Survey of Urine Diverting Dry Toilet Projects in Sri Lanka

(Report 1 of 3 from "Evaluation of the Appropriateness of Ecological Sanitation in Relation to the Social, Cultural and Economic and Financial Context of Sri Lanka")

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EXECUTIVE SUMMERY

Urine diverting dry toilets (UDDTs) were introduced in Sri Lanka in 2001 by NWSDB together with EcoSolutions, UK. The systems used in Sri Lanka are all double vault systems. Before usage the floor of the empty vault is covered with straw. After each use ash is added to cover the feacal material. The material is stored in the first vault until the second one is full. The visited places stated a storage time between one and five years. The sanitation process of the faecal material stored in the closed vault seems to be a combination of composting and desiccation. The UDDTs in Sri Lanka are commonly referred to as (dry) compost toilets.

Urine and wash water are drained via a common pipe to a soak pit. On top of the soak pit trees or other plants are grown to use the nutrients of the urine. However, an active reuse, applying urine as fertilizer to the soil was not observed or documented.

Information was given of the existence of two urinals, which are equipped with a collection facility for the urine to be used on banana plants. This could not be confirmed.

The information given regarding existing composting toilets is often misleading. Since numbers are not correct and the concept of ecological sanitation is not thoroughly understood by all stakeholders. According to information received at this stage, between 73 and 100 compost toilets were constructed in Sri Lanka since 2001. How many of these toilets are in use can not be established.

It seems that after the pilot project by NWSDB in 2001 the created momentum was not used for further activities. However, recently the interest in ecosan technologies is increasing. Numerous stakeholders expressed there willingness to get involved into ecosan. The main problem seems to be the lack of knowledge and capacity as well as the unclear institutional situation.

Discussions with users of existing compost toilets and first interviews with residents and future residents and with relevant other stakeholders were already conducted at this stage and allow some preliminary recommendations which are part of this report.

A list of past projects related to ecological dry composting toilets is presented in this report, including an evaluation of the site visits based on the recorded data of the field visits. A photo documentation of these visits is attached in Annex I.

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1 INTRODUCTION

1.1 Background (cited from ToR)

"UNICEF WASH programme in Sri Lanka is providing essential support to line ministries, relevant district government agencies, NGOs and CBOs to meet the water, sanitation and hygiene needs for the Tsunami affected population. The assistance is also extended to include war affected and needy communities in non Tsunami affected areas. Currently, more than 50 sector partners are providing Water, sanitation and hygiene services to the Tsunami affected population in camps and transitional shelters.

Over the last 12 months UNICEF has provided and distributed important quantities of supplies, equipment and cash for construction of water, sanitation and hygiene facilities in many locations in response to the disaster.

Currently, the strategy is gradually shifting from relief to address construction and development perspectives. UNICEF has already outlined the water supply, sanitation and hygiene Plan of Action for the period 2005-2008 in consultation with government line ministries and other agencies. The plan involves construction of water supply schemes, environmental friendly and child friendly sustainable sanitation systems and sector capacity building.

Ecological toilets have already been promoted at pilot scale in Sri Lanka over the past decade as a way to save water, provide sanitation where other alternatives prove infeasible, protect the environment from faecal contamination and provide households with fertilizer and soil conditioner. …

Based on the above, UNICEF and Government counterparts (MoH), partner NGOs (world Vision, Action Contre la Faim, OXFAM, ITDG) and other organizations (hired) an international consultant … to evaluate the appropriateness of ecological sanitation in relation to the social, cultural and economic and financial context of Sri Lanka."

1.2 Ecological Sanitation

The philosophy of **Eco**logical **San**itation (ecosan) is based on the consistent implementation of the "closing the loop approach" (Nutrient Cycling), where urine and faeces are regarded as resources rather than waste. If collected separately they can be used as fertilizer or as soil conditioner. Ecosan approaches are mainly on-site or semi-central. They provide a viable alternative to cost extensive and unsustainable central wastewater management solutions as well as to environmentally unsustainable on-site solutions such as pit latrines and septic tanks.

The Ecosan concept, see Figure 1, facilitates sustainable natural resource management and the improvement of sanitation and livelihoods. By sanitizing human excrements in an environmentally sustainable approach and providing organic fertilizer, which does not contaminate land and water resources, the Ecosan concept maximizes both, the benefits of environmental sanitation and agriculture.

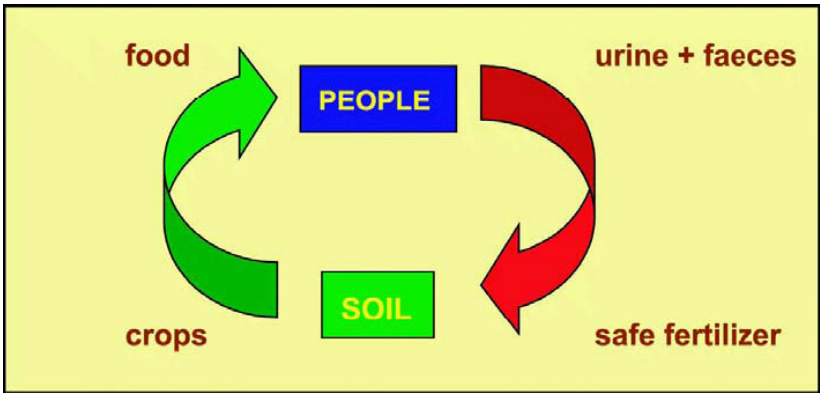

Figure 1: Improving Sanitation and Livelihoods through the Ecosan concept
(Source: **www.ecosanres.org**)

Technologies:
Ecological sanitation comprises several technologies. There are no fixed designs. However, each technology has to be adapted to local conditions. Ecosan is a holistic approach towards the treatment of all kind of wastewater – greywater (generated in kitchen, bathroom), brownwater (generated in flush toilet), yellowwater (urine and water), blackwater (faeces and water) – and undiluted human faeces.

Ecosan-Toilets:
There is a huge variety of ecosan toilet technologies available. However, the on-site low-cost technologies for private households can be grouped in composting and desiccation toilets, in urine-diverting and non diverting systems, and in single and double chamber systems. Ecosan toilets are normally raised above ground. But do not necessarily have to.

The technology used in Sri Lanka so far is urine-diverting desiccation toilets (UDDTs), whereas the stored material is sanitized by a combination of desiccation and composting. The systems in Sri Lanka have two chambers. The UDDTs in Sri Lanka are commonly referred to as composting toilets. To prevent any confusion, this term is also used in this document.

For additional information on Ecological sanitation visit www.ecosanres.org or www.tuhh.de/susan/.

2 TASK AND EXPECTED OUTCOME ACCORDING TO TOR

Task 1 according to ToR: "Take stock of recent experiences on Ecological sanitation and of pilot projects carried out in Sri Lanka during the past 5 years."

The following end product/deliverable is expected after the first month of the consultancy, August 29, 2006: "Progress Report No1: List of past project related to ecological dry composting toilets"

The terms of reference can be found in the annex.

3 METHODS

Activities carried out addressing Task 1 during the first month of the assignment are listed below. The site visits to ecosan sites, relocation and resettlement areas and welfare centers, the literature review and the interviews carried out with stakeholders and users of ecosan were already relevant for other tasks of the assignment. However, logistically it was useful to combine certain activities. The methods stated under 3.1 to 3.5 directly addressed Task 1. 3.4 to 3.7 were already relevant for the remaining tasks of the assignment (see ToR in Annex).
Not mentioned below is a presentation prepared as an introduction for the members of the Sanitation Task Force. It was presented August 4, 2006.

3.1 Ecosanres news group

On May 15, 2006 the following message was posted to ecosanres@yahoogroups.com:

.... I will be working on a study "appropriateness of ecological sanitation in relation to the social, cultural and economic and financial context of Sri Lanka".
Anybody who is involved in sanitation in Sri Lanka (not only ecosan!) and who is willing to share some information and give me some input please contact me.
Maybe there are already some relevant studies carried out. ... "

Paul Calvert, Ecosolutions, India; Ron Sawyer, Sarar Transformación, Mexico; Elisabeth Maria-Huba, World Toilet Organisation, Germany; Gerald Eder, Hydrophil, Austria and Arne Panesar, Consultant, Germany replied and provided contacts and useful information.
Of particular interest is the work done by Paul Calvert, and World Toilet Organisation (WTO) for Habitat for Humanity and World Vision (see 3.4 Literature review).

3.2 Internet research

An Internet research was carried out to get information on Ecosan related activities in Sri Lanka.
The following sites provided useful information:

- GTZ ecosan Database,
  www.gtz.de/en/themen/umwelt-infrastruktur/wasser/9835.htm
- Ecosanres Database
  www.ecosanres.org
- Archive of the ecosan discussion group
  http://groups.yahoo.com/group/ecosanres
- UNDP website
  www.undp.org/energyandenvironment/sustainabledifference/PDFs/Asia/SriLanka.com.pdf

3.3 WATSAN activists in Sri Lanka

During the literature research relevant key persons and organisations and their contacts were noted. On August 2, 2006 an e-mail, asking for information on ecosan was sent to approximately 60 contacts. An attached excel sheet was prepared to fill in the required information. The information received and the sources are listed in Table 2 of ecosan activities presented under 4 Outcome.

3.4 Literature review

Relevant literature and documents were downloaded from the Internet, were sent by members of the ecosanres ewsgroup, by WorldVision, by World Toilet Organisation, by UNICEF, by Paul Calvert, and Elisabeth von Muench or received from D.Senevirathne (NWSDB), from SEVENATHA and from SARVODAYA.

Reviewed documents are listed below. Documents which are not directly related to the activities carried out in the first month are not included.

Documents directly related to ecosan activities in Sri Lanka:

- (?) A Demonstration Project on Eco-Sanitation in Urban, Peri-Urban and Rural Sri Lanka, Case Study of Pilot Project in Matale Municipal Council Area, SEVENATHA, Sri Lanka
- Paul Calvert (2001), Ecological Sanitation in India and Sri Lanka, 1st International Conference on Ecological Sanitation, China
- (2002) Report on Consultative Workshop on Strategy for Eco-Sanitation, National Water Supply and Drainage Board, Sri Lanka
- P. Calvert (2002) Ecological Sanitation in Sri Lanka, Interim Mission Report
- N.I. Wickremasinghe, N.U.K. Ranatunga (2003) Report on Evaluation of Existing Dry Compost Toilets (Eco-Toilets) in Sri Lanka, National Water Supply and Drainage Board, Sri Lanka
- P. Calvert (2003), Bringing ecosan to South Asia, 2nd International Symposium on Ecological Sanitation, April 2003, GTZ and IWA, Germany
- E. Maria-Huba, T. Panzerbieter (2005) Mission report, 2005/06/07 - 2005/06/15, World Toilet Organisation and Habitat for Humanity, Sri Lanka
- E. Maria-Huba, T. Panzerbieter (2005) Water is Life, Sanitation is Dignity, WTO Sri Lanka Mission 2, World Toilet Organisation and Habitat for Humanity, Sri Lanka
- E. Maria-Huba et al. (2006) Sanitation is more than life - Sustainable sanitation options for Sri Lanka, Volume I-III, World Toilet Organisation & World Vision, Sri lanka – Germany
- Bills of Quantaties for Composting toilets implemented by Practical Action, Sarvodaya, Sevenatha and Action contre la faime

Relevant documents related to sanitation in Sri Lanka

- Minutes of Sanitation Task Force Meetings
- Minutes of National Coordination Meetings on Water, Sanitation and Drainage
- Minutes of Water and Sanitation Co-ordination Meetings in Ampara, Mannar, Puttalam, Galle and Vavuniya District
- (2003) Some Experiences in Development Cooperation in Sri Lanka, Pocket Booklet, helvetas, Sri Lanka
- N.Herath (2005) Manual 1 Latrine Construction, Technical Manual Series on Rural Water Supply and Sanitation, Helvetas, Sri Lanka
- T.Moore (2005) Guidiance for Solid Waste Management in Transitional Schelter Sites (TSS), Project Galle 2005, Sri Lanka
- J. Zarins (2006) Best Practice Guidelines for the On Site Decommissioning of Pit Latrines/Septic Tanks within Transitional Shelter Sites, Project Galle 2005, Sri Lanka
- (2006) Policy Issues Discussed at the Country Programme Mission, Handouts, NWSDB, Sri Lanka

Specific documents for Puttalam District

- M.G.Razaak (2006) Social Impact Assessment of Muslim IDPs in Welfare Centers - Puttalam District, Inception Report, North East Housing Reconstruction Project (NEHRP)
- S.H.Hasbullah (2006) Investigation on Environmental Suitability of 26 Sites in Puttalam for House Construction for IDPs, Draft Report
- (2006) Baseline Survey Report on Water and Sanitation in Welfare Centres in Puttalam - Draft, FORUT, Sri Lanka

3.5 Meetings / Telephone calls

The following key persons were interviewed about ecosan activities either during a meeting or via the telephone:

Table 1: Interviewed key persons

Date	Key Person	Organisation
30.07.06	Kannan Pasupathiraj	Australien Red Cross
31.07.06	Ananda Jayaweera	UNICEF
04.08.06	*48th National Coordination Meeting on WATSAN Sanitation Task Force Meeting*	
07.08.06	Philippe Barragne-Bigot	UNICEF
	D.Senevirathne	NWSDB
08.08.06	Fidel Peña Angon	ICRC
	Varuna Rathnabharathie	Practical Action
	Arim Corea	Consultant
	Hilke Ebert	GTZ
	Reinhard Dalchow	KfW
	Fiore Pietro	Movimondo
	Sarath Abeyawardena	IWMI
	Roberto Saltori	UNICEF
09.08.06	*FIELD VISIT with D.Senevirathne, NWSDB to Kaluthara, see 3.6 Site Visits*	
10.08.06	Udani Mendi	SARVODOYA
	Mary Lear	IOM
	Bob Cunning	IOM
	Tony Senevirathne	Habitat for Humanity (HfH)
	Kit Dyer	UNICEF
	Jayarathne	SEVENATHA
	Adam Berthoud	OXFAM
	Athula Jayamanne	NERD
	Ian Jones	UNICEF
15.08.06	*FIELD VISITS with Sevenatha to Matale Sites, Meetings see 3.6 Site Visits*	
	Palitha Jayaweera	COSI
16.-18.08.06	*FIELD VISITS in Puttalam District, Meetings see 3.6 Site Visits*	
21.08.06	*FIELD VISITS with Sarvodoya to Rathmalana sites, Meetings see 3.6 Site Visits*	
22.-24.08.06	*FIELD VISITS, Kaluthera, Balapitya, Galle, Hambantote, Meetings see 3.6 Site Visits*	

Minutes of each meeting/telephone call are available on request.

3.6 Site visits and Interviews

During the first month of the assignment the following places were visited:

09.08.06: Kaluthara District - Inspection of ecosan toilets

The composting toilets in Bulansinthale, Kaluthara district were visited together with D. Senevirathne, Chief Sociologist at National Water Supply and Drainage Board (NWSDB). All the present compost toilets were inspected (see annex for inspection protocol).
The information given for this site varied from 10 – 15 toilets constructed in 2001. The site visit could verify the number of constructed toilets as 10. For the gathered data see 4.2 Evaluation of Ecosan site visits.

15.08.06: Matale District - Inspection of ecosan toilets, Meetings with key persons

In the morning a meeting with the following persons was organized:
- the Municipal Health Inspector, Mr. Gamini,
- two representatives of Sevenatha, Lasanthe and Sudith,
- the five community development agents responsible for the communities with compost toilets and
- the community leader, Luky, who was already involved in the implementation of the project.

After a lively discussion seven compost toilets in Matale town were visited.

A meeting with Palitha Jayaweera, Community Self Improvement (COSI), was arranged for the afternoon.

16.-18.08.06: Puttalam District - Visit of relocation sites (Hijarath Puram, Karambe, 90 acres) and welfare centers (Saltern), interviews of key persons, organizations and residents

Day 1: Upon arrival a meeting with the NGO Rural Development Forum was set up. After discussing their activities and experiences we went to the relocation site Hijarath Puram. In Hijarath Puram the childrens club and residents were visited. One family was interviewed. The questionnaire can be found in the annex.

Day 2: The first meeting of the day was with Ida Suhanya, field officer of UNHCR. She explained the activities of UNHCR in the district and handed over a copy of the baseline study on sanitation in Puttalam district carried out by FORUT on behalf of UNHCR.
After this, Mr. Raphio from RDF joined and together we visited the Woman Society of Nayakkarchenai which is involved in home gardening. After this the site of a flush toilet built by RDF was inspected. The owner was interviewed.
After lunch we visited the relocation area Karambe. One family was interviewed (see annex for questionnaire).
On the way to the welfare centre Saltern we stopped at the office of the NGO Agromart and discussed their activities. In Saltern the community leader and his family were interviewed (see annex for questionnaire).

The Assistant Director of the Agricultural Office, Puttalam, K.M.A. Sukoor was interviewed early evening.

Day 3: Together with the UNICEF WASH Programme Officer and the Assistant Programme Officer, Ian Jones and Radika Sivakumaren the Managing Director of the NGO ISRC, A.M. Mihlar was interviewed. He then joined for the site visits to the relocation site "90 acres". At "90 acres" the community leader together with residents were interviewed (see annex for questionnaire). After the interview homes, one home garden and a compost site were visited. On the way back to Puttalam we visited sites where ISRC constructed flush toilets.

On the way back to Colombo the village Karukkupane near Chilau was visited. COSI implemented a urinal at a school. The urine is supposed to be used for banana plants. The school was empty and the site was inspected without a guide. No reuse could be verified. According to COSI the system can not be seen. This will be followed up.
At the same site residents were interviewed.

21.08.06: Colombo – Inspection of ecosan toilets, Meetings with Sarvodaya

After a discussion with K.W. Remathilaka, Regional Technical Adviser, Mr. Karunadasa, former administrator and Mr. Peiris, Technical Officer in charge of Headquarters, at the Sarvodaya office, five composting toilets in Rathmalana were visited.

22.-24.08.06: Kaluthara, Galle, Hambantote Districts – Visit of relocation sites, interviews of key persons, organizations and residents

Day 1: The ecosan workshop held by Practical Action (PA) in Kaluthera was visited. At this occasion ecosan was discussed with the local family, PA staff, local masons and the PHI.
In Balapitiya together with the Field Officer from HfH "compost toilets" were visited, which turned out to be septic tanks with French drains.
In Galle a meeting with Mr. Nishante, Director of Arthacherya Foundation was organized. At this meeting Mr. Nishante introduced the interesting work done by Arthacherya Foundation in the fields of solid waste management and home gardening. A site visit for the next day was planned.

Day 2: Suranga de Silva, UNICEF Assistant Project Officer (WASH) was met in the morning and together the Senior Public Health Inspectors (SPHIs) for Galle district, H.A. Gunawaradhana and Mr. Nimalasiri was met. After a very informative discussion, a home garden, implemented by Arthacherya Foundation, was inspected and the owner of the house interviewed. The relocation sites Dadalla and Gallagodawatta were visited. In Gallagodawatta members of nine families gathered and answered the questions of the questionnaire together. In the early evening the staff of the NGO Malteser was interviewed.

Day 3: Mr. Rajapaksa, field officer of Practical Action and the communication officer of Practical Action were met in the PA office Ambalantota. The SPHI of Ambalantota, A.Jayasundara was interviewed and after this Mr.Hemapala and Ms. A.P.Sumanaunthit, agriculture instructors at Department of Agriculture of Rice Research Station, Ambalantota. Furthermore the Manager of the ecotourism project *Ecostop* was interviewed and four composting toilets constructed by PA inspected.

4 OUTCOME

The following presents the deliverable of Task 1 - the list of past projects related to ecological dry composting toilets. Additional to this, an evaluation of the site visits including the recorded data of the field visits, a photo documentation of these visits are presented.

4.1 List of recent experiences on Ecological Sanitation and of pilot projects in Sri Lanka

The presented list of projects in Table 2 presents the information available on November 20, 2006. However, numbers of constructed toilets change daily. Since the numbers of constructed toilets differ significant according to the information source, only the numbers of composting toilets at sites visited by the consultant are verified. According to information received at this stage, between 73 and 100 compost toilets were constructed in Sri Lanka since 2001. How many of these toilets are in use, could not be established.

According to reports (WTO mission reports) and meetings Habitat for Humanity (HfH) constructed composting toilets in Balapitiya, Thotagamwua, Galle, Batticaloa, Trincomalee, and Mandana. After visiting the sites in Balapitiya it was understood that the term ‘composting toilet’ was misinterpreted. The inspected toilets were flush toilets with a plastic septic tank and a French drainage system. Supposedly the other sites have the same systems and are therefore not included in the list. However a follow up is needed since World Toilet Organisation donated at least 13 urine diverting squatting pans to HfH in 2005. However, according to an HfH field officer an ecosan training is not done yet.

Table 3 provides an overview of the projects currently under construction or planned.

Table 2: List of ecosan related projects in Sri Lanka.

District / Town	Year	Number of toilets		Verified by consultant	Information Source
		constructed	in use		
Pilot Project of NWSDB together with EcoSolutions					
Matale / Matale	2001	10	5	7 (4 in use)	D.Senevirathne, Paul Calvert, Deepthi Sunmanasekera, SEVENATHA
Matale / ?	2002	10	?	No	D.Senevirathne, Paul Calvert, Deepthi Sunmanasekera, SEVENATHA
Colombo / Rathmalana	2001/02	5	5	5 (3 in use, 2 no access)	D.Senevirathne, Paul Calvert, Deepthi Sunmanasekera, SARVODAYA
Colombo / Willorawatta	2001/02	5	?	No	D.Senevirathne, Paul Calvert, Deepthi Sunmanasekera, SARVODAYA
Kaluthara / Bulatsinhala	2001/02	10	6	10 (6 in use)	D.Senevirathne, Paul Calvert, Deepthi Sunmanasekera
Practical Action					
Hambantota / Kalamateya	2006	4	3	4 (3 in use, 1 under construction)	Varuna Rathnabharathie, PA
Vavuniya / Paraveepuram	2006	1	?	No	Varuna Rathnabharathie, PA
Ampara / Samanthurei	2006	1	?	No	Varuna Rathnabharathie, PA
Kaluthara / Veragala	2006	1	Not yet	1 (under construction)	Varuna Rathnabharathie, PA
IOM					
Ampara / Komari		1	No	No	Mary Lear, Bob Cummings, IOM
ACF					
Jaffna / Karainagar	2005	15 (30)	?	No	Kannan Pasupathiraj, Australian Red Cross (Mohamed Aleem, ACF)
Jaffna / Karathivu	2005	4?	?	No	Varuna Rathnabharathie, PA
Trincomalee / Muttur	2005	15	?	No	Kannan Pasupathiraj, Australian Red Cross
Ampara / Kalumunai	2006	1	?	No	Mohamed Aleem, ACF
Batticaloa	2006	2?	?	No	Mohamed Aleem, ACF
Potuvil	2006	2?	?	No	Bob Cummings, IOM
Australian Red Cross					
Jaffna / Maruthenkerni	2005	1	?	No	Kannan Pasupathiraj, Australian Red Cross
Vadamarachichi East	2005	1	No	No	
CARITAS					
Mullattivu	2006	1	Not yet	No	Kannan Pasupathiraj, Australian Red Cross
SARVODOYA					
Ratnapura / Panahaduwa	2006	1	?	No	K.W.Premathilaka, Sarvodoya
Ratnapura / Galpaya	2006	1	?	No	K.W.Premathilaka, Sarvodoya
UN Habitat					
Galle	2006	1	?	No	Carolina, UN Habitat
British Council					
Monaragala / Athimale	2005	2	2	No	Kannan Pasupathiraj, Australian Red Cross
FORUT					
Jaffna	2006	1	?	No	Kannan Pasupathiraj, Australian Red Cross

Table 3: List of ecosan related projects under construction of planned

Organisation - District / Town		Planned	Constructed	Information Source
Practical Action				
Hambantota / Kalamateya		24	24	Varuna Rathnabharathie, PA
Hambantote		20	end of Dec.	Varuna Rathnabharathie, PA
Ampara / Samanthurei		25	end of Nov.	Varuna Rathnabharathie, PA
Ampara		20	end of Dec.	Varuna Rathnabharathie, PA
Baticaloe		1	finished	Varuna Rathnabharathie, PA
Galle / Moragoda		11	end of Nov.	Varuna Rathnabharathie, PA
Matara		11	end of Nov.	Varuna Rathnabharathie, PA
Kaluthara		10	end of Nov.	Varuna Rathnabharathie, PA
Putlum		1	end of Nov.	Varuna Rathnabharathie, PA
Chillaw		1	end of Nov.	Varuna Rathnabharathie, PA
Colombo		1	end of Nov.	Varuna Rathnabharathie, PA
Swiss Development Agency				
Matara		50	0	Roberto Saltori, UNICEF
Australien Red Cross				
Jaffna / Maruthenkerni		491	0	Kannan Pasupathiraj, Australian Red Cross
Irish Red Cross				Bob Cummings
OXFAM				Adam Berthoud, OXFAM
IOM				Mary Lear, IOM
UN Habitat				Carolina, UN Habitat
Caritas/ Mulaitivu		300 ?		Kannan Pasupathiraj, Australian Red Cross
COSI				Palitha Jayaweera, COSI

4.2 Evaluation of Ecosan site visits

26 compost toilets in four different districts; Colombo, Kaluthara, Matale and Hambantota; were inspected. All compost toilets were double chamber urine-diverting systems with squatting pans. Of the 26 inspected toilets only 14 were used, two were not accessible. Three compost toilets were converted to flush toilets; two were abandoned, one demolished, one under construction and one broken.

The sites in Matale and Rathmalana are extremely dense. Toilets are attached to the house or inside the house, whereas at the other sites toilets were outside.

Only in Bulatsinthale and Hambantota all existing compost toilets could be visited.

In Matale 20 toilets were implemented by the local NGO Sevenatha in 2001/02. However, since the then responsible field officers left Sevenatha the location of only 10 toilets is known. These were built in Phase II in 2002. Of the 10 toilets known by Sevenatha 7 were visited, two are said to be collapsed, and one is inaccessible in hilly area.
The ten compost toilets in Colombo, in Rathmalana and Willorawatta, were installed by the local NGO Sarvodaya. At the time of the visit by the consultant nobody at Sarvodaya office was able to verify the location of the five compost toilets built in Willorawatta.

4.2.1 Data of field visits

The inspected toilets were all of the same type in Sri Lanka generally referred to as composting toilets.

None of the toilets contained visible amounts of paper, since the owners use water for cleaning. Only one toilet contained plastic.

Three women using the toilet were pregnant and had no complaints.

All the users add ash after usage. However, ash is added in different quantities and sometimes not enough.

None of the users reused the urine. Whereby reuse in this document refers to the application of urine on the soil as fertilizer. The direction of the urine into a soak pit with a tree planted on top, a plant bed, is not regarded as active reuse in this document. The plant beds are sometimes not visible anymore. The composted feacal material was reused in two sites. If the vaults are emptied and the compost is not reused, the material was buried. Most of the toilets are emptied after 2-5 years. One toilet was emptied after one year.

In two cases it was not sure if the owners use one or two vaults.

None of the owners using the toilets stated problems for the usage of the toilet for children. Whereby, some people, who converted their compost toilet to a flush toilet, stated the problematic use for children as one of the reasons for the conversion.

All the used compost toilets were in a good to very good condition. There was rarely any smell and no flies. Cockroaches seem to be very common, but not stated as a problem.

Nearly all the urine pipes of the toilets constructed in 2001/02 were broken (see Photo documentation, Annex I).

Table 4 contains a selection of the data recorded during the field visits.

Explanation of columns of Table 4:

Use:	Use of the compost toilet, Is it used by the owner?
Reuse:	Reuse of urine and solid material, Is urine used as fertilizer? Yes = y(u) Is the dried / composted material applied to the soil? Yes = y(f)
Pipe:	Quality of pipe, No complaints = ok, broken = b
G:	Garden, Is there home gardening in the compound?
PB:	Status of plant bed, Is there a plant bed? Are there plants grown on top of the soak pit?
Overall:	Overall impression of the toilet
Smell:	Smell of the toilet, a = ammonium f = faecal material
Ash prov.:	Is enough ash provided?
W:	Is water for cleaning and hand washing provided?
S:	Is soap for hand washing provided?
Insects:	Are there insects in the toilets? m = many, l = little, n = none c = cockroaches, f = flies
Full Vault:	Number of vaults / chambers which are full
Emptied:	How often was the toilet emptied already?

y = yes, n = no, n.v. = not visible

Table 4: Data of Filed Visits

Site #	Use	# users	# kids	Re - use	Pipe	G	PB	Overall			Smell			Ash prov.	W	S	Insects			Full vaults	# Emptied	Comments
								:-)	o	:-(	:-)	o	:-(				m	l	n			
09.08.06 - Kaluthera/Bulatsinhale - Installation 2001 - Christombo Farm Community/Tea and rubber estate *Mihiri Gikile* (private company) General: Not enough toilets, women queue, man open defecation, water logging renders public pit latrine unusable in rainy season																						
1	Converted into flush toilet																					Not enough ash, too many visitors
2	x	7	2	No	b	y	y	x			x			y	n	y	c			1	1	Seem not to put ash after use, use two vaults
3	x	5	3	No	b	y	n	x			x			y	y	n		c		1	1	Urine pipe removed, no plant bed visible
4	Abandoned																					
5	Demolished																					Used before now pit latrine, want to extent the house
6	x	4	2	No	b	n	n		x			x		y	n	n			x	1	2	"Full" vault only half full, covered with straw
7	x	4	1	No	ok	n	n		x			a		y	y	n			x		2	
8	x	5	2	No	b	n	n		x			a		y	y	y		c		0		Family not present, only little ash, door broken
9	x	6	3	No	b	n	(y)	x			x			y	y	n	c			1	1	Soakpit was broken, now removed, extension of house
10	Converted into flush toilet																					Too many visitors/children, before satisfied with ecosan
15.08.06 - Matale - Installation 2001 - altogether 20 compost toilets (4 in hilly areas, 4 converted or removed) SEVENATHA only knows the location of the 10 toilets built in Phase II (7 visited, 2 collapsed, 1 hilly area)																						
11	x	11	6	No	ok	n	n.v.		x			a		n	y	n		c		1	1	Used by two families, not enough ash *
12	Converted into flush toilet																					Soak pit was blocked, broken leg *
13	Abandoned																					Not the original tenants, no training *
14	x	8	5	No	b	n	n.v.			x	x			n	y	n			x	0	0	Inside, very dense, water in empty vault!, no steps
15	x	4	2	No	b	n	y		x			a,f		y	y	y			x	0	0	New flush toilets right beside despite high GWT
16	x	4	2	No	?	n	(y)		x			x		y	y	y		f		0	1	Inside, VERY dense, soak pit seems to be blocked
17	Not used																					Wall of one vault collapsed due to rain *
21.08.06 - Rathmalana - Installation 2001 altogether 10 (only 5 visited, SARDOYA does not know the location of the 5 toilets in Willorawatta at Moratuwa)																						
18	x	5	2	y (f)	ok	n	y	x			x			y	y	n	c			0	1	Solid collected by small business *
19	x	4	2	y (f)	n.v.	y	n.v.	x			x			y	y	n			x	0	1	Solid gets reused in mothers house 10km away *
20	x	2	0	No	b	y	y	x			x			y	y	n	c			2	1	Seems like two vaults are used
21	User absent - no access																					Neighbour complained about smell of ecosan *
22	User absent - no access																					
24.08.06 - Hambantota - Installation 2006 (6-0 months ago) altogether 4 compost toilets																						
23	Under construction																					Waste collectors, would use compost in garden
24	x	4	1	?	ok	y	y	x			x			y	y	n			x	0	0	Kivula South, since January 2006, nice plant bed
25	x	3	1	?	ok	y	y	x			x			y	n	n			x	0	0	Kivula, 4 month ago built, plant bed just small tree
26	x	4	1	?	ok	y	y	x			x			y	y	n			x	0	0	Kivula, 3 months in use, plant bed just small tree

* more comments below

* Complete comments for sites 11, 12, 13, 15, 17, 18, 19 and 21:

11: Used by two families, kids trained by mother and do not have any problems, ash not enough, husband brings from restaurant, 3kg/day needed, attached hand rail for elderly and kids, rocky area, emptying hard work, done by wife, volume reduced ½ => very compacted
12: Two months ago compost toilet converted to flush toilet, stated reason: water level too high during rainy season, soak pit was blocked, had to remove urine manually => maintenance too high, neighbor did not like, construction poor, bad smell, flies during rainy season, recently water connection, other story: leg broken => too difficult to use,
13: Not the original tenants, were not trained, used for three months, did not like it, use pour flush now
15: Adjacent to swamp, three flush toilets right beside, before 15 people for one flush toilet, 6 months ago neighbor built flush toilet, asked about ecosan but did not like, never used it, but also have problem with water table, comment of user: No smell, no flies, everything very good
17: Due to rain chamber collapsed, door broken, use toilet of neighbor, want to use ecosan again, used for two years without problems
18: Solid is collected by small business for flowers and vegetables, household has compost bin for organic waste, neighbor packs compost and sells for 30 LKR/1.5kg
19: Ecosan compost gets reused in mothers house, 10km away, small portion at home, like compost toilet very much
21: Was used perfect before by single man, now new users => smell, neighbor complaints about smell, has flush toilet and no problems with GWT

4.2.2 Photo Documentation of Ecosan site visits

See Annex I

5 CONCLUSIONS AND RECOMMENDATIONS FROM SITE VISITS AND CONDUCTED INTERVIEWS

The site visits were very important for the understanding of the general sanitation issues in Sri Lanka. The following remarks are concentration on issues related to compost toilets.

The issues and recommendations mentioned below need follow up by the consultant and are only preliminary findings. The list of relevant issues is not completed at this stage.

Institutional issues:

The relevant **regulations** have to include composting toilets as an option. Even so the guidelines on latrine construction by NSWDB and the National Policy on Urban Water Supply and Sanitation include composting toilets, these are not the documents

used for approval of sanitation facilities. The NSWDB guidelines are very often not even known neither by implementing agencies nor by Public Health Inspectors.
Technical and design issues:

Nearly all the toilets built in 2001 had broken **urine pipes** or non-functioning soak pits. The newly constructed compost toilets did not show any problems but the design was exactly the same. To prevent the problems arising after a certain time of usage change in design should be considered.

It appears that there is no knowledge about the **reuse of urine**. Implementing bodies assume a reuse is not possible in Sri Lanka. However, the interviews carried out so far show hat at grass root level people would be willing to experiment. The future users of composting toilets should be at least informed about this possibility.

According to interviews with a wide range of stakeholders, ecosan users and non-ecosan users, a **seat riser**, in Sri Lanka called "Commode", is the preferred option. However, it seems not to be known by any level of stakeholders that a commode is also possible with composting toilets. This option should be given to the users.

The options to develop a **ceramic** squatting pan or/and commode have to be explored.

The height of the **steps** is sometimes a problem. One step more or a simple handrail can solve this.

For the **location** of the toilet a potential extension of house should be taken into consideration.

The users have to be informed that an **in house** option is available.

Asking people if they know compost toilets, they often answer "Yes" and refer to an **ancient technology** used by their forefathers. You will discover these were pit latrines. Based on this it is VERY important to discuss appropriate approaches for the introduction of ecosan technology as a modern technology. An open hole with a cover, which looks like the cover for the pit of the pit latrine will not be very successful. Also the name is important.

Capacity building:

The **trainers** have to be better trained and should themselves not consider composting toilets as an inferior technology or only as an option for poor people.

Approaches:

Compost toilets have to be marketed as a fancy product not only as a solution to difficult or poor locations. Different **target groups** will need different approaches.

Depending on the **location**, different entry points could be used, e.g.

- Water scarcity = present ecosan toilets as a water saving technology

- Collapsing soil, rocky ground, high ground water table = present ecosan toilets as solution
- Area with agriculture and/or high input of fertilizer = present ecosan toilets as production unit
- None of the above and middle class = present ecosan toilets as the fancy new arrival from Sweden ☺

Identify and approach **politicians** with a "green" attitude.

The promotion of ecosan technologies has to be interlinked with **solid waste management**, in particular with home gardening activities.

Monitoring has to be taken more serious. It should not happen that the location of pilots is not known. The follow up is crucial for the success of an introduction of a new technology.

APPENDIX I

- Photo documentation 1: Ecosan site visits in Kaluthara District
- Photo documentation 2: Ecosan site visits in Matale District
- Photo documentation 3: Ecosan site visits in Colombo
- Photo documentation 4: Ecosan site visits in Hamabantota district

Photo 1 & 2: Site # 2
Side view toilet — Disconnected urine pipe

Photo 3 & 4: Site # 3
Side view toilet with chambers — Missing urine pipe

Location: Bulatsinhale, Kaluthara District	
Date: 09.08.2006	
Photo documentation 1, Progress Report I	**Appendix I**

Photo 5: Site # 4
Abondened toilet

Photo 6: Site # 5
Demolished toilet

Location:	Bulatsinhale, Kaluthara District	
Date:	09.08.2006	
	Photo documentation 1, Progress Report I	**Appendix I**

Photo 7 & 8: Site # 6
Toilet entrance with open urine pipe — Inside of toilet

Photo 9: Site # 7 (left) and Site # 8 (right)

Location:	Bulatsinhale, Kaluthara District	
Date:	09.08.2006	
	Photo documentation 1, Progress Report I	**Appendix I**

Photo 10: Site # 7
Urine pipe properly connected

Photo 11: End urine pipe of site # 8 not connected to soak pit

Location:	Bulatsinhale, Kaluthara District	
Date:	09.08.2006	
	Photo documentation 1, Progress Report I	**Appendix I**

Photo 11 & 12: Site # 9
Front view with owner and urine pipe — End of urine pipe

Photo 13 & 14: Site # 10
Converted Toilet with collection pit — Removed urine pipe

Location: Bulatsinhale, Kaluthara District	
Date: 09.08.2006	
Photo documentation 1, Progress Report I	**Appendix I**

Photo 1: Site # 11
Inside of toilet

Photo 2 & 3: Site # 14
Entrance toilet, animal stalls, kitchen — Urine pipe

Location:	Matale	
Date:	15.08.2006	
	Photo documentation 2, Progress Report I	**Appendix I**

Photo 4& 5: Site # 15

Inside of toilet — Urine pipe (also see next picture)

Photo 6: Site # 15

Disconnected end of urine pipe

Location: Matale	
Date: 15.08.2006	
Photo documentation 2, Progress Report I	**Appendix I**

Photo 7: Site # 16
Toilet from outside, note density

Photo 8: Site # 16
Urine pipe connected to evaporation bed with tree planted on top

Location:	Matale	
Date:	15.08.2006	
	Photo documentation 2, Progress Report I	**Appendix I**

Photo 9: Site # 17
Toilet not in use

Location:	Matale	
Date:	15.08.2006	
	Photo documentation 2, Progress Report I	**Appendix I**

Site # 18

Photo 1 &2: Front view of toilet with urine pipe Connected to plant bed — Inside of toilet

Site # 19

Photo 3 & 4: Entrance of toilet — Compost derived from toilet and used in garden

Location: Colombo, Rathmalana	
Date: 21.08.2006	
Photo documentation 3, Progress Report I	**Appendix I**

Photo 5 & 6: Site # 20

Inside of toilet | Broken urine pipe

Location: Colombo, Rathmalana	
Date: 21.08.2006	
Photo documentation 3, Progress Report I	**Appendix I**

Photo 1: Site # 23
Toilet under construction with old pit latrine to the left

Photo 2: Site # 24
Left to right: Owners house, compost pit, toilet, plant bed

Location: Hambantota District	
Date: 24.08.2006	
Photo documentation 4, Progress Report I	**Appendix I**

Photo 3: Site # 24
Plant bed

Photo 4: Site # 25
Front view

Location:	Hambantota District	
Date:	24.08.2006	
	Photo documentation 4, Progress Report I	**Appendix I**

Photo 5: Site # 26
View from side, note urine pipe connected to soak pit and tree planted on top

Photo 6: Site # 26
Inside of toilet
(pan model the same in all compost toilets in Hambantota)

Location:	Hambantota District	
Date:	24.08.2006	
	Photo documentation 4, Progress Report I	**Appendix I**

APPENDIX II

- Inspection Protocol

Protocol of Site Visits

Place/Date:	Year built / Used:
Technology:	Plant bed:
Number of users:	Garden:
Children:	Locked:
Pregnant woman:	

Overall impression:	☺	☐	∅	☐	☹	☐
Smell:	☺	☐	∅	☐	☹	☐
Specify:	faeces, ammonium, woody, mouldy					
Addition of:	Ash	☐	Sawdust	☐	Soil	☐
	provided:		Yes	☐	No	☐
Water:	provided:		Yes	☐	No	☐
Soap:	provided:		Yes	☐	No	☐
Colour:	Black	☐	Grey	☐	Brown	☐
Flys:	Many	☐	Little	☐	None	☐
Worms:	Many	☐	Little	☐	None	☐
Cockroaches:	Many	☐	Little	☐	None	☐

Full vault: app. Storage time:
Vaults in use:

Consistency:	Stiff	☐	Soft	☐	Watery	☐
Paper:	A lot	☐	Some	☐	None	☐
Foreign Matter:	Plastic, Kitchen waste, Cans, ...					
Solid Reuse:	Yes	☐	No	☐		
Urine Reuse:	Yes	☐	No	☐		

User Satifaction:
Comments: