable sanitation – a micro integrated system of compilation, treatment and reuse of solid residues and domestic liquids.

“Developing strategies for the disposal and use of greywater in the non-sewered areas of South Africa” was presented by Kirsty Carden. She was talking about a comprehensive study about an evaluation of existing greywater management practises and recycling activities as well as water consumption habits in South Africa. Furthermore Carden pointed out the importance of a properly managed greywater to reduce health risks.

Stefan Deegeners’ speech “EcoSan – a step towards sustainable rural development in Eastern Europe” focused on a pilot project for a school in the Ukraine. The results of the project showed clearly that double vault urine diverting toilets are acceptable even for primary school children and that schools are an ideal location for promoting dry toilets rural and peri-urban areas.

#### Exkursion to Projects

On Wednesday afternoon pilot projects in the immediate vicinity of Durban were visited. At the first stop the participants had the opportunity to tour a dry urine diverting toilet. This toilet system was successfully constructed and accepted by the users. The sitting toilets provide a separation where urine goes into the front bowl (“The first goes in front”) and the faeces into the back whole (“The second goes in the back”). The volume of the collection chamber is calculated for one year, where the faecal material can dry while using the second chamber. After one year the material will be used as fertiliser in the users’ gardens. Furthermore a urinal was constructed in every bathroom to avoid misuse by men. The collected urine will be soaked into the soil via a small soak pit.



Picture 3: Urine diverting toilet in eThekweni region, South Africa. Picture 4: Biogas demonstration plant in eThekweni region.

The second project was a biogas plant, where both human excreta and animal dung are used for gas production. The plant was constructed more than one year ago and is operated by the users since that

time. The wastewater from the flush toilets is transported directly into the underground plant, where the human dung has to be admitted manually. The overflowing water is used for irrigation purposes.

Even though the biogas plant is working currently, it is questionable if the facility is permanently in use, hence no overflow is visible and the gas cooker in the kitchen was relatively new. However, the project shall be seen as demonstration, rather as alternative to the existing dry toilets.

The last stop-over was the University of KwaZulu-Natal, where the Pollution Research Group is doing field trials. After an introduction to the ongoing research project by Dr. Rodda, the conference participants had the opportunity to have a closer look on the single trials. Every single trial has been supervised by the students, who were explaining the project and answering questions. Beside trials about the use of urine as fertiliser, the pathogen transfer from buried dried faecal material to the surrounding soil are carried out.

The University supports additionally the Cato Manor Initiative, which is involved in urban agriculture. The area around Cato Manor is characterised by a high unemployment, poorness and a lack of food supply. The project offers the opportunity of planting small urban gardens, where support is offered from the University and the eThekweni Town council in terms of trainings and seeds. The gardens shall be irrigated with greywater, where perma-culture as well as rainwater harvesting is proved.

All in all the excursion was accompanied by intensive discussions and a sharing of individual experiences among the congress participants.

### **3.4 Tuesday 26.5.2004**

#### **Parallel session 10A and 10B**

Pearson Mkeni opened session 10B and presented field trials for urine. The results of the trials showed that an undue quantity of urine tender to depress yields due to an increase of salinity in soil. But these effects will occur at application levels much higher than it is envisaged by the conventional fertilising practises. He recommended to establish optimum rates of application locally.

Pernilla Tidåker analysed in her doctor thesis at the Swedish SLU life cycle assessments for two different scenarios: a urine-diverting scenario and a conventional one. The study demonstrated that an agricultural system using human urine has several environmental benefits if the system is well designed.

Justine Anschütz was evaluating the last EcoSan conference in Lübeck and found out that the main issue was on technical aspects, mainly neglecting political and economic issues which are still lacking behind.

#### **Parallel session 11A und 11B**

Ina Jurga presented in Session 11A from a GTZ project in China, in which the Chinese administration forces the construction of ecological sanitation concepts. Thus about 1 million dry toilets with urine diversion were constructed in the last years. In order to live up to the MDGs still Millions of toilets are necessary.

In Session 11B Obed Kawanga presented the results of the baseline study from Madimba EcoSan pilot project of Lusaka, Zambia. The study found out that peoples' cultural background is an important influence factor for the acceptance of EcoSan concepts. Important constraints are the lack of knowledge on EcoSan principles and financial support and he emphasized the importance of effective collaboration and networking as well as community participation.

Patrick Bracken and Elisabeth Kwarnström presentation broached the issue of „Making sustainable choices – the development and use of sustainability oriented criteria in sanitary decision making“. The list consists of criteria for health, environment, economy, society and culture and technical function of

the system for the assessment of sustainability of sanitation systems. The sustainability criteria are recommended to be used for any strategic sanitation planning and decision making processes whether on a macro or micro project level.

### **Session 12**

The conference was closed with a general brainstorming in the panel for the formulation of the conference statement and the “Recommendation of Action” to the next conference. Arno Rosmarin and Aussie Austin were chairing this session where more than 60 statements were given. One of the chore issues was the importance to transfer research results to regulations to develop guidelines for the reuse of human excreta.

With a gala dinner at Sibaya Entertainment Kingdom the conference ended.

### **3.5 Friday 27.5.2005**

#### **Post-conference seminar on agriculture and horticulture aspects of Ecological Sanitation**

Håkan Jönsson and Elisabeth Kwarnström were chairing the post-conference session on agricultural and horticultural aspects of Ecological Sanitation. The purpose of the seminar was to gather persons with experiences and/or interests in the reuse of urine and faeces in order for crop production, with a focus to network and exchange experiences on demonstration activities promoting reuse.

Keynotes were given by Peter Morgan, who presented demonstration activities in the reuse of human compost and urine for growing crops under local conditions in Zimbabwe. The main focus of the presentation was on experiments to demonstrate effects of vegetable growth by using toilet compost and urine as fertiliser.

Leocadie Bouda from Crepa presented strategies to overcome cultural barriers challenging the reuse of human excreta in Burkina Faso. She presented the current situation and based on the local practises various steps (like social mobilisation, domestic visits, demonstrations, etc.) to overcome these restrictions.

The last keynote presentation was given by Paco Arroyo. He was speaking about agricultural use of urine and faeces in Mexico and experiences with demonstration gardens and acceptance of the local population.

The presentations followed group discussions, with a special focus on individual experiences in demonstration trials aiming to define five key bullets to answer the questions “How to organise successful demonstration experiments?” With presentations about the group results in the plenum and final conclusion the seminar ended in the afternoon.

## **4 Outcome**

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The “3rd International Conference on Ecological Sanitation” provided an eclectic mix of sanitation related issues from different perspectives of various disciplines. The sessions and discussions submitted the current status of research, information about ongoing activities and shared experiences. The discussions with practitioners from around the globe gave insight to problems and solutions on the ground.

The informative and well balanced programme of the conference was the base for a very social, inspiring and instructive week. The gathered information and the newly established contacts will be of great value for my further research and work.