

DRY SANITATION TRAINING AS A STUDENT PROJECT – MAKANA, SOUTH AFRICA

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Abstract

A cooperation between the South African municipality Makana and the Finnish municipality Raseborg gave birth to a project to enhance the use of improved dry toilets in the rural areas of Makana. Some students from the environmental degree programmes at Novia University of Applied Sciences were engaged for the task. The Ministry for Foreign Affairs of Finland gave funding for the project.

The first group of students made a feasibility study on the current situation in 2011. They observed the problems and made recommendations for the future. In March 2014 a second group of students went to follow up what had happened in the meantime and to train the users of the dry toilets in the villages. This article focuses mainly on the experiences of the second group and what lessons can be learned by student projects like this.

Profound preparations have to be done, when students are sent out to a foreign country without a teacher. A lecturer from the university visited Makana before the students to prepare things for them. The students had participated in a course concerning i.a. dry toilets; they had an examination on a very suitable publication and the expected situations that the students were to meet were discussed.

Meeting the reality in the field, the students were thus prepared to draw conclusions and answer the challenges. They quickly developed a training manual that they used themselves and gave to responsible locals. They also made a long list of recommendations for the future use and maintenance of the dry toilets.

Things in Makana have improved, thanks to the engagement of many municipality officers and to the projects undertaken by the Novia students. A maintenance program has been set up and responsible persons for this have been appointed in every village. The engagement of locals is of utmost importance for the success of a project, especially when the change of attitudes is needed.

Keywords: dry sanitation, students' project, training, maintenance, dignity

1 Introduction

Many parts of the developing countries suffer from a lack of proper sanitation equipment. It's estimated that as many as 2.6 billion people live without proper sanitation (Huuhtanen & Laukkanen 2009, p. 5). In many rural areas there are no toilets at all and where something is built, the systems suffer from over use and bad maintenance. This was the situation in 2011 in the South African municipality Makana as well.

The South African White Paper on Basic Household Sanitation (2001) states that negative effects of poor sanitation are i.e. public health problems, environmental impacts and contamination, economic impact of poor sanitation and social and psychological problems. Water borne diseases lead to both vast health problems and to big economic costs.

Without proper toilet facilities near the home, people have to use bushes, preferable in the darkness. This is especially dangerous for women and children. Sanitation is also a question of dignity and equality. In addition to this, gender factors should be taken into account when planning for improved sanitation. (Huuhtanen & Laukkanen 2009, p. 40). Lundin (2013, p. 24) states in her thesis that any sanitary solution is better than no solution. As one woman in her study stated: toilets would make the women ladies.

The United Nations' Millennium Development Goal (MDG 7 C) aims to halve the proportion of people living without sustainable access to basic sanitation by 2015 (United Nations w.y). Basic sanitation is defined as *"having access to excreta disposal facilities, such as a sewer or a septic tank, a pour-flush latrine, a simple pit latrine or a ventilated improved latrine. "Improved sanitation" facilities include flush toilets or pit latrines, if they are not shared between households and provide privacy"*. (WHO 2010)

The White Paper on Basic Household Sanitation (2001) gives principles for strategies that will be undertaken to address the sanitation problem in South Africa. Beside the households also the communities have their responsibilities for proper sanitation. The white paper also states that basic sanitation is a human right and that the government is obliged to create possibilities for all South Africans to gain access to basic sanitation services.

With this background the authorities in Makana were very eager to improve the sanitation situation in the municipality.

Within a cooperation between Makana and the Finnish municipality Raseborg a project to enhance the use of improved dry toilets (DT's) in the rural areas of Makana was conducted in 2011 and 2014. The project was funded by the Ministry for Foreign Affairs of Finland. The project coordinator Börje Mattsson from the municipality of Raseborg contacted the environmental degree programmes at Novia University of Applied Sciences and the discussions lead to the decision to engage some interested Novia students to give their contribution to solve some of the problems. They were given the opportunity to do part of their internship or their thesis on the subject.

2 Background

The responsible lecturer at Novia UAS, Maria Söderström, started preparing for the participation of students by visiting Makana. She checked the current situation and made acquaintance with the local authorities. This happened in September 2011.

In November 2011 the first two students, Sofie Lundin and Henna Timonen, went to Makana for one month and made a feasibility study on the current situation, when only one village in all the rural areas of Makana had got dry toilets (DT's). This was a pilot study and the students observed how the DT's were used, what their condition was and what people were thinking about the new equipment. The possibility to enlarge the use of DT's to other parts of the rural areas of the municipalities was investigated and different suitable toilet models were presented for representatives of the municipality of Makana. Then the students made recommendations for the future.

In March 2014 the following group of three students, Essuman Musa, López-Murcia Javier and Rayale Abdirahman, went to follow up what had happened in the slightly more than two years that had passed since the first group made its recommendations. Was everything functioning well and were people satisfied with the DT's?

This article focuses mainly on the experiences of the second group and what lessons can be learned by projects like this. How should preparations be undertaken within the university to prepare the students for both expected and unexpected things far away from teachers and supervisors? And what about the success of the project itself? Was it a successful one and will things work in Makana now by its own unaided efforts?

3 Profound preparations

All the students that were engaged in the project had passed a three credit course Water and Sewage Management. Within the course also the dry toilet issue was dealt with.

As extra preparations concerning the special challenges that the introduction of dry toilets in developing countries imply, the students had to read and write an examination on the publication *A Guide to Sanitation and Hygiene in Developing Countries* (Huuhtanen & Laukkanen 2009). The publication illustrates in a practical and good way many problems that may occur when introducing dry sanitation in new areas. There are many psychological, religious and gender related factors that influence people's attitudes towards the new equipment. So although the DT's are supposed to make things easier and safer for the villagers, they may still oppose the modernity. The publication gives good advice concerning sanitation and hygiene training as well.

The expected situations that the students were to meet in the foreign country were discussed. Things such as language problems in the villages and the fact that they probably had to inform illiterates as well as educated people were dealt with.

4 Meeting the reality in the field

By the time the students arrived in Makana in 2014 the municipality had already installed 65 DT's in five different locations. These were composting toilets of the kind shown in figure 1 and 2.



Figure 1 and 2. One of the composting toilet models used in the Makana villages. Photo by Javier López-Murcia.

Both groups of students noticed the same thing, although the problem was still more obvious in 2014 because of more DT's in the villages. The maintenance didn't function. Many of the DT's were broken in some way and had been abandoned because of that.



Some of the problems the students encountered in the villages:

- Broken doors, most likely due to strong winds (picture 3)
- Missing or broken locks or handles on the doors
- The composting belt, that was supposed to convey the waste to the composting part at the back of the toilet building, was stuck with paper and plastics. In many places too much paper was used.
- No sawdust, dry grass or other bulking material.
- No locks in the back chamber, which may cause a risk to children playing around.

Picture 3. Example of a broken toilet door. Photo by Javier López-Murcia.

5 Answering the challenges – the development of a training manual

It was decided beforehand that the students should train a few persons to be trainees for the DT users and to take some responsibility for the maintenance of the DT's. The training was based on the students own observations and discussions with community members of different villages.

The first training session was conducted in the City Hall and was directed to some of the municipality officers and some villagers. This session was mainly theoretical. This method didn't, however, feel very appropriate, knowing the many problems in the villages.

That's why the students decided that the rest of the training sessions had to be practical demonstrations on the sites. They also decided to write an easy training manual to help the trainees to conduct their task. The manual was written in a simple way, using many pictures as support for the trainees.

6 Education on spot

The on-site training was divided into two different sessions. The first session concerned the proper use of the DT's and everybody's responsibility to maintain the cleanness of the toilet. The purpose of this session was to make the trainees understand everything they needed to know about the use of the toilets.

The session was conducted so that the Novia students first instructed and showed everything in practice. They had a person from the municipality who translated everything from English to the local language Xhosa. The students had many interested listeners, as can be seen in pictures 4 and 5.



Figures 4 and 5. Education about the proper use of dry toilets in Makana villages, conducted by Novia students. Photo by Javier López-Murcia.

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After the demonstrations two or three of the trainees in each village made demonstrations to show that they had understood. They were trained how to show the proper use to others. The training also contained an overview of the importance of sanitation hygiene and how diseases are spread.

The second session concerned composting of the latrine waste. This education was planned to be directed to the persons that were to take more responsibility for this than the others in the future. Because no such persons had been chosen by that time, all the trainees took part in this session as well. Thus more persons than originally planned were trained to take responsibility for the maintenance, handling of the compost material, collection of bulking material and to see that every toilet was equipped with hand washing water.

The municipality of Makana had some officer at the students' disposition at all times to take care of the transportations and the translation, when the situation required it.

7 Recommendations for the future

Based on their experiences the students made the following recommendations for the management of the DT's in Makana:

- It is strongly recommended that the municipality employs on a full-time or part-time basis designated people to take care of the maintenance since we believe, based on discussions with community members and on observations of their reactions while conducting the training, that the handling of the faeces and maintenance tasks will not be carried out voluntarily and, therefore, will put at risk the sustainability of the project itself.
- One or two persons trained from each of the sites should be in charge of handling the faeces and the whole composting process as well as of the maintenance of the toilets. Preferably these designated people are members of each community where the toilets are installed, and not "outsiders", as they are in constant communication with the respective communities, have a better knowledge of the real situation and can then act rapidly under potential challenges. At the same time, this will create employment on a local basis and will help to improve the living standards of these communities.
- The municipality must ensure that the tasks assigned to the responsible persons are supervised regularly so that these are carried out in a proper manner. Monitoring is essential for the development of the project.
- Very few toilets were functioning correctly during the students stay in Makana. Most of them had problems with the conveyor belt that transfers the waste into the back chamber. Of those that were working properly, there was often another problem, such as broken doors or ceilings. Therefore, immediate repair of the facilities is necessary for the proper utilization of the toilets.
- In the training manual it was specified that doors must be closed after use to avoid damages caused by strong winds. However, the door hinges appeared to be inappropriate to hold the doors, as most of them were broken, and it would be highly recommended to install more resistant ones.

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- It should be possible to close the door from inside and outside of the facility. From the inside in order to grant privacy to the user as well as for safety reasons and from the outside to prevent the doors from being damaged by strong winds.
- Toilets should be checked daily that they are functioning correctly and any damage in the toilet facilities must be reported immediately to the municipality in order to be repaired as soon as possible. This way, access to a sanitation system is ensured at all times and problems related to hygiene can be avoided.
- Dry toilets do not make use of water but it is necessary to add some bulking material after every use to avoid flies, odours and to accelerate the composting process. Examples of these are maize leaves, banana leaves and sawdust, but given the characteristics of all of the sites visited, dry grass is the bulking material that is considered to be the most readily available and abundant one.
- It is suggested that the grass that is cut by the municipality on the surrounding areas as part of gardening maintenance could be transported to these sites and be used as bulking material for the dry toilets instead of being dumped in a landfill.
- Alternatively, those persons given the responsibilities for handling the compost and maintaining the toilets could also be in charge of cutting the grass, collecting it and making sure that there is enough of it in the buckets placed inside the toilets.
- Then, in every individual facility there must be one bucket for the grass and one brush that is used exclusively for cleaning the toilet.
- The chambers placed at the back of the toilet facilities can be easily opened and, therefore, these pose a risk for children that may be playing around. To avoid undesired situations where the children could get infected with diseases it is highly recommended to close the chambers with locks.
- Many of the roofs have been seriously damaged or completely ripped off by strong winds due to the oversize or the incorrect installation of these. Thus, new roofs should be installed making sure that there is no extra surface exceeding the size of the building and the ones that are still in place should be cut accordingly.
- The space between the toilet and the door is small in some of the constructed toilets, making it very uncomfortable for the users or even impossible to close the door as their legs touch against this when sitting. These toilet facilities should be expanded to avoid such problem.
- Wooden or brick boxes should be built for carrying out the composting process of the faeces. In the training manual there are instructions indicating how these should be built.
- The community members from the villages should be encouraged to use the fertilizer on their own crops or to sell it to nearby farms if there are no crops around or no interest in using it.
- Efforts to involve other stakeholders must be made. For instance, cooperatives for the production of toilet paper may be interested in participating in the development process of dry toilets in Makana. Also farmers could be interested in acquiring the final fertilizer product on a regular basis and, thus, facilitating the creation of contracts that could contribute to alleviation of poverty in these rural areas.

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- In each of the villages there is one type of building structure of the toilet facilities. However, the structure differs between villages and, then, there is not a standardized building for the whole project. This creates inconsistencies and different problems depending on the structure of the building. Therefore, it is recommended that a single type of building structure is chosen for being built in all sites.
- There should be a regular form of increasing awareness among the communities on the benefits of using dry toilets, which are: improved hygiene that prevents diseases, the collection of waste, a method to save water and the possibility to reutilize the nutrients as a fertilizer. For example, the designated responsible persons could participate in the community meetings and emphasize in these points while spreading the word. It was observed that the main cause for using the toilet in a wrong manner was the lack of knowledge among the users, as the toilets were installed but no instructions on how to use them were given. However, it was also observed that a big part of the local people of each community did not perceive the dry toilets as a good solution and they continue to practice open defecation. Therefore, it is crucial that a change in their mindset takes place and this could be achieved through the community meetings mentioned before. In this way, we suggest education as the means to increase awareness and knowledge on the correct utilization of the dry toilets.
- A hand-washing device should be installed next to the toilet facility to prevent the spreading of diseases. Of all the inspected toilets, only one tap was located behind one of the buildings. A possible solution suggested in the first meeting with the focus group was to install a rain water collector attached to the toilet building that will capture the water in a container below. It is important that this water is only used for hand washing purposes and not for drinking. In addition, such containers must not be fully open to avoid insects in the water.
- The number of users of a single toilet varies significantly from site to site, in some cases exceeding the capacity of these. For example, in one school three toilets were installed for 85 students and 4 teachers, which equals to an average of 30 users per toilet, while in one farm there is one toilet per household. Then, more toilets should be built in this area in order to be able to maintain a proper functioning of these.
- The municipality should verify that the final toilet building is being constructed according to their specifications before the work would be handed over by the contractors. In some cases the doors were incorrectly built and not functioning properly.
- The training manual was developed only in English and, even though the trained people were asked to demonstrate what was taught in each session, to verify that they understood all points explained, it should be translated into local languages like Xhosa and Afrikaans to ensure a complete understanding.
- The current model of dry toilet installed (SANIX) in the rural areas only provides one chamber with a low capacity bucket for the collection of the waste. This creates the need of having to transport the faeces to another location for composting, instead of carrying out the composting process on-site. If the dry toilet installed has two or more chambers the composting can take place in the same toilet facility and it will reduce the risks associated with carrying out the latrine waste, such as possible contamination of nearby water bodies. Another disadvantage of the SANIX dry toilet model is that, although it diverts the urine from the faeces, it does not collect it as this is poured straight into the soil. Urine is an excellent fertilizer that needs little treatment and could be easily collected in cans. In addition, the

conveyor belt from the SANIX model appears to get stuck with certain ease and, of the toilets installed in Makana, very few turning handles are currently working.

- Therefore, with aims for further development of the project in the future, it is advised to consider the advantages and disadvantages of the current system installed compared with other more standardized systems utilized worldwide which may seem less sophisticated but perhaps are more convenient for the current conditions of the rural areas in Makana.

8 The current situation in Makana

Things in Makana have improved, thanks to the engagement of many municipality officers and to the projects undertaken by the Novia students. A maintenance program has been set up and responsible persons for this have been appointed in every village with DT's. More toilets will be placed in new villages as soon as the economic situation allows.

That is, the development program will go on and hopefully by its own unaided efforts. The starting point for that should now be rather good.

9 Lessons learned

To prepare students for projects like this, it's important to make thorough preparations. It's of course important that they know enough about the core issue, but when you are to conduct a project in another culture, there are many other things to take into account as well.

You cannot come as an outsider to tell people what to do. You have to take their culture, habits and values into account as well. In sanitary issues, like in this case, also religions and beliefs play a significant role. Involving local people is very important, because they are acquainted with these things.

The negative experiences from the first dry toilets out into the rural areas of Makana show that the involvement of locals as trainees for the villagers is very essential. There must be local persons who think that the project is important and who have knowledge to share with the others. The instructions concerning the new things must be told in a way that's in line with the local culture, using words that people understand.

It's also essential to decide who's responsible for the maintenance of the equipment. Many projects in the third world have failed because of failing maintenance. Enough persons must have the knowledge on how to do this, they must have access to spare parts and, last but not least, they must be motivated to take care of the maintenance. For this some money may be needed.

In the Makana case a good cooperation between the trained villagers and responsible officers of the municipality can guarantee a good future for the dry toilets and better sanitation conditions for the inhabitants in the rural areas.

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