



Introducing ecological sanitation in northern Mozambique

FIELDWORK REPORT

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Introduction

Sanitation is at a crossroads in Mozambique. The Improved Latrine (Latrina Melhorada) has historically been promoted by both 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 three-metre pit latrines. The Government and donor subsidised SanPlat slab was promoted for its low cost, ease of cleaning and small squat hole that prevented children from falling into the pit. Unfortunately, while this is a valid option, alternatives to this system were not considered or promoted. SanPlats were built at slab construction centres in cities and small towns throughout the country. However, experience in Niassa has shown that they 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 capital of Niassa Province, have effectively closed or are only being sustained by emergency funds given in a random manner. The future of these centres is uncertain but 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 as diseases such as cholera continue to undermine local health, and as water sector agencies have more clearly recognised the limitations of projects that only focus on water supplies.

The collapse of the country's centralised slab-construction programme has left the sanitation sector somewhat uncertain about how to move



Manuel Oragy putting ash/soil mix down his EcoSan latrine in Muita

forward. Sanitation policy is currently unclear, particularly at provincial level. It is into this policy environment that ecological sanitation (EcoSan) has been introduced with considerable and, to some people, surprising success.

ESTAMOS, a Mozambican water supply, sanitation and HIV/Aids prevention/education non governmental organisation (NGO), and WaterAid, a British water supply and sanitation NGO, have spent the last 18 months integrating environmental sanitation into their fieldwork in Niassa Province¹. Communities participating in sanitation initiatives are, among other things, given a range of options to consider when attempting to improve their sanitation. Instead of continuing with a 'one size fits all' policy, ESTAMOS and WaterAid-supported initiatives allow families to choose between improved or EcoSan latrines. Importantly, people consistently prefer EcoSan to other options when offered a choice.

This paper focuses on ESTAMOS' and WaterAid's sanitation work in Niassa Province. Niassa is located in the northwest corner of Mozambique and is the most sparsely populated province in the country. It is characterised by poor infrastructure, a weak cash-based agricultural economy, and political and social isolation. The programmes under

WaterAid – water for life
The international NGO dedicated exclusively to the provision of safe domestic water, sanitation and hygiene education to the world's poorest people.

1. WaterAid is providing technical and financial support to the Provincial Department of Water and Sanitation (DAS) which has 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".



Above, ESTAMOS field worker, Maria de Fatima Luisa Martinho shows Sara Sanudia compost from an EcoSan latrine

discussion are in two rural districts and the peri-urban areas of Lichinga².

This paper explores the key lessons learned from the ESTAMOS and WaterAid initiatives in Niassa Province. It aims to provide insights into the cultural acceptability of EcoSan, explain the methodologies used to introduce it, explore why many households are choosing it over better promoted alternatives like improved latrines, looks at the key results from monitoring and evaluation in the field that are guiding future work and offers some conclusions.

What is EcoSan?

EcoSan methods safely use human waste as compost. By allowing human waste to decompose with a mixture of ash and soil in permanent latrines, space is saved in often small yards, as the pits do not need to be re-sited and local agriculture can also benefit from a renewable source of fertile compost. The composting process breaks down any pathogens in the faeces and so the compost is safe to use to grow food. As dry latrines the system also limits both flies and smells. Two types of EcoSan latrines are typically used:

- The **Fossa Alterna** uses two permanent shallow pits that are partially lined. A moveable latrine slab is placed on the first pit. Soil and ash are deposited into the latrine after each use to facilitate the transformation of the faeces and urine into compost. Once the first pit is full, the latrine slab is moved to the second pit and the first pit is covered with an additional layer of soil and left to compost. When the second pit is full, the contents of the first pit are removed to a secondary composting point or, if enough time has passed, dug out and used directly as compost. The latrine slab is then returned to the first pit, and the process starts again.
- 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. 60 x 60cm square SanPlat slabs 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 soil. The contents are then watered down and a young tree is planted the following day. Trees currently being tested in Arbour Loos in Niassa include guava, mango, orange, avocado, as well as a range of local fruit trees³.

Cultural barriers to EcoSan

Initial concerns that EcoSan would be culturally unacceptable are eroding over time. Recently, ESTAMOS has learned that many families in Niassa, and particularly in places like Mandimba and Lichinga, were already planting 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)⁴. These products are eaten without reservation, although people are 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.

Linked to the above is the acceptance of a small number of Arbour Loos at family agricultural plots in Niassa. Farmers understand that a shallow pit latrine, which will be used for the three or four months that a family lives on their 'machamba' (agricultural field), can be used productively 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 an environment where access to agricultural products like soil conditioners and fertilisers are limited, farmers throughout Niassa experiment with, and use, a variety of materials for compost, including organic materials like 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 is evident in a number of places where ESTAMOS and WaterAid are working.

Niassa is a province of diverse religious communities. Islam is most widely practised followed closely by Christianity – where Catholicism predominates. To date, ESTAMOS and WaterAid have not encountered objections to the use and handling of compost containing human excreta by Muslims or Christians. In fact a large number of Muslim families in Lichinga have EcoSan systems, and none have expressed reservations about this compost to their fields.

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

3. See Morgan 1999 and 2001 for further details EcoSan systems being tested in Zimbabwe and elsewhere

4. See Breslin, Kelleher and Sugden 2001 for details on this, as well as Msomphora 2001 and SAMINET 2000

These insights suggest that, while new at some levels, EcoSan 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 (see Key lessons learned).

Methodologies applied in Niassa

In Niassa, ESTAMOS uses a range of participatory methods and social marketing techniques with communities involved in water and sanitation initiatives. Communities 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 address⁵.

ESTAMOS has also 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 Alternativa, and who spoke eloquently about the numerous advantages of the system over her previous improved latrine. She spoke about how her EcoSan latrine had no flies and no longer smelt. 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 Alternativas have been built throughout Lichinga and Mandimba and in addition, four Arbour Loo models were constructed for a weekend festival in Lichinga which had hundreds of visitors. Communities interested in sanitation send representatives to these demonstration facilities, and are given the opportunity to talk to owners about their new systems. This has led to considerable demand for EcoSan latrines in both Lichinga and Mandimba.

ESTAMOS also made use of an agricultural demonstration plot by planting a guava in an Arbour Loo. The results were impressive as the guava plant outgrew older guava plants on the farm within a period of six months. Farmers showed interest in Arbour Loos but the agricultural station is unfortunately now closed.

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

Demonstration models have been built at two locations in Maúá – in Maiaca and Maúá Sede. In Maúá Sede, these models have included Fossa Alternativas, improved 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. As has been the case with ESTAMOS, community groups from villages in Maúá who are interested in sanitation are brought to see these existing latrines to help decide which would best suit their needs.

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

The approach used by ESTAMOS and WaterAid partners in Maúá 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 Alternativas is expected to exceed 100 by the end of this calendar year. Applications for other systems are at present at zero.

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 Alternativas 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

5. See Breslin 2001 for the full process

BOX 1:

Formal applications for latrines in Maúá (as of December 2002)

- Fossa Alternativas: 432
- Improved latrines: 179
- Improved traditional latrines: 121

Number of latrines actually constructed in 2001 (as of December 2002)

- **Maúá Sede:** 21 Fossa Alternativas, 8 improved latrines and 6 traditional improved latrines
- **Maiaca:** 18 Fossa Alternativas
- **Lichinga:** 93 Fossa Alternativas
- **Mandimba:** 194 Fossa Alternativas
- **Metangula:** 5 Fossa Alternativas and 3 improved latrines. Note: all 8 families who originally wanted an improved traditional latrine have asked for a Fossa Alternativa instead after actually seeing these latrines.

BOX 2: 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 also includes bricks

latrines in Niassa have offensive odours, are full of flies and because there is moisture evident they can also house mosquitoes in the superstructure⁶. 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.

Second, families do not have a great deal of space in their yards for toilets, yet EcoSan provides people with an alternative that addresses this problem. People see the Fossa Alterna as a permanent solution, in sharp contrast to pit latrines that eventually fill and need to be relocated. New sites for latrines inside small yards will not have to be found with a Fossa Alterna, and people will not have to constantly excavate new three 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. But now I no longer need to worry about space in my yard for new latrines because I will never need to relocate my Fossa Alterna”. 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 EcoSan latrine can be used for small vegetable plots within a family's yard, and some are now also considering the Arbour Loo in their main fields outside town.

As one user comments, “I now have a latrine (Arbour Loo) in my machamba. 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. This means that 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 seven months and it took approximately one hour to excavate the pit. When the compost was excavated, the local technician for the Department of Agriculture stated that it was the best compost he had ever seen. The compost was then taken to an ESTAMOS agricultural plot where field trials are being run with the Department of Agriculture to test how different vegetables respond to human compost. In Lichinga, the first pit was excavated after the pit was sealed for nine months⁷. On seeing the compost, which smells like dirt and did not resemble human excreta at all, 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”.

Interest in EcoSan has subsequently grown as people have seen that the contents of the pit do in fact transform and fears about excavating unprocessed faeces have diminished considerably.

Fourth, the concepts behind EcoSan make sense to people, as they 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. Including ash/soil mixtures in the process is proving relatively easy, especially with regular follow-up support. Over time, as people see the value of introducing the ash/soil mix, when their toilets do not smell, do not attract flies and lack the humidity to entice mosquitoes, the management practices continue to improve. Moreover, few have said they think the use of excreta is culturally unacceptable – instead many families insist that it is simply logical.

Fifth, there is a growing sense that the shallower pit depths of EcoSan latrines will ensure that groundwater is not contaminated. This is an important issue among residents of Lichinga and Maúa Sede, especially as people link poor health with poor drinking water from their household wells. In Lichinga, participatory exercises highlighted residents' concerns about

6. 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 has 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.

7. 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 three to four months at their “machambas”.

groundwater contamination, in particular that groundwater enters latrines during the rainy season. There was no evidence of groundwater entering any of the EcoSan latrines during the last rainy seasons.

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

Sixth, latrines in general and EcoSan latrines in particular, are proving to be a source of some status and prestige 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. In particular people speak about their problems with using the bush during the rainy season and often comment on a greater desire for privacy. EcoSan latrines are new, and to some degree exciting in comparison with other, more established alternatives. Given its recent arrival in Niassa many users refer to it as a modern toilet and this is undoubtedly contributing to the acceptance and increasing demand for EcoSan in the province.

Finally, interest in EcoSan increased greatly after the rains. This was partially because EcoSan latrines remained relatively odour free during the rains, and flies did not infiltrate during the humid months from December to April. However, most importantly Fossa Alternas constructed before, and in some cases during, the rainy season did not collapse. Given the soil conditions in Niassa, many families complain that their improved and traditional latrines collapse during the rains. But because Fossa Alternas have shallower pits and the first 30cms are lined with brick EcoSan latrines have far greater stability than can be achieved with three to five metre deep conventional pit latrines.

The combination of these factors is contributing to increasing demand for EcoSan latrines in all the areas where ESTAMOS and WaterAid are working. 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.

Key lessons learned through ongoing monitoring and evaluation

ESTAMOS in Lichinga and Mandimba and WaterAid's partners in Maúa have included an ongoing monitoring and evaluation programme as a central part of this initiative. This is providing

critical information that is strengthening the understanding of sanitation in the province.

The sanitation monitoring and evaluation programme occurs every three to five 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 future plans and thinking about hygiene education and technology modifications.

At the start a number of problem areas were identified. First, a considerable number of households had odour problems because they were afraid of filling their pits too quickly and therefore were not including enough soil/ash after each use. Instead they would only put a small handful of ash/soil down the pit, which did not cover the excrement. This has since been changed in Lichinga and Mandimba where smells have been reduced or eliminated altogether.

However, as Box 3 demonstrates the problem have been similar in Maúa. For example in Maiaca many families are only using small quantities of ash, rather than an ash/soil mix and have experienced some problems with odour. However, two families who are using large volumes of both soil and ash do not have these problems and this is helping to persuade the others to use larger quantities of both ash and soil.

Sanitation coverage is very low in Maúa and 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 and continuous follow-up has been required in Maiaca and Maúa to ensure that the systems are being managed properly.

To allay fears that the latrines will fill too rapidly and will therefore not allow enough time to pass for the latrine contents to transform into compost the alternating pits are now being deepened from 1.3 to 1.5 metres. This has proven to be important because the first sets of Fossa Alternas built were filling too quickly (one family filled their

8. 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.

BOX 3:

Monitoring and evaluation 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-quarters full. The rest are either half or a quarter full

Left and far left: Mwenyenguzu Alifa demonstrates the benefits of EcoSan to his neighbours by showing them the tools that the need to build them with and the squat slab that the latrines typically use. He is hoping to plant fruit trees using the compost from his EcoSan latrine. "These are Mapoza seeds," he says "They will bear a white or red fruit which I can sell."



first pit in less than six months) as neighbours were using the latrines as well. Often three families were using a latrine designed for a family of seven.

The evaluations also showed that men do not use the Fossa Alternata when they only need to urinate. Instead, they urinate in the bathing area adjacent to the latrine and this can cause offensive smells. Urinals are now being considered as an option in the washing area to reduce smells and to divert urine away from the system as a whole.

The results have shown that EcoSan latrines require 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 ash alone does not kill smells as effectively as ash/soil mixtures. It should be remembered that the smell associated with conventional toilets also increases during the rains, and that a well managed EcoSan latrine is certainly less odorous than its alternatives.

Other results show that in Maúa 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. Instead they use their hands. Afterwards, families believe their hands are dirty from the soil/ash and therefore are washing their hands. This 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 cannot afford soap.

One issue that has recently emerged in Lichinga is of considerable importance. Many of the families who have invested in a Fossa Alternata also have a conventional pit latrine. The project

teams assumed that these conventional pit latrines would be closed once the Fossa Alternatas were implemented. However, 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 Alternatas in Lichinga and their 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 their parents. Second, many parents do not want the children to get their Fossa Alternata dirty (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 more complicated. Many people in Lichinga believe in various forms of witchcraft. One common way to bewitch a family is to place '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 second toilet. The problem is that many of these conventional pit latrines should be closed off because they are contaminating the groundwater. The challenge will be to address this problem, which again will be complicated.

Finally, the evaluations have noted the rate of latrine construction is slowing 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 and as such, they are currently investing in improved water supply instead of sanitation. ESTAMOS and WaterAid have therefore decided to continue working in participating villages for a further one or two years to allow families to invest in services over time. ESTAMOS is now aiming to reach the people which have been identified by communities as those who are least likely to be able to participate in these programmes including widows and single mothers with weak social support networks. ESTAMOS is doing this by experimenting with a range of mechanisms that target demonstration latrines specifically to these groups. Problems such as those outlined here are

becoming evident through constant monitoring and evaluation. This system is also producing a range of positive results. The results show that people like their latrines and that they generally show them off to neighbours. 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. In areas where this practice was not being done correctly interventions have been successful and systems are now being used correctly. Well-managed latrines have limited smells (if any) and do not have flies. Evaluations have also shown that the second pit is covered in Lichinga and Mandimba so that children will not hurt themselves inside the latrine (this issue is being addressed in Maúa, as it is part of the family's contribution to their systems). Some pits have filled quickly while others – which are not being used by neighbours – should take about 12-15 months to fill. Finally it was found that groundwater did not enter Fossa Alternas during the last rainy season.

The question that remains is whether people will actually excavate their pits once the faeces and urine have been converted to compost. None of the participating households have expressed concerns or fears about this eventuality and recent excavations have certainly allayed people's unstated fears. This question will only be answered when people fill their second pit and so need to excavate the first one. At this stage evaluations will also show whether people excavate deeper pits (1.5 metres) or stop after the first metre.

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 Mozambique. Evidence suggests that EcoSan is a viable option in Niassa, and that many families prefer EcoSan to other alternatives. Results have shown that EcoSan is a viable option in peri-urban as well as rural areas, and evidence suggests 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 Mozambique and beyond. First, the use of participatory methods and social marketing tools seems to provide a good mix. 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, ongoing monitoring and evaluation 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, projects have not forged ahead while problems emerged that could, in the end, destroy the initiative. The ultimate goal is broad sanitation coverage, but coverage is meaningless if the systems are not used correctly. The key in is to ensure that there is a solid base from which to build a larger programme.

Furthermore, ongoing monitoring and evaluation has created a proper learning environment within ESTAMOS and WaterAid. Both organisations are learning a great deal about how EcoSan is applied. Findings show 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 these problems are now being addressed more effectively than they were when the projects began. Health and hygiene initiatives are now being reconsidered and consequently strengthened because results have shown what is working and what is not.

And finally, ESTAMOS and WaterAid are offering communities choice. The goal is to ensure that families throughout Niassa have sanitation systems that contribute to better family and community health. ESTAMOS and WaterAid do not want to make the mistake that has plagued the sanitation sector internationally – offering communities and families one choice that is deemed 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 undo 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 Maúá 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 of using conventional pit latrines in these areas is therefore minimal to non-existent. It would be a disservice to these families to simply dismiss their legitimate concerns about the handling of transformed faeces and urine. 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. 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 this status.

What has been seen in Niassa is that people can make informed choices, and that 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. The key is to let people decide for themselves which technologies suits them best and enable them to make informed decisions about their own future services.

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