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CREATING LIVELIHOOD THROUGH DRY SANITATION VALUE CHAIN IN MNYAMATSINI, SWAZILAND



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Today, more than ever before, the world's economy is running by small and medium sized enterprises. In the developing countries such as Swaziland necessity-driven informal and formal enterprises are regular way of generating income for households. Yet in Swaziland, the unemployment rate exceeds 50% of the youth labor force, and is among the highest in Africa.

Dry sanitation can provide possibilities for entrepreneurship for community members to empower themselves. However, the use of human excreta for agricultural purposes is often associated with negative thoughts, therefore it is necessary to know the entrepreneur mindset towards such a controversial topic as dry sanitation business. The objective of this study was to investigate the opportunities and challenges of small scale entrepreneurship related to dry sanitation entrepreneurship, in Swaziland. This was conducted by interviewing people from different social groups, from grass root level to higher authorities of the field.

Through the outcome of the study, an applied dry sanitation value chain for Mnyamatsini community was created. The Dry sanitation value chain consists of 8 steps; education, building and maintaining of toilets, selling the end products, emptying the toilet chambers, maturing the compost and urine, applying the fertilizer to the field and selling the fertilizer and vegetables on the market. The research results indicate that both investors and possible business partners see business around dry toilets as innovative, ecological and interesting. While the general attitude among local people in Mnyamatsini is positive as well, there are several challenges to overcome such as stigma around human waste in Mnyamatsini, which could be eased by having support from higher authorities of the field. Yet they require laboratory tests, which prove the fertilizers to be safe to use. In addition the current dry toilet models are too expensive for inhabitants to build in rural areas.

KEYWORDS:

Value chain, dry sanitation, entrepreneurship, Swaziland, community development

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YHTEISÖN TYÖLLISTÄMINEN KUIVASANITAATIOARVOKETJUN KAUTTA MNYAMATSINI, SWAZILAND

Nykyään, enemmän kuin koskaan aikaisemmin, maailmantalous pyörii pienten ja keskisuurten yritysten voimalla. Varsinkin kehitysmaissa, kuten Swazimaassa, vähävaraisuudesta johtuva virallinen ja epävirallinen yrittäjyys on monelle kotitaloudelle jokapäiväinen tapa hankkia elantoa. Tästä huolimatta Swazimaassa nuorisotyöllisyysaste on vain 50 % nuorten työvoimasta. Se on yksi Afrikan alhaisimpia työllisyysastelukuja.

Kuivasanitaatio tarjoaa yhteisöille mahdollisuuden yrittäjyyteen ja parempiin tuloihin. Tästä huolimatta ihmisperäisen lannoitteen käyttöön maataloudessa liittyy usein negatiivisia ennakkoluuloja. Sen takia on tärkeää tutkia kuivasanitaatioyrittäjyyteen liittyviä käsityksiä. Tämän tutkimuksen tarkoitus on selvittää mahdollisuuksia ja haasteita, jotka liittyvät kuivasanitaation mahdollistamaan pienyrittäjyyteen Swazimaassa. Tutkimuksessa haastateltiin henkilöitä yhteiskunnan eri ryhmistä, ruohonjuuritasolta alan viranomaisiin.

Tutkimustuloksien perusteella rakennettiin kuivasanitaatioarvoketju Mnyamatsinin alueen tarpeille. Tähän kuivasanitaatioarvoketjuun kuuluu kahdeksan eri vaihetta, jotka ovat: sanitaatiokoulutus, käymälöiden rakentaminen ja kunnostus, sivutuotteiden myynti, kuivakäymälöiden tyhjennys, kompostointi ja säilytys, kompostin ja virtsan käyttö lannoitteena sekä lannoitteen ja vihannesten myynti.

Tutkimustulokset osoittavat, että paikalliset investoijat sekä mahdolliset liikekumppanit näkevät kuivakäymäläliiketoiminnan potentiaalisena, innovatiivisena, ekologisena ja mielenkiintoisena. Vaikka yleinen mielipide Mnyamatsinissa on positiivinen, on tulevilla liiketoiminnalla haasteita. Jotta stigmaa aiheen ympärillä voidaan lieventää, paikallisten päättäjiä tukea tarvitaan. Päättäjät vaativat kuitenkin laboratoriotestejä, jotka osoittavat lannoitteen turvalliseksi käyttöä. Lisäksi tämän hetken kuivakäymälät ovat paikallisille liian kalliita.

ASIASANAT:

Kuivasanitaatio, pienyrittäjyys, arvoketju, Swazimaa

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LIST OF ABBREVIATIONS (OR) SYMBOLS

(Write a list of symbols or abbreviations here. If you do not use a list of abbreviations or symbols, remove this page. Use the "Abbreviations or symbols" text style when you write the list.)

CC	City Council of Mbabane
CIA	Central Intelligence Agency
CDC	Center for disease control and prevention
CMT	Community management team
GDTF	Global Dry Toilet Association of Finland
GDP	Gross domestic product
GLM	Green Living Movement
HIV/AIDS	Human immunodeficiency virus infection / acquired immunodeficiency syndrome
MDGs	Millenium Development Goals
MDSP	Msunduzi Dry Sanitation Project
MDSWMP	Mbabane Dry Sanitation and Waste Management Project
NAMBOARD	The National Agricultural Marketing Board
OECD	Organisation for Economic Cooperation and Development
PELUM	Participatory Ecological Land Use Management
PRSAP	The Swaziland Poverty Reduction Strategy and Action Plan
SEDCO	The Small Enterprise Development Company LTD
SNL	Swazi National Land
TUAS	Turku University of Applied Sciences
UN	The United Nations
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNISWA	University of Swaziland
WHO	World Health Organization

1 INTRODUCTION

Many rural areas in Swaziland are economically weak and unemployment rates are high, due to the fact that the small scale farmers are lacking money to invest in fertilizers. At the same time, the same areas are in need of sustainable sanitation solutions. The human excrements contain the most important nutrients needed for plants to grow.

The aim of this thesis was to collect current opinions towards the business around dry sanitation in Swaziland from people operating in different sectors. The actions around dry sanitation are divided into smaller steps, and the opportunities and challenges are analyzed within them. Through the outcome of the results an applied dry sanitation value chain for Mnyamatsini was created. In 2014, a set of qualitative semi-structured interviews was conducted reviewing the perceptions of the inhabitants of Mnyamatsini, the decision makers of the field and potential business partners towards entrepreneurship and value-chain creation around dry sanitation. The research helps not only Mbabane Dry Sanitation and Waste Management Project, but also Mnyamatsini community members.

The economic value and interest of dry sanitation from the local investor and possible business partners, is an important aspect for the local community members to believe into the livelihood creation through dry sanitation. The Swazi culture, respects the higher authorities and therefore to be able to launch the business the community needs the support of the local authorities.

The research process was a long learning process in both personal and educational level. While conducting the interviews, the author had a very inspirational time. The inspiration came straight from the dedicated community. The same inspiration provided the energy to write, and dive deeper into the entrepreneurial possibilities that dry sanitation can offer in Swaziland. Even if entrepreneurship was not the strongest area of knowledge, it seemed that only by empowering the local people through the project activities, the development projects can

have sustainable and long lasting results. Therefore great compliments to Mnyamatsini Community Management Team and Youth Group, Wandile Dlamini, Jonna Heikkilä, GLM Swaziland, UNISWA and NKEKES11.

2 LOCATION AND PROJECT INFORMATION

2.1 Swaziland

Swaziland is a small landlocked country, geographically located in Southern Africa, between South Africa and Mozambique (Picture 1). The total land area of Swaziland is 17,364 square kilometers as the length from north to south is around 200 kilometers and from west to east approximately 150 kilometers. The terrain consists of mostly mountains and hills with some moderately sloping plains, the climate varying from tropical to near temperate. From the total area of Swaziland 10% is arable land and 0.89% permanent crops. Lately Swaziland has suffered from droughts and the current environmental issues include limited supplies of potable water, overgrazing, soil degradation and soil erosion. (CIA 2014.)



Picture 1 Map of Swaziland (CIA 2014).

In year 2014, the population was 1.4 million, consisting of 98% Africans and of 3% Europeans with; the annual population growth rate being 1.17 %. The Swazi life expectancy is 48 years, one of the lowest in the world. Almost 60% of the populations are youth, under 25 years old (Figure 1). Approximately 41% of the population live under the international poverty line of \$1.25 per day. About 70% of the Swazis live in the rural areas, and as population increases, the country has trouble providing new job opportunities both in the rural and urban areas. (CIA.)

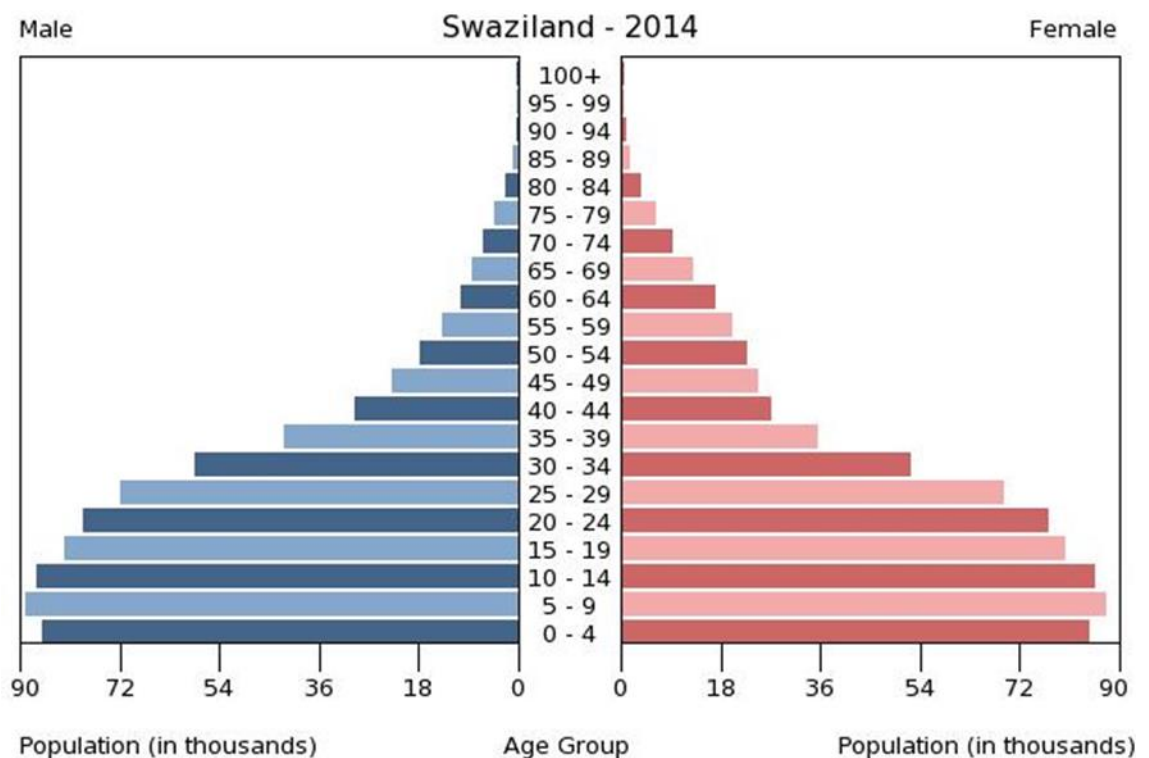


Figure 1 Population pyramid (CIA 2014).

Colonized by the Great Britain in the early 19th century Swaziland gained its independence in 1968. Swaziland is also called the Kingdom of Swaziland and, it is Africa's last absolute monarchy reigned by the King Mswati III, who does not allow greater democracy or political parties.

Every social system has its own norms and structures, both formal and informal. The society in Swaziland can be seen as very hierarchical both in official and

unofficial levels. Swaziland is one of the countries where traditions have been conserved more tightly than in any other country in Africa, and yet traditions have been striven to be integrated in to the reformed society. In Swaziland social structures value strongly traditions and culture, which can be seen in everyday life. (Kasenene 1993, 5.)

As the government of Swaziland is aiming to be a middle income country by 2025, there are some major challenges to be faced first. HIV/AIDS prevalence among adults is 26%, which is the highest rate in the world. Drought and lack of opportunities in rural areas have caused rural-urban migration and 60% are living in informal settlement areas. Swaziland's unemployment rate rose from 26 to 40 per cent during the past decade and 70% of the people live on less than two dollars per day. Poverty has been linked to weak social indicators, exacerbated by the high prevalence of HIV. (UNICEF.)

Over half of Swaziland's 1.4 million people depend on subsistence farming. But years of economic slowdown, a devastating AIDS pandemic and recent droughts linked to climate change have made it increasingly hard for the rural population to live off the land, therefore new ways to do farming are explored out. According to FAO's most recent hunger figures, one in three people in Swaziland is undernourished. (FAO 2014.)

2.2 Mnyamatsini

Updated information about Mnyamatsini is hard to find. Since the data in governmental offices varies from source to another, the info used in this thesis was received from the local chief, Abraham Bhembe. The chief governs the area, and therefore the information from him is used in the thesis. Information is from baseline study that was conducted in year 2013 as part of the planning process for the MDSWM project.

Mnyamatsini is a rural area five kilometers away from the capital, Mbabane. Situated on a hill side in Ezulwini Valley, Mnyamatsini spreads quite high and wide. The area is partly forest and partly spacious, and there is a few water

sources such as streams and one a river flowing from a mountain source. On the Mbabane side of the area there is a big water pipe which goes to a electric power plant near eDladleni dividing the area, leaving most of the settlements on the Ezulwini side of the pipe. Mnyamatsini settlements are accessed by a road to Mvutjini, from the highway to Ezulwini. (Kirstinä et al. 2013, 8.)

The area consists of 8 zones, from which number 4 is the project site. The total of 10 000 people live in the area of the 8 zones. Most of the people in Mnyamatsini are farmers and small scale entrepreneurs obtaining their living from agriculture. Mnyamatsini is under the Swazi National Land (SNL), which means as mentioned before, instead of a City Council the village Chief governs all the zones. Each of the zones has a headman, who enjoys the chief's trust and communicates between the villagers and the chief. (Kirstinä et al. 2013, 8.)

The infrastructure of the area is in poor condition. There are no surfaced roads and there is one greater main road runs across the project area, which is around 3 meter wide. On the top of the hill, there is Ezulwini Electricity power spot and some of the roads go all the way to the top. Some of the houses are connected to the electricity and water, which is provided and driven by the community itself. There is no official drainage network; hence the inhabitants have to pour out their sewage into the ground. In Mnyamatsini there is a primary school, one larger grocery store, several fruit and vegetable stalls and a church, but the area is lacking important services such as a health clinic. (Kirstinä, et al. 2013, 8.)

Most of the inhabitants (94%) own the houses that they live in. The average households are rather big in size with the normal size of 9.3 persons and therefore most of the plots are spacious with gardens, but small houses with no space can be found as well. The common form of sanitation is pit latrine; where one digs a pit, places a shelter on top of the pit, use it until the pit gets full and dig a new hole (Kirstinä et al. 2012, 12). According to the baseline study of the area, the pit latrines are partly hazardous, as some contaminate the stream and some are too close to the houses. One of the biggest upcoming sanitation prob-

lems will be lack of land, therefore room for new pit latrines will be hard to find. (Kirstinä et al. 2013, 8.)

The Mnyamatsini community management team (CMT) and youth group consists of around 40 inhabitants from both genders. They are the local project beneficiaries working with project activities, during the time of interviews in Mnyamatsini waste drop off point, which is situated in the middle of the zone number 4. The unemployment within the youth had led to increasing crime rates and Youth Against Crime was formed to reduce the crime rate in Mnyamatsini and due its active members they were taken into the project as one of the target groups. (Kirstinä et al. 2013, 8.)

2.3 Economy of Swaziland

Despite its favorable location, mild climate, and a relatively diversified production base, Swaziland has been one of the slowest growing economies in Africa for almost two decades. The average annual growth of 2.3% in 2002-2012 is below the average of the continent, 5.3%. (Brixiová & Kangoye 2013, 5.) “Swaziland’s economy is diversified: agriculture, forestry and mining account for about 9% of the annual GDP, manufacturing mostly sugar related products and textiles represents around 41% of GDP; and services especially governmental services, constitute about 41% of the GDP”. (World Bank 2014.)

Even if Swaziland is considered to be middle income country, it has been for a slow growing economy in Africa for long time. The public sector, which is supported by the government, is greater than it is supposed to be, and causes straight problems in limiting private sector job creation and entrepreneurship. Swaziland’s economy is extremely dependent on South Africa as it receives 85% of the imports and the majority, 60% of the exports go there. The global crisis affected negatively the South African economy, and because South Africa is Swaziland’s most important trade partner, it caused a significant negative impact on Swaziland’s economy as well. (Brixiová & Ncube 2014, 7.)

In Swaziland the share of working age population (15-64) in 2010 reached 43 % and the youth employment rate exceeds 50% of the youth labor force, being among the highest in Africa. The unemployment rates between the subgroups have exceeds sustainable limits, since the youth, women and rural population are most impacted. Private sector development such as entrepreneurship can be part of the solution to fight against the youth unemployment. (Brixiová & Kangoye, 2013, 7.)

2.4 Mbabane Dry Sanitation and Waste Management Project

Mbabane Dry Sanitation and Waste Management Project (MDSWM) (2014-2016) is a development cooperation project between Turku University of Applied Sciences (TUAS), the Global Dry Toilet Association of Finland (GDTF), University of Swaziland (UNISWA) and Green Living Movement (GLM) Swaziland as local partners. Ministry of Foreign Affairs of Finland is the financier of the project. (MDSWM)

MDSWM project is working in three project communities in Swaziland: Mnyamatsini, Malagwane and Mangwaneni. All the project communities are located on the surroundings of Mbabane, the capital of Swaziland. The aims of the project is to improve the sanitation conditions and waste management in the project communities. "MDSWM project utilizes the best practices and lessons learned of the former project, Msunduza Dry Sanitation Project (2007-2013). (MDSWM)

As it says in the project plan: "In the beginning of the project, organised youth groups are formed or further strengthened with attraction of new members. Community Management Teams (CMT) will be organised for each of the community and they will foresee the project implementation at the local level." Each of the groups consist of both women and men. (MDSWM)

The project organises trainings in the project villages. The workshops cover topics such as dry sanitation, dry toilet construction, waste collection, permaculture and agroforestry. Initially, the given education was particularly targeted for the

youth of the communities, who will gain skills for income generating activities and get support for their livelihood. The idea is, that the knowledge that that CMT and youth group have learned through the project will be spread to other community members as well. Education is not only targeted to the CMT and youth group members, but also to different medias in order to disseminate improved sanitation and waste management further as well as create public discussion on Swaziland's development challenges. (MDSWM)

3 ENREPRENEURSHIP

Today, more than ever before, the world's economy is running with small and medium-sized enterprises. Studies about entrepreneurship show that every day, hundreds of thousands new enterprises are established and they are trying to reach their customers and fighting for their place in the market. (Pinson et al. 2006, 2.)

The words enterprise and entrepreneurship are much used in everyday conversation and media, but not enough attention is paid to what the actual word means. The words contain both positive and negative characters depending in which content they are used. Enterprise is a very flexible word, associated with the very large, multinational firms, yet it is associated with individual endeavor. The positive connotation comes often from individual enterprise as relating to individual creativity, innovation and development. The same word receives negative characters when applied to a large, multinational organization. (Lowe et al. Marriott 2006, 1.)

A narrow meaning of enterprise or entrepreneurship is creating, running and developing business activity, but this is not how it necessarily always is, because there is a lot of business activity that does not demonstrate much enterprise. In wider perspective enterprise or entrepreneurship does not only mean business start-up but also the process of being in the business, business growth and development. (Lowe et al. Marriott 2006, 3.)

3.1 Entrepreneur mindset

Individuals can be enterprising in how they live their lives, and it is said that those who are enterprising create and pursue more opportunities. Entrepreneurs embrace many diverse themes such as becoming more independent and self-reliant throughout life, by gaining the necessary knowledge and skills and attitudes. (Lowe et al. Marriot 2006, 5.)

Taking risks, is tightly included to enterprising behavior, and where there is a risk there also can be either success or failure. The word success is also hard to define as, to some people it means social standing while to others financial gain and everything in between. (Lowe& Marriot 2006, 5.) The risks that entrepreneurs have to face can be either financial, material or/and psychological. The uncertainty of the income is one of the most challenging aspect of starting a new business. To get the business off the ground during the critical start up phase takes normally many working hours, because it must be made sure, that everything that must be complited on time, gets actually complited. Even if the risks of being an entrepreneur are there, owning business can be the way to independence and having control over one's life. If the business is running well it also gives an opportunity for a better life, not only by making profit but also by having freedom to choose the concept and make the decisions. (Hatten 2006, 38.)

Moreover the words discover set of personal qualities and the Organisation for Economic Cooperation and Development (OECD) has analyzed the entrepreneur person "An enterprising individual has a positive, flexible and adaptable disposition towards change, seeing it as normal, and as an opportunity rather than a problem. To see change in this way, an enterprising individual has a security, born of self-confidence, and is at ease when dealing with insecurity, risks, difficulty and the unknown. An enterprising individual has the capacity to initiate creative ideas...develop then, and see them through into action in a determined manner. An enterprising individual is able, even anxious, to take responsibility and is an effective communicator, negotiator, influencer, planner and organizer. An enterprising individual is active, confident, purposeful, not passive, uncertain and dependent."

Even though the personal qualifications mentioned encourage people to be enterprising, these stereotypical images of entrepreneurs do not always go hand in hand with reality. The understanding of "entrepreneurs" differ from culture to culture. (Lowe & Mariott 2006, 13.)

3.2 Defining SMEs

The enterprise and entrepreneurship definitions are closely related with smaller business, which is often referred to as “small and medium sized enterprises” (SMEs). (Bridge et al 2009, 1.) Depending on the industry, the size of the small business varies. Normally a business is small, if it is independently owned, operated and financed. The personnel size is relatively small and has quite little impact on its industry. (Hatten, 2006, 4.) SMEs are divided by the number of employees as follows: small enterprises, 1-49 employees and medium enterprises 50-249 employees. (IFC; MSME country information, 2010, 2.)

3.3 Importance of small business

SMEs are engines in job creation and over 50% of jobs worldwide are created by them, since governments and large firms are not able to provide basic jobs for everyone who wants them. Even if the percentage is more than half of the world's population, very few businesses actually employ many people. (Lowe & Mariott, 2006, 22.) Not only small and medium size- businesses are important employers, but also they cover 90% of the global business. Therefore normally governments see enterprises as vital in the country's economy, trying to encourage more enterprises and innovations at all levels in the society. (Bridge et al. 2009, 9.)

In general small and medium size enterprises supply many benefits not only for the country's economy, but also for other areas in the society as well. These benefits include new technological changes, such as new products and new industries that come hand in hand with new innovations, unemployment reduction by providing jobs and improve nation's education level while educating employees for new work. For the government the enterprises provide tax benefits and new services. At the same time the business demands structural changes, such as deregulations and new services. (Bridge et al. 2009, 13.)

Normally a small business has the advantage of being more flexible and being able to make profit by serving smaller niches than larger firms. Hence the small business have been seen traditionally as source of new ideas and especially considered to be highly effective in exploiting new business ideas. (Lowe & Marriott 2006, 22.)

3.4 From idea to actual business

A start-up process of a new business is always involved with entrepreneurship. The process of making the idea to actual business goes through different phases.

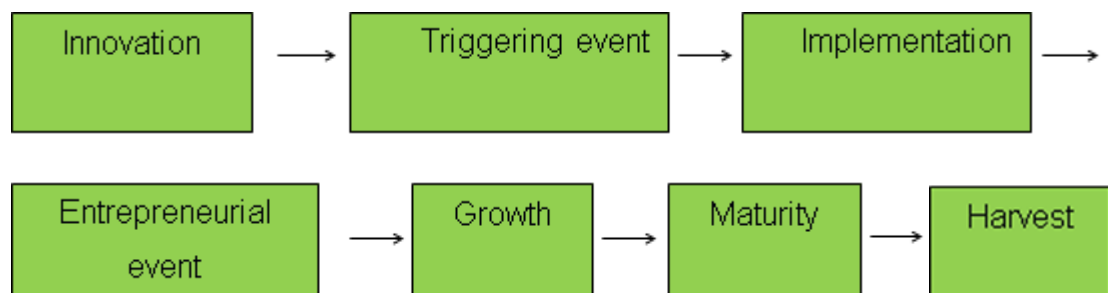


Figure 2 Business phases (Hatten 2006).

The stages of the entrepreneurship process are innovation, triggering event and implementation, whereas the stages of small business management are growth, maturity and harvest (See Figure 2). (Hatten 2006, 34.)

3.4.1 Innovative idea

Everything in entrepreneurship starts with the innovative idea for a new product or service process. Therefore, most of the organizations are formed as a result of some kind of innovation. (Lowe & Marriott 2006, 18.) Innovation occurs as a response to opportunities in the area, where the entrepreneur comes from. The innovative idea can come from the entrepreneur itself, or alternatively the idea can be brought externally. In this state the entrepreneur is going through the

idea in his/her mind by thinking through all angles, entrepreneur should think questions such as: Who are the customers? Is the timing right? What is the business model? In this stage a rough business plan helps to see the business in bigger concept. Processing the idea with other people and receiving feedback from people, who know the market and from the potential customers is also important in the first stage. This phase does not have a time limit; it can take from a month to years, before the entrepreneur moves on to the next step, to the triggering event. (Hatten 2006, 35-39.)

3.4.2 Triggering event

The triggering event is a specific event or occurrence that pushes the entrepreneur from the stage of thinking to doing. Some of the entrepreneurs must serve as a role model for a new business idea, in this case normally it takes longer to move from an idea to actual business. To move to the next step the entrepreneur must take into consideration the competition, resources and the government policies. In the innovative and triggering stages the entrepreneur's personal qualities can help him/her, if the personal characteristics are, for example ambiguous and willingness to accept a risk. (Hatten 2006, 35-39.)

3.4.3 Implementation

Implementation is the step, in which the organization is formed. Since the business is now formed and in reality, the risk, that entrepreneur is taking, is growing as well. To have the business to this level the ownership and the commitment to the idea is in strong stage in the entrepreneurs mind. On this stage the business must response to many forces such as; the competitive forces, consumer desires, capabilities of suppliers and legal regulations. At least one of the following is always included to the implementation phase: introducing new product, introducing new method of production, opening new market, opening new supply source or industrial reorganization. (Hatten 2006, 39-40.)

3.4.4 Growth

After implementation, in a good case, the business starts to grow and to make living for the entrepreneur. The business management starts to play a greater role. There are many environmental factors that affect the startup process, these include for example: competitors, customers, suppliers, investors, bankers, resources and government policy. Business matures as it grows, and in growth stage the business management pays more attention to the team building, setting strategies, and creating the structure and culture of the business. This is the phase, where people in the team can specialize in and concentrate on what they do the best. (Hatten 2006, 35-39.)

3.4.5 Maturity

This start up process phase of maturity is reached when the business is considered well established. Maturity in business is identical to maturity in people and nature, characterized by more stability than before. Although the business will face many challenges in the future, the survival of business looks promising. The environmental factors affecting maturity phase are the same as in the harvest phase: competition, regulation, employees, customers and vendors. (Hatten 2006, 35-39.)

3.4.6 Harvest

It has been said that harvesting is the stage of business, when people related to the business can pick the fruit after years of labor. Steven Covey says; "One of the key of being effective in life is, beginning with end in mind". (Hatten 2006, 35-39.)

3.5 The cultural view

The issues of entrepreneurship vary from culture to culture. Even the word entrepreneurship varies, and by nature some cultures appear to be more susceptible towards enterprise than others. It has been said that dislocation and life's hardship can lead easier to enterprise, this is due to people's inner experience of surviving. Culture plays an important role not only in influencing attitudes towards entrepreneurship but also towards risk and failure. (Bridge et al. 2009, 12.)

Most of the entrepreneurs in less developed countries are necessity entrepreneurs. Necessity entrepreneurship means that people are entrepreneurs because there is no other employment available. In developing countries, the opportunity identification and ideas of the self-employed entrepreneurs are influenced strongly by their own immediate circumstances, culture and traditional values, the locally available resources and the limitation of their own market knowledge. The lack of opportunity to communicate with more distant potential customers causes entrepreneurs to be unable to appreciate the requirements of a wider market, for example, in quality standard and values and therefore have little opportunity to tap into more lucrative business. (Lowe & Marriott 2006, 253.)

3.6 Youth Entrepreneurship in Swaziland

The economy of Swaziland is facing negative results of oversized public sector, which has its impacts on job creation and entrepreneurship on private sector. Most of the inhabitants in developing counties are normally self-employed, formal or informal. In general, low productive entrepreneurship has been normal in the context of Africa, but productive entrepreneurship has been mostly missing. (Brixiová et al. 2014, 4-7.)

There are key factors constraining entrepreneurship in Swaziland as well as in other developing countries. Many studies show, how important the access to

credit for foundation of SMEs is. To be able to start a new enterprise, the business environment and regulatory framework, the initial capital and entrepreneur skills need to be in place. The business environment is not only about business, but also about traditional decision making structure. The decision making culture can be slow because of high bureaucracy and underestimating the skills of young people. (Brixiová et al. 2014, p4-7.)

A new entrepreneurship normally does not have a ready network to support it over the first challenges. The lack of network forces the entrepreneur to start business in low-barrier, high-competition sector. The skills of workforce are important as well, since it can be a limiting factor for a start-up. The better the workers are educated and have expertise to do their part of the job, the greater positive impact it has, especially when introducing a new, controversial business idea. (Brixiová et al. 2014, p4-7.)

A potential unexperienced entrepreneur faces many challenges in Swaziland. There are few existing entrepreneurship programs in the country, but they are often not so well tailored to the need of new entrepreneurs. The programs should go beyond the business plan to expertise on how to start a business. As in many other countries around the world, the greater challenge that the young entrepreneurs face, is limited access to finance/start-up capital. Yet the government has made an effort to address these constraints, but bigger effort needs to be made to reduce the youth unemployment. (Brixiová et al. 2014, 6-12.)

There are a few organisations in different sectors, providing training and start-up money for young Swazi entrepreneurs, such as the Youth Enterprise Fund (YEF), established by the Government of Swaziland in 2009 to support the youth entrepreneurship. TechnoServe Swaziland and Junior Achievement Swaziland (JASD) are NGOs, providing the same services as YEF. These initiatives are needed, but Swaziland should create a better plan for youth employment. (Brixiová et al. 2014, 12-13.)

Even if the unemployment rates are high in Swaziland, the shortage of entrepreneur skills has lowered search effectiveness for potential young entrepreneurs.

neur and the rate of youth start-ups. The studies show that support for training is more effective in stimulating productive start-ups than subsidizes. Swaziland's high youth unemployment challenge cannot be solved with entrepreneurship alone, but of the solution. (Brixiová et al. 2014, 9.)

4 SANITATION, A WORLDWIDE DEVELOPMENT PROBLEM

Even if lack of adequate sanitation continues being great human health problem especially in the developing countries, still 60% of the world population, mainly in Africa, Asia and South America, live without improved sanitation facilities, which cause 80% of the major diseases in the developing countries. Moreover, over 1 billion people are practicing open defecation, which is the main cause of diarrhoea. Lack of improved sanitation causes not only diseases, but also hygiene problems, environmental pollution because of water and soil contamination with human waste, and especially women have to face the increase of insecurity. Even though today most of the people in the world live in urban areas, more than 7 out of 10 inhabitants without proper sanitation come from the rural areas. (WHO, 2014, 24-29.)

4.1 Defining sanitation

According to the World Health Organization (WHO), sanitation means facilities and services for the safe disposal of human excreta as well as maintenance of hygienic conditions, through wastewater disposal and garbage collection. Sanitation plays crucial part of every person's life. Having access to adequate sanitation facilities defines much what we can and what we cannot do in our society. Normally improved sanitation facilities, defined by the WHO, separates the human waste from human contact and includes different type of toilet facilities, such as flush or pour flush toilet, pit latrine, ventilated pit latrine and composting toilet. (CDC.)

4.2 Millennium Development Goal number seven

The Millennium development goals (MDG) have approached to its end, and the Goal number seven aims at halving by 2015 the proportion of people without

sustainable access to safe drinking water and basic sanitation. Basic sanitation means not only having the lowest-cost technology for hygienic excreta and sullage disposal but also one should have clean and healthy living environment, both at home and in the neighborhood of users. During the year 2015 it has been discussed whether the goals have been reached, and what the targets are for Post 2015. In year 2012 there was still 2.5 billion people who did not have access to improved sanitation facilities. Some progress has happened since 2 billion people has gained access to the sanitation facilities since the beginning of the MDGs. The greatest improvement has happened in Eastern-Asia and the least progress are in sub-Saharan Africa. There are many success stories as countries, but the unequal development as regions has not happened. The rural areas have not faced such uplift with the sanitation as the cities, the improvement has not reached the poor and marginalized people. Yet the progress has benefitted the rich people and the gap between rich and poor has become wider. (WHO 2014, 4-18.)

4.3 Sanitation situation in Swaziland

As anywhere in the world the lack of safe water and sanitation has a huge impact on inhabitants' everyday life, so it does in Swaziland. In year 2012, one third of the population in Swaziland did not have access to safe drinking water, and most of the rural households relied on communal water taps or drew water from the local rivers and wells.

Lack of proper sanitation and clean water causes 140 children death every year in Swaziland. In Swaziland typhoid fever and diarrhea are the most common diseases caused by poor sanitation. During the winter 2014 a nationwide outbreak of diarrhoea resulting from Rota-virus killed nearly 40 children (Ministry of Health).

In Swaziland, the common sanitation facilities are flushing toilet, pits, both dry- and bucket latrines and a pour flush latrines. Normally, there is a link between the level of poverty and types of sanitation facilities used, and so it does in

Swaziland. As Daniel Shothole, a representative from the Ministry of Health says the greatest sanitation problem in Swaziland is, the lack of access to proper sanitation facilities for people in rural areas. (WHO 2014, 24-29). The sanitation coverage in urban areas is higher than in rural areas, in year 2012, 56% of people living in rural areas had access to improved sanitation facilities whereas in urban areas 63% (See Figure 3).

Swaziland	Sanitation coverage estimates					
	Urban (%)		Rural (%)		Total (%)	
	1990	2012	1990	2012	1990	2012
Improved facilities	63	63	44	56	49	57
Shared facilities	29	29	15	18	18	21
Other unimproved	6	7	10	9	8	8
Open defecation	2	1	31	17	25	14

Figure 3 Sanitation coverage estimation in Swaziland (WHO/ UNICEF, 2014).

In rural areas, 8 % of Swaziland's population had to defecate in open (WHO 2014, 3.) Water has become very expensive in Swaziland due to droughts that the country has suffered with the past years. Because of this, many households with water closets have started to use pit latrines instead. (Akatema, 2008, 31.)

4.4 Dry sanitation as an alternative solution for sanitation problems in Swaziland

In nature, nothing is called waste and, therefore products filled with organism are naturally reused for several purposes, such as nutriment and nutrients for other organism. Ecological sanitation, mimicks the human nutrient cycle, where the nutrients of excreta are used for soil enrichment. The principle of ecological sanitation is: in theory that the amount of nutrients that is needed to grow grain to feed one person is approximately the same amount that is in the urine and excrement of the same person. Dry sanitation is an ecologically improved sanitation method, which does not inquire water, a scare natural resource. This sustainable solution turns human excrement into a resource, transporting the human waste into treatment process and becoming a safe and inexpensive ferti-

lizer. The final product can be used in the agricultural fields as a fertilizer or soil enrichment material. (Huuhtanen & Laukkanen 2009, 7-9.)

In the ancient times people have used human excreta in the agricultural fields as an organic fertilizer, and still in some cultures this method is used. Due to modern water closets and the social status, the value of human excreta, basically a free fertilizer, used both in agriculture and horticulture, is highly underestimated. Often the human excreta used as a fertilizer is not only underestimated but also consisting stigma around it. This “free” natural resource is always available in all societies and especially urine is rich in nitrogen, which makes it very cost-efficient. Urine and human faeces contain high amount of nitrogen, phosphorus and potassium which are the most critical nutrient elements for agricultural production. (Heinonen-Tanski & Van Wijk Sijbesma 2003, 1-4.)

4.5 The nutrients in urine and human excreta

“If urine fertilization is done carefully at the correct time, the amount used is moderate, and the urine is incorporated directly into the soil, urine nitrogen has the same agricultural values as nitrogen of commercial mineral fertilizers and the barley absorbs almost all urine nitrogen” (Stintzing 2002 ,161-162).

Nitrogen is essential for a plant's protein synthesis and, phosphorus is important for example vegetation' DNA and RNA enzyme reaction Even though nitrogen is an essential element for all life, it can turn into a pollutant when applied in a wrong place or concentration. If applied too much, the vegetables can contain too much nitrate or the groundwater might become contaminated by nitrite and nitrate. If there too much of urine is produced, the nitrate levels can be lowered by adding ash or lime into it. (Heinonen-Tanski & Van Wijk Sijbesma 2003, 6.)

The human faeces contain a high amount of phosphorus and potassium, which is needed to secure plant metabolism as well as it affects the plant shape, size, color and taste. In addition to that, the faeces contain carbon, which can ease the fraction of organic matter in the soil. This increases the organic matter and

is a potential way to improve the soil structure by making it more resistant to floods and erosion. (Heinonen-Tanski & Van Wijk Sijbesma 2003, 6.)

4.6 The best practices of handling excreta

Before using the human excreta as a fertilizer, it needs to be made safe to be used. The treatment of human excreta needs to be handled carefully and safely due to its high content of pathogens. Especially through solid fecal material diseases, such as diarrhoea, cholera and typhoid fever, can spread easily. The best way to make human excreta safe to be used is to compost it. The adequate processing methods such as collecting, storing and treatment, need to be planned carefully to enhance human health. The bacteria can spread to ground water through leaching or surface water reserves through surface runoff, and in worst case scenario reduce the availability of clean water. Therefore, the handling of excreta has to be performed according to the best known practices. (Heinonen-Tanski & Van Wijk Sijbesma 2003, 6.)

When the closed nutrient loop is ensured, more people would be able to produce food and other plant products in low income areas. Hence it reduces the contamination effects from unsafe excreta disposal and balanced use of chemical fertilizers. Yet the right use of excreta reduces waterborne enteric microbiological diseases as there would be less contaminated wastewater. If the farmers start using urine and the compost as fertilizers, they can reduce the dependency of commercial fertilizers. (Heinonen-Tanski & Van Wijk Sijbesma 2003, 7.)

5 IMPROVING WELFARE THROUGH DRY SANITATION VALUE CHAIN

By improving sanitation, welfare can be directly increased as a whole. Sanitation and water are connected directly to public health, the environment and rural development. To be able to tackle the ongoing worldwide sanitation problem, it requires looking for new and innovative solutions. The same 2.5 billion people without proper sanitation are normally the same people living in poverty, under \$2 per day. In order to motivate people to work towards cleaner and healthier environment, income generating activities should be included into developing projects, through which people can improve the environmental conditions and at the same time guarantee their livelihood. (Jenkin & Scott 2010, 1-2.)

The value chain is a concept that describes the step by step refinement of a commodity from a raw material to a finished product. Each step of the value chain increase the value of the product. Interlinked value-adding activities that convert inputs into outputs which, in turn, add to the bottom line and help create competitive advantage. The last link in the value chain is the distribution. (Logistiikan Maailma.)

There are two ways how the sanitation chain is most often described; either in material flow or series of technological artifacts accommodating the flow. Many studies have found that improved sanitation has often favorable socio-economic returns to households and therefore to society as well by contributing to clean environment, improved health, dignity and quality of life, among many other benefits. Even though sanitation options that protect the environment, such as dry sanitation, might be more costly to provide, yet the benefits are highly valued by households, tourists and businesses. (WSP 2012.)

It is often believed, that the people in developing countries will not adapt to improved sanitation without subsidies, but it is not true. Most of the latrines that people buy in the developing world have been installed by homeowners, maybe with community support mechanism, but still they have paid for their own la-

trines. Yet when planning to build more expensive improved sanitation facility poorer households might not afford to pay for them without subsidies. (Schuen & Parkinson 2012, 1-5.)

The composted human excreta can be either used onsite or offsite. Onsite use means, that the household uses urine as fertilizer and manure as soil enrichment by themselves. This is proved to increase the biomass production as well as chemical quality of crops which is why it brings economical value to the households. Offsite composted excreta reuse has the possibility of collection and packing of organic fertilizer. In developing countries rarely the organic fertilizers have more financial value than the commercial fertilizers. Yet once the organic fertilizer from dry toilets is sold, it has straight financial value to the household. (Schuen & Parkinson 2012, 8.)

6 PURPOSE AND NEED OF THE RESEARCH

The objective of this thesis was to assess the opportunities for small scale entrepreneurship and the challenges related with dry sanitation experienced by the beneficiaries of the project, potential local business partners and Swaziland's decision makers of the field. This was conducted by studying the different entrepreneurial possibilities in the dry sanitation chain and through the outcome finding sustainable means of employment for youths and other community members in the project sites. Entrepreneurship is one way for community members to empower themselves, and therefore it is necessary to be familiar with the entrepreneurial mindset towards such a controversial topic as ecological sanitation business.

Dissemination of all innovations depends heavily on the attitudes, not only of the local people, but also of the higher authorities. The Mbabane Dry Sanitation and Waste Management Project introduces dry sanitation and waste management as a potential income generating innovation at the community level in Swaziland. Assuring people of the new innovation and changing their attitudes takes time. Current attitudes towards business possibilities around dry sanitation have not yet been properly studied in Swaziland. The dissemination of the dry sanitation in Mnyamatsini depends heavily on the income possibilities that the dry toilets enable in the community level. (MDSWM.)

As the outcome of the research results, this study divides the dry sanitation process into smaller steps and calls it the dry sanitation value chain. This value chain is created according to the answers of interviews. The purpose of the dry sanitation value chain is to support the small-scale business around the concept. Furthermore the study takes a look at what the general requirements from the decision makers of the field are and whether there are organic fertilizer producers in Swaziland. In addition, the potential business partners were determined during the research.

The need for this study arose from several different reasons. First of all, there is the fact that for the local project partner and inhabitants, it is interesting to know, if there are possible business partners, and what they think about dry sanitation. Secondly, understanding the ongoing mindset of the cooperation community towards the entrepreneurship around dry sanitation is important, since in the previous project (MDS) business based on dry sanitation did not start to grow as wished; whereas in Zambia the local community has taken the ownership of similar project and has started to create business around it (Kuwenga & Piirilä 2013, 3-8). Thirdly people in Swaziland are respectful of higher authorities, and therefore the authorities' opinion about dry sanitation should be discussed in order for the people on grassroots level to feel as comfortable as possible to proceed with such a comprehensive innovation.

The research theme was given by the Mbabane Dry Sanitation and Waste Management project coordinator Jonna Heikkilä and project leader Sari Huuhtanen. One of the goals of the Mbabane Dry Sanitation and Waste Management project is to empower the local community. In many development projects the continuity and ownership of the project are not on sustainable ground, once the project ends the possible good results will be forgotten. Ownership means the beneficiaries accept to the outcome of the project practices in a sustainable way. Therefore, in order to achieve the project goal and to have sustainable and long-lasting results from the project both for the local inhabitants and the environment, the entrepreneur mindset based on dry sanitation needs to be studied in the early state of the project cycle.

Through this study it will be shown whether the project partners believe in the entrepreneur possibilities that building dry toilets will make possible. The results discuss the Mnyamatsini people's attitudes and define major challenges and possibilities coming from the value chain of dry sanitation. The results will show how the community wants to develop the dry sanitation value chain and gives a general perspective on whether the community empowerment through dry sanitation value chain creation is sustainable.

6.1 Research questions

- I. What are the challenges and the opportunities with the dry sanitation business in Swaziland, in the experience of the Mnyamatsini community, local enterprises, and decision makers?
- II. What is the dry sanitation value chain like in Swaziland? What are the attitudes towards it in the Mnyamatsini community management team and the youth group?
- III. How would the community like to organize the sanitation business?

6.2 Research methods and schedule

During the spring of 2014, the research began with gathering information from several bachelor's theses, project reports and scientific publications related to the topic. The practical training took place in the summer of 2014, during which the researcher's knowledge of the Swazi culture and the practical understanding of dry sanitation increased. The interviews were conducted in a relatively tight schedule during August and the beginning of September in 2014. Defining and redefining the subject have taken place in all steps of the research process.

The approach to this study is qualitative; this means that the research assesses the understandings and opinions of different stakeholders by using qualitative interviews and observation while gathering the data. The study focuses on and uses the Mnyamatsini community as an example, but the study can be applied to other places in Swaziland as well.

A wide range of methods was chosen to collect the necessary data for the study, but most of the information was gathered through interviews, focus groups, and observation. It was important for the researcher to listen to the stories that the respondents told during her two-month internship period and during the interviews, in order to collect as many views as possible regarding the dry sanitation entrepreneurship in Swaziland. The network that the researcher

made during her internship, before the actual research, was helpful in finding the right people to interview.

6.3 Interview as a research method

The primary information was gathered by interviewing eight persons from youth group and 11 people from CMT, working on the project site in Mnyamatsini. These groups were chosen as respondents since they are the ones who are foreseen to be the sanitation entrepreneurs in the future. The individual interviews were held from August to September, 2014. In the village, a small group of randomly chosen villagers were interviewed on the main street in Mnyamatsini for the study, in order to chart their attitudes towards dry toilets. Even if the randomly chosen small group of villagers was relatively small (15 persons) it gave a perspective on whether they had heard about dry sanitation or not and on what their opinion was about it and about the end products from dry sanitation.

CMT and the members of the youth group worked almost every day at the community's waste drop off point, which is located in the middle of Mnyamatsini; most of the interviews took place around 10 meters away from the drop off point. The distance was considered to be far enough to make the situation private, so that the interviewee could feel comfortable and without the need to filter the answers.

The group of decision makers of the field consisted of representatives from the Ministry of Agriculture and the Ministry of Health. These higher authorities were chosen to know primary information on whether there are any governmental laws or regulations to take into account when starting a business with products from dry toilets. Other people were found by using the snowball method during the internship and interviewing period. The snowball method was chosen because the topic had never been studied before in Swaziland and often people who were interviewed for this study suggested other potential people on the same field of interest. These people were:

- 2 Msunduzi Sanitation experts, from a previous project. They were interviewed in group, in order to know what the main challenges with dry sanitation businesses are.
- 2 local nurseries. A&M Production located in Mnyamatsini and The Green House, situated 1km away from Mnyamatsini on the roadside towards Manzini. These nurseries were interviewed in order to determine whether they would be interested in either buying the fertilizer or having demo gardens.
- 3 Garden Center; Build It, Carters Inn and Khuba Traiders, selling fertilizers in Mbabane. They were interviewed in order to determine the type of fertilizers people in Swaziland use, whether they sell organic fertilizers at the Garden Center and what requirements they have for their products and their view on their clientele's potential interest in fertilizers from dry toilets.
- Pick&Pay and Shoprite, local grocery stores. They were interviewed so that the leading grocery store chains' opinions on vegetables fertilized with urine could be determined and in order to find out whether they would be willing to take these vegetables into their selection.
- Mr. Akhona Fakudze, Founder of Swazi Organics. The only registered organic fertilizer company was interviewed in order to define the challenges and possibilities of the market interest and also to find out about the challenges of entrepreneurship in Swaziland.
- Abraham Dlamini. Dry toilet builder. He has gained skills in building dry toilets through the project, and has been working closely with the community and the City Council of Mbabane. He offered his knowledge on the dry toilet cost reduction and thoughts about Swazi Culture related to dry sanitation.
- Guba Swaziland. Experiences of another Nongovernmental organisation introducing dry toilets to communities in Malkens, Swaziland.
- Mr. Natmi Dalmini from SEDCO. SEDCO is "A public enterprise under the Ministry of Commerce, Industry and Trade established in 1970 to awaken, promote and support entrepreneurial talent with a vision and

prime focus to create jobs and sustainable employment within the Small, Micro and Medium Sized Enterprises (SMME's) and thus make meaningful contribution in the larger socio-economic development of the country." SEDCO was interwoven to determine whether investors see dry sanitation as a profitable business and have interest in it.

The individual interviews made with the Mnyamatsini community members, representatives of the Ministries and the entrepreneurs are based on semi-structured beforehand planned questionnaires. To ascertain that the interview questions would serve their purpose they were tested with two persons before the actual interviews.

A part of the interviews was conducted in the local language siSwati and the local interpreter played a major role by translating the answers to English. Active GLM Volunteer Mr. Wandile Dlamini was chosen to be the interpreter due to his good background knowledge of the project and the respect he had from the local community.

It became clear to the interviewer that the community's knowledge of the dry sanitation and the possible business around it was not on the same level as it was thought to be beforehand, for example to some interviewees the word sanitation needed to be explained. Therefore it was a major challenge to balance between refreshing the interviewees memories of the concept and yet trying not to lead the questions too much.

In the beginning, when the research was planned, the focus group of this study was supposed to be only the youths, due to them being the special beneficiary group of the project. The disagreements within the community required the perspective of this study to be broadened and therefore CMT was also interviewed. Some of the sample groups were determined by their relation with the Mbabane Waste Management and Dry Sanitation Project, but most of the interviewees were chosen by using the snowball technique. Despite all the challenges during the interviews, the saturation point was found from the interviews. Because the value chain perspective of dry sanitation has not directly studied at least not in

Swaziland, it took long time to gather the background knowledge that was needed to start the actual research.

6.4 Research limitations, objectivity and validity

One of the biggest field research limitations was the time. Most of the people doing research get surprised by how much time the interviews and appointments takes. The well-known expression “African-time” does not cooperate well with the tight time schedule, therefore in order to do an in-depth study, more time would be needed. During one month the researcher planned to gather all necessary information for the study. The one month showed to be too short due to some misinformation, the local winter holidays, various conferences and other activities that were held in Swaziland at the same time. For example, one of the ideas was to hold group conversations with other groups than Sanitation Experts as well and to make a SWOT analysis, but the meetings were cancelled due to several reasons.

The questionnaires were tested beforehand, but it came as a surprise that at the time of the interviews that the CMT and the youth group members did not know as much about dry sanitation as had been assumed beforehand. Therefore it took a longer time than planned to interview one person. To make interviews by using the help of an interpreter is always a challenge and some of the expressions might get lost in translation. Moreover, since English was the mother tongue of neither the researcher nor the interpreter.

The interviews were conducted before the CMT and the youth group had finished their education on dry sanitation and the timing could have affected the answers. The researcher got the feeling that some of the interviewees tried to please her by answering positively, instead of answering honestly. Also, the fact that researcher had to explain different components and include the idea of generating income into the topic might also affect the answers, making people answer more positively than they actually felt.

Even though the topic of the research was chosen in the beginning of the summer 2014, the researcher found it hard to see the whole concept of the topic. Hence the idea of the research was slightly changing and narrowing down along the way, when it became apparent that the topic started to get too broad to handle.

The research had a broad scope in order to figure out the possibilities not only on the community level, but also the interest of the market for the end products from dry toilets. Some parts could have been searched with a deeper focus, in order to understand the concept better. Yet the study does give a good basis for a deeper market research with the same theme and at the same time provides necessary information for the project about the attitudes towards dry sanitation in Mnyamatsini.

6.5 Analyzing data

During the interviews conducted in the community, the answers were written down in a note book, instead of on a laptop, because the interviewer felt that when using a laptop, it diverted the interviewees' attention away from the actual questions. After the interview, the answers and notes were stored as soft copies and later analyzed by using Microsoft Excel. Due to the nature of a qualitative research method, the answers cannot be predicted precisely; therefore this research was influenced by the unpredictability as well, but mainly positively by getting vast amount of research data.

The collected data is analyzed by using the theoretical framework set up, which is introduced in the previous chapters. The analyzing is done by discussing the research questions, separating the answers under most common themes that came up with each question. By doing this, the large data was easier to handle and the major themes of the answers were found.

7 RESEARCH RESULTS

The overall goal of this thesis was to determine step by step the current ongoing challenges and opportunities that business around dry sanitation value chain faces in Swaziland. This was examined by finding the opinions of people from different levels of society. As an outcome of these results, a potential dry sanitation value chain will be created to meet the needs and suggestions of people in Mnyamatsini.

The research results base on all conducted interviews and on a SWOT analysis based on the answers and the findings on community level. The results are divided into three sections. The first section clarifies the acceptance and need for dry sanitation facilities in Mnyamatsini, which is followed by opportunities and challenges in the dry sanitation business, in perspective of each interviewed group. The final part of the results is dry sanitation value chain creation combined with the CMT's and the youth group members' opinions on how the business around dry sanitation should be organised.

7.1 Need of new improved sanitation facilities in Mnyamatsini

All the interviewed people in the CMT and the youth group stated that dry sanitation could be a solution for the sanitation problems in Mnyamatsini. The reason that was mentioned most often are the small plot sizes that the local chief submits for the inhabitants. Hence the families are lacking space in their yards to dig new pit-latrines. Normally, if the household size is 7 people, the pit-latrine gets full within 3 years. This is combined with the use of modern sanitary napkins, which after used are disposed into the pits, where they absorb the liquids speeding up the filling of the latrines.

Among the CMT and the youth group, both durability and the fertilizer produced from dry toilets are mentioned as the second most important reason for the inhabitants to get dry toilets. Due to this, the persons interviewed believe that it is possible that the local inhabitants might pay more for the toilet. Other positive

reasons that support the dry toilets are as follows: they do not smell when they are used right and would be safer as livestock falls into the old pit holes.

7.2 The current attitudes towards dry sanitation in Mnyamatsini community

The question number two examined attitudes that the CMT and the youth group have faced while speaking about dry sanitation within the community (appendix 11(6)). The question number two for the randomly chosen villagers examined first-hand information about their attitudes towards dry sanitation (appendix 12(6)). There seemed to be a division within the community, but few were totally negative-minded. Both the CMT and the youth group pointed out, that their own lack of information about the topic caused misunderstandings and is one reason eliciting negative answers from a part of the community. This has been a serious issue within the groups, since many people outside of the project have shown interest to know more about the use of compost in soil improvement and the benefits of the urine as a fertilizer. By the time of the interviews the CMT and the youth group had not received education on the topics yet.

Both the CMT and the youth group stated that people have been more surprised and curious than negative, when discussing dry sanitation. They have been spreading the word at the local church during Sunday Mass. People from the area have approached the groups asking about dry toilets and they have been commissioned to build them for one private person and for a local school. According to the interview results, there tended to be a division between the youth and the seniors in the community, as the youth seem to have still greater stigma around the subject, and they are more sensitive to other people's opinions.

The CMT and the youth group emphasized that the villagers are not sceptic about dry toilets in itself, but the compost and the emptying of the chambers. Persons, who were strongly negative towards the concept during the interviews, believe that neither the urine nor the compost is suitable for fertilizing or for the soil improvement. Even the people who are interested in the dry toilets are

doubtful on; the possibility to use human origin fertilizer on the agricultural field. Yet the CMT and the youth group members believe that through hard work on their part and by showing a good example to the other villagers, the ones who are questioning the concept will eventually change their mind.

Out of the randomly chosen villagers that were interviewed, 2/3 emphasized that dry sanitation is a good idea, mainly due to the free fertilizers that can be used on the agricultural fields. Within the year 2014, the randomly chosen villagers would have heard about dry sanitation through the radio or seen it in the newspapers, which is why the CMT and the youth group feel more comfortable with proceeding into the community to spread the idea. There has been a misunderstanding about the status of public dry toilets in Mnyamatsini, the local inhabitants have thought toilets are built for the GLM members, and are not meant for normal villagers. This misapprehension has been set straight later on.

As with all new innovations, it takes time to integrate ideas on community level, and the CMT and the youth group both stated that it would be necessary to have lessons organised by them to help better integration. By starting to build dry toilets for households, it provides a vital example for the other community members to see the toilets in actual use.

7.3 Dry sanitation business challenges and opportunities in Swaziland

In this section, different challenges and opportunities related with dry sanitation business will be analyzed. The answers are divided under each interviewed group, starting from grassroots level in the Mnyamatsini community, followed by the local entrepreneurs of the field, ending with the higher authorities of the field.

7.3.1 Business perspective of Mnyamatsini Community

Majority of the Mnyamatsini youth group emphasized that they believe the dry sanitation business to be a sustainable and a long-lasting income generating

activity for them in the future. Only two of them answered that they are not sure about it. The CMT members are slightly more concerned, five of them said that they see dry sanitation business to be a sustainable and a long-lasting income generating activity, two of them were not sure and one stated that it will not be a long-lasting income generating activity yet.

Both of the groups stated many opportunities related with the dry sanitation business in Mnyamatsini that support their opinions. The CMT and the youth group pointed out that there is no more space to dig new pit-latrines, therefore environmental conditions seem to push the community to look for new solutions, in order to avoid a health hazard in Mnyamatsini.

Two of the CMT members stated that most of the group members are unemployed and therefore able to use lot of time for the project activities. They also pointed out that there has always been unemployment in Mnyamatsini, now for the first time there is a possibility to learn new useful information, that can be applied into practice and at the same time have a chance for activities that generate income. Even a small income would be more than what most of them earn at the moment, and the people are ready to do anything to get their children into school. This fact itself motivates most of them to try to introduce dry sanitation in the community.

The groups see the current high cost of dry toilets as the biggest challenge related with the dry toilets. Most of the people living in Mnyamatsini are unemployed, or have an agriculture related small enterprise, therefore they don't have money to pay the high cost of dry toilet at once. Both of the groups stated that in order to get the toilets, the community members would need to take a loan, which could be a challenge. Yet both of the groups emphasized that dry toilet is a long-term investment, which would in time pay back its higher cost for the poor farmers.

One of the youth group members stated that in long-term perspective, dry sanitation business can start providing them stable income, but at the beginning the idea is new to the community and it will take time to disseminate the idea into

the community. Furthermore, it takes even longer to start getting commissions to build the toilets. This long-term perspective can be, especially for young people, a factor that drives them out of the project to look for other employment possibilities. Moreover, the time of getting toilet commissions will have a linear effect on other possible business around dry sanitation, such as emptying the dry toilets and selling the fertilizer. Similar worries came up with one of the CMT members, but she was more concerned that there would be no income at all from dry toilets.

The end products of dry toilets are mentioned often in the interviews as opportunity for the farmers in the area. The ongoing situation in Mnyamatsini, where farmers do not have money to buy fertilizers, would be eased with the “free” products from dry toilet. In addition to fertilizer, both of the groups seem to perceive all the aspects of the dry sanitation value chain as a profitable business, as long as the right market is found. Answers for the question number 18, on which parts of the dry sanitation value chain they see as a possible income generating activity, were divided equally between building of the dry toilets, selling the vegetables fertilized with the urine, and selling the actual fertilizer.

People who stated that they either are not sure or don't believe that dry sanitation is a sustainable and a long-lasting income generating activity, pointed out the stigma around the topic both within the interviewed groups and whole community. They emphasized that people in the community are looking down at them, since they work with waste. This is a huge challenge and the only solution they see is to cooperate closer with the local chief and Ministry of Health. In addition to these answers, the issue of stigma around dry sanitation was raised in other answers as well. It seems that biggest difference between the “negative” answers and people who mentioned stigma but still stayed positive towards the topic, is the solution part. The people who answered negatively thought that an external authority can solve the problem, in comparison with the ones that were positive and thought that the change starts within the CMT and the youth group by getting used to the work around dry sanitation.

Concerns about health problems caused by poorly managed composting process were stated by one of the youth group member. The traditions of using squatting toilet was also mentioned as a challenge, especially for people who have always used this type of latrine, in the beginning it would feel uncomfortable and unhygienic to use a new type of seating toilet.

7.3.2 Business perspective by people working on same field of interest

Swazi Organics is the only registered organic compost enterprise in Swaziland; they started to operate in year 2009. The owner of the enterprise, Mr. Akhona Fakudze, says that there is only 3-4 other entrepreneurs, who work in the same business, but none of them is registered because of a difficult and expensive registration process. He emphasizes that most of the people in Swaziland do not have money to register their enterprises, since the overall-cost is over 4000 rand, (300 €). Moreover, the banks do not grant loans for SMEs, because they lack back-up money in case the business runs down. In addition, the registration is centralized and the people have to go from one office to another, meanwhile most of the entrepreneurs either run out of money or get tired, giving up on the registration process.

Mr. Fakudze has done laboratory tests with his compost to find out the nutrient components, and he proposed cooperation if the people in Mnyamatsini have problems to get into the Malkens Research Centre. He says the tests are the only way to be able to sell the compost on the market, because both the private households and the enterprises, who sell fertilizers, want to know the nutrient components.

He emphasized that the biggest challenge with business around organic compost is finding the market and the right people. People have used to applying commercial fertilizers into their agricultural fields and therefore to change the routine to a new one seems hard for Swazi people. Not only finding the market is challenging, but to get the license to operate on the market is hard.

At the moment, most of the fertilizers come from South Africa, both the organic and the commercial, which is a shame due to the unused resources here in Swaziland. Mr. Fakudze stated that in the future the organic fertilizers market will boom, if the markets continue to grow as they have within the last five years.

7.3.3 Business perspective by possible fertilizer business partners

Out of the possible business partners, six representatives of different enterprises were interviewed, and results are analyzed together to see the differences and similarities between the answers. This group consists of two nursery gardens, one in Mnyamatsini and other 1km away from Mnyamatsini on the roadside towards Manzini as well as three garden centers in Mbabane selling fertilizers and other agricultural products.

Due to the media, all of the persons interviewed in this category had heard about dry sanitation and the possibility of using urine and compost as fertilizer in agricultural field. The general attitudes towards the concept were positive, only one of the fertilizer shops was negative towards use of both urine and compost from dry toilets in agricultural fields. Nowadays in Swaziland, most of the shops selling fertilizers for agricultural purposes have organic fertilizers in their product selection. All the interviewed representing garden centers and nurseries emphasized that organic fertilizers should have a lower price than chemical fertilizers.

During the interviews, Khuba Traders' manager emphasized that previously he had been searching for information about the nutrient components in urine and was very aware of the whole concept. He stated that nowadays the customers' demand of organic fertilizers is increasing; therefore he had started to look for an organic fertilizer which has a high amount of the desired nutrients. Yet the general opinion among the interviewed persons is that the majority of the customers are not aware of the damages that commercial fertilizers cause on the soil. During the interviews, the Swazi people are often categorized as lazy peo-

ple, which is why they prefer the use of chemical fertilizers; these fertilizers need to be applied only once, whereas organic fertilizers require more work. In addition to that, in Swaziland the prices of commercial fertilizers have been stable and have not risen yet.

All of the interviewees thought that in the beginning fertilizer from dry toilet should be cheaper in price than the other organic fertilizers. During the time of the interviews, the regular price for the organic fertilizers was 22r (1,67€) /10kg. Both of the interviewed nurseries were interested to have a demonstration garden next to their other plantations, where the customers could see the effect of the new products.

Majority of the persons that were interviewed in this group seem to have positive attitudes towards the products from dry toilet value chain. Only one the interviewees, manager of Carters Inn, stated that they were not ready to take the fertilizers into their product selection, but the others thought that their customers would be willing to test the new products and they were ready to market the products themselves.

7.3.4 Business perspective by possible vegetable buyers

Three possible vegetable buyers were interviewed in order to know their opinion about vegetables fertilized with urine. One fruit stall on the roadside in Mnyamatsini was interviewed as well as 2 leading grocery stores in Mbabane; Pick and Pay and Shoprite.

The fruit stall in Mnyamatsini, located on the main road close to the community's waste drop off point, was positive about the concept. The owner thought that the local fruit stall owners should be introduced into the project as well, because they could be the selling the vegetables for the locals in the future. She thought that people would buy the vegetables, as long as the vegetable and fruit sellers know what to answer to the questions coming from the community. She emphasized that she would be ready to take the vegetables into her stall to sell them.

Both representatives from the leading grocery stores (Pick&Pay and Shoprite), especially the representative from Pick&Pay showed interest in selling the urine fertilized vegetables in their stores. They have been invited to the discussion on the topic by the City Council of Mbabane. They emphasized that nowadays Pick&Pay has a larger organic fruit and vegetable selection than before in order to meet their customers demand. The price paid to the farmers for their products is the same independent on whether they are organic or not. Both Shoprite and Pick&Pay get their vegetables and fruits through the National Agricultural Marketing Board (NAMBOARD), which sells vegetables procured in Swaziland directly to the major consumers and retailers. Therefore, in order to get the vegetables into these two grocery stores, the community must find out the requirements from NAMBOARD.

7.3.5 Business perspective by the Msunduzi Dry Sanitation Experts

Ms. Phindile and Mr. Mlungisi were interviewed as the representatives of Msunduzi dry sanitation experts. They have both been working with dry sanitation during the MDS Project; resulting in several years of experience on dry sanitation when applied it in practice in community level.

Area-wise Mnyamatsini and Msunduzi are very different. For many people in Swaziland planning of future is not what they are used to. Yet to be able to start business around dry sanitation, CMT should look already into the future needs such as business plan and storage room for compost. Community members' awareness of the fact that there is a place where to store the compost once the chamber is full, would motivate them to produce quality compost, which has been challenge in Msunduzi. Sanitation Experts say that inhabitants in Msunduzi are ready to give the compost for free, as long as they could get rid of it. Because of misuse, or non-use of the toilet, the chambers are full of paper, which is why the compost cannot even be used for soil enrichment in tree production.

In opinion of the interviewed Sanitation Experts, the people in rural areas would be willing to use both the urine and compost, because they are in a bigger need of fertilizers for their agricultural fields than people living in urban settlements. Sanitation Experts also points out the fact, that people do not mind where the vegetables are grown or what they are fertilized with as long as the taste is competitive.

7.3.6 Experienced by SEDCO

Mr. Natmi Dlamini from SEDCO was interviewed in order to determine whether there is an interests in dry sanitation among the investors, and to get a better understanding of the challenges that the SME's face in Swaziland. Mr. Dlamini had read about dry sanitation from a local newspaper. He finds the idea good, especially for the rural areas of Swaziland, where flushing toilets are not common and farmers are suffering of bad harvests.

In his opinion, the community should start writing, in early state of the business phase, a financeable business plan, including their ideas on how to make profit out of dry sanitation. This would not only make the business-idea clear for the community itself, but also attract innovative investors, who are constantly looking for new ideas. In general, the problem with the business in Swaziland is that the people lack new ideas and keep repeating the same old modes of business. At the moment, this is the biggest advantage that the community working with businesses around dry toilets has, to be the first on the market selling the new product.

The second biggest advantage that the community has is the totally organic product, which has both environmental and social benefits coming with it. Mr. Dlamini emphasizes, that Swaziland is starting to go towards ecological and green thinking, resulting in the investors starting to invest more and more towards business around these subjects. The change is not happening fast, but the investors are always one step forward in predicting the trends, compared to other people in Swaziland. Most of the organic products are not of Swazi origin,

but from South Africa and other foreign countries. These two aspects combined are the advantage that will attract many investors and should be mentioned when introducing the dry sanitation value chain idea to investors: a totally new product in Swaziland's market that nobody else has been promoting yet and that is environmentally friendly.

As the biggest challenges with dry sanitation business Mr. Dlamini sees the health hazards. The largest reason behind the health hazards is the workers lack of education and a poorly managed dry sanitation process. In the beginning, the community needs to show commitment to be able to win the customers on their side, since the brand new product does not only bring advantages, but also challenges. The community needs to show that the outcome of their work is good quality, otherwise they will not only lose the customers but also the investors.

All of the SME's are facing many difficulties in Swaziland. The size of the country is small and therefore the market size is limited. The country lacks regulations for imported goods and therefore several foreign products have overtaken the markets. Because the market size is relatively small, entrepreneurs feel more comfortable in producing commodities for markets that are stable, at the same time this limits people from thinking out of the box resulting in similar products being produced.

The country lacks startup money for the new SME's, which would be vital for the new enterprises. Mr. Dlamini has seen many great business ideas, which are lacking in money at the beginning and due to this the entrepreneurs have given up. It is not only the lack of start-up money that makes the starting process for new enterprises difficult, but also the high taxes that the entrepreneurs have to pay for the government. To be able to solve above mentioned problems involves too much politics and tax reliefs from side of the government, and therefore it is seen as impossible process.

7.3.7 Perspective of Higher Authority: Ministry of Agriculture and Ministry of Health

The interviews with the higher authorities of the field were conducted in order to find out their opinions about dry sanitation and whether there are any governmental laws or regulations in Swaziland to take into consideration when establishing business around dry sanitation.

Ms. Windile Dlamini, a representative of the Ministry of Agriculture had heard about dry sanitation, but did not know how the ecological sanitation process works exactly. She pointed out, that the dry toilets are a relatively new idea and only within the last few years they have been publicly known as an alternative for a sanitation facility. At the Ministry of Agriculture, they have realized that organic farming is an upcoming trend in Swaziland and the mindset of the farmers is slowly changing towards green thinking.

At the time of the interviews, Ministry of Agriculture promoted the use of commercial fertilizers, since the farmers are more interested in using them compared to other products. Yet the Ministry of Agriculture would be interested in supporting the farmers in starting the usage of the compost and the urine from the dry toilets, as long as the farmers themselves approach the Ministry about it.

So far there are no regulations or laws for the use of the end product of dry toilets on the agricultural field nor are there about selling vegetables that have been fertilized with either urine or compost from dry toilets. Once the fertilizers from dry toilets get popular among the farmers, it is necessary to set some regulations to ensure the safe use of compost. The Ministry of Agriculture hopes the farmers would contact them, not only in order to make the regulations for the control of the quality of compost, but also so that they could support the farmers in any way they can.

The Ministry of Agriculture finds making a business out of farming related products challenging, because Swaziland lacks the financial support for agricultural businesses; this is one reason why most of the farmers in Swaziland are and

continue as small scale farmers. The Ministry of Agriculture supports the idea of “free” fertilizer from the dry toilets and sees it both as a positive development and a good way to increase the harvests. This could be the key motivational factor for the farmers to be willing to invest into the dry sanitation facilities in order to produce quality compost.

Mr. Daniel Sithole was interviewed as a representative of the Ministry of Health. He sees dry sanitation as a good idea on paper, yet in reality as a challenging solution for Swaziland’s sanitation problems, since the inhabitants in Swaziland are not gotten used to recycling human waste.

According to Mr. Sithole, there is a common stigma around dry sanitation in Swaziland and the only way to ease it, is to educate people on the topic. For the Ministry of Health, taking part in the education or promotion of dry sanitation is impossible until they have received laboratory tests proving the urine and the compost to be free of pathogens and other bacteria that might cause health hazards. This laboratory test samples must be Swazi origin, samples that come outside of country are not valid, due to different environmental and climate factors. Yet Mr. Sithole recommends Cape Town as a laboratory test place, since the area is very active in spreading the idea of dry sanitation.

Because dry sanitation is a new innovation in Swaziland, and there have not yet been other pioneers trying to get the compost or the urine on the market, at the moment there are no regulations made to restrict the selling of the urine or the compost from dry toilets, neither are there any regulations regarding the selling of vegetables that have been fertilized with human excreta. The only regulations that are related to the topic are the WHO guidelines for pit-latrines.

If the community proceeds with using the urine and the compost from dry toilets as a fertilizer on the agricultural field, the Ministry of Agriculture does not have anything against it, but in case of a health hazards, they need to get involved. Once the community accepts the concept, they must be well educated on each step of dry sanitation so that health hazards do not occur. The smell of urine is strong, therefore Mr. Sithole from the Ministry of Health believes that the com-

munity will not start using it. They are also concerned about the public toilets, since there is no way to make sure that the people add the dry substance after using the toilet, and in this case the faecal material will remain wet.

At the time when fertilizers from dry toilets become more common in agricultural use, dry sanitation guidelines must be made by the Ministry of Health and the Ministry of Agriculture to make sure that people can find information when necessary. They also recommend making guidelines, on community level, for the safe emptying of the chambers of dry toilets. Mr. Sithole from the Ministry of Health sees the role of the Ministry of Health as vital in order to ease the stigma around sanitation, and to get long-lasting and sustainable results from the project, therefore they recommend a closer work relationship with the government.

7.4 Dry sanitation value chain

The purpose of this thesis is to get a deeper look into the different parts of a dry sanitation value chain in Mnyamatsini. The interview questions were targeted in such a way that they would elicit the respondents' opinions on each dry sanitation section. Dry sanitation components in this research mean the different actions that needs to be taken to be able to complete the whole dry sanitation process. During the interviews the major dry sanitation parts were defined by the author, since different actions around dry sanitation were not clear for Mnyamatsini CMT and youth group members. Yet the groups came up with some of the dry sanitation value chain parts. Based on the respondents' answers, eight major actions around dry sanitation work came up, these actions will now be analyzed by looking into the opportunities and the challenges that were brought up in the answers.

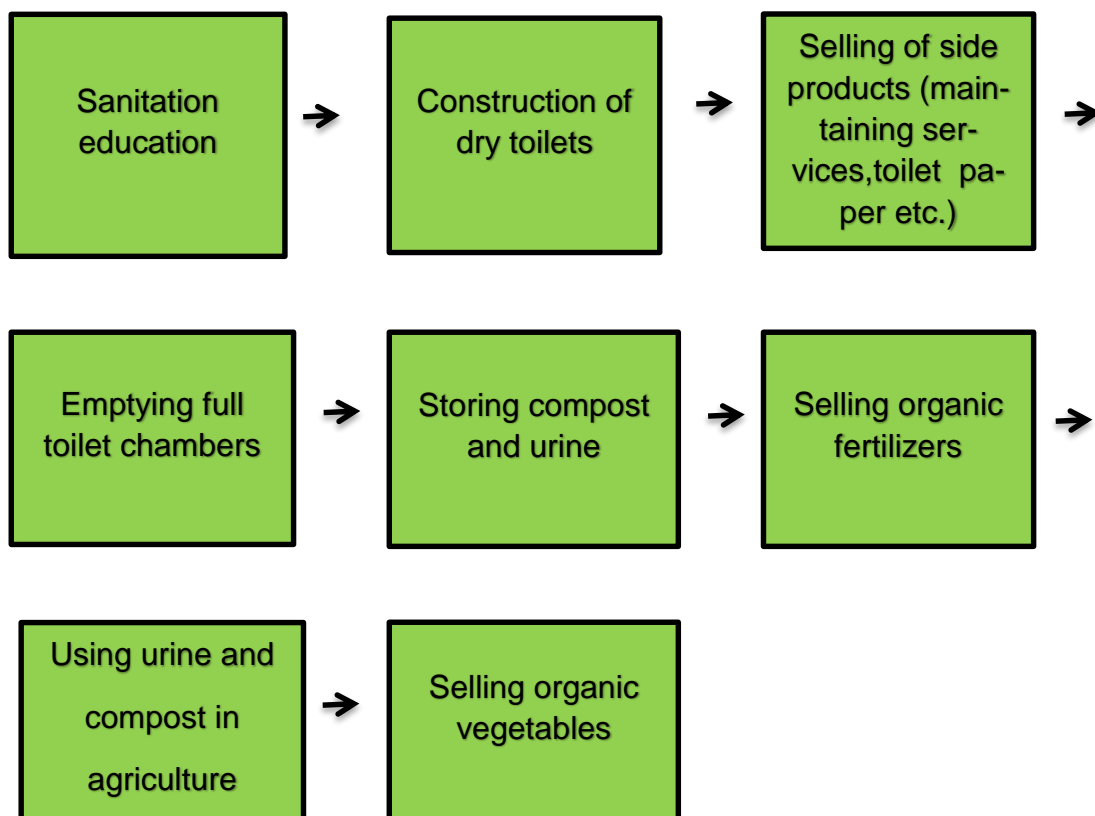


Figure 4 Dry sanitation value chain.

7.4.1 Sanitation education

Sanitation education is the first step of the dry sanitation business value chain (see Figure 4). Before people are educated and have gained knowledge on dry sanitation, they often have a negative attitude towards the idea of dry sanitation. This answer came up with many respondents on answers.

Both, CMT and youth group emphasized that the sanitation education should be given for free, for both their own community and other communities. Education is the way the groups can spread the word about dry sanitation, and at the same time ease the stigma towards it. One of the CMT group members thought that they could have t-shirts or educational posters put up in the town, where they promote dry sanitation. All group members agreed that the chief should give them time to hold short educational sessions during the monthly communi-

ty meetings. Other ideas that came up on how to educate people were: walking from door to door or by organizing workshops.

The biggest challenge during the time of the interviews was that neither of the respondent groups thought that they had enough knowledge on dry sanitation for giving trustworthy answers to questions, which have been rising from other community members' side. Yet three of the CMT members expressed that they have been explaining dry sanitation at their churches and people's responses had varied from positive to negative.

7.4.2 Construction of dry toilets

The second value chain step for dry toilets is the construction of the toilets (Figure 4). In this part, the focus was to study what the challenges with the current model of the dry toilet were and did the community members see the construction phase as a part of the income generating activity or not.

All of the CMT and the youth group members that attended the dry toilet building workshop have received education on how to build dry toilets. There are two professional builders within the CMT and the youth group that know how to build toilets without external help. During the time of interviews, part from the two builders not know how or were comfortable with the idea of building the toilets without external help. One of the builders is the leader of the CMT Lucky Maseko and he stated during the interview that there are 12 people in the community showing interest in having a dry toilet in their homestead. In addition, there are two ladies from private households in Lobamba that have ordered the dry toilets already. Moreover, the city council of Mbabane is promoting dry toilets, since there seems to be a growing market for the construction of dry toilets outside of the community.

The main challenge is not the promoting of dry toilets on community level, but meeting the tight budget of the community members so that they could afford to pay for the new toilet facilities. The high cost of the toilets, which during the time of interviews was 7000-10 000 (SZL) (534-762€), is seen as major challenge

that needs to be overcome. According to the answers of the interviewees of the CMT and the youth group, the highest cost for a dry toilet that the community members could afford to pay, was 2500 SZL (191€). According to the CMT and the youth group members as well as the Ministry of Health, this signifies that the building materials' costs should be reduced by for example using local materials. Mr. Abraham Dlamini, who got training from MDSWM project on building of dry toilets and is working closely with the project, points the same fact that the cost of the dry toilets should be lowered.

In addition to using local building materials to reduce the costs, the CMT and the youth group members explained about their plan to start collecting one SZL (0,08€) donation from each of the CMT and the youth group member that wants to have a dry toilet in their homestead in the future. This collection would continue until each of them has a dry toilet. This requires a deep trust for each other, which has seemed to be a challenge within the groups. One of the interviewed youth group members stated that if they manage to accomplish this, it will set an excellent example of the power of a group and of commitment for the other community members. In addition to the donation plans, the groups have been considering taking loans but since most of the interviewees do not own anything to use as a guarantee for it, they emphasized the loan as an impossible option.

Even though there are challenges to overcome, in a long run both the CMT and the youth group saw the building of dry toilets as a profitable part of the dry sanitation value chain. A majority of the CMT and the youth group interviewees stated that they must work harder than they had done so far, in order to convince the other community members of investing into the toilets. Four of the interviewed members thought that they need to have more knowledge about the benefits of dry sanitation on social and emotional level, in order to influence the community members with the right statements when they are considering the costs and benefits of their future sanitation facility.

During the interviews, the question about division of salary came up, since not all the group members can participate in building the dry toilets. It seems like

the groups had discussed the money issue, since both the builders and the other group members emphasized that at the beginning the salary for building the toilets should be divided between all of the CMT and the youth group members.

Half of the randomly chosen villagers would be interested in buying dry toilets as the next toilet facility. Two of the interviewees that answered no, pointed out that they already have two toilet facilities in their household; and one, said that she was too old to empty the chambers which is why she preferred pit latrines. The interviewed people seemed rather to be concerned about having dry sanitation than having outright negative opinions about it. This came up in the answers, in which the interviewed stated that he/she is not ready to buy a dry toilet yet, but in the future they might buy one, once they have a better understanding of the new toilet facility.

7.4.3 Salling of side-products

The third step of the value chain is the selling of the several side-products and the services for the toilet users (Figure 4). These side products include the selling of raw materials for building a toilet or the selling of sawdust, ash and other materials that would be dispensed after using the toilet. Other services could be provided as well, such as the maintaining services and the cleaning services. (Jenkins & Scott, 2010 16.)

The CMT and the youth group did not mention the selling of the side products as an income generating activity. The majority thought that the future toilet owners would have sawdust and ash from their own homesteads and therefore it would be unnecessary to sell them. The maintaining of dry toilets should be given for free in the beginning.

The interviewees, that raised the issue of local material usage in the dry toilet construction, were concerned about the fact that all of the reusable materials, such as corrugated iron, have been sold to the Mnyamatsinis waste drop off point.

7.4.4 Emptying the full toilet chamber

Emptying the toilet is the fourth step (Figure 3) and this has been a challenging issue during the previous projects. According to Sanitation Experts' in Msunduzwa people were interested in having dry toilets, but in most of the cases they are either not producing quality compost or willing to empty the chambers themselves due to the stigma related to processing faecal matter.

As mentioned before, the emptying of chambers needs to be planned carefully and in order to have customers from Mnyamatsini community, an "emptying service" should be offered. This came up in several statements during the interviews; in the future dry toilets are seen as an acceptable solution, but the emptying of the chambers is not. The Ministry of Health insists on a guideline manual, which should be made for the customers and handed when the customers buy a dry toilet from the Mnyamatsini CMT and Youth group. This practice would reduce the health hazards connected to working with human faeces.

According to three respondents, two from the youth group and one from the CMT, it would be recommendable in the beginning to empty the chambers for free, especially if the compost is of good quality. As the time goes on, the inhabitants should start paying them for the service.

7.4.5 Storing the compost

Storing of the urine and the compost is the fifth dry sanitation business value chain step (Figure 3). The answers to the question, whether the CMT and the Youth group see the storing of the compost and the urine in one place as a good solution, were divided between storing together and storing at homesteads. The people, who have big fields, would prefer to use the majority of the urine and the compost as a fertilizer and for soil improvement in their own home gardens. Yet they stated that not all of the inhabitants in Mnyamatsini have such large agricultural fields; therefore these inhabitants who are in need of improved

toilet facilities, but not in need of fertilizers, should be offered a place to bring the compost and the urine.

One of the Youth group members emphasized that especially in the beginning, it is better to store both the urine and the compost together in order to facilitate the monitoring of the composting process and making sure that the quality of the compost is good. Three CMT members stated that the storage for the compost should be well secured, so there could be no vandalism. The Sanitation Experts from the MDSP emphasized, that it is necessary to have one common place to store the compost: it shows for other inhabitants that the CMT and the youth group are serious about the business. In addition, the inhabitants can trust that they can bring the compost somewhere once the chambers are full.

7.4.6 Using urine as a fertilizer and compost as soil improvement agent

Using compost as a soil improvement agent and urine as a fertilizer is the sixth step on the dry sanitation business value chain. The part of the interviews that focused on this investigated whether the people are willing to use both of the byproducts or only the urine on their agricultural fields. The CMT and the Youth group of Mnyamatsini have communal agricultural fields. On these fields, the idea is to have demonstration fields and later on harvest the fields and sell the products on the market.

According to the results of interviews, the use of urine as a fertilizer on the agricultural fields seems to be a more acceptable method than the use of compost as a soil improvement agent. Some of the people in the CMT and the Youth group of Mnyamatsini had already started to use urine as a fertilizer as part of the MDWM project activities. When talking about the issue of fertilizers, a majority of the interviewed wished to have a dry toilet of their own, since they are all in big need of fertilizers; therefore they emphasized that they would use both the urine and the compost on their own agricultural fields as a fertilizer or for soil maintenance. In case there were some leftovers, they would sell it on.

There was a big division between the negative answers: some emphasized that the youth would not use either of the products because of the stigma surrounding the subject; in comparison, just as many answered that the senior members would not accept the products. The general reasons for why the use of manure and urine were not accepted within the CMT and the Youth group were the possible health hazards, the harmful effects on plants, and the negative attitudes towards the subject. The Ministry of Agriculture proposed that once the use became more common in and outside of Mnyamatsini, the Ministry would be informed and updated on the situation.

Both the CMT and the Youth group stated that the people in Mnyamatsini are in need of cheap fertilizers; at the moment cow manure is the most used fertilizer and is normally bought from the neighbors. Due to the respect for higher authorities in the Swazi culture, the groups suggested that both the Ministry of Health and the Chief would be included into the project, so the people would feel comfortable with the use of these fertilizers.

Only three out of the 15 randomly chosen villagers thought that they would never use urine as a fertilizer or compost for soil maintenance. These three persons stated that the health issues and the idea of using human manure as a fertilizer in agricultural field made them too uncomfortable. Yet one of these three persons emphasized that with time she could see herself using the products, once they are proved to be safe to use. Other people thought that they could use the products, especially the urine on their fields, because they were in need of fertilizers.

7.4.7 Selling the organic fertilizer and the vegetables

The final step of the dry sanitation value chain is the selling of the vegetables that have been fertilized with urine, or alternatively selling the actual fertilizer on the market (Figure 3). People in and outside of Mnyamatsini were introduced with both activities. According to the research results, both the CMT and the Youth group members believe, that in the long-run combining the sale of the

vegetables and the fertilizers is the biggest income generating activity in the dry sanitation value chain.

Even if the use of urine was relatively accepted in Mnyamatsini, almost none of the interviewees saw the selling of urine as a fertilizer as a profitable business in Mnyamatsini, because it is relatively easy to collect and store and therefore unemployed villagers would not invest in that. However, the selling of compost was seen as a profitable business, because it requires more work in advance. The CMT and youth group were not willing to buy either the urine or compost, because they believed that their own dry toilets would generate enough fertilizer for their needs. Yet, before investing to their own toilets, they emphasized that they would buy the compost and urine to show good example to other community members.

Most of the interviewed villagers proved the CMT's and Youth group's prediction to be correct: none of the randomly chosen villagers that were interviewed would buy the urine, since they would rather collect it themselves. All the interviewed randomly chosen villagers that answered positively towards the use of compost, for example on tree production, thought that they would buy it from the market as long as it would be cheap enough.

As mentioned before, a majority of the shops selling fertilizers for agricultural purposes were positive towards the idea of taking the fertilizer into their product selection. The garden centers recommended the urine to be bottled into various sizes of containers; from 1l up to 10l canisters. Not all the interviewed enterprises required laboratory tests either for the urine or for the compost. For the Green House it would be enough that the products show their effectiveness, for example on the demonstration fields. Yet, Khuba Traders and A&M production requires a list of the nutrient components and a manual for the application of the fertilizer for the customers. One of the garden centers, Khuba traders, stated that for the shop to be able to sell the fertilizer under the concept of organic fertilizers, the product would need a specific license number. Other relevant information that the fertilizer package should include were the following: expiry date and manufacture date, ingredients (amounts of nutrients). Additionally the

package should look professional, so that the customers would believe the product will work.

A vast majority of the interviewed CMT member, of the Youth group members and of the community members would buy vegetables that have been fertilized with urine. During the interviews six persons mentioned, that some of the fields are on top of old pit latrines anyway and that they are buying these vegetables; therefore buying vegetables that have been fertilized with urine or from the field that has been maintained with compost would make no difference. The only priority for the vegetables that came up during the interviews was the taste: as long as they taste as good as any other vegetable, that was all that matters. Yet it seems that there is some difference depending on whether the fertilizer is from the interviewee's own dry toilet or bought from the market: the use of one's own urine and compost is more acceptable than the use of others'.

7.5 Joint enterprise or association as a business model

When discussing with the CMT and the Youth group about the future prospects of who would be working with dry sanitation, almost all of them answered that the groups will be working jointly, especially in the beginning. During the times of interviews there seemed to be disagreements between the groups, but the common opinion was that they will stay working as one big group. Views on how they divide the main group into smaller subgroups varied as well as the "group" size. One of the youth stated:

"We must work as community as whole. Everybody must learn to do their part well, in order for us to get quality pre-compost from the toilet owners, and to be able to make it as ready-to-go compost into the markets."

There was division between the answers, whether the older people should work in the same subgroups with the youth, since the working pace is so different. Moreover, in the Swazi-culture there is a respect for elders, which made the youth to worry whether they would end up doing a majority of the work, and also that the CMT members might not listen to their opinions.

When discussing whether the people should specialize on one field of interest - for example on building, emptying the chambers or taking care of the demonstration fields - or should they rotate the work, only two persons thought it would be better to build up expertise. The reasoning behind the idea of rotating the work is to ease the stigma, and also to feel as comfortable as possible with each step of the dry sanitation value chain. Other benefits mentioned with rotation were: the new skills people would gain by learning about each component of the value chain, everybody would have to work equally as hard, and everyone would have to take responsibility and get good results from the work.

A vast majority of the respondents thought that they should constitute themselves as either an association or a joint enterprise, so it would guide their work in the future. They stated that especially the youth are now vanishing from the project due to disagreements between the groups and in addition they are looking for employment from Mbabane. The association would give them a right to operate on the field and at the same time they gain more respect within the community. The owner of Swazi Organics, the only registered organic fertilizer company in Swaziland, supported the idea of registering the group either as an enterprise or as an association.

The common worry that the respondents had towards the association or an enterprise and the actual work was related with money. Since they are not used to handling money, even small amounts of it can cause huge disagreements between the members of the group. Therefore, they thought that they would benefit from small business management education. The CMT worried that the salaries would be not shared equally and the youth group members were worried that they would end up doing all the work, but in the end the consensus was that the salary would be shared equally. Other challenges with the work were the disrespect within the communities, a lack of communication, and a lack of business management skills. The lack of commitment was mentioned five times among the answers from the youths, but the CMT did not see that as a problem.

8 CONCLUSION AND FUTURE PROSPECT

The study of livelihood creation through dry sanitation value chain aimed to research the current opinions towards business around dry sanitation in Swaziland, as well as dividing the actions related to dry sanitation value chain into smaller steps and consider the opportunities and challenges within them. In this chapter the results will be analysed.

8.1 Changing attitudes

During the interviews, for the respondents in Mnyamatsini it seemed hard to point out sanitation problems in Mnyamatsini; moreover, none of the respondents linked them to hygienic problems. The practical issues, such as a lack of lands, were mentioned most often as problems related to sanitation. Sanitation challenges are tightly linked with the culture and with the ongoing situation that people live in.

Another issue related to the attitudes that should be noted is the existing stigma surrounding the human waste, and therefore also towards the fertilizers of that origin used for agricultural purposes in the Mnyamatsini community. Dry sanitation needs to be integrated well into the community by education that is targeted at the CMT, and at the youth group as well as at the whole community. Yet when the interviews were conducted, the idea of dry sanitation was relatively new, and it always takes time to disseminate a new innovation into a community. When taking the time prospect into consideration, the Mnyamatsini community is well dedicated to the project activities and has adapted well to the concept of dry sanitation. The general problem with the development cooperation and the tight schedules force the project to proceed faster than the locals' knowledge and acceptance allow, which might be a challenge for the CMT and the youth group.

There are several reasons why dry sanitation is a potentially more acceptable sanitation solution in the rural areas than in the urban areas. A household's fu-

ture prospects are related to the acceptance of dry sanitation. When people are able to earn an income in the rural areas, they are more likely to stay and plan the future there, which makes them invest in long-term solutions. The findings indicate that: first of all, most of the people in Mnyamatsini are small scale farmers that do not have money to buy fertilizers. Secondly, the majority of inhabitants own their houses, which provide them permanent shelter. Thirdly, most of them are unemployed or working in an informal sector. As Schuen & Parkinson 2012, mention in the study of Financial and Economic Analysis of Ecological Sanitation in Sub-Saharan Africa, poorer households might not have finances to improve their sanitation facilities, and so it is in Mnyamatsini. The deep poverty levels in the area make it difficult for inhabitants to improve their sanitation situation by themselves, even though they would be motivated to do so. Dry sanitation, if accepted within the community, could not only increase social sustainability by providing free fertilizers and improved long-term sanitation facilities, but also increase the environmental sustainability.

The results of the research indicate that the laboratory tests for both the urine and the compost should be made as soon as possible, in order to access the market and prove the fertilizers safe for use. Since one of the project partners is UNISWA, they might have accessible laboratories at their facilities. Another option is to use either the Malkens' Research Centre or to send samples to Cape Town, where there is active research and promotion of dry sanitation. Laboratory tests would help to mitigate the stigma related to the use of human waste, and ensure that the Ministry of Health could stand behind the concept. The research results support the same concept that was pointed out in Experiences of Dry Sanitation in Southern Africa, (Haimi et al 2008) respect for higher authorities is a cultural norm in Swaziland, which is why their support is necessary in convincing Mnyamatsini community as well as other communities to invest into dry toilets. Moreover, the nutrient levels can be shown only with the laboratory tests, which a majority of the fertilizer shops require. On the other hand, if the laboratory tests were not made while the promotion of dry sanitation would continue and both the urine and the compost would be used, the higher authorities of the field might get in the way of the dry sanitation entrepreneurs.

The benefits gained from the dry toilets need to be explained well to the local inhabitants, so that their interest towards dry toilets would be achieved. Human waste should rather be seen as a personal resource than as waste that can later be used in agricultural purposes for the maintenance of the soil and at the same time to secure the food production and potentially generate income as well.

8.2 Dry sanitation as sustainable income source for Mnyamatsini community

The investors, the higher authorities and the people working in the same field emphasized that the Swaziland's business environment is shifting towards greener economy, and therefore business based on ecological products will become more profitable than before. As a result there is a slowly growing organic market and a community-based dry sanitation business could profit from it as well. This requires fast adaption from the CMT and youth group in order to move from the level of an innovative idea to triggering the event and starting the actual business. (Hatten 2006.)

“In Swaziland the need of new youth employment and at the same time shifting the business models towards green ideas is very urgent.” -SEDCO

For attracting local investors from Swaziland, it seems that the project is hitting the market at the right time for promoting business for the youth entrepreneurs and innovative green business ideas. This would be a great step forward in reducing the CMT's and the Youth group's dependence on the project. In addition, by getting local investors to support in the business the CMT and the Youth group could avoid some of the major challenges related to start-ups in Swaziland, such as a lack of funding. Yet the dry sanitation business would concentrate around building of the toilets for rather a long time before the manure and the urine would be produced, tested, stored, packed, and sold to the market.

Lowe and Marriot 2006 note, normally entrepreneurs in developing countries have problems finding a suitable market for their products outside of their own communities; this is not necessarily the case with Mnyamatsini. Mnyamatsini's

CMT and Youth group have been working closely with MDSWM project from the beginning of the project cycle, and have benefitted from the knowledge and the network of local project partners. This cooperation has created an opportunity for them to make necessary connections of their own, and to get potential customers outside of the community. In addition, the CMT and the Youth group have been able to strengthen their trust on business possibilities around dry sanitation. The future plan of the project is to create a network between all the project communities, which could give the CMT and the Youth group of Mnyamatsini a possibility to at first educate the people about dry sanitation and later cooperate with them on the business.

Research results indicate that in Swaziland there is a market for both the fertilizers from dry toilets and the vegetables fertilized with urine. Even though business around urine based fertilizers does not seem to be profitable in Mnyamatsini, it could be sold to bigger operators that do organic farming. The CMT and the Youth group should find external partners that buy bigger bulks of vegetables, so that they could have a continuous income. One of these partners could be NAMBOARD and the Mnyamatsini group could negotiate with them in order to find out their requirements for the vegetables they buy. Also, the local restaurants are alternative places for selling the vegetables. In general, many of the interviewed persons pointed out the fact, that the environment where today's market-vegetables are grown are inadequate, therefore the attitudes were more positive about buying vegetables than about buying the fertilizers. There was only one requisite for the vegetables, the taste: as long as the taste of the vegetables is good, there would be a demand for them. When entering to a new market, there is always risk of failure associated with it, which is why a proper business plan should be made by the community.

The price of commercial fertilizers has been rising steadily in other parts of the world, and in the future this trend will be seen in Swaziland as well. Farmers, who are able to finance fertilizers for their agricultural fields, were showing concerns about the potential future rise of the commercial fertilizers. This trend of

rising artificial fertilizer prices could cause a bigger market for the dry toilets and at the same time better the sanitation situation.

As Hatten 2006 states, in the beginning of the enterprise start-up process, it is important to determine the potential customers and the market that the product is targeting. Even though it seems that there is a market for the end products from dry toilets outside of Mnyamatsini, the CMT and the Youth group of Mnyamatsini need to start educating the inhabitants inside their own community, in order to get customers for dry toilet business at the local level. Yet better in-depth market research should be made.

Brixiová & Kangoye 2013, showed that the Swaziland's public sector is oversized and therefore it is necessary to create jobs in the private sector. However, the business environment in Swaziland is not easy for the start-up businesses. In the same study, it was emphasized that the lack of government funding for the start-ups forces many potential business ideas to their end, before they have gotten a chance to get into the market. During the interviews, this same fact was mentioned by Mr. Dlamini from SEDCO; he suggested writing a small financeable business plan, which would guide the CMT's and Youth groups' work forward as well as to see the enterprise as a bigger concept. For business around dry toilets, it is a potential risk to lose the interested business partners and potential funders, if the starting process of the business was to be postponed into the future and the current opportunity to cooperate with the project partners was not seized.

Lowe & Marriott 2006 explains in the beginning that starting an enterprise normally either requires the promoting of a new product or has to start competing for customers with other enterprises on the same market. While dry toilets are a totally new innovative solution for the rural areas' sanitation problems, the current price of the toilets does not seem affordable for poor households. However, it needs to be recognized, that the model of dry toilet that is used in the project needs either to be radically modified by using local building material or subsidised. When looking at the dry sanitation value chain created for Mnyamatsini, the first profitable step is the building and the maintenance of the toilets. In case

the price of dry toilets is not lowered to appreciate the local circumstances, there will not be a market for dry toilets in Mnyamatsini. This same problem of too expensive toilet solutions was faced in a study made by Schuen & Parkinson 2012.

During the interviews, some of the respondents said that they could see themselves as working as persons emptying the full chambers from the dry toilets. These answers showed not only the great dedication that was shown during the interviews, but also raised the issue of safe storing of the full toilet chambers. In the case that the households prefer to keep the composts maturing on their own households, the CMT and the Youth group members could check together with the toilet owners that the process is done right. In addition to that, there should be a step-by-step guide book for the toilet owners containing advice related to dry sanitation processes to avoid health hazards. Sanitation experts from the previous project commented, that even if there had been quality compost from dry toilets in Msunduza, they did not have a place to store the compost. Even though the plots in Msunduza and Mnyamatsini are different in size, the fact that there now is a ready thought plan for composting part in the future, it should smoothen the moment when the chambers become full. In addition, it would motivate the CMT and the Youth group not only to make sure that the households produce quality compost but also to strengthen their belief in the business. For the MDSWM project activities, UNISWA is trying to find the best practises for the composting part that would reduce the health hazards and would be suitable for the local use.

When analysing the results, it came up several times, that people must see the urine used as a fertilizer or the compost from dry toilet used as a soil enrichment in actual use, otherwise they will not believe that it functions as promised. The demonstration fields enables the local inhabitants to come and follow the urine application and other work related to dry sanitation, which would help to get the social acceptance for using human waste as a fertilizer on agricultural fields. When the local nurseries have demonstration plots as well, more people will see the “new” fertilizer, which will help to get visibility. Project partners in

Swaziland could also demonstrate the idea at the University of Agriculture, where they have better facilities to compare the efficacy of urine as a fertilizer to other fertilizers.

Even if the goal and the idea is to get quality compost, in case the dry toilets are not managed well and the compost is of poor quality, as a back-up plan the CMT and the youth group could look for partners, who make biogas and sell the compost for those farmers or enterprises. For example, Swaziland's biggest export good is sugar and the Royal Swaziland Sugar Corporation is making biogas from left over parts of sugarcane and in addition they are active in corporate social responsibility; they could be a potential partner for the back-up plan. In the event that the quality of the compost is good enough to be used it can be marketed for tree planters.

When looking at the answers as a whole, the majority of the respondents were positive towards either of the use of fertilizers or the sale of vegetables fertilized with by-products from dry toilets, whereupon the conclusion is that dry sanitation value chain can be a long-term income generating activity in Swaziland, not only for the CMT and the youth group of Mnyamatsini, but to other persons as well. However, there are challenges, which are possible to overcome with help from the project partners and the higher authorities. These challenges include the laboratory tests for the urine and the compost, decreasing the building costs of the dry toilets by using alternative materials, and finding a market for the products. To overcome the social and the cultural challenges requires great commitment from the CMT and the youth group, so that they will be able to face the opinions of their own community and at the same time show an example of using the fertilizers from dry toilets in order to change their attitudes. Even though the present situation is not necessarily applicable to the future, the present situation seems to be positively fruitful for launching the business around the dry sanitation value chain.

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Questioners for interviews

Community Management Team and Youth group in Mnyamatsini

1. What sanitation problems there are Mnyamatsini?
2. Do you think that dry sanitation is the answer to the sanitation problems in Mnyamatsini? Why?
3. What kind of attitudes people in Mnyamatsini, despite the community management team and youth group, have towards dry sanitation?
4. Are people willing to have dry toilets in Mnyamatsini? If no, who?
5. Do you feel that you have enough knowledge of different actions around dry sanitation, such as building the toilet, maintaining it, composting the manure etc.?
6. Do you know how the composting process proceeds in dry toilets and how to apply the compost safely into your agricultural field?
7. Would you prefer to use composted human manure or urine on your own agricultural field?
8. Would you like to store the compost on your own homestead in the storage room, or do you prefer it to be stored somewhere else?
9. Would you buy compost from dry toilets to fertilize your agricultural fields? If no, why? If yes, how much would you pay for it?
10. Do you think other people in Mnyamatsini would buy the manure from dry toilets to fertilize their agricultural fields? If no, why? How would you tackle this problem?
11. Would you buy vegetables fertilized with the compost from dry toilets? If no, why?
12. Can you imagine people in Mnyamatsini buying the compost from dry toilets to fertilize their fields?
13. Would you prefer to use the compost yourself in your own agricultural fields, or would you sell it further for example to other farmers?
14. Could working with dry sanitation be possible and long lasting income generating activity in Mnyamatsini? If no, why?
15. Which parts of the dry sanitation value chain do you see as possible income generating activity?
16. What challenges do you see when working with dry sanitation?
17. Who do you see working with dry sanitation in the future?
18. How do you see the work with dry toilets should be organized?
19. Anything else you want to say?

Mnyamatsini villagers

1. Have you heard about dry toilets?
2. What is your opinion about the dry toilet?
3. Would you like to have dry toilet at you own homestead?
4. Would you buy the manure/urine from the dry toilet?
5. Would you buy vegetables fertilized with the compost from the dry toilet?
6. In your opinion, what are the biggest sanitation problems you have in Mnyamatsini?

Nurseries

1. Have you heard about dry toilets?
2. What do you think about it?
3. Would you be interested to sell the compost from dry toilets or urine in your shop?
4. Do you see the selling of these fertilizers as profitable business?
5. Do you have any requirements for the end product of dry toilet, so it can be sold in your shop?

Garden centers

1. Have you heard about dry sanitation? What is your opinion about it?
2. Is the business with organic fertilizers profitable?
3. Where do you buy your fertilizers?
4. Would you be interested to sell the compost from dry toilets or urine in your shop?
5. What do you require that from the compost from dry toilets or urine, so it can be sold in your shop?
6. What do you think could be the price of compost from dry toilets or urine?
7. Do you think selling of end products from dry toilet could be profitable business? Why?

Representative of the Ministry of Agriculture Windile Dlamini,

1. Have you heard about dry sanitation?
2. What is the opinion of Ministry of Agriculture about it?

3. What do you think about the idea of using the end products from dry toilets in Agricultural purposes?
4. Would Ministry of Agriculture be interested to support the fertilizers from dry toilets?
5. Would Ministry of Agriculture be interested to subsidize organic fertilizers from dry toilets?
6. Are there any regulations or laws from Ministry of Agriculture for the usage of compost from dry toilets in the agricultural fields?
7. How the farmers can normally finance the fertilizers that they need for their fields?
8. If the usage of the compost will get popular in Mnyamatsini, what is the response from the Ministry of Agriculture side? Do they need to inform somebody?
9. Do you have any recommendation to give to us?

Representative of the Ministry of Health, Daniel Shithole

1. What are the biggest sanitation problems in Swaziland?
2. You have attended to dry sanitation workshops, what is your opinion about dry sanitation?
3. How would you solve this stigma against recycling of human waste?
4. What are the biggest risks with dry sanitation?
5. Is there any laws / rules /regulations from Ministry of Health for the dry toilets and handling of the faeces or compost?
6. Is there any laws / rules /regulations from Ministry of Health for selling of vegetables which have been growing on the agricultural field fertilized with the compost from dry toilet?
7. If there is Lab tests, which will prove the compost to be safe to be used, would Ministry of Health stand behind it as well?
8. If the community members will start to use the urine and compost from dry toilets in Agricultural purposes, and it is proved to be safe, what is Ministry of Health's response?
9. If the community will accept the concept and start to use the compost on their field and there is no regulations from Ministry of Health, they are not doing anything against the law due there is no law?
10. Is there any regulations/ laws on selling vegetables fertilized with end products from dry toilets?
11. What recommendations do you have to give us?
12. Anything else you want to say

Swazi Organics, Akhona Fakudze

1. What is your business about?
2. Have you done laboratory tests for your compost? Where?
3. What are the problems, when selling the organic compost?
4. Have you heard about dry sanitation and the end product from dry toilets?
5. What do you think about it?
6. For me the buyers have been extremely positive and they seemed to be very interested to buy our product. Can define the reason behind this?
7. Do you see the business from dry sanitation value chain as profitable business opportunity?
8. What challenges do you see coming with it?
9. How do you see the future markets for the organic compost?
10. Since you know the market for the organic fertilizers, do you have some recommendations, where could we try to sell the compost from dry toilets?
11. Anything else you want to say?

Guba Swaziland, Emma Grandville

1. You have simple bucket dry toilet, what kind of challenges have you faced, when introducing it to community members or people who work with Guba Swaziland?
2. There are many models of dry toilets, why did you choose to promote the bucket toilet?
3. What do you think about the dry toilet model, where the urine is separated from the faeces?
4. You have gotten good compost from the dry toilet, for how long time the composting process takes? Have you tested the compost?
5. What do you use the compost for?
6. What are your future plans with the dry sanitation project?
7. Anything else you want to say?

Interview Mr. Natmi Dlamini Sedco Board Member

1. What does SEDCO do?
2. Have you heard about dry toilets? What is your thought about them?
3. What do you think about the business around dry toilets?
4. What opportunities do you see coming with the entrepreneurship around dry toilets?
5. What challenges do you see coming with the entrepreneurship around dry toilets?
6. What are the challenges in general for the entrepreneurs in Swaziland?
7. Do you have any hints to give for the community to be able to succeed with their business plan?
8. Anything else you want to say?

Sanitation experts, Mlungisi and Phindile

1. For how long time have you been working with dry sanitation?
2. Have you heard if any people have used the compost from the dry toilets as a fertilizer on the field?
3. Have you started business around dry sanitation? If no, why?
4. Have you heard that somebody has started the business around the dry toilets?
5. What have been the main challenges with the business around dry sanitation?
6. Where the compost could be sold?
7. Do you believe that the dry sanitation could be income generating business? If no, why?
8. What recommendation can you give to Mnyamatsini community?
9. Anything else you want to say?

Abraham Dlamini

1. How did you end up working with dry sanitation?
2. For how long time have you been working with dry sanitation?
3. What do you think about it dry sanitation?
4. Do you see the dry sanitation as a business opportunity for your community?
5. Is it possible to make the dry toilets cost effective enough for the people living in rural area?
6. How would you modify the dry toilets, to be more cost effective?
7. Can the community members effort to invest in dry toilets?
8. What is the price that the community members could effort to pay for dry toilet?
9. What do you see as biggest challenge for the community not to come up with business around the dry sanitation?
10. What do community members need in Mnyamatsini to help them to put up the business around dry sanitation?
11. Would you grow your own vegetables on the compost from the dry toilet?
12. Would you buy compost from dry toilet?