

INTRODUCING ECOLOGICAL SANITATION IN RURAL AND PERI-URBAN AREAS OF NORTHERN MOÇAMBIQUE

Edward D. Breslin, Country Representative, WaterAid – Moçambique, CP 276, Lichinga, Niassa Province, Moçambique. Wateraid-mz@teledata.mz

And

Feliciano dos Santos, Director, ESTAMOS, CP 174, Lichinga, Niassa Province, Moçambique. Estamos@teledata.mz

1. Introduction

Sanitation is at a crossroads in Moçambique. The “Improved Latrine” (“Latrina Melhorada”) has historically been promoted by government and donors as the minimum level of sanitation service allowable in the country. The “Improved Latrine” has consisted of a SanPlat latrine slab placed over existing traditional latrines or over newly excavated 3-metre pit latrines. The government and donor subsidised SanPlat slab was correctly promoted for its low cost, ease of cleaning and small squat hole that prevented children from falling into the pit. Unfortunately, alternatives to this system were not considered or promoted. SanPlats were built at slab construction centres slabs in cities and small towns throughout the country, and at least in Niassa had almost no impact on rural communities.

Despite some successes, this initiative has faltered considerably with the suspension of donor funds. Many slab construction centres like the one in Lichinga, the Provincial capital of Niassa Province, have effectively closed or are only being sustained by emergency funds transmitted to construction centres in a random manner. The future of these centres is uncertain but all evidence suggests that they will eventually be closed.

Ironically, this is occurring at a time when awareness of the importance of sanitation is growing, particularly at the Provincial level in Niassa. Interest in sanitation has grown in Niassa as diseases such as cholera and diarrhoea continue to undermine local health, and as water sector agencies have more clearly recognised the limitations of development interventions that focus solely on water supply.

The collapse of the country’s centralised slab-construction programme has left the sanitation sector somewhat uncertain about how to move forward. Sanitation policy is currently unclear, particularly at Provincial level. It is into this policy environment that ecological sanitation has been introduced with considerable and, to some people, surprising success.

ESTAMOS, a Mozambican water supply, sanitation and HIV/Aids prevention/education NGO, and WaterAid, a British water supply and sanitation NGO, have spent the last 18 months integrating environmental sanitation into their field

work in Niassa Province.¹ Communities participating in sanitation initiatives are, among other things, given a range of options to consider when attempting to improve their sanitation situation. Instead of continuing with a “one size fits all” policy, ESTAMOS and WaterAid-supported initiatives allow families to choose between “Improved Latrines” and EcoSan systems. Importantly, people consistently prefer ecological sanitation to others when offered a choice.

This paper focuses on ESTAMOS’ and WaterAid’s sanitation work in Niassa Province. Niassa Province is located in the northwest corner of Moçambique and is the most sparsely populated Province in the country. The Province is characterised by poor infrastructure, a weak cash-based agricultural economy, and political and social isolation. The programmes under discussion are operating in two (2) rural districts and within the peri-urban context of Lichinga.²

This paper explores the key lessons learned from the ESTAMOS and WaterAid-supported sanitation initiatives in Niassa Province. The following section provides insights into the cultural acceptability of EcoSan in Niassa. A section follows this on the methodologies used to introduce EcoSan into Niassa. Section Four explores why many households are choosing Ecological Sanitation over better promoted alternatives like “Improved Latrines”. Section Five concentrates on key M&E results from the field that are guiding future sanitation work in the Province. The final section offers some conclusions for consideration.

2. Cultural barriers to EcoSan?

Initial concerns among sector role players that Ecological Sanitation would be culturally unacceptable to the vast majority of Niassa residents are eroding over time. Recently, ESTAMOS has learned that many families in Niassa, and particularly in places like Mandimba and Lichinga, have planted trees, pumpkins, and a range of vegetables like tomatoes on abandoned pit latrines (the planting of banana trees on disused pit latrines is a common practice in neighbouring Malawi. See Breslin, Kelleher and Sugden 2001 for details on this, as well as Msomphora 2001 and SAMiNET 2000). These products are eaten without reservation, although people are somewhat reluctant to talk about this practice in public gatherings. The consumption of agricultural products grown on abandoned pit latrines strongly suggests that potential “cultural concerns” regarding food grown with human excrement are not grounded in the reality of community practice in Niassa.

¹ WaterAid is providing technical and financial support to the Provincial Department of Water and Sanitation (DAS) who have overall responsibility for water supply and environmental sanitation in the Province. WaterAid field support for water supply and environmental sanitation is concentrated in the districts of Maúá and Nipepe, where WaterAid is supporting DAS and the District Directorate of Public Works and Housing (DDOPH – Maúá and Nipepe) in their efforts to implement the government’s National Water Policy and draft “Implementation Manual”. ESTAMOS works in Mandimba and Lichinga Districts. ESTAMOS receives funds from a range of donors including WaterAid, and its watsan programmes are guided by Mozambique’s National Water Policy and draft “Implementation Manual”.

² For a discussion of how the programme is being implemented in Lichinga, see Breslin 2001.

Linked to the above is the acceptance of a small number of Arbour Loos (see Box 2) at family agricultural plots in Niassa. Farmers understand that a shallow pit latrine, which will be used for the 3-4 months that a family lives on their “machamba” (agricultural field), can be turned to productive purposes by planting a tree on the pit as the family gets set to return to their permanent homes. The idea of fruit orchards at family “machambas” is an idea that is slowly growing in some parts of Niassa.

In addition, farmers throughout Niassa experiment with and use compost. This is important in an environment where access to agricultural products like soil conditioners and fertilisers are limited. Farmers use a variety of organic materials for compost, and this has included animal faeces (particularly goat) and at times human excrement. The use of human excreta for agricultural purposes is not widely discussed for a range of cultural reasons, but it is evident in a number of places where ESTAMOS and WaterAid are working.

Importantly, Niassa is a Province of diverse religious communities, but Islam is the religion most widely practised in the Province followed closely by Christianity (Catholicism predominates among Christian denominations). To date, ESTAMOS and WaterAid have not encountered objections to the use of (and handling of) transformed human excreta by Muslims or Christians. A large number of Muslim families in Lichinga have EcoSan systems, and none have expressed reservations about applying transformed human excreta to their fields.

These insights suggest that Ecological Sanitation, while new at one level, is something that is both grounded in local practice and acceptable to many despite the initial reservations of some health officials and sector professionals who found the concept of using human excreta for productive purposes problematic. Their concerns,

primarily surrounding the safe use of human excreta, have subsequently abated over time, as will be suggested below.

Box 2: The Arbour Loo

The **Arbour Loo** is a simple ecological sanitation system that does not require families to directly handle transformed excreta. A latrine slab covers an unlined pit, and a moveable superstructure surrounds the pit. It should be noted that 60 x 60 square SanPlat slab are proving to be an excellent slab option for the **Arbour Loo**. Soil/ash mixtures are included after each use to facilitate the transformation of the excreta. The slab is removed once the pit is two-thirds full and the pit is topped up with garden compost, kitchen wastes and/or soils. The contents are then watered down and a young tree is planted the following day. Trees currently being tested in **Arbour Loo**s in Niassa include guava, mango, orange, avocado, as well as a range of local fruit trees. See Morgan 1999 and 2001 for further details on the **Arbour Loo** and other EcoSan systems being tested in Zimbabwe and elsewhere.

3. Methodologies applied in Niassa

A strange debate about the respective values of participatory methodologies versus social marketing techniques is occurring in some circles. This debate is largely academic, as most practitioners employ a combination of social marketing and participatory processes at field level.

In Niassa, ESTAMOS uses a range of techniques at community level. Communities involved in water and sanitation initiatives are taken through a Participatory Hygiene and Sanitation Transformation (PHAST) process that helps communities decide what key water and sanitation problems they would like to address (the process is described in detail in Breslin 2001).

Moreover, ESTAMOS has used local radio to considerable effect. Interest in EcoSan was enhanced in Lichinga through a series of radio interviews with a woman who had received a Fossa Alterna, and who spoke eloquently about the numerous advantages of the system over her previous “Improved Latrine”. She spoke about how her toilet no longer smelled and was fly-less. She spoke with pride about how her neighbours admired her new latrine, and how she will one day transform her yard with the compost produced in the latrine. The radio show continued for a few weeks, with listeners asking for more details about these new latrines.

Finally, ESTAMOS has made great use of demonstration latrines. Model **Fossa Alternas** have been built throughout Lichinga and Mandimba. In addition, four **Arbour Loo** models were constructed for a weekend festival in Lichinga that drew hundreds of people over a 2-day period. An **Arbour Loo** was also planted at an agricultural demonstration plot. Guava planted in an **Arbour Loo** was initially tested at this agricultural station, and the results were impressive as the guava plant outgrew older guava plants on the farm within a period of six (6) months. Farmers showed interest in Arbour Loos but the agricultural station is unfortunately now closed.

Communities interested in sanitation send representatives to these demonstration facilities, and are given the opportunity to talk to owners about their new systems. As will be discussed below, the latrines “sell” themselves in many ways, and have led to considerable demand for Ecological Latrines in both Lichinga and Mandimba.

In Maúa, interest in EcoSan is also considerable. Like ESTAMOS, a local team of community activists supported by DAS, DDOPH – Maúa and Nipepe and WaterAid are introducing sanitation through the PHAST methodology. Sanitation ladders are used at community level after a series of PHAST exercises about health and hygiene issues. Families are given a range of technical choices to consider, and advantages and disadvantages of each system are explored with residents.

Demonstration models have been built at 2 locations in Maúa – in Maiaca and Maúa Sede. In Maúa Sede, these models have included **Fossa Alternas**, “Improved

Box 3: Formal Applications for Latrines in Maúa (as of October 2001)

Fossa Alternas = 242 formal applications

“Improved Latrines” = 149 formal applications

“Improved Traditional Latrines” = 151 formal applications

Note: These have still not been constructed

Latrines” and “Improved Traditional Latrines” which consist of a thin layer of cement over and around the squat holes of existing traditional latrines to facilitate better sanitation hygiene on existing infrastructure. As has been the case with ESTAMOS, community groups from villages in Maúa who are interested in sanitation are brought to see existing latrines.

Radio has been less effective in Maúa than in Lichinga and Mandimba. As a result, the programme in Maúa is exploring local drama to reinforce messages on sanitation in general, and EcoSan management in particular.

Box 4: Number of Latrines Actually Constructed in 2001 (as of 10 October 2001)

Maúa Sede – 21 **Fossa Alternas**, 8 “Improved Latrines” and 6 “Traditional Improved Latrines”

Maiaca – 18 **Fossa Alternas**

Lichinga – 37 **Fossa Alternas**

Mandimba – 38 **Fossa Alternas**

Metangula – 5 **Fossa Alternas** and 3 “Improved Latrines”. Note: all 8 families who originally wanted an “Improved Traditional Latrine” have asked for a **Fossa Alterna** instead after actually seeing these latrines

It should be noted that the approach used by ESTAMOS and WaterAid partners in Maúa is now having an impact beyond these particular programmes. In Metangula, a sanitation programme has also been initiated using PHAST, demonstration models and some radio. The response to EcoSan has been considerable, and the number of formal applications for **Fossa Alternas** is expected to exceed 100 by the end of this calendar year. Applications for other systems are at present at zero.

4. Why EcoSan over other alternatives?

But why is there such support for EcoSan in a Province that has, for years, learned of only one sanitation alternative? The reasons are varied but important for a full understanding of the potential for EcoSan in Niassa and perhaps elsewhere.

First, families who are now using **Fossa Alternas** consistently suggest that the absence of flies and the lack of odour are considerable advantages of EcoSan systems over “Improved Latrines” and “Improved Traditional Latrines”. Most conventional pit latrines in Niassa have offensive odours and are full of flies. Many also house mosquitoes in the superstructure given the moisture that is evident in many “closed”

Box 5: Formal Applications to ESTAMOS for Latrines (as of October 2001)

Mandimba – 108 **Fossa Alternas** and 0 “Improved Latrines”

Lichinga – 56 **Fossa Alternas** and 0 “Improved Latrines”

“Improved Latrines”.³ This has not been the case with the **Fossa Alterna**, even during the rains when management of EcoSan becomes more important and somewhat more complicated as will be discussed below.

Second, families do not have a great deal of space in their yards for toilets, yet EcoSan provides people with a legitimate alternative that addresses this problem. People think of the **Fossa Alterna** as a permanent solution, in sharp contrast to pit latrines that eventually fill and need to be relocated. New latrine sites inside small yards will not have to be found with a **Fossa Alterna**, and people will not have to constantly excavate new 3-metre pits (although they will have to excavate transformed excreta on a regular basis).

As one woman whose family has a **Fossa Alterna** recently stated, “I will have this latrine for the rest of my life. I had no more room in my yard for new pits. I no longer need to worry about space in my yard for new latrines because I will never need to relocate my **Fossa Alterna**”. And it is this sentiment which is proving to be a powerful incentive for people to choose a **Fossa Alterna** over other conventional pit latrines.

Third, EcoSan offers people the potential for added economic value, and this too is proving to be a considerable incentive for people who depend on farming for at least some of their economic well being, and who are generally quite poor. Compost from an ecological latrine can be used for small vegetable plots within a family’s yard, and some are now considering the **Arbour Loo** in their main fields outside of town as suggested above.

As one user comments, “I now have a latrine (**Arbour Loo**) in my machamba (field). During the agricultural season my family can use this latrine which is an improvement on our situation in the past. But what is most important is that we can plant a young tree there at the end of each harvest. In the future we will have many fruit trees because we will make a new pit each year and plant a new tree when we are finished for the year”.

The possibility of using human compost for agricultural purposes is gaining momentum with the first pit excavations. Two pits have now been excavated – one in Mandimba and another in Lichinga. In Mandimba, the first pit had been sealed off for a total of 7 months. It took approximately 1 hour to excavate the pit. When the compost was excavated, the local technician for the Department of Agriculture noted that this was the best compost he had ever seen. The compost was brought to an

³ It should be noted that many families **do not** have closed superstructures. Instead, a wall of bamboo with no roof surrounds most latrines in the Province. This has some advantages (for instance mosquitoes do not reside in the superstructures) but have the considerable disadvantage of **added** smell during the rains (as water enters the latrines) as well as concerns over individual safety as people enter waterlogged or slippery latrines during the rains.

ESTAMOS agricultural plot. ESTAMOS is running field trials now with the Department of Agriculture to test how different vegetables respond to the human compost. In Lichinga, the first pit to be excavated was done so after the pit was sealed for 9 months.⁴ The owner said, “This is incredible. I was worried about this but now I do not have any fear about the compost. I will tell everyone about this”.

Box 6: Existing Subsidy Programme in Maúa

Contribution per family by WaterAid through DDOPH – Maúa and Nipepe:

- 1 Plastic Sheet to line the roof of the superstructure
- 1 latrine slab
- 1 small contribution of cement for bricks to line 30 cms of the pit(s)

Family Contribution:

- Excavate pit(s)
- Buy Bricks for lining pit(s)
- Bamboo
- Straw
- Traditional Cord
- Wooden Poles
- Rocks
- Sand
- Water
- Labour for construction
- Cover for second pit

Note: For “Improved Traditional Latrines”, WaterAid is contributing cement only.

Total Cost of a **Fossa Alterna** - ~US\$18 – 27 (depending on locale)

Total Cost of “Improved Latrine” - ~US\$13-20

Total Cost of “Improved Traditional Latrine” - ~US\$4

ESTAMOS’ subsidy includes bricks

Interest in EcoSan has subsequently grown as people have seen that the contents of the pit do in fact transform (there is no evidence of faeces for instance and the humus smells like dirt), and fears about excavating unprocessed faeces have diminished considerably.

Fourth, the concepts behind ecological sanitation make sense to people, as these concepts are simple and easy to understand, especially with demonstration models in place. People living in Lichinga and Mandimba (but not Maúa) generally have some experience with pit latrines (usually traditional latrines). Including ash/soil mixtures in the process is proving less difficult to do, especially with regular follow-up support as discussed below. Improved management practices are evident over time as people see the value of introducing ash/soil mixtures, as their systems do not smell, do not attract flies, and lack the humidity to entice mosquitoes as is the case with other pit latrines in the area. Moreover, few have said they think the use of excreta is culturally unacceptable – instead many families insist that it is “logical”.

Fifth, there is a growing sense that the shallower pit depths of EcoSan systems will ensure that groundwater is not contaminated. This is an important issue among Lichinga residents and in Maúa Sede, especially as more people link poor health with poor drinking water quality from their household wells. In Lichinga, participatory exercises highlighted residents’ concerns about groundwater contamination, in particular that groundwater enters latrines during the rainy season. Importantly, there

⁴ It should be noted that the two pits described above were used by more than one family, and hence the fill rates were somewhat unusual and faster than we expect for a normal family latrine. In Maúa, fill rates are much slower – greater than one year – because many families spend at least 3-4 months at their “machambas”.

was no evidence of groundwater entering any of the EcoSan latrines during the last rainy season.⁵

The challenge we are facing is that we still have to consider ways to limit the potential spread of pathogens to family water points, as family yards are quite small as stated above. This will mean, among other things, that we have to consider lined and closed pits. The costs of this would be prohibitive with conventional sanitation systems but is reasonable and affordable with EcoSan. Experiments have started in Maúa with new lining designs.

Sixth, latrines in general and EcoSan latrines in particular are proving to be prestigious and a source of some status in project sites. As is common elsewhere, the reasons for latrine acceptance are varied. Families are not primarily interested in sanitation for health reasons, but rather for reasons of status and convenience. People speak about their problems with using “the bush” during the rainy season in particular, and often comment on a greater desire for privacy as a critical factor in sanitation uptake. EcoSan systems are new, and to some degree “exciting” in comparison with other, more established alternatives. Many users refer it to as a “modern toilet”, given its recent arrival in Niassa. This is undoubtedly contributing to the acceptance and increasing demand for EcoSan in the Province.

Finally, interest in EcoSan increased markedly after the rains. This was partially due to the fact that EcoSan systems remained relatively odour free during the rains, and flies did not infiltrate these systems during the humid months of December – April. Most importantly however was that the **Fossa Alternas** constructed before and in some cases during the rainy season did not collapse. In Niassa, many families complain that their “Improved Latrines” and “Traditional Latrines” collapse during the rains, given the soil conditions in the Province. Yet, families with **Fossa Alternas** did not experience these problems while their neighbours’ latrines were collapsing. The reason is that the **Fossa Alterna** is a shallower pit, and therefore on more stable ground, and the first 30 cms are lined with brick. This gives the EcoSan systems far greater stability than can be achieved with 3-5 metre deep conventional pit latrines.

The combination of these factors is, in the end, contributing to increasing demand for EcoSan systems in all the areas where ESTAMOS and WaterAid are working. And evidence from Metangula and parts of Maúa suggests that families may even switch from “Improved Traditional Latrines” and “Improved Latrines”, as they become more aware of the advantages of EcoSan in practice.

⁵ Discussions have started with the Robens Centre for Public and Environmental Health (UK) to monitor groundwater quality at some project sites over the coming years to evaluate whether groundwater is still being contaminated **even though** it is not entering EcoSan latrines.

5. Key lessons learned through on-going M&E

ESTAMOS in Lichinga and Mandimba and WaterAid's partners in Maúá have included an on-going M&E programme as a central part of this initiative. On-going M&E, which is often neglected in water and sanitation programmes throughout the world, is providing critical information that is strengthening our understanding of sanitation in the Province.

The sanitation M&E programme occurs every 3-5 months and focuses on whether sanitation systems are being used and managed properly. Problem areas are identified at household level and across households, which then informs our thinking on hygiene education and technology modifications.

When we started, a number of problem areas were identified. First, a considerable number of households had odour problems because they were afraid to fill their pits too quickly and therefore were not including enough soil/ash after each use. They would put a small handful of ash/soil down the pit, which never covered the excrement. This behaviour has since been modified in Lichinga and Mandimba where smells have been reduced or eliminated altogether.

As Box 7 suggests however, the problem is somewhat different in Maúá. In Maiaca for instance, many families are using only small quantities of ash. We have been able to modify this behaviour slightly because the two (2) families who are using larger volumes of both soil and ash after each use do not have the same problems of odour as the families using small quantities of ash only. Continuous follow-up has been required in Maiaca and Maúá to ensure that the systems are being managed properly. Sanitation coverage is very low in Maúá. As a result, many families are modifying their behaviour quite considerably as they start to use toilets. Including soil/ash after each use is one of many new behaviours that are being learned and applied. Additional time and support is therefore needed.

We have also worked to allay fears that the latrines will fill too rapidly and thus do not allow enough time to pass for the latrine contents to transform into compost. We are deepening the alternating pits from 1.3 metres to 1.5 metres. This has proven to be important because the first sets of **Fossa Alternas** that we built were filling too quickly. One family filled their first pit in less than 6 months. The reason for this is that neighbours were using these latrines as well. So, three families were using a latrine designed for a family of seven.

We have also learned that men do not use the **Fossa Alterna** when they need to urinate only. Instead, they urinate in the bathing area adjacent to the latrine, and this can cause offensive smells. We are now considering urinals in the washing area as well to reduce smell and to divert urine away from the system as a whole.

We have also discovered that EcoSan requires greater management and care during the rainy season, when Niassa Province as a whole becomes quite damp. Families have a difficult time identifying dry soil to include in the ash mixture, and we are finding that ash alone does not kill smell as effectively as ash/soil mixtures as suggested above. It should be remembered that the smell associated with conventional toilets increases as well during the rains, and that a well managed EcoSan system is certainly less odorous than its alternatives.

Importantly, in Maúa we are finding that handwashing is probably increasing. Families generally have a gourd of ash or soil/ash in the latrines, but few actually use a cup to scoop the ash or soil/ash mixture. They use their hands. Afterwards, families believe their hands are dirty from the soil/ash, and therefore are washing their hands. This is something we did not consider when starting the programme, but we are discovering that it is a positive, if unintended spin-off. Ash and soil of course are excellent cleaning agents as well, which is an added benefit for the families who can not afford soap.

One issue that has recently emerged in Lichinga is of considerable importance. Many of the families who have invested in a **Fossa Alterna** also have a conventional pit latrine. Our assumption was that these conventional pit latrines would be closed once the **Fossa Alternas** were implemented. ESTAMOS has recently learned that this is not the case. Families cite two reasons for this practice. First, it appears that mothers and fathers are the only ones using the **Fossa Alternas** in Lichinga. Children are using the family's first latrine. The reasons stated by parents seem to be two-fold. First, cultural norms suggest that children should not use the same latrine or washing area as parents. Second, many parents do not want the children to "soil" their **Fossa Alterna** (perhaps again because it is viewed by many as something "modern" and prestigious). Families want to show neighbours their latrines, and want the latrines to be clean. It is believed that a reconsidered health and hygiene programme targeted at parents and children will help alleviate this problem over time, although the cultural norms discussed above will certainly be more complicated to address.

The second reason is certainly more complicated. Many people in Lichinga believe in various forms of "witchcraft". One common way to "bewitch" a family is to place

Box 7: M&E Results from Maiaca (September 2001)

All 18 latrines constructed were visited in September to evaluate use and maintenance practices. Key results were:

- Evidence that latrine is being used – 100% (18 out of 18)
- Household includes ash and soil after each use – 11% (2 out of 18)
- Household only including ash after each use – 89% (16 out of 18)
- Household has cover over second pit – 39% (7 out of 18)
- Evidence of handwashing – 89% (16 out of 18). Verified by soap and water available in the latrine and evidence that soap is being used
- Slab is free of faeces and urine – 83% (15 out of 18)
- Percentage of First Pits that have been filled – 0% (0 out of 18). Two pits are over three-fourths full. The rest are either half or a quarter full

“medicine” in someone’s toilet. This is a cause for concern among those who intend to use the transformed excreta for agricultural purposes. Although it is rarely talked about, many seem to fear the insertion of “bad medicine” in their latrines by an angry visitor. As such, many families (not all) are showing people their latrines but not actually letting visitors use them, as they want to “protect” their transformed excreta. As such, many families simply tell visitors that they may use the previous toilet. The problem is that many of these conventional pit latrines should be closed off because they are certainly contaminating the groundwater. The challenge will be to address this problem, which again will be complicated.

Finally, we have noted a slowing of latrine construction in some parts of Niassa. The reason seems to be quite simple – government has correctly asked communities and families to contribute to their own development. This takes the form of cash and material contributions. Yet Niassa is poor, and the ability of families to actually make contributions for both improved water systems and family latrines at the same time is stretching already limited family resources. Many people in Niassa still believe the greatest threat to family and community health is contaminated water. As such, they are investing in improved water supply over sanitation at this point. ESTAMOS and WaterAid have therefore decided to continue working in participating villages for a further 1-2 years to allow families to invest in services over time. This is logical but in many respects unusual in Moçambique and elsewhere. Importantly, ESTAMOS is now experimenting with a range of targeting mechanisms that target demonstration latrines to families identified by communities as those who are least likely to be able to participate in such programmes because of poverty (such as widows and single mothers with weak social support networks).

These problems are becoming evident through constant M&E. Importantly, the M&E system is also producing a range of positive results. We know that people like their systems and that they generally show them off to neighbours. We know that families are keeping their latrines extremely clean (free of urine and faeces) in places where children and adults are allowed to use the same system (like Mandimba, Maúa and Metangula). Ash/soil mixtures are present within toilets and ash/soil mixtures are being included after every use. Well-managed latrines have limited smell (if any at all) and do not have flies. We have successfully intervened in areas where this practice was not being done correctly and we know that the systems are being used correctly. The second pit is covered in Lichinga and Mandimba so we are no longer worried that children will hurt themselves inside the latrine (this issue is being addressed in Maúa, as it is part of the family’s contribution to their systems). We also know that some pits have filled quickly while others – which are not being used by neighbours – should take about 12-15 months to fill. We know that groundwater did not enter **Fossa Alternas** during the last rainy season in any of the areas where we are working as well.

The question that remains is whether people will actually excavate their pits once the faeces and urine have been converted to compost, and once the second pit is full. None of the participating households have expressed concerns or fears about this eventuality and recent excavations have certainly allayed people's "unstated" fears. But we will only know if people will actually excavate their first pits once the second pits fill. And we will also need to find out if people will excavate deeper pits (1.5 metres) or stop after the first metre.

6. Conclusions

ESTAMOS and WaterAid are successfully introducing EcoSan into a variety of contexts that have yielded new insights into the potential for EcoSan in a country like Moçambique. Evidence suggests that EcoSan is a viable option in Niassa, and that many families prefer EcoSan over better promoted alternatives. We have shown that EcoSan is a viable option in peri-urban as well as rural contexts, and we have evidence to suggest that many people will invest in EcoSan systems even if they already have a conventional pit latrine.

A number of factors have contributed to the successful introduction and expansion of EcoSan in Niassa that may be relevant for others working in Moçambique and beyond. First, the use of participatory methods and social marketing tools seems to provide a good mix that should be promoted elsewhere. Designing programmes that allow people to explore their realities more effectively (with participatory methodologies) combined with a social marketing approach that uses different mediums of communication (radio, drama, and visits to demonstration latrines) to reinforce knowledge seem to enhance the programme considerably.

Second, on-going M&E has proven to be critical in at least two ways. ESTAMOS in Lichinga and Mandimba and WaterAid's partners in Maúa have been able to identify problems and intervene rapidly at household level. As such, we have not simply forged ahead while problems emerged that could, in the end, destroy the initiative. Our goal is broad sanitation coverage, but we know that coverage is meaningless if the systems are not used correctly. The key in our view is to ensure that we have a solid base from which to build a larger programme.

Furthermore, on-going M&E has created a proper learning environment within ESTAMOS and WaterAid. We are learning a great deal about how EcoSan is applied because we are constantly monitoring our work. We are finding that a series of problems seem to emerge consistently across projects (like using small quantities of soil/ash to extend the life of the latrine) and that we are now addressing those problems more effectively at the start of a project. We are reconsidering and consequently strengthening our health and hygiene initiatives because we are learning what is working and what is not in practice.

And finally, ESTAMOS and WaterAid are offering communities choice. Our goal is to ensure that families throughout Niassa have sanitation systems that contribute to better family and community health. Yet we do not want to make the mistake that has plagued the sanitation sector internationally – offering communities and families one choice that is deemed by “sanitation experts” and policymakers to be the only true option. Mozambicans have for years been offered one choice, and while that choice suited many people (and had a considerable impact) it did not suit others. South Africa and Zimbabwe considered the VIP to be the only option for rural people yet policymakers and practitioners in both countries are now trying to undue the damage of the “one size fits all” approach as their sanitation programmes struggle financially and institutionally.

EcoSan practitioners and advocates run the same risk. EcoSan advocates are walking a fine line when they dismiss other options, and should instead be challenging others to include EcoSan as a legitimate sanitation alternative in programmes that currently do not include EcoSan. Instead of creating conflict by claiming that VIPs and SanPlats are somehow second rate options, EcoSan practitioners should be promoting choice, and ensuring that communities are well informed about the strengths and weaknesses of all sanitation options.

To do this, the EcoSan community needs to acknowledge that pit latrines have saved millions of lives worldwide, and are a safe alternative for many. In Maúa for instance, many families are choosing conventional pit latrines over EcoSan because they do not want to handle excreta. These people live in areas where the groundwater table is quite deep and below thick layers of soil, clay and rock. The threat to groundwater contamination in these areas is therefore minimal to non-existent. We would be doing a disservice to these families if we simply dismissed their legitimate concerns about the handling of transformed faeces and urine. We would be saying, in effect, that people with legitimate concerns about faeces management could not be part of a broad sanitation solution. The impact would be clear – these families would disengage from sanitation initiatives that did not meet their needs and would continue to be exposed to harmful pathogens simply because the vision of sanitation practitioners is so narrow, biased and borders on the arrogant. EcoSan sadly runs the risk of being a cult within the sanitation community, and EcoSan could be isolated for all the wrong reasons because of its “cult status”.

What we are seeing in Niassa is that people can make informed choices, and the end result is what we all seek – a reduction in the number of people worldwide without adequate sanitation. EcoSan can stand on its own merits without the need to condemn other technologies. Families in Niassa are choosing EcoSan over others, and this is powerful on its own. Our approach is to let people decide, and to marvel at the fact that so many in Lichinga are choosing EcoSan over their better known comrades.

Acknowledgements

The authors wish to thank the following people for their invaluable support in the development of this and other EcoSan papers and their immense contributions to the development of EcoSan in Niassa:

- The staff of ESTAMOS
- The Niassa Department of Water and Sanitation (DAS)
- DDOPH – Maúa and Nipepe
- Nick Burn
- Peter Morgan
- Lindsey Breslin
- Ana Jamia Mapira
- Rita Waite
- Ron Sawyer
- Vicky Blagbrough
- Steve Sugden
- John Kelleher
- Virginia Roaf
- Ingvar Andersson
- Steve Esrey
- The Mvuramanzi Trust (Zimbabwe)

References

- Breslin, E.D.** (2001). "Introducing Ecological Sanitation: Some Lessons from a Small Town Pilot Project in Moçambique". Paper presented at the Stockholm Water Symposium 2001 and forthcoming in ***Water, Science and Technology***.
- Breslin, E.D.; Kelleher, J.; and Sugden, S.** (2001). "EcoSan: An Old Approach Re-Applied" in ***Oasis: The WaterAid Journal***, Autumn/Winter 2001, pp. 8-9.
- Msomphora, M.** (2001). "Ecological Sanitation in Malawi: Experiences and Traditional Practices". WaterAid – Malawi.
- Morgan, P.** (1999). *Ecological Sanitation in Zimbabwe - A compilation of manuals and experiences*. Aquamor Pvt. Ltd, Harare, Zimbabwe.
- Morgan, P.** (2001). *Ecological Sanitation in Zimbabwe - A compilation of manuals and experiences (volume II)*. Aquamor Pvt. Ltd, Harare, Zimbabwe.
- SAMiNET.** (2000). "Update: Eco-Sanitation". WaterAid Southern African Region (Malawi, Moçambique and Zambia).