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Anniina Kirstinä

GOSSIPING ABOUT SANITATION

– Role of Communication in Innovation Diffusion



TURUN AMMATTIKORKEAKOULU
TURKU UNIVERSITY OF APPLIED SCIENCES

At its best, friendship is about sharing the challenge of understanding.

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Diseases which spread due to lack of sanitation facilities and knowledge on hygiene can in the worst case cause death. The problem occurs worldwide, and it touches mainly the lives of the poorest. Access to sanitation facilities is a significant way to improve people's well-being.

Turku University of Applied Sciences, Global Dry Toilet Association of Finland and Salvation Army of Swaziland have built dry toilets in an urban community in the capital of Swaziland in southern Africa. Dry toilets take control over the bacteria and prevent environmental degradation. In addition, the final compost product from the dry toilets can be utilised to prevent soil erosion, and the separated urine as a fertiliser in gardening. The thesis work aims to support the final phase of the dry sanitation project and a safe exit strategy.

Dry sanitation meets the criteria of an innovation as a new sanitation solution in the community. In addition to the innovation, according to Everett M. Rogers' Diffusion of Innovations Theory other factors influencing the diffusion process are the target community, time and communication channels. The study focused on the unofficial communication about sanitation and dry sanitation in the community. The objective was to study the unofficial structures through communication structures, and their role in the innovation diffusion. Information was gathered through interviewing community members from four different groups; sanitation experts trained by the project, dry toilet caretakers and their neighbors, and traditional leadership.

The results showed that communication structures within the sample groups are rather weak, and they are based more on official structures. Despite the common goals community leaders and sanitation experts have little cooperation. Neighbors have very little knowledge about dry sanitation. The strongest communication occurs between sanitation experts and dry toilet caretakers, and in these groups potential for increasing the diffusion process can be seen.

KEYWORDS:

Communication, dry sanitation, diffusion of innovations, community development, Swaziland

Anniina Kirstinä

JUORUILUA SANITAATIOSTA

– Kommunikaation merkitys innovaation diffuusiassa

Sanitaatiomahdollisuuksien puute ja huono hygieniatietoisuus voivat aiheuttaa sairauksia, jotka pahimmillaan johtavat kuolemaan. Ongelma koskettaa jopa kolmasosaa maailman väestöstä, erityisesti vähäosaisia. Sanitaatio-olojen parantaminen on merkittävä keino vaikuttaa ihmisten hyvinvointiin.

Turun ammattikorkeakoulu on yhdessä Käymäläseura Huussi ry:n ja Swazimaan Pelastusarmeijan kanssa rakentanut kuivakäymälöitä urbaanissa yhteisössä Swazimaan pääkaupungissa eteläisessä Afrikassa. Kuivakäymälä pitää bakteerit kurissa ja ennaltaehkäisee ympäristön pilaantumista. Sanitaatiopalvelun lisäksi kuivakäymälästä saatava kompostoitu lopputuote voidaan hyödyntää maanparannusaineena, ja eroteltu virtsa lannoitteena kasvimaalla. Opinnäytetyön tarkoituksena on tukea hankkeen viimeistä vaihetta ja vetäytymisstrategiaa.

Kuivasanitaatio täyttää innovaation kriteerit yhteisölle uutena sanitaatiosovelluksena. Everett M. Rogersin innovaatioiden leviämisteorian mukaan ilmiöön vaikuttavat innovaation lisäksi kohdeyhteisö, aika ja kommunikointikanavat. Tutkimuksessa selvitettiin yhteisön sisäistä, epävirallista kommunikointia sanitaation ja kuivasanitaation osalta. Tavoitteena oli selvittää yhteisön epävirallisia rakenteita kommunikointirakenteiden kautta, ja tämän roolia innovaation leviämisen prosessissa. Tutkimus toteutettiin haastattelemalla yhteisön jäseniä neljästä eri ryhmästä; hankkeessa koulutetut sanitaatioekspertit, kuivakäymälöiden hoitajat ja heidän naapurinsa, sekä yhteisön perinteiset johtajat.

Tuloksista käy ilmi, että kommunikointiverkostot näyteryhmien välillä ovat heikot ja ne pohjautuvat enemmän virallisiin suhteisiin. Yhteisön johtajilla ja sanitaatioeksperteillä on yhteisistä tavoitteista huolimatta vähän yhteistyötä. Naapureilla on selkeästi vähiten tietoutta kuivasanitaatiosta. Eniten kommunikointia tapahtuu sanitaatioeksperttien ja kuivakäymälöiden hoitajien välillä, ja heissä on myös nähtävissä eniten mahdollisuuksia toimia innovaation leviämistä edistävinä tahoina.

ASIASANAT:

Innovaation leviäminen, kommunikaatio, kuivasanitaatio, Swazimaa, yhteisön kehitys

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LIST OF ABBREVIATIONS

EHEP	Environmental Health Education Project
GDTAF	Global Dry Toilet Association of Finland
HDR	Human Development Report
HDI	Human Development Index
TUAS	Turku University of Applied Sciences
UNDP	United Nations Development Program

1 INTRODUCTION

Gossiping is usually seen in a bad light. Talking behind people's back, stories become more colorful than they were originally, and eventually all facts and details have turned upside down. The object of these talks may be utterly unaware of the happenings around him. Yet gossiping can be a good thing.

I-phones and touchpads spread first from ear to ear before reaching the hands of actual customers. Peer opinions and experiences have enormous role in consumerism, and marketing boards are well aware of that. At times a rumor can be released just to draw attention of potential customers, and as our self-esteems do not want to accept that there are things that we have not been informed about, our ears will listen carefully the unofficial news, gossip.

Researchers worldwide have studied success of development programmes and spread of medical innovations. Everett M. Rogers' published first edition of Diffusion of Innovations in 1962. Innovation diffusion theory determines how different organisations and individuals take new ideas to replace or complete old ones. Time, features and social circumstances all play an important role in innovation adoption and in this research communication shall be studied more carefully.

Aim of this thesis is to support Msunduza Dry Sanitation Project in Swaziland. Composting faeces and utilizing manure as fertilizer has been a common part of agriculture in the history, and now the project has updated these practices and is applying them in urban areas. As the project is coming to its end in 2013 and the last two years will be focused on creating safe exit strategy, including capacity building and creating means for sustaining achieved results, thesis work supports this by defining possible obstacles and barriers in the entire process and thus trying to eliminate them. Purpose is to study communication and find ways to further develop the process of communication within the community in order to enhance the innovation adoption and community development.

Swaziland is a country like any other where new solutions and new ways of thinking must be introduced for the sake of development and sustainability. Adopting innovation is about accepting things we do not know about but what can be a start for development and change into better. Change has its demands for flexibility, will and ability to see prospective results, but change has also its risks as no one can see the future. Yet, change has its opportunities, which are without limits. As a student of Innovation Academy at Turku University of Applied Sciences innovation diffusion is an interesting theme to focus on.

In the focus of this study is communication and community structure, aiming to support sustainability and development. Diffusion of innovations serves as a framework binding all together. Theory part reflects previous studies made within the project as they have gathered a fine base of the social conditions prevailing in the community and the understanding of innovation on the technical part. Research part shall bring results on what is influencing on the adoption of dry sanitation in the community.

2 SANITATION IS CHALLENGING THE SOUTH

Sanitation is a vast problem. Lack of proper sanitation troubles people in countless countries all over the world, and it is the people with lowest incomes who suffer the most. Roughly one third of world's population has poor access to or absence of sanitation facilities causing infectious diseases and diarrhea, in worse cases even death (International Year of Sanitation 2008, 2012). Sanitation has been declared as a human right by the United Nations in 2010. It is also one of the Millennium Development Goals, under goal number seven, "to ensure environmental sustainability", which aims to bring down the number of people without access to sanitation and safe drinking water by half by the year 2015. According to the United Nations, despite the efforts made most improvements are still not accessible to the poorest of population. (United Nations 2012.)

Sanitation troubles especially the southern countries, in earlier days titled as developing countries. In poor areas where nutrition and health care are inadequate, control of parasites, worms and diseases such as pneumonia and cholera is vital for keeping up the basic wellbeing, and that is why proper sanitation is so important. Poor sanitation is a typical problem on densely populated informal urban areas. People move from rural areas to town seeking for a job, and in lack of proper financial backup they settle down where ever the cheapest, often into unplanned townships. Informal areas spread rapidly and city planning struggles to respond to growing needs.

2.1 Swaziland – a southern country

Swaziland is counted among the poorest countries in the world. Geographically Swaziland is a small land locked country in southern Africa (picture 1). Country is covering an area of 17 000 square kilometres, as the length of country from north to south is approximately 200 kilometres and from east to west less than 150 km. Neighboring countries South-Africa and Mozambique surround the mountainous kingdom. Population is 1.2 million and consist of mainly Swazis,

form of governance is monarchy and the head of the state is King Mswati the third. (UNDP 2011, 171; Ministry of Foreign Affairs of Finland 2006).

Swaziland suffers from health related problems as statistics show life expectancy of 49 years. According to Human Development Report 2011, inadequate water resources and water pollution lead to death in 456 cases per million people. (UNDP 2011, 129, 152.) Low life expectancy can also be explained through excessive numbers of malnourished children and HIV-infections.



Picture 1. Swaziland on the map of Africa (Central Intelligence Agency 2012).

United Nations classifies Swaziland as a medium human development country according to the Human Development Index (HDI) with value of 0.522, close to low human development countries. HDI indicates human development on a national level, and it is based on social and economic factors, mainly health, education and income, varying on a scale from zero to one (UNDP 2012). To compare some other countries in southern Africa, HDI in South Africa is 0.619, Lesotho 0.450, and Mozambique 0.322. Swaziland's HDI has been relatively

good in 1990 with index of 0,526, but very low in 2000, 0,492. In 2011 HDI had risen close to its highest position ever. (UNDP 2011, 128-129,133.)

2.2 Msunduzi Dry Sanitation Project

Sanitation problems have been tried to solve through many ways in Swaziland. To mention a few organisations, Hand in Hand, a German based non-governmental organisation have constructed neighbourhood care points including pit latrines in communities around Swaziland, and City Council of Mbabane has helped inhabitants of Msunduzi by financing construction of pit latrines through Urban Development Program.

The Global Dry Toilet Association of Finland (GDTAF) has also a sanitation project in Mbabane, the capital of Swaziland. Msunduzi Dry Sanitation Project is a joint project between GDTAF, Turku University of Applied Sciences (TUAS) and Salvation Army of Swaziland. Project originates from a baseline study on the project area in 2004, as Mbabane Municipality planned a project together with TUAS. Outcomes showed a need to increase knowledge on health and environmental issues in Msunduzi, and so two projects were established; Environmental Health Education Project (EHEP) in 2005, and Msunduzi Dry Sanitation Project in 2007. (Koivisto 2005, 50, 87.)

Project area Msunduzi has estimated 16 000 inhabitants and is one of the biggest townships in Mbabane. Area is densely populated, and housing is partly informal. (Koivisto 2005, 36.) Common form of sanitation in Msunduzi is a pit latrine; Dig a pit, place a shelter on top of the pit, use it until the pit gets full and dig a new hole. Another style is a so called "flying toilet", simply referring to disposal of faeces in a plastic bag. After releasing one self, the plastic is thrown away anywhere in the surroundings or dumped to open waste skip. Both have undesirable consequences to health creating a risk for bacteria to be spread and mixed with water or even food. People practice also open defecation.

Compared to the flying toilet, benefit with pit latrine is that faeces are placed under ground and therefore not in direct contact to people. Nevertheless rats

and other rodents can get in and out of the pit. If the pit has been dug too deep it can also contaminate ground water. Third problem is that new pits must be dug every time one gets full, and especially in a mountainous area like Msunduzi space is becoming scarce. Pits can be a safety risk if they are not properly constructed and even collapse.

Project objective is to improve state of health for people living in the area through practicing sustainable sanitation culture and sanitation hygiene. Implementation focuses on construction of dry toilets together with training and increasing knowledge on sanitation. In the community level activities rely on a group of local volunteers, Sanitation Experts, who visit homesteads and educate dry toilet users on how to take care and maintain their dry toilets. Project objectives are in line with the poverty reduction strategy of Swaziland, the United Nations' Millennium Development Goals and the development goals of Finland. Project has received funding from the Ministry of Foreign Affairs of Finland for three periods, 2007-2008, 2009-2011 and 2012-2013. The present, third phase will be finalizing the project, and thus the objectives are supporting safe exit strategy; to guarantee sustainability in knowledge and know how on sanitation, hygiene, composting and gardening. The main objective remains the same throughout the project, but in the last phase implementation is focused on capacity building and increased participation. (GDTAF 2012a, 2, 12, 14-15.)

3 DRY SANITATION AS INNOVATION

Utilising sanitation products in agriculture is an ancient method. It had been a natural part of nutrient cycle until the arrival of water closets and sewer networks in the late eighteen and nineteen hundreds (Hassan 1998, 26). Considering the informal settlements in Mbabane's urban areas where sanitation facilities are scarce or insufficient, dry sanitation can be seen as an innovation. Dry sanitation is a great example on how development does not have to involve big ideas, and yet it can simply bring the most needed improvement into daily life of common people.

According to Rogers, an innovation can be an idea, practise or object new to its adopter, whether individual or group. Innovation can be physical or abstract, series of functions or a single tool that brings solution to problem or improves desired results. Concept is subjective; the idea itself can be old, but whether particular person is familiar with it or not, that determines innovativeness. (Rogers 1995, 10-11.)

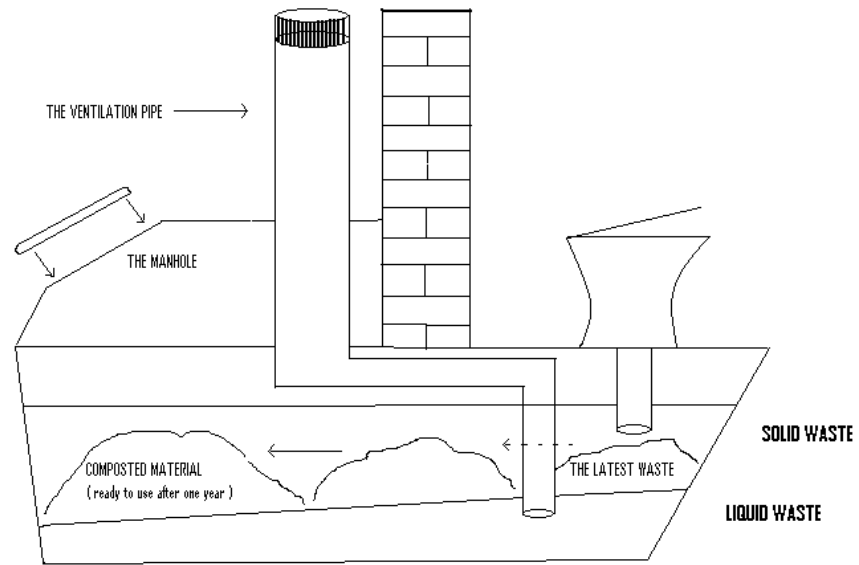
Innovation concept can be paralleled to technology. Just like technology, also innovation can be divided into two parts, hardware and software, in other words technical tools and instructions on how to apply them. Unfamiliar technical application does not convince at once but instructions help to understand the functions. Most innovations include both of these two elements, and they both have role in convincing the potential adopter. (Rogers 1995, 12-14.)

According to Everett M. Rogers' theory there are five elements influencing on the adoption of an innovation: compatibility, relative advantage, complexity, triability and observability. Compatibility of an innovation means how the new practice or idea fits into needs of users and their previous experiences. Relative advantage reflects the received benefits and complexity is about how easy or difficult the innovation is to be used. Triability and observability are also important for experiencing the innovation before making decision to adopt or reject. (Rogers 2003, 15-16.)

Dry sanitation does not use any water. It is therefore cheap to use and it saves scarce water resources for more vital use. Dry toilets offer two relieves: one is a suitable solution to sanitation problems in areas where water resources are scarce, and secondly they produce fertilisers for gardening and for improving the soil, both enhancing the possibility of self-sufficiency in food production. The two chamber system enables composting of manure; after first chamber gets full, manure is left to be composted and the second chamber is taken into use. Also the urine is collected separately to make sure the compost itself remains as dry as possible as drought is essential for the composting process. Dry toilet needs to be built only once, and it is safe to use. Ground water doesn't get in touch with the manure as it is collected into chambers on top of the ground. Chambers may also be locked to make sure no children or animals have access to the manure.

3.1 Dry sanitation in Msunduza

By year 2011, altogether 27 dry toilets have been built by the project, and yet at least 13 more are budgeted to be built before project ends after 2013. Toilets are placed both in private households and in public places, such as community meeting points, sports grounds and a school yard. (Global Dry Toilet Association 2012a, 3.) There are two types of dry toilets in use, Enviroloos (pictures 2 and 3) and composting dry toilets (picture 4).



Picture 2. Structure of an Enviroloo dry toilet (Msunduza Dry Sanitation Project 2011).



Picture 3. Enviroloo dry toilet in Msunduza.



Picture 4. Dry toilet demonstration model.

In 2008, Haimi and Ranta from TUAS made a research comparing two dry sanitation projects in Swaziland and Zambia in 2008. Main objective was to find out, how dry sanitation is taken in by people living in these two project areas, another one being Msunduzu. They also determined factors for development of sustainable sanitation culture in southern Africa. Though the project in Msunduzu was in a very beginning at the time of the research, it can be said based on their results that some of innovation factors were seen in a positive light already in 2008. Some people had had a chance to experiment dry toilets and they seemed interested especially about the composting product, while others did not recall what dry sanitation means or they had not understood the concept. It was deducted that true adaptation can be only seen within a long

period of time as dry toilets are not yet much appealing to the vulnerable people in Msunduzi as life is taken day by day. Inhabitants believed that more training could help to overcome prejudices and to get interested on the subject. (Haimi & Ranta 2009, 60, 70, 73.)

3.2 Innovation study on Zambian Dry Sanitation Improvement Programme

The Global Dry Toilet Association of Finland has another dry sanitation project in Zambia, in Copperbelt province. Zambian Dry Sanitation Improvement Programme was established in 2006 to increase the knowledge on hygiene and to improve the condition of sanitation in the region of Kaloko. (GDTAF, 2012.) In year 2008 Toni Paju made a survey on dry sanitation as a part of his bachelor thesis. Diffusion of innovations formed theoretical framework for the study correlating knowledge and attitudes among the inhabitants of the program area. Survey is based on the idea, that knowledge reduces uncertainty, and thus increases the chances to adopt the innovation. (Paju 2008, 9.)

There are many similarities in the survey from Zambia 2008 and Swaziland 2011. Both are about dry sanitation in the Southern Africa, and Rogers' theory is used as a frame work. Yet there are also many differences in the research methods as well as in the cases, which give a great opportunity for comparison. In Zambia the research was executed in the very early stage of the program, only two years after the launch, and only with one toilet being built. Project area is around same range as the project area of Msunduzi in Swaziland, with some 10 000 inhabitants representing eight communities. Six communities were included in the study. Interviewees were divided into four groups based on their participation on trainings or being a member of the sanitation club or had at least some kind of awareness about dry sanitation. Data was both quantitative and qualitative, and it was partly analysed with SPSS -program, using cross tabulations and frequencies, partly making deductive conclusions on open questions. Results were utilised in recommendations on key factors affecting the diffusion of dry sanitation in project area. (Paju 2008, 7, 10-11, 30.)

Interviews were structured beforehand and included both quantitative and qualitative questions to reflect the diffusion of innovations –theory by E. Rogers (Paju 2008, 10). Main results of the study show that people expect dry sanitation to benefit them as an innovation with free fertilizers and improved hygiene. Compatibility of dry sanitation had some controversy to the society when talking about handling human excreta and using it as fertilizer. Complexity of the toilets was pointed out in the answers which indicated lack of knowledge among people who had not attended any training on the matter and compared this to knowledge of the ones who had participated. Triability and observability was another point which made it difficult for the people to say their opinions, since there was by far only one dry toilet built. (Paju 2008, 32-33).

From communication channels educational meetings were the most common one to receive information on dry sanitation, but also connections between social structures such as school, healthcare and sanitation clubs were pointed out to be influencing on peoples familiarity with the subject. According to Paju's research community structure spreads information mainly within the village or through Kaloko Centre, situated in the middle of the project area, to other villages. Social structures are very homophilous and informal. As a conclusion it is said that knowledge and attitudes towards dry sanitation do reflect each other, and the prevailing norms in the society which might be hindering the acceptance, can be overcome. (Paju 2008, 35 -36, 38, 56.)

4 COMMUNITY STRUCTURES

Following the changing needs of different stakeholders plays a significant role in any organisation's success. By identifying the needs organisation takes the first step towards adopting new practices for improvement. In many cases it can be noticed that change does not necessarily have to mean a complete turn-over from current practices, but the social environment does play an important role. Community structures have been in the interest of researchers for a long time, and yet it is only known very little. There is a special kind of potential in community which could be utilized.

4.1 Subjectiveness of a community

Community can be defined by comparing it to other similar terms. Sometimes such terms as organization or network are used when talking about community, though these three words are not synonyms. According to Heikkilä, Hyyppä and Puutio (8, 2009) organisation refers to a community in which each member have their own task, a job to do, and thus the roles are stricter than in a community. Network on the other hand is looser than community; Network can include many communities, organizations and individuals in different sizes gathered around common interest. Again, network has the potential to tighten up and form a community between its members, and also inside an organization individuals can form their own communities. Community has larger meaning than the other two, and one of its main characteristics is identity, the experience of being part of the community. A person can live in an area, and yet feel not belonging into it. For example in Msunduza it has been discovered that some community members do not feel as being part of the community, yet they are residents of the area (Akatama 2008 ,34).

4.2 Social system

Innovations spread as two counterparts are in interaction with each other. These counterparts can be in contact directly, as two friends having a

conversation, or indirectly, for example by reading a printed newspaper. Through these activities there can be seen patterns of how the idea has been passed on from one counterpart to another, each one making the social system. Also communities form social systems. According to Rogers (1995, 23-24.) social system can be a set of individuals, organisations or groups where its particles are in contact with each other due to common goal or problem solving related to it. Each of these social units can be distinguished from other units. For example in Msunduzi community leaders form one unit, and staff of a nongovernmental organisation another and so on.

Each social system has its own norms and structures, both formal and informal (Rogers 1995, 23-24). Society in Swaziland can be seen as very hierarchical both in official and unofficial levels. Peter Kasenene (1993, iv) states in his book "Swazi Traditional Religion and Society", that 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. Each subarea of Msunduzi has its own community leaders. Leaders are chosen by election, where every household have one vote. There are some 6-7 leaders in each subarea, and their chairman presents the area in the Central Committee, leading the entire community. Leaders are unofficial leaders, i.e. they form their own governance inside the community and work together with the municipality and government, but have no legal power for example over the land. Nevertheless they are respected by the community in large, and many disagreements between community members are resolved through the leadership. (Ngobese 2011.)

Norms can be seen as informal rules which individuals in the social system are expected to obey. According to Rogers (1995, 26) norms can originate from different kind of organisations; religious, cultural, organisational or communal. Norms are essential part of a community, and in Swaziland, to be part of the society is among the most valued things (Kasenene 1993, iv, 102; picture 5). Sharing with family and friends, and rich giving to the poor are common, but

changes can be seen as well. Some want to sustain the culture, while others want to renew (Kasenene 1993, 109). Ancestors and beliefs have a major influence on the values in Swazi culture. There are many norms and taboos, learned from parents and grandparents, and by following which individual shows high morality. Although purpose of taboos is to protect the individual and community from misery, also negative aspect can be related to some of the taboos. (Kasenene 1993, 25, 125).



Picture 5. "Don't ask what your community can do for you, but think what you can do for it" – graffiti in Msunduza (Kolonen 2011).

The ways of making the decision to adopt or reject an innovation varies between social systems depending of its structure. There are three ways for making the decision to adopt an innovation. One is optional decision making. Individual has the freedom to adopt or reject the innovation regardless from what other units want, although others may have influence on the decision making. Another way is collective decision making where a group of individuals

reaches consensus and everyone must adapt to the change. Everyone can choose themselves how to implement the adoption as long as the result is the same. Third option is authority decision making, where a certain person or a group makes a decision on behalf of everyone and individuals' opinions have barely any meaning. Compared to the other two this one is the most rapid one. (Rogers 1995, 28.)

Rogers distinguishes also the so called "change agents" within each system according on their role in the innovation adoption process. Haimi and Ranta (2009, appendix 2) interviewed professionals from local health care and community services. These interviewees can be considered as Rogers' Change agents, who usually present an outside organisation from the target unit. Agent's task is to enhance adoption of innovation, or the opposite, to slow down harmful or unwanted process. Change agent has usually higher education than the target unit, which makes change agents somewhat different compared to the main adoption group. (Rogers 1995, 27-28.)

5 COMMUNICATION

In brief, communication is about passing information from one creature to another, including a sender, the message, a receiver and channel through which the message is going through. The most suitable communication channel can be chosen by determining to whom the message is being delivered to and what is the message aiming to do. (Rogers 1995, 18; 2003, 205.)

5.1 Unofficial social structures

Communication forms its own structures. Within wider social structures there can be division into two; official and communicational structures. The first one mentioned is built inside an organisation or a group following the hierarchy of the system and making each individual part of it. Arrangements show patterns for example in a work place, where high, mid and low level positions function vertically, and co-workers on the same level horizontally. Besides official structures there are always unofficial structures, formed by individuals themselves. Communication and exchange of thoughts is not only bound with official structures, but can give more realistic picture on how individuals are actually in contact with each other. This brings together social structures, communication and homophily, where similarity brings individuals together. Within social systems there are structures how different units are organized as a whole. Individuals do not necessarily behave identically, and yet there can be seen patterns how things happen and take place time after time, which helps to predict behaviour and thus reduces uncertainty in it. (Rogers 1995, 24-25.)

5.2 Need and purpose for communication

Survival of many species is based on working together. In order to survive it is essential to receive warnings about dangers and share hints on hotspots for nourishment. As human being has developed into more intelligent form also means and needs of communication have become more diverse. It is no longer

about mere survival or cooperation, but also about less fundamental needs such as need to feel respected or to express feelings.

Contents and means of communication depend highly on the purpose it is aiming to fill. In general it could be said that communication can have as many purposes as there are needs, and as many contents as there are senders. Innovation presents a new form of practice, another way to survive more efficiently, and thus it can be determined as another purpose for communicating; for spreading the knowledge. Involved parties aim for gaining mutual understanding through exchange of information, which should usually go two ways. (Rogers 1995, 5-6.)

5.3 Forms of communication

Mass media brings information from outside of the common social structure of potential adopters, and can thus be the source for new unknown ideas. These so called cosmopolitan channels are important in raising awareness, whereas local channels support the adoption phase. Mass media has its benefit by reaching a large number of people at once, whereas communication between individuals can be deeper, as the approach is more personal. Both means can be combined in diffusion process. At the beginning attention can be captured through mass media and afterwards start putting more effort into smaller target groups. It has been discovered that mass media is more effective channel in the stage of raising awareness, and when it is about an innovation on which people do not have strong opinions about. Interpersonal communication on the contrary is efficient later in the adoption process, and when values or opinions related to the innovation are very strong among potential adopters. (Rogers 2003, 205, 207.)

In southern countries, such as Swaziland, access to mass media may not be as easy as compared to the north, but nevertheless mass media has equally meaningful role in the diffusion. Level of welfare and incomes can be seen in the communication forms in Swaziland. Only a small percentage of the population have access to internet, and cell phone calls are highly expensive

when there is only one company in the business. Newspapers are sold all around the country with a fair price, but the newspapers on the national level are only two, The Swazi Observer and Times of Swaziland.

5.4 Participants

It can be said, that similar groups or individuals communicate more with each other, than with groups or individuals that are different. Homophily is about similarity of two parties. The opposite, heterophily means difference between parties, in this case communicators. In innovation diffusion homophily is an important factor; it is more likely for people to accept information from people to whom they have something in common or more important, with who they socialise with. (Rogers 1995, 18-19.) Well educated socialise more with other educated people, fishermen socialise with other fishermen and teenagers socialise with other teenagers. Information is exchanged between people who share similar understanding, knowledge, goals, culture, language, and so on.

For an innovation to spread from one person to another it requires some heterophily as well; if two parties are absolutely homophilyous, neither one has information that the other would not have as well. Therefore absolute homophilyous is not part of innovation diffusion. If the only difference between individuals is the knowledge about the innovation, it is the most desired state. (Rogers 1995, 306.)

5.5 Barriers of communication

There are various factors in the process of communication that contribute in its success. Communication can be intentional or unintentional, the receiver may notice the message or not, and even the message itself can either be understood as it was meant by the sender, or message can be understood wrong. Unofficial, communication structures can be used to estimate when an individual is exposed to innovation for the first time and from whom does the information come from. Whereas communication networks may be the key element to innovation diffusion, lack of them can also be the preventive power

in situations where there is no network or the network does not work as desired. (Rogers 1995, 24-25.) In 2008 interviewees had no problem talking about sanitation issues, unlike the researchers assumed. However they did discover that talk was more or less superficial, which might refer to the fact that this topic is yet a taboo in many societies. (Haimi & Ranta 2009, 88.)

6 TIME ASPECT

The fourth factor in innovation diffusion together with social structures, communication innovation itself, is time. Time needs to be reflected to other factors in order to study implementation of the diffusion, and it needs to be evaluated through certain sub theories. Rogers has three sub theories; Innovation decision process, adopter categories and rate of adoption.

6.1 Innovation decision process

According to the first sub theory, innovation decision process is about the different stages that individual or group goes through while adopting innovation. Stages do not always occur in the same order and it is also possible for the individual to regress back to previous stage. First comes knowledge on the facts of innovation and awareness of its existence. Person begins to understand the functions. Second stage is persuasion whether the idea is good or not, weighting pros and cons, and possibly looking for more information to strengthen the opinion. Individual conceptualises an attitude about the innovation, and on the third stage makes decision. Activities in practice confirm decision by either adopting or by rejecting innovation. Fourth stage is about implementation, taking innovation in to use, and possibly re-inventing it to make it suit better the circumstances or needs. Final stage is confirmation, where individual is convinced on the benefits and is ready to recommend innovation to others. (Rogers 1995, 20-21.)

6.2 Adopter categories

Another sub theory about time is called adopter categories. Within an organisation, community or group can be recognised certain characteristics which define individuals' adoptiveness. Other people are more open to new ideas, whereas others prefer old customs until they have no other choice. Example shown by the early adopters plays a major role in the adoption of innovations. People can be divided into five groups; "innovators, early adopters,

early majority, late majority and laggards". Each group can be described with certain characters, for example innovators are adventurous, whereas laggards are more or less outsiders in the community. (Rogers 1995, 264-265). When different groups are put on a figure where y is number of people adopted the innovation, and x is time, usually the figure is shaped like a bell, low in the beginning and end, high in the middle.

Rogers' theory brings together time aspect and communication in adopter categories. Analysing communication activity between individuals, groups or organisations, others can be distinguished as more likely to adopt innovation in the early stage. When dividing adopters into two groups, earlier and later adopters, there are some clear differences between the two. People who are more likely to adopt innovation in the first half of the linear process, are active communicators both inside and outside their typical social environment. They also have access to mass media, are looking for information and thus also have more knowledge in general. In fact their characteristics are similar to opinion leaders, and early adopters are also in connection to change agents. Associating between these groups can bounce the innovation to spread on its own as soon as opinion leaders are convinced. (Rogers 2003, 223, 282-285.)

6.3 Rate of adoption

Third sub theory is about time and percentage of people adopting innovation cumulatively. Curve is usually s-shaped, and can be explained with adopter categories. In the beginning rate of adoption is very slow, until it speeds up with the early adopters and early majority, slows down and speeds up again with the late majority, calming in the end due to laggards. Adoption rate is dependent on how the innovation is experienced by the adopters, on social system structures, and how effectively change agents are promoting the innovation. (Rogers 1995, 22- 23; 2003, 222.)

7 PURPOSE OF RESEARCH AND RESEARCH PROBLEM

Research aims to support Msunduza Dry Sanitation Project's exit phase. Safe and sustainable exit plan includes capacity building, and through the study of social structures ambition is to bring in more knowledge about existing resources, and thus guiding where the capacity building should be directed to. The research is based on the unofficial, communicational structures. Social structures are partly similar to communicational structures, and this gives a direction for the research. Researcher's own interest towards communication is a noteworthy influencer for outlining the field of study, and in addition Rogers' theory on diffusion of innovations offers wider perspective on the subject as whole. As we understand the communication structures in the community, we see where the functionality lies, and we have a chance to understand the unofficial, not authority based social structures. In order for an innovation to spread there needs to be communication between all possible stakeholders to form a network. Therefore it is important to know what are people talking with each other about dry sanitation, and is this communication advancing the diffusion and adoption processes.

Research aims to answer the following questions as results:

- What are the contexts when talking about sanitation and dry sanitation within the community members?
- Who are the participants in the communication about sanitation and dry sanitation?
- What is the content of messages passed in communication about sanitation and dry sanitation within the community members?
- What qualitative signs can be seen in the communication?

Purpose is to define how communication effects on the innovation diffusion process. Results tell about communicational structures in the community, and what is the quality of communication supporting innovation adoption and diffusion. In comparison to dry sanitation, also sanitation in general is included in the research. Norms, attitudes and needs for including sanitation into daily communication reflects on the opportunities for dry sanitation as well. Results reflect how the education given in the project has reached community members but it is not directly pointed in the results implementing the possible outcomes.

Research concentrates on communication on community level leaving out communication within the project administration. This can have its disadvantages, for example in a case where the project itself would be problematic on its approach concerning the community and partners, for example not sharing enough information or using inappropriate methods. Yet, the way innovation is spreading should not be depended on any outer sources, but the inner structures. Project evaluation is seen as a separate process.

It is assumed that most relevant form of communication in Msunduzi is word of mouth due to general state of communication means in the country. It is also assumed that the communication is mainly happening between toilet caretakers and sanitation experts, because they are the ones who are in contact due to the official structures, the project. What makes it interesting is to find out is if the knowledge spreads from the caretakers to their families or neighbors, and what exactly is the role of leadership according to common people. Expected results shall give more knowledge about factors in communication, possible barriers and ideas for improvement. With this knowledge it can be estimated which parts need to be supported in the community through capacity building for maximizing the opportunities for the innovation to be adopted widely.

Furthermore, study might add some substance to the field of innovation diffusion study as the reasons behind rejection or low rate of adoption have been remaining somewhat unknown. Constructive criticism and development needs that Rogers, the father of the theory himself, presents are covered in the current research in many parts. Differing from most innovation studies, case

Msunduza is not being studied after the innovation has been adopted by majority of the system, whereas a usual case is that innovation is examined only after the phenomenon. Neither dry sanitation has diffused rapidly, nor has it been much re-invented in the area. Another note is that data has been collected during the diffusion process and these unfinished diffusions can actually provide us much more information than the successful ones. (Rogers 2003, 111-112.)

8 IMPLEMENTATION

Choosing the focus of the research is a process itself. Researcher had been involved in the project before starting the research, by participating sanitation experts' weekly meetings six months before starting research, and was therefore aware of what has been going on in the project. Yet, it was important to negotiate with the stakeholders about what should be focus of the study. Researcher talked with Sanitation experts volunteering on the project, project coordinator from TUAS, representatives from Salvation Army of Msunduza and from Global Dry Toilet Association of Finland, health inspector from the City Council of Mbabane presenting official authority and other professionals on the field of study. In addition written material from the project was observed; Annual reports, previous thesis works, evaluation reports, and sanitation experts' record of their working hours, including topic and type of event. This data is left out of the research itself.

8.1 Interview as a research method

Interviews were conducted in November and December 2011, analysing was done in April and May 2012. Research is carried out through interviewing stakeholders in the project area Msunduza. Interviews are based on structured, before-hand planned questionnaire, which was the same to everyone interviewed (Appendix 1). Local interpreter had an important role as he was free to present the questions the most suitable way to approach people in such matter. The idea is to present questions in a form that brings out desired matters in the eyes of the research objectives. Straight question may not always give a straight answer especially when topic involves attitudes or personal matters. Question number 16 about interest towards sanitation clubs was added after some interviews were conducted due to request from the project management. The same data was used for another research, and adding this question brought more value into it. Some of the questions handle directly sanitation experts' or leadership's work, which can be seen in the answers in a

more detailed form compared to what is discussed about other stakeholders. Interviews were continued until saturation point, when no new relevant information is estimated to occur.

8.2 Interview as a situation and sample groups

Knowing local culture is vital, how people can be approached and on what matters. Though people may not bring out certain aspects in the interview it does not mean that these aspects would not exist, for example knowledge, social relationships, attitudes and actions. Straight questions might not always bring out the desired kind of answers, when interviewee may not know or do not want to tell. This should be taken into consideration more carefully to find out the motives behind activity. Interviews were conducted in the local language, siSwati, which interpreter translated into English. People were interviewed in their own living environments (picture 6), except one at workplace as interviewee's requested. Interviewee has to be able to feel comfortable, no need to hide, filter or give false answers. It is the responsibility of the interviewer to refresh interviewees' memory in case it is needed, and yet not to lead the question too much. In general environment and social situation have their role as well.



Picture 6. Interviewing a leader at community meeting point (Heikkilä 2011).

Single interviews separately from each other may not have much value, but when interviewees can be categorized into groups, information becomes richer. Johanna Blakley represents her thoughts on TED, a non-profitable forum for exchange of ideas, with a title “Social media and the end of gender”. Blakley, researcher on mass media and entertainment brings out a question: “Why are we using demographics categories such as age, sex, educational level or ethnic group, when there are other factors that bind individuals together much stronger?” She states that categorization based on for example hobbies or values can give more informative statistics on state of health or about political view, than the traditional categorisation. (Blakley, 2011).

In this study sample groups are determined by their relation to dry sanitation project and role in the community which in this case study is the most purposeful method. Sample groups are four; Sanitation Experts, community

leaders, dry toilet owners and neighbors of the last mentioned. Interviewing people from different groups is an attempt to guarantee broad view on the role of dry sanitation as part of the community and on the communication channels between stakeholders.

Sanitation experts are volunteering on the Dry Sanitation Project. They have been trained for their duties during first project years, and their tasks include mainly supporting toilet caretakers, monitoring condition of dry toilets and educating people of Msunduzi on dry sanitation and environmental health. Main target group of education is the dry toilet owners. There are eight sanitation experts, five men and three women. Experts present all six areas making up Msunduzi; Corporation, Gobholo, Mncitsini, Mncozini, Mntulwini and Mqobolwane. Experts have been chosen to the task by community leaders of their own area, and they are operating under Salvation Army of Msunduzi. Two experts to be interviewed were chosen based on their age, sex, area of living, experience in dry sanitation and also interest towards the research.

Caretaker of dry toilet is responsible for dry toilet in his or her homestead or at a public place. Public toilets are commonly situated at community meeting point, and some also on sports grounds and two in a primary school. He or she makes sure that the toilet is clean and well maintained, and is responsible for educating other people on how to use the toilet. He or she is usually owner of the homestead where dry toilet is situated, long term tenant or in the case of public toilets, chosen for the task by his or hers leadership. Caretakers to be interviewed were chosen to present each six areas, both sexes, both type of dry toilets and both private and public toilets. Interpretation's preference and interviewees' availability had an effect as well.

The interviewed neighbours live in an immediate distance from one of the homesteads or public meeting points with a dry toilet. Neighbours to be interviewed were mainly chosen based on their availability and partly on the choice of the interpreter. Each subarea of Msunduzi has its own community leaders. There are from six to seven leaders in each area, and chairman of

leaders presents the area in a Central Committee, leading the entire community.

8.3 Analysing data

Interviews were written down during the activity, each interview on its own form. Notes made on the interviews were stored as soft copies using Windows Word and further analysed with Microsoft Excel. Theory created a framework inside which the interviews were conducted and firstly analysing process is a discussion between the collected data and the theory. Due to the nature of the method, in a qualitative research it can never be said what information exactly will be received and this partly influences the research.

Research does not rely only on the collected data, but theory shows the direction what kind of info is being looked from the data. For example communication structures were analysed by picking all answers which were referring to communication between any of the stakeholders. There after these answers were divided into groups based on who was the source of communication and after that what is the contents, message, and to whom is it sent.

9 RESULTS

As the goal of this study is to determine current communication in Msunduza on sanitation and dry sanitation, also result must reflect this order. Results are divided into current sanitation situation in the project area and communication. Outcomes on current sanitation serves as background for the rest, categorising from which point of view interviewees are commenting sanitation and dry sanitation issues. Communication between stakeholders is divided into contexts, participants and themes.

9.1 Current sanitation

Information about current sanitation practices come through following questions; What kind of sanitation are they using, who are the people sharing the toilet, and what kind of choice people have when choosing their sanitation type.

Interviewees answered on the interview questions based on their own experiences, and thus the type of toilet that they have in use pays a significant role on results in general. Interviewees use three types of toilets; flushing toilet, pit latrine and dry toilets, both composting dry toilet and Enviroloo dry toilet. One interviewee did not have own toilet at all, but he uses neighbor's toilet or composting dry toilet at the community meeting point. In another case the old pit was still in use because the dry toilet was freshly built and missing a padlock from the chamber at the back. Among sanitation experts and community leaders no-one has a dry toilet. One dry toilet caretaker complains about bypassers as they defecate in the bushes next to the homestead.

There is no significant variation in user numbers between different types of toilets. All private toilets, dry toilet, pit latrine and flushing toilet, were used by both small numbers, from four to five people, and by bigger groups, from eight to nine people. Sample includes only three public toilets, from which two are dry toilets and one pit latrine, and according to the interviewed toilet users some 16 to 40 people use them per day. Toilets are typically shared with family members

in the same household, and in some cases also with neighbors and tenants. Public dry toilets and some pit latrines are used by anyone passing by because of accessible location next to a path or next to a community meeting point. Some private dry toilet caretakers do not allow neighbors to use their toilet because they do not take care of it, but leave it messy. Especially Enviroloo caretakers feel they do not want to share the toilet with too many people, because it gets full fast. Also community leaders mention problems with neighbors, who at times use their toilet without permission when it is not locked.

Interviewees who use pit latrines say this is the only type they can have in the area or only type they can afford. Another noteworthy point is that there might be no access to sewage at the time of making the decision which type toilet to construct. Also homesteads with flushing toilets seem to have no other choice because their houses have a built-in flushing toilet, or there is no space to build a toilet outside the house.

9.2 Communication channels and contexts

In the interviews focus was on the contents of all sanitation related conversation in general. Dominant communication channel for sanitation is word of mouth. In addition pictures are mentioned to have been used to support education on dry sanitation. Used communication channels can be further divided into social or physical environments where conversation takes place, in this case education at Salvation Army, community meetings at meeting points and community leaders' meetings, sanitation experts' weekly meetings at Salvation Army and experts' visits to homestead.

Salvation Army is mentioned only by few caretakers and leaders in a form of attending a seminar or training organized by the project some years back. One leader comments that workshops are not considered good in order to educate because only few people have the chance to attend and learn. None of the neighbors mentioned these trainings.

Community meetings serve as a channel for transmitting information about sanitation issues, including dry sanitation, to everyone in the community. One leader says that they do talk about sanitation in the meetings because it is one of the biggest challenges; they talk about the standard of pit latrines, grey water disposal and any problems that people are facing. It is a big challenge and leaders talk in every meeting. According to another leader, sanitation experts are given a chance to teach in every meeting, and this has been a place for some to hear about dry sanitation for the first time.

One neighbor says that sanitation is discussed only in community meetings. Leadership encourages everyone to have a toilet, and conversation in meetings includes also cleanliness in general. Some interviewees bring out the point that not all attend these meetings, and thus there should be someone who would visit homesteads on sanitation issues. One caretaker confirms this by saying that she does not attend community meetings because of disabilities to move.

9.3 Participants in conversation and subjects of matter

Different participants in sanitation discussion in general are mainly the same as in the research sample, though some other counterparts are also mentioned. Data is analysed based on how each group associates with another, on what matters and how often.

Many people in Msunduzi are still using flying toilets, and leaders are trying to tell people not to. Experts work together with the leaders, for example they need permission from leadership in order to talk to the community in the meeting. One leader says experts have never visited his place, but has seen them going around. Another leader supports this by saying that he has no contact with experts.

From community leaders' point of view it is not easy to be a leader in Msunduzi. Leaders feel that communication is blocked to reach the city officials; leaders feel isolated, and also that city council is keeping information to itself, and not informing leaders in time. In addition city council is the one who

can instruct people to do what is needed but does not seem to know how people actually live in Msunduzu.

People from city council have visited and said that should improve pit latrines, but there is no money, so it is a challenge. Everyone have ideas and questions, but there is no permission to work without city councils permission.

City council is not mentioned by other stakeholders besides community leaders.

According to some caretakers, experts visit homesteads nearly daily whenever passing by, or at least weekly. The regular expert visiting homestead talks with other people in the homestead as well, whereas some other experts, not the regular one, visiting the same homestead talk with caretaker only. Caretakers do not mention much about approaching experts by themselves. One says that she reports to expert when needs assistant, for example for fixing flaws of toilet construction, expert has given her word to come and fix it, and so caretaker has not asked anyone else to come and help. When there has been change in from one expert to another for being responsible for monitoring that homestead, expert came to inform about the change beforehand. In some other homesteads caretakers say that contact with experts is not happening often and there is not much help from the experts; Experts come and check the toilet at the back to see is it ok, and are they using any saw dust. Anyhow caretakers are satisfied with experts' work who on the other hand, have for example helped finding saw dust which can difficult at times.

Neighbors of dry toilets caretakers say they have personally hardly any contact with experts. Experts have been seen while constructing toilets, visiting dry toilet owner's place next door or in community meetings. One says that have never met sanitation expert, and another one has never been inside dry toilet. In one case expert have talked with the neighbor about how their pit latrine is situated in a difficult place. One neighbor has been educated by an expert on importance of dry sanitation and how it works. After all neighbors feel positively about experts educating and helping homesteads with dry toilets.

Caretakers do not talk much about their dry toilets with other users, unless there is a need to collect dry substances or other tasks they need help with dry toilet.

Some users are complaining why cannot put diapers in to dry toilet, why to have a toilet if cannot do that. One caretaker is thinking not to let other people use the dry toilet, and he is building a new pit for those people. In their homestead they are quarrelling a lot and the family is failing even to take care of the pit latrine, and so he doubts their abilities to use a dry toilet. Others don't even close the lid and then flies get in and can cause cholera. At the moment only four people are using the dry toilet, and in future caretaker will let others use the dry toilet too, after guiding with principals, rules to follow. One of public dry toilet caretakers says that personal life can set obstacles on taking care of the toilet, especially if only one person is trained on the task.

Caretakers do not talk much about dry sanitation. One caretaker is not able to move outside homestead because of sickness. Anyhow many people ask about the toilet, but caretaker does not want to talk, because if they would also start using their dry toilet, it would get full fast. Dry toilet caretakers are not much in contact with other dry toilet caretakers either. One tells that he has been trying to find some other people to see how they are working with this type of toilet. Another one says that an expert have told him to go and see community member's homestead who also has a dry toilet. He has not gone yet, but would learn from others who have similar toilets.

Dry toilet caretaker used to allow neighbors to use the toilet, but not anymore:

They didn't help cleaning or anything else, and the size of the Enviroloo doesn't really allow many people to use it, gets full fast.

Another problem with toilets is the smell. Caretaker pushes manure to the back of the chamber during night when other people are asleep, so that neighbors cannot complain about the smell. During daytime it is hot so the manure smells, and she hast to do it early in the morning or at night time. To neighbors it is difficult to talk about sanitation. Going to toilet is private, so they don't like talking about it. But do talk with own children.

Communication and cooperation between experts is good so far. In addition to weekly meetings they help each other whenever problematic situations occur,

approximately once a month. Experts admit that at times conflicts have arisen within the group, but they consider themselves open, and everyone is able to talk freely. In addition to sanitation, experts talk with people about poor access to clean water and tidiness of the area. Outside work experts do not talk so much about sanitation, might only be commenting a smelly toilet. At home expert is the one taking care of sanitation facilities.

9.4 Themes

Themes are divided into participation on decision making, how people have been introduced to dry sanitation in the first place, education, and maintenance and taking care of toilet facilities

9.4.1 Participation in decision making

According to some dry toilet caretakers, before building the toilet they were asked if they want to have a toilet, whereas other caretakers say, the toilet was brought without asking a thing. Yet, some interviewees say they had been identified to have a need for toilet, and accepted the toilet due to this. It was also mentioned that homesteads were not given the freedom to choose which type of toilet they would receive. One of caretakers is telling what people should know more about dry sanitation before receiving it:

With dry toilet you have to work and push, go to the back and check. This should be thought before giving the toilet so that the owners can take care. Problem is how to push and how to take out the manure, how to compost and to put to the garden.

Experts have similar feelings. According to them, problem is how people have been chosen to have toilets. Some are failing to take care of their toilets because of disabilities, and other family members are not taking it seriously. According to Experts, these homesteads have deserved to get the toilet, but in the end it is the experts who have to go and work with it.

In comparison to pit latrines, there seems to be similarities in the participation in decision making. Neighbors tell they have received pit latrine through Urban Development Program, and they were only asked to point the place for the

toilet, but no other questions were asked. Leadership tells that they had been participated in the process by choosing whether toilets should be given to homesteads or to the community level.

9.4.2 Common talk about importance of sanitation

According to leaders sanitation is common topic nowadays because of pressure from city council, and also because of sanitation experts working on the matter, Leaders say that in every meeting experts are given a chance to teach. One of leaders has been in contact with health motivators from governmental hospital saying that diarrhea and children who are vomiting come mostly from Msunduza.

To some caretakers and their neighbors sanitation is not common topic, to others it is major topic. Most only talk with family members when there is problem, for example when toilet needs to be cleaned. In some families topic leads easily to quarrelling, and might thus be avoided. Another given reason for not talking about sanitation is the privacy aspect.

9.4.3 Being introduced to dry sanitation

The first time interviewees have heard of dry sanitation varies from four years to less than one year from the time of interview. To toilet caretakers and to their neighbors usual timing to hear about dry sanitation for the first time is when dry toilet has been built for themselves or for the neighbor. Some of the toilet caretakers and community leaders mentioned they have also attended a workshop at Salvation Army where dry sanitation was introduced. None of the neighbors mentioned these trainings. One of the community leaders had been initiating the project, and another one said sanitation experts have come to educate in a community meeting. Sanitation experts did not know about dry sanitation until they were trained for their duty. Neighbors do not know much but would like to know more.

9.4.4 Talk about dry sanitation

Sanitation experts teach dry toilet caretakers about the toilet functions and explain reasons behind rules. According to caretakers, expert helps, teaches how to use the toilet, encourage into using toilet paper and saw dust, how to take care of the toilet and to maintain, what to do when it gets full, and how to do raking and pushing. In general experts are concerned about the cleanness of toilet. One caretaker tells that he likes sanitation experts because they told him that he can make compost, and he has got a garden where to use it.

I am satisfied with work of experts, in the beginning was hard to understand. Now I know that this is modern sanitation, when separating urine from the manure. They have made me understand how it functions.

Some confusion occurs too. One caretaker has heard from experts that with dry toilet I is not allowed to use any chemicals, as people do with pit latrines to push the manure down, and now caretaker is confused what to do.

When talking about dry sanitation, from experts' point of view there has been poor cooperation from people. People are putting plastics and wrong kind of toilet paper inside the toilet, some have attitude that they do not want to listen. Some have bad attitudes towards environmental issues in general, for example by littering right next to someone who is collecting the litter. One of leaders agrees by saying that more education is needed, and that people who are said to be looking after the toilets are not doing their work properly.

On the other hand, experts say that there is now better understanding on dry toilets compared to start of the project, and this makes it easier to work with people. Little by little they are getting through to these people as they keep on teaching. According to both caretakers and experts some people are even asking how they could get their own dry toilet.

9.4.5 Maintenance and taking care of sanitation facilities

With pit latrines and flushing toilets there is not much to do for maintenance. If there is need to do any construction work or fixing sanitation facilities, people

find helping hands within family or friends. Bigger construction works demand skills from outside immediate social relationships. Some dry toilet owners deny neighbors to use their toilet as a consequence of not helping in keeping toilet clean. In some homesteads this can cause conflicts, and even between neighbors. Some dry toilet caretakers share responsibilities of taking care of the toilet with neighbor, both with public and private dry toilets. Some dry toilets caretakers ask help from sanitation experts.

10 CONCLUSIONS AND THEORETICAL IMPLICATIONS

This research was studying the unofficial, individual based communication among certain group in the project area. Communication between counterparts reflects unofficial social systems and networks, also possibly points out the key persons for innovation diffusion, opinion leaders. Conclusions are divided into communication structures and other theoretical implications.

10.1 Communication structures and innovation diffusion

What is discovered is that communication is relatively scarce between sample groups. Cooperation is happening clearly more on a formal level than in personal relationships. Though community leaders were not seen much interested on dry sanitation at the beginning of the project, according to experts they are now very much concerned. From leadership's point of view important topics in sanitation are communal structures and challenges. City officials were not interviewed, but they were mentioned by the community leaders, which implicates officials' part in communication structures. Communication between these two parties seems to go mainly one way, which is typical in a hierarchy social system. Nevertheless all actors in the official level, community leaders, sanitation experts, City Council and health motivators from governmental hospital, are sharing same interests on sanitation issues. Between some individuals there can also be seen connections over social grouping.

As Rogers describes innovation including both "hardware" and "software", in Msunduza's case only one is fully available. Basically anyone has access to innovation itself through number of public dry toilets, but responsibility of sharing knowledge on how to use dry toilet and what is its purpose is in the hands of a certain group of individuals. According to both leaders and experts, the later mentioned have been given a chance to present in community meetings, but these presentations are hardly mentioned within the interviewees as a source of information. Community meetings' potential as forum for sanitation issues has got some obstacles on the way, as criticism towards

leadership indicates that not everyone in the community is satisfied with their work. In addition, experts do not seem to be much in contact with community leaders, which is a sign of poor cooperation. If these obstacles can be overcome, community meetings might have the potential for being a place for effective communication; they are open for everyone, Experts have been given a chance to bring out their knowledge, and leadership has sanitation on their agenda.

As it was mentioned in one of the interviews, some experts contact with only one person in the homestead, while others socialise with everyone. By being in contact with as many people as possible might increase the knowledge, decrease controversial attitudes and create stronger connections between different groups. In this point it is vital to remember, that sanitation experts work on a voluntary basis, and this may effect on their motivation and resources. Same applies to connections between neighbours and experts, which is not much to mention about. In general neighbours seem to have very little information on dry sanitation. Sanitation experts' group itself has a good spirit. Norms do not seem to limit their work, and everyone is free to express themselves freely. Experts meet regularly and are ready to come and help each other even in unexpected problems with dry toilets.

Another group with potential for disseminating information are the dry toilet caretakers. Challenge within caretakers is that most of them do not want to share their knowledge about dry sanitation, because it would mean that more people would use the facilities. Commonly toilets are shared with neighbors and tenants, but with dry toilets it is different. Dry toilet cannot be used as carelessly as other toilets in order it to be able to keep up producing the services it is made for. In one sense the toilet caretakers have not fully adopted the advantages of dry sanitation; Instead of denying access to some, caretakers should see it as a benefit if chambers get full rapidly and final product would be ready to be applied or sold. In this case problems are still two; caretakers are worried about wrong kind of items ending up to the chambers and composting process slowing down. What comes to the structures, there is yet no organisation who

would buy the manure and urine. Additionally practical experience on how final products can be utilised is needed.

Between caretakers there is practically no exchange of experiences. One has tried to find others to talk with, and another one has been encouraged by a Sanitation Expert. The attitude is right, only the action is missing. Some caretakers have disabilities and are not able to move outside homestead, meaning a limited amount of social relations. Communication between Experts and caretakers is mostly coming from Experts. This supports the official structures' position, as experts are mainly approaching caretakers due their responsibility. Commitment from public dry toilets' caretakers' side has shown difficulties as they work alone. Need for sharing the work load and taking shifts might grow the user numbers of public dry toilets.

Likewise conversation in general, also the variety of social environments and situations where communication about sanitation takes place is somewhat limited according to the results. This might reflect that sanitation is a taboo, or people simply feel there is no need to talk about the subject. Nevertheless, there seemed to be no problem to discuss sanitation on the interview. Workshops are, for some interviewee, not the best suitable place to teach about dry sanitation due to timing and poor attendance. This message comes both from leadership as well as from neighbours, who do not mention workshops at all. Communication channels in use rely mainly on word of mouth and to some extent pictures produced by the project. Reasons behind this might be scarce resources, and also project planning which determines what methods Sanitation Experts, who are the main educators, can utilise in their work.

Experts teach about use and maintenance and also about hygiene and guide also in other environmental related problems. Positively dry toilet caretakers give examples how experts help with tasks that are out of their scope. Caretakers show trust towards Experts when communicating openly about coming changes. Neighbours have positive perception about experts. In some homesteads sanitation experts' visits are experienced more as inspections, but despite any problems experts have been able to change caretakers' attitudes in

perception of dry toilets, and experts' skills are being recognised in private life as well. These show the potential in sanitation experts being in the key role for spreading the innovation and building a system around it.

People cooperate closely in maintenance and cleanness of toilets in general, but in worst cases these can cause quarrelling and even conflicts, a clear barrier in communication. Individuals seem to have differences in attitudes on sanitation within homesteads. In some people's opinion dry sanitation maintenance has controversial practices in comparison to other types of sanitation, referring to the partly unknown rules. Between dry toilet users sanitation is not much included on conversations. It seems that not everyone using dry toilets is even aware of its functionality and purpose, and to some need for privacy is a value that comes before communication needs. Attitudes also towards environmental concerns exist, but change can be seen. Sharing the responsibility of taking care of dry toilet facilities with a neighbor seems to be working well with many caretakers.

Caretakers seem to have knowledge about the importance of hygiene and risks it may cause for the health. Some other dry toilet users seem not to care, and due to this caretakers may have denied them access to the toilet. This shows good attitude from caretaker's side, and later on are willing to further train other users. Changes in attitudes can be recognised as well; some caretakers may have been willing to share their dry toilets in the beginning, but have decided not to share their sanitation facilities with guests or neighbours because of untidiness or more importantly because of a small chamber getting full too fast. This involves only Enviroloo-model, which have no longer been constructed within the project since trial period in the beginning of the project when the two models were being compared. Fast phase of filling the chambers is at the moment seen as a problem, and not as a resource, which might indicate that people are not yet practising the utilisation of manure. In addition according to a caretaker communication between neighbours has some barriers as relations between are not close.

10.2 Other theoretical implications

According to Rogers, innovation adoption happens slower within organisations than when it is a single individual making an optional decision. “The more persons involved in making an innovation-decision, the slower the rate of adoption”. (Rogers 2003, 221.) It seems that adoption process has not yet boost in Msunduza. The only ones who actually have dry toilets are the same who have been targeted to receive education and dry toilets by the project.

Participation in decision making forms the base for how people experience ownership towards their sanitation facilities, which can have a crucial effect on the innovation adoption process as a whole. Participation seems to vary a lot. Choosing the type of toilet depends on space and infrastructure, but also financing, and in general people do not feel that they can have much choice on what type of toilet to have. It is clear in most cases that choosing the type of toilet was not done entirely freely by the individuals, but it was authority based. This was more or less the case regardless what type of toilet it was. Variety in individuals answers might also reflect attitudes of not having the freedom to make own decision, which is important with an innovation like this, where the responsibility is fully on the individual. It is acknowledged that in the beginning of the project criteria for choosing homesteads to receive dry toilets were mainly concentrating on vulnerability and who deserves to get one, rather than who has the motivation and skills to actually take care of the toilet and utilise its benefits in practice. In fact, it might have been a surprise to some of the dry toilet caretakers, that the toilet they have been identified to receive was not a typical type of toilet, but more demanding dry toilet. Comparing to another project where City Council had constructed pit latrines to homesteads in Msunduza, decision making process seems to be very similar, authority based. Hierarchy in the structures can be seen clearly, though also in a positive light as the leadership of Msunduza had been involved in the process. However authority based decision making without involving the ones whose lives the decision influences on, there is always a risk of not having enough ownership, which hinders the adoption process.

Results can be reflected on the theory part concerning the compatibility of innovation in comparison to other models. Dry toilet owners clearly appreciate their toilets and want to take care of them, although by not letting people know or use the toilet they are actually hindering the diffusion process. It is noteworthy to mention that the caretakers complaining about small chambers are mainly Enviroloo toilet owners, which are no longer financed in the project, and thus the problem has been partly eliminated. Clear difference between dry toilet owners and other types of toilets is that toilets are rather used among small number of people because of chambers which get full fast and untidiness that the guests allegedly leave behind. What comes to pit latrine users, significant number do not know any other sanitation forms besides pit latrines, which could explain the fears of dry toilet owners why people do not know how to use dry toilets.

11 DISCUSSION

Research was outlined to handle the communicational structures inside a community and its members. Sample groups were relatively small, and results are based on somewhat generalisations within these groups. Instead a more accurate study on communication structures would need to go deeper into individuals and their networks. Another important point is the role of city officials, who, as the key position holders, could have been included in the study, perhaps by interviewing representatives.

Innovation presents new and unknown. Purpose is to offer solution to a problem, even though success has its requirements before rate of adoption starts to take off. Change happening in a culture where ancestors and traditions form one of the highest values, needs more work than in an environment where taking risks with unfamiliarity is a demand for surviving in the tight competition. As the dry sanitation project is coming to an end in Msunduza, even radical solutions for capacity building and sustain should be considered. Change and adopting new things can never happen only superficially, but it requires evaluating values. One of the biggest problems hindering development is a system that does not work, or lack of it. People spending their days from dawn till dusk filling their basic needs and at the end of the day they are left with not much more as when they started. Poor access to media and communication networks leaves people with little new knowledge and ideas, keeping up the traditional communication structures which are strongly formed around authorities.

11.1 Self-evaluation, ethics, validity and reliability

Research problem has been narrowed and specified during the research process, first from communication to communication as part of the diffusion of innovations theory. This can lead to a situation where the set of questions are not measuring everything that was planned to be analysed. Choosing methods for data collection could have been more encouraging to participate. Setting

questions could have been more descriptive. Or other “activating” methods, such as drawing a map of social networks, writing a story of a typical day based on whom interviewee meets and what is the subject they talk about.

Before starting each interview it was explained to interviewee what is purpose of the research. Personality of interviewees is being protected and all data referring to identification is handled separately from research data. In one interview there happened to be a sanitation expert also present. It was a good example on how different parties can have opposite opinions on same thing, when caretaker was saying that there is not much contact with experts because he is the only one educated. In experts point of view caretaker had agreed to educate the rest of the homestead. Based on this conversation there might be some divergent opinions on the communication between two parties.

11.2 Cultural interperation and awareness

As researcher’s cultural background is something very different from the context of the research, there is always a risk to make fals interpretations, or even to forget cultural effect and make conclusions and judgements based on researcher’s own background. The base of the research should not be personal views and values, but objectively, neutrally the culture which is being observed and comprehend.

Interviews were not conducted in fully natural situations, because of the presence of the researcher, an outsider in the community. Yet interviewees had the opportunity to use their mother language and be in their own home environment having the most of conversation with a community member (interpreter). There is always a risk that interviewees give answers they wish the case to be or what they think the researcher would like them to say, rather than explaining the actual state of matters.

Researched had some insight of the local culture before starting the research. Researched was familiar with the project a due to internship preiod. Knowledge on the project detailed facts helps to read the answers. For example one of the

experts mentioned being a sanitation expert since 2004, though the project has not been started until 2008. Before the project another project, Environmental Health Education Project was established in the same area, and interviewee must be referring to this.

Whereas researcher knows only some basic words and phrases from the local language, even the smallest details such as tone of voice have had an impact on the message coming through the interpreter. Researcher's concentration was mainly on the interpreter due to fact that notes to previous question were written down while interviewee was giving answer to the next one in a local language.

11.3 Way forward

In the first phase of the project focus of education has been on Sanitation Experts, and thereafter on dry toilet owners, primary beneficiaries. Next important step for the innovation to spread would be to engage secondary beneficiaries, all community members in Msunduzu, and key officials making decisions concerning the area. As a solution for some not being able to attend workshops could be organising same courses repetitively on different times, both in daytime as well as evenings and on weekends. This way people being obligated elsewhere, would have the chance to attend. Marketing the courses is vital likewise. Diversifying the communication channels in use could have a significant effect on the diffusion of innovation. Among other things, marketing of workshops and final products could be done through posters and community meetings, and education itself could include more creative forms, such as plays, songs and poems.

Sanitation experts presenting the project organisation could use their position in approaching the media to get more prominence for the topic in general. People's awareness could rise rapidly, and discussion would involve stakeholders on a broad range. Sanitation experts should also take the given opportunity to present in community meetings to get bigger numbers introduced to the concept of dry sanitation, and to discuss what opportunities different

stakeholders could have. Perhaps someone has a garden and is interested in buying efficient and natural fertilisers, and someone else would be keen on starting a business for collecting and delivering the urine from toilets to buyers.

As the small incentives which experts have been receiving will no longer be available after the project funding ending after 2013, experts will most likely face a challenge to balance with their responsibility and other offers. One way to keep experts motivated in action could be establishing some kind of profitmaking consultancy organisation where their knowledge and specialization could be further tapped. A crucial improvement which would be creating a system where composted manure and collected urine is collected from dry toilets, by for example a small company, which would pay for the customer according to product's quality. Company would sell manure and urea forward to ones who need it for improving fertility of the soil. Depending on the demand, emptying of solid waste chambers could also be seen as a service, and it would be the customer paying for it to be emptied once in two or three years, whenever it becomes full. What comes to caretakers, their awareness on this kind of services is important. The company itself should have skills for marketing their product and facilities for storing. Land space is scarce in the project area, and therefore storing time should be as short as possible.

Caretakers' group should be brought together to share their knowledge with each other, and to plan a more organised system to get the full benefit. In order for them to get manure and urea sold people need to be convinced on the usefulness of these products, and caretakers could start by applying them in their own gardens and plots, showing example in deeds. Disagreements within toilet users can be solved through efficient training of caretakers to not only maintain the facilities but also to have skills to educate all other users to reach for the same goals. Environmental clubs which have been in the project plan could serve as a forum for people with different views and experiences to come together to share ideas.

Despite the prevailing problems with land ownership in Swaziland, even a small scale soil improvement and plantation fertilization can have significant impact on individual's lives, not to mention the long term effects.

12 SOURCE MATERIAL

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Questionnaire structure for interviews

1. What type of sanitation you have in your homestead, and who are the people using it? What is the number of people using it?
2. How do you decide the type of sanitation for your homestead? How did you decide to have this type of sanitation?
3. Do you have experience on dry sanitation? When was the first time you heard of dry sanitation?
4. In your opinion, what is the difference between dry sanitation and any other forms of sanitation?
5. Can you name any reasons why someone would NOT want to have a DT?
6. Do you have any plans concerning your current sanitation facilities?
7. How do you maintain your sanitation facilities? What are the tasks that you need to perform, how often?
8. Do you need help when maintaining your sanitation facilities? What are the issues you need help with? Who provides assistant?
9. How often are you in contact with sanitation experts and on what matter?
10. Are you satisfied with the help got from sanitation experts? Yes/no, why?
11. Is sanitation a common topic? If yes, with whom and about what? If not, can you name any reasons?
12. What are the things people should know more about dry sanitation, and how this information should be given?
13. In your opinion, what is the role of community leader in sanitation issues?
14. Do you think there is a link between wellbeing and sanitation, how would you describe it?
15. In your opinion, what are the benefits and challenges in dry sanitation?

An additional question which was added for other project studies:

16. If there was a sanitation club would you like to join? Purpose is to share information to anyone interested. Are you ready to share information, and how often would you like to meet?