2011

NETWAS Uganda

EVALUATION REPORT FOR SUSTAINABLE SANITATION AND CAPACITY DEVELOPMENT FOR SUSTAINABILITY OF SANITATION IN UGANDA

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Acknowledgement

This end of project evaluation is one of the main outputs of the EcoSanRes II project Knowledge Node of Uganda. The evaluation involved a wide range of Sustainable Sanitation stakeholders ranging from Knowledge node staff to partners in the field, beneficiary of EcoSan demonstrations, NGOs and government officials.

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This review was both a job and a learning experience for all involved. One particular comment I heard was "This has been a good learning event for Stakeholders, why did it have to be half day!" It was a humbling experience.

I consider myself privileged to have been part of this important process, and I strongly believe the work of this knowledge node will continue to touching and transforming the sanitation preferences of Ugandans.

ACRONYMS

AC	Advisory Committee
ATC	Appropriate Technology Center
CBO	Community Based Organizations
CDO	Community development Officer
CTLS	Community Total Led Sanitation
CRS	Catholic Relief Services
DANIDA	Danish International Development Agency
DAO	District Agricultural Officer
DPO	District Production Officer
DWSCG	District Water and Sanitation Conditional Grant
DWD	Directorate of Water Development
EcoSan	Ecological Sanitation
EHD	Environmental health department
ESR 2	EcoSan Res II
GoU	Government of Uganda
GTZ	Germany Technical Cooperation
HIP	Hygiene Improvement Programme
IEC	Information Education Communication
IRC	International Water and Sanitation Resource Centre
JWSSP	Joint Water Supply and Sanitation Programme
KCC	Kampala City Council
LC	Local Council
LeaPPS	Learning for Policy and Practice in Household and School Sanitation
LG	Local Government
MDG	Millennium Development Goals
MoFPED	Ministry of Finance, Planning and Economic Development
MoH-EHD	Ministry of Health Environmental Health Department
MoE	Ministry of Education
MWE	Ministry of Water and Environment
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organisation
NETWAS	Network for Water and Sanitation
NGO	Non Governmental Organization
NSWG	National Sanitation Working Group
O&M	Operation and Maintenance
PFA	Prosperity for All
PEAP	Poverty Eradication Action Plan
PHCCG	Primary Health Care Conditional Grant
PSI	Population Services International
PSI	Population Services International
PWD	People With Disability
RWS	Rural Water Supply
SEI	Stockholm Environment Institute
SWRWSP	Southwest Rural Water and Sanitation Program
TOR	Terms Of Reference
TOT	Training of Trainers
UBS	Uganda Bureau of Standards
UDDT	Urine Diversionary Dry Toilet
UNICEF	United Nation Children's Fund
USAID	United States of America - Aid
UWASNET	Uganda Water and Sanitation Network of NGOs and CBOs
UWESO	Uganda Women's Effort to Support Orphans
UWS	Urban Water Supply Urban Water Supply
WASH	Water, Sanitation and Hygiene
WFP	Water For People
WRM	Water Resources Management

EXECUTIVE SUMMARY OF KEY FINDINGS

NETWAS was established in 1996 by three Directors of the ministries of Water, Health and Social development. The overall goal of NETWAS is "To contribute to the improvement of the living conditions of especially the poor in terms of Water, sanitation and Hygiene"; its mission is to build capacity through training and organization development support; to promote a culture of learning and improvements in knowledge management covering Networking, Research and Information dissemination for improved service delivery in the WASH sector.

There has been and still are several EcoSan related projects in Uganda mainly focusing on how to extend sanitation option to populations with challenges in adopting the conventional pits or flush toilets. All these initiatives are faced with numerous capacity and knowledge related challenges. It was against this realization that the EcoSanRes II knowledge node was launched in Uganda, sponsored by SIDA and managed by the Stockholm Environment Institute –SEI.

The overall objective of the Knowledge Node is to contribute to sustainable sanitation development in Uganda through facilitating and co-ordinating capacity development and knowledge management in the sector. The project had a life span of 15 months at the end of which an evaluation was planned, to gauge the effectiveness of the process and activities of the Node towards the intended results.

EVALUATION METHODS

The evaluation employed the following five approaches triangulated to ensure accuracy of information and learning by those involved: Desk review of program documents; key informant interviews with knowledgeable individuals in the sector; Semi-structured interviewing with all respondents to allow exploration of thoughts and experiences; a short questionnaire; and a de-briefing workshop to share the preliminary field finds, as well as solicit further input from stakeholders.

The workshop employed focus groups: i) Demonstration users – farmers and school; ii) National level ministry and Kampala city Council iii) Makerere/NARO research and training and iv) NGOs.

There were two limitations to the evaluation process: Time and financial resources.

PROGRESS AGAINST PROJECT OBJECTIVES

The EcoSanRes II knowledge node is an initiative which most people in the sector expect to stay for a long time. Quite a lot has been achieved in the 15 months it has been in operation, and the idea that it has ended did not at all register in the minds of all people the evaluation team talked to. It occurred to the evaluation that all stakeholders team were eager to provide input on how to make the node more effective so it can continue to provide even better quality services. The Knowledge Node achieved all the project objectives, with a few challenges.

Objective 1: To generate knowledge and develop capacity among stakeholders to design and implement sustainable sanitation solutions

A pool of 53 men and women were trained on Ecosan construction. These were composed of masons, farmers and government departments in Wakiso and Mukono districts. Further learning happened during the National Sustainable Sanitation sharing workshop that replaced the Training of Trainers. The workshop attracted over 70 participants, who presented, shared and discussed the national EcoSan strategy.

Two EcoSan systems and three structures were demonstrated: Both *Arbor-loo* and Spiral *Fossa alterna* are composting toilets, while the Urine Diversion Dry Toilets (UDDT) is built on the principle of total separation of urine and solids, treatment, storage and re-use. The number of toilets directly demonstrated by NETWAS was 6 UDDT and 1 *Fossa alterna.* The node provided information on *Arbor-loos* and UDDTs that are being constructed in Arua and Koboko districts by Caritas Arua and in Kamwenge and Kyenjojo districts by HEWASA.

Objective 2: To strengthen communication and marketing of the sustainable sanitation knowledge node products and services in Uganda

The communications strategy was developed and already in use to guide information dissemination. Information from reviews and studies was re-packaged and widely disseminated through fact sheets, posters and fliers and through public events, training, conferences, workshops, one-to-one delivery and the website.

The Website was upgraded and information generated by the node posted. The node membership databank was developed and has over 150 members. However there were some difficulties in accessing the documents posted on the website, as searchers failed to trace particular location. This information had not been communicated to the node.

Objective 3: To increase awareness on sustainability issues of sanitation amongst stakeholders at the local, national and regional levels

The node developed fact sheets, posters, flash cards and fliers for awareness creation, such as the ones listed below.

- Risks and Safe Handling of urine from Urine Diversion Dry Toilet (11/2010) A4 size
- Risks and safe Handling of feaces from Urine Diversion Dry Toilets (11/2010)
- Risks and Safe Handling of excreta from compositing toilets: *Arbor-loo* and *Fossa Alterna* toilets
- Facility design and benefits of *Fossa Alterna*
- EcoSanRes II Uganda Knowledge Node information brochure.

A market study on the re-use of EcoSan products was carried out and widely disseminated. Through NETWAS membership on the NSWG, node products and information were shared, creating interest and support. The node participated in a number of national and international events in which results from the studies were shared: NTV Eco-Talk; USAID HIP/USAID project dissemination meeting; the national sanitation week celebrations in Adjumani District; second East African sanitation conference-Kampala; civil society learning journey and capacity building workshop for the southern region, South Africa.

Objective 4: To establish sound systems for efficient management of the node project within NETWAS

The Advisory Committee (AC) was set up composed of representatives from The World bank, MWE, Crestanks, DED, Makerere University Faculty of Technology, NARO, MoH-EHD, UWASNET and NETWAS. The committee met twice and there after resorted to email communications and one-to-one meetings with the node personnel. NETWAS had great expectations of the AC, especially of filling the gap of an EcoSan sub-committee to the NSWG, but this did not materialize. A communications assistant was employed, and regular bi-annual reports sent to SEI.

FIELD FINDINGS

The evaluation viewed the purpose of capacity building and demonstrations by the Knowledge node as to influence perceptions for adoption. The evaluation was therefore keen to learn if perception towards EcoSan were changing.

There were several initiatives to promote EcoSan in Uganda. The knowledge node promoted, supported and demonstrated three EcoSan technologies: UDDT was the most common, followed by *Fossa Alterna* and lastly the *Arborloo*. Besides these demonstrations, other NGOs had supported EcoSan construction in both urban and rural areas.

Another initiative by the MWE was establishment of the ATC that promoted proven WASH technologies through quarterly dissemination workshops, advocated for sustainable sanitation at national levels during national gatherings and exhibitions. The Node supported construction of a UDDT and *Fossa Alterna* structures at the ATC. ATC planned to employ a holistic village model approach, with EcoSan as one of the components. They intend to monitor and evaluate quarterly, modify until the facilities suite local realities and are affordable.

District officials saw their role as advising farmers on how to use the humanure, popularizing, promoting and supporting dissemination. The training by NETWAS served to raise the consciousness to EcoSan as a valuable asset to both the production and health sectors. Unfortunately, without budget lines to finance activities, the officers in Wakiso had done nothing; and the officials from Mukono "piggy-backed" on other programs (the hand washing campaign) to promote EcoSan. District respondents called for further awareness creation targeting mostly schools, and using the village forums to sensitize the wider community.

Key informant information from the MWE in particular shade light on the genesis and evolution of sanitation systems in Uganda, which was to address the need for affordable and sustainable sanitation for growing townships. The system was subsequently scaled up especially in problem areas where pit and Flush toilets had failed.

It was emphasized that Ecological Sanitation is a system and not the structures or facilities, and that promotion efforts should focus on the system. The systems were differentiated based on the principles of mixing or not mixing of excreta.

- Drop, mix (urine and solid), and walk away
- Drop, mix (urine and solid), store (hole in the ground, or pit), and walk away.
- Drop, mix, flush and walk away
- Forth system is Drop, sanitize/hydrogenise, and recycle

It was made clear to the evaluation that while the ministries of health and water were motivated to promote EcoSan to promote public health and decrease environmental pollution, the ministry of Agriculture was motivated by the value that the EcoSan products would add to the agricultural systems. The centrality of the ministry of Education as responsible for human resource development was highlighted.

All respondents benefited from the Knowledge Node products and services, especially the information. Information from the node was used in awareness creation, as handouts for visitors and University students, for lobbying and advocacy and other promotion efforts.

The perspectives of the community were changing slowly gauged from the kinds of questions asked. While people still asked questions of curiosity and application, there was strong indication that the questions were moving toward appropriation and at one site implementation. At the school, parents were positive and several community groups wanted to be trained. However the experience of NGOs and past government initiatives told a slightly different story:

The NGO experience was that EcoSan worked better in single households, than in institutions and public places; people sought the knowledge on EcoSan but still expected government or the NGOs to construct the structures for all of them. The main issue that cut across all experiences was the negative attitude towards the handling and re-use of humanure on crops, fresh of decomposed.

Promotion efforts of EcoSan by trainees varied, ranging from none at all to proactively using local megaphones to call people to the demonstration sites. Nonetheless all demonstration sites received people weekly to tour the facilities, which proved that demonstrations fulfilled their purpose.

District officials' interest in promoting EcoSans is picking up. In Mukono District Local Government during the hand washing campaign, the health office took over 200 participants of the hand washing campaign to see the demonstration, and had integrated EcoSan messaged in their community awareness programs in 2 sub-counties. In Wakiso the production office was committed to taking up the NETWAS demonstrations and scale out the awareness on use of humanure in the district.

The interest at the national level was demonstrated by the several ministries, academia, research and NGO personnel on the governance body of the Knowledge node, and especially their active participation in the Node promotions events at the national level.

Respondents gave the following challenges

- People saw the UDDT models as too expensive, reserved for the rich.
- At community level there were mainly socio-economic challenges: Land tenure and size, religion, lack of knowledge and perceived soil fertility.
- The challenge of humanure handling and re-use at the school: there was no demand for the products, and no one at the school wanted to handle the emptying.
- School faced the challenges of disposing of menstrual pads, and urinals blocking during rain seasons.
- One NGO faced the challenge of operation and maintenance of toilets used by several households; UDDTs in flood areas being emptied in the flood waters; lack of market for EcoSan products in the city.
- Another NGO observed that even with the use of locally available materials, and training 50 masons, there was no demand or adoption of Ecosan
- People seemed to be contented with conventional pit toilets,
- The perceived lack of privacy with the *arbor-loo* toilets.

All respondents advised the Knowledge Node to continue training, awareness creations, information generations, analysis, repackaging and disseminations. Other pieces of advice included closer collaboration with academic institutions and NARO to tap into their research personnel and by so doing strengthen the node's research deliverables. Several National level respondents advised social marketing and social research, strengthening linkages with Ministry of Education, and strengthening the AC to become a sub-committee to the NSWG. Lastly farmers advised that future demonstrations be improved based on lessons learned from their experiences (need for less expensive structures, integration of a washing unit, exploring the use of local materials, improvising to ease empting of UDDTs), and to use local languages when training at community levels.

PROGRESS AGAINST RESULT AREAS

R1.1: Enhanced capacity of central government, LGs, NGO / CBOs and private sector agencies in health, water, education and agriculture sectors in the promotion and implementation of sustainable sanitation solutions in Uganda.

At the national level, participants in the workshop who were drawn from all the stakeholder institutions above indicated that they had benefited from sharing of Best Operational practices, repackaged fact sheets on risks and safe handling practices, and study reports by the knowledge node. Translation of these into promotional efforts was evidenced at some of the demonstration sites and by the Health department of Mukono district Local Government. But much is still needed to be done in the sector especially in terms of revising the capacity building approach to focus more on the system, to address social marketing, marketing skills, deal with attitudes of both promoters and communities, and empower trainees to take on the role of promotion and implementation of sustainable sanitation.

R1.2: Research findings are integrated in transfer of skills and knowledge in sustainable sanitation solutions: The desk study on risks and safe handling practices was done and results were fed into the fact sheets shared under the IEC. These were widely distributed, regarded as high quality information and were being used by stakeholders; NGOs, academic institutions and government officials.

R2.1: Sustainable sanitation stakeholders have access to updated information: Information from the baseline study/research on Ecosan coverage, use and extent of integration was analyzed, repackaged and distributed through emails, website and as hard copies. Specific reference was made to the fact sheet, as being well summaries and ready to use. Several information gaps were also identified and stakeholders looked to Knowledge node to address these gaps.

R2.2: Knowledge Node profile raised amongst sector stakeholders: The Knowledge Node was said to be a unique valuable resource to the sector and to actors at all levels, from ministries, to researchers, districts, NGOs and farmers. After only 15 months of implementation, the Node had gained visibility and recognition in the Water and Sanitation sector of Uganda. To some stakeholders, it had become a "one stop center" for information on EcoSan, to others it was a forum for forging partnerships and accessing new updates in the sector. As such, stakeholders "refused" to accept that because its funding had ended and it may cease to exist.

R3.1: Stakeholders are aware of the importance of sustainability in sanitation and support promoters and implementers at all levels: Wide awareness had been created and continued to be created through the demonstrations, trainees and stakeholders. It was the national support to EcoSan promoters and implementers that was poorly coordinated and inadequate. Specific reference was made to the weak Advisory Committee, the stalled EcoSan strategy; the out-dated policies and Acts, e.g. the public health Act 1964, the resultant absence of any form of legal basis for EcoSan promotion, weak to absent political will, the fact that EcoSans were not differentiated by the National Bureau of statistics as a sanitation option, etc all boiled down to inadequate support to EcoSan promotion.

R4.1: Efficient and effective project management: This was partly achieved. Stakeholders expected more from the node advisory committee in terms of strengthening the node management.

ANALYSIS AND DISCUSSIONS

The realization of the significant achievements above but without actual adoption compelled the evaluation to explore underlying and fundamental factors. Based on issues raised by Key informants, and from listening to trainees, the questions coming from communities and personal observation, it was clear the sector needed a paradigm shift.

- System approach as opposed to structures/ facilities: The promotional message needed to be holistic and detailed about the types of systems and their implied effects on water, health and Agriculture.

- Assessing progressive community learning as opposed to structural adoption: Before people invest in an asset, they go through a process of mental transformation that can only be accessed through listening intentionally to their questions. The evaluation was keen to explore these questions and concluded that there was still hope for adoption.
- Training, knowledge management and research FOR development as opposed to AND development: While AND development requires the direct involvement in development activities, FOR implies that the project is proactively linked to development agencies who would uptake its deliverable and scale them up to development levels. In this regard, the project should have identified and forged formal collaborative arrangements with development agents to uptake the products of the Node. It was observed that roles and responsibilities of actors where not stressed and follow-up activities did not include uptake of the Node deliverable for scaling out.
- The education ministry is a must player: Unlike the Ministries of health, Water and district departments of Agriculture that recognized their role in sustainable sanitation, the ministry of Education had not come on board. The involvement of schools seemed to be more by default than by conscious design to contribute towards its mandate of equipping the human resource all other ministries have to work with. The evaluation concludes that unless this ministry realizes its central role in sustainable Sanitation, the outcry for awareness will continue forever.

KEY RECOMMENDATION

Overall program focus

- The Node has to continue. At the moment the needs being addressed by the Node have no other alternate providers. Secondly, the gains achieved in the 15 months need consolidating, and proper preparations made for the continuity of the functions of the node. As such the Node needs a sustainability strategy.

- Identify and establish formal linkages with key development/ service delivery actors that will take up the proven EcoSan innovations and scale them out.
- The Node needs to carry out a careful analysis of the impact of its contributions, the responses to its messages by the general public and the adoption rates.
- Special awareness and advocacy effort needs to be made specifically to interest and bring on board ministry of education.

Capacity building

- Capacity building should focus more on attitude change, right from the course contents, to design and delivery
- Demonstrations in the future need to focus on appropriation of structures with specific emphasis on the system function, ensuring that whichever materials and structures piloted the sustainable sanitation principles work
- Specific capacity building program should be developed and piloted with schools receiving demonstrations, and specific steps integrated towards influencing parents.
- A monitoring and tracking system needs to be developed, one that would involve the teachers and pupils in monitoring progress towards adoption of EcoSans at household levels.
- The capacity building curriculum by the Node should clearly show and address the fears related to the different sanitation systems from the health and water points of view, and the benefits to agriculture. These should be based on statistical data from districts on the coverage, water born disease prevalence, the associated costs of treatment and diversion of household labor to attend to the sick, etc
- During training and other Node events, discussions on the specify of stakeholders need to be carried out and shared; for these the Node needs to target decision makers as well as implementers, and ensure that all the roles at the different levels are taken care of.
- The follow up program should have a clear promotion monitoring focus, with milestones to be reached and accountability to be provided.
- Trainees need further capacity building in facilitation and analytical skills, in order for them to effectively initiate community discussion forums, assess social and structural issues affecting adoption, to deal with cultural and religious biased.
- The node needs to equip trainees with TOT skills to address the increasing demand for training from the communities; specific information sheet for promotion needs to be developed, addressing questions people would ask, and highlighting the principles and practices that would maximize benefits. Translation of these into local languages to make them more user-friendly should be done.

Research

- There is need for multi-stakeholder think-tanks to explore options, opportunity and information to address some of the emerging challenges: the gender and other social issues, e.g. PWD; structural and economic. The think-tanks should be linked to ATC that would pick up the suggestions, carry out Action Research and generate options.
- The node needs to collaborate more formally with Makerere faculties of Engineering and Bio-chemistry to share topics for research that students and other researchers can take up.
- The node needs to forge a formal working relationship with NARO and NAADS, to influence research and development external inputs and overall food safety and food security in relation to re-use of EcoSan products.
- The knowledge node needs to document facts and figures on the evolution and practices of EcoSan in Uganda, coverage and types of Ecosans, pocket of good practices, challenges and mitigation efforts. Stakeholder are itching for local data, and looking to the node to provide this information.
- The database of expertise the node should have a section on researchers from institutions such as NARO, ATC and Makerere, who can be called upon to partner with ministries to carry out specific research on demand

Knowledge management

- The Node should intensify the use of mass media to create wider public awareness and education.

- An inventory of all users of EcoSan products needs to be carried out at district level. This information should feed into Node data bank as possible markets for products, and made available to development partners promoting EcoSan

- There is an outcry for a ready-to-use O&M manual. The node needs to first assess the O&M knowledge and practices out there so that the manuals target the weaknesses, gaps as well as tap into the strengths and existing innovations. The Node needs to facilitate collaboration among all stakeholders intending to produce these manuals, in order to mitigate the danger of sending mixed messages, and duplication of efforts.

- The packaging of information for the different communities of users should be based on research findings on the social as well as geo-physical factors and needs of each locality.

- Many web sites have "mostly asked questions and answers". The node over time should analyze the most asked questions and provide answers so that whoever visits the website can access this information.

- The Node needs to compel stakeholders to use the website. Links to the page's different sections should be provided first and foremost, specific request made to those who encounter challenges accessing the documents provide feedback to the Node.

- The website should be made interactive, with regular discussions forums, and updates from elsewhere in the world. This may require an additional person to the current employees attached to the Node.

1. INTRODUCTION

1.1. ABOUT NETWAS UGANDA

NETWAS was established in 1996 by three Directors of the ministries of Water, Health and Social development. The purpose was to have an organized response to needs created in the sector as a result of the decentralization, privatization policies and the shift in practice to emphasis demand driven service provision with community participation as central.

As such NETWAS exists to complement the mother ministries (as well as other actors in the WASH sector) in the areas of information/knowledge management, and capacity building. NETWAS interventions have therefore been aligned to contribute towards the aims and objectives of the Ministries of Water, Health, Agriculture and Education, as has been the activities of the Ecological Sanitation Research II (EcoSanRes II) project.

The overall goal of NETWAS is "To contribute to the improvement of the living conditions of especially the poor in terms of Water, sanitation and Hygiene"

The Vision: "A center of excellence in capacity building and knowledge management in the WASH sector at local, regional and international levels"

The Mission: "To build capacity through training and organizational development support; promoting a culture of learning and improvements in knowledge management covering Networking; Research and Information dissemination for improved service delivery in the WASH sector"

The aims and objective of the EcoSanRes II Knowledge Node was contribute directly to and enhances the mission and overall purpose of the Netwas.

1.2. BACKGROUND TO ECOLOGICAL SANITATION IN UGANDA

Ecological Sanitation in Uganda is part of the national efforts to enhance improved sanitation and hygiene practices. The National Objectives for sanitation and hygiene promotion are defined within the framework of the PEAP/MDG; the Health Sector Strategic Plan (HSSP); Water and Sanitation Sector Strategic Investment Plan 2015 (WSS SIP15); and the MoES sector plans. These are:

- Improved sanitation coverage and usage; New sewerage connections; Improved hand washing practice; and Improved safe water chain;

Guidelines were also provided to LGs to encourage the use of up to 10% of the conditional grants (PHCCG, SFG, and DWSCG) for hygiene and sanitation. 30% of the Local Governments were reported to be implementing integrated hygiene promotion and the sanitation work plans financed by PHCCG, SFG, DWSCG and other sources for achievement of the PEAP targets. But there was minimal compliance of funds allocation and releases for hygiene and sanitation activities from the SFG, and PHCCG.

Seven Development Partners with GoU prepared a Joint water and Sanitation Sector Programme Support (JWSSPS) for the period 2008 -2012. Under the programme seven components were identified namely; Water Resources Management (WRM); Rural Water Supply (RWS); Urban Water Supply (UWS);Water for Production (WfP); Sanitation; and Sector Management Support (SMS). It is within this framework that Ecological Sanitation is being promoted in Uganda, addressing the sanitation coverage and the safe water objectives above.

This shows that Ecological sanitation is not a new in Uganda. The baseline survey conducted by the Knowledge node (Ofumbi, 2010), shows that there has been numerous initiatives in EcoSan, with the large scale promotion traced back to the 1996 - 2013 South-Western Towns Water and Sanitation Project. Table 1 below lists some of these initiatives in chronological order.

Table 1: EcoSan initiatives in Uganda

EcoSan Initiatives in chronological order	
• 1996 – 2013: South-Western Towns Water And Sanitation Project. • 2001-2002: UDDT and compositing toilets by LVEMP • 2001-2002:Distric water and sanitation conditional grant • 2002: Improvement of Sanitation in Kanawat Health center • 2002-todate: Katosi women's group • 2003- 2013: NUSAP (World bank) • 2003 – 2004: UDDT in Secondary schools in Kalungu • 2003 – 2008: AMREF – African Medical Research Foundation • 2004-2010: Kamufunzi Education institutions Masaka	• 2004: Mbale School of Hygiene • 2007- 2010: FORUD/PROTOS • 2007- 2010: JESSE/PROTOS • 2008 – 2009: ACF/ECHO • 2008: Area Agricultural modernization project • 2008-2018: Special marketing approach in scaling up sanitation and hygiene in urban slums of Kawempe division Kampala • 2009: Self uptake of ecological Sanitation toilets by households in kabala municipal • 2009- 2013: CIDI • 2009-2013: Education institutions in Kamwenge
Other initiatives without specified dates include: UDDT and composite toilets by Kitgum town water supply extension and basic sanitation program; Water supply and sanitation Arua Diocese and Maracha Hospital; Pdimu landing ecosan project UDDT and construct wet lands; Multistory dry toilets in Rubaga girls secondary school; Rural was supply and sanitation program; UDDT for pupils in Biina Primary school, Luzira; Construction of UDDT in Kampala slums, KCC EcoSan project; DED ecosan; Public health care conditional grant; Small towns water and sanitation project; UNICEF sanitation project; SNV sanitation project; SHED – UNDP; SSECODA; Uganda Red cross; Compassion international; CDD; Ministry of Education (SFG); Kampala City Council – (SIDA); RUDMEC; Save the Children Uganda; Send A Cow Uganda; and Action against hunger, etc	

Source: NETWAS 2009

While earlier literature (NETWAS 2009) indicates that EcoSan was first promoted in difficult area, the de-briefing workshop of this evaluation proved that the actual initial purpose was to provide sustainable water and sanitation solutions to rural township (Eng. Tushabe, personal communication). See box 1. This box also shows the power of well packaged and targeted information in changing attitudes.

Box 1: Genesis of EcoSan in Uganda

A book on Ecological Sanitation System written by Dr. Kilama of Tanzania and Winblad Uno of Sweden was the trigger. The author expounded on the principles of not mixing human excreta, which caught the attention of Ugandans who were looking for sustainable sanitation options. They understood that by this principle, 80% of the problems associated with human excreta management would be solved. A workshop was later conducted in 1996 in Jinja, where the Internationally renown Winbald Uno in EcoSan gave talks and presentations to participants from Uganda, Kenya, and Tanzania. The South Western Towns Water And Sanitation Project, Ecosan component 1996 – 2013 was born as a result of this workshop.

However the fact that EcoSan toilets worked in some areas where pit toilets and flush toilet failed seemed to fuel subsequent promotions, resulting in the observed targeting of especially urban areas with similar challenges.

The scaling out of EcoSans in Uganda faced a number of challenges; the reuse of dried substrates, high rate of filling of vaults especially in the primary schools and public toilets, poor O&M continued to pose challenges to adoption (NETWAS, 2009). These challenges pointed to the need for capacity building, especially in O&M. Several projects emerged under capacity building and many are still on-going. Table 2 below high lights some of these initiatives.

Table 2 Capacity building efforts under sanitation

Name of project	Project objectives / intervention areas	Donor	Duration	Converge
District Water and Sanitation Condition Grants	• Hygiene and sanitation promotions • Construction of public sanitation facilities • Demonstration of ecological sanitation	GoU/DPs	On-going	Country-wide
Primary Health Care Conditional Grant	• Health promotion	GoU/DPs	ongoing	Countrywide
School Facilities Grant (SFG)	• Construction of latrines and hand washing facilities in primary schools	GoU/DPs	ongoing	Countrywide
Local Government Development Fund	• Construction of public sanitation facilities, hygiene education in line with identified priorities	GoU/DPs	ongoing	Countrywide
National Hand washing campaign	• Make hand washing with soap at key junctures (before feeding a child and after using a toilet) common practice among mothers and care givers of children below 5 years and school children 6-14 years.	DANIDA, UNICEF and GTZ MoWE, MoH, Mukwano	Pilot phase complete	Being rolled out Countrywide
Hygiene Improvement Project (HIP)	• Development and implementation of capacity building plan in behavior change skills and competencies needed to effectively implement the ISH strategy; • Development of a hygiene behavior change tool kit with specific guidelines and tools for Hygiene Improvement	USAID Bureau for Global Health; local partners: Plan International, CRS, IRC PSI, CCF	2007-9	

	and HIV/AIDS Integration.			
Training of selected stakeholders in community led total sanitation and sanmark.	• build district capacity to employ CLTS and promote sanitation marketing	World Bank, UNICEF	2009/10	Mbarara, Mukono, Kamuli, Iganga, Namutumba and Moroto 30 UNICEF districts
Sanitation Marketing in Uganda	• Consumer report detailing triggers and barriers for latrine construction in Uganda • Communication materials for sanitation marketing. • National Communication plan	Funding yet to be confirmed	2009/10	Country wide
LeaPPS	• To contribute to a sustainable household and primary school sanitation and hygiene situation in selected districts and sub-counties through structured learning, action research and greater coordinated support amongst stakeholders.	IRC, SNV	2007-9	Kynejojo, Kamwenge, Arua, Koboko
Institutes of learning: • Makerere Institute of Public Health • Makerere University: Faculty of Technology • Kyambogo: Department of Civil and building engineering	• Offer professional courses and education in sustainable sanitation: Bachelors and Masters • Conduct and disseminate results of applied research – sometimes in partnerships with development and implementing organizations	GoU	ongoing	Country wide
The African Sanitation Knowledge Network (ASKNet) is an African association of individuals, groups, institutions and organizations.	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.			

Source: Project document for Sustainable Sanitation Knowledge node in Uganda, 2009

One would expect a lot of change from all these training and considerable progress towards adoption. The information available and recommendations by the 79 participants of the National Sustainable sanitation Workshop (NETWAS 2010) revealed that most of these initiatives worked independently, the resultant impacts were scattered in small pockets, lessons and knowledge accrued not organized and managed for wider public consumption, and there was no centralized mechanism to coordinate for learning and appropriation. This partly explain the low coverage of EcoSans - 0.5- 1% even after such efforts to promote it. The overall latrine coverage estimated at 69% in Uganda is still low (NETWAS, 2009), and according to Mr. Mukama of MWE (personal communication) includes facilities the ministry would condemn. Several challenges were identified in the genesis and scaling out of EcoSan.

Some of the identified challenges were

- Unclear institutional leadership and inadequate political support for sanitation affects inadequate resource allocations and enforcement of legislation and regulations on sanitation and hygiene. This affects the morale and motivation of sanitation implementers.
- Inadequate funds and financing mechanisms available for sanitation and hygiene at both national and local government level.

- Lack of knowledge, skills and limited access to information on alternative sanitation technology options to suit the different needs and conditions of communities, geographical conditions and economic capacity in the rural and urban settings affects scaling out of sustainable sanitation options.
- Limited use of fertilizers has been sighted as one of the major constraints to agricultural production and productivity in Uganda (MoFPED, 2009).

Under the EcoSan strategy (2010 - 2018), efforts by the MWE to create a multi-stakeholder working group called the Ecosan coalition failed to take off, leaving the coordination and learning component un-attended. It was partly because of these challenges and for knowledge generation, management and wider dissemination that the Uganda EcoSanRes II Knowledge Node was set up.

1.3. OVER VIEW OF THE ECOSANRES 2 PROJECT

Ecological Sanitation Research 2 – EcoSanRes II is an international environment and development program on ecological sanitation, sponsored by SIDA and managed by the Stockholm Environment Institute (SEI). The overall mission of the program is to develop and promote pro-poor sustainable sanitation through capacity development and knowledge management. One of the main methods identified for achieving this mission was for EcoSanRes II to contribute to the development of networks of knowledge and expertise nodes[1] in sustainable sanitation in several parts of the world.

The overall Development Objective for the project was to develop and promote sustainable sanitation (see box 2) in the developing world through capacity development and knowledge management as a contribution to health, equity, poverty alleviation and environmental quality.

Specific Objectives

- Effective capacity development through Nodes at regional and /or national levels for the promotion and development of sustainable sanitation.
- Strategic knowledge developed based on demand and analysis of needs for the enhancement of sustainable sanitation.
- Catalytic global communication, networking and knowledge, management for the promotion and development of sustainable sanitation.
- Effective ESRII programme governance and management for capacity development, knowledge development and communications.

1 A knowledge and expertise node is an organization or network of organizations that can take a leading role in the promotion and development of sustainable sanitation in a specified region.

Box 2: Working understanding of Sustainable Sanitation

A sustainable sanitation system is economically viable, socially acceptable and proven technically, institutionally appropriate and protects the environment and natural resources. EcoSan is one of the sustainable sanitation options because it embraces a holistic approach to sanitation and water management through the basic principle of closing the (nutrient) loop between sanitation and agriculture. However facility's fulfillment of sustainable sanitation depends on its meeting all sustainability criteria, which are site and context specific.

The main objectives of sustainable sanitation globally are

(i) to reduce the health risks related to sanitation contaminated water and waste
(ii) to prevent the pollution of surface and ground water
(iii) to prevent the degradation of soil fertility
(iv) to optimize the management of nutrients and water resources. The concept can be implemented through a great

The establishment of EcoSanRes II knowledge nodes network globally was facilitated by EcoSanRes II (ESR II), WASTE and IRC with the aim of strengthening country and regional capacity for scaling up sustainable sanitation. Through EcoSanRes II, eight such nodes are implemented. One of the nodes has been in Uganda. Box 3 below provides overall and specific objective of the EcoSanRes II Uganda Knowledge Node

Box 3: EcoSanRes II knowledge node Objectives

Overall objective of the Uganda Knowledge node

Contribute to sustainable sanitation development through facilitating and co-ordinating capacity development and knowledge management.

Specific objectives:

- To generate knowledge and develop capacity among stakeholders to design and implement sustainable sanitation solutions
- To strengthen communication and marketing of the sustainable sanitation knowledge node products and services in Uganda
- To increase awareness on sustainability issues of sanitation amongst stakeholders at the local, national and regional levels
- To establish sound systems for efficient management of the node project within NETWAS

The purpose of this evaluation is to assess and document the progress and results of the EcoSanRes II Knowledge Node of Uganda. This report is the main output of the evaluation process.

Subsequent sections cover the methods used; key finds on the progress towards objectives and results areas, evaluation analysis, discussions and recommendations. The sections are presented in turn below.

2. METHODOLOGY

2.1. SUMMARY OF TOR

2.1.1. Objective of Consultancy

The overall task of this consultancy was to carry out the end of the EcosanRes II project evaluation, to prepare an evaluation report covering the outcomes, outputs and lessons learnt. The process included a half day learning/dissemination meeting to share preliminary findings of the evaluation, and to solicit further input from stakeholders.

2.1.2. Specific Consultant's responsibilities/Activities:

- Develop a detailed schedule of activities and Developing/discussion of assessment tools
- Collect all the necessary background information on the project and carry out a literature review aimed at understanding the project in details. (A list of some of the documents is in Annex 1)
- Carry out the evaluation as per the proposed methodology. The evaluation was to cover all six EcoSan demonstration sites, key government National stakeholders, NGOs, Trained masons, members of the National Sanitation Working group.
- Present findings during the end of project workshop and lead group discussion to come up with next steps on sustainable sanitation in Uganda
- Compile high quality final report

2.2. Outputs

One end of project evaluation report

2.3. Approaches used

a) Documents review

Several projects reports were reviewed and provided information contained in this report, specifically as regards the overall program concept; that is, the program focus, progress over time, Key issues arising over the course of implementation, Key stakeholders and their function, challenges and mitigation measures (see annex 1). The documents were very resourceful.

b) Key informant interviews

Key informants were selected as individuals with specific knowledge and experience with the project and the EcoSan sector. Respondents in this category included the Assistant Project manager, Trainee farmers (4), Trainee teacher (1), Trained mansions (2), Demonstration sites managers (Households -, institutions – 1 Muteesa Primary School). Household respondents were also the farmers.

c) Semi-structured interviews

Semi- structured and open ended interviews were held with district stakeholders from the departments of agriculture (3), NAADS (1), health (2), Community Development (2) representatives on the Steering and Advisory committees (3), and NGOs (4).

d) Questionnaire

A questionnaire was sent by email to the two up-country NGOs active in the project: HEWASA from Fort Portal and CARITUS Arua. Both NGOs sent in their responses.

e) Workshop

The purpose of the workshop was twofold: to provide feedback from the field findings and to solicit further stakeholder input into the evaluation. Two approaches were used: Plenary presentations for verification of the preliminary findings, and focus groups discussions.

Four focus group discussions were held with i) Demonstration users – farmers and school; ii) National level ministry and Kampala city Council iii) Makerere/NARO research and training and iv) NGOs.

Both the plenary and focus groups were highly engaging and valuable contributions were made, that have been integrated into this report.

2.4. Limitations

Duration: Ten days were assigned to the whole process from literature review to submission of the report. This affected the breadth of coverage of stakeholders, the depth of literature review as well as the depth of information generated and analysed.

Financial resources: The current inflation and the resultant increase in commodity prices and services affected the actual money available to do a thorough job of the evaluation. It was because of finances that the days were reduced, that up-county NGOs and others could not attend the workshop and share their experiences as well as input into the final document.

The evaluation report will be widely shared. One of the recommendations from the workshop was an inter-ministerial half day meeting to formally present the results of this evaluation.

3. PROGRESS PROJECT DELIVERABLES

3.1. PROGRESS AGAINST OBJECTIVES AND ACTIVITIES

OBJECTIVE 1: TO GENERATE KNOWLEDGE AND BUILD CAPACITY AMONG STAKEHOLDERS TO DESIGN AND IMPLEMENT SUSTAINABLE SANITATION SOLUTIONS.

Indicator: At least 50% of the established resource pool of sustainable sanitation practitioners established and is providing quality services to LGs, NGOs and PSOs by April 2010.

A pool of 53 men and women composed of masons, farmers and government departments in Wakiso and Mukono districts was trained. Furthermore, the National Sustainable Sanitation workshop that replaced the Training of Trainers attracted over 70 participants, who presented, shared and discussed the national EcoSan strategy.

Indicator: At least 3 new sustainable sanitation concepts, approaches and technologies are available and utilized in the water, health and agriculture sectors in Uganda by end 2010.

Two systems and 3 structures have been demonstrated: Both *Arbor-loo* and Spiral *Fossa alterna* which are composting EcoSan toilets; Urine Diversion Dry Toilets built on the principle of total separation of urine and solids, treatment, storage and re-use. Those directly demonstrated by NETWAS were six UDDT and one *Fossa alterna*. The node also provided stakeholders with information on *Arbor-loo* and *Fossa alterna* to other NGOs in the districts of Arua, Koboko, Kamwenge and Kyenjojo districts.

Progress against Activity 1.1:

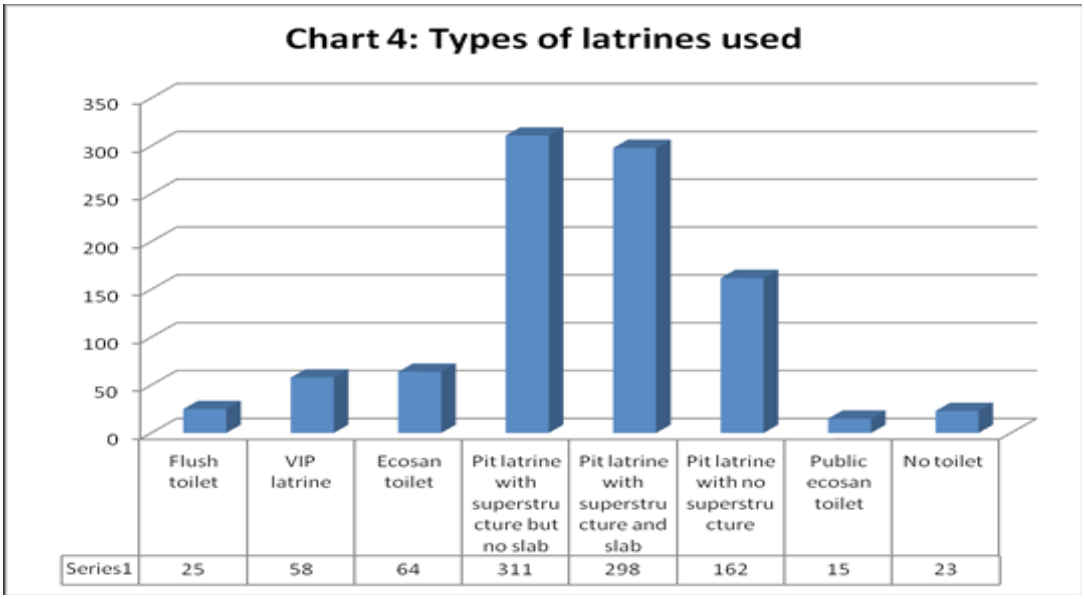
Conduct a countrywide baseline survey on ecological sanitation coverage, use, and extent of integration of sustainability issues in sanitation in Uganda

A "country wide baseline survey on ecological Sanitation coverage, use and extent of integration of sustainability issues" was carried out and a report submitted in May 2010. The study covered 32 sub-counties in 16 districts, 66 institutions and 957 households.

Key finds

Coverage (Fig. 1): Ecosan toilets accounted for only 7% of all sanitation facilities. However, only 3.5% of the Ecosans completed the ecological loop that is separated the excreta, treated, stored and re-used. Most EcoSan toilets were found in the South-Western regions. This was attributed to the government Ecosan Projects like South- West Towns Water and Sanitation Project, Area Agricultural Modernization Project, AMREF, Water and Sanitation Conditional Grant (PAF), and ARMEF support in Kabale districts provided 160 households Ecosan toilets.

Figure 1 Latrine coverage



Source: Baseline Study by Ofumbi (2010)

Awareness: 63.3% of the respondents had not heard of EcoSan and only 33. 5% had seen one. Most of the respondents who had heard of ecosan were from Mbarara, Mukono, Kamwenge and Kampala. The baseline study indicated that Pallisa had no EcoSan, but personal communication with the MWE indicates at least 60 were constructed. As such the least cases were in, Moroto and Nebbi. Respondents received most of the information from Friends (18%), Health workers (17%), community (15%), and local officials (10%). Only one respondent heard from Television and flyers and only 5 from news papers. .

Outreach using EIC materials: Most respondents had not been reached through any of the means often employed: posters – 16%; Radio – 16.7%, Campaign – 20%.

Promotion: During promotion exercises, lots of information was provided. The study explored, how much of this information was retained to inform decision making by the 33.5% respondents who had heard about EcoSans . The information retained included:

It separates urine and from faeces – 31%; Good technology better than pit toilets– 24%; It produces manure – 14% and Operation and maintenance requirements– 13%

- In contrast, when asked reasons for taking up EcoSan toilets (motivating factors), the results were different. For instance longevity of the facilities was more valued than being cheap
- Durable – 31%; Produces fertilizers – 28% (Re-use of composite – 7%); Does not smell – 16%; and Cheaper – 8%
- The information generated by this study (Baseline study by Ofumbi) is extremely useful in designing and targeting promotional messages
- A national workshop held in November 2010, introduced stakeholder to the concepts and practices of sustainable sanitation in the country

Promotion at institutional level: Institutional/ public EcoSan toilets were constructed partly to demonstrate EcoSan technology and partly to solve sanitation problem where other forms of sanitation technologies had failed. The institutions targeted where schools, health units, prisons and administrative headquarters (District Water Offices and District Health Departments). For the public places, the target was mostly markets and landing sites

Challenges of EcoSans: 43% blockage of urine diversion pipe, 41% - improper use of toilets; 6% - no place to deposit the compost; 5% - need for frequent emptying; and 5% - the construction not safe for use.

Other challenges included cultural beliefs especially on the use of ash; Religious practices – specifically the need for a washing unit by Muslims and limited knowledge about EcoSan.

Consequently only 91 (62%) of the 146 EcoSans were functioning, 29% were not in use or abandoned, 5% mixed urine and solids and 4% not completed. Most of those functioning were at household level and in schools. Those not functioning were mainly in public places: landing sites, markets/ trading centers and taxi/bus parks mainly due to poor management and awareness creation. At users' level there were O&M issues that hinged on the appropriateness of user education.

The re-use of nutrients from urine and compost was still very limited. Most of the urine was drained in the ground and the compost takes long to accumulate. In institutions the quantities generated were economically viable but there was no ready market in most of the districts. Consequently, the compost was either disposed in the bush or buried.

Contributions: The cost of the household EcoSan toilet ranged between UGX 0.8 million and UGX 3 million. Over 90% of the cost of all EcoSan toilets in the study was contributed by projects implemented by the Government, Development Partners and NGOs. KCC and SWTWSP asked households to contribute UGX 100,000 which was about 5% of the cost. Some projects like AMREF did not ask for contribution from households. The two households visited by the study (Ofumbi, 2010) that constructed EcoSan toilet without external support used local materials; timber, mud and wattle.

Recommendations: Several recommendations were made for the National, district and users' levels. At the national level the need for structural appropriation to match the financial capabilities of communities, and support to tailor-make design of facilities to address user needs. At district level: to strengthen management structures.

Progress against Activity 1.2:

Liaise with technology institutes, NGOs and agricultural groups (Kyambogo Institute of technology /UNFFE / NGO) to design and demonstrate alternative sustainable sanitation technology options in the areas related to re-use, appropriate latrine technology, etc. pilot projects informed by priorities identified during the baseline will be documented and information shared.

Under the guidance of the Steering Committee and Advisory committee, NETWAS took up the management of the MWE Appropriate Technology Center, based in Mukono. The role of the center among other tasks is to study, test, appropriate and demonstrate sustainable sanitation options.
To this end, the project financed the demonstration of two types of EcoSan toilets at the center: The Urine Diversion Dry Toilet – UDDT and *Fossa Alterna* Spiral. Section 4.4 below details the progress and future intentions of ATC as regard EcoSan appropriation and promotion.

Progress against Activity 1.3:

Conduct a desk study on the risks of handling by products
The desk study was completed and results fed into three fact sheets and posters shared under the IEC package. These have been widely distributed and used by stakeholders; NGOs, Farmers, academic institutions and government officials; The fact sheets were:

- Risks and Safe Handling of urine from Urine Diversion Dry Toilet (11/2010) A4 size
- Risks and safe Handling of feaces from Urine Diversion Dry Toilets (11/2010)
- Risks and Safe Handling of excreta from compositing toilets: Arbor-loo and Fossa Alterna toilets

Progress against Activity 1.4:
Conduct a training of trainers (TOT) for 100 persons including TSUs, Ministry and selected LGs, NGOs/CBOs and private sector firms in innovative sustainable sanitation issues and promotional approaches; this will include a M&E system for training events to facilitate appropriate follow-up of the training and replication.

This activity was achieved in two ways. First a detailed technical training was carried out involving District officials, masons, and farmers on the benefits of Ecosan and how to construct the facility. Secondly instead of a TOT, a national sustainable sanitation workshop was held. These events are discussed in turn below:

a) Technical training

Two training workshops were conducted: Mukono June 16th – 18th 2010 and Wakiso July 13-16th 2010. All together 53 individuals were trained consisting of masons (22), farmers (17), Health Assistant (3), Community Development Officer (2), CAO (1), Ag. DAO (2), DHI (1), NAADs (1), DPO As (1), and Program Coordinator (1) (Table 3). These trainees were entered into the data base of local expertise to construct, operate and manage EcoSans.

Table 3: Trainees in EcoSan system operations and Construction

	Mukono June 16th – 18th 2010	Wakiso July 13-16th 2010	Totals
Masons	15	7	22
Farmers	5	12	17
Health Assistants	2	1	3
CDO	1	1	2
CAO	1		1
Ag.DAO	1	1	2
DHI	1		1
NAADs		1	1
DPO Ag		1	1
Program coordinator		1	1
Gender			
Females	5	9	14
Males	21	18	39
Total	26	27	53

The Objectives of the training were fourfold

- To enhance participants skills and knowledge on sustainable sanitation (EcoSan technologies)
- To develop strategies/action plans aimed at scaling up the technologies in the respective sub-counties
- Define the elements of a low cost EcoSan toilet for scaling up at local levels.
- To increase awareness on re-use, sanitation health risks and management of EcoSan facilities.

The topics covered included the rationale for EcoSans, types of Ecosan facilities with emphasis on the UDDT, O&M and demonstrations of UDDT at homes selected by the Districts.

Key questions raised by participants after the training were: How long the units takes to fill; cultural beliefs on the use of ash and human waste, witchcraft, alternatives to ash; Alternative materials, e.g. logs instead of the expensive slabs; Specific ratios of water to urine, manure to soil for farm re-use; The use of wash water by Muslims, need for a wash facility; Other uses of by-products other than manure; Using EcoSan in congested places, with small pieces of land; EcoSan benefits to none-farmers; How long it took for the manure/urine to be sanitized and Fear of disease transmission

Proposed way forward: Was mainly to use local languages for instruction and documents; sharing of the workshop report, request for an O&M manual, increasing the duration of the workshop to allow more exploratory learning, and to reduce the distance of the demonstration from training venue

b) The training of trainers: changed to Sustainable Sanitation workshop.

The workshop held on 4th and 5th November 2010 at City Royal hotel Bugolobi Kampala, facilitated discussions on ways of closing the sanitation loop, shared information and knowledge around sustainable sanitation options, reviewed the Ecosan strategy 2008, and jointly developed strategies to address the bottlenecks of sanitation in Uganda.

A total of 79 participants attended, representing various stakeholder agencies, from the Ministry of Water and Environment, Ministry of Health, District Local Governments, Private Operators, International and Local NGOs, Research, Makerere University, and farmers. Below is a list of the presentations made and some of the recommendations made by participants.

- Presentation and discussions on the concept of sustainable sanitation: *Sustainable sanitation, Ecological sanitation- What is the difference? Covered good practices from Sweden, Niger and Burkina Faso*
- Overview of sanitation marketing in Uganda: This covered steps in the process of awakening and inspiring communities, empowering and engaging, and sustaining the strategy, and various recommendations were provided, including taking on UBS to differentiate between sanitation facilities.
- Ecological sanitation 10 year strategy (2008-2018) implementation status: some progress had been made in implementing this strategy, with challenges and bottlenecks. The strategy had the following four components:
    - Strategic component 1: Coordination & Networking
    - Strategic component 2: Change of Attitudes
    - Strategic component 3: Concept and technology
    - Strategic component 4; Political Support

Challenges with the strategy included: Other Line ministries; health and education not committing officers to form the EcoSan coalition; Most stakeholders perceiving that funding should only come from the MoWE; Branding of EcoSan products requires a 'converted' National Bureau of Standards, which would take time; procurement rigidity for subsidies; Important Partners at various levels, Local Government and National levels were not yet 'converted', which was a hindrance to EcoSan promotion; and The public health Act silent on re-use, which hindered promotion.

> Workshop participants identified several gaps in the strategy, for instance: Ecosan Coalition committee not being formalized; Limited collaboration between coalition committee and stakeholders; absence of baseline data on Ecosan coverage; and the silence of the strategy on the perceived contribution of Ecosans to development; as well as challenges to implementing the strategy.

- Organizations/ agencies promoting Ecosan in the WASH sector of Uganda: the presentation outlined all agencies involved in EcoSan, and their involvement in EcoSan promotional activities.
- Community Led Total Sanitation (CLTS) in Uganda: an approach that was introduced in Uganda in 2007 by Plan Uganda, and that was recognized in the National Development Plan as an approach towards sanitation promotion. Proposed scaling up modalities included: Institutionalizing CLTS with a particular line ministry taking the lead; Expose and sensitize policy makers country wide; Strengthen CLTS coordination mechanisms- currently done by the National Sanitation Working Group; Work with government at all levels to ensure sustainability; Increase the pool of facilitators for community level implementation, and Strengthen networking and partnerships between WASH actors for information sharing.
- EcosanRes II Uganda knowledge node activities: (Addressed in this report)
- Opportunities, challenges and mitigation measures of Sanitation Marketing and CLTS
- Benefits and potential risks of human urine in farming: a Ugandan experience based on a joint pilot project/ research conducted by NARO, KCC, Makerere University and UWESO, experiences presented in the workshop were based on pilot projects with farmers in '*Kyanja' (peri-urban setting)* in Kampala and '*Migyera' (Rural setting)* in Nakasongola district
- Sludge Management and Use
- Treatment technologies for human faeces and urine

- Farmers' experience sharing on ecosan- agricultural application

- Prevalence of ecological sanitation and associated factors in Kabale municipality, Kabale district, Uganda: Two main conclusions were made
    - Ecosan contributed quarter of the total sanitation coverage with more than a half of the toilet facilities in Kabale Municipality.

    - Factors associated with Ecosan included education, occupation, religion, age of the respondents and income.

As part of the way forward, the workshop discussed and documented challenges and gaps that each participating agent was to address.
Overall the workshop was well received and has been flagged by respondents in this evaluation as one of the best learning events on EcoSan they participated in.

Progress against Activity 1.5:

Update and regularly publish a databank on sanitation service providers, experts and capacity building providers for use by stakeholders.

The databank was updated and over 140 members subscribed. This process was still ongoing and regular update being made. Several of these members were invited for the EcoSan promotional activities and many participated.

Also a data bank for local masons with skills in EcoSan construction is being developed. 22 local masons from Mukono and Wakiso district were entered into the database of masons trained on EcoSan construction.

OBJECTIVE 2: TO STRENGTHEN COMMUNICATION AND MARKETING OF THE SUSTAINABLE SANITATION KNOWLEDGE NODE PRODUCTS AND SERVICES.

Indicator: Stakeholders access 100% of the updated knowledge Node products and services by the end of 2010

Interviews with stakeholders and results of the de-briefing workshop indicate that the Knowledge Node products were valuable and being accessed by many stakeholders. Efforts to re-package and widely disseminate the Node services and products through public events, training, conferences, workshops, direct delivery and the website were clearly paying off.

There was a slight challenge in accessing the documents from the website and some community level trainees found the English language limiting their utilization of the fact sheets and posters.

Having said this, it was not easy for the evaluation to assess the actual percentages of access.

Progress towards Activity 2.1

National launch of the knowledge node to raise awareness of the node project and its intentions

The knowledge node was launched on November 17th 2009 at Biina Primary school. The guest of honor was Ms. Jennifer Namuyangu the then minister of state for water, and Madeleine Fogde from SEI. Other participants included stakeholders from private sector, line ministries, local and international NGOs, development partners and religious leaders, teachers and pupils.

ACTIVITY 2.2

Develop and implement a communication strategy for the knowledge node (including a framework for M&E) as part of a wider strategy of the Resource Centre. Specific support will be required from the SEI Communication team in the communication audit, analysis and design of communication products.

The communication strategy was developed with valuable input from the NSWG and Steering committee. The communication strategy provided guidance to the node, employing the identified channel for dissemination of the Node products and services nationally and regionally. NETWAS intends to continue using this strategy for disseminating sanitation related materials even after the node project ends.

Reports, fact sheets and posters were widely disseminated and responses from stakeholders indicted that the information was valuable and being used by stakeholders. Upcountry NGOs, farmers, members of the Advisory committee all said they used the node products. For instance the baseline survey report was used as basis for lobbying ministries to refocus their interventions; the fact sheets were being used as teaching aid for university training and as guide to users by NGOs and trainees.

Progress against Activity 2.3

Update and maintain a functional water and sanitation resource centre website with web links to critical policy organs (MoWE, MoH, and MAAIF), institutes of learning and interested partner organizations to ease access to information and products.

A folder under Ecological sanitation was created at www.watsanuganda.watsan.net /page /264 known as the Uganda Knowledge Node in which documents and information were posted for stakeholders' use.

The node membership databank was developed and regularly updated. At the time of the evaluations, over 150 stakeholders expressed interest in membership and many respond to the Node blog. Reports of studies commissioned by the Node were uploaded and shared in form of fact sheets, and posters.

The Node products and services were also disseminated widely to stakeholder in the WASH sector, through the National Sanitation Working Group (NSWG).

OBJECTIVE 3: TO INCREASE AWARENESS ON SUSTAINABILITY ISSUES IN SANITATION AMONGST THE STAKEHOLDERS AT LOCAL, NATIONAL AND REGIONAL LEVELS

Indicator: By 2010, at least 4 presentations and articles published in contribution to one policy change on relevant policy.

News clips: A number of newspaper articles were published

Presentations: Various presentations were made in sector forums. The National Sanitation Working Group was instrumental in guiding the node activities and its members benefited from the knowledge Node products. At a Dissemination workshop of technologies in the Appropriate Technology centre and at the District Health Inspectors Conferences the Node shared its products. Consequently EcoSan was recognized as a viable and desirable sanitation system in Uganda.

Progress against Activity 3.1

Develop an advocacy package and IEC materials[2] on sustainable sanitation in response to the findings of the baseline survey, and other studies conducted. This will also include simplification of the ecological sanitation strategy and Sanitation sub sector strategy, materials on O&M of public sanitation facilities and others. Technical support will be required from the SEI Communication team in the design of the strategy and materials.

The Ecosan advocacy package was completed and includes Posters on Ecosan toilet dimensions for both composting and UDDT toilets, as well as posters on proper use and safe handling of Ecosan bi- products. Fact sheets resulting from the base line survey and desk study on risks and safe handling constitute the advocacy package. These fact sheets were disseminated at the Joint Sector Review in October 2010, during the national workshop on sustainable sanitation, at the Appropriate Technology Center and use during training of stakeholders in northern Uganda on basic principles of Ecosan Construction. The list includes:

- Risks and Safe Handling of urine from Urine Diversion Dry Toilet (11/2010) A4 size
- Risks and safe Handling of feaces from Urine Diversion Dry Toilets (11/2010)
- Risks and Safe Handling of excreta from compositing toilets: *Arbor-loo* and *Fossa Alterna* toilets
- Facility design and benefits of *Fossa Alterna*
- Facility design and benefits of an Arbor-loo.
- Facility design and benefits of a UDDT.
- Primary and secondary processing of Ecosan by products.
- EcoSanRes Uganda Knowledge Node information brochure.

Progress against Activity 3.2

Conduct desk study using findings from local and international research, adapt findings and prepare information materials on risks of handling by products. This study will be conducted in collaboration with the team from SEI.

This study was conducted and indicated above, the findings from this study contributed to the facts in the fact-sheets above.

Progress against Activity 3.3

Conduct a market study on demand for re-use of excreta as fertilizers and other by products. NETWAS will be supported by an agronomist from SEI in this assignment.

The market study "Market Study on demand for use of wastewater, excreta and faecal sludge and other related products" was complete and report submitted in April 2011. The study covered 8 towns in 4 regions of Uganda: Central (Kampala and Mityana), Eastern (Jinja, and Busia), Western (Mbarara and Rukungiri) Uganda.

Key finds to note are summarized as follows

- The government had in place policies and legal instruments to guide the management of waste water products. Several government ministries and town councils in addition, also had guidelines, ordinances and policies on discharge, and on the management and re-use of waster waters. However the enforcement mechanisms were weak or absent to ensure that those concerned adhered to the guidelines.

[2] Collaboration with the WSP is especially critical here to ensure alignment with the national integrated communication strategy and avoid duplication of IEC materials

- The waste water treatment capacity had not development in tandem with the general population, urban growth and industrialization. As such a lot of the wastes from urban centers and factories were discharged in the environment untreated.
- While the demand for waste water products was generally low, farmers of flowers, bananas and vegetables around Kampala used contaminated water from Nakivubo channel, and some went to cesspool operators for untreated sludge, exposing themselves and their clients to diseases.
- Nakivubo channel and many others channels in growing urban centers were open sewers that polluted sources of domestic water, like L. Victoria's Murchison bay.
- NWSC particularly discouraged the use of sludge for fear of introducing heavy metals from industries into the environment. But noted from above, some people still used it.
- There had been and were on-going initiatives to address some of these challenges. Makerere University through the BIO-EARN project worked with the City abattoir to partially treat the waste water and grow an artificial swamp to help clean up the water; KCC in conjunction with NARO researched on re-use of urine from EcoSan from slums by farmers in 2 communities. Research by NARO outlined the recommended application of urine and corresponding financial benefits. But this knowledge was not widely shared to effect change at policy or implementation levels.
- Through these initiatives, a few enlightened farmers were willing to pay, for especially urine. For instance flower farmers paid between Ug. Shs. 20,000 – 40,000 for sludge from NWSC. The challenge was transportation and the offensive smell as one drives through town.
- The readiness of the general population to accept re-use was affected by the perceived soil fertility; the tradition of not applying any fertilizers to the soil; cultural attitude towards re-use of human excreta; lack of, or limited local data on health security when using and eating especially vegetables fertilized by waste water products.
- Conclusions of the study pointed to the un-readiness of the general public for commercial utilization of waste water and EcoSan products; and the need for more studies to provide convincing data on food safety when utilizing humaure.

Progress against Activity 3.4

Documentation, packaging and disseminate information on lessons, best practices both local examples and international research in sustainability issues in sanitation including profiling of lessons in re-use of by products

Documentation of inspirational Ecosan stories in Uganda was done, this has been finalized and the booklet produced and being shared.

Progress against Activity 3.5

Participate actively and share experience, research results in foras such as the national sanitation working group[3], joint sector review and other sub sector thematic working groups to influence policy review, analysis and dissemination on sustainability in sanitation

NETWAS is a member of the National Sanitation Working group (NSWG) and actively shares the activities and results of EcoSanRes knowledge node with the NSWG. This captured the attention of the stakeholders in the sector. Furthermore NETWAS through its position on the NSWG invited actors to the IRC International Water and Sanitation Resource Center offices on 12th February 2010 for the emptying of *Fossa Alterna* event.

The Node participated in the Joint Sector Review 2010 and shared Ecosan information.

[3] Including the Eco-San Coordination Committee upon it's formation

A special telecast on NTV "ECO-TALK" discussing issues of EcoSan was aired.

The node participated in HIP/USAID project dissemination meeting that took place on March 11th to 12th 2010 at hotel Africana. Information pertaining to sanitation marketing and WASH integration in HIV/AIDS was shared.

The node also participated actively on the Preparatory committee meetings for sanitation week that calumniated in the national cerebrations in Adjumani District In February 2010 and shared its findings with attendees.

Progress against Activity 3.6

Participate in regional and international conferences and learning events like the AskNet conference[4] 2009 and the 2nd East African Sanitation Conference on the node experiences, results, and potential for regional outreach. The papers to be presented will be shared with the SEI and or the NSWG for their inputs. Where possible, NETWAS will also attend other international conferences like WEDC upon availability of funding from other programmes within the organization or external sources.

The node participated in the second East African sanitation conference-Kampala, where an exhibition desk with materials on Ecosan was displayed. A number of issues were clarified in relation to Ecosan through question and answer. There was great interest in the reality of Productive Sanitation, especially the IEC materials that depicted green gold. At this conference the node signed up 29 new members for the node data bank.

The node communication officer attended a civil society learning journey and capacity building workshop for the southern region from 17th to 21 may 2010. Knowledge and information was received on development and importance of a communication and marketing strategy, case study development, how to handle and work with media and website management, including field visits.

Node representative participated in a regional workshop on sustainable water and sanitation management in East Africa, held in Kampala.

The Node Coordinator participated in the World water week in Stockholm in 2009 and 2010.

The Node Coordinator also participated in the Africa water week, 2009 in South Africa.

OBJECTIVE 4: TO ESTABLISH AND OPERATE SOUND SYSTEMS FOR EFFICIENT MANAGEMENT OF THE NODE PROJECT WITHIN NETWAS

Indicator: Clean project audit reports: Progress reports submitted to SEI on time

NETWAS provided bi-annual project reports to SEI as agreed, and kept the donors informed on progress, through Skype meetings between the node and SEI.

Indicator: Bi-annual progress review and consultations held with project stakeholders
NETWAS through the media procured and reinstated an auditing company -Dhadialla

Progress against Activity 4.1:

[4] NETWASNETWAS has to register membership with AskNet

Review the intervention logic in consultation with project stakeholders in the inception period

An advisory committee was set up and it held its first meeting at NETWAS offices in Luzira on 5th November 2009.
The committee was composed of representatives from The World bank, MWE, Crestanks, DED, Makerere University faculty of Technology, NARO, MoH-EHD, UWASNET and NETWAS.

The project summary was prepared, presented and discussed as well as EcoSan interventions by other actors. Based on this the committee proposed areas of focus in order for NETWAS to add value and minimize duplication of efforts in the 1 ½ years of the project life.

Progress against Activity 4.2:
Orient the Advisory committee on the knowledge node initiative and their expected advisory role

The committee held its first meeting on November 5th 2009. Main discussion topics included initiation activities: Committee membership, Criteria for chairmanship, the program and participants for the launch. The second meeting held in March 2010 focused mainly on review of progress and planned activities.

However, it was noted that subsequent face-to-face meetings failed due to the very busy schedules of members. The Node manager resorted to individual face-to-face meeting with members, emails, as well as soliciting guidance from NETWAS SC.

Progress against Activity 4.3:

Advertise and recruit a Communication Assistant to develop, disseminate and follow up on the communication services.
The process was successfully completed. The communication Officer Dennis Lukaaya was hired and reported to work on the 8th of February 2010. His contract ended in February 2011.

Progress against Activity 4.4:

Prepare and submit timely regular physical and financial progress reports and annual reports conforming to SEI procedures and templates.
Progress reports were sent on a bi-annual basis, 3 reports (financial and technical) were presented and the annual report for December 2009 circulated. The reports provided detailed updates on progress made, activities deferred and future plans.

Progress against Activity 4.5:

Conduct regular progress review and end of project evaluation
Competitive recruitment was conducted to arrive at the evaluators of the Knowledge node. This document is the End Of Project Evaluation Report.

Most planned activities were successfully completed, with the ones below finalized over the evaluation period:

- Through a partnership with GTZ- German Technical Cooperation, the node supported the construction of a two stance UDDT EcoSan toilet in the suburbs of Bwaise, Kampala.
- The node was in the final stages of developing An EcoSan case booklet, showing all experiences of EcoSan users in Uganda for wider promotion of the technology. The book was also completed over the evaluation period.

4. RESPONSES FROM THE FIELD

The purpose of the EcoSanRes II Knowledge Node was to build capacity through training and demonstrations for awareness creation, with the resultant expectation of trainees becoming advocates and practitioners of EcoSan. As such, while the evaluation considered the use and benefits by those using the demonstration facilities, it was more important to probe on how these demonstrations were used to create awareness and promote EcoSan in the surrounding communities. It was for this reason that the evaluation team visited all six demonstration sites and explored perceptions of users, visitors and the types of questions asked to assess whether or not the demonstrations and training fulfilling their purpose.

Also to note, the training involved district and sub-county officers from the Community Development, Production and Health sectors for the purpose of creating awareness at the district and sub-county levels for support to demonstrations as well as scaling up of EcoSans in the districts. Responses from stakeholders that were interviewed are presented in turn below.

4.1. EXPERIENCES FROM FARMERS AND DEMONSTRATIONS

4.1.1. Most interesting aspects about the EcoSan system

Although all construction of toilets was completed by December 2010, not all facilities were used immediately: at the time of this evaluation the toilet at Kasengeje had not been used and another at Galigatya, Mukono had been used for a few days. Nonetheless, all respondents had specific interests in EcoSans as indicated here.

All farmers appreciated the permanent aspect of the UDDT EcoSan structure - not having to construct ever again. One farmer was particularly excited about the EcoSan toilet being shallow and safe.

“If anything fell in, it can easily be recovered (e.g. mobile phones, money, even babies)”, he said. The evaluation team visited when news over the radio had just announced babies thrown in deep pit latrines, which triggered the realization of the value in EcoSans being shallow.

Farmers also mentioned the absence of smell and the manure generation. But only one farmer had used the urine on bananas, and the farmer informed the review team that she had been using her household urine on bananas prior to the demonstration.

The review observed that 2 of the farmers had cattle and accessed urine from the cows.

4.1.2. People’s perceptions

Adoption of EcoSans is about people receiving accurate and convincing information to inform change in attitudes. The review was therefore keen to learn from demonstration manager what the perceptions of the general public about the EcoSan system were.

In Kasengeje, the demonstration was built by the roadside where all passing by can see. Many of them think the toilet is for the rich, and mostly asked questions about the cost.

In general people generally abhorred touching human excreta- fresh or decomposed. The Kasengeje farmer recalled that in Jinja and Entebbe during colonial times, White families used similar toilets and employed people to empty them, and that people despised them. People perceived toilet empting as a task for the lowest social status.

Using solid excreta in crop farming: People in Kasengeje were initially negative but further discussions, recalling the past when open defecation in the plantations was the norm, how this contributed to soil fertility, and how healthy leafy vegetables – *amaranthus spp* from places men urinate look, perceptions began to change. People also recalled a time when HIV/AIDs patients were advised to drink their urine and many people did, and the belief that urine cures TB. These further discussions helped change attitudes a little.

All farmers noted that perceptions were slowly changing. At the time of the review, whenever Mr. Ssempa of Kasengeje went someone asked about the toilet and many who did not attend the training wanted to learn. He gave an example of a lady whose conventional latrine was full and who was seriously considering replacing it with an EcoSan. Sarah from Mukono narrated a story of a visitor who feared to use the facility and wanted to go for the pit toilet. After persuasion, the visitor complied and found the UDDT interesting and easy to use. Sarah's immediate neighbors to the demonstrations also frequented the facility to check if it really did not smell.

4.1.3. Questions people ask

The absence of structural adoption prompted the evaluation to explore the kinds of questions being asked by the public. When asked how he was confident attitudes were changing, one of the respondents replied,
"I consider the facial expressions and the types of questions asked".

This was the trigger that prompted the evaluation to explore more on the types of questions to gauge progress towards adoption, rather than concentrating on structures. Also because the systems were hardly a year in operation, it was too early to consider actual structure construction as the indication of progress.

Theories on behavior change according to Mr. Mukama of MWE (personal communication) consider a similar trend of assessment to track change: a) Knowledge acquisition b) Analysis c) Decision making and d) Action

With this in the background, the evaluation framed the trend of questions at the demonstration sites into four phases: Questions of curiosity; Application; Appropriation, and Implementation, discussed in details under section 6.4. Table 5 below presents the types of questions asked by community members.

Table 4: Types of questions community members ask at demonstration sites

Respondents	Curiosity question	Application questions	Appropriation question	Implementation questions
Ssempa Proactively promoting Not yet used, just improvised the washing facility for Muslims		Can it work in town, on small plots? What about us who have no farm to utilize the manure? How does one sustain the supply of ash?		
Ssuna No effort to promote In use – December 2010, with washing facility for Muslims	Who provided this facility? How long does it take to fill?		How can the facility be made cheaper? Can a permanent concrete container with a tap be constructed for urine?	How do I get a good mason to construct for me?
Sarah – Proactive to promote and visited by launch of *hand* washing used since January	Where does the solid matter go? Does it really not smell? Can ash really work? How does the system works? How and where do you empty the urine? What tools do you use to empty the solids?		Are there alternatives structures for people with little money?	
Kyeyune Not promoting as yet In use for 3 days	What is this new structure all about? How does it work? Do you really believe what is said?	Will the plastic pan not fall in? Can little children use it well?		

4.1.4. Promotion efforts

The purpose of demonstrations was to promote the EcoSan system. The review explored how promotion was being carried out by those trained and the beneficiaries of the demonstrations. There were varying levels of promotion efforts, ranging from none at all to deliberate announcements over the local megaphones and meetings. This raised the questions as to whether or not demonstration beneficiaries were assigned the role of promotions and it they were held accountable for it.

There was no deliberate effort to promote EcoSan in Bulondo. However the demonstration was strategically placed where people coming to the ancient Kabaka Mulondo's palace for cultural rituals, or going to the nearby health center saw and inquired about the toilet. The care takers were parents of the trainee (who lives elsewhere), and they tried to share with people whatever information they received from the son. This raised other promotion questions, "what information were the parents who were not trained sharing?", "What was the emphasis, the structure or the system?"

The review team was informed that prior to the EcoSan toilet, people of the "Bulondo clan" who frequented the palace used to contribute to building shallow pit toilets annually because the place is rocky. The EcoSan had proved to be the appropriate system and many expressed interest but were put off by the cost (estimated at Ug. Shs. 1,000,000/=). The care takers gave instruction to all users and so far users were compliant. Interest had been generated and from the nearby village a Preacher who received many guests was interested but asked if Netwas would construct for him.

On the other hand, Mr. Ssempa of Kasengeje used the local megaphones in his house to create awareness. Vehicles stopped by daily, many read the poster he put on the toilet and some made inquiries. No records were made of how many people toured the toilet and specific questions asked but the respondent estimated about 5 people toured per week.

Sarah in Mukono also used local megaphones to announce and invite people to see and learn. By the time of the evaluation, she had received 12 people via the megaphones. In addition she received about 3 people weekly to tour the toilet. Furthermore, Mukono district Heath office took about 200 people during the tip-tap hand washing with soap launch to tour the toilet. Whenever there was training, Sarah used the opportunity to tell others. However it was noted that her younger children still use the old latrine for fear of ruining the system.

Mr. Kyeyune of Mukono had used the toilet for a few days as it had to be adapted to provide a washing unit. As NAADS Parish Coordination committee, he had intentions to use the various meetings to create awareness. Secondly, through his role as LC chairman he would bring representatives from his farmer groups as well as communities to learn from the demonstration. The review team found two men who had come to tour the toilet, and the wife took them around. The home reported that about 5 people came to inquire and tour in a normal week. One particularly interested person was a medical student working in a nearby health unit, who promised to bring his friends as well.

To this end, it was clear the demonstrations were creating awareness and influencing attitudes.

4.1.5. Challenges

Land tenure and security: In Kasengeje several farmers from the trainee's groups had been squatters they lost their land holdings, were compensated and moved elsewhere. But the trainee was confident they would build EcoSan toilets as many had already consulted on construction modalities.

Religion: Several people in the community were Muslims who need a place other than the toilet pan to wash. The requirement deterred the use of the EcoSan toilet until a washing unit was improvised.

Lack of knowledge: Few people had been trained. These found the need for wider awareness greater than they could handle, as most of them had other responsibilities besides the demonstrations. The trainees did not feel confident to train as they were trained as users and not as trained – trainers. They were more confident facilitating guided tours around the toilets.

Soil structure and perceived fertility: All expect one demonstration were well located where most residents already had "good" conventional latrines. Trainee farmers found it rather unrealistic to convince people to just abandon their conventional latrines. Secondly people in these locations hardly applied fertilizers to their crops, as such the need for manure was not perceives as urgent. It was farmers in NAADs groups who had tried buying chemical fertilizers that expressed some appreciation to the alternative of humanure.

Unclear roles of Districts and Sub-counties in the promotion of sustainable sanitation: Trainees from the two districts were nominated by the district officials, It was assumed that the districts would provide the trainees support to roll out the Ecosan awareness creation, but this was not the case. The Bulondo demonstration fell in a newly formed sub-county – Mende and most of the challenges narrated had to do with the unclear roles of the district and sub-counties in support to EcoSan. The respondents noted that while officers talked a lot about EcoSan, they did not allocate a budget line to support those trained in creating awareness and scaling up. The sub-county was without formal leadership, and consequently on one to support EcoSan initiatives.

Contributions: Households contributed in kind: They fed the workers – breakfast, lunch, tea; fetched water, and completed the top structures (plastering). The implied message to the public seems to be that the facilities were too expensive and aid was needed to shoulder the bulk of the costs. This partly explains the request by the Preacher in Bulondo to NETWAS.

4.1.6. Follow up support by NETWAS.

In scientific research, demonstration sites are monitored and records taken to assess whether or not the hypothesis tested was proved or disproved. As such, the evaluation expected the follow up activities of NETWAS to include monitoring and recording on the use of the facilities, promotion efforts, changing perceptions as well as adoption.

As it were, follow-up activities by NETWAS mostly monitored completion of structures, challenges of use which resulted in the innovation of a washing units, provision of information mainly the fact sheets and posters. The main purpose for the demonstration, which was promotion was not followed up, which could explain varied efforts exhibited by demonstration managers and total lack of promotions especially by masons.

4.1.7. Advice to NETWAS

The request to respondents to provide advice was purposely to identify perceived gaps, areas that could be improved and what did not work. In this case the only aspect of the training that did not work well was the use of English as instruction language.

Awareness creation: Farmers' suggested the use of all media communication channels – film shows, radio, local megaphones, posters in local languages with space for contacts of the mason and demonstration site heads, signposts to direct people to the demonstration and refresher courses to keep trainees updated with new development.

Demonstration improvement: Farmers proposed larger chambers for large families, the use polythene bags so that emptying is easier, step pads showing the proper way to face so that even visitors are compelled to use the facility properly, and having at least 2 demonstrations per sub-county to deal with increased demand.

Stop doing: Using English alone as the instructional and documentation language. Some materials needed translation to add maximum value at community level.

4.2. INSTITUTION: MUTEESA 1 PRIMARY SCHOOL

Participants in the de-briefing workshop proposed the targeting of schools as an opportunity to equip as well as change the attitudes of the next generation towards EcoSan use and to reach parents. Monitoring the use of facilities by children as well as the perceptions of parents would provide good information on progress towards positive change. One school in Wakiso district had received and used Ecosan toilets.

4.2.1. Types of systems promoted at the school

Muteesa 1 primary school in Kayunga Wakiso District was located on about half an acre of land, and supported 240 pupils plus 12 teachers. Prior to the demonstrations, pupils and teachers used a public toilet outside of the school that was poorly managed and unhygienic. Training on EcoSan was carried out in October 2010, and through the support of IRC, and later Peter Morgan from Zimbabwe three types of EcoSan were constructed by NETWAS: 2 *Fossa alternas* – rectangular and doom shaped pits, hand washing unit and urinals. The school contributed water, storage for materials and labor provided by the pupils.

The girls' wing had urinals with squatters, bathrooms, one *Fossa Alterna* with 2 stands. The boys and teachers wing had the same but without bathrooms and the lower classes (P.1 and P.2) use the spiral *Fossa alterna*. All these facilities were being use and managed according to the given regulations. There was no offensive latrine smell from the toilets.

4.2.2. Use and perceptions

Learning and adoption had been gradual. At the time of this evaluation, all pupils knew and adhered to the rules, except a few incidences with new pupils who required instruction. There was no resistance from parents. Parents were given an overview of the usage, advantages and disadvantages of Ecosan by the trainee teacher..

Perceptions were generally positive. Parents were only concerned about land size and access to continuous supply of ash. The school addressed this by making Wednesday an ash day and pupils were keen to bring ash. At the time the school had collected 2 drums full of ash. In a week the school used about 2 buckets of ash. The teacher suspected that the pupils perceptions were very positive because the situation before was very bad.

Questions being asked: Parents ask about the breakdown of costs, the purpose and use of ash, soil and leaves, the associated cultural taboos and alternative materials for construction. The model structures were deemed too expensive.

4.2.3. Promotion efforts by the school

At the beginning of every year, pupils received lessons on the use of EcoSans. The school had written educative and instructional materials posted in the facilities to guide new users. On assembly results on how the facilities were used and managed were announced – good, poor or improved. Wednesday was also the healthy day and various health topics were introduced, including EcoSan.

The teacher trained by NETWAS talked to very many people in the community, and several appreciate the technology but most of them had very small landholdings and perceived the structure as requiring considerable space.

Opportunities to train: The trained teacher was willing to teach groups of community people that invite him but was not sure NETWAS would let him use "their" materials and information.

The review considered this to reveal three important aspects of the project:

- The inadequate emphasis on promotion and what the purpose of posters and factsheets was.
- The unspecified roles and responsibilities of the trainees towards promotions
- Secondly, the request for training by community groups reveals the need for TOT that was diverted into a national workshop. While the national workshop served an important purpose of brining stakeholders to share, it did not address the initial purpose of TOT, and this was still needed.

4.2.4. Benefits and lessons

Improved hygiene at the school especially for girls during menstrual periods: A special bathing place was provided. Secondly the facility was permanent, it only required emptying. The manure could be used by farmers to improve productivity but this had not happened as no emptying had taken place.

Lessons: Teachers realized that the ash had been misused. Smaller containers and half buckets were adopted instead. Pupils were involved in the end of day operations: Ash was poured in every close of day to make sure all solids are covered over night.

4.2.5. Support from NETWAS

Resources: Bricks, cement, roofing materials. The school provided labor, water by involving children.

Training: The teacher had been to several learning events but recalled two that were detailed. The training on the *Fossa Alterna* with the support of Jo Smet of IRC and the training on the Spiral fossa Alterna by Peter Morgan from Zimbabwe.

Information: The school received fact sheets, posters, and flash cards. The teacher also communicated and accessed information through emails and telephone calls on the shifting of use from the filled chambers, and about fears they had before they started using the facilities.

Website: not used as the internet at the school was not reliable due to poor connection.

Follow-ups: The school received several visits, almost every weekend in the first part of the program. The Spiral was to be used by the lower primary children and NETWAS came to check on use, the collection of materials to be used (ash, soil, dry leaves), orientation of users, to deliver and to check on the shifting of chambers. The school was preparing to empty the filled chamber but needed an emptying guide to deal with the fears and negative attitudes.

Workshops or meetings and exposure visits: None

4.2.6. Challenges

There was no place for disposing of pads by girls. The system only regarded two types of human excreta, and forgot the menstrual needs of females. Many girls still deposited pads in the pit.

Blocked urinals during rain seasons: Pupils entered the urinal with muddy shoes and the mud got washed into the pipes.

Continual requirement to train new comers: A group of active pupils and teachers create awareness.

The empting of the pit had not been done. The school did not have a care taker to empty the chambers and teachers were not willing. The perceptions on handling humanure were still negative. Also the school did not know who would take the manure. It was assumed that farmers would be interested but none had shown interest.

4.2.7. Advice to NETWAS

Continue: NETWAS should continue providing information because the EcoSan system was new and users as well as promoters needed as much information as they could get.

Improve: Support staff to deal with the emptying, and to plan better on the re-use of products (proposed use, selling or give out free).

4.3. NGOS

Four NGOs were involved in the evaluation. Two were Kampala based but worked in several areas of Uganda and 2 from up-country. Most NGOs are service delivery in operation, that is, they work with communities to introduce and scale up innovations. Under the training, research and development continuum, most NGOs fall under development because they up take innovations from research and training, and make them available to communities. Other service delivery agencies include Sub-Counties, Farmers Organisations, Religious organizations, private and government institutions (Schools, hospitals, markets) and household.

The discussions with NGOs were therefore two pronged: To draw out their experiences with promoting EcoSans and the gauge the usefulness of the Knowledge node to the NGO sector

4.3.1. CIDI – also UWASNET regional coordinator

CIDI works mainly in urban centers, promoting EcoSan toilets at household level (Constructed in Kasubi, Nakulabye, and Makindye in Kampala).

At the time of the evaluation the promotion of EcoSan had been phased out for lack of donors support. CIDI experience in urban centers faced several challenges. The first challenge was the market for re-use of EcoSan products in the city. Most of the facilities were built in congested areas without any agricultural activities. Secondly they constructed for landlord of large estates, with several household using the same units. Management and maintenance were problematic. Thirdly UDDTs in flood areas got emptied by flood water and became a health threat.

Three main lessons: It is important to plan for the re-use of products before construction, the users of an EcoSan must be 6-8 and preferable under one household head, and UDDTs should never be constructed in flood areas.

Value addition from participating in NETWAS program: CIDI through this project gained partners; learned that in farming communities the re-use was not such an issue as farmers would use it for agriculture; that there was need to actively market the products and not wait for demand; accessed a lot of valuable information on management, IEC materials, information on Operation and maintenance, got CDS and booklets, and used the website once.

Advice: Lobby for re-use in urban centers through rigorous marketing, involving private sector for packaging and handling. CIDI observed that after a while the KCC EcoSan users collected products but did not know where to use them, and was of the view that NETWAS should move from cheap units to well finished attractive ones to interest the urban rich.

4.3.2. Water for people.

Water for people is a USA based NGO, operating in 11 countries worldwide and in 3 countries in Africa: Malawi, Rwanda and Uganda. In Uganda the organisation worked in the West – Kyenjojo District and Central – Mukono District. The program focused on providing sustainable water and sanitation programs, emphasizing sustainability in order to address the underlying causes of short lived successes.

The EcoSan project run from 2009 – 2010 promoting two technologies: UDDT and *Fossa alterna*. A total of 18 facilities were constructed, 7 in Mukono (6 Ecosan and 1 pour and flush toilets) and 12 Ecosans in Kyenjojo. Construction was completed and the office had embarked on monitoring to assess people's perception every three months.

Perception: The use of compost was a challenge as people were not comfortable to use or sell the EcoSan products. Farmers found it more acceptable to apply urine on bananas and they observe that these looked healthier, but would not use it on any other crops.

The actual use of the toilets was good; users collected all the required input materials and applied as advised. The facilities were clean and did not smell.

Adoption: Largely people were comfortable with the conventional pit toilets. They also had relatively fertile soils and did not as yet appreciate the need for fertilizers. Secondly, the organization realized that although they had constructed using a wide range of materials for the house structure – concrete, grass, mud and wattle to cater for low as well as medium earners, there had been no adoption as yet. 50 masons were rained in construction, O&M but they too received no demand for their services. In a market survey, the organization asked, "if given 1 million Uganda shillings, what would you use is for". No respondent mentioned EcoSan toilets. They had other priorities like school fees, improving the house, etc. Water for People realized the need to further awareness creation; and learned the lesson that providing all materials did not help. They resolved never to subsidize.

Participation in NETWAS program: Water For People participated in two main Knowledge Node activities: March 2010- the emptying of *Fossa altena* at Luzira and the November stakeholder sharing workshop. The respondent also communicates and consulted on phone, emailed, and used the website way back.

Benefits: Water for People found the Node a source of rich information on EcoSan – bills of quantities, construction materials, guides to proper use of EcoSan toilets, operation and maintenance. The information was well packaged in soft

and hard versions of study reports and other relevant documents. At the Luzira emptying event, three staff members participated, they witnessed the emptying for the first time, asked questions and received good responses. The stakeholder workshops provided valuable information on various EcoSan technologies, opportunities to share and learn and to forge partnerships. At the time, Water for People was contemplating forging a formal partnership with NETWAS.

4.3.3. UP-COUNTRY NGOS

Both HEWESA and CARITAS Arua are partners of NETWAS from another program, the SIMAVI Leapps action research program. HEWESA is based in fort Portal and CARITAS in Arua. Both NGOs visited the demonstration site at Muteesa 1 primary school during an exchange visit.

Under the knowledge node, NETWAS provided the NGOs with training materials and IEC materials, and a guide to safe handling of urine and humanure. Between the two of them and including facilities constructed under the LeaPPs action research, there were 25 *Fossa alternas* and 5 *arbor-loos*; HEWESA had three 4 stance *Fossa alternas* at primary schools, 2 single stance at primary schools, 10 *Fossa alternas* and 3 *arbo-loos* at household level; CARITAS in the first phase of LeaPPs had 4 two stance *Fossa alterna* toilets in Koboko District and five 3 stance *Fossa alterna* toilets in Arua District at primary school level. In the second phase there were eight spiral *Fossa alterna* toilets for selected key schools, two spiral *Fossa alterna* toilets for selected key community stakeholders (still in progress), two *arbo-loos* in progress for households and one completed *arbo-loo*.

Number of users: HEWESA reported 970 and CARITAS Arua 2141.

Perception of people: In Fort Portal there is interest in the longevity of the structure, making it cheaper in the long run, and also because the toilet did not smell. However there was still negative feeling about handling and re-use of humanure.

In Arua the NGO received mixed reactions as some people demanded the project to be extended to other sub counties, schools etc, while some said EcoSan toilets should be left for households; still others preferred the traditional pit latrines because of O&M challenges especially with institutions and the general public.

Benefits: HEWESA considered having several options to present to people as great benefit. There was also raising interest of the both political and technical district leadership in promoting *Fossa alterna*. CARITAS saw benefits as economic: the technologies being cheap, cost effective, not time consuming and decomposed humanure as a fertilizer option; Social: no flies, bad smell, and the system was environmentally friendly and Technical: easily adopted by any practicing mason.

Challenges: Both NGOs faced attitudinal challenges towards handling and use of manure based on social cultural beliefs. Other challenges were the apparent absence of privacy in *arbo-loo* toilets and reservations about demolish the structure. The expectation of people that the NGO would construct for everyone was disappointing.

Mitigation: In Fort Portal, HEWESA demonstrated the use of humanure from a *Fossa alterna*, continues to provide messages on safe use, handling and re-use of humanure. They also continue to provide technical support at different levels; district, sub-county, and community.

CARITUS tries the involvement of local/opinion leaders, continued with sensitization, and improvising to improve *arbo-loo* privacy. They were trying to instill self reliance skills in communities by requesting demonstration beneficiaries to contribute in kind.

4.4. APPROPRIATE TECHNOLOGY CENTER - ATC

The Appropriate Technology Center – ATC for Water and Sanitation was established in May 2010 by the Ministry of Water and Environment as an initiative to promote Action Research and the development of appropriate technologies for water and sanitation. The center was managed by NETWAS.

The goal of the center was to undertake action research, develop and promote of appropriate technologies in water supply and sanitation. Its work fell under three broad areas:

- Research on water and sanitation issues and technologies
- Promotion and Capacity building. The center runs demonstrations
- Trains and researches using the Action Research approach on technologies to ensure soundness and relevancy to the local needs. It explores approaches used and assesses social appreciation and appropriation.

NETWAS constructed two EcoSan facilities at the center. The center improved on the finishing with tiles. They intended to use the manure in the gardens.

Promotion: ATC promoted proven technologies through quarterly dissemination workshops, advocated at national levels during national gatherings and exhibitions.

Plans for future promotions: ATC intended to build on the NETWAS demonstration initiative and was carrying out a survey on social factors related to sanitation. The new focus was to demonstrate a variety of structures using a wide range of locally available materials from June to August 2011. ATC planned to employ a holistic village model approach, with EcoSan as one of the components. They intended to monitor and evaluate quarterly, modify until the facilities suited local realities and were affordable.

Lastly, ATC planned to develop a manual with the breakdown of all costs, materials, process etc as a handout to individuals that come to inquire about construction modalities.

Advice to NETWAS: ATC observed that during training the roles of the various participating institutions in promoting EcoSans was not discussed. The masons for instance only knew the role of constructing and did not market themselves. There was need for increased efforts to ensure community preparedness for the use and maximizing products from EcoSans.

4.5. DISTRICT AND SUB-COUNTY OFFICIAL TRAINEES

Discussions with district officials focused on their role in promoting sustainable sanitations, what they intend to do with the NETWAS demonstrations and challenges they faced. Three sectors were covered in the two districts: Production, health and community development.

4.5.1. PRODUCTION AND COMMUNITY DEVELOPMENT - WAKISO

Role of the district on sanitation

District production department officials saw their role as advising farmers on how to use the humanure, popularizing, promoting and supporting dissemination. They however noted that until the training by NETWAS, the production sector focused on crops, pests and agronomical practices. The training raised their consciousness to EcoSan as a valuable asset to the sector. Meanwhile with inorganic fertilizers being expensive, farmers had been looking for affordable alternatives and the district officers had no clue how to assist then. They were sure with concerted efforts to create awareness people would be receptive to EcoSans for the benefit of fertilizer. They intended to use the three demonstration site of NETWAS in Wakiso to promote EcoSan for humanure production and re-use.

Challenges and mitigation measures

The district financial year starts in June. NETWAS training came after the departments had already budgeted and there was no budget line to cater for new activities. The NAADs technical fund they would have tapped into had been taken from the district and given to farmers. At the time of the evaluation, the budgeting process was underway and officers committed to including a budget line for EcoSan promotion, and that it would focus on appropriation using locally available materials. At the Muteesa Pr. School officers planned to use the small school garden to show case the benefits of humanure and its proper application, and would later identify other site for replication.

The officers observed that while EcoSan touched and was relevant to several sectors, at the time there was no coordination and involvement by health, Water and Education sectors was weak. The respondents planned to call a meeting, share and initiate collaboration among the district sectors.

Wakiso district had another project on bio-digesters using cattle and pig manure, they thought the system could integrate human excreta with a loop from the latrine to supplies the digesters. They asserted that after the digestion process the sludge is sanitized and safe for crop application.

The group anticipated an increase in demand for EcosSan toilets but they were apprehensive about the cost. They noted that farmers demanded information but expected the resources for construction to come from government. Piloting with affordable materials could help.

The district realized that they needed a person to specifically follow up the EcoSan demonstration sites. At the moment there was none. The DAO on her follow up trips to NAADS farmers visited one of the demonstrations at Kasengeje but this was incidental. A formal link to demonstration sites was needed.

4.5.2. Mukono District Health Office

It was the district Health Inspector (DHI) and two health assistants from 2 sub-counties who participated in the training by Netwas.

The DHI recalled that The Ministry of Water and Environment and the Lake Victoria Environmental Management project (LVEMP) constructed EcoSan toilets in public places, mainly at landing sites and market centers and had face numerous challenges, which he attributed to different and poor toilet-use cultures and religious backgrounds. To him, it was Netwas that came with the idea of EcoSan at household levels.

The health department followed up the demonstration site by Netwas at Kikandwa village Kabimbiri sub-county and Galigatya in Nanga parish, and trained communities through the assistant health and community development officers. The community health workers moved house to house talking to people and discussing issues. They then call a community meeting to address identified issues. They do this at least 3 times a month, covering three villages. Kasawo sub-county has 41 villages, and so far 17 had been covered and 4 village had been visited twice where health workers raised concerns

At sub-county level, the department carried out sensitization on EcoSan together with the hand washing with soap campaign, which was launched in Kikandwa village where the EcoSan demonstration toilets was because there is no budget line for EcoSan awareness. During the launch of the hand washing with soap campaign, the district took all participants to the EcoSan demonstration site. Since then, district officials had not followed up to see if any farmers have adopted.

The DHI pointed out that under the decentralized structure it was at sub-county level that would budget for EcoSan promotion and development. Unfortunately, the chiefs had not been sensitized and as such lots of lobbying and advocacy was urgently required.

Levels of interest: So far in areas where awareness had been created, people rang the DHI to inquire if there were alternatives to the "Kikandwa model", ie UDDT at the demonstration site. Many had toured toilet and liked it but were limited by the cost. When asked about substituting concrete with logs he shared that the challenge with logs was in the species use. They had allowed people to use logs with sanplats. As they washed to keep the place clean, logs were rotting and eventually fell in and people blamed the concrete slabs and not the weak logs.

Secondly, the respondents pointed out the need for continual campaigns. The hand washing launch had been done before under the "Rural water and Sanitation" program. And before the re-launch the coverage was only 8%. After the re-launch the ratio improved to about 38% in the sub county. Repeated launches were essential for normalizing new practices.

Way forward: The department realized their role in creating awareness at household as well as institutions like schools for adopt. They had plans to budget for awareness creation and encourage adoption in the 2 sub counties.

Advice to NETWAS: Target institutions with awareness creation. Schools presented a pool of children that can be used to reach their homes and interest parents, target more farmers, one farmer per sub-county was not sufficient for diffusion of knowledge and practice; encourage promoters to use village meetings to continue educating the public; and marketing encouraged through masons.

4.5.3. SUB-COUNTY CDO

The Community Development Officer - CDO learned about EcoSan through the Health Assistant who attended the theoretical training. He was encourage and participated in the construction of the demonstration site and at the time of the evolution participated in sensitizing people. Most interesting to him was the opportunity for re-use to boast crop production. He used to have a negative attitude towards humanure but at the time of the review, he considered himself converted. In his sub-county sensitization had been completed in 3 parishes of Kabimbiiri, Namalili and Kasada.

Questions asked by people: People asked mostly about costs, utilization, durability and possible challenges. Other questions were about alternative construction materials and if additional masons would be trained.

4.6. NATIONAL STAKEHOLDERS

There were two respondents from this ministry, the first one was a key informant on the initial drivers of EcoSan in Uganda, and as such the discussion focused mainly on generic background information on EcoSans in Uganda. The second one served on the NSWG and was active in supporting district implementation of EcoSans. The interview therefore concentrated on the roles of the NSWG as well as the MWE in promoting EcoSan.

4.6.1. Ministry of Water and Environment (Eng. Tushabe as key informant)

Sanitation in the wide sense of the word is all encompassing; including animal, rodent and human excreta management, but most people limited it to human excreta management. According to Eng. Tushabe, the underlying challenge in promoting EcoSan was that people wrongly viewed Ecosan as a technology or facility.
"Ecosan is a system of managing human excreta, not a structure", he emphasized.

The discussion classified human excreta management over the years into four systems based on the principle of whether or not there was mixing of solid and liquid excreta. The four systems are:

- Drop, mix (urine and solid), and walk away (do not desire to look). This is the oldest system that relied entirely on nature to recycle the excreta. People took no responsibilities whatsoever. This system was alright when human populations were small and scattered.

- Drop, mix (urine and solid), store (hole in the ground, or pit), and walk away. This system is still widely used in Uganda, with pit toilets covering 69%, while several people still use the bush with a hoe and cover the excreta with soil.
- Drop, mix, flush and walk away: The flush toilets are less than 2000 years old. This system was necessary for the proper management of communal excreta using a centralized sewage management system. However taking into account the volumes: 50 kg per person per year of solids + 500l of urine per year generates 550 litres, and in order to flush each person utilizes 30,000l of treated water a year. This gives 30,550l of contaminated sewage per person per year. If not well treated, the phosphates responsible for photosynthesis, as in the case of Uganda, is released into the water charnels leading to the infestation of algae on the water bodies.
- The fourth system is Drop, sanitize/hydrogenise, and recycle (the EcoSans system). In this system there is no mixing of urine and feces, which caters for 80% of excreta management. It fully utilizes the principles of: no mix, confine, treat and utilize. It was pointed out that even eggs of Ascari worms (lumbricoides) that are problematic in the other systems, after 4-6 weeks of hydrogenization, using a 6" diameter vent, ash or lime, the ph increases (9-11) resulting in rapid death of pathogens and destruction of cysts.

- Comparative nutrition value of EcoSan products: Based on the nutrient values in Table 5 below, urine a is pure soluble fertilizer, while feces are mostly fiber which helps condition the soil.

Table 5: Estimated nutrient contents of urine and faeces

Contents	Feces %	Urine %
Nitrates – N	20	80
Phosphates- P	35-40	60-65
Potassium – K	20	80

Source: Eng. Tushabe (personal communication)

It was noted that there were over 20,000 EcoSan toilets in Uganda, mostly in Kabale, Ntugamo, and Bushenyi, but many especially the public ones faced challenges. Most of the problems encountered were because masons looked at EcoSan as a structure and ignored the operation and maintenance principles of sustainable sanitation. It was therefore emphasized that, "When thinking EcoSan, it was important that one thought of the principles, operation and maintenance".

Ministerial interests in EcoSan

The MWE became interested in sanitation when a research conducted on the over 200 springs around Kampala in 1994 found 99% contaminated from latrines. Pit toilets had contaminated the underground water, as well as leakages from old sewage pipes. The motivation was fear of pollution.

The Ministry of health was also motivated by fear of pathogens. It was only the ministry of Agriculture that could be motivated by value addition from proper re-use of products.

It was clear then that human excreta belonged to the soil not water. In water it generated fear while if treated and recycled back to the soil it was valuable. As such, the sustainable sanitation challenge called for an integrated approach, not necessarily one ministry being responsible.

4.6.2. MWE/ National sanitation working group.

The focus of this discussion was on the roles of institutions in promoting EcoSans, and relevancy of the NETWAS Knowledge Node to the MWE.

What was good about the project? Through the Node, the MWE center for sanitation made useful allies; benefited from knowledge sharing; participated in promoting innovation and learning events through which they interacted with other

professionals and shared, and had access to the valuable information in the resource center. The MWE sanitation center participated with NETWAS on the NSWG, and benefited from NETWAS' sharing of information and knowledge on EcoSan.

Whose role is it to promote the adoption of EcoSan? The National level provided technical backup support, quality assurance and IEC materials to districts. But under the decentralization policy, the districts were responsible for promoting adoption and through the extension staff reach communities.

Nonetheless, The MWE Sanitation center worked in all districts and constructed several public Ecosan.

Challenges:

Mainly Operation and maintenance. The MWE Sanitation center was coming up with an O&M manual to guide Ecosan facility management. The second challenge in promotion was that the promoters at district level had not been converted as the current demonstrations were too expensive for even the promoters to adopt.

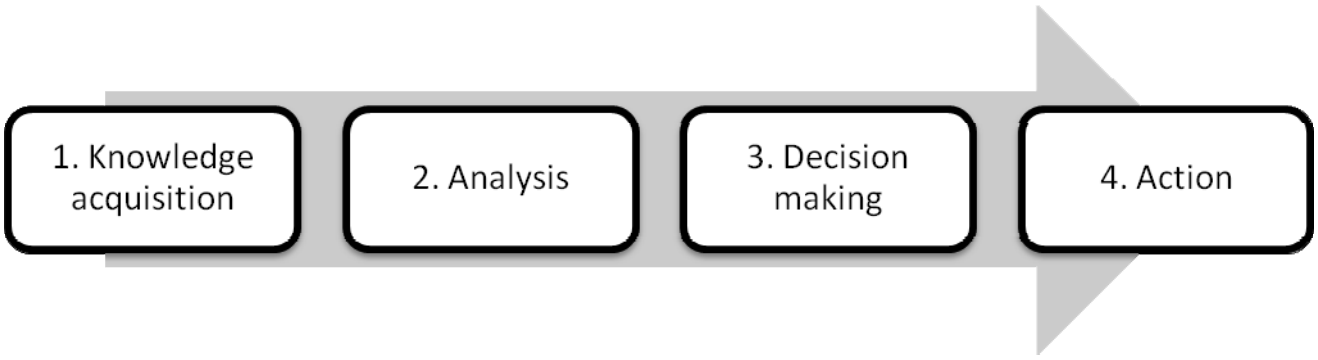
Adoption and impact of EcoSan still low. The challenge had been with tracking adoption and use. There was need to lobby UBS to differentiate EcoSan from other toilets and based on the data an atlas showing the coverage of the different technologies sanitation developed. Otherwise at the time, differentiation of data by UBS on types of sanitation facilities depended entirely on individual interviewer, and their level of awareness of the difference between pit toilets and EcoSans.

Lessons: It was not profitable to construct EcoSans for communities that had not see a good EcoSan in operation. There was still general lack of awareness and information, which made learning visits to site where the EcoSan systems functioned optimally necessary for promotion.

Advice: There was need for a clear promotional strategy, a need to pilot with affordable local materials at demonstrations; to make use of promotional materials – IEC; continuous mobilization and sensitization – to get well trained and motivated ambassadors, as was done with hand washing campaign. Masons could be the *ambassadors* but these required retraining and equipping them with communication and marketing skills and providing follow up support. Ambassadors needed skills in handling different customers: easy ones as well as difficult ones.

Theory of behavioral change: Discussions about the analysis of types of question being asked at the demonstration sites, led the respondent to share about the theory on the phases of behavioral change. This information helped cement the relevancy of looking at questions: Fig.2 below capture the sequence of behavioral change

Fig. 2: Steps in behavior change



4.7. ADVISORY COMMITTEE - AC

The main roles of the committee were to guide and provide oversight supervision to the Knowledge node, ensure quality, and provide input into the design of activities. Although the group met twice, individual members benefited from their participation in the different events organized by the node. The review therefore concentrated on the personal and institutional gains from the node by AC members.

4.7.1. National Agricultural Research Organization -NARO

NARO, besides being a stakeholder in EcoSan, had collaborated with Kampala City Council- KCC in the research on EcoSan products and food safety, and nutrient application in two farming communities. NARO was also represented on the Advisory Committee of the Knowledge node. The main focus of the evaluation therefore was on the value addition for being on the committee, and specific research needs of EcoSan in Uganda.

Value addition of the NETWAS project: Access to information from different players and cross fertilization; access to well generated, managed and repackaged information on EcoSan. The respondent recalled the EcoSan coalition group that was to coordinate and bring together actors but had not taken off. The Node had played the roles of brining actors together regularly to share and learn from each other. While KCC trained masons and other users, the Node added more trained masons as well as farmers. The Website of the Node would provide a valuable service of publishing NARO research findings and papers, if and when uploaded. Researchers benefit when other writers reference their papers, a service the node could play through the website and other publications.

Additional areas that could be researched on:

- The cost – effectiveness of transporting urine from urban to rural areas and the actual cost-benefit margin.
- How safe was the urine from hospitals. Did chemicals from drugs get neutralized with long term storage or was there danger here?

4.7.2. Makerere Department of Civil and Environmental Engineering

Benefits from being on the committee: The opportunities to work with people from different sectors and backgrounds, and the enriching resultant lessons from their perspectives. The fact sheets of the program were useful in training of a Masters program at University of Dar-es-saalam , and in the 3rd year Public Health Engineering course at Makerere University. The respondent wanted to refer students to the Website but failed to access the fact sheets on line. There seemed to be a challenge in negotiating the site to access specific information.

Challenges of the committee: It was almost impossible to get all members to attend the face to face meetings and the committee was compelled to resort to virtual discussions. The respondent observed that the sanitation sector had few qualified people to share roles and that the few who were interested and competent spread thin trying to address all the representative demands of the sector.

Advice to NETWAS: There was still need for EcoSan demonstrations. Very many people including some University students had no idea at all about EcoSan. NETWAS should include a small budget for applied research by students on a competitive basis. The approach was tried by DWD and had very good results.

Promotion of Ecosan should emphasize social marketing in cooperation with other organizations, especially private sector. There was need for research to generated local success stories instead of relying entirely on data from abroad. Local results speak louder when promoting technologies.

The respondent saw the issue of costs as an excuse. EcoSan toilets were cheaper than pit toilets but the problem was with the masons, who want to put up expensive neat facilities when they could provide the same services using local materials. In Kabale people were already using local materials.

Promotion: There was need to research on who actually built toilets in homes and communities. Instead of targeting private masons, these local builders could be trained, which may ease adoption.

4.8. THE STEERING COMMITTEE-SC/ NSWG/ WORLD BANK

Role of the SC: The SC provides over all guidance and supervision to NETWAS. The SC was interested in two important opportunities as regards the EcoSanRes Knowledge Node: linking academic field research to the Node knowledge pool, and having EcoSanRes II knowledge node committee also serve as a sub – committee for the NSWG. The link to Makerere was forged but the NSWG sub-committee did not materialize.

Benefits from participating: Foremost was the valuable information from studies. Already the results of the baseline survey were being used to lobby ministries to revisit their emphasis on hardware materials, to consider software, such as awareness creation and other social factors affecting sanitation. The marketing study is expected to provide some input into the wastewater management in small towns. The November workshop was extremely informative about the real issues facing the sector, coming directly from the different practitioners. He visited the website just to see how it looks.

He noted and pointed out that in the South West, social workers were involved in the promotion of Ecosans and they brought up the social issues, while elsewhere the concentrated was limited to structures. There was need to revisit the social aspects of EcoSans.

.Advice: There was still need for more information and knowledge on several topics, especially O&M of public facilities. There was an opportunity to liaise with Makerere so as to tap into this human resource to carry out studies which can still be pursued. NETWAS needed to review the National Sanitation strategy and to identify a niche where it can add value and strive to effectively occupy. The promotional message needed re-targeting to address the needs of different user. The message also needed to portray a complete system, not just the structures. Social marketing was required to explore what drove the market, assess behaviors of users and to devise appropriate marketing approaches.

There was need to revive the AC, to include NAADS and other development partners so as ensure recognition, and that AC serves competently as a sub-committee to the NSWG. This kind of AC would effectively meet the urgent need to coordinate actors, enhance networking and cross-sharing.
NETWAS needed to find local cases where the sanitation loop was completed and showcase these, to encourage loop completion.

Conclusion: Discussions with the different stakeholders above confirmed that EcoSanRes II Knowledge node was essential for the sector, had no equivalent in knowledge management, but that there were aspects that needed re-addressing in order for it to become even more relevant. The next section explores progress made by the knowledge node towards its result areas, in the 15 months of operations.

5. PROGRESS AGAINST RESULT AREAS

Reviewing of program documents and interviews with NETWAS personnel provided information on activities and progress against objectives that were covered under section 4 above. However for the assessment of results, the review relied on information from the field and the de-briefing workshop, focusing on views of the stakeholders.

Quite commendable progress was made in the 15 months the node had served the sector, with a few gaps. Detailed findings on result areas are discussed in turn below.

5.1. RESULT AREA 1

R1.1: Enhanced capacity of central government, LGs, NGO / CBOs and private sector agencies in health, water, education and agriculture sectors in the promotion and implementation of sustainable sanitation solutions in Uganda.

At the national level, participants of the workshop were drawn from all the institutions above and they indicated the following benefits; Sharing of Best Operational practices; repackaged fact sheets, access to study reports, summaries re-packaged into promotional materials, and lessons from some of the demonstration sites.

Having said this, it was clear from the workshop that while considerable progress had been made against objectives, there was much more demand and need for further capacity enhancement at all levels. It was noted that ministers, politicians, and District officers as well as sub county chiefs were still in need of training and exposure so as to appreciate/ embrace their role to support EsoSan at their levels.
Furthermore, it was clear that capacity building needed repackaging to focus on the system approach, address social marketing, marketing skills, deal with attitudes, empower trainees to take on the role of promotion and implementation of sustainable sanitation.

R1.2: Research findings are integrated in transfer of skills and knowledge in sustainable sanitation solutions

The desk study was carried out and results fed into the fact sheets shared under the IEC. These were widely distributed and used by stakeholders; NGOs, academic institutions and government officials.
Researchers and academicians were using the materials as references for writing and training, while others used them for operation, maintenance and more generally in promoting EcoSan.
The evaluation also revealed several research issues that affected adoption of sanitation solutions, such as the concern about food safety if EcoSan products from hospitals were used, use of local materials and if these would deliver the same quality of EcoSan services and adhere to the principles of total Ecosan; issues of differentiation and matching sanitation options to specific location factors (water logged, prone to floods, land size and tenure, religion, institutions, gender, PWD, etc).

5.2. RESULT AREA 2:

R2.1: Sustainable sanitation stakeholders have access to updated information.

When asked if the node ceased to exist what value would be missed, all focus groups during the de-briefing workshop listed access to relevant, updated and researched information as the foremost value. Information generated from study/research reports, was well analyzed and repackaged for easy use. Specific reference was made to the fact sheets. Stakeholders also mentioned information accessed through sharing among practitioners during workshops, and participation in field level events.

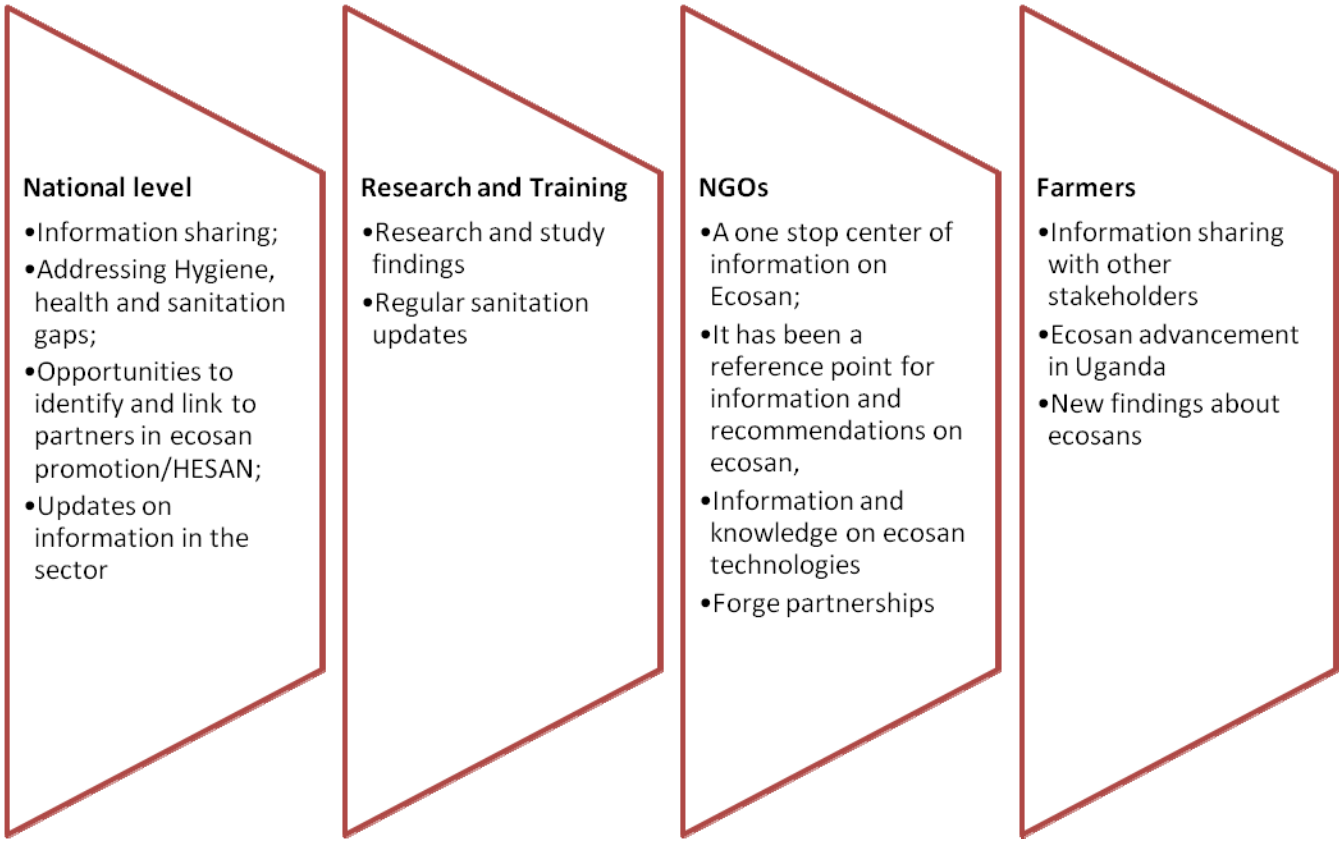
Several information gaps were also identified and stakeholders looked to Knowledge node to address these gaps.

R2.2: Knowledge Node profile raised amongst sector stakeholders

How does one determine the level of "profile raising" of a 15 months project? The evaluation framed a question to get responses that would shade some light on the value stakeholder placed on the knowledge node. The question on what would be missed if the Knowledge node ceased to exist was also intended to assess the stakeholders views and perceptions about the value addition of the Node. Responses indicated that the node was a unique valuable resource to actors at all levels, from ministries, to researchers, NGOs and farmers.

Only after 15 months of implementation, the node had gained visibility and recognition in the Water and Sanitation sector of Uganda. To some stakeholders, it had become a "one stop center" for information on EcoSan, to others it was a forum for forging partnerships and accessing new updates in the sector. Figure 3 below presents the perceptions of participants from the four focus groups.

Figure 3: Views of stakeholders about the Knowledge node



5.3. RESULT AREA 3

R3.1: Stakeholders are aware of the importance of sustainability in sanitation and support promoters and implementers at all levels

While EcoSan has been promoted in Uganda since 1996 as a sustainable sanitation solution for growing small townships, and subsequently adopted for problematic areas, and whereas several agencies including government programs have been involved in structural provision of EcoSan toilets, this evaluation shows that support to EcoSan promoters and implementers was poorly coordinated and inadequate. District respondents in this evaluation confessed that support to promotion of sustainable sanitation was one of their roles. In Wakiso officers had been sensitized and trained in EcoSan, but support to implementers or demonstration sites had not happened for lack of a budget line to facilitate activities. However, as a result of the evaluation questions, respondents committed to including a budget line on EcoSan promotion. In Mukono, the health department opted to piggy-backing on on-going community level awareness activities, and had already started with the hand washing with soap campaign.

It was also noted that the majority of current EcoSans facilities were constructed by projects and not the users. The workshop proposed a survey to specifically focus on adoption, challenges and mitigation measures, so that planners can better target their promotion and support efforts on the real issues and factors hindering adoption of Ecosan.

On the National level, specific reference was made to the stalled EcoSan strategy, which had been discussed by participants of the November 2010 Sustainable Sanitation workshop but had not yet been put in operation; the out-dated policies and Acts, e.g. the public health Act 1964 that prohibits emptying of sanitation facilities, the resultant absence of any form of legal basis for promotion, weak to absent political will, the fact that EcoSans were not differentiated by the National Bureau of statistics as one of the sanitation option, etc all boiled down to inadequate support to EcoSan promotion at the national level as well.

5.4. RESULT AREA 4

R4.1: Efficient and effective project management

Although the project activities and objective were carried out diligently, the intended results from the Advisory committee (AC) were not fully met. The AC was set up to guide the management of the Knowledge node but also intended to provide services to the National Sanitation Working Group as a sub-committee. Through these results from the knowledge node it was anticipated that there would direct influence on the decisions of the NSWG. Overall the support from this committee was assessed as inadequate by respondents.

Stakeholders talked to over the course of this evaluation recommended that this committee be strengthened, its membership revised to include NAADS and people who would be available to attend and provide the much needed governance. Stakeholders would look to the strengthened committee to organize them into pressure groups for advocacy, beginning with completion of the EcoSan strategy, to the revision of Acts and policies to make them supportive and enabling for EcoSan promotion in Uganda.

6. ANALYSIS AND DISCUSSIONS

The EcoSanRes II Knowledge Node is an initiative that most people in the sector expect to stay for a long time. Quite a lot has been achieved in the 15 months it has been in operation, and the idea that it had ended did not at all register in the minds of all respondents the evaluation talked to, except the staff of NETWAS. It occurred to the evaluations that all stakeholders were eager to provide input to make the Node more effective so that it continues to provide even better services.

On the other hand, going through the above sections, all activities and objectives were met, most results were also beginning to emerge, but there was hardly any actual construction of EcoSan toilets by households or institutions as yet. Based on issues raised by Key informants, and from listening to trainees, the questions coming from communities and personal observation, it was clear the sector needed a paradigm shift somewhere. This section attempts to highlight those aspects that need a shift and provides some analysis and discussions on these.

6.1. SYSTEM APPROACH AS OPPOSED TO STRUCTURES/ FACILITIES.

The training and promotional emphasis of Ecosans had been on the results, benefits and the structures. As such households with "good" conventional pit toilets and flush toilets have not appreciated the need for EcoSans. This has led to the observed trend that "promoters are not users of EcoSans".

"Ecological Sanitation is a system not a structure or facility", as pointed out by Eng. Tushabe, but what is a system, one may ask?

The online Business Dictionary.com defines a system as an organized, purposeful structure regarded as a whole and consisting of interrelated and interdependent elements (components, entities, factors, members, parts etc.). These elements continually influence one another (directly or indirectly) to maintain their activity and the existence of the system, in order to achieve the goal of the system. All systems

(a) Have inputs, outputs, and feedback mechanisms,
(b) Maintain an internal steady-state (called homeostasis) despite a changing external environment,
(c) Display properties that are peculiar to the whole (called emergent properties) but are not possessed by any of the individual elements, and
(d) have boundaries that are usually defined by the system observer

A system operates on principles that must be fulfilled in order to maximize its benefits. That is, systems obey rules that cannot be understood by breaking them into parts, and they stop functioning (or malfunction) when an element is removed or altered significantly.

Systems operate at different levels depending on the focus of analysis. The overall sustainable sanitation system for instance, encompasses the institutions regulating mechanisms, the organisation and management, the users and the entire technical infrastructure required to achieve sustainability: collection, transport, treatment and management of end products of human excreta, grey water, solid waste, storm water drainage and industrial and agricultural rest products. At this level the analysis covers the societal aspects of sanitation. This evaluation shows that for the case of Uganda, there are still gaps in information and services at this level, for instance by city or township authorities and at institutional levels such as the schools.

Another level of sanitation is at the structural level. There are two generic categories of systems at this level but this evaluation identifies a third system:

(i) Closed systems: theoretically the system has solid boundaries and where only the components within the system are assumed to exist in a self-sufficient state. There is no contact with the external environment.

(ii) Open systems: the real-world systems that have permeable boundaries through which they continually exchange energy, material, and information with their external environment.

(iii) Partially close system: components or steps of the system are closed, while others are not.

This understanding of systems informed the evaluation analysis of what was really happening with the efforts to ensure sustainable sanitation, and specifically motives driving the promotion of EcoSans in Uganda.

Assessing the evolution of human excreta management provided by the key informant above with a systemic view, provides the picture in Box 4 emerges.

Box 4: Major sanitation systems

1. **Ancient system**: Free defecation -Drop, mix and walk away. Nature used to deal with the excreta as the population of humans was still small. A fully open system. Contaminating ground runoff water and causing disease.
2. **Pits** – open, closed, deep or shallow, short term or longer term use: Drop, mix, store and walk way. An open system giving off offensive smell generated from excretions of bacteria that feed on the mixture rich in nutrients, polluting the underground water.
3. **Flush toilets**: Not 2000 years old – Drop, mix, flush and walk away. This was a centralized system to manage human excreta in urban areas. Partially closed system in the septic tanks, but open in the soak pits, if a pipe broke or blocked and if the subsequent treatment is poor.
4. **Partial EcoSan**: Drop, mix, treat, store and reuse. Partially closed, confines the solid excreta but the urine percolates into the ground, but is treated. There is no data to prove whether it is fully devoid of pathogens after mixing with the solid.
5. **Holistic EcoSan system**: Drop, separate, treat, store and reuse in the soil and or biogas production. A fully closed system: total separation, treatment and confinement until decomposed.

The most important realization is that the differences and value of sanitation systems are in the principles of whether or not the system is open or closed, if the substances were treated or not, and the state the products are in at the time of re-entry into the environment, and not the type of structure. Promoters need to be conscious of this difference in the sanitation systems being promoted. The table 7 below highlights the various systems and their implications for the Water, Health and Agricultural sectors.

The evaluation is convinced that once the principle of separation, treatment, storage (in a closed system) and re-use is appreciated, promoters, trainers and users will appreciate the differences in the available sanitation options and make better informed decisions concerning EcoSan.

Secondly, emphasizing the system will open up people minds to devise innovative ways of using locally available materials to achieve the same systemic principles and results of drop, separate, treat, confine and re-use. As it is, the emphasis on structures is partly the reason for low adoption because of the associated cost and wrongly perceived safety

of all the other systems. With the national coverage of latrines at 69%, and urbanization growing at 15%, centralized and/ or on site sanitation options cannot adequately address the sustainable sanitation aspiration of Uganda, where health hazard and water pollution are fully contained. The general public needs to be aware of the full short-term and long term implications of their sanitation choices. Table 6 below summarizes the implications sanitation choices.

Table 6: Sanitation system implications of water, health and agriculture

System	Principles in operation	Inputs	Implication for Water, health and Agriculture if used to date.		
Ancient system: Free defecation	Open system: Drop, mix, go	None	Water Pollution from runoff water	Health Diseases from exposed excreta and polluted water	Agriculture Some nutrients recycled back
Pits	Partially closed: Drop, mix, store Solids are contained but liquids percolate out.	Deep pit, Top structure, equally expensive	Pollution of underground water	If not well managed, smells, source of flies. Diseases from flies and polluted water	No benefit or danger. Deprived nutrients
Flush toilets	Partially closed: Drop, mix, flush and go Solids remain in the septic tank but liquids flow into the soak pits and percolated.	Toilet structure Water, septic tanks, and soak pit	Pollution from the soak pits if water table is high. Pollution from poorly managed sewage systems Use of treated water to flush excreta	Postponed responsibility, accumulated danger as the stored sewage eventually gets into the environment	None officially although people in urban agriculture use products from cesspools and channels.
Partial EcoSan *Fossa altenas Abor-loos*	Partially closed. Drop, mix, treat and reuse the mixture	Shallow doom shaped or rectangular pit, movable concrete slab Simple to complex top structure Ash, soil, dry leaves	Pollution can still happen from the percolation of liquids	No smell or flies if well treated. Could cause disease if the water table is high	Re-use of composite. Urine is lost. Improved soil structure.
Holistic EcoSan UDDT	Closed system Drop, separate, treat, store and re-use. Until products are compatible with environment.	A strong above ground chamber. Tightly shutters Simple to complex top structure Ash	No danger if not in the flood prone areas	None if well managed	Re-use of both urine and solids. Enhanced soil fertility and structure

Source: Analysis by the Evaluator based on information from NETWAS documents and key informants

6.2. PROGRESSIVE COMMUNITY LEARNING AS OPPOSED TO STRUCTURAL ADOPTION

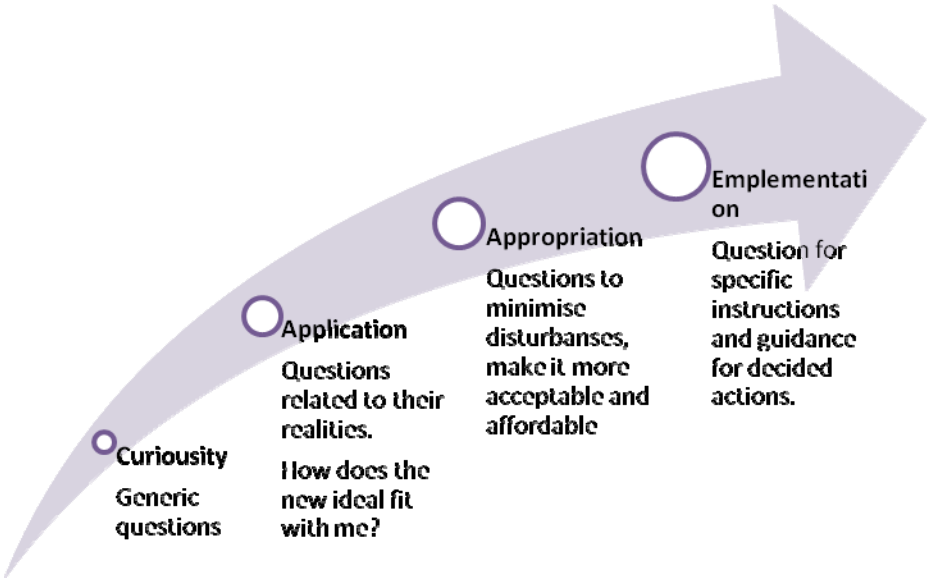
Pit toilets were introduced in Uganda in the 1800 by missionaries. To date the 69% coverage indicates that some communities and households still have no toilets and many that mis-use them. Overall investment in sanitation facilities whether at construction or operation and management level is low; yet besides food and eating habits, sanitation systems and habits are the other life threatening departments of any home and community.

If asked in any average home, who takes care of the toilet, who ensures that it is well used and cleans, the answer will more often than not be the maids, servants and in some homes, no one. The other general observation is that in an average home, sanitation facilities are hidden away shacks, small and uncomfortable for anyone to spend time there. Investing in well finished toilets requires a radical shift in attitudes and will take repeated bombardment with awareness messages.

The EcoSan system comes in with new demands in terms of operation and maintenance involving more the household heads than the other systems. It also requires a paradigm shift in the attitudes, behaviors and practices around the excreta that was once dropped and one walked away. People need first and foremost to access a holistic message on sustainable sanitation, understand, accept it, be motivated to adopt, facilitated to remain enthusiastic and committed to the system idea.

Without any construction of new units, it was essential therefore for the evaluation to find proxy ways to measure progress in attitude change and learning. Over the period of this evaluation the team explored changes in attitudes and several responses were given by beneficiaries of the demonstration toilets. Focusing on the types of questions the evaluation attempted to construct and access progress made in changing attitudes at each demonstration site. Four specific stages have been identified as highlighted in figure 4 below.

Fig. 4: Steps in community learning based on the types of questions asked.



- Curiosity stage: Generic questions are asked. The learners are curious to see or learn generally what the new idea is all about. Questions are often, “What is this? Or , “How does it work”?; “ Where did it come from?”
- Applicability: Learners begin to contemplate how the idea can be used. If they are to venture, what will it mean for them? Questions are, “How much ash? How long does it take to fill? What about young children?”

- Appropriation stage: The learners have weighed the pros and cons of the new idea; have appreciated the implications, now they ask questions on possible changes to make the idea work for them. They may not mention the constraints but will provide options for appropriation, adoption or adaption. “Can local material be use? What if a polythen bag is used to ease emptying? Can a cemented pit work instead of plastic jerry-can? Where do Muslims wash from”, etc
- Implementation: When the learner is ready to implement, the questions are on the actual deliverables, e.g where to get inputs, contacts of suppliers, etc.

This approach proved that progress was made towards appropriation (see table 4) as also emphasized by respondents and the de-briefing workshop. There emerged a strong recommendation for research on the use of local materials, to make the structures affordable and still adhere to the EcoSan system principles.

The cases of demand for a washing unit, prove that while the construction thought structure, the users though system, and demanded for a unit that would allow them to follow their religious practices without violating the UDDT principles. Once the washing unit was improvised, people started using the facilities. Perhaps the most important types of questions to watch out for are appropriation questions. In essence the question is saying, “I would take up this technology, approach, etc but there is this obstacle”. If these obstacles are addressed, probably actual adoption will happen.

Lastly, it was not clear in the evaluation, whether or not there was conscious follow up of visitors to facilitate them from one level of learning to the other. In Kasegejje there was an indication that the demonstration manager engaged people in further discussions to move them along, but this seemed an exception, not the norm.

6.3. TRAINING, KNOWLEDGE MANAGEMENT AND RESEARCH FOR DEVELOPMENT AS OPPOSED TO AND DEVELOPMENT

The temptation to push research and training programs into the development arena are real and seem realistic on the surface. If a research and training institution is doing a good job of building capacity and generating knowledge and technology, they are often challenged to trace the development impacts of their achievements. Without being clear on programmatic boundaries and freedoms, many well meaning ‘research and training institutions’ spread thin trying to achieve development impacts, far outside of their mandates.

It is against this realization that this evaluation specifically addresses the boundaries implied by EcoSanRes II knowledge node program initial intent. The intention was to bridge the knowledge gap through training, research and demonstrations. Implicitly this makes the project one of FOR development, as opposed to AND development.

- FOR development however, requires that the project links to development actors who are able (have resources and expertise), willing, and committed to uptake the research and training products and scale them up to more households, institutions. and communities for wider adoption
- AND development implies that the program from inception has the means, expertise and time to take on the scaling up of proven technologies to development levels, which is not the mandate of this project.

As such demands and recommendations for scaling out should be avoided, and instead emphasis should be on identifying and forging formal linkages with development/ service delivery partners such as NGOs, Local government, Farmers organizations, etc to scale up the innovations.

Nonetheless the knowledge node, being the initiator of the project needs to play a facilitating, brokering, and catalyzing role to link proven innovation to development agents. Roles and relationships between the Knowledge node and development/ service delivery stakeholders need to be clear from inception to avoid mis-conceptions and unrealistic expectation later on.

In this evaluation it was clear some stakeholders related with the knowledge Node as a development agent (asking for more structures), or a donor (expecting financial facilitation). This is where a central coordinating body becomes essential, to help streamline roles and responsibilities, minimize duplications as well as hold stakeholders accountable for what they commit to do.

6.4. THE EDUCATION MINISTRY IS A CENTRAL PLAYER

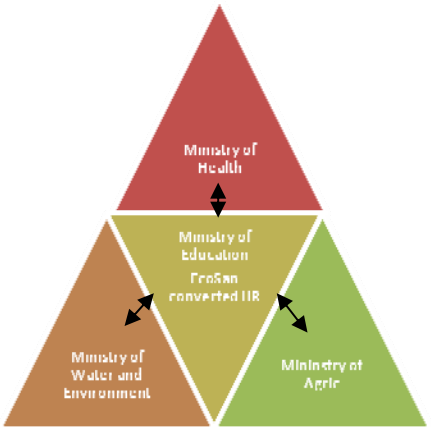
Each ministry and government department is entrusted with valuable national assets: The health of the people, the natural resources, the infrastructure, and so on. Above them all and central to the success of all is the Ministry of Education that has been entrusted with building the human capital that all other ministries employ and work with.

The outcry for continued capacity building, awareness creation and sensitization all reflects the ineffectiveness of the Education system to deliver a competent human resource for the various ministries, LG sectors and programs.

In the domain of sustainable sanitation, and having learned that it is a system with governing principles, it is important that people are educated about sanitation options early in life. If the primary school dropout rate in some areas is as high as 54% in Kabarole District Hakibaale sub-county (eainfocus.com), and this is known to the education sector, the unavoidable question is, what strategies are in place to equip these pupils to become valuable human resources at whatever stage of education they drop out?

The recommendation to target schools with EcoSan is urgent, but if not integrated into the curriculum, pupils will regard it as optional, something nice to do and not essential for their survival. There have been efforts to integrate Sustainable Sanitation in the education curriculum that was put on hold, this effort needs to be revived as the actual adoption of EcoSan depends on it. Consequently the illustration that captures well the inter-ministerial linkages must have Ministry of education in the middle as indicated in Fig.5 below. Ideally the human resource needs of the other ministries should inform the curriculum development and revisions of the education sector, so that is remains relevant to the development trends of the nation.

Figure 5: Inter-ministerial collaboration for Sustainable Sanitation



7. RECOMMENDATION

7.1. OVERALL PROGRAM FOCUS

7.1.1. There is an urgent need for the project to identify key development/ service delivery actors that will take up the proven EcoSan innovations and scale them out. Development agents include mostly NGOS, Farmers Organizations and cooperatives, Sub-counties, Religious agencies and institutions. Clarity of the roles and boundaries of the node need to be established from the beginning o avoid raising expectations outside of the nodes mandate.

7.1.2. A careful analysis of the effects of full or partially subsidizing toilet construction and the resultant message to the public needs to be done. Would the focus on primary schools as demonstration sites reduce the dependence? Would using less costly materials do it? Water for People demonstrated using these and still there has been on adoption. This kind of analysis needs to be part of whole process, and area specific so that tailor-made support is provided. Uniform treatment should stop.

7.1.3. Special promotion efforts need to be undertaken by the NSWG to bring the Ministry of Education on board. The de-briefing workshop proposed an inter-ministerial half day event, probably involving any parliament committees on education, water, health, and Agriculture, to present the evaluation results.

7.2. CAPACITY BUILDING

The training, demonstrations and sharing events all contributed to the pool of knowledgeable individuals on EcoSan, but it seems like a drop in the ocean. Data on EcoSan coverage, responses from the field and workshop all expressed an urgent need for increased awareness creation. This evaluation also realizes the need but with a slightly different focus:

7.2.1. Capacity building should focus more on attitude change. The realization that trainees need exposure visits to places where EcoSan works well before training and putting up demonstrations should be tried out. Secondly the course contents, design and delivery should all target attitudes as well as providing knowledge and skills.
Demonstrations in the future need to focus on appropriation of structures with specific emphasis on the system function, ensuring that whichever materials and structures piloted the systemic principles work. This should run through the training, demonstrations and promotion messages.

7.2.2. When working with schools, children need to be taught the principles of the system. It was pointed out that school children would effectively influence their parents; but this will only happen if a specific capacity building program is developed and piloted with schools receiving demonstrations, and specific steps towards influencing parents with a rewarding system for children who convince their parents to adopt EcoSan. Opportunities when parents come to schools such as parents' days, or other events should be used to educate parents, distribute fliers with information on the systems, the principles, practices and benefits of EcoSans. A monitoring and tracking system needs to be developed, that would involve the teachers and pupils in monitoring progress towards adoption of EcoSans at household levels.

7.2.3. The capacity building curriculum by the node should clearly show the fears related to the different sanitation systems and the benefits to agriculture. The design and delivery of the training in the different parts of Uganda should be based on statistical data from districts on the coverage, water born disease prevalence, the associated costs of treatment and diversion of household labor to look after the sick, etc. All these will be necessary for people to appreciate the health and cost implications of their sanitation choices and practices.

7.2.4. The training and follow up programs should have a clear promotion intent, milestones to be reached and accountability to be provided. Experiences of the Healthy Sector in Mukono point to the need for proactive promotion through community meetings, repeated launches until change happens. Trainees need capacity in facilitation skills to initiate community discussion forums to assess social and structural issues affecting adoption, to deal with cultural and religious biased.

7.2.5. During training there is need to discuss, specify and share roles. The follow up activities by the node should monitor promotion and any other roles agreed upon. The roles of Districts and sub- counties in providing leadership and support should be emphasized. And because the recommendation is for agencies to take up their responsibilities, the selection of who attends from an office is essential. The node needs to target decision makers as well as implementers. In Mukono where the DHI and community level officers participated, already there were promotional efforts.

7.2.6. It was observed that at demonstration sites, it was not the trainees that talked to visitors, which raised the question of the quality of messages being passed on, and whether the right emphasis was placed on the real issues. The Node needs to equip trainees with TOT skills since demand for training from the communities is high. Secondly a specific information sheet for promotion needs to be developed, basing on questions people would ask, and highlighting the principles and practices that would maximize benefits. Translation of these into local languages would make them more user-friendly.

7.2.7. Once the training program is re-designed to address all the above, re-training of masons and demonstration managers should be carried out. The emphasis should be the systems not structures; affordability and efficiency not class and appearance. These should also be equipped with marketing as well as facilitation skills to enable them promote EcoSans confidently and correctly.

7.3. RESEARCH

Demonstrations sites in this phase have been useful in awareness creation and revealing some structural and social aspects the design of the structures had missed. The religious issue of washing by Muslims, the gender issues of handling of pads, pampers and condoms would not have been revealed if it was not for the demonstrations. The proposal to damp these in the toilet only to be sorted later could be problematic among people whose attitudes towards empty EcoSan units and handling humanure was still negative.

7.3.1. There is therefore need for a multi-stakeholder think-tank to explore options, opportunity and information to address some of these challenges: the gender and other social issues, e.g. PWD; structural and economic. The think-tank should include private sector as well as development agencies, and should be linked to ATC, that would then pick up the suggestions, carry out Action Research to generate sanitation options.

7.3.2. The key research issues proposed in this review should be followed up.

- The Node needs to forge formal relations with Makerere School of Engineering and Faculty of Bio-chemistry to share topics for research that students and other researchers can take up. Joint proposals can be developed with these departments to tap into academic portfolio resources.
- The Node needs to reach out to new initiatives as knowledge managers and disseminators: Bio-Chemistry faculty has launched a second project to follow up on BIO-EARN, Bio-Innovate that is looking at generating bio-gas from animal dung from slaughter houses. The node needs to follow these closely and collaborate with them in order to take up information and to disseminate it among stakeholders. Also similar innovations can be tried out with EcoSan products. Wakiso District respondents talked of bio-digesters using animal dung, but that can be linked to EsoSan toilets. All these will provide valuable information that the Node needs to collect and inform others in the sector.
- The Node needs to forge a formal working relationship with NARO and NAADS, to influence research on external inputs and overall food safety and food security. Research on the reuse of human excreta

from hospitals, and effects to chemicals from medicines on crops would best be handled by NARO. NARO has appropriate laboratories and the expertise.

NB: Some respondents were of the view that all hospital products should be incinerated, sterilized and destroyed for safety measures.

7.3.3. Most of the literature quoted by the sector is from outside of Uganda. The Node needs to document facts and figures on the evolution and practices of EcoSan in Uganda, coverage and types of EcoSan toilets, pocket of good practices, challenges and mitigation efforts. Stakeholders are looking to the Node as a one-stop-center of information on EcoSan in Uganda, and the Node needs to be able to provide quality, accurate and up-dated information.

7.3.4. The node and its AC should start fundraising for a research grant on EcoSan to not only fills the information gaps, but to support research on specific topics that address pollution, diseases and opportunities for agriculture.

7.3.5. The database of expertise the node should have a section on researchers from institutions such as NARO, ATC and Makerere, who can be called upon to partner with ministries to carry out specific research on demand.

7.3.6. Social research to understand the social issues and implications for adoption: land tenure, religion, PWD, is needed. There seems to be deep rooted social issues around EcoSan adoption than just the use of the structure and humanure. Watching several channels of Television in Uganda, one is bombarded with an overwhelming sense of superstition, belief and practices related to Spirits. The demonstration site in Bulondo adjacent to a cultural site and numerous people, rich and poor frequent that place. Social research to better understand and deal with cultural beliefs around sanitation behaviors of communities is needed. Not so much to change culture but essentially to appropriate the promotion messages and the structures.

7.3.7. The evaluation observed that EcoSans built in schools were well managed while those build in other public places, and in congested areas were abused. One recommendation from CIDI was to limit the numbers of users to 6-8, which does not make sense if a school with 240 pupils maintained theirs. The issues could not be so much the numbers as it is the number of heads. At household level, there is often one head in charge of the EcoSan, as well as in schools - there is also one recognized authority. The case of slums where several households use the same facility presents as many heads as there are households. The public places are worse because every user becomes a head in themselves. This is a research hypothesis that the node could explore through social research to assess the link between the numbers of “heads” and O&M of a facility. This will help inform subsequent packaging of EcoSan promotion messages.

7.3.8. Every community is unique. The recommendation for social marketing of EcoSan should be informed by well researched and proven social data. For instance research on the relationship between the wealth of a household and its sanitation facility, how to link EcoSans to status and influence, social terms and sayings that send deeper messages, interpretation of words and actions, etc need to be done to inform the social marketing.

7.4. KNOWLEDGE MANAGEMENT

This component takes up from research, to organize, manage, package and disseminate information.

7.4.1. Several respondents in this review recommended the use of mass media to create wider public awareness. The program has used these over this period but as one-off events. The media advances in Uganda and the affordability of radios and TVs by more household, presents an opening for information dissemination. There is however need for careful development of the messages to be aired or published. Several options to be used include

- Talk shows with questions and answers sessions
- Regular news articles
- Documentaries
- Advertisements
- Drama

Each one of these approaches should be driven by a unique message and pre-determined desired results. The secret to success is to involve those who have benefited as much as possible.

7.4.2. The promotion of EcoSan rightly flags the use of humanure as one of the valuable benefit. Adopters have run with this message, constructed several structures without planning for re-use. The assumption that there are groups ready to take the manure has been disproved and many facilities in some areas have ended up dumping the manure in bushes. Agriculture in Uganda also faces the same challenge of producing for an UNKNOWN market. However there are now initiatives for instance in the banana sector for tele-marketing, and contract farming (Kabahenda and Kapiriri, 2011). The main principle is for farmers to produce specific crops, quantities and qualities for an already defined market.

- An inventory of all users of EcoSan products needs to be done by district. This information should feed into the Node databank as possible markets for products. This information will be useful for the research component on food safety as well as the capacity building component on safe handling and actual benefits from humanure application
- Before demonstrations or scaling up of EcoSan, an inventory of who would use the product in the locality needs to be carried out, and the EcoSan users made aware of the quantities and quality. Experience from Biina Primary School showed that while sanitary pads buckets are provided, pupils still damped them into the pit. Upon emptying, users of the product noticed pads and were concerned. Such humanure qualities aspects need to be discussed with those who will take the products.

7.4.3. Several promoters of EcoSan have realized the need of the O&M manual. While there could be lots of guidelines, there is need for two types of O&M manuals: training as well as implementers O&M manuals. This is essential in sanitation because the owners of the knowledge are not often the managers. For public places, poorly paid people are assigned to manage the facilities, who may not be respected by users and as such the instructions they provide not followed. A simple training manual given to trainees to equip the facility managers that include users' guidelines and maintenance practices is essential.

- The node needs to first assess the O&M knowledge and practiced out there so that the manuals targets the weaknesses, gaps as well as strengths and innovations.

- The node needs to facilitate collaboration among all those who intend to produce these manuals. This will prevent the danger of sending mixed messages, and duplication of efforts by the sector

7.4.4. Different communities of would-be users of EcoSan need tailored messages; urban dwellers who may have no need for manure; farming communities that need to complete the ecological loop; those in problematic areas such as rocky or high water table. The training and promotional messages must be targeted. The packaging of information for the different communities should be based on research findings on the social as well as geo-physical factors of a locality.

7.4.5. While the website exists, is operational and the Node has uploaded all documents, it seemed to the evaluation that the few users who tried getting information could not find the information they were looking for.

- The Node needs to review the page and make the information and locations more accessible to users

- Researchers are interested in having their papers published and referenced. The Node needs to carry out a survey of other users specific needs, and tailor the page to address these needs. For instance there could be a section for research papers, as opposed to summarizing these as part of workshop results, and notify users wherever new information is posted. Then more researchers would be attracted to the Node.

- Other sites have "mostly asked questions and answers". The Node over time should analyze the most asked questions and provide answers so that whoever visits can access this information. And periodically update the fact sheets to keep up with the trends of questions asked.
- Lots of emailing has been used to disseminate information. A link to the webpage should be provided first and foremost, specific request made for those who have challenges accessing the documents to provide feedback to the node. This will help the Node monitor the accessibility of the site, ensure that stakeholders go there and get feedback from users on the ease or challenges of negotiating the website.

Annex 1: REFERENCES

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Annex 2: Field level Respondents.

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