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ASSESSING PROJECT SUSTAINABILITY IN DEVELOPMENT COOPERATION

– Case Msunduza Dry Sanitation Project



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Development cooperation has changed from short-term disaster aid to multilevel cooperation with the target areas. Additionally, the quality of the results in terms of effectiveness, efficiency and sustainability is now seen as an overall objective to aim for.

Project practises, which are one from of development cooperation, have various benefits that, however, are somewhat of challenges at the same time. The outcomes are rather easy to point out due to restricted intervention area but sustainability of the outcomes is regarded relatively challenging to achieve. Sustainability among the other quality criteria contributes to the overall development in the area and secures the productivity of the benefits for the future generations.

Turku University of Applied Sciences together with Global Dry Toilet Association of Finland, the Salvation Army Swaziland and the City Council of Mbabane executed a development project in Swaziland, southern Africa. Msunduzza Dry Sanitation Project (2007-2013) aimed to create a sustainable and healthy sanitation culture in Msunduzza, one of the largest residential areas in the capital city Mbabane. This research assesses the sustainability of the project through different sustainability dimensions and clarifies the level of assimilation and distribution, operation and maintenance, and institutional structures supporting dry sanitation.

The biggest challenges concerning sustainability revealed to be in the field of community participation and cooperation. Working relations between individuals and institutions seemed to suffer from personal conflicts and insufficient communication. Additionally, the ownership of the project practises has not been reached and this can be seen in an inadequately functioning collaboration and badly maintained dry toilets. Also education revealed to be not efficient enough to meet the needs of the community members to be able to use compost and urine from the dry toilets built by the project.

As a conclusion, dry sanitation related activities are likely to decrease now after the end of the project or if the existing institutions will function properly, the achieved level of improvements may stay stable. The years right after the end are the most sensitive ones and will determine the future of the project outcomes.

KEYWORDS:

Development cooperation, project, sustainability, Swaziland

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KEHITYSYHTEISTYÖHANKKEEN KESTÄVYYDEN ARVIOINTI – Tapaus Msunduzan kuivasanitaatiohanke

Kehitysyhteistyö on muuttunut alkuaikojen hätäavusta monitasoisempaan yhteistyömuotoiseen toimintaan. Lisäksi työn tehokkuus, vaikuttavuus ja kestävyys nähdään laadun kriteereinä ja kokonaisvaltaisina tavoitteina.

Kehitysyhteistyöllä on monia muotoja, joista yksi on projekti- eli hankemuotoinen toiminta. Sillä on monia hyviä puolia, jotka kuitenkin samaa aikaa voidaan nähdä sen heikkouksina. Hyvin rajatun toiminnan vuoksi projektien tulokset ovat usein helposti nähtävissä, mutta niiden kestävyys katsotaan kuitenkin melko vaikeasti saavutettavaksi. Kestävyys vaikuttaa alueen yleiseen kehitysprosessiin ja vahvistaa tulosten tuoman vaikutuksen saatavuutta myös seuraavilla sukupolvilla.

Turun ammattikorkeakoulu yhdessä Käymäläseura Huussi ry:n, Swazimaan Pelastusarmeijan ja Mbabanen City Councilin kanssa toteuttivat kehitysyhteistyöprojektin vuosina 2007–2013 Swazimaassa, eteläisessä Afrikassa. Msunduzan kuivasanitaatiohanke pyrki luomaan kestävä ja terveellisen sanitaatiokulttuurin yhteen pääkaupunki Mbabanen suurimmalle asuinalueelle, Msunduzaan. Tämä tutkimus arvioi hankkeen kestävyyttä sen eri ulottuvuuksien kautta ja selvittää kestävyyttä ylläpitävien tekijöiden eli omaksumisen ja jakautumisen, käytön ja huollon sekä institutionaaliset rakenteiden tasoa.

Tulokset paljastivat suurimpien haasteiden olevan yhteisöllisessä osallistumisessa ja yhteistyössä. Työskentelysuhteet näyttivät kärsivän yksilöiden henkilökohtaisista konflikteista sekä vajavaisesta kommunikaatiosta. Lisäksi saavuttamaton omistajuuden tunne näkyi huonosti toimivissa institutionaalisissa rakenteissa sekä konkreettisemmin huonosti hoidetuissa käymälöissä. Myös koulutus ilmeni olleen tehotonta tavoittaakseen aktiivisesti yhteisön jäsenet ja varmistaakseen heidän tietotaitonsa hyödyntää projektin rakennuttamista kuivakäymälöistä peräisin olevaa kompostia ja virtsaa.

Johtopäätöksenä voidaan todeta, että kuivasanitaatioon liittyvät toiminnot tulevat todennäköisesti vähenemään projektin päättymisen jälkeen tai jos yhteisöllinen toiminta vakiintuu, voi se ylläpitää saavutettujen tuloksien tason vakaina. Vuodet juuri hankkeen loppumisen jälkeen ovat herkkää aikaa ja määrittävät lopullisen kestävyys tason.

ASIASANAT:

Kehitysyhteistyö, projekti, kestävyys, Swazimaa

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
CIA	Central Intelligence Agency
COHRE	Center of Housing Rights and Evictions
DAC	Development Assistance Committee
EHEP	Environmental Health Education Project
GDP	Gross Domestic Product
GDTF	Global Dry Toilet Association of Finland
GLM	Green Living Movement
HDI	Human Development Index
IFAD	International Fund for Agricultural Development
ILO	International Labor Organization
MDG	Millennium Development Goals
MDSP	Msunduzza Dry Sanitation Project
MFA	Ministry for Foreign Affairs of Finland
NGO	Non-governmental organization
ODA	Official Development Assistance
OECD	Organization of Economic Cooperation and Development
TUAS	Turku University of Applied Sciences
UN	The United Nations
UNDP	The United Nations Development Programme
UNEP	The United Nations Environmental Programme
UNICEF	The United Nations Children's Fund
WHO	World Health Organization

1 INTRODUCTION

Development cooperation has a long history worldwide and it has gone through changes in order to adapt to the needs of the developing countries. Yet, the concept of development cooperation is under discussion since the state of it in terms of satisfactory results is questioned. In spite of long-term assistance for African countries, the continent still presents the most severe social, political, environmental and economic challenges. Furthermore, the effect of development assistance is a controversial issue and it is even claimed of causing only harm and hindering independent development turning poor countries more and more dependent on the outside support. Nonetheless, great amount of positive achievements in the field of development cooperation cannot be questioned and either the opportunities that lies there. (Kaberuka 2013; Andrews 2009, 8-9.)

In addition to attaining positive improvements, the results need to be sustainable in order to serve future generations and to be able to contribute to the overall development. The more long-lasting the benefits are, the more efficiently the resources have been used. Thus, it is profitable in every way to have sustainable results. (MFA 2013a.) This thesis reviews project practices as a form of development cooperation and the sustainability aspect in project execution. Additionally, it uses Msunduza Dry Sanitation Project as a case study giving a comprehensive assessment of its sustainability. The multidimensional structure and uniqueness of projects make them an interesting subject of research. Project consultant Paul Silfverberg has mentioned that common sense works in project operations but it is not always quite enough. Numerous factors need to be considered while implementing a project especially concerning the sustainability aspect, which should be taken more as an overall objective than part of the project quality.

Theoretical part of this thesis covers development cooperation as a concept and presents development work implemented by the leading development entity in

Finland, the Ministry for Foreign Affairs. Secondly, it clarifies the structure of project cooperation and the definition of project sustainability as well as how such could be assessed. The research part presents the case study, the methods of the research and finally gives an assessment of the continuity of the benefit-factors initiated by the project.

The research has been a long learning process both on an educational and on a personal level. Opportunity to get familiar with Swaziland and to develop professionally can be said being sustainable and a far-reaching benefit. Acknowledgements for contributing to this thesis are addressed for the project partners and everybody who agreed to participate in the interviewees: the community members of Msunduza, the City Council of Mbabane, Salvation Army of Swaziland, Turku University of Applied Sciences, Global Dry Toilet Association of Finland, the local interpreter and all those who gave time and support for this research are praiseworthy.

2 OVERVIEW OF DEVELOPMENT COOPERATION

2.1 From aid to cooperation

The first foreign aids were donated in the early 19th century when the United States passed assistance to Venezuela after an earthquake in 1812 as an Act for the Relief of the Citizens of Venezuela. The current form of development aid originates from the end of the colonial era when the western countries started to pass funds to respective colonies. Great Britain's Colonial Development Act, established in 1929, gave loans and funds for improving the infrastructure, such as transportation, water supply and power, as self-interest aid, in order to enhance British industry and employment. In the 1940's, The Colonial Development Act transformed into Colonial Development and Welfare Act which included also education and other social sector activities. (Hjertholm and White 2000, 4.)

After the Second World War, the concept of aid became clearer when the United States supported European countries in reconstruction. At the same time western countries, especially Britain and France, continued to support their former colonies. The formation of the United Nations and the World Bank pushed the development work forward by starting allowing loans for the European countries and later in the 50's to the developing countries (Hjertholm and White 2000, 10). In the 70's and 80's, the main goal of development work was to provide technology and expertise, and the idea of economic growth was strong. Any kind of project work, however, did not have very long-term effects at that time, and activities in question were seen to fade away when the resource flows ended. (Laakso and Iso-Markku 2012)

In 1990's and 2000's, it became clear that the concept of development work needed reformation. The main goal of emphasizing technology and economic growth changed into an efficient reduction of poverty. Instead of providing comprehensive expertise services, developed countries started to implement project cooperation where donors offered general budget aid or sectoral aid.

Thus, receivers had more power to aim the funds for targets they saw the most important. (Laakso and Iso-Markku 2012.) Developing countries were wanted to get more involved in their own development and steer it themselves. Development aid separated clearly from crisis and humanitarian aid in terms of duration. Development cooperation was more of a long-term work with long-term influence, whereas crisis and humanitarian help were there to relieve the consequences of a war or a natural catastrophe.

Nowadays development cooperation consists of numerous forms of aid and cooperation work. It can be seen as transfers of official resources from a country to another such as Official Development Aid (ODA) which is accurately defined by Development Assistance Committee (DAC) of The Organization of Economic Cooperation and Development (OECD). Aid that is defined as ODA is transferred from a developed country to a developing country, it has to be from a public source, the purpose of it has to be for economical development and well-being of the receiving country and it has to be concessional by character. Development cooperation can also be seen as planned project and policy practices and all activities within those. Third way of seeing development cooperation is seeing it as a fight over resource distribution where different sides are pursuing their own interests. (Koponen et al. 2007, 337-359.)

2.2 Finnish development cooperation

In Finland, the official development assistance is managed by the Ministry for Foreign Affairs which implements development work as the following conventions: bilateral development cooperation between the government of Finland and the government of the receiving country; multilateral cooperation which works through international development and funding institutions; and regional cooperation which covers geographical regions over the country borders. Finland works also in cooperation together with other European Countries, finances Finnish and international NGOs' development work, supports private sector in development cooperation and serves humanitarian aid in crisis areas. (MFA 2013b.) Additionally, it grants support for development

policy research, public relations, higher-level education institutions, cultural cooperation and government institutions (MFA 2013c.) Funding can be allocated for sectoral budget support or general budget support, for technical assistance, scholarships, project interventions, administrative costs, or as contributions to specific programmes by international organizations or multilateral institutions or for donor country personnel (MFA 2013d). In 2014 Finland's appropriation of official development work was 1 102.6 million euro and for actual development cooperation by the Ministry of Foreign Affairs was allocated 879.4 million euro. Other ODA funding was 210.8 million euro and covered administration costs, EU's development budget, disbursements for international organizations and refugee reception costs. (MFA 2013e).

MFA's support for NGOs' development work in 2012 was 103 million euro. NGOs carry out a great deal of Finland's development work by executing projects and producing communication material about development policy and current issues. (MFA 2014a.)

The focus of Finland's development work has been the least developed countries in Africa and Asia. The focus is on Ethiopia, Tanzania, Mozambique, Kenya, Zambia and Nepal since the bilateral development cooperation with those have been the most long-lasting. In addition, Finland has been doing intensive development work with the most fragile countries such as Afghanistan, the Palestinian territories and South Sudan. (MFA 2013f.)

3 CONCEPT OF DEVELOPMENT PROJECTS

3.1 Projects in development cooperation

A project is a totality formed by tasks with its beforehand defined goals and schedule and it is implemented by its organization with defined resources. Projects are always based on their goals and they can be divided into five categories: investment projects, development projects, research projects, account projects and production projects. (Silfverberg 2007, 21.) Development projects have been the traditional and most known type of development cooperation. They are time and space oriented and they have their starts and their ends. They include not only monetary help but also knowledge and know-how. (Koponen et al. 2007, 347-348.) Development projects aim for long-term improvements but must be remembered that the actual project is time-limited. One challenge is to end the project successfully by forming a process that works as a sustainable basis after the end of the project. The objectives can be divided into three categories: development objectives which are the long-term improvements; direct objectives which mean the concrete results and for third, concrete outputs such as manuals or data systems. (Silfverberg 2007, 22.)

Projects differ considerably from each other and they can be part of any sector from infrastructure to gender equality. They also function differently and are implemented by different operators. Project practices have been a popular way of development cooperation due to its rather easy measurability. The impacts have been easy to point out and projects have been branded with their unique identities. However, project practices have lost its popularity when budget aid and other newer form of development cooperation have increased. The biggest problems with projects are connected with the productivity and sustainability. The impacts are better seen in short-term effective projects where the outcome is something more concrete. Long-term changes such as behavioural changes are rarely seen since the project is not usually attached to the receiver's government and do not have enough time for "rooting" into the systems and institutions. (Koponen et al. 2007, 349-350.)

Despite projects losing popularity, they are going through changes in order to meet the needs of the developing countries. More and more, the practical work has been transferred to the receivers. More often the financial management is run by the locals and the personnel is assembled by the local experts. Donors work as advisors and help in the implementation. Project work has also transferred somewhat from governments and companies to NGOs, non-governmental organizations. (Koponen et al. 2007, 349.) Therefore, it can be said that despite the pointed out problems within the project cooperation, development projects are still seen as an important part of the development work.

In order to implement a successful development project there are some qualifications to fulfil. If the project is implemented in cooperation, like development cooperation projects, commitment and participation of all project stakeholders is essential already in the planning phase. Participatory project planning ensures that it is based on the needs and choices of the beneficiaries. It is also recommended to join all similar projects in the same area in order to secure the efficient use of the resources and to create widely working solutions. The project plan has to be able to be used as a management tool which works as a strategic guideline defining the goals, principles and implementation model of the project. (Silfverberg 2007, 29-30.)

The activities in a developing project should never be dependent on the project or the funding of it. The project should be seen as a start for new activities, not as a producer. On the other words, the project itself should not produce the improvements but create a system or organization that does that. Long-term activities cannot be build on the project organization thus it will be taken down at the end of the project. The project can build a completely new institution or be built on already existing one which can be strengthened through the project activities if needed. (Silfverberg 2007, 30.)

Additionally, risk identification is an important part of the project implementation. Risks can be divided into external and internal risks. External risks are independent of the project such as environmental or political condition and

changes, internal are factors that are dependent on the project implementation such as funding and employees' know-how. Both of the risk types can endanger the implementation and sustainability of the project and thus they need to be identified on the early stage of the project as well as during the implementation. (Silfverberg 2007, 31.)

3.2 Project cycle

Life of a development project among any other projects consists of different phases. Project cycle is a framework for project life stages from its birth to its end and guides the project process. (Figure 1.)

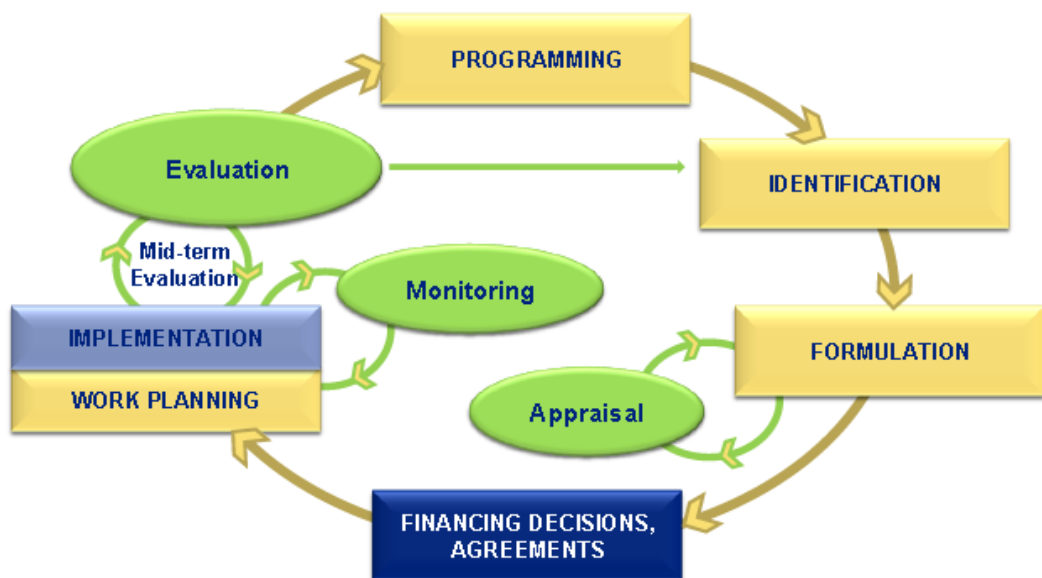


Figure 1 Project Cycle (MFA 2012a).

A project starts from the programming phase when the development objectives of the project and the development goals of the receiving country are linked together. It includes the identification of national challenges and opportunities in the field of development and the outcome brings out development objectives and priorities. Thus, it is a country level plan to set out the development

framework and on which project planning should be based on. (ITAD 1999, 7; MFA 2012a, 28, 32.)

The scope of the second phase, identification, is to generate a project idea and develop it further or develop an already existing idea. It presents project alternatives brought up by decision-making carried out in cooperation with all partners. The chosen alternative is formed into a concept which describes the key objectives and relevance of the project. Participation of beneficiaries and analysis on the problems are preceding the actual identification of the selected alternative. (ITAD 1999, 7; MFA 2012a, 28.)

All project planning should include a background (baseline) study which clarifies development needs, the views of the stakeholders and the work of other institutions such as NGOs in the area. Additionally, it should clarify local social and cultural situation including traditions and beliefs as well as analysis on gender and minority groups. Infrastructure such as the road and transport network and the waste management system of the area should be deciphered as well as the natural environment including natural resources and possible natural hazards. Baseline data should also clarify the financial situation in the area as the financial distribution and the overall level of wealth. The purpose of the baseline study is to ensure that that development needs and project objectives will meet during the implementation. (MFA 2012b, 19.)

Feasibility study assesses whether the project plan is about to reach the beneficiaries and is it aligning development objectives of the target area as well as the traditional customs and habits. The study clarifies the technical and scientific soundness of the project and is it administratively manageable and financially justifiable. Additionally, it assesses the need for the project outcomes and how likely the benefits will be sustainable. (UNEP 2005, 10.) The detailed planning of the project takes place during the formulation phase (MFA 2012a, 29).

Before the final project plan, an appraisal plan is formed to work as an ex-ante evaluation which observes the project from the outside view and gives an

evaluation of its relevance, feasibility and sustainability before the project is implemented. It works as another opinion and assesses the project critically to avoid underestimation of the important factors in reaching the project objectives. (MFA 2012a, 54.)

The implementation phase includes all the activities set up in the earlier phases and the project is executed as determined. During the implementation the progress of the project is assessed whether it is on the planned track and on its way of reaching the objectives. Additionally, the objectives are assessed in a sense of them being possible to reach. This monitoring is an ongoing activity during the whole project and it can give information on the initial assessment of relevance, efficiency, effectiveness and sustainability. (UNEP 2005, 12.) Implementing includes a management system that works as a decision-maker, monitors and reports and plans evaluation as well as cooperates with all the stakeholders. Thus, it carries all the implementation activities. (MFA 2012a, 61.)

Predicting and managing both internal and external risks is an important part of the implementation. Managing risks is recognizing them and being prepared for the outcomes. Changes in economic factors, incorrect estimation of the sustainability of the project, dissatisfaction of the beneficiaries, unwillingness to perform responsibilities by some of the partners, political or any other contextual changes and insufficient project management are all possible risks to come true. (UNEP 2005, 12-13.)

Evaluation is the last phase of the project cycle and the function of evaluation is to work as a learning tool and to measure the efficiency, effectiveness and sustainability of the project. All in all, how the project reached the objectives (ITAD 1999, 8). Despite evaluation being the last phase of the project cycle, it can be conducted in different phases of the project. Appraisal evaluation, ex-ante evaluation, is carried before the project implementation; mid-term evaluation is carried out in the half-way of the project and it gives information about the success of the project thus far and guidance for the rest of the project implementation and for the possible continuation decision; final evaluation at the end of the project assesses how the objectives are reached and it can be used

as a lessons-learnt document for the similar upcoming projects; and finally an ex-post evaluation which is carried out after the project completion and it gives a picture of the sustainability of the project. (MFA 2012a, 76-77.)

4 PROJECT SUSTAINABILITY

4.1 Definition of project sustainability

Different actors in development work have their own definitions for project sustainability, but the general conjunctive idea is connected with the continuity of implemented activities after the funding and other forms of intervention ends. Asian Development Bank (ADB), African Development Bank (AfDB) and International Fund for Agricultural Development (IFAD) do not define project sustainability as the actual continuity of the benefits from the development intervention, but as the probability and likelihood of those benefits to be maintained after the monetary assistance has ended. Organization of Economic Cooperation and Development (OECD) presents three dimensions of project sustainability: 1) continuation of positive benefits resulted from the project practices, 2) probability that these benefits and achieved institutional structures will be maintained and 3) the ability to be resistant to risks, both internal and external. (ADB 2010, 4.)

4.2 Sectors of project sustainability

The concept of project sustainability can be divided into different sectors; *institutional, ecological, economic, political, socio-cultural* and *technological*. *Ownership* can be seen as an individual sector although it is firmly connected with institutional and socio-cultural factors.

Institutional sustainability

Institutional sustainability means the stability of institutional structures that maintain the achieved practices. It is the institutional support from the target area and it ensures that the project activities are ran, planned, implanted and evaluated properly without help outside. (IFAD 2009; Hietalahti 2004.)

Economic and financial sustainability

Economic and financial sustainability is seen as one of the most difficult to reach. It means the capability for economic independence and it ensures that the project based activities will not end due to any financial reasons and they are resilience to economic risks. It is said to reduce household vulnerability. (IFAD 2009.) The possible funding for the activities to continue after the donor's funding needs to be planned well. It has to include the financial aspects between different stakeholders and institutions as well as the wider economic situation and effects in it caused by the financial project activities. (MFA 2012a.)

Social sustainability

Social sustainability, also known as socio-cultural sustainability, is connected with the social and cultural issues such as gender and equality as well as general acceptance and commitment to the activities brought by the project. It is connected with the personal level of beneficiaries, and to reach such sustainability the project practices should be aligning with the local cultural characteristics. (IFAD 2009.)

Technical sustainability

Technical sustainability, including equipment but also skills, know-how and methodology, means the continuity of the access to the technical solutions and the suitability of those solutions to the present cultural and environmental conditions as well as them being politically accepted (IFAD 2009). Ensuring technical sustainability includes training for maintenance and operations, access to the used materials and spare parts as well as the usage of local materials, labor and other services. Used materials should be simple and durable. (IFAD 2009; MFA 2012a.)

Political sustainability

Political sustainability could be seen as part of institutional sustainability but here it is defined as a separate sector. It means the commitment from the

government and enabling the project practices from that level. Project practises should be aligning with the present political outlines. (IFAD 2009.)

Environmental sustainability

Environmental sustainability is probably the most easiest to understand due to its current situation in the global forum. It covers all the factors that might have an effect on the natural environment and means that the project activities use the natural resources with the limits of nature's carrying capacity. It includes also the resilience to environmental hazards. (IFAD 2009.)

Ownership

Ownership is seen as one of the sectors although it is closely attached to the institutional sustainability. It means the beneficiaries accept the activities to their lives and feel committed to the outcomes of project practices in a sustainable way. (IFAD 2009; Hietalahti 2004.)

4.3 Factors affecting project sustainability

Project execution includes a great range of factors having an effect on the sustainability of the positive outcomes and both internal and external forces should be identified as part of the planning process. Internal factors are features inside the community or the project management whereas external ones are coming from outside of the project such as economic situation. The factors can be divided in numerous ways and here they are divided into institutional structures, project practises and contextual factors. (House 2007, 62-68; Hodgkin 1994, 7.)

4.3.1 Institutions

Support from the administrative level such as national and regional agencies is an essential factor for the project sustainability. Political outlines together with the local legislation and policies such as national strategic plans have a great influence on the project practises on the high level since they steer the development work on a country level. Aligning project practises with local

policies is important in order to reach sustainable results. Additionally, political stability has an effect on long-term benefits. Political changes and war for instance can make sustainability difficult to achieve. (AusAID 2000, 3,9; Hodgkin 1994, 7-8.)

Addressing local institutions is important and supporting the connections between the government and non-governmental organizations is essential since the local institution structures will adapt the project activities after the phase-out. Identifying factors affecting institutional structure is an important part of the planning and design phases since social and political sectors are closely attached to the institutional activities. Working culture in general, decision making, financial management, different procedures and responsibilities varies. Relationships with different institutions should be acknowledged as well as the capacity for planning, budgeting, implementing and evaluating. If the target institutions are not found functional enough in terms of capacity, developing them can and is recommended to include in the project plan. (MFA 2012a, 23-24.)

4.3.2 Project practises

Project management and the whole project life-cycle from planning to evaluation significantly determines the outcome. In planning and design phase proper preparations are essential to carry out, the operational approach has to be efficient and monitoring and evaluation effective in terms of affecting on the activities. (Hodgkin 1995, 21.) Project that are built on an existing institution instead of a new one tend to be more sustainable, however the capability of the local management to adapt new structure, ideas and systems is affecting sustainability. Additionally, projects need to be managed and implemented flexibly in order to get the best out of the lessons learnt to reach the best possible outcome. Project management need to be able to react to changes concerning project needs and priorities. (AusAID 2000, 5.) Decision-making, problem solving and communication with all the stakeholders are under the responsibilities of the project management. (Hodgkin 1995, 21.)

Participation of all project stakeholders is important during the whole project implementation. All project partners, local government and especially the beneficiaries should be actively involved in project practises from planning to implementation. From top to down led projects have a risk to fade away because beneficiaries do not get the feel of ownership of the project. (AusAID 2000, 4.) Participation increases local capacity and interest towards the system, thus self-empowerment and the willingness to be involved in the project increases. (McConville 2006, 14.)

4.3.3 Contextual factors

Contextual factors include social and cultural factors such as the characteristics of the project community in terms of gender equality and division, baseline skills and educational level as well the quality of the leadership and existing rules and regulations. Traditions, core values and customs within the community are part of the socio-cultural factor and since they steer the behaviour of the community members, they have significant effects on the project success and sustainability. Furthermore, the basic living standards in the area, the level and availability of services and technology and environmental conditions have affects on the project and its sustainability. (House 2007, 7; McConville 2007, 13.) One part of ensuring social sustainability is to acknowledge how the project outcomes will be distributed in the community. The baseline information collection using both statistical and participatory methods gives a wide view on the situation and engages stakeholders in the project planning. The social sector is attached to other sectors since it includes all institutional practices, economic power, politics, religions, justice, values and ethics. However, it is said that cultural aspects should not prevail over universal human rights. (MFA 2012a, 20.)

During the project planning, addressing all the environmental factors such as environmental concerns and the effects on the project practices should be conducted. Environmental conditions are important to be acknowledged

especially in the areas that are sensitive to climatical variations (MFA 2012a, 22).

Additionally, the economic situation on a larger scale influences the project implementation and through that sustainability. Many of the projects are also dependent on material that can include technical parts or water for example and due to this availability of materials is important as well. Natural, political and other disasters should be taken into account since these can have a major influence on the project implementation and thus sustainability and the vulnerability on such disasters should be considered. (House 2007, 7; McConville 2007, 13.)

4.4 Sustainability in MFA's development cooperation

MFA states that Finland is implementing development policy and cooperation which aim to produce sustainable long-term impacts. However, since development is an outcome of several factors, identifying specific results of development cooperation is rather challenging. Results of the interventions merge with the development stream and support the overall development. (MFA 2013a.) MFA has integrated the aspects of sustainability into its development work. It follows OECD's project quality assessment for evaluating projects and programmes and sustainability is part of the criteria in addition to relevance, effectiveness, efficiency and impact. The ministry's definition for sustainability corresponds to the others, thus it means the continuity of the activities after the funding of the donor ends. In assessing sustainability, MFA advises to consider the following aspects: the extent of the continuing benefits after the assistance and all the factors that have positive or negative influence on the project continuation. (MFA 2010, 19-20.)

To support social sustainability MFA works along with the universal human rights that are stated in the UN conventions, ILO standards and other treaties. MFA sees assessing the human right situation as an important part of the project planning and implementation and pays attention to the marginalized groups in a sense that project activities should not do harm to these groups.

Finland's development cooperation should also parallel with the environmental carrying capacity and all natural resources should be used in a sustainable way. Finland pays special attention to the climate change, promotes the fair distribution of its costs and supports the most vulnerable people in adaptation to the changing environment. Overall, there are three regulation categories steering the Finnish development work concerning environmental sustainability: legal regulations such as Environmental Impact Assessment, international conventions like United Nations' Framework Convention on Climate Change and finally sectoral regulation following Finland's development policy. (MFA 2010, 20-22.)

In MFA-funded and NGO-managed project practises, sustainability aspect is included in reporting that all funded projects are responsible to submit. In project plans, project managements have to point out all the partner institutions, choosing criteria and partners' contribution to the project implementation. The risk assessment brings out the risks possible to constrain the project outcomes and sustainability. In addition, the phase-out plan has to be included in the project plan or project has to plan how the responsibility of project activities will be transferred to the local institutions. Since community participation is an important part of the project quality, the participation of all beneficiaries, local communities for instance, has to be clear. Project management is also responsible to point out how the project will be evaluated and monitored during and after the implementation. (MFA a.) In annual reports, project managements are similarly responsible to point out specific achievements and constraints such as how the project has been affected by external factors and how the beneficiaries have taken the responsibility of project activities. The encountered problems in project implementation and the efforts in solving them are part of the report. The continuation of the project activities has to be under consideration. (MFA b.) In the spring of 2014, the report template was renewed and MFA published a new template. It includes i.e. the achievement of long-term changes, how the capacity building of project partners has resulted in the capacity building of the local civil society and how the experiences during the

project have changed or enforced the views about the sustainability of the project and how those have affected into the phase-out plan. (MFA 2014b.)

4.5 Assessing project sustainability

MFA regards sustainability as one of the project evaluation criteria and thus it has set generic evaluation questions concerning sustainability to be considered during the assessment. The question covers the continuation of the maintenance of the benefits produced by the project, identifying factors that might hinder or enhance sustainability and assessing has the phase-out ensured sustainability. Additionally, the ministry includes the promotion of gender equality and climate sustainability into the assessment. (MFA 2013g, 29.) However, there is no universal assessment tool for project sustainability since the features and nature of development projects varies. The following presents some approaches for assessing project sustainability.

WASH

In project classification by WASH, some key questions concerning a specific project are set to address whether the conditions to ensure sustainability have been met. The assessment is meant to carry out several years after the phase-out and most of the questions are qualitatively measured so the answers will be defined through general sense and human estimation. The answers determine in which classification class the project will be set. (Hodgkin 1994, 29.) Projects in *class 1* exceed the accomplished level after the end of the project i.e. the situation still improves after the funding and other support end. *Class 2* includes projects that stay on the same level after the project end and will not rise due to lack of financial or other resources. The accomplished level has gone down in the project in the *class 3*, however the level might be stable but still under the level at the end of the project. In *class 4*, the project achievements slowly decrease and eventually fade away entirely. This kind of classification is a loose framework and is often based on loose information but still gives a picture of the continuation of the project activities after the end. (Hodgkin 1994, 6.)

UNDP and World Bank

Sustainability scoring used in Water and Sanitation Programme by UNDP and World Bank is based on indicators measuring the key determinants of sustainability. These three categories, technical, institutional and social have each five sub-indicators; physical condition, operation and maintenance, financial management, consumer satisfaction and willingness-to-sustain. Each sub-indicator is scored and these scores will be added together under every top-indicator. Total sum gives each indicator a score and the overall sum of all indicators gives a score of the project on sustainability. This system was used in a research which analyzes different approaches to rural water systems having sustainability as one of them. The research covered 125 community water systems in six countries. Table 1 clarifies the key determinants as the aspects, the sub-indicators and the used data sources. (Sara and Katz 1997, 31.)

Table 1 Measuring sustainability by scoring sub-indicators (Sara and Katz 1997, 31).

Table 13. Sub-indicators of sustainability		
Aspect	Sub-indicator	Source of Data
Technical	Physical condition	technical assessment
Institutional	O&M	water committee interview
	Financial management	technical assessment/water committee interview
Social	Consumer satisfaction	household survey
	Willingness-to-sustain	household survey

Water Aid

An international NGO Water Aid has created a simple assessment tool, the Sustainability Snapshot, for measuring sustainability. However, since Water Aid is concentrated on simple water systems, the list of indicators is rather short and includes only three categories which all of them are somehow related to technical sustainability. The categories are *financial*, *technical skills* and *equipment and spare parts*. The result is determined by a three-point scale from 1 (unlikely) to 3 (likely). In spite of the narrow coverage, the final step is to identify hindering factors and form a way forward. Table 2 shows the

Sustainable Snapshot as an example table ready to be used in assessing sustainability of a borehole with a hand pump. (Sugden 2003, 2-3.)

Table 2 Sustainability Snapshot (Sugden 2003, 3).

Technology	Borehole with handpump
Financial	
Technical skills	
Spare and equipment	

Asian Development Bank

Asian Development Bank assesses project sustainability according to the likelihood of the continuation of the implemented practises. Projects are ranked based on the sustainability assessment based on the defined determinants, which covers most of the sectors of project sustainability. Projects are rated on a four-point scale from *the most likely, likely, less likely to unlikely*. (ADB 2010, 7-8.)

Sustainability Assessment Matrix by McConville

The success of the project management from need assessment to evaluation can be researched through the sustainability assessment matrix, which ranks the success of ensuring sustainability during each project phase. The ranking is given based on four recommendations that steer sustainable project management. The five project phases are *Needs Assessment, Conceptual Design And Feasibility, Design And Action Planning, Implementation and Operation And Maintenance*. The sustainability factors facing these phases are *Socio-Cultural Respect, Community Participation, Political Cohesion, Economic Sustainability and Environmental Sustainability* (Table 3). Each matrix element includes four defined sustainability recommendations, so called check boxes, and the elements gain one point from each recommendation (Appendix 1). Thus, each element get scored on a scale 1-4. The maximum point for each life stage and sustainability factor is 20 making the maximum score of the whole project 100. This assessment matrix can be used during the project implementation or after the project has been completed. Therefore, it does not

pay attention on the actual achievements but more on the project planning and implementation activities. (McConville 2006, 22.)

Table 3 Sustainability Assessment Matrix (McConville 2006).

Life Stage	Sustainability Factor					Total
	Socio-cultural Respect	Community Participation	Political Cohesion	Economic Sustainability	Environmental Sustainability	
Needs Assessment						
Conceptual Designs and Feasibility						
Design and Action Planning						
Implementation						
Operation and Maintenance						
Total						

5 MSUNDUZA DRY SANITATION PROJECT

5.1 Swaziland

Msunduzi Dry Sanitation Project took place in Swaziland, which is a small, 17 364 sq km, landlocked country in southern Africa between the borders of South Africa (430 km of border) and Mozambique (105km of border). It was colonised by Great Britain until the late 19th century and the independence was granted in 1968. Swaziland is the last absolute monarchy in Africa and reigned by King Mswati III. It consists of four administrative divisions; Hhohho, Lubombo, Manzini and Shiselweni and official capital city is Mbabane although Lobamba is regarded as the royal and legislative capital city. The climate in Swaziland varies from temperate in the mountainous areas in the west and northern part of the country to the tropical climate in the low veld in the southeast. The lowest point of the country is the Great Usutu River (21 m) and highest Emlembe (1 862 m). Swaziland suffers from drought, soil degradation, erosion, the limited amount of potable water and overgrazing. (CIA 2014.)



Picture 1 Map of Swaziland (CIA 2014).

Swaziland has a population of 1.4 million of which 97 % are Africans and 3 % Europeans and the annual population growth rate is 1.17 %. The life expectancy is 50.1 years, the birth rate 25.68 / 1000 inhabitants and the death rate 13.95 / 1000 inhabitants. However, Swaziland is on the first position in the HIV/AIDS prevalence rate with the rate of 25.9 % (2009) and this has an effect on the expected statistics mentioned above as well as on infant mortality and the distribution of population by age and gender. Approximately 5 500 people die every year for AIDS. (CIA 2014.) Human Development Index (HDI) is a statistic that includes life expectancy, education and income. On a worldwide HDI-ranking list, Swaziland is ranked as the 141st out of 187 countries with a value of 0.536. (UNDP 2013a; UNDP 2013b.)

The GDP (Gross Domestic Product) of Swaziland on a purchasing power parity basis is 5 700 dollars per capita. On a worldwide ranking list, it is the 154. Economically Swaziland is heavily dependent on South Africa since most of the exports go over the western borders and most of the imports come from South Africa as well. Additionally, the currency of Swaziland, emalangeni, is pegged to the South-African rand. Swaziland produces agricultural products such as sugarcane, cotton and corn as well as industrial products such as coal, wool pulp, sugar and textiles. Approximately 40 % of the population are unemployed and 69 % live under the national poverty line. Most of the employed are working in the field of agriculture. The change rate of urbanization is 1.19 % and 21.1 % of the population live in urban areas, 74 000 in Mbabane. (CIA 2014.)

Some of the most serious environmental problems in Swaziland are the erosion and the degradation of soil which has enhanced by deforestation. The root cause for erosion is population growth and increased need for space. Steep slopes and heavy rains make the soil especially vulnerable to erosion. Additionally, the pollution of water is another environmental problem. The sources of pollution are industry and agriculture but also insufficient treatment of wastewater which increases the spreading of water based diseases. (Encyclopaedia of the Nations 2014.) In Swaziland, over 160 children die annually from diarrheal diseases caused by polluted water or poor sanitation. All

in all, 280 000 people in the country, nearly third of the whole population, do not have access to clean water sources and 430 000 people, nearly 40 % of the population, do not have access to proper sanitation. People with HIV/AIDS are especially vulnerable to water based diseases among other diseases. (WaterAid.)

Development work in Swaziland is steered by three official strategies. National Development Strategy, launched by King Mswati III in 1999, defines developmental mission and vision together with appropriate strategies for socio-economic development. It is meant to strengthen the development planning and management capacity of the government. The Swaziland Poverty Reduction Strategy and Action Plan, launched in 2008 by the government, is a response and a national implementation program for the Millennium Development Goals defined by the UN and it is based on six programme pillars to improve the economic situation, the quality of life of the poor and good governance. The third development strategy is The Government Priority Programme, 2008-2013, which set priority areas and targets for the ministries to focus on. (UN Swaziland 2012.)

5.2 Concept of sanitation

There are several definitions for sanitation. The simplest ones cover only the access to toilet facilities but the wider definitions include the collection, transportation, treatment and disposal of waste. Additionally, privacy and safety issues are part of sanitation. The definition can be spread also to cover other waste types such as household trash and hospital waste as well as grey and storm water. (COHRE et al. 2008, 17)

The Millennium Development Goal (MDG) 7C states that by 2015 the proportion of the population without sustainable access to safe drinking water and basic sanitation should be halved. The Goals were published in 2000 and now when the year 2015 is only one step ahead the goal concerning the access to sources of water has been reached. However, still 2.5 billion suffers from the lack of access to adequate sanitation facilities. (UN.) The situation is the worst in Sub-

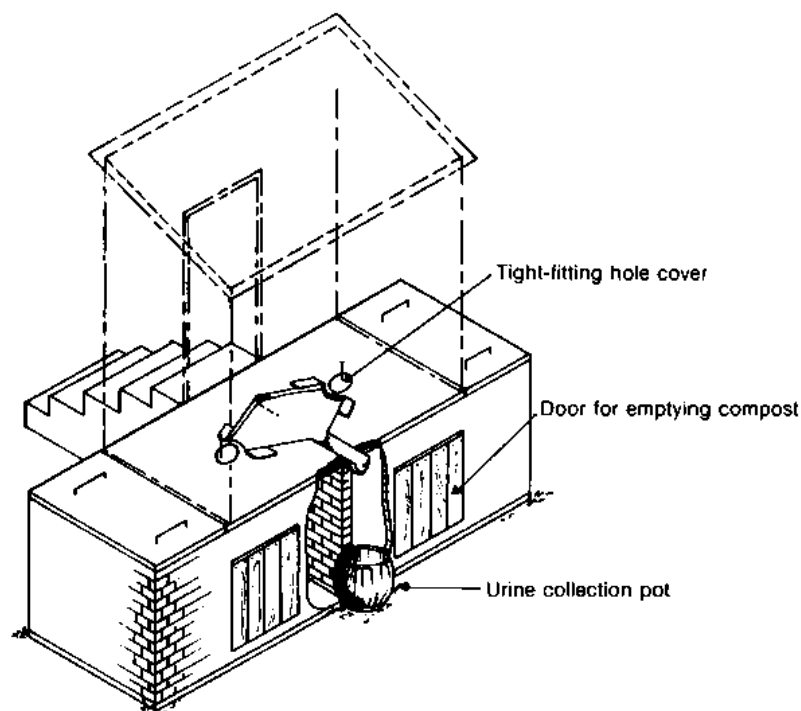
Saharan Africa, Southern Asia and Oceania (WHO 2011.) Human waste and waste waters contain hazardous pathogens such as bacteria, viruses, helminths and protozoa that can cause cholera, typhoid, hepatitis and schistosomiasis which are potential threat to humans especially to children, the elderly and other vulnerable groups (WHO 2002). The annual death rate caused by diarrhoeal diseases is 1.8 million people from which 90 % are children under 5 years old (World Water Council). Inadequate sanitation has enhanced several other development problems. It affects public health, education, labour and environment. These hinder significantly economic growth and according to the World Bank the cost of poor sanitation is e.g. 6.4 % of GDP in India and 2.4 % in Niger. (World Bank 2013.)

Sanitation systems prevent pathogens from spreading to the environment. Without proper sanitation facilities and hygiene practises, they are able to pollute drinking and bathing water, food such as vegetables and provide breeding sites for flies and other insects. In order to prevent these risks, toilets have to be designed paying a close attention on separating the waste from the ground and ensuring proper ventilation. (WHO 2002.) WHO and UNICEF divide sanitation facilities into two categories: improved sanitation, which hygienically separates the waste from human contact, and unimproved sanitation. "Improved" includes flushing toilets, piped sewer systems, septic tanks, pit latrines (both ventilated one and one with a lid) and composting toilets. "Unimproved" includes flushing elsewhere which means excreta being flushed nearby the household, pit latrines without a lid, buckets, hanging toilets which are toilets built above a body of water, and open defecation. (WHO and UNICEF 2013.)

Dry sanitation means a sanitation facility that does not require water. This category includes a wide range of solutions from a simple pit latrine to a two-chamber composting toilet. Pit latrines consist of a dug pit and a shelter construction and they can be ventilated to avoid flies. Composting toilets are toilets usually with two chambers that separate the waste from the ground. Composting process kills pathogens and the end-material can be used as a soil

improver and a fertilizer. Additionally, urine can be separated and used as well as a fertilizer. The idea of reusing human waste is old and already 1000 years ago in Syria faeces were dried and used as a fertilizer. (Peasey 2000, 3)

Composting toilets save water and do not require digging pits and therefore they can be built on ground with a rock near below. They can be constructed from local and simple material and the waste is separated from the environment and animals. Picture 2 shows an example of a composting toilet with two separate chambers. When the first chamber is full, the material will be left to compost and the other chamber is in use. Composting supports the natural nutrient cycle, provides fertilizer and when used properly they cause no smell. Composting toilets need relatively a lot of maintenance and they need to be used properly. Misuse can cause smell and makes the toilet unpleasant to use. Additionally, cultural characteristics such as using water for cleaning can have an effect on the usage. The stigma on human waste as well is a major factor in utilizing the composted excreta. (Peasey 2000, 28-29; Franceys et al. 1992.)



Picture 2 Double chamber composting toilet (Franceys et al. 1992).

5.3 Msunduzi

Msunduzi is the largest community in the capital Mbabane with the population of 16 000 and it is a semi-urban district with six communities: Maqobolwane, Mncozini, Mncitsini, Gobholo, Mntulwini and Corporation. There is formal housing in the area but at the same time a lot of informal settlements and the living standards vary significantly. A great number of inhabitants do not have access to adequate sanitation and waste management and the unemployment rate is high. Geographically Msunduzi is mountainous and steep slopes together with heavy rains and decreased amount of vegetation makes the soil sensitive to erosion. Additionally, traditional mud and stick- houses built even on the steepest slopes are endangered during heavy rains. The administrative in Msunduzi is officially the City Council of Mbabane which is responsible for the policymaking. However, traditionally the elders of the communities, the Central Committee, are the decision-making body at the community level. (MDSP 2011.)

According to the study implemented by Turku University of Applied Sciences in 2004, 85 % of the households had some kind of toilet and 10 % had a flushing toilet. The rest were without any kind of toilet. The area is partly covered by the municipal sewerage system but the locals claim that only 50 % of the inhabitants have access to it. Septic tanks are common but not everybody can afford to the emptying service. Additionally, pit latrines are very common in the area and are hazardous especially during the rains when the bacteria can easily transfer to the waters and soil. They also require a lot of space and the plots are relatively small. Some that are without any kind of toilet uses the so called flying toilet which means defecating in a plastic bag and throwing it to the surrounding environment. (MDSP 2011.)

5.4 Background of the project

Msunduzi Dry Sanitation Project has its roots in the year 2004 when Turku University of Applied Sciences (TUAS) together with the City Council of Mbabane conducted a baseline study in Msunduzi. The aim of the study was

to define the environmental health situation in the area and the results brought out that poor sanitation in the area is a major concern. Furthermore, already in 2003, the Global Dry Toilet Association of Finland (GDTF) organized a seminar addressing the problems with inadequate sanitation and connection between sanitation and health and despite the Millennium Development Goal on water and sanitation, dry sanitation projects had not been widely implemented. In 2006, GDTF launched a development programme of dry sanitation in developing countries. Turku University of Applied Sciences had the Environmental Health Education Project going on in Mbabane from 2004 in cooperation with the City Council of Mbabane and in 2007, the new project, Msunduzi Dry Sanitation Project, was launched through that. TUAS and GDTF were in charge in the project planning process but it was done in cooperation with all the official project partners and the Central Committee in Msunduzi. The project was implemented in three phases and at the end of 2013, it came to its end. (MDSP 2006; MDSP 2011.)

Msunduzi Dry Sanitation Project was implemented in cooperation with four partners: the Global Dry Toilet Association of Finland, Turku University of Applied Sciences, Salvation Army of Swaziland and the City Council of Mbabane. The project was funded by the Ministry for Foreign Affairs of Finland and the GDTF as a registered non-governmental organization enabled the requisition. The GDTF promotes ecological sanitation all over the world and worked actively together with Turku University of Applied Sciences which coordinated the project. Especially the department of Sustainable Development participated in terms of students carrying out their practical trainings and bachelor thesis' in Swaziland. (MDSP 2011; GDATF 2013.)

The Salvation Army as the local partner has played an important role in the project due to its trust through the communities. It works in a central place in Msunduzi and is the only clinic providing medical help mainly for the residents in Msunduzi. Due to the severe HIV/AIDS situation in the country, the provided services including medical counselling are highly used and the Salvation Army is well aware of the resources and services in the area. During the project,

Salvation Army worked as the local coordinator being responsible for bookkeeping and payments and acted as a supervisor for the local employees. Additionally, it provided a venue for the workshops organized by the project. Another local partner, the City Council of Mbabane provided essential guidance and support and most importantly gave its approval for the project implementation. All the toilet construction permits were approved by the City Council and in addition, it provided office space and access to internet for the students from TUAS. (MDSP 2011.)

The main beneficiaries are the people in Msunduzi who had a possibility to get education on sanitation, hygiene and gardening and the project aimed to reach as many people as possible. Public and private toilets have offered improved sanitation facilities for those who have access to them and they can benefit from the fertilizer produced by the toilets in terms of bigger crops, better health and extra income. Everybody who worked in the project has gained knowledge on sanitation and important work experience, the women and the youth for instance. Additionally, the Sanitation Experts have gained irreplaceable education and they can benefit from that in the future even in terms of occupation. Another group of beneficiaries is the professionals and other higher operators who attended the Higher Level Courses organized by the project and gained knowledge on sanitation. (MDSP 2011.) Long-term beneficiaries include all the people in Msunduzi when they benefit from the improved state of the environment and health. The idea of dry sanitation is introduced both on a communal and on a regional level, thus the possibilities of dry sanitation to spread to other communities exist. (MDSP 2011.)

Additionally, the Finnish partners, especially Turku University of Applied Sciences have gained important knowledge on implementing a development cooperation project since all of the experience can be used in the future projects. The project has also offered a lot of practical training positions and thesis subjects for the students of the Department of Sustainable Development. They have gained knowledge on working in the field of development cooperation. (MDSP 2011.)



Picture 3 Public toilet in Msunduzi (Salla 2013).

5.5 Project objectives and implementation

The objectives of the first phase in 2007-2008 defined in the project plan followed throughout the whole project. The first of five objectives was an improved sanitation hygiene in terms of increased amount of adequate toilets both in public places as well as at private households, however having a focus on the private ones, an improved hygiene practises, a reduced stigma of faeces and toilets and a decreased amount of poor sanitation based diseases such as diarrhoea. The second objective was an increased and more effective home gardening and composting in the area and third an improved state of the environment in terms of decreased pollution of water, cleaner environment due to increased composting and number of toilets, reduced erosion, increased vegetation and improved possibilities to education. The fourth objective was an improved state of women and youth. The aim was to have an improved

knowledge on participation, hygiene and income possibilities through education and to have an improved state of nutrition, health and livelihood. The fifth and final objective was improved knowledge and know-how of the Finnish implementer. (MDSP 2006.)

The second phase was implemented in 2009-2011 and the theme of community participation was particularly highlighted (MDSP 2008). The third and last phase in 2012-2013 emphasized the sustainability of the project and focus was on the continuation of the positive results and the effectiveness of the project activities paying attention especially on the concept of ownership, the responsibility of the project and the role of local partners and beneficiaries. The idea of dry sanitation was expected to spread within Msunduzi communities but as well on a larger scale nationally. The project aimed people to build more dry toilets independently, set up community gardens and to understand the connection between environment and health, thus to perform proper hygiene practises as well as using and maintaining the dry toilets properly. (MDSP 2011.)

The project has funded a construction of 47 toilets (44 in Msunduzi) of which nine of them are in public places and the rest at private homesteads. The local employees, the educated Sanitation Experts have done the fieldwork in the communities monitoring toilets and educating people on sanitation, hygiene, composting and gardening. Additionally, people have been educated through workshops on dry sanitation in general, dry toilet construction, health and hygiene and composting and gardening. Two workshops, the Higher Level Courses, were organized to reach higher operators such as universities, local NGOs and local, regional and national administratives. The construction of environmental clubs, Enviro Clubs, were to create a stable institution to offer people peer support, help and knowledge on sanitation and gardening as well as a possibility to establish community gardens. In the final year, the Msunduzi Environmental Association was established to work as an umbrella organization for the Clubs.

5.6 Risk identification

The risks compromising the project outcomes were identified in the Project Plan of the first phase. Cultural issues such as attitudes towards dry sanitation and composting were seen as one risk to the project, and education as a response was included in the project activities. Community participation by the community members and the local authority were seen as another risk jeopardizing the project outcome. Including them actively in the project decision making, planning and implementation was mentioned being an efficient factor in enhancing local participation. Third risk was stated as bureaucratic problems since enabling the project process is dependent on the recognition of the Central Committee by the City Council of Mbabane. Thus, the cooperation with both of these operators would be active during the whole project implementation and acknowledging their opinions and suggestions was seen as a way to avoid this risk. The responsibilities on the project activities were planned to be handed over to the community members at the end of the project. (MDSP 2006.)

In the second phase of the project (2009-2011), in addition to the risks mentioned above, a couple of more were identified during the two previous years. Conflicts between individuals and organizations took place and this was seen to compromise the project and conflict management training was included in the activities in order to avoid any conflicts. Vandalism towards public toilets in Msunduzi occurred and the responsibility to solve this safety issue was addressed to the Central Committee and the community police. Politicization of the project was mentioned as a risk as well. The concern of the project being involved in politics was acknowledged and therefore the political independence was emphasized. The community members were expected to take more responsibility on their toilets and the responsibility of the project activities after the end of the project was addressed to the Salvation Army. (MDSP 2008.)

In spite of the work in emphasizing community participation, in the project plan for 2012-2013 it was still seen as a risk and the need to improvements existed and capacity building for the community was addressed as a response. Additionally, conflicts were still seen as a risk as well as vandalism towards

public toilets. The project was assigned to be aware of possible political instability since due to the national revolts in northern Africa some signs of it were seen in Swaziland in the spring of 2011. Despite the active work in transferring the responsibility of the project from Turku University of Applied Sciences to the Salvation Army and the community members, the sustainability of the project as an issue to be addressed was pointed out. (MDSP 2011.)



Picture 4 Gardening workshop in Msunduza (Salla 2013).

6 INTRODUCTION TO THE RESEARCH

6.1 Purpose and perspective of the research

The purpose of this thesis is to assess project sustainability thus the probability of the continuity of the positive benefits obtained by the Msunduzu Dry Sanitation Project and bring out the factors that have hindered the sustainability of the project as well as the sustaining factors that carry the idea of dry sanitation. Sustainability assessment is part of the overall quality assessment and gives a partial view about the overall success of the project (MFA 2012, 18-19).

Sometimes the sustainability aspect seems to be taken as self-evidence and the efforts to achieve it are underestimated. Too often the intervention comes too much from the outside of the community and does not root to the systems, especially behavioural related subjects, and through time the benefits fade away entirely. Thus, this thesis is meant to give a clear assessment of the Msunduzu Dry Sanitation Project but also emphasize the importance of project sustainability and its factors. It can be used as a lessons-learnt document while implementing similar projects and to understand the complicated system of project sustainability.

The research observes sustainability as totality consisting of the sustainability dimensions presented in chapter 4 and the presumption is that to achieve comprehensive sustainability all the dimensions need to be sustainable. In this research, the defined factors upholding the production of the benefits are the assimilation and distribution of the concept of dry sanitation including attitudes, acceptance, education, communication and equality; operation and maintenance which are related to practical activity; and community participation and the institutions which defines the cooperation and working structures that uphold the idea of dry sanitation. People's attitude and acceptance is essential to sustain the idea of dry sanitation since people are less willing to do something which they do not see right or good. It includes also social equality

and possible limitations which could hinder the assimilation of dry sanitation for some people. Communication including education on sanitation is the factor that supports the diffusion of dry sanitation in Msunduza bringing the benefits to increased amount of people enhancing the improvement of environment on higher level. Operational activities mean the usage of toilets and utilizing the waste and urine. This brings the benefits for those specific people who were chosen to have a toilet but also upholds the visible side of dry sanitation working as a showcase and as an example for other people.

Based on the benefit-factors, assimilation and distribution, operation and maintenance and community participation and institutions, every individual sustainability dimension is assessed separately clarifying institutional, socio-cultural, political, technological, environmental, economic and ownership-related achievements and challenges in order to found out the likely level of sustainability. The dimensions are divided into two categories: internal and external sustainability. Internal sustainability includes dimensions that are connected with people's behaviour and activity on different levels such as social issues and institutional functioning. Thus, it includes institutional, socio-cultural and political sustainability as well as ownership. External sustainability includes dimensions that are concerning factors that are not directly related to people's behaviour such as economic and technical factors. It includes economic, environmental and technological sustainability. The division is only loose and informal and the meaning is to emphasize the meaning of social income and people-based working. In conclusion, the comprehensive sustainability of the project is assessed based on the level of achievement of each sustainability dimension. Table 4 clarifies the structure of the sustainability perspective used in this research.

Table 4 Assessing sustainability

Sub-factors	Factors	Sustainability dimensions (aspects)	
Administrational acceptance and support	Assimilation and distribution	Internal Institutional Socio-cultural Political Ownership	Comprehensive sustainability
Changing attitudes			
Education and communication			
Social equality			
Dry toilets	Operation and maintenance		
Utilization of compost and urine			
Project management	Community participation and institutions	External Technical Economic Environmental	
Sanitation Experts			
Msunduzi Environmental Association and Enviro Clubs			
Community gardens			
Caretakers of the public toilets			
Local NGO			

6.2 Methods of the research

The approach to this research is a methodological data triangulation which means using multiple research strategies, in this case both qualitative and some quantitative data; interviews and observation; and existing literacy data including quantitative and qualitative information, in this research the official project plans, the annual reports, previous thesis' and other project material. The benefit of triangulation is the reduction of inappropriate certainty as results may differ from each other and eliminate certainty. It also presents wider views and increase reliability since the results complete each other. (Hirsjärvi et al. 2007, 38-39.)

Qualitative research is based on comprehensive data acquisition using real and natural sources and conditions. Therefore, using people as a data acquisition instrument is advisable and this idea is based on the belief of an observing and discussing person being more reliable than concrete measuring. Qualitative analysis is not necessary based on theories and hypothesis but on the researcher's inductive analysis and revealing of unsuspected factors. Interviews, observing and other qualitative methods are used in the data collection process. Sampling is done by convenience, not by random sampling,

in order to get suitable and functional data. Qualitative research is also adaptable and can reform during the research process and studies are always seen and handled as unique cases. (Hirsjärvi et al. 2007, 160.)

Quantitative analysis is based on the law of cause and effect which is established on realistic ontology. It emphasises the idea of reality being based on objectively verifying facts. Quantitative research uses numeric data and fundamental set and sample being planned and chosen in advance. Variables are processed and analyzed in worksheets. Percentage tables and statistical testing of the significance of the results are part of the analyzing process. (Hirsjärvi et al 2007, 135-136.)

6.2.1 Interviews and other data collection

Most of the data for this research was collected through interviews using a semi-structured questionnaire. Interview is a flexible research method and it includes multiple benefits. It is human based and gives possibility to speak freely and extensively about factors affecting the interviewee personally. It is also possible to clarify and deepen questions in terms of additional questions and justification. Interviews works well in situation when the subject is extensive and answers are expected to be multifaceted. (Hirsjärvi and Hurme 2009, 35.) Semi-structured questionnaires include open questions, thus the interviewees can answer with their own words having no defined options. Additionally, the questions are same or cover same themes but the order and form of questions can vary. Semi structured interview emphasizes people's interpretations and what different factors mean for and weigh with them. (Hirsjärvi and Hurme 2009, 47-48.) Interviews being a multi-purpose and flexible tool it does include some problematics. Interviewing and lettering is time-consuming. Additionally, it is said that interview as a research method includes several source of errors in terms of reliability. The interviewee might want to give socially expected answers for instance. Some difficulties might arise in the analysis and interpretation phases since analysing free-form data is somewhat problematic. (Hirsjärvi and Hurme 2009, 35.)

The interviews for this research were carried out in Mbabane in May 2013. Interviews were done in the local language, siSwati, and translated into English by a local interpreter who worked as a field coordinator in the project. Small part of the interviews was carried out via e-mail in English. There were six chosen sample groups and the question covered the general attitude towards dry sanitation, the use and maintenance of the toilets, home and community gardening, use of the compost, community participation and ownership of the project. The choosing of the interviewees was based on their connection to the project and each sample group had their own questions due to their variable role in the project implementation.

6.2.2 Sample groups

The Sanitation Experts had a significant role in the project implementation and they are part of the institutional system left in Msunduzi after the end of the project. The question directed to them inquired their background, motivation and responsibilities in the project as well as their thoughts about the future especially their continuity as a Sanitation Expert in order to clarify the strength of that specific institution. Questions also covered Enviro Clubs concerning Experts' participation and roles in order to find out how sustainable Clubs are and will Experts' knowledge on dry sanitation be available in Club activities. Additionally, questions inquired Expert's thoughts about the design of the toilets and the use and maintenance of them in order to clarify technical sustainability, on the other words, is there technical factors that might hinder the use of the toilets. The thoughts about people's attitudes towards dry sanitation and the use of compost were clarified as well to point out the changes on a social and cultural level. (Appendix 2.)

The owners of the dry toilets are the main beneficiaries of the project and they have a great possibility to improve their living through the benefits brought by the toilet. The questions directed to them covered the usage and maintenance of the toilet as well as challenges they have faced and benefits they have gained. The questions inquired Enviro Club participation in order to find out how

sustainable the Enviro Club institution is. The use of the compost from the toilets is an important part of the project, thus the use and thoughts about it as a fertilizer was clarified to show how strongly the new habit has rooted to people's minds. The toilets are meant to serve as many people as possible and to promote equality to enhance the efficiency, therefore it was important to find out if the toilet is used by everybody in the homestead. Finally, the question covered ownership towards the toilet in order to find out how strongly the owner is committed to it. (Appendix 2.)

The community leaders are the policymakers in Msunduza and they have been participating in the project but most importantly they gave their approval for the project implementation in the beginning. Questions clarified their role in the project now and in the future in order to explain their attitudes towards the project and dry sanitation. Additionally, the questions covered leaders' thoughts about community gardens and the use of compost as fertilizer to see whether they see the potentiality in those. It was also asked how they see people's attitude towards dry sanitation and building toilets independently to see is there a chance that the idea of dry sanitation spreads in the area after the funding ends. Their views about potential upcoming challenges clarified the future and the resilience to those risks. The leaders were also asked to tell about their thoughts about the Enviro Club in order to find out whether the Clubs have the support from the leaders which has an effect on the sustainability of that institution. (Appendix 2.)

The toilet caretakers are the ones responsible for all the public toilets. They are meant to maintain the toilet and open the door for the users. They are not hired employees but are allowed to keep the small toilet fee people are paying. The questions directed to the caretakers covered the background as a caretaker and their views about the future in order to find how motivated they are. They were also asked about challenges in being a caretaker and in the actual work in order to find out possible risk factors. Finally, they were asked about the Enviro Clubs and the benefits those would offer to see the potentiality that they would be part of that institution. (Appendix 2.)

The fifth group consists of project partners i.e. representative from the City Council of Mbabane, Salvation Army and Turku University of Applied Sciences. Additionally, the field coordinator is included in this group due to his meaningful role in the project. The questions directed to them included their views about people's willingness to build toilets by themselves, community gardens, the use of toilet compost as fertilizer and about Enviro Clubs to get their vision on the sustainability of the intervention. (Appendix 2.)

All interviewees were given time to tell everything else they had in mind concerning the project. The Sanitation Experts were interviewed in a place and time agreed advanced and all seven of them were interviewed, the toilet owners were chosen through random sampling choosing two owners from each community and the interviews were made in their own plot. The leaders were chosen through random sampling as well or their close relationship to the project and the interviews were made at their own plot. There are seven public toilets in Msunduza and all of them excluding one have a care taker. All of them were interviewed either at the toilet or in their own plot. The project partners were interviewed in their place of work or via e-mail. Altogether, 33 interviews were made.

7 RESULTS

The overall objective of the project was to create a sustainable and healthy sanitation culture in Swaziland. The results of this research are divided as defined in the previous chapter into three groups; assimilation and distribution, operation and maintenance, and community participation and institutions; in order to clarify acceptance of dry sanitation on different levels, practical functioning, and working and cooperative structures upholding the concept.

7.1 Assimilation and distribution of the concept of dry sanitation

The assimilation and distribution of dry sanitation in Msunduza is divided into administrative acceptance and support to give a picture on the regional and national attitude towards dry sanitation; attitudes to clarify the acceptance on a more personal and individual level; education and communication to clarify the distribution and diffusion level concerning dry sanitation, and social equality to clarify on which level dry sanitation in Msunduza is available for everybody including all special groups.

7.1.1 Administrative acceptance and support

The interviewed community leaders agreed that there are a great number of benefits in dry sanitation: a proper toilet that is a life-time toilet, increased gardening, the utilization of the compost and urine as well as prevention of diseases especially for old people were all mentioned. However, one leader stated that there are not many benefits in using the compost and the urine since the stigma of human waste is so strong. Half of the interviewed community leaders thought that the benefits of dry sanitation are still widely understood in the communities. The rest stated that only a few at the most see the benefits. However, they all agree that further education is needed and the stigma of human waste is a major issue. One problem is also the great number of tenants which makes the turnover of the people high in Msunduza. New residents need to be educated and it is not always easy especially with a subject like this.

Community leaders' roles concerning dry sanitation varied. Some of them had participated more in the project activities than others. Part of them had attended workshops and encouraged people to use and maintain their dry toilets in the right way. One told that he is also working with the City Council in terms of project related issues. Almost all of the leaders participated in the toilet owner selection process. The project got approval from the leaders before the implementation and now all of the interviewed leaders stated that they do see benefits in dry sanitation. Almost all of them say that there is a future with dry sanitation. They emphasized the role of the leadership in problem solving and Enviro Club activities. One leader said that the leaders should have been participated more in the project activities and informed of meetings and other important issues concerning the project.

The City Council of Mbabane has been supporting the project through the implementation and according to the interviewees, now after the end of the project they state to continue to work in Msunduzi by promoting dry sanitation. They have also started dry sanitation projects in other communities outside Msunduzi which can be seen as a great achievement and as a result of long-term promotion of dry sanitation by MDSP and as an overall acceptance for the whole concept of dry sanitation. Additionally, the local Ministry of Health has participated in the higher-level courses organized by MDSP and in the last course the right way of utilizing the compost was clarified and the representatives of the ministry were told to feel positive about it. Also they seemed to have a wrong image about the use of the compost as soil enrichment and during the course this was corrected.

MDSP has also been aligning with the Swaziland Poverty Reduction Strategy and Action Plan and thus can be said that it supports the national development goals. The project's aims to improve people's livelihood and the state of the environment go together with the strategy's aims to increase income from agriculture, to enhance people's skills, to improve working conditions for the poor, to improve people's health, to improve sanitation, water supply and waste

disposal and to ensure food security. (Ministry of Economic Planning and Development of Swaziland 2007, 39, 47, 50, 65, 80-88.)

7.1.2 Changing attitudes

Bad timing of the project came out when another leader told that the project started at the same time with elections and it is always a negative factor. People might have thought that the project has something to do with the politics and thus raised negative assumptions. Experts stated that changes regarding people's attitude towards dry sanitation have taken place. People are now more open to talk about sanitation related issues after getting to know more about the concept. All of the Experts told that now people welcome them in their homes and are more open for discussions. Yet, occasionally some complaints occur.

The progress can be seen in the publication *Changing Attitudes Towards Dry Sanitation in Msunduzi, Swaziland* where two studies were compared in order to find out whether the attitudes have changed since the beginning of MDSP. The first study was conducted in 2008 and the other one in 2011. The research reveals that the progress on people's attitudes regarding health and hygiene has been considerably positive. Composting dry toilet is now seen as a potential toilet to replace pit latrines and as an improved sanitation system. People are now more willing to discuss toilet related issues, however, the need for such discussion is not daily and thus it cannot be seen as a common topic. Toilet issues are seen as private matter and are brought up mostly due to related challenges. (Heikkilä et al. 2012, 6-8.)

7.1.3 Education and communication

The common opinion within all of the interviewees was the education not being sufficient enough to get people widely and fully understand the whole concept of dry sanitation. Several of the interviewees stated the education started too late and being not "powerful" enough. One interviewee stated that challenges concerning people's level of learning should have been predicted earlier and a plan of action should have been made advanced enough.

Educating people has started too late. Why it was started not until recently?
- Community leader

Challenges in communication were mentioned as one problem in Msunduzu and one of the interviewed community leaders told that communication has not been working well and people have been unaware of what is going on in the project. Other parties in the project agreed as well that communication between different stakeholders has been insufficient. Another leader stated that the work of the Sanitation Experts in that specific community has not been good. The other one has been doing too much by herself which has raised confusion and the other Expert has not been active enough. A couple of statements about leaders not been involved enough in the project come out among them.

Anniina Kirstinä studied communication and diffusion of innovations on sanitation in Msunduzu in her Bachelor Thesis 'Gossiping about Sanitation – Role of Communication in Innovation Diffusion' (2012). The study reveals that communication between different stakeholders is rather scarce and the communication seemed to be mostly one-way especially between the community leaders and the City Council but also between the Sanitation Experts and the caretakers of the private toilets. Additionally, some of the Experts deal with only one person in the homestead and the education does not necessarily spread with others. The neighbors of the toilet owners had very little knowledge on dry sanitation which tells that the information concerning sanitation does not cross the plot borders. Kirstinä stated that one reason for the care takers of the private toilets being unwilling to share their knowledge is the concern of their toilet being used against their will. (Kirstinä 2012, 47-49.)

Kirstinä's research also clarifies different communication channels. Most of the workshops were organized at the Salvation Army's facilities and not everybody has been able to attend. (Kirstinä, 2012, 39.) This came out also during the interviews for this research when a couple of the owners told that they have been in bad condition and thus not able to come to the Salvation Army. Additionally, in spite of the high unemployment rate in Msunduzu there have been some complaints the workshops being in the middle of the week days.

Another community channel is community meetings where the Sanitation Experts have had time to talk and educate the whole community on sanitation. In some communities it is the leaders who talk about the importance of adequate sanitation and in some other communities the Experts are given a chance to talk in every meeting. (Kirstinä 2012, 40.)

7.1.4 Social equality

The project has been emphasizing the participation of women in the project activities. Three of the seven Sanitation Experts are women and according to the MDSP Annual Report of 2012, most of the people educated by the Experts were women. Additionally, the majority of the participants in the workshops have been women. Also the youth have been reached by the project in terms of school visits and supporting the youth group in one of the communities.

The toilets are suitable for everyone to use but in some slightly case-specific challenges may occur. The toilets need relatively a lot of maintenance work and some groups such as the elderly or people otherwise in poor physical condition may have difficulties in keeping the toilet in a state where it works properly. Many of the toilet owners are old people and some of them stated to have difficulties in carrying out all the needed physical chores such as collecting the dry substance. A majority of the owners told that they take care of the toilets by themselves and no-one in the homestead is helping. Some of the interviewed toilet owners also told that due to their poor condition they have not been able to attend the workshops organized at the Salvation Army and thus in that sense they have not been exposed to the education provided by the project.

7.2 Operation and maintenance

Operation and maintenance includes practical activity concerning dry toilets such as the usage, maintenance and construction and additionally utilization of compost and urine to find out the level and diffusion of the concrete service of the toilets.

7.2.1 Dry toilets

According to the interviews in May 2013, six toilets out of eleven were in use, however, two of them having major problems and one having minor problems. The rest, five toilets, were not in use at all. Thus, the usage percent of the toilets is relatively low. Moreover, toilet monitoring covering more toilets, 27 altogether, conducted also around May 2013 by the Sanitation Experts and students, supports this statement. Seventeen toilets were in use including six with problems of some kind and ten toilets were not in use at all.

We are very proud of our toilet; we couldn't have afforded for the toilet by ourselves. - Toilet owner

Needed work is the only reason why we do not use the toilet (.....) I would not consider using the toilet ever in the future. – Toilet owner

The toilet is not in use because it is broken. – Toilet owner

In some homesteads only one person, the owner, was using the toilet due to misuse by the other family members or tenants. In those homesteads where all the residents were using the toilet, the owner told he/she had educated them in the right usage. However, in most cases the owner was the only one to maintain the toilet and high age and/or low physical condition has been causing challenges in terms of collecting dry substance for instance. A couple of the owners had a family member to help them and a couple of them mentioned Sanitation Experts visiting every now and then. Other problems concerning the toilets included missing or not suitable technical parts or difficulties in handling the compost. Some of those with problems with the dry substance had a solution for it but those ones with technical problems seemed to be unable to solve it by themselves and stated that they would need some help from the project while the project has been unwilling to help them. The reasons for toilets to be not in use at all were the toilet being unfinished, misuse of the toilet, broken technical part, lack of dry substance and disinterest towards the toilet.

Missing or too short urine pipe seemed to be a common problem among the dry toilets. Another and more challenging problem is the design of the seat with a urine separation. In many toilets the separation did not work properly and the

urine pipe has got blocked by the dry substance. Some owner stated as well that the seat is not very pleasant to use. Enviroloos seemed to have a variety of technical challenges such as broken parts and leakages which are problematic to repair by oneself. The amount of normal maintenance work concerning Enviroloo-model is bigger than in a regular composting dry toilet. Part of the owners stated that they have gotten enough education in the workshops for instance about the usage and maintenance of the toilet but part of them expressed a need for further education and also education for all of the users, not just for the owner.

The Sanitation Experts doubt that all of the owners will keep using and maintaining their toilets in a correct way without them guiding since they have not witnessed full dedication towards them. Also doubts about people's dedication to maintain their toilets occurred among the community leaders who mentioned it as one of the challenges in the future.

I am not sure about the willingness of people to maintain and use their toilets; probably they will not continue because they are lazy. People have gotten used to go to the workshops and they will miss those. Without them they will forget.
– Sanitation Expert

Part the interviewed community leaders and some of the Sanitation Expert mentioned that the selection of the toilet owners has been failed due to the lack of commitment. Yet, leaders do confirm that they have been responsible for the selection. One leader suggested a penalty fine for misbehaving owners and emphasizes them being role models for other community members.

In spite of the challenges concerning the toilets all the owners named themselves as the owners of their toilets. The feel of ownership however does not show in the maintenance level of the toilets and some of the owners still require support from the project in terms of cleaning equipment for instance.

One of the objectives of the project was to get people to build toilets by themselves. This target seems yet to be reached since almost all of the interviewees agreed that at least for now the toilets are too expensive for people to build. One leader said that they need to be educated in getting the costs

down and somebody to show a good example for others. Additionally, the general lack of interest towards dry sanitation hinders the building. City Council however stated continuing the work in Msunduzi promoting building of dry toilets but admitted the high price being a challenge.

The publication *Changing Attitudes Towards Dry Sanitation in Msunduzi, Swaziland* agrees that people have been reluctant to build dry toilets independently. The need for such toilets was questioned since there are a lot of pit latrines built by the City Council and some of them were not in use at all. Additionally, a pit latrine was seen as a better option in a monetary sense and due to lesser need for maintenance work. (Heikkilä et al. 2012, 8.)

7.2.2 Utilization of compost and urine in gardening

Five of the eleven interviewed toilet owners told they have a garden and two were planning to establish one. One had already used the composted material in the garden and six stated that they will or could use it when the compost is ready or after further education. Two stated that they would not use it due to health concerns. Some of the owners did not have a plan for the compost because of the non-acceptance by the family members. The understanding towards the benefits from utilizing compost in the garden did exist within the toilet owners and some of them stated that as one of the advantages in dry sanitation. However, the stigma towards human waste still lies in people's minds and the usage of compost is relatively low at the moment. Many of the owners expressed a need for further education on handling the compost and using it as soil enrichment. Some claim that understanding the whole concept can be difficult for people.

The Sanitation Experts pointed out the stigma of human waste as well and even some of them were doubtful or in a need for education on the use of composted human waste. All the interviewed community leaders agreed on this and stated the utilization of human waste is and will be a challenge in the future and further education on that is definitely needed. One of the leaders confirmed that there

are incorrect beliefs within people about the principles of the utilization and that has hindered the use of the compost.

There is a problem with the compost. Some people think that the fertilizer comes straight from the toilet without being treated in any way. Urine is easier to use.
– Community leader

Utilizing human faeces is difficult for Swazis to understand. – Community leader

According to a couple of the interviewed leaders, the acceptance of dealing with human waste is exceptionally challenging because it is seen as being against the local culture and difficult to understand.

Another major factor hindering the use of the compost and urine is the City Council which requires scientific proof that the compost is safe to use with right techniques. The use of the compost has not been recommended and even forbidden, yet testing has not been enabled due to insufficient testing facilities. The actual testing also includes a lot of challenges since it is unclear should the sample be taken from the compost material or from the vegetables. All in all, the safety relies heavily on the usage techniques and knowledge about the compost process.

7.3 Community participation and institutions

Another major factor hindering the use of the compost and urine is the City Council which requires scientific proof that the compost is safe to use with right techniques. The use of the compost has not been recommended and even forbidden, yet testing has not been enabled due to insufficient testing facilities. The actual testing also includes a lot of challenges since it is unclear should the sample be taken from the compost material or from the vegetables. All in all, the safety relies heavily on the usage techniques and knowledge about the compost process.

Institutions and communication includes project management to clarify the attendance level of local partners in MDSP to find out the commitment for the project; the formed or attempted institutions: the Sanitation Experts, the Msunduzi Environmental Association, Enviro Clubs, the caretakers of the

public toilets and community gardens to clarify the activity and functioning level of them; and also the activity and functioning level of a local NGO working with dry sanitation in Msunduza.

7.3.1 Project management

According to the project plans and the annual project reports, the involvement of the project partners varied significantly and also communication between different partners seemed insufficient. The project implementation was heavily dependent on TUAS and the input and coordination skills by the Salvation Army were seen rather weak. As a local coordinator having trust among the community, strong involvement from it would have been especially significant and thus the insufficient input for the project is a major factor for the sustainability. The problem was acknowledged from the beginning but notable progress did not take place. Challenges concerning the involvement by the City Council took place as well. According to the interviews, the City Council's interest towards the project varied during the years which made cooperation quite challenging. The City Council claimed that they had not been involved enough by the project.

Additionally, insufficient communication caused challenges in the project implementation and often someone felt uninformed about the project activities. The weekly meetings of the Sanitation Experts were a place for common discussions and cooperation but both the Salvation Army and the City Council did not attend the meetings regularly.

7.3.2 Sanitation Experts

Educating and employing local Sanitation Experts has been one new institution in Msunduza. Most of them had been working in the project from its beginning and all of them were chosen to act as an expert by the community. Motivators for working in the project were willingness to work with people, getting knowledge and learning new things, sharing ideas and wish to see changes in the community and in the situation of sanitation. Almost all of the Experts stated

that they will continue their work as Experts after the project has ended and one mentioned educating people also outside Msunduza.

Another stated that she will always work for her community. However, they all had other plans beside work as an expert and one mentioned that if he will get employed, the job will come first and sanitation work after that. All of the Experts were happy for being able to work in the project. They appreciated the education and knowledge they have gained during the years. Nevertheless, one mentioned the problem of plans changing so many times which made working less pleasant. Additionally, financial income and one's own toilet were mentioned as gained benefits.

I will continue as an expert and I will also educate my relatives outside my community. – Sanitation Expert

Now I have an education. – Sanitation Expert

7.3.3 Msunduza Environmental Association and Enviro Clubs

Another new institute established by the project is Msunduza Environmental Association and the Enviro Clubs. About half of the interviewed toilet owners had heard about the clubs and two of them were a member. Most of them were interested in knowing more and could have seen themselves as members. One of the owners who told being a club member said that he is the only member in the club so the club was not active. Another owner brought up the club being a good way to educate people in the right usage and maintenance of the toilets. Most of the Experts stated being a member of an Enviro Club but the activities of the clubs seemed rather passive and even the experts were not always aware of the meetings and in some cases the club was not active at all. One Expert said that he does not understand the meaning of the clubs and one told that some people think that the Experts benefit from the clubs on behalf of others. However, most of them agreed on the importance of the clubs and were willing to make the clubs work or even establish one and work as active members or more like as supporters or mentors.

Almost all the interviewed community leaders had heard of the clubs and they felt very positive about them in terms of problem solving and sharing ideas and could definitely join one. Those few who had not heard of the clubs stated them to be a good idea and could see themselves as members. The attendance of the leaders was seen an important part in making the clubs work and their role would be educating or mentoring the clubs.

It is leaders' responsibility to organize the clubs. – Community leader

Only a couple of the care takers of the public toilets told being aware of the clubs but they as well thought the idea is good in order to promote dry sanitation, gardening and hygiene practices. Almost all of them are willing to join a club. One care taker expressed his disappointment in the situation where there had been a lot of talking about establishing a club in his community but nothing has been done even though the Sanitation Experts promised to organize meetings.

7.3.4 Community gardens

The project has also promoted community gardens to be established. Almost in every community a place for a garden could be found according to the interviewed community leaders. However, they stated that organizing water, fencing and seedlings could turn up to be a challenge. Additionally, strict rules need to be agreed to prevent people from misbehaving. If these challenges can be overtaken, the leaders think that there are possibilities to have successful community gardens. Majority of other interviewees stated that the challenges in cooperative activities and community participation seem to be so intractable that they doubt that any gardens will be established at least in the near future.

The idea should be represented to a couple interested people who would know how to listen and they would be leaders in the project. – Community leader

7.3.5 Caretakers of the public toilets

The caretakers of the public toilets are another institution to be maintained. All of them were chosen by the community or asked by the Experts. A couple of

them lived closed to the toilet and another one had a shop close by and these were seen as selection criteria. They told to have some challenges such as non-availability of water for cleaning, misbehaving people and lack of help they would need. One caretaker said that she would need help in emptying the urine container and one with a broken toilet but they have not received the help from anyone and the other one does not even know from whom to ask for assistance.

There is no-one helping with the full urine container. – Caretaker

Few of the caretakers stated the small payment they get as one benefit in being a care taker and one also mentioned the knowledge he would gain. However, their views about the future vary. One said that all depend on the cooperation and how it is going to work. If working with others seems not to work well, he will not be willing to continue as a caretaker.

Everything depends on the working relations. Good relations are needed; if cooperation is not working I will not continue as a caretaker. – Caretaker

Few of them said seeing the future as good but two of them stated that the future does not seem to be very positive due to broken toilets.

7.3.6 Local NGO

One other institution functioning in Msunduzi is an NGO called Green Living Movement (GLM) Swaziland which has its sister organizations in Zambia and Finland. It is relatively new and still a small-scale organization. It started through Finnish contribution and through local active people who have the willingness to improve their community. GLM cooperated with the project in terms of workshops for instance and at the moment they have a capacity building project going on in Msunduzi and Dlangeni which is another community in the outskirts of Mbabane. Part of the members of the organization live in Msunduzi and at least one of them has been active also in the dry sanitation project.

The interviews confirm that GLM will continue to work with dry sanitation in Msunduzi. However, the role of GLM in Msunduzi concerning the themes of

the project depends on the functioning of cooperation between different institutions and individuals. GLM has roused suspicions and negative attitudes partly due to individual conflicts and wrong assumptions around Msunduza and some people have clearly showed their unwillingness to work with it. Reasons for such attitudes can be various but the personality and state in the community of the local representatives as well as how GLM was originally presented in the community all have an effect.

8 CONCLUSIONS

Conclusions are divided into two categories as previously defined: internal sustainability including people based dimensions and external sustainability dimensions that are not directly connected with people's behaviour and mindset. The overall assessment concludes all of them together giving an estimation on the sustainability of the positive outcomes initiated by MDSP.

8.1 Internal sustainability

Institutional sustainability

There are several institutions in Msunduzi that potentially can carry and promote dry sanitation and uphold the networks to support people to use and maintain sanitation facilities, to do gardening and work together for common good. The future, however, depends on the cooperation and how it is going to work between individuals. Personal arguments and even rough disagreements have hindered stable structures to be build.

Since none of the Sanitation Experts stated that the payment they have been getting is their only motivation for working in the project, could be concluded that at least part of them will continue their work. Moreover, some of them felt it as their responsibility towards their communities and. However, must be remembered that all of the experts were chosen by the community and they did not contribute to their selection by themselves and thus the real initiative and inner will for working as an expert does not fully exist although getting chosen can be regarded as a privilege. The project has been long and the Experts have learnt a lot during the implementation and since some of them mentioned being grateful for the education they have been getting, could be said that the continuation of the Sanitation Experts' work is person-specific. It is likely that few of them will continue educating people to some extent but since some of them said that possible work prevails sanitation work it is unlikely that those Experts who have least expressed spontaneity and interest in the hands-on work will continue their role as a Sanitation Expert. The continuity of their work

is also somewhat dependent on the Environmental Association and the clubs since most of them are more or less involved in those. Hence, the active association and participation of the Experts can possibly uphold their work towards better sanitation, increased gardening and active community participation in Msunduza.

The project has tried for long to establish Enviro Clubs but since still after long attempts the clubs do not seem to work the focus was put on the Environmental Association and in the future the possible clubs would work under that. The association was tried to be established several times earlier but it did not succeed. However, at the moment it has an officially formed board and if the conflicts can be avoided and the cooperation works well there is great possibility to have a stable and functioning association. The conflicts between individuals and difficulties in working together have been the main issues for the clubs and the association not to work. The advantages in having the clubs and the association are recognized around Msunduza on behalf of the leaders as well as the toilet owners, the Experts and others. Thus, the need for such cooperation within the communities exists. Nevertheless, the risk of the association to go down due to personal conflicts exists and this should be widely acknowledged. The concept of working together for common good seems to be difficult to be executed.

It can be concluded that the Enviro Clubs are unlikely to work in the near future since there has not been evidence for fully functioning club activities. However, the Environmental Association now has a good base to work properly and could be said that it is more likely than less likely to succeed. Yet, it has to be taken into account that the association is still in the early stage and in a sensitive phase for changes since it is not yet stabilized in the community as a sustained institution. If the association will start to function properly and efficiently, the clubs might have a second chance to be established although it would need real commitment, effort and participation from a group of people large enough to sustain the activities. Since the founding of the association was mainly in consequence of the activity of a few community members, it has better

opportunities to be sustainable than the clubs of which an establishment was mostly done by MDSP. Nevertheless, the association was formed during the project and with the support from the project and can be easily attached to MDSP activities, thus even it is not a fully independent structure.

Another form of community cooperation is community gardens whose establishment the project has been promoting. Since the overall cooperation has been challenging and the leaders named some obstacles concerning such gardens, can be concluded that establishing them is less likely or even unlikely to happen. The challenges included both social and technical problems and thus the establishment would need real commitment, cooperation and participation as well as financial contributions.

Caretakers of the public toilets have been relatively independent and somewhat invisible in the project. Hence, the end of the project will improbably affect their work. Part of the caretakers however have not been able to fix broken toilets or even get assistance for that and for other issues, thus it could be said that if the challenges continue it is possible that the use of the toilets fades away during time. Since the toilets need maintenance and if there is no-one helping the caretakers their work becomes impossible. Whereupon, the conclusion is that the work of the caretakers is less likely to continue if the other institutions will not work supporting them.

A major factor in stabilizing institutional structures into the community is the support and involvement of the local decision-making bodies, the central Committee and the City Council, as well as the Salvation Army as a local and well-rooted organization. The community leaders have been rather passively participated in the project although they recognize their responsibilities and important role and also the benefits brought by the project. However, they have not taken the responsibility of actively administer the structures concerning dry sanitation. The City Council stated that they will continue the work in Msunduzi but since they are implementing several sanitation projects in other areas those will most likely take most of the related resources. Additionally, since the Central Committee and the City Council have had disagreements, even if one of

them would take the administrative responsibility it could possibly end up in hindering actions from the other party. The Salvation Army was an important local coordinator but the involvement was quite low in spite of its good position and trust in the community. Although there was somewhat of synergy between theirs and MDSP's operations, the Salvation Army does not seem to be able or willing to continue in a coordinative position in the future. Another matter to consider is the distribution of the project activities inside the City Council and the Salvation Army since mainly one person from each organization has been dealing with project related issues. Thus, the participation is not well-rooted within their own structures.

One challenge concerning cooperation and establishment of sustainable institutions is that dry sanitation offers benefits which are possible to be seen rather far in the future. Due to poverty people are not that willing to notice future but the present and are seeking more short-term benefits. However, there is a base for institutional sustainability even though it is not achieved at this moment. None of the established groups; the Experts, the Association and the care takers; is not functioning without complications. A lot depends now on the actions of the Association and cooperation with GLM which seems to have a rather stable and functioning group. It is also working closely together with other GLM groups in Finland and Zambia so that form of outside support is still available for Msunduza.

Political sustainability

The recognition from the community leaders for any cooperative activities is essential. The leaders feel positive towards dry sanitation and they see the importance of their role in sanitation related issues. Thus, this recognition enhances the institutional sustainability in terms of leaders' support for all activities concerning dry sanitation. Additionally, the support from the City Council is highly important since it works as a decision maker in Msunduza alongside the community leaders. The support from the national level is also highly important and the acceptance from the Ministry makes the project

politically sustainable since there are no political or governmental factors to hinder the benefits.

Socio-cultural sustainability

Dry sanitation has gained a good status in Msunduza despite the cultural-related stigma towards human faeces, as one of the leaders said that utilizing human waste is against Swazi culture. All in all, the toilet itself unlikely includes factors that could affect social sustainability but the challenge is the handling and utilization of the waste, especially faeces since the use of urine is easier to understand. However, people are starting to understand the concept and the benefits dry sanitation can offer and even though the traditional culture is against it, people told seeing some evidence of utilization before. Thus, the concept is not entirely new. The challenge is that people have not got enough education in order to use the compost in a safe and right way and some misunderstandings have taken place. Although education has been implemented during the years it has not reached all of the toilet owners who are now lacking of knowledge and know-how on the utilization of the compost. Supply and demand have not met.

The overall improvement of sanitation in the area supports social sustainability in terms of gender equality. Increased access to toilets reduces the need of women to walk long distances during night time and be vulnerable to physical and sexual violence. Toilets in schools support girls to continue school during their periods since often they are forced to stay at home. This and the female participation in the project have made a good base for social sustainability. Everyone in Msunduza has an access to a public dry toilet and thus the project has benefitted everyone in the area in spite of their participation what so ever. However, the limitations to elderly and physically disabled people have dry toilet related challenges and thus can be said that the toilets do have limitations towards specific groups. Since many of the toilet owners are elderly people this is something that can have a great effect on the usage of the toilets and can be said to be an equality problem and affecting both social and technical sustainability.

Socio-cultural sustainability has been reached in rather satisfied volume. Although the stigma towards human waste still exists to some extent, people identify the benefits and the leaders support the concept. There is no severe social or cultural factor that could jeopardize the project outcomes.

Ownership

Ownership seems to be relatively controversial issue. Since all of the interviewed toilet owners stated that they feel like owning their toilets, could be concluded that full ownership in that sense is reached. However, part of the owners has minor or major challenges which they have not been able or willing to solve out and they have expressed demands for receiving help from the project and this tells that for some parts ownership is yet to be reached. Few of the interviewed owners have been using and maintaining their toilets properly and expressed being pleased to have the toilet. Since at the present they have no challenges and they have been happy with the toilet, can be concluded that these specific owners will continue to use and maintain their toilets. The overall ownership of dry sanitation in Msunduza is heavily dependent on institutions and their capability to sustain all the activities and is not fully achieved at this point.

8.2 External sustainability

Environmental sustainability

Environmental sustainability is included in the project at itself since one of the objectives is to improve the state of the environment. Composting supports the natural cycle of nutrients and as a dry toilet there is no need for water which can thus be used for other purposes. Additionally, there are no environmental hazards that could endanger the use of the toilets. All in all, the whole concept supports environmental sustainability and can be concluded that the volume of that is dependent on the continuation of the institutional structures and on the toilet owners' motivation to use and maintain their toilets. Whereupon the project is environmentally sustainable but the prospect of environmental

improvements in the area is partly achieved through the well functioning toilets and enhanced knowledge on the connection between environment and human health.

Economic sustainability

The construction of a dry toilet is still too expensive for the people in Msunduzi to build independently so it is very unlikely that it would happen on a common level. Another challenge is toilet paper which everybody does not afford to and the usage of newspaper as tissue in large quantities hinders the composting process. Also some tools that are needed for handling the compost and keeping the toilet clean are not available for everybody. Major challenges however concern the Enviroloo toilets which include more technical parts and when broken need to be replaced or fixed economic difficulties can prevent this to be done and stop the usage of the toilet. The economic benefits provided by the project such as selling the compost and urine have not shown any sign of existence and thus it is unlikely that such activities will appear. Additionally, since the Experts have not shown any interest to utilize their knowledge and know-how financially at this point, it is unlikely that it will happen in the future either. The Environmental Association has a possibility and skills for fundraising, so it is possible to happen but it is fully dependent on the functioning of the whole association and cooperation. Economic sustainability is thus not achieved since there are several challenges caused by lack of funding.

Technical sustainability

The project supports technical sustainability since the toilets are built from locally available materials and by using local constructors. The dry composting toilets are simple and do not include easily breaking parts. However, the challenges with the urine separation and the seat are something to decrease the technical sustainability of those toilets. Other challenges concern the Enviroloo toilets which are ready-made products from South-Africa and as stated earlier, include more technical parts which are vulnerable to breakages. Spare parts are difficult to get and breakages are problematic to fix by oneself.

It is rather possible that in the future the Enviroloo owners will confront more related challenges. In this sense, the technological sustainability is not fully achieved.

Technical sustainability is closely attached to the economic sustainability since the materials and labor most often need financial contributions, thus the economic situation has an effect on the technical side of the toilets. Yet, it is something that should be acknowledged by the project management while planning a project. There is however collaborative ways to cope with economic and technical challenges which could have been utilized more efficiently in Msunduza. A communal funding for tools and other equipment is something that could have been implemented although when looking at the willingness to cooperate with other people is rather low, executing such funding would most likely face challenges.

8.3 Overall assessment

A majority of the sustainability dimensions include some sorts of challenges, whereupon the conclusion is that the project is not fully sustainable. However, the actions carried out right after the end of the project impact the overall result significantly. Thus, the present situation is not necessarily corresponding the future. The most effectual challenge seems to be communication and cooperation which affect mostly in the fields of institutional sustainability and ownership. Throughout the project difficulties in working together have occurred so it has been a known challenge almost from the beginning of the project and efforts to solve such problems have not been fully succeed. Therefore this might be even more intractable issue now when there is no outside assistance. The community leaders however have acknowledged the problem and if the Environmental Association succeeds the possibility for improvement exists.

Dry toilets, composting, gardening and education on those as well as on hygiene and toilet construction together with communal cooperation have been the factors producing the benefits initiated by the project. Those toilets with committed and satisfied owners without challenges will most probably continue

producing those benefits. The rest however is dependent on the functionality of overall cooperation in the community, the Environmental Association and the local NGO Green Living Movement Swaziland. The toilet owners with toilet related challenges can be said to be dependent on those institutions and additionally the diffusion of dry sanitation in Msunduza is dependent on those.

If MDSP is reflected with the project classification by Hodgkin (1990), it can be said to be in the class 3 where the level of benefits drops down from the achieved level at the end of the project but stays still stable. Another option is the class 2 where the benefits continue on the same level as at the end of the project and lack of resources such as human labor prevents any further diffusion. Class 1 where the benefits replicate and expand seems at the moment very unlikely to be achieved due to the numerous challenges. Additionally, the class 4 where the benefits fade away entirely seem rather unlikely since part of the toilet will most likely continue functioning well and some institutional activities exist. The final results can be seen in a couple of years after the sensitive time right after the ending and the independence and commitment of the community can be observed.

9 DISCUSSION AND RECOMMENDATIONS

9.1 Reflecting the challenges

Complication of communal cooperation and participation seem to be the one of the main challenges hindering the sustainability of the project. Reasons for such to occur can be various, but when looking at the overall challenges in Msunduza such as unemployment, poverty and HIV/AIDS some evidence of connections between those and the project can be found. The priorities for poor people can be income and nutrition for present days rather than for the future on a long-term. On the other words, it may be difficult to think about tomorrow, the community and the future generations when the survival of oneself today is unclear. If the level of one's living is low, the priority is that oneself rather than the community and if this way of thinking evolves on a larger scale, it can result in a situation where the community will not support people in need. This sort of self-interest can be said being a survival method and this can also explain the conflicts between individuals to some extent. Moreover, the traditional structures of communities and the position of female gender for instance have to be taken into account when considering the challenges. HIV/AIDS can also decrease people's mental motivation as well as physical condition and thus people with HIV/AIDS might not be that willing to participate on a communal level. Additionally, in Msunduza the high amount of tenants has an effect on the level of participation since people unlikely want to put an effort at a community where they are staying only temporarily.

Another issue to be reflected is the status of sanitation and the stigma of human waste. Sanitation is regarded very personal subject and cannot be taken as a truism to talk about it in public. Additionally, sanitation is not necessary seen as a lifeline that would require urgent actions and the importance of adequate sanitation might get underestimated. Different cultures have their own way of dealing with sanitation and it may be difficult to affect on such personal and sensitive issue. With dry composting toilets, the challenge is human waste and

the idea of handling and utilizing it. The barriers can be health and safety related or even superstition.

One issue that arose during the interviews was education provided by the project. Some complained it started too late and many expressed a need for further education especially on the utilization of the waste. In addition, the evidence of the need for further education has occurred among the Sanitation Experts. Workshops have been organized during the project on diverse subjects, hence as stated earlier, the supply did not meet the demand. On the other words, the education has not reached essential people. This is something that should have been acknowledged earlier. Perhaps different kinds of educational approaches could have been executed and since at least in theory the Experts were meant to educate people in the community meetings, this should have been made sure and perhaps utilize those opportunities more efficiently. Additionally, the knowledge and know-how of the Experts could have been tested and strengthened during the project years. Since their knowledge has partly been rather insufficient, their capability of teach other people has not been as good as it could have been.

In spite of education being not sufficient enough, have to be remembered that in education and communication there are always two parties: the giving and the receiving party. They both need to be active in order to successfully transmit the information, knowledge and/or know-how. Thus, the actions by MDSP are not necessarily the only cause for the insufficient education. The responsiveness of the community members in Msunduza has to be considered when evaluating education. A person has to actively receive the offered information, not expecting that the learning happens by itself. Even the best education system will not reach the recipient if one is being passive in responsiveness.

9.2 Taking a look at the future

MDSP has been a relatively long project facing both challenges and opportunities which result in good knowledge and know-how of all the project partners being able to implement projects of a similar kind. The experiences

and the written documents can be used as lessons learnt papers in order to avoid the potholes on the way to achieve a healthy sanitation culture and improved environmental health elsewhere and perhaps while continuing work in Msunduzu.

The education by MDSP did not reach everybody successfully, thus some new education formats could be implemented in the future. Educating one whole homestead at a time would be something worth trying since in Msunduzu the information did not diffuse within a homestead that much. Additionally, the education would perhaps be organized in the homesteads in order to avoid for example the challenges concerning workshops in locations where everybody is not able to arrive in. Selection of the toilet owners could also be reformed to ensure the motivation to use and maintain a composting dry toilet or maybe any toilets would be given and the aim would be on an independent constructing including a design of a low-cost toilet with a proper seat and urine separation. In addition, the training of local employees could be strengthened in comparison with the experts in Msunduzu in a sense that they would be fully educated and prepared mentally and socially to work and educate people using high knowledge on sanitation and good presentation skills. A demonstration toilet with a garden could be a good way to present the idea of dry sanitation to the people. It would be important to show the use of compost and urine in practise since it includes a lot of suspicions and misapprehensions.

The Sustainability Assessment Matrix by McConville, presented on the pages 26-27, could perhaps be a good tool being included in the project implementation since it emphasizes the sustainability aspect from the planning phase to the end and it is easily formed into projects of different kind with different objectives. Additionally, while implementing a project with a somewhat of a similar executing format, the assessment method used in this thesis could be utilized since it is formed specifically for a dry sanitation project. The most important part is to see sustainability as an overall goal and build the project from that moving backwards to the practical level of implementation. The initiative and the practical execution whereas need to start from inside the

community and move from down to top where the outside party works as a support and assistance body.

9.3 Validity, reliability and ethics of the research

Triangulation as a research method reinforces the validity and reliability of the results since the different methods fulfil each other. Used literary data consisted of official project plans, reports and publications and observation by the writer was based on a three-month practical training period in the project in Swaziland together with a three-month project assistant period in Finland which have resulted in rather good knowledge about the project. Interview as a research method however include more inaccuracy factors that are essential to be taken into consideration. Writer's understanding about the concept of project sustainability and related definitions improved during the writing process, thus retrospectively, in order to have the most valid question the questionnaire could have included questions that are more specific and during the interviews some of the questions seemed to be slightly irrelevant. In spite of this, the answers worked as a satisfactory data source.

Another factor in interview study is interpretation. In this case study, the questions were asked in local language, siSwati, and then the answers were translated into English by a local interpreter. He worked in the project and was familiar with the project content, thus can be said that the likelihood of having misunderstanding in that sense is rather low. However, the possibility of the interviewees to come up misapprehensions exists and all in all, when the answers are translated first into English from siSwati and then understood in Finnish some defects may have taken place. More effective factor in interview study is the answers being untruthful or otherwise not matching with the reality. The interviewee might have wanted to give socially acceptable answers, answers that were thought to be expected or for some reason the interviewee did not want to reveal the right answers. In this research, the interviewees were asked about the benefits of dry sanitation and the use of compost and urine. Most of the people expressed their good knowledge on this but unfortunately, it

cannot be seen in reality since usage level of compost and urine is low. Therefore, it is possible that the interviewees have heard of and learnt the benefits but the real understanding is still yet to be achieved. There is a wide range of interviews carried out in Msunduzi during the Finnish cooperation in the area and thus the people might be quite used to being interviewed and even with the same kind of questionnaire. This can enhance the probability of the answers being what the interviewee expects to be the right and expected one.

The timing of the research has an effect on the reliability. Sustainability related evaluations are usually carried out a couple of years after the end of the project, as ex-post evaluations. The time at the end of the project does not give a fully reliable image since the effect of the end of the assistance cannot be seen yet. Processes right after the end govern the concrete sustainability of the benefits. Therefore, this research gives an estimation and prediction on the continuity of the activities initiated by the project based on the research result at the time of the end the project.

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Sustainability Recommendations (McConnell 2007, 23-47)					
	Socio-Cultural Respect	Community Participation	Political Cohesion	Economic Sustainability	Environmental Sustainability
Needs Assessment	<ol style="list-style-type: none"> 1. Generate a yearly calendar of work and social life in the community. 2. Identify social preferences and traditional beliefs associated with project subjects. 3. Determine the health-education level in the community. 4. Recognize the gender roles in water and sanitation 	<ol style="list-style-type: none"> 1. Conduct a participatory needs assessment at the local level to determine local development priorities. 2. Identify stakeholders and community leaders. 3. Determine the type of political organization and cohesion at the community level. 4. Reach a consensus with community members that project intervention is appropriate 	<ol style="list-style-type: none"> 1. Conduct situational analysis of regional and national issues, such as political structures and stability, government policies, and foreign aid. 2. Ensure that proposed project is consistent with regionally identified development priorities and plans. 3. Research the history of NGO and government projects in the area. 4. Establish communication lines with existing NGO and/or government institutions in the area 	<ol style="list-style-type: none"> 1. Understand the local and national economic situation (poverty level, employment, cost of living, flow of resources) 2. Understand how the community economic situation is affected by the project subjects 3. Identify sources of monetary and non-monetary resources (material, labor, and tools within the community) 4. Assess the community willingness-to-pay in both monetary and non-monetary terms for water and sanitation services 	<ol style="list-style-type: none"> 1. Identify local resources for water and sanitation 2. Collect data on climate and environmental constraints that will factor into the project design 3. Identify potential environmental concerns at the local and regional level 4. Determine community understanding of environmental problems and the willingness to correct them
Conceptual Design and Feasibility	<ol style="list-style-type: none"> 1. Assess how the proposed intervention will affect daily activities and socio-cultural roles within the community 2. Evaluate the willingness and capacity of the community to perform operation, maintenance, and disposal requirements for each design 3. Design recognizes and respects traditional gender roles 4. Recognize why biases exist towards certain technologies by donors and/or locals 	<ol style="list-style-type: none"> 1. The project goals are clearly defined and understood by the community and development workers 2. Identify a representative committee that can act as the community liaison throughout the project 3. Present several technically feasible alternatives for community evaluation and feedback 4. Community members formally select a design based on an understanding of the constraints involved in the selection process 	<ol style="list-style-type: none"> 1. Develop working relationship with partner organizations, including at least one that based in the host country 2. Consult the plans and design of other organization on similar projects 3. Explore option to integrate existing technologies or programs conceptual design 4. Contact potential partner institutions for project financing 	<ol style="list-style-type: none"> 1. Estimate the implementation costs of each conceptual design 2. Estimate operation, maintenance, and disposal costs for conceptual design 3. Assess the community willingness-to-pay in both monetary and non-monetary terms for each improved system 4. Conduct an economic feasibility assessment to evaluate long-term project viability based on cost estimates, projected operation and maintenance costs, community willingness to pay, the need for outside resources, and the availability of outside funding 	<ol style="list-style-type: none"> 1. Assess the capacity for sustainable water use in the geographic area 2. Consider how seasonal variation in water supply, demand, and environmental conditions will affect each conceptual design 3. Consider land needs and availability of suitable land for each alternative 4. Conduct a site impact analysis for each alternative
Design and Action Planning	<ol style="list-style-type: none"> 1. Understand the traditional structure of community projects 2. Consider the seasonality of labor in setting the timeline 3. Explore options for increasing gender equity in project roles and capacity building 4. Confirm that labor and resource contributions are equitably divided 	<ol style="list-style-type: none"> 1. Community input is solicited in refining the selected technical design 2. Final technical design is approved through a process of community consensus 3. Community members are involved in identifying and sequencing tasks that will be incorporated into an action plan 4. The community members and development workers approve of the timeline responsibilities laid out in the action plan 	<ol style="list-style-type: none"> 1. The roles and responsibilities of partner institutions are defined in a detailed action plan 2. Agree in financial commitments 3. A timeline is drafted that meets the requirements of all institutions involved 4. Final project design and action plan are presented to partner institutions and local, regional and/or national level authorities 	<ol style="list-style-type: none"> 1. Verify the costs and availability of resources 2. Confirm the community contribution for money, materials, equipment, tools and labor 3. Finalize budget based on local costs, available resources, and community contribution 4. Develop an action plan for resource procurement 	<ol style="list-style-type: none"> 1. The final project design minimizes ecological disturbance, energy use and waste emissions 2. The project design uses renewable and/or recyclable local resources 3. The action plan consider the seasonality of resources 4. Develop an environmental action plan to mitigate impacts during construction

Implementation	<ol style="list-style-type: none"> 1. Set a realistic work schedule, based on available resources and preferred work styles 2. Scheduling includes float time to allow for the unexpected 3. Encourage the involvement of women throughout the construction process 4. Use public gatherings to review benefits of the project, promote education and discuss operation and maintenance 	<ol style="list-style-type: none"> 1. Involve the community in revision of the action plan, program changes, and problem solving 2. Work with a local foreman or work supervision in organizing labor 3. Train local laborers in any new techniques and tools that are introduced 4. Finalize the management plan with respect to the "built" system 	<ol style="list-style-type: none"> 1. Contact institutions in the area for assistance in training and labor requirements 2. Inform partner institutions of the start of construction, project milestones and major changes 3. Invite local government and NGO official to view the construction site 4. Discuss partner roles in operation and maintenance 	<ol style="list-style-type: none"> 1. Community members contribute to project implementation 2. Recheck the quality of materials and equipment during resource procurement 3. Monitor spending and budget restrictions throughout the project implementation phase 4. Draft final report on the budget and share with community members and partner organization 	<ol style="list-style-type: none"> 1. Recheck physical and environmental constraints used in the project design and make design corrections if necessary 2. Take precautions to avoid contaminating existing water resources and minimize environmental impacts during implementation 3. Involve the community in waste management and environmental education 4. Restore any areas disturbed during construction
Operation and Maintenance	<ol style="list-style-type: none"> 1. Discuss unanticipated constraints to system use 2. Discuss unexpected limitations to maintenance schemes 3. Reassess how gender roles affect the proper use and perceived benefits of the system 4. Ensure that costs and benefits are equitable distributed within the community 	<ol style="list-style-type: none"> 1. Community members are actively involved in performing the necessary operation and maintenance 2. Conduct a participatory evaluation to get community feedback and suggestions for improvements 3. A community organization exists with the capacity to make decisions regarding the operations and maintenance of the system 4. The system is controlled by culturally appropriate and traditionally respected people 	<ol style="list-style-type: none"> 1. Invite officials to the opening ceremony 2. Coordinating institutions sign a formal agreement that defines their roles and expectations in operation and maintenance of the system 3. A locally based institution is involved in project monitoring 4. Share monitoring reports and project evaluations with partner institutions 	<ol style="list-style-type: none"> 1. Estimate realistic, long-term operation and maintenance costs based on the "built" system 2. Financing exists to cover projected operation and maintenance costs 3. A financial management organization exists to manage operational/maintenance costs and the distribution of benefits 4. Regularly review and adjust the financing system 	<ol style="list-style-type: none"> 1. Minimize, treat and dispose of waste properly 2. Explore alternative plans for reducing the use of consumables 3. Monitor and evaluate environmental impacts 4. Continue environmental and hygiene education efforts

Questionnaire for the interviews

Toilet Owners

1. Is your toilet in use, if not why?
2. Do you maintain your toilet or is there someone who helps you with it?
 - i. Is sanitation Expert: What happens if the Sanitation Expert is not there to help you, who will maintain it?
3. Do you know who you can discuss with about sanitation issues if any problems occur? Have you heard of Enviro Clubs for example? Would you consider joining one?
4. Have you faced any challenges in using or maintaining your toilet?
 - i. If yes, what and how did you overcome them? Who has or will help you with them?
5. If you compare composting toilet and the toilet you used to have, what differences can you name between them? What possible advantages?
6. What are your plans concerning the composted waste and urine? What will happen to them? Are you going to use them in some way?
7. What do you think about the use of waste as a fertilizer? Can you name some of the benefits of the fertilizer from the dry toilet? Are there any disadvantages that come to your mind? Do you understand the benefits?
8. Have you attended any workshops organized by Msunduza Dry Sanitation Project? Do you think it has helped you with your toilet and garden? Can you name some issues you have found the most relevant to yourself?
9. Are all of the people in your homestead using the toilet? How many people are staying and thus using it? If not all, why not?
10. Do you consider your toilet as your own?
11. Have you got enough information concerning your dry toilet?
12. How did you get your dry toilet?
13. Anything else you want to say?

Sanitation Experts

1. How did you end up being a Sanitation Expert and how long have you worked as an expert?
2. What duties do you perform at the moment concerning the dry toilets in your area?
3. How do you see your future after Msunduza Dry Sanitation Project ends? Do you think you will continue with dry sanitation in some way?
4. Are you part of an Enviro Club? How do you see your role in a club in the future?
5. What motivates you to work as a Sanitation Expert?
6. How have people welcomed you, a Sanitation expert, to their home?
7. Are people willing to discuss with you about sanitation issues? Have you noticed any kind of changes in this over the project years?
8. What is your opinion on the design of the dry toilets? Do you consider the use and maintenance of them easy?
9. How has it been working for the Msunduza Dry Sanitation Project? Are there any benefits that you think you will use after the project?
10. How do you see the sustainability of the Msunduza Dry Sanitation project? Will people continue to use and maintain their toilets? Do you think there will be challenges that might arise in this after the project ends? Can you name some?
11. Anything else you want to say?

Toilet Caretakers

1. How did you become a caretaker of a dry toilet?
2. What duties do you perform concerning the dry toilet and does anyone help you with those duties?
3. How do you see your future as a caretaker?
4. What challenges are there in being a caretaker? What benefits?
5. Have you noticed any kind of challenges concerning the use or maintenance of the dry toilet?
6. Do you think the dry toilet in your community serves everyone in that area?
7. Have you heard of Enviro Clubs? Are you or will you be part of one in the future? What benefits could there be of such a club?
8. Anything else you want to say?

Community Leaders

1. What has been your role and responsibility concerning dry sanitation in your community? What actions have you performed concerning the dry toilets there?
2. What do you think are the benefits of dry sanitation in your community?
3. Have people understood the benefits of dry sanitation so that there will be toilets built after the project ends?
4. How do you see the future of dry sanitation in your community? How do you see your role regarding dry sanitation in the future?
5. Have you noticed any kind of challenges concerning dry sanitation that may occur in the future? Who would be the person to solve those problems?
6. Have you heard of Enviro Clubs? Are you part of one or would you consider joining one? How do you see your role in the club in the future? In your opinion, what are the benefits in having an Enviro Club?
7. How do you see the use of composted waste and urine as a fertilizer in the future?
8. Anything else you want to say?

Project Partner Representatives

1. How do you see the future of dry sanitation in Msunduza?
2. Have people understood the benefits of dry sanitation so that there will be toilets built after the project ends?
3. How do you see the use of composted waste and urine as a fertilizer in the future?
4. Do you think there will be community gardens in Msunduza and do you think they will be successful?
5. Have you noticed any kind of challenges concerning dry sanitation that may occur in the future?
6. How do you see the future of Enviro Clubs?
7. Anything else you want to say?