

# SANITATION STAKEHOLDERS WORKSHOP REPORT

30<sup>TH</sup> – 31<sup>ST</sup> MARCH 2016

University of Dar es Salaam, TANZANIA



## THEME: TURNING WASTE INTO VALUE

Organized and Funded by



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**TABLE OF CONTENTS**

ACRONYMNS.....	4
CHAPTER 1.....	6
1.1    INTRODUCTION .....	6
1.1.1    Executive Summary.....	6
1.1.2    Objectives.....	7
1.1.3    The current Sanitation context in Tanzania.....	7
1.1.4    Profile of Presenters .....	8
1.1.5    Workshop presentation topic issues .....	12
1.1.6    Questions discussed during break-out sessions .....	12
CHAPTER 2.....	14
2.1    PROCEEDINGS.....	14
2.1.1    Registration process.....	14
2.1.2    Presentation Progress.....	14
2.1    Breakout Sessions.....	14
2.1.3    Facilitation.....	15
2.1.4    Secretarial Process.....	15
2.2    Welcoming Remarks.....	15
2.3    The Official Opening.....	16
CHAPTER 3.....	18
3.1    PRESENTATIONS .....	18
3.1.1    The Capacity building gap in the sanitation sector in Tanzania, .....	18
3.1.2    The SUSTAIN program – a new approach to ‘view and do’ sanitation? .....	19
3.1.3    Sustainable Sanitation in East Africa: A comparison of two National Sanitation Programmes in Tanzania and Rwanda. ....	20
3.1.4    Gender responsiveness of access and utilization of water and sanitation facilities in Makerere University and University of Dar es Salaam.....	22
3.1.5    Turning fecal sludge into a business venture-obstacles and progress.....	23
3.1.6    Measuring success and assessing project sustainability-lessons from Cameroon .....	24
3.1.7    Serving the un-served; the Case of Community-based Bio-sanitation in the Urban People’s settlement in Kenya. ....	26

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3.1.8	Turning waste into a business and value adder for people and the agricultural sector-challenges and opportunities.....	27
3.1.9	The Sanitation Profile in Tanzania (Lessons From The National Sanitation Campaign).....	29
3.1.10	The Role of CBO's for Sustainable Sanitation Implementation.....	30
3.1.11	Faecal Sludge Management and Microbiological Safety of Reuse .....	31
3.1.12	Safe Water and Agriculture and its linkage to Sanitation .....	32
3.1.13	Innovations in Sanitation Marketing and Business. ....	33
3.1.14	Urban recycling and natural waste management. ....	34
3.1.15	SWASH in Tanzania-is up scaling possible?.....	34
3.1.16	Decentralized waste water treatment systems-learning by doing.....	35
3.1.17	Addressing urban sanitation to informal settlements using community action and co-production. ....	36
3.2	BREAKOUT SESSION (DAY 1) .....	36
3.3	BREAK OUT SESSION (DAY 2).....	37
3.3	REFLECTION OF DAYS .....	38
CHAPTER 4	.....	41
4.1	IDEAS FOR RESEARCH COLLABORATIONS OF PROJECTS/ LINKS .....	41
CHAPTER 5	.....	42
5.1	APPENDICES .....	42
5.1.1	List of Participants .....	42
5.1.2	Guest of Honor Opening Speech .....	50
5.1.3	Curriculum questionnaire summary .....	54

**TABLE OF FIGURES**

Figure 1:Successive breakout sessions .....	15
Figure 2:welcoming remarks by Dr J. Norbert .....	16
Figure 3:Key Note Speech By Mrs Dorisia Mulanshani.....	17
Figure 4:Presentation on the development for the sanitation program.....	19
Figure 5: Presentation on the Sustain Program.....	20
Figure 6:Presentation on Sustainable Sanitation in Eastern Africa .....	21
Figure 7:Presentation: Measuring success and project sustainability .....	25
Figure 8: Presentation on Bio-Sanitation.....	27
Figure 9:Presentation on "Turning Waste to Value" .....	28
Figure 10: Debriefing at the UDSM sludge dewatering facility by Miss Miriam .....	37
Figure 11:visitation at the UDSM faecal sludge de-watering facility .....	38
Figure 12: Presentation on the Role of CBO's in sanitation .....	31
Figure 13: Presentation on Faecal Sludge Management.....	32

## **ACRONYMNS**

**AfDB**- African Development Bank

**AMCOW**- African Ministers' Council on water

**CBOs**- Community Based Organizations

**CCBRT**- Comprehensive Community Based Rehabilitation in Tanzania

**CEO**- Chief executive officer

**CSO's** - Civil Society Organization

**DANIDA**- Danish International Development Agency

**DAWASCO**- Dare es Salaam Water and Sewage Corporation

**DFI**- Department for international development

**ILO** - International Labour Organization

**ISM** - Integrated Sanitation Management

**MDG's**- Millenium Development goals

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*Workshop organized as part of the collaborative capacity building program "SUSTAIN'-  
Sustainable Sanitation in Theory and Action*

**NGO**- Non Governmental Organization

**NHC** - National Housing Cooperation

**SADC**- Southern African Development Community

**SAWA**- Sanitation and Water Action

**SDG**-Sustainable Development goals

**SIDA**-Swedish International Development Cooperation Agency

**TAWASANET**- Tanzania water and Sanitation Network

**TBA**- Tanzania Building agency

**UDSM**- University of Dar es Salaam

**UNESCO**- United Nations Educational, Scientific and Culture

**UNICEF**- United Nations Children's Emergency Fund

**USAID**- United States Agency for International development

**WASH**- Water, Sanitation and Hygiene

**CHAPTER 1****1.1 INTRODUCTION****1.1.1 Executive Summary**

The Sanitation workshop was organized by the Department of Water Resources Engineering UDSM, Tanzania and Lund University Centre for Sustainability Studies, Sweden. This initiation dialogued as part of a SIDA funded capacity building program on strengthening Post-Graduate training in Integrated Sanitation Management (ISM) at UDSM between 2015-2020. It drew delegates from both private and public, including Sanitation practitioners, Academicians and Policy makers working directly on sanitation issues in Africa, as well as in-direct linkages to Sanitation in their work.

This workshop also endeavored to create an avenue for Sanitation stakeholders to engage with other similarly interested in the cross fertilization between sectors and actors to realize the multiple benefits of sustainable sanitation for furthering human development and sustainability in Tanzania and beyond. The Sanitation workshop took place from 30<sup>th</sup>- 31<sup>st</sup> March 2016 at University of Dar es Salaam Business School, UDSM Campus.

This successful Programme was structured in such a way that the first sessions on the first and second days, Participants were given a chance to present through tangible examples of what sustainable sanitation may look like in practice varying from different sectors and scales of implementation which are described in the main document. To encourage the development of 'actionable knowledge' all participants were divided into three work-group sessions that encouraged participants to identify and build tangible future collaborative partnerships that focused on:

- Current and future research and training gaps in sustainable sanitation
- Linkages of theory with action i.e. linking researchers (and students) with practitioners and policy makers
- Synergies between sanitation and other productive sectors such as agriculture, energy, water and finance to enable adoption of innovative and adaptive systems that promote recycling and reuse of resources.

The majority of the workshop focused on discussing and identifying (also in writing) viable pathways to improve and advance implementation of sustainable sanitation in Tanzania in both theory and practice. The details of interventions contributed by participants as per objective of this consortium are provided in appendices.

### **1.1.2 Objectives**

With a threefold approach, this stakeholder dialogue workshop aimed at:

- Stimulating stakeholder interests on the multiple benefits of sustainable sanitation for human development and environmental protection.
- Facilitating a platform to open up a dialogue between stakeholders directly or in directly working on issues linked to sanitation.
- Identifying pathways to improve synergies, between and within stakeholder groups, in order to enhance possibilities for research, training and implementation of sustainable sanitation ideas and practices.

### **1.1.3 The current Sanitation context in Tanzania**

Access and availability to sustainable sanitation systems are currently low throughout Tanzania, with serious and far reaching implications on not only individual health and welfare, but more importantly on community livelihoods and the overall development of the country. Some of the reasons for this stem from the fact that sanitation, in the past, has been largely neglected by global development donors and the national government, due to its high capital investment costs and inherent complexity when it comes to implementation and technology adoption. Recently however, the sector has been given more attention for its multiple benefits to human development and environmental protection when linked to other productive sectors such as energy and agriculture. Scaling up efforts to reach the newly adopted Sustainable Development Goals, especially in the fast growing city of Dar es Salaam, will require more attention to these productive linkages between sectors and here, perhaps more than anywhere, does sanitation

have the possibility to play a critical role in supporting the development of reuse oriented productive systems in the future.

Tanzania too is experiencing the increasing pressures of climate change, urbanization and global financial crises on its ecological and human systems and with this as a backdrop the country must address the issue of sanitation if it is committed to become a middle income country by 2025. To achieve this however, we must change the way we perceive and do sanitation work. It requires us to acknowledge that an integrated approach to sanitation is needed, whereby researchers and practitioners collaborate more directly, where both software and hardware tools are prioritized, and onsite and off-site systems work together and are linked with neighboring sectors such as water, energy and agriculture. As such it could be seen as a key element in the country's sustainable development strategy to reduce vulnerability to climatechange, increase food and energy security and contribute to prosperous and sustainable livelihoods.

In general terms the Sanitation Workshop was described as a very successful since the information presented was well received and that the participants actively participated in contributions towards achieving the goal of introducing the PhD program of Integrated Sanitation Management at the University of Dar es saalam (UDSM). However, this two-day interactive program attracted awareness among Policymakers, Media, Academicians and Practitioners on the real issues happening on Sanitation.

#### **1.1.4 Profile of Presenters**

##### **Richard Kimwaga**

A senior lecturer at the Department of Water Resources Engineering of University of Dar es Salaam where he teaches in both engineering integrated water resource management and integrated sanitation management. He holds a MSc in Water Resources Engineering and a PhD in Wastewater Treatment Engineering both from UDSM. His research focuses on all aspects of environmental engineering, including sanitation. He is co-coordinator of the SUSTAIN capacity building program in collaboration with Dr. Sara Gabrielsson.

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*Workshop organized as part of the collaborative capacity building program "SUSTAIN'- Sustainable Sanitation in Theory and Action*

**Sara Gabriellsson**

An Assistant Professor at Lund University, Sweden and co-coordinator of the SUSTAIN capacity-building program at UDSM together with Dr. Richard Kimwaga. For the past three years she has done research on the challenges and opportunities of implementing a community based water and sanitation scheme in two villages in Iringa District, Tanzania. She holds a BA in Anthropology and Environmental Studies from University of Victoria, Canada, a MSc in International Environmental Science from Lund and is the third PhD graduate in the world in the field of Sustainability Science, which attempts to bridge the gap between the natural and social sciences to produce actionable knowledge to sustain both people and the environment.

**Elijah O. Odundo**

A Programmes Coordinator at Umande Trust, Kenya. Has over 8 years experience in WASH. Holds a MSc. Education for Sustainability (Environmental and Development) from London South Bank University, UK and a PhD candidate at Jomo Kenyatta University of Agriculture and Technology, Kenya.

**Alex Manyasi**

Kenyan from Sanergy, a social enterprise in Nairobi Kenya. He sits on several committees at the Kenya association of Manufacturers; a member of several technical working groups at the ministry of health, and a member of the UN Global Compact working group against corruption in Kenya. He's pursuing his PhD in Leadership and Governance.

**Fredrik Sunesson**

From Sweden, a founder and CEO of Slamson Ghana Ltd., which provides sustainable solutions for infrastructure challenges in developing contexts, and has worked for the past 9 years in Ghana. He has led and consulted on a number of projects in Ghana that involve both local grassroots initiatives and municipal public-private partnerships.

**Juliet Waterkeyn**

Co-founder and CEO of Africa AHEAD, the organisation which pioneered the Community Health Club Approach, one of the foremost strategies used for hygiene behaviour change and community mobilization for sanitation. She received an AMCOW award for her contribution to sanitation in Africa in 2010.

**Jacqueline Thomas**

A Senior Scientist for WASH research at the Ifakara Health Institute. Her professional training is in microbiology and environmental engineering. For the past three years Dr Thomas has been conducting applied WASH research in rural and urban Tanzania. Her focus has been on resource recovery from faecal sludge and safe applications for faecal sludge products.

**Elisa Urbinati**

Elisa joined MSABI as country manager last December (2015). She has a nuclear engineering Masters degree and has worked for over ten years in the Oil and Gas industry. Elisa has held both technical and leadership positions within the companies she worked for and has managed different projects in several locations.

**Angela Huston**

A PhD candidate in Sustainable Water Resources at McGill University, Canada. Her interdisciplinary research mixes participatory social science methods with traditional engineering tools to develop a holistic understanding of water, sanitation, and hygiene issues in Buea, Cameroon. She has worked with Engineers Without Borders Canada's Global Engineering Initiative and Waterlution's Transformative Leaders for the Future Program.

**Tim Ndezi**

A civil engineer with wide experience of working in participatory development with poor communities on water and sanitation and housing and shelter schemes. In particular, he is pioneering micro-credit lending using small group savings and credits schemes known as the Federation model on water, sanitation and housing schemes in Tanzania. Tim has a PhD in water and sanitation management from Loughborough University (WEDC), UK. At present he is the Director of Centre for Community Initiatives, a local NGO in Tanzania supporting slum development in Tanzania.

**Wilhelmina Malima**

Holds an MSc in Environmental Engineering from Roston on Don State Building Academy, Russia. She has 17 years of experience in the aspects of water and environmental sanitation, where she has worked with Government in Local Authorities (Dodoma), international NGOs (WaterAid) and the UN (UNICEF). Currently she is working as a WASH advisor with the local NGO Sanitation and Water Action (SAWA). She is also the National Coordinator for Water Supply and Sanitation Collaborative Council (WSSCC) and the Chairperson of Tanzania Water

and Sanitation Network (TAWASANET). Her special passion is to give sanitation and hygiene much more eminence and recognition than it currently receives.

**Theresia Kuiwite**

An Environmental Education and School WASH Coordinator, working for the Ministry of Education, Science and Technology in Tanzania since 2008. Theresa is a graduate of University College of Dublin, where she received a MSc in Environmental Resource Management. She has developed the National SWASH Strategic Plan and National SWASH Guidelines for Tanzania.

**Robinson Mdegela**

An Associate Professor in Fish Medicine and Aquatic Toxicology at Sokoine University of Agriculture, Tanzania. He holds a PhD from the Norwegian School of Veterinary Science, Oslo. He currently teaches fish and wildlife diseases, risk analysis and environmental toxicology. His current research is on Safe Water for Food Production. In this project risks of using low quality water for vegetable and fish production is being assessed in addition to perceptions, incentives, cost benefit analysis and policy environment.

**Zabron Brown Mwaipopo**

Holds a BSc in Civil & Environmental Engineering, and Project Management both obtained from the USA. He has over ten years work experience in all aspects of Civil, Buildings and Environmental works. He has several training and courses certification in the Engineering field. He has experience in planning, designing and supervision of environmental and sanitation sector projects globally. Zabron joined BORDA in 2012, currently works as a head of technical department, in projects involving Wastewater Treatment Solutions, Community Based Sanitation, Decentralized Solid Waste Management and Biogas Projects. His professional experience and positions have involved working and living in different countries, namely USA, India, Kenya, Uganda, Zambia, Sudan,

**Harriet Kebirungi**

A PhD Candidate at Makerere University and University of Dar es Salaam with the thesis entitled: Gender Responsiveness of Access and Utilization of Water and Sanitation Facilities in two East African Universities. She is lecturer at Kyambogo University. She has conducted baseline survey on water quality and aquatic biodiversity in the Albertine Graben. She was team leader in the review and update of the Water and Sanitation Sector Gender Strategy (2010-2015), Ministry of Water & Environment in Uganda. She has collaborated with DFID, AfDB, Danida, UNICEF, ILO, and USAID, Caniage Cooperation of New York, SIDA, SERAC and OeAD.

**Dorisia Mulashani**

An engineer and acting director of the Program Coordination Unit at the Ministry of Water and Innovation. Since August 2015 she is also the coordinator and secretary for Technical Working Group IV that deals with sanitation and hygiene and coordinates the linkages between the Water Sector Development Program and School and household sanitation within the National Sanitation Campaign.

**1.1.5 Workshop presentation topic issues**

- Meeting the SDG on sanitation in Tanzania – Needs and future targets
- Sustainable sanitation in theory – Challenges and opportunities
- Sustainable sanitation in action – What may it look like in practice

**1.1.6 Questions discussed during break-out sessions*****Break-out session 1*****Identifying knowledge and capacity gaps and synergies**

- Where are the current knowledge gaps within WASH and productive sanitation? (topics/themes)
- What are the most urgent and important issues we should be focusing on? (ranking)
- What do we need more training on to improve human capacity to implement sustainable sanitation? (practical skills, competencies, courses)
- Who needs more training in the sanitation sector? (current employees, novices, academics?)
- Where can synergies be made with other sectors to improve training, research and implementation as well as reduce costs? (linkages)

**Break-out session 2****How do we ensure long-term funding for master students in ISM?**

- How may we secure funding for students in integrated sanitation management at UDSM today and in the future?
- How may we make it possible for employees working in the sanitation sector (NGO's, CBO's, Government, Private companies etc.) to partake in MSc training in ISM while still working?
- How can the MSc and PhD program at UDSM be integrated with organisations involved in sanitation implementation to produce actionable knowledge that benefit both practitioners, academia and the public?

**Break out session 3****How can we build collaborative partnerships to strengthen post-graduate training and improve sustainable sanitation research and implementation?**

- What do we need more research about to improve sustainable sanitation implementation (topics)
- Who should be involved in generating this research? (practitioners, academics, policy makers, consultants, everyone!)
- What are some of the options for funding such collaborative research? (donors, government, foundations, multilaterals)
- What could a collaborative research partnership across sectors look like?
- Who are willing to work on a joint research proposal and what would it focus on?

**CHAPTER 2****2.1 PROCEEDINGS****2.1.1 Registration process**

This consecutive Two-day Stakeholder Dialogue Workshop took place from March 30th to 31st 2016. The day progressed with a registration process, where participants registered their Names, Organization and Contacts respectively. This workshop attracted a turnout of almost 90% of all participants invited, including those who attended for their own awareness. As scheduled everyone was expected to have registered by 09:00 AM every day.

**2.1.2 Presentation Progress**

Designated Men and Women professionals were given a chance of 15-20 minutes to make their presentations to the audience on respective days. They educated the audience on the implementation strategies practiced by these Organizations (Societal groups, NGOs etc), Institutions as well Investment Companies in Tanzania and Africa in general. This gave an insight of the initiatives being made on Sanitation to address the escalating issue of Human health related diseases increasing in the context of the African society. Each presenter was given an extra 5-10 minutes to take in questions from the audience. The interactive dialogue gave the audience chances to clarify and contribute their views of each initiative presentation.

**2.1 Breakout Sessions**

This successive dialogue strategy enabled the participants to interact and discuss the key issues and contribute on the gaps needed to be made from the objectives of the workshop. Participants were divided into 3 groups, which broke out into 3 sessions on the respective days. These breakout sessions were very interesting and participatory in form of gender mainstreaming. Men and women contributed their views on the issues given to discuss in these sessions and this informational knowledge was recorded and minuted.



*Figure 1: Successive breakout sessions*

### **2.1.3 Facilitation**

The facilitation process was conducted by Dr Richard Kimwanga and Dr Sara Gabrielsson, who took the workshop through its successes.

### **2.1.4 Secretarial Process**

The proceedings for the whole workshop were recorded effectively and this involved a constituted secretariat who took minutes throughout the program.

## **2.2 Welcoming Remarks**

Convivial remarks by the Head of Department of Water Resources Engineering Dr. J. Nobert was made on behalf of the UDSM Vice Chancellor Prof. Cuthbert Kimambo who is was unable to attend the officiating ceremony of the workshop. He took the opportunity to welcome the participants to this important meeting. He revealed that this workshop was organized as part of the collaborative capacity building program “SUSTAIN’- Sustainable Sanitation in Theory and Action. He also enlightened the meeting that Dr Gabrielsson, initiated this project as she was conducting her research in Iringa, Tanzania and partnered with the UDSM. This ignited the need from SIDA to fund the component of capacity building in the area of Sanitation at the University. Initially a Master program in Integrated Sanitation Management (ISM) is currently running with funding from the EU. However, a proposal was written to SIDA in their efforts to

identify the knowledge research gaps in the sanitation field. The PhD programme came out prudent in this cause, which brought about this relation to attract theory as well as Practical.

Therefore, in this workshop of intellectuals and professionals with vast knowledge and practical experience, their societal knowledge is required to include in the class theory for the advocated postgraduate PhD course of Integrated Sanitation Management (ISM). This dialogue is to enable collection of information necessary to implement our ideas in these courses.



*Figure 2:welcoming remarks by Dr J. Norbert*

Further on Dr Kimwanga added on that the Government is very keen to address issues on Water and Sanitation. By doing so, the Government of Tanzania is engaging in programs like such on Postgraduate studies in Integrated Water Resource Management to strengthen the Human Capacity.

### **2.3 The Official Opening**

A key note speech from Mrs Dorisia Mulanshani, the Acting Director of the Tanzanian Water Sanitation Development program and Secretary of Sanitation was addressed to the Delegates. In her summarized words to officially open the workshop she stated that through the Ministry of Water and innovation, the Government of Tanzania is working on proceedings to ensure there are smooth execution of various programs and projects in the water and sanitation

### *Sanitation workshop 30<sup>th</sup> -31<sup>st</sup> March 2016*

services. These areas include enhancing government leadership in water sector and sanitation subsector planning processes; strengthening and using country systems; and to build sustainable water and sanitation sector financing strategies.



*Figure 3:Key Note Speech By Mrs Dorisia Mulanshani*

Tanzania has a strong system for implementing existing policies. However, what is needed is to strengthen the use of data to guide resource allocation, strengthen and sustain financing mechanisms for rural communities to reduce inequalities in access to both water and sanitation.

**CHAPTER 3****3.1 PRESENTATIONS****3.1.1 The Capacity building gap in the sanitation sector in Tanzania,**

Dr. Richard Kimwaga, Senior Lecturer, University of Dar es Salaam.

This presentation focused on the Human Resources Gaps and shortage in Water Resources management sector to meet the MDG's. A study was conducted by IWA to know expertise required to meet the set objectives in Water and Sanitation management. The strength of the scope and methodology of this research was based on pegging the population of the country in relation to the growth rate, which was a very unique study from the rest of the SADC countries. Clear indications resulting from Health and Education showed clearly the gaps and shortages of Human resource in this sector with additional 4.3 million Health workers and 18 million teachers required respectively. However, the IOWA project developed its methodology in phases, which included in the second phase identifying competences needed in this field, assessing the HR services required for the Water and sanitation management in the country, and achieving the MDGs. The study involved participation and data collection from various stakeholders including Private Sector, Public Service, CBOs and NGOs.

The competences very important in the management of water and sanitation management from the studies indicated the need to engage the following expertise to meet the MDGs;

1. Water and Sanitation Engineers
2. Electrical and Mechanical Engineers
3. Management and Finance Project Managers
4. Social and software

In conclusion an emphasis of the identified competences there was need to address the Operation and Maintenance (O & M) facilities for the set targets to be sustainable. Community mobilization, Designs, software, communication skills are also necessary to be included in the curriculum of the post graduate studies.

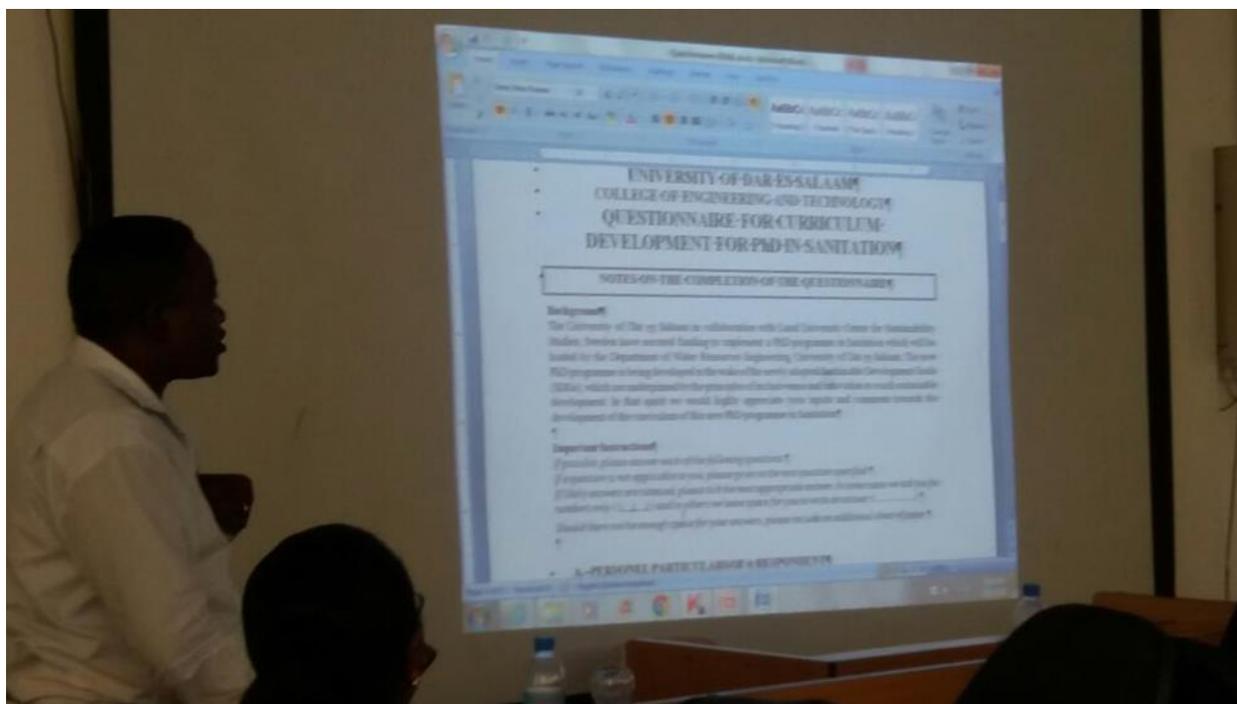


Figure 4: Presentation on the development for the sanitation program

### 3.1.2 The SUSTAIN program – a new approach to ‘view and do’ sanitation?

Dr. Sara Gabrielsson, Assistant Professor, Lund University, Sweden

“Sanitation is more important than political freedom”, by Mahati Maghandi, set off this presentation. Tanzania is facing challenges in managing Sanitation and factors such as rapid population growth which has led to this problem of attaining the targeted MGDs. The Government has continued to address these such challenges in Urban and especially Rural setups by engaging and supporting such programs to manage failures in the sanitation sector in the country.

The theory of Improved Sanitation facilities, the linear sanitation development path such as the sanitation ladder, management of waste could be a new approach to ‘view and do’ sanitation. However, in marginalized communities, they are particularly exposed to the unhealthiness of having to deal with the raw waste services. However, introducing sanitation systems can take a very long time and financing such project costs is a challenge in Tanzania.

Furthermore, a solution to solve this longtime problem could be to meet the needs of society and how we can continue to sustain livelihoods without compromising the natural systems which is very complex. Hence an emphasis on the need to come out with solutions from various

experts and professionals in this workshop was a step success through the participatory approach. Sustainability science has fitted in Sanitation through these above. Synergies of turning Human waste into value, benefits of WASH, address Sanitation services, Social benefits, and barriers in achieving knowledge without leaving out how the academia setup institutional framework hinders the research to acquire this knowledge. SIDA was going to fund this PhD program for 5 years, hence the need to build this network in sanitation sustainability knowledge gap.



*Figure 5: Presentation on the Sustain Program*

### **3.1.3 Sustainable Sanitation in East Africa: A comparison of two National Sanitation Programmes in Tanzania and Rwanda.**

Prof. Juliet Waterkeyn, Chief Executive Officer, AFRICA AHEAD, South Africa

This presentation focused on the comparison between two problem solving approaches on sanitation in Rwanda and Tanzania. With an objective to prevent health related diseases such as diarrhea killing infants in these two countries, the “F –diagram” illustrated the of fecal transmission pathways and interventions in managing this problem. “Behavioral change is important than putting facilities in place”, was the key highlight of her presentation.

An approach being used in Rwanda is conducting National community based Environmental health promotion programs, introducing community health clubs which aim to improve and

*Sanitation workshop 30<sup>th</sup> -31<sup>st</sup> March 2016*

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management the sanitation facilities in the rural villages. This NGO has partnered with the government and other organizations to implement these hygiene programs by constructing proper and latrines for each household and sensitizing communities on hand washing hygiene. Training, and road shows and generally stakeholder participation has worked really well in Rwanda, and while in Tanzania this methodology being used is still lacking behind. It was put forward that a sanitation programs can also integrate in many more important issues like waste recycling, malaria, safe food and drinking water campaigns that could be linked to the paradigm shift of integration approaches in achieving sustainable development.

However as one of the most challenges faced by many other African countries has been record keeping and statistics of very reliable information on sanitation to help compare how these programs have improved over the years. Lack of Technical support and Finance as well as Human Resources has also played a role in implementing.



*Figure 6: Presentation on Sustainable Sanitation in Eastern Africa*

**Question/Discussion**

One of the delegates asked how much this project cost to be implemented. In her response she mentioned approximately \$3-5/individual, though the government of Rwanda has put in about 10 million US dollar into this sanitation projects scheduled to be completed in 2 years' time.

Another interesting question was raised on the biasness of such programs towards rural areas by one of the Delegates. He mentioned like Rwanda in the presentation the concentration of implementation of this program was in the rural areas only without focusing on the peri-urban settlements which are highly prone to sanitation related diseases. She responded that in countries like Zimbabwe they managed to train people to implement such projects in the urban towns although the priorities are still set to the most marginalized rural communities.

**3.1.4 Gender responsiveness of access and utilization of water and sanitation facilities in Makerere University and University of Dar es Salaam.**

Miss. Kebirungi Harriet, PhD Candidate, Uganda.

In her introduction, to her presentation, she started one key point why her major interest was to research on the Universities as communities. It is important to know the behaviour of these graduates we are training to implement these projects in society. These institutions and their environments in which we are training our future implementers is relatively important to be discussed, before they go out in the communities. Increased demand for higher education has brought about an increase in student enrolment in these two universities over the past years and the challenge that facilities designed for a fewer population have still remained the same. However, this brings a concern in trying to attain the MDGs, SDGs and UNESCO demands in water and sanitation and inclusion of women in the decision making.

The profile of sanitation has relatively not been captured, in our policies like Tanzania has a policy on WASH Uganda does not have. While Uganda has a Water and Sanitation strategy which Tanzania doesn't have. Little focus in the response of how students have towards the issues of water and Sanitation landscape needs to be researched, and assess the receptions including how management responds to these issues. Among others included the needs and access to these sanitation facilities in these universities, knowing that the initial designs did not accommodate for this grown demand, including the physically challenged individuals and female students.

Human rights, international institutional frameworks, political sociology, gender mainstreaming are backing up this study in to ensure the issue of water availability and usage in

these universities planned layouts. Results showed a number of issues through the methodologies used to capture the information both quality and quantitative techniques. Hand washing facilities, drinking water, usage (10- 15 liters/day/student), accessibility to sanitation facilities and pressure on them, including the management of these facilities by the Universities were areas of concern. Management of faecal and sanitation waste was a challenge observed in these universities due to the shortages of water and also initiatives of recycling, enterprising are to lacking, due to finances.

### **Question/Discussion**

In her last remarks she requested a backup to her recommendations from the Delegates for practical ideas that could work in the universities as an initial start, to be implemented in addressing these challenges faced by institutions.

#### **3.1.5 Turning fecal sludge into a business venture-obstacles and progress**

Mr, Fredrik Sunesson, Founder and Director, Slamson Ghana Ltd

Slamson is a Ghanaian company aims at providing low cost and technically sound sustainable solutions for the waste management and energy sectors. He also stated that some of the sewerage system programs being implemented to reduced waste are not even meant for African societies, but if only other countries would try out what they are doing to make or invest in waste recycling companies Africa would be more proactive. He has worked in most difficult environment and social challenges facing Ghana currently including liquid waste management, organic compost and charcoal production, clean water, and landfill gas.

In Accra city, 10% of the sewerage management does not work and inappropriate disposal of the liquid waste is poured into the ocean without being treated. This was a call for Slamson to establish a treatment plant, where about 60-70 trucks in a day dispose the liquid waste to it. That is only about 40% of the waste that is being brought to the treatment plant. They have also placed some portable septic tanks in the residential, industrial and hotels areas where trucks collect sludge. Slamson has received funding from the Dutch and English government which to establish this treatment plant, and support from the Ghanaian Government.

This waste treatment plant is still at a small scale, but have managed recover valuable products that can be used such as compost, fertilizer, insect meal, bio-char which is used to manage their operating cost. The production of bio charcoal is a success because it has been quite important

where 70% of the household in Ghana use charcoal and an attempt to reduce deforestation` since it's the 3rd country in the world leading in deforestation.

### **Question/Discussion**

One of the delegates wanted to find out what sort of policies or incentives are being given to get companies that a delivering the faecal sludge to the plant. It was mentioned that at the moment the company is only to get maximum of 60 trucks daily for their capacity and with the support from government of Ghana, it has been a success while both parties benefit.

Another wanted to know how thick the sludge they receive, because they are involved in a similar project they want to implement in Tanzania but the faced challenges of the raw material texture. He explained mentioned that this system has concentrated more on the portable pit toilets mounted in the communities which gives the right texture required.

How have the people of Ghana reacted towards the charcoal product u area producing out of faecal waste and how have you managed the market to meet the demand of your other products like organic fertiliser?

It was clarified that the response towards this product has received tremendous consumption. Because it on the market it an image of the original charcoal and costs lesser, most of the consumers have appreciated it. The demand for these products is also growing because the quality of these products is good.

### **3.1.6 Measuring success and assessing project sustainability-lessons from Cameroon**

Dr. Angela Huston, PhD candidate, McGill University, Canada

This presentation was based on the studies carried out to determine how projects or systems have been effective, putting theory into practice and how do we take the data available and ensure that it represents the actual situation as it is on the community and how do we use that data to ensure it is used to design effective program. Further she highlighted that reliable sanitation service can be obtained through availability, accessibility, quality and affordability by the community.

There is a need to measure reliability through quantitative and qualitative indicators in which both are necessary to represent the four parts of reliability. Common themes found in successful projects entail sustainability concept which involve economy, society and community, environment and cultural vitality aspects. Furthermore, a closer look was taken to

having clean environment in which there is a risk to groundwater supplies due to infiltration of liquid waste from toilets.

The concept of turning waste into value has been done through waste management to resource recovery involving eco sanitation. The failure of projects has been facilitated by corruption which increases monopoly and discretion and reduces accountability. The key to success there has to be a willing to fail and learning from the failures using reliability/sustainability lens. Monitoring of the indicators is a very important tool in enabling of sustainability of these projects. From the studies Africa it can be concluded that after a project failure, it is important to improve on your past weaknesses than start fresh project, to enable effectiveness and sustainability.

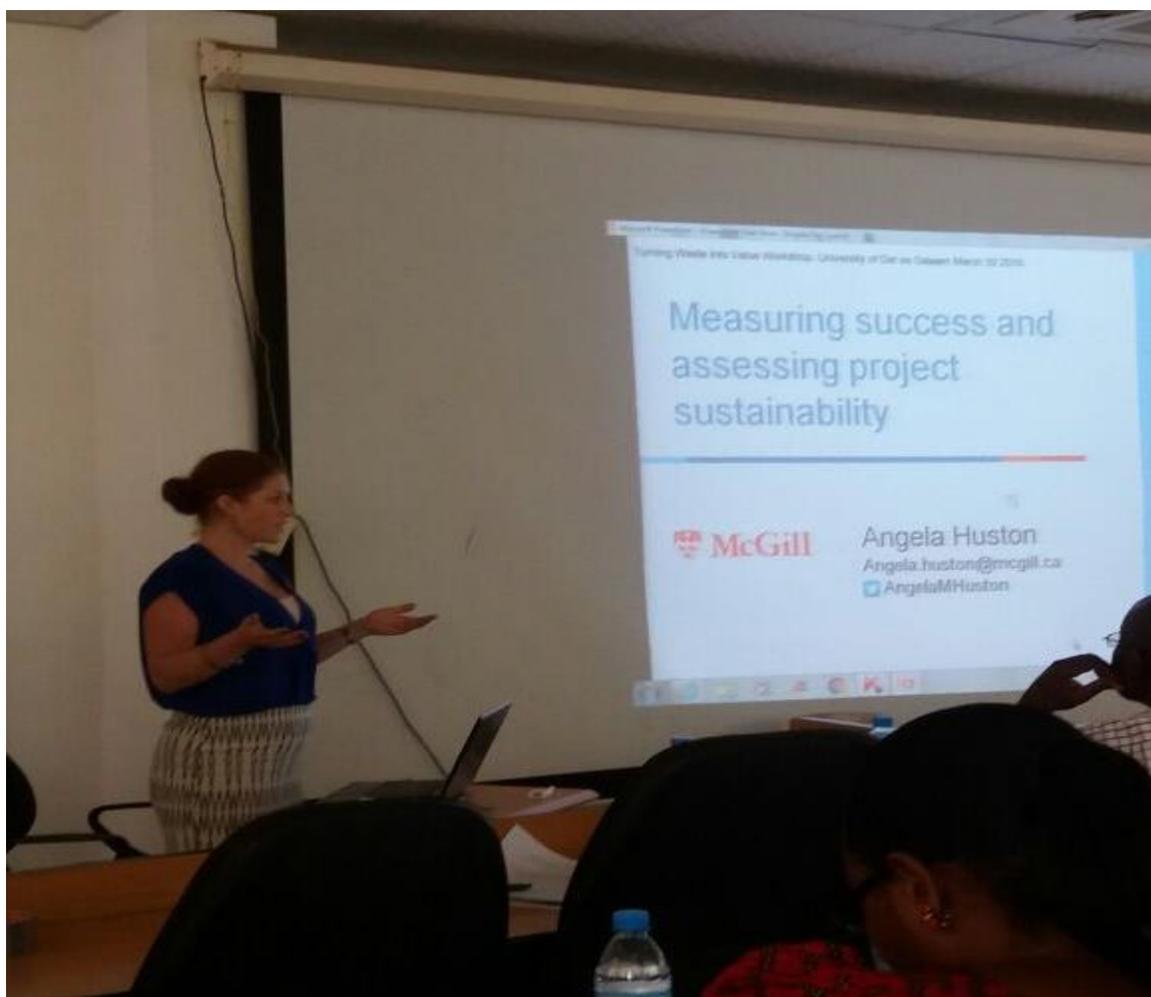


Figure 7: Presentation: Measuring success and project sustainability

### **Question/Discussion**

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*Workshop organized as part of the collaborative capacity building program "SUSTAIN'- Sustainable Sanitation in Theory and Action*

Are there any other Resource recovery technologies or lessons being implemented successively from Faecal waste and making valuable products in Africa apart from Ghana?

Is there any place Ecological Sanitation (EcoSan) is being implemented successfully in Africa?

There is need to take an EcoSan project failure, why is it not reliable and work on its failures.

In Tanzania, Ecosan is opted in urban areas especially where the water table is high. However, because it becomes difficult to dig up a pit hence the only solution for the community is Ecosan. These waste products are still a challenge for disposal and technologies are being researched in which this program can be linked with agriculture. Adaptation of certain designs, for example from Botswana were done here in Tanzania for construction of toilets with separate bathrooms but due to religious and cultural factors it was not very successful.

### **3.1.7 Serving the un-served; the Case of Community-based Bio-sanitation in the Urban People's settlement in Kenya.**

Mr. Elijah Odundo, Project manager, Umande Trust, Kenya

Umande Trust focuses in informal and low income settlements normal referred as slums but they prefer calling them "people's settlements". Their main objective is to solve some issues of water and sanitation as a basic Human right in the identified communities due to inadequate sludge management leading to water borne related diseases. Umande Trust came up with bio-sanitation as an intervention for the problem caused by lack of space in informal settlements, minimal evacuation in toilets and ensure maximum access to the toilets.

The establishment and introduction of bio-centres in different communities in Kenya has been successively been implemented. Not only is this project solving the water and sanitation problems, but these centres are used to sell clean energy products, access to bank loans for those individual interested in investing in the biogas centers, community resource centre, business centre and biogas production point. The production of biogas from the bio digestion from human waste is producing gas to use in the household.

Over 40 biocentres have been built up in Kenya, biogas production and use has reduced indoor pollution, access to water and sanitation by the informal settlement dwellers and improved income for the groups by creating employment. Despite of that Umanden Trust faces challenges from both the community and government.

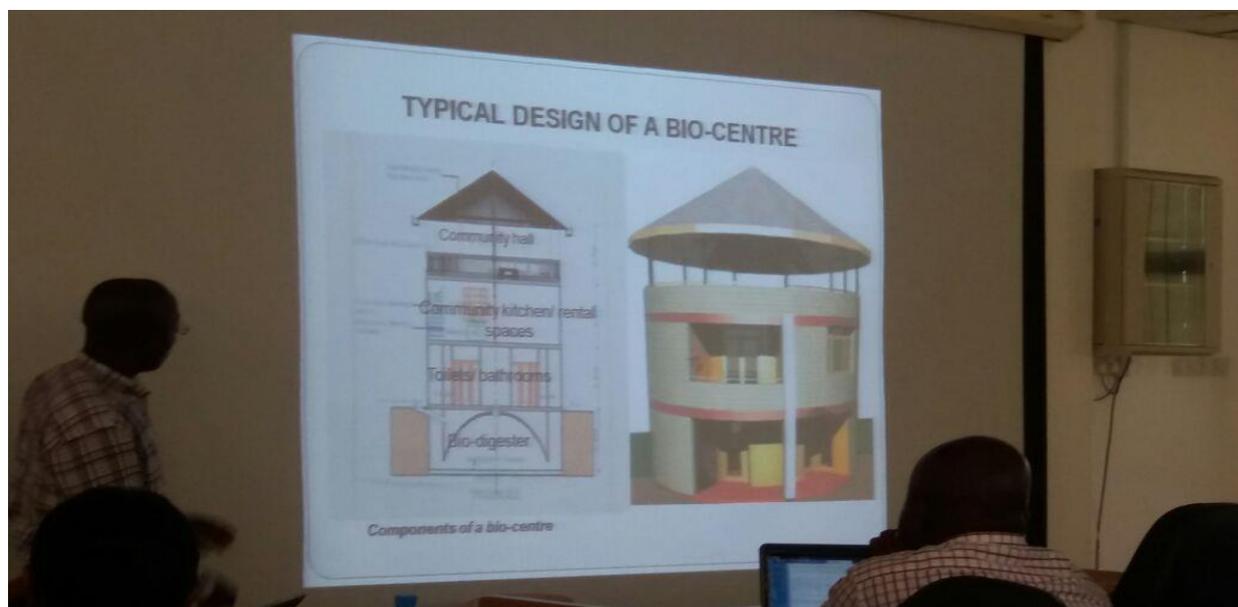


Figure 8: Presentation on Bio-Sanitation

### Questions/Discussion

People running the bio centres, the biggest thing inside them is the pride they feel.

He was asked if there is a link the bio centres with the community health clubs. He was asked about the source of funds for construction of the bio centres

### Answers

This approach of biocentre it has mobilized the community and community groups identified without forming them. The source of funds used for the construction of the biocentres is from the partnership Umande trust entered with Equity bank and some little funds obtained from borrowing the facility.

### **3.1.8 Turning waste into a business and value adder for people and the agricultural sector-challenges and opportunities.**

Mr Alex Manyasi, Government Relations, Sanergy, Kenya

Most people are living in the informal sectors of Nairobi, Kenya and challenges of lack to access hygienic sanitation has continued. Only 15% of the Nairobi slum are connected to the sewers, no presence of pit latrines due to the presence of high water table, construction of concrete toilets has been a challenge due to lack of space and land tenure. Also the threatening crisis of food insecurity due to declining of soil fertility and decreasing yields persists.

A full value chain approach has been put in practice to tackle the sanitation crisis; it has involved prefabricating the toilets (size of the toilets 1.5 by 1), selling them to people and install them, provision of cleaning materials, education on how to manage cleanliness of the toilets, collection of waste and treating them. The waste is converted to valuable by products such as organic fertilizers and insect based animal feed. Further a franchise agreement with the customers is initiated to abide sanergy standards of hygiene and provision of loans to people so as they can afford to buy the fresh life toilet.



*Figure 9: Presentation on "Turning Waste to Value"*

### **Questions/Discussion**

He was complimented for practicing occupational health and safety by the collectors of this waste containers.

He was asked if they take into consideration of micro-organisms and toxic compounds as the treated waste is used for growing crops because it might lead to various problems to consumers.

The waste is heavily controlled which ensures no contamination is expected and periodic tests are done in every stage of growth in crops to ensure no contaminants.

### **3.1.9 The Sanitation Profile in Tanzania (Lessons From The National Sanitation Campaign)**

Mr. Anyitke Mwakitalima, a coordinator of National sanitation campaign with for main acting ministries including Ministry of health and social welfare, Ministry of water and irrigation

The president office regional administration and local government authorities and Ministry of education clearly explained the purpose of the campaign, sanitation problem that they are dealing with and the achievements obtained from the time of establishment up to present. It was pointed out that major focus area of the national sanitation campaign includes Improvement of toilet at household level and primary schools, Elimination of open defecation and promotion of Hygiene (Hand washing with running water). Mr. Mwakitalima also pointed out that The National Sanitation campaign is not operating in all villages in the country.

The campaign started with 42 local governments authority's councils but now it's operate in 163 councils in the countries. In identification and selection there are several criteria's that are used which including Areas with the lowest sanitation coverage, High diarrheal prevalence and Areas where rural water supply project were implemented. Together with the achievement such as 6004 villages which is about 118493 household have improved sanitation still other villages have an achievement of less than 25%.

Therefore, in general still there is a work to be done with high speed so that to be able to achieve the Millennium Sanitation Goals (MSGs) through which the national sanitation campaign operates .in terms of the approaches, there are two main approaches that are used including the promotion using the CLTS (Community Led Total Sanitation) mainly behavior change promotion and enforcement of law and regulation.

#### **Discussion/questions**

A delegate wanted to know about the reliability Data for Tanzanian sanitation campaign achievement for the data presented by a presenter from Rwanda seem to be very different from the data presented by the national sanitation campaign coordinator.

On the concern Mr. Mwakitalima explained that Data presented by a presenter from Rwanda based on TSSU as a source, TSSU were run without the involvement of the government. They deal mainly on toilet building than the hygiene part of it. He also pointed out that hand wash program did not achieved the targets cause the hand wash facility that were put in place were only temporary, they only be used in very short time.

**3.1.10 The Role of CBO's for Sustainable Sanitation Implementation**

Mrs. Wilhelmina Malima who is a Director SAWA and a member of Tanzania water and Sanitation Network (TaWASa.net)

TaWaSa.net Is a network of CSO's (civil society organization) focusing on water and sanitation with 62 listed members. The organization was established in 2008. In 2014 the zonal wash learning Forum was formed that includes:

- lake zone,(Mwanza ,Kagera )
- central zone,(Dodoma and Singida )

The purpose of the forum is to bring closer other NGO's far from the once existing in Dar es Salaam, putting them together and get their input easy.

CSO are working in the villages and communities. On the ground all of the project circle from the planning, mobilizing the community, awareness creation to construction is implemented with the community. Most of the projects done by TaWaSa.net are participatory (involving the community), in building the capacity CSO are involved in training the community on managing the project.

In addressing the sanitation issues TAWASA.net addresses it as a complete set, including the need of having improved facility, having hand washing facility with soap, having the dish trap and the need of having the solid waste bins. In School TAWASA.net address the need of the schools to have special rooms for Adolescence girls and the need of the children to have improved sanitation facility. In all its activities TAWASA.net operates per national guide lines. In terms of Research, finding and monitoring, TAWASA.net is required to present a report in water week showing what is happening on the ground in water project. Also TAWASA.net are involved with testing the upcoming technology (urine diversion) and influencing the chain (TAWASA.net present the peoples voice). TAWASA.net play the role of policy dissemination in terms of Preparation of simplified version of the policies (putting policies in the simple language that people can understand such as posters and pictures).

In additional Mrs. Malima pointed out some of the challenges faced by TAWASA.net including limited capacity in terms of skills and financial, limited linkage at district level coordination and Gap on the involvement of the stakeholders leading to poor allocation of resources. To conclude she explain the future plans of the organization (TAWASA.net) including involvement of Media through Media Wash Workshop in expanding understand of WASH concept in the community, training the media on what to focus on in writing and reporting the sanitation issues, strengthening communication within the network, dissemination of SDGs, involving parliamentarian councilors in sanitation workshops and forums and establishing the wash resource center.



Figure 10: Presentation on the Role of CBO's in sanitation

### Question/Discussion

A delegate wanted to know the function of UNICEF in Tawasa.net

Mrs. Malima explained that UNICEF is among the partners who play the advisory role within the network SAWA as the local NGO TAWASA.net is the chair, the leadership is found by the local NGOs. The international NGO's can be members in TAWASA.net but not the leading for it is the network of local NGO's.

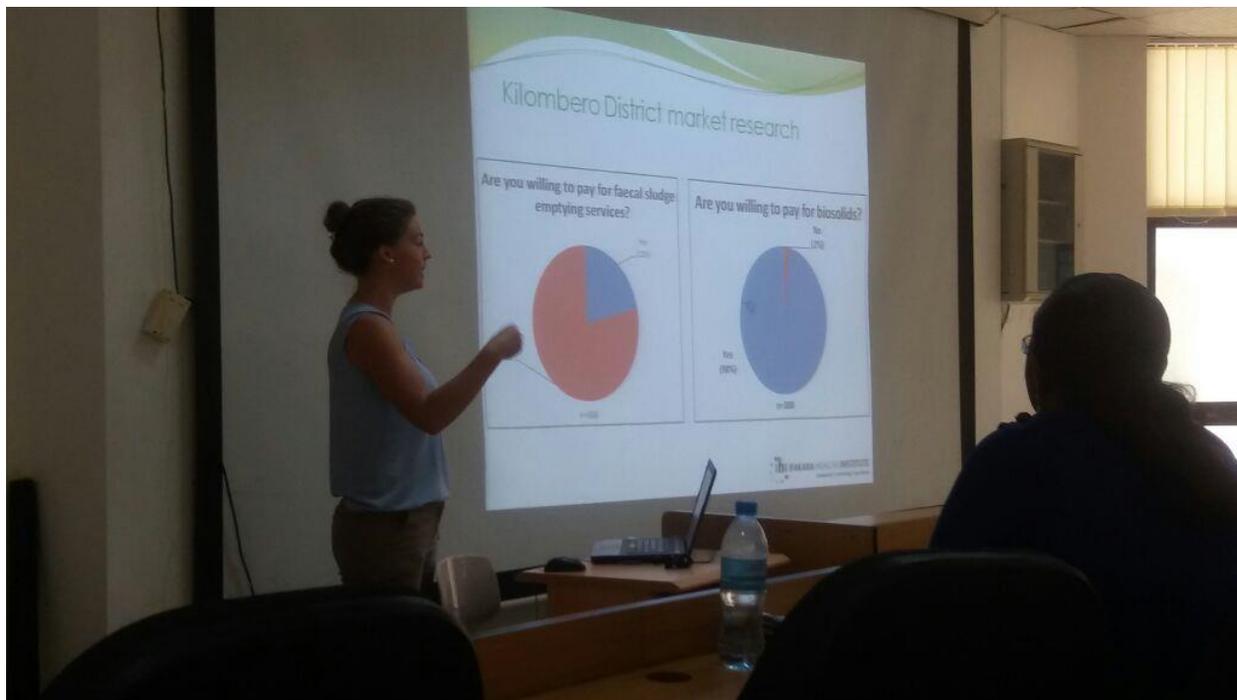
#### 3.1.11 Faecal Sludge Management and Microbiological Safety of Reuse

Dr Jacqueline Thomas a senior scientist for Wash research at Ifakara Health Research Institute

The situation of faecal sludge management in Dar es salaam though was pointed out that 10 % is sewerage, 20 % is septic tanks while 70 % is pit latrines and also pointed out that there is a need for alternative source of fuel for now Charcoal is the main source of cooking fuel in Tanzania and more than 1 million ton used annually, also there is a reduction in productivity due high cost of fertilizer although the farmers are willing to pay for bio solids.

In additional she explained about the safety of the biosolids from sludge, using the example of biosolids from Kigamboni its shows that there is a big variation of the number of coli from the sludge from the same bed depending on the position were the sample was taken and the duration of sludge in the drying bed.

Concluding She pointed out the physical, chemical and biological test that can be conducted in Ifakara laboratory and University of Dar es salaam laboratory, she also pointed out the parameters that cannot be tested in the two laboratory due to lack of capacity and instruments but yet the parameter is important in the analysis of sludge.



*Figure 11: Presentation on Faecal Sludge Management*

### **3.1.12 Safe Water and Agriculture and its linkage to Sanitation**

Robin Mdegela an associate professor in Fish Medicine and Aquatic Toxicology at Sokoine University of agriculture together with his PhD student Winfrida Mayilla

It was explained that the main objective of SAWAFO is to identify and characterize chemical and microbial contaminants in water, soil and crops in Low Quality Water. She also pointed out the farmer's views over the use of waste water in production, the benefit they obtain and the negative effect such as diseases. In addition, Winfrida explain that lack of policy and regulation for Low Quality Water use in food crops irrigation in Tanzania and lack of recognition by the public of Low Quality Water as an alternative source of water is among the major barrier for sustainable use of Low Quality Water.

Professor robin presented about the Chemical and Microbial Contaminants in low Quality Water whereby though the graph he showed how effective are stabilization pond in the removal of Ethinylestradiol and Antibiotics and Reduction of *Escherichia coli* concentration in waste water. He also pointed out that Waste Water Stabilization Ponds were performing well in

removal of *E. coli* in treated effluent than the Morogoro River (Vegetables irrigated with Morogoro River were contaminated with *E. coli*).

### **Discussions /Questions**

Member was concerned about the processes taking place in the ponds for reduction of endocrine compounds as the presentation shows that there is significant removal of endocrine and antibiotics, for the processes will be very important in forming the bases of design and Where did the endocrine be analyzed, for most of the laboratory in the country still lack the capacity of analyzing the EDC?

Another member wanted to know how many farmers are utilizing this Low Water Quality and in the future how many they will be.

On response of the concerns Professor explain that since at the beginning of the research started there were no clear hint of what will be the results of the research, they did not concentrate on the processes that are taking place rather than the concentration of chemicals and antibiotics at the beginning and at the end of each pond, so the exactly processes are not Known yet.

The analysis is done in Morogoro in SUA Laboratory. About the number of farmers that are using LQW ,he explain there no exactly number but most of the farmers that have an access to this water uses them, but considering the people that are using it all together are so many foe the product from this farms are sold everywhere.

#### **3.1.13 Innovations in Sanitation Marketing and Business.**

Miss Elisa Urbinati who is a project manager of MSABI (Maji Safi kwa Afya Bora Ifakara)

*(Micro-finance and subscription based delivery of improved sanitation)*

The major aim of the organization is to Improve health standards related to water and sanitation through education programs and infrastructure improvements and Assist community empowerment, leading to sustainable businesses and management of water assets. Together with the achievement that were obtained since the establishment of the organization Miss Elisa explained the approaches of CHOO SALAMA and CHOO CHAPCHAP that have been used to deliver their services to the community .she explained of the differences of the two approaches and community response over the approaches. In conclusion she pointed out that When remobilising for recruitment, although 92% of clients were interested but when presented with the final payment service and latrine, only 27% actually applied for service.

**Question/Discussion**

Member wants to know if there is cooperation between the organization (MSABI) with the government and financial institutions, the exactly price paid for CHOO SALAMA and the effectiveness of the design over the special group (disable)

Miss Elisa explained that government know about the organization but it not in cooperation, the organization obtain grand from the financial organization and the price for CHOO SALAMA is about 750000/ whose the design also consider the disabled group.

**3.1.14 Urban recycling and natural waste management.**

Mr. Matthew Haden, the founder of the Recycler Limited

He is concerned with onsite waste management which involves on site sorting and cleaning, waste reduction, general and hazardous waste removal from large industries and commercial places. He does so because there is a large amount of waste produced in Dar es Salaam city around 4500 tons per day in which most of it ends up in rivers, oceans, forest and about 40%ends up in legal landfill. Waste that is not recyclable such as plastic bags are changed into energy and recycle able waste such as beverage bottles is sold back to industries.

He is foreseeing in doing large scale production of biogas, household/community insect derived protein using “buu bin” and further large scale production of insect derived protein for chicken food which makes them grow healthy. The aim of having zero waste it is not only recycling but completely eliminating the waste. Currently he is not dealing with e-waste (electronic waste) yet.

**3.1.15 SWASH in Tanzania-is up scaling possible?**

Mrs. Theresa Kuiwite, national SWASH director, Ministry of Education, Science, Technology and Vocation

A SWASH baseline survey that was conducted in 2009 for 2697 schools, the results promoted the need for a special SWASH program because of inadequate SWASH facilities, limited number of teachers’ expert in SWASH, absence of respect and loss of dignity and safety particularly for girls and for persons with disabilities.

SWASH put its efforts to deal with the misfortunes and the effective indicators that shows these efforts have been done were; making the facilities available and maintained, hygiene practices

being continuously observed, improved health, equitable access for girls and students with physical disabilities and improved school attendance and educational performance.

The reasons behind the SWASH success was the use of both hardware and software facilities. Hard ware facilities involved for both sanitation and water infrastructures, software facilities involved provision of training materials, literature, knowledgeable teachers and other personnel in hygiene education.

Among many challenges experienced by SWASH is the steady increase in enrolment of pupils in primary school facilitated with the policy of free education versus SWASH facilities which lead to inadequate and completely lack of the facilities in some schools. Scaling up is possible and inevitable and this can be largely apprehended by maintaining the partnership model between ministries, LGAs, FBOs, individuals, NGOs and CBOs.

Achievements under NSC-National Sanitation Campaign from 2013-2015 were from both school WASH and household community. The target was to reach 812 schools but at the end the target was doubled. SWASH has brought a great impact in schools and community as it has demonstrated increased health and psychological wellbeing of students and reduced absentees in school. This has also influenced behavior in household.

### **3.1.16 Decentralized waste water treatment systems-learning by doing.**

Zabron Mwaipopo and Godlove Ngoda, BORDA

DEWATS stands for Decentralized Wastewater Treatment Solutions, it is a technical and social approach to sanitation in which the system is very flexible and adaptable to different kind of scenarios where central system can't reach the users and the government can't provide because of geological conditions. It serves individual household, schools, hospitals, real estate's from very small to large scale.

The waste water is treated in three processes:

- Primary treatment process
- Secondary treatment process
- Tertiary treatment process

The primary treatment can either be done by digester-biogas dome or by settler- septic tank. Then waste water is passed to anaerobic baffle reactor/filter which increases the BOD reduction up to 90%. Finally, the water is passed to planted gravel filter were odor, color and nutrients are removed. The product of all these processes is; biogas, produced for different purposes such as cooking and treated water; which can be reused for agricultural purposes. The project has been implemented in several areas such as BORDA offices, St Jude school, CCBRT hospital, TBA and NHC estates, IST-Upanga. Pre-fabricated DEWATS are also produced.

In addition, the human excreta by itself it's not sufficient for production of large amount of biogas, for instance human excreta obtained from 10 houses it fits for one house biogas needs.

The cost for installation of the system varies depending on geological conditions, approximately 2000-3000 USD.

### **3.1.17 Addressing urban sanitation to informal settlements using community action and co-production.**

Dr. Tim Ndezi, director, Centre for Community Initiatives (CCI)

CCI is a non-governmental organization (NGO) which operates in informal settlements and slums where it is difficult to provide utilities due to lack of space between houses hence it was crucial to address aspects of livelihood empowerment, housing, water and sanitation. It works by providing loans to people who want improve their latrines by connecting to sewerage.

Community action was triggered by mobilizing people so as to help urban poor to come together and have a voice to demand their rights and help build sanitation infrastructures. Also the relationship between low income communities and the state corporations was emphasized so as to put a proper working relation between the two in addressing sanitation and other infrastructures issues.

CCI uses simplified sewerage which is a low cost alternative that is particularly appropriate for a high density urban settlement because it uses small diameter pipes of 100mm in diameter and relatively small slopes of 0.05, it also involved improving the traditional toilets to suit the simplified sewerage and currently 42 houses have been connected to a sewer pipe network which feeds into waste ponds. DAWASCO were involved to provide man holes/receiving point of sewers to the sewer ponds.

The move was successful due to political support obtained from municipality and utility (sewer ponds),the availability of resources to install sewer pipelines, manholes and improved toilets, willingness of community to participate and work together including the landlords and tenants.

### **3.2 BREAKOUT SESSION (DAY 1)**

Dr Kimwaga gave a briefing on the objectives of this break out session. He further explained that the need to offer the PhD program in Integrated Sanitation Management which was brought about from the studies that showed knowledge gaps in this field of Human resources. More Lectures need to be trained on in ISM and hence due to the growing demand and enrolments of tertiary education, it is a major step in meeting our MDG's on sanitation in Tanzania and the rest of the African countries.

The needs assessment is one of the prerequisites for the University for any new programs proposed, hence this stage is equally important as part of stakeholder engagement. Furthermore, feedback from these sessions will be very important for the implementation of this program to addressing the issues of sanitation. The main objective was also to identify the

gaps they felt was relevant to be added to this course curriculum in relation to the demand from the practical society and experiences from the various organizations and companies present.

### **3.3 BREAK OUT SESSION (DAY 2)**

It was a discussion which was raised as a result of Dr kimwaga's presentation and how to ensure long term funding for master students in ISM. The stakeholders wished to know the minimum number of students to be enrolled for the PhD program, the cost per student per year and the duration so as to get the clear picture of the funds needed. Emphasis was put in collaborating with private sectors which experience sanitation problems in different ways this can facilitate funding of students for the program who will later work for them or approaching the private companies and requesting them to offer scholarship for this program. Also the prerequisites of the course should target professions and making it to be a part time session program.



*Figure 12: Debriefing at the UDSM sludge dewatering facility by Miss Miriam*



Figure 13:visitation at the UDSM faecal sludge de-watering facility

### 3.3 REFLECTION OF DAYS

Dr. Kimwaga initiated the discussion based on how much has been invested in sanitation policy and yet there is no action on the ground in terms of its content. He also emphasized that there was need to put all the theory that has been discussed into practice? (Walking the talk)

#### **Discussions:**

- Lack of sanitation champions to steer the process. There should be champions that will create other champions to work on the sanitation issues.
- A decision on how to make things to go to another level in sanitation is urgently required
- Basically of the components in the research have been done already, however a shift to put research into practice is needed.
- Application of different knowledge that has been done and work together.
- There is a huge gap between the academic (sciences) and the practices which have to be addressed
- The science /academic theory should be clearly shown in reality.
- More emphasis should be put into the funding that will move the theory to practices. Research result should be clearly presented with the real pictures of how they can be put into the practice.

### **3.2 OUTCOME FROM DISCUSSIONS**

Linking theory with action-the challenges and opportunities of sustain for the existing masters and future PhD in integrated sanitation management

<b>Issues on Sanitation</b>	<ul style="list-style-type: none"> <li>• The definition of sanitation has to be harmonized in the context of WSSA as well as the PHA</li> <li>• Hygiene needs to be considered</li> <li>• Suggested the name of the PhD course should be called Environmental Health and have more integration</li> <li>• Training on social science, behavioral science, social psychology should be included</li> <li>• Health awareness on disease causing and transmission for effective preventive measures to be enforced</li> <li>• sanitation should be integrated into other disciplines, and not to stand alone</li> <li>• Students to be enrolled should be on those who have done Environmental Health for Masters to enable them to join and build capacity of EH</li> <li>• Identifying of other efforts going on in the sector for linkage purposes, such as co research activities</li> <li>• Low cost affordable technical options for WASH</li> <li>• Project managerial and Leadership skills to be included</li> <li>• Dealing with beliefs and norms</li> <li>• Regulatory/provisions of policy issues</li> <li>• Behaviour change in hygiene and sanitation comparative studies</li> <li>• Private sector involvement, involving financial institutions, policy makers and technical crafts working together</li> <li>• Linking ministries with training issue and practical oriented training</li> <li>• Operating and maintenance culture should be supported at all levels</li> <li>• Training should involve best practices such as globalization, climate change, resource management and the 4 R's</li> <li>• Raising the profile of sanitation sector</li> <li>• Gender role on WASH, women play key role in safe guarding, hence should be given high priority</li> <li>• Promoting WASH into business/marketing</li> <li>• Implementation, education health, water</li> <li>• Knowledge management</li> <li>• Soft skills should be involved which include presentation and reporting</li> <li>• Latrine emptying-Eco-San</li> <li>• Innovative research</li> <li>• Advocacy, all sectors, NGO's (change of mind set)</li> </ul>
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<b>Key issues to be addressed</b>	<ul style="list-style-type: none"> <li>• Sanitation leadership advocacy</li> <li>• Lack of coordination between stakeholders</li> <li>• Policy at all stages</li> <li>• Financing sanitation sector</li> <li>• Priority of water over sanitation</li> <li>• Training miss-match</li> <li>• Lack of multi-discipline approaches</li> </ul>
<b>Identified Gaps</b>	<ul style="list-style-type: none"> <li>• Research translation to policy</li> <li>• Training + knowledge in alternative solutions</li> <li>• Policy analysis, implementation, policy for alternative solutions</li> <li>• Lack of flexibility in NGO/research funding</li> <li>• Standards for private sectors</li> <li>• Market demand-how to research</li> </ul>
<b>Training/Practice</b>	<ul style="list-style-type: none"> <li>• Theory to practice more needed</li> <li>• Graduates with no jobs</li> <li>• Lack of work experience</li> <li>• Are masters/PHDs in sanitation multi-discipline?</li> <li>• Having the right skills for sanitation multi discipline</li> <li>• Msc for practical implementation</li> <li>• Implementing skills short term</li> </ul>
<b>Synergies</b>	<ul style="list-style-type: none"> <li>• Outreach to Universities, NGOs and Manufacturing companies</li> <li>• Raising sanitation agenda</li> <li>• Implementation in line with the National policy</li> <li>• Sharing information among stakeholders</li> </ul>

## CHAPTER 4

### 4.1 IDEAS FOR RESEARCH COLLABORATIONS OF PROJECTS/ LINKS

*Regional Environmental Health Program-* Mwanza and/or Musoma, Tanzania and Kisumu, Kenya

*Focus-* Integrating the community health club approach with conventional and alternative sanitation solutions to assess 'real' sustainability outcomes

*Partners-* AfricaAhead, Ifakara Health Research Institute, BORDA, LUCSUS, McGill University, SEI, Umande Trust

*From theory to Action on Climate and Adaptation-* Operationalizing and assesing the challneges and opportunities of an integrated sewerage recovery and reuse system to miltigate climate and promote sustainable livelihoods in Dar es Salaam, Tanzania.

*Focus-* Assessing the challenges and opportunities of setting up a productive sanitation value chain whereby bio-charcoal is produced using fecal sludge. And identifying the trade-offs in terms of climate mitiation and the up-scaling potential.

*Partners-* Water Resources Engineering at UDSM, LUCSUS, Centre for Community Initiatives and Slamson Ghana Ltd.

## CHAPTER 5

### 5.1 APPENDICES

#### 5.1.1 List of Participants

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5	Neema Tindamanywe	COSTECH	<a href="mailto:Ney_tinda@yahoo.com">Ney_tinda@yahoo.com</a>
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*Workshop organized as part of the collaborative capacity building program "SUSTAIN'- Sustainable Sanitation in Theory and Action*

*Sanitation workshop 30<sup>th</sup> -31<sup>st</sup> March 2016*

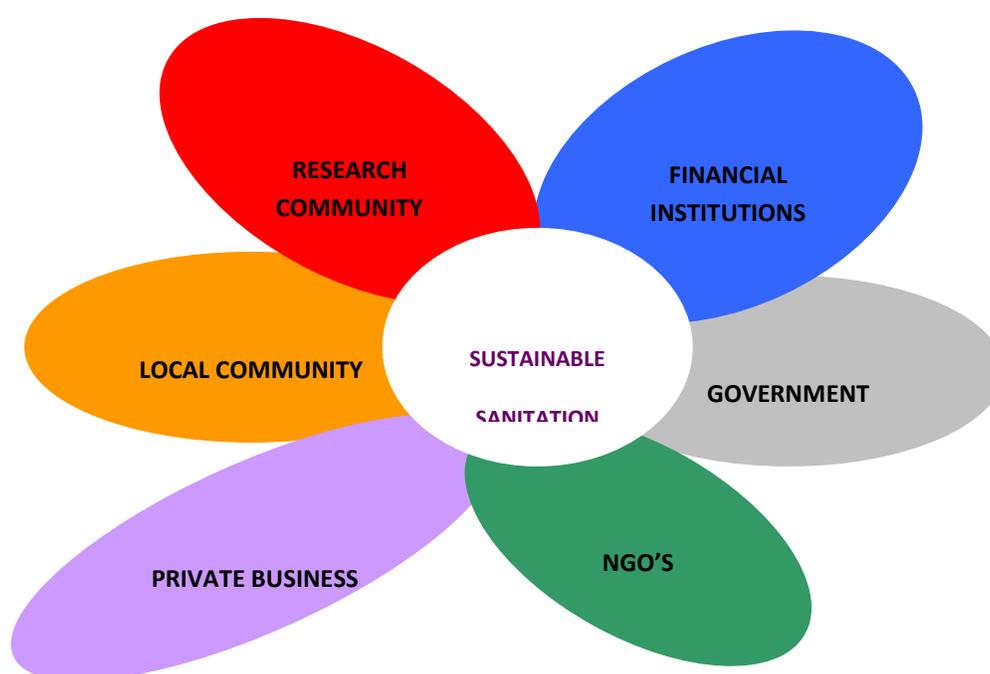
21	Harun Makandi	COSTECH	<a href="mailto:hmakandi@yahoo.com">hmakandi@yahoo.com</a>
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23	Joel Nobert	UDSM	0752546259
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27	Hildegarda Kiwasila	WRDP	<a href="mailto:khildegarda@yahoo.com">khildegarda@yahoo.com</a>
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29	Zabron Mwaipopo	BORDA	<a href="mailto:mwaipopo@bordanafrica.org">mwaipopo@bordanafrica.org</a>
30	Tim Ndezi	CCI	<a href="mailto:ccitanzania@gmail.com">ccitanzania@gmail.com</a>
31	Fredrik Sunesson	SLAMSON GHANA	<a href="mailto:fredrik@sirix.se">fredrik@sirix.se</a>
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37	Ramadhani Kitwana	DPS/UDSM	<a href="mailto:rkitwana@udsm.ac.tz">rkitwana@udsm.ac.tz</a>
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## 5.1 Agenda Schedule

### Turning Waste into Value

*Identifying capacity gaps and collaborative partnerships to advance sustainable sanitation training, research and implementation in Tanzania*



<b>DAY 1</b>	<b>Wednesday 30<sup>th</sup> of March – Plenary room B100 at UDBS</b>
08.30 – 09.00	<i>Registration</i>
09.00 – 09.15	Introduction to workshop and participants Dr. Richard Kimwaga & Dr. Sara Gabrielsson
09.15 - 09.30	<i>Welcome Address</i> Prof. Cuthbert Kimambo, UDSM Deputy Vice Chancellor with introduction by Dr. J. Nobert, Head of Dept. of Water Resources Engineering and Principal, COET, Prof I. Rubaratuka
09.30 – 10.00	<i>Key Note Address</i> <ul style="list-style-type: none"> <li>• <b>Meeting the Sustainable Development Goal on Sanitation in Tanzania - challenges and opportunities</b> Mrs. Dorisia Mulashani, Acting Director Water Sanitation Development Program and Secretary of Sanitation, Ministry of Water and Innovation</li> </ul>
10.00 - 10.30	Sustainable Sanitation in Theory <ul style="list-style-type: none"> <li>• <b>The capacity building gap in the sanitation sector in Tanzania</b> Dr. Richard Kimwaga, Senior Lecturer, University of Dar es Salaam</li> <li>• <b>The SUSTAIN program – a new approach to ‘view and do’ sanitation?</b> Dr. Sara Gabrielsson, Assistant Professor, Lund University, Sweden</li> </ul>
10.30 – 11.00	<i>Tea and coffee break</i>
11.00 – 12.30	Sustainable Sanitation in Action – lessons from beyond Tanzania <ul style="list-style-type: none"> <li>• <b>Turning waste into a business and value adder for people and the agricultural sector – challenges and opportunities.</b> Mr. Alex Manyasi, Government Relations, Sanergy, Kenya</li> <li>• <b>Sustainable Sanitation in East Africa: A comparison of two National Sanitation Programmes in Tanzania and Rwanda.</b> Prof. Juliet Waterkeyn, Chief Executive Officer, AFRICA AHEAD, South Africa</li> <li>• <b>Serving the un-served; the Case of Community-based Bio-sanitation in the Urban People’s settlement in Kenya.</b> Mr. Elijah Odundo, Project manager, Umande Trust, Kenya</li> <li>• <b>Gender responsiveness of access and utilization of water and sanitation facilities in Makerere University and University of Dar es Salaam.</b> Miss. Kebirungi Harriet, PhD Candidate, UDSM/Makerere U.</li> </ul>

- **Turning fecal sludge into a business venture – obstacles and progress** Mr. Fredrik Sunesson, Founder and Director, Slamson Ghana Ltd.
  - **Measuring success and assessing project sustainability – lessons from Cameroon** Miss Angela Huston, PhD Candidate, McGill University, Canada.
- 12.30 – 13.00 Sustainable Sanitation in Action - Panel
- **What has made these activities sustainable?**
- 13.00 – 14.00 **Lunch**
- 14.00 – 14.30 Sustainable Sanitation in Theory – Identifying knowledge and capacity gaps
- **Results from the SUSTAIN PhD Curriculum needs assessment**  
Dr. Richard Kimwaga, Senior Lecturer, University of Dar es Salaam
- 14.30 – 16.00 Sustainable Sanitation in Theory – Break-out session 1  
(Follow assigned colour dots on your name-tag to find your group and room)
- **Identifying knowledge and capacity gaps and synergies**
- 16.00 – 16.30 **Tea and coffee break**
- 16.30 – 17.00 Reporting back and consolidating results from break-out session 1  
(Room change: Conference Room of the Centre for Continuing Education – ground level, next to UDBS)
- **What are the most urgent gaps and issues that we should focus on?**
- 17.00 – 18.00 **Optional study visit to UDSM fecal sludge dewatering facility**
- DAY 2** **Thursday 31<sup>st</sup> March - Plenary room B100 at UDBS**
- 08.30 – 09.00 Reflection on Day 1
- 09.00 – 10.30 Sustainable Sanitation in Action – Lessons from Tanzania (Plenary- B100)
- **The Sanitation Profile in Tanzania – lessons from the National Sanitation Campaign.** Mr Anyitke Mwakitalima, National Sanitation Campaign Coordinator, Ministry of Health and Social Welfare.
  - **Faecal sludge management and microbiological safety of reuse.** Prof. Jaqueline Thomas, Ifakara Health Research Institute
  - **The role of CBO's for sustainable sanitation implementation.** Mrs. Wilhelmina Malima, Director SAWA and Chair of TaWaSa.Net

- **Safe water and agriculture and its linkages to sanitation.**  
Prof. Robinson Mdegela, Sokoine University
  - **Innovations in sanitation marketing and business, micro-finance and subscription based delivery of improved sanitation.**  
Miss Elisa Urbinati, MSABI, Tanzania
- 10.30 - 11.00      ***Tea and coffee break***
- 11.00 - 11.30      Linking Theory with Action – The challenges and opportunities of SUSTAIN
- **Existing MSc and future PhD in Integrated Sanitation Management**  
Dr. Sara Gabrielsson and Dr. Richard Kimwaga
- 11.30 – 12.30      Linking Theory with Action – Break-out session 2  
(Follow assigned colour dots on your name-tag to find your group and room)
- **How do we ensure long-term funding for master students in ISM?**
- 12.30 – 13.00      Reporting back from break-out session 2 (Plenary- B100)
- 13.00 - 14.00      ***Lunch***
- 14.00 – 15.00      Sustainable Sanitation in Action – Lessons from Tanzania (Plenary- B100)
- **Urban recycling and Natural Waste Management – limitations and progress.** Mr Matthew Haden, Founder, The Recycler Limited
  - **SWASH in Tanzania – is up-scaling possible?**  
Mrs. Theresa Kuiwite, National SWASH Director, Ministry of Education, Science, Technology and Vocation
  - **Decentralized waste water treatment systems – learning by doing**  
Zabron Mwaipopo and Godlove Ngoda, BORDA, Tanzania
  - **Addressing urban sanitation to informal settlements using community action and co-production - a case study of simplified sewerage at Vingunguti informal settlement in Dar-es-Salaam**  
Dr. Tim Ndezi, Director, Centre for Community Initiatives
- 15.00 – 15.15      Linking Theory with Action – Introduction to break out session 3  
Dr. Sara Gabrielsson, Lund University, Sweden
- 15.15 – 17.00      Linking Theory with Action – Break-out session 3 with tea and coffee  
(Follow assigned colour dots on your name-tag to find your group and room)

- **How can we build collaborative partnerships to strengthen postgraduate training and improve sustainable sanitation research and implementation?**

16.00 - 16.30

***Tea and coffee break***

17.30 – 17.45

Reporting-back from session 3 and consolidating action plan(s)  
(Room change: Conference Room of the Centre for Continuing Education – ground level, next to UDBS)

17.45 – 18.00

- **Putting our ideas into sustainable action**

Closing of workshop

(Conference Room of the Centre for Continuing Education – ground level, next to UDBS)

Financial sponsor:



### **5.1.2 Guest of Honor Opening Speech**

#### **KEY NOTE ADDRESS**

Meeting the Sustainable Development Goal on Sanitation in Tanzania – Challenges and Opportunities

The Protocol Observed,  
Ladies and Gentlemen,  
Good Morning,

I am glad to be invited in this important meeting to share our views with regard to the development of the sanitation sub-sector in Tanzania. As you all know, on 25<sup>th</sup> September, 2015 at the United Nations Sustainable Development Summit, the World leaders adopted the 2030 Agenda for Sustainable Development which includes a set of SDGs to end poverty, fight inequality and inequality, and tackle climate change by 2030. The Agenda with a set 17 goals and 169 targets came into effect on January 1<sup>st</sup>, 2016 replacing the Millennium Development Goals adopted in 2000.

Tanzania as a country and member of UN is signatory in the adoption of this Agenda. The Government of Tanzania realizes the key role of improved sanitation and safe water supply in the poverty alleviation and economic development efforts at large. Our commitment to achieve equitable access to sanitation and safe water is anchored to our recognition that, access to those public services is a pre-requisite for all Tanzanians to lead a life of human dignity; a cause that extends beyond metrics and results to touch on the daily lives of our people.

The SDGs' Goal 6 is dedicated to water and sanitation, with associated targets that specifically related to water, sanitation and hygiene. The Goal 6: "Ensure availability and sustainable management of water and sanitation for all" was an important recognition of critical role that water and sanitation play in human development, and hence, its function in the elimination of poverty in our communities. The effort reached this far to forge global partnership to address the means of implementation to achieve the SDGs is fundamental in social and economic progress not only for our Tanzania but to all countries which are still lagging behind in fully achieving the SDGs.

Comparatively speaking, the international community is progressively upgrading these macroeconomic and social frameworks, the SDGs inclusive, when at looking at the MDGs the major departure. In the SDGs, the countries are called on to improve not only drinking water and sanitation but comprehensively to deal with other challenges too, such as, water quality, reduce amount of untreated wastewater, reduce water scarcity, implement

integrated water resources management and trans-boundary cooperation, and protect water related ecosystems. Targets 6.1 and 6.2, the two targets related to drinking water and sanitation, set a higher benchmark than the MDGs did, they emphasize on universal and equitable access.

Government of Tanzania on its side has participated in the formulation and implementation of these development frameworks. There are a number of interventions in water and sanitation programs that have been envisaged for sometimes now, with all aimed at improvement of water and sanitation status in the country. The Water Sector Development Program was an effort to comprehensively aiming at improve status of people with access to safe, clean and equitable provision of water services in urban and rural; and improving access to improved sanitation. The Program took off on July, 2007. The National Sanitation Campaign was launched in September, 2013 to facilitate the sensitization and provision sanitation and hygiene services in Tanzania.

Tanzania strives to achieve high quality livelihood to all its citizens by 2025 through improved service delivery in various life portfolios. With regard to Water Supply, Sanitation and Hygiene (WASH), the target is to achieve universal access to safe water supply by 2025; 75% of the population access improved sanitation and ensure Open Defecation (OD) is eliminated by 2019. Currently, access to safe water supply is urban 86% and rural 68%, and improved sanitation 12% respectively. In addition, 12% of the population practices OD. The country aims to increase access to safe water supply to 74% of rural population by 2015; increase access to improved sanitation to 53% and reduce OD from 12% to 6% by 2016. These targets would be achieved through the Water Sector Development Programme on water supply and the National Sanitation Campaign on hygiene and sanitation.

Still, the trend is showing, there are a long way to go to achieve universal access. There are challenges posed by the SDGs which includes; the bigger population, most of whom are in rural areas, are still not accessing improving sanitation, and still have 12% Tanzanians practicing open defecation. 72% of the population using unimproved sanitation facilities; 6% schools and 50% health centres without basic hygiene and sanitation facilities. On water supply, we need to address the gap of more than 50% of people who are using unimproved water sources especially in poor rural areas, and to improve quality of rural water supply. There is a need to eliminate open defecation and to ensure sustainability of water supply in rural areas.

It has been realized that, the main bottlenecks hindering the water supply and sanitation services in Tanzania are as follows;

- ❖ Lack of harmonized implementation plans for the National Sanitation Campaign that exist amongst stakeholders in particular activities implemented by NGOs and

CSOs are inadequately articulated in the National Sanitation Campaign (NSC) framework.

- ❖ Inadequate private sector involvement in water and sanitation services.
- ❖ Insufficient resources for Water Users Associations (WUAs) and Community Owned Water Supply Organizations (COWSOs), both to build and keep them operational once created, resulting in slow progress in formation of WUAs and COWSOs accompanied by operational and maintenance programs.
- ❖ Inadequate reporting system from implementing agencies in the field to the central coordinating bodies.
- ❖ Inadequate resources (human and financial) particularly for implementation of sanitation and hygiene interventions.

Tanzania committed to take several actions in order to achieve the enhancement of water supply and sanitation schemes sustainability and reduce inequalities. These actions include:

- ❖ **Separate service delivery from regulatory functions:**  
Ensure that Water User Groups, Water User Associations and Private Operators operate with level of autonomy required. In order to encourage good management and prevent excessive profiteering of only specific group of operators, standard contracts will be developed. The Ministry of Water and Irrigation in collaboration with the President's Office, Regional Administration and Local Government will supervise the recruitment of registrars at Local Government Authority by 2016. The later will be responsible for registration of Community Owned Water Supply Organizations (COWSOs).
- ❖ **Harmonization of Implementation Plan for promoting sanitation:**  
The Ministry of Health and Social Welfare to develop a guideline that stipulates focus areas on promoting sanitation and hygiene which all the stakeholders will be engaged. This measure will ensure the common goal on sanitation and hygiene is attainable and that through this approach the country commits itself to increase access to improved sanitation to 53% and reduce ODF from 12% to 6% by 2016.
- ❖ **Strengthening resource mobilization:**  
A mechanism to be established by the Ministries of Water, Health and Education to accelerate the mobilization of resources both human and financial which are required for the implementation of sanitation and hygiene interventions. Inadequate resources have been identified as among the barriers to improved service delivery on sanitation and hygiene services in the country.
- ❖ **Private Sector:**

The Ministry of Health and Social Welfare, Ministry of Water, Local Government Authorities in collaboration with the network of CSOs will work together to strengthen the private sector participation in the delivery of sanitation and hygiene service by building capacities to the same and creating enabling environment to access technical support and open up the business opportunities on the sector. The private sector involvement in sanitation and hygiene is expected to be of great importance in strengthening the supply chain on sanitation and hygiene services.

To conclude, let me summarize, the Government is working on to ensure there are smooth execution of various programs and projects in the water and sanitation services. The areas include enhancing government leadership in water sector and sanitation subsector planning processes; strengthening and using country systems; and to build sustainable water and sanitation sector financing strategies. It should be noted that, Tanzania has a strong system for implementing existing policies. What is needed is to strengthen use of data to guide resource allocation. Also, strengthen and sustain financing mechanism for rural communities to reduce inequalities in access to both water and sanitation.

### 5.1.3 Curriculum questionnaire summary

UNIVERSITY OF DAR ES SALAAM

COLLEGE OF ENGINEERING AND TECHNOLOGY

QUESTIONER ANALYSIS FOR CURRICULUM

DEVELOPMENT FOR PhD IN SANITATION

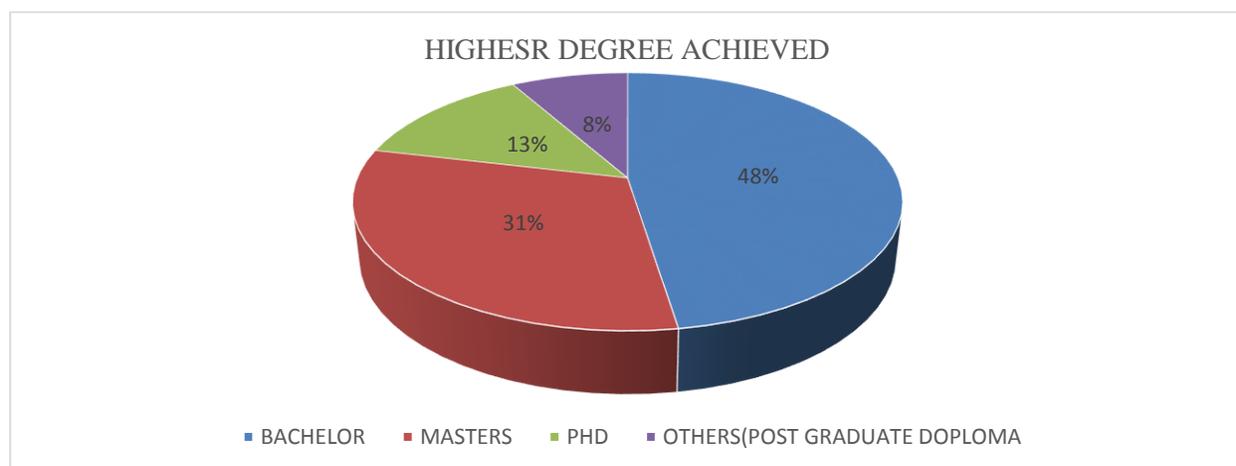
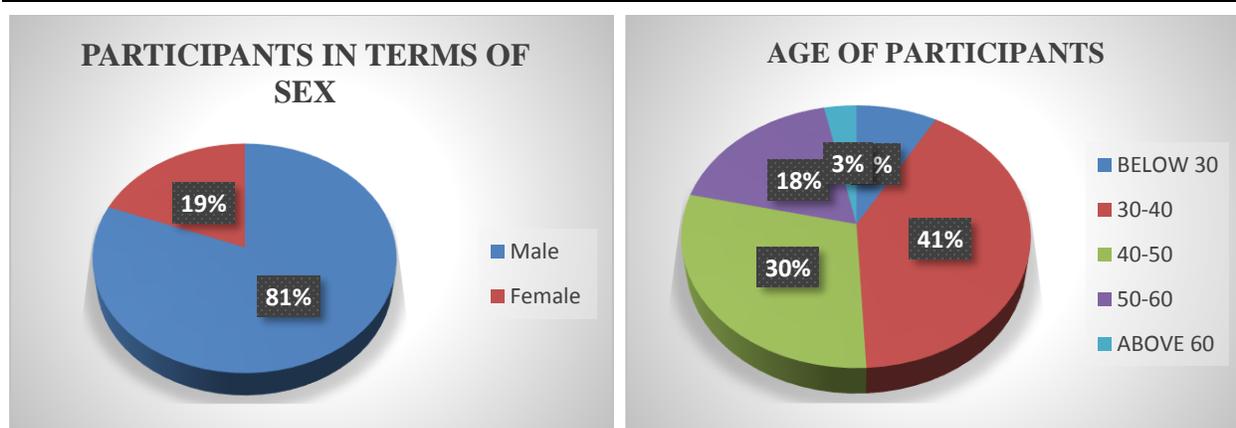
#### BACKGROUND

The University of Dar es Salaam in collaboration with Lund University Center for Sustainability Studies, Sweden have secured funding to implement a PhD programme in Sanitation which will be hosted by the Department of Water Resources Engineering, University of Dar es salaam .The new PhD program is being developed in the wake of the newly adopted Sustainable Development Goals (SDGs), which are underpinned by the principle of inclusiveness and innovation to reach sustainable development. In that spirit we would highly appreciate your inputs and comments towards the development of the curriculum of this new PhD programme in sanitation.

To determine the need of the PhD in sanitation different stakeholders from different part of the country were consulted including participants from **Arusha, Mwanza, Dodoma, Mtwara and Morogoro.**

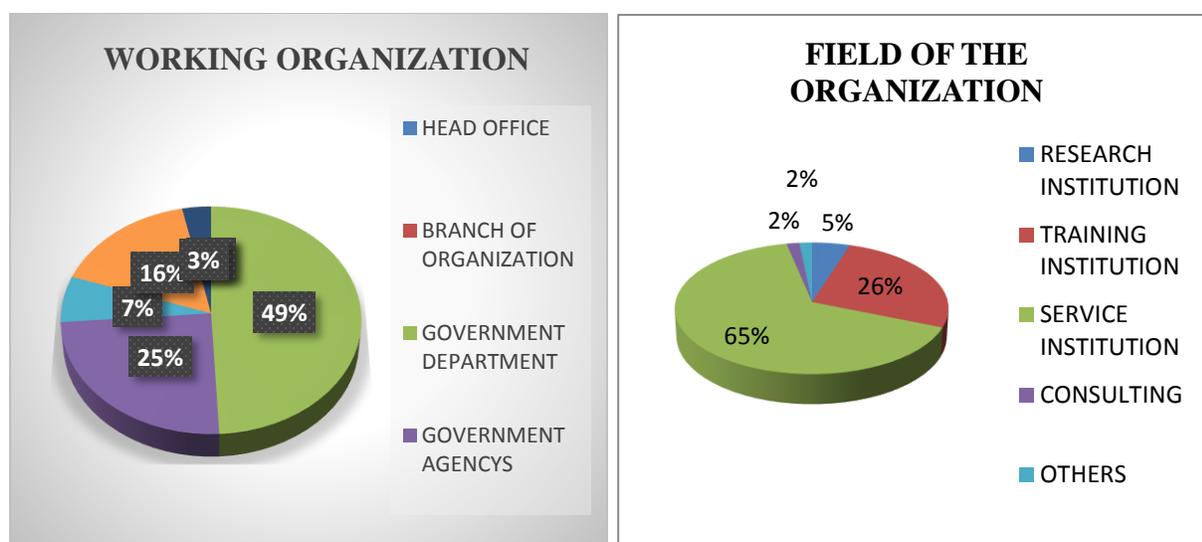
#### PARTICIPANTS DETAILS

Among the stakeholders that gave their input include the member from different sex, age and educational background. The highest percentages of stake holders were male of the age between 30 -40 years old with the highest level degree of Bachelor.



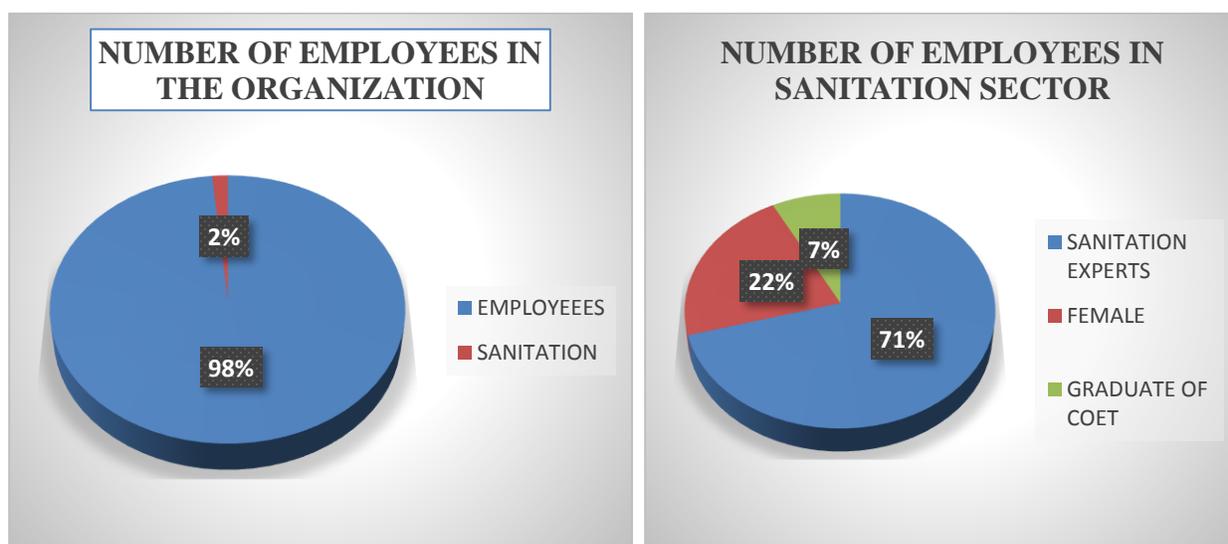
#### CHARACTERISTICS OF THE ORGANIZATION

Most of the stakeholders approached are working in governmental department in the service provisional institutions.



#### NUMBER OF EMPLOYEES IN THE ORGANIZATION IN RELATION TO SANITATION EXPERTS.

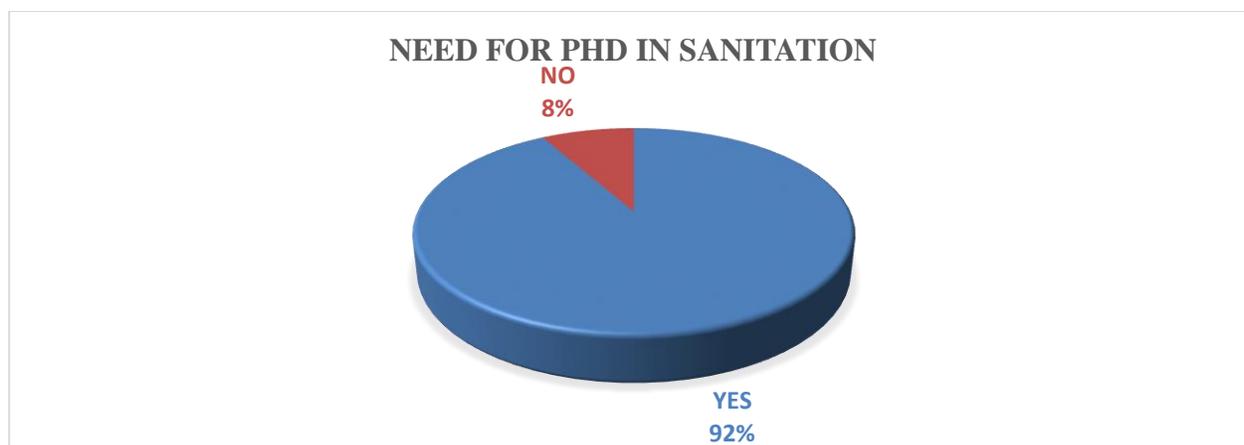
Taking into consideration all the stake holders interviewed, only 2% of the total number of employees in the participating organization are in sanitation sectors (are working as sanitation expertise)



#### CURRICULUM FOR PhD IN SANITATION

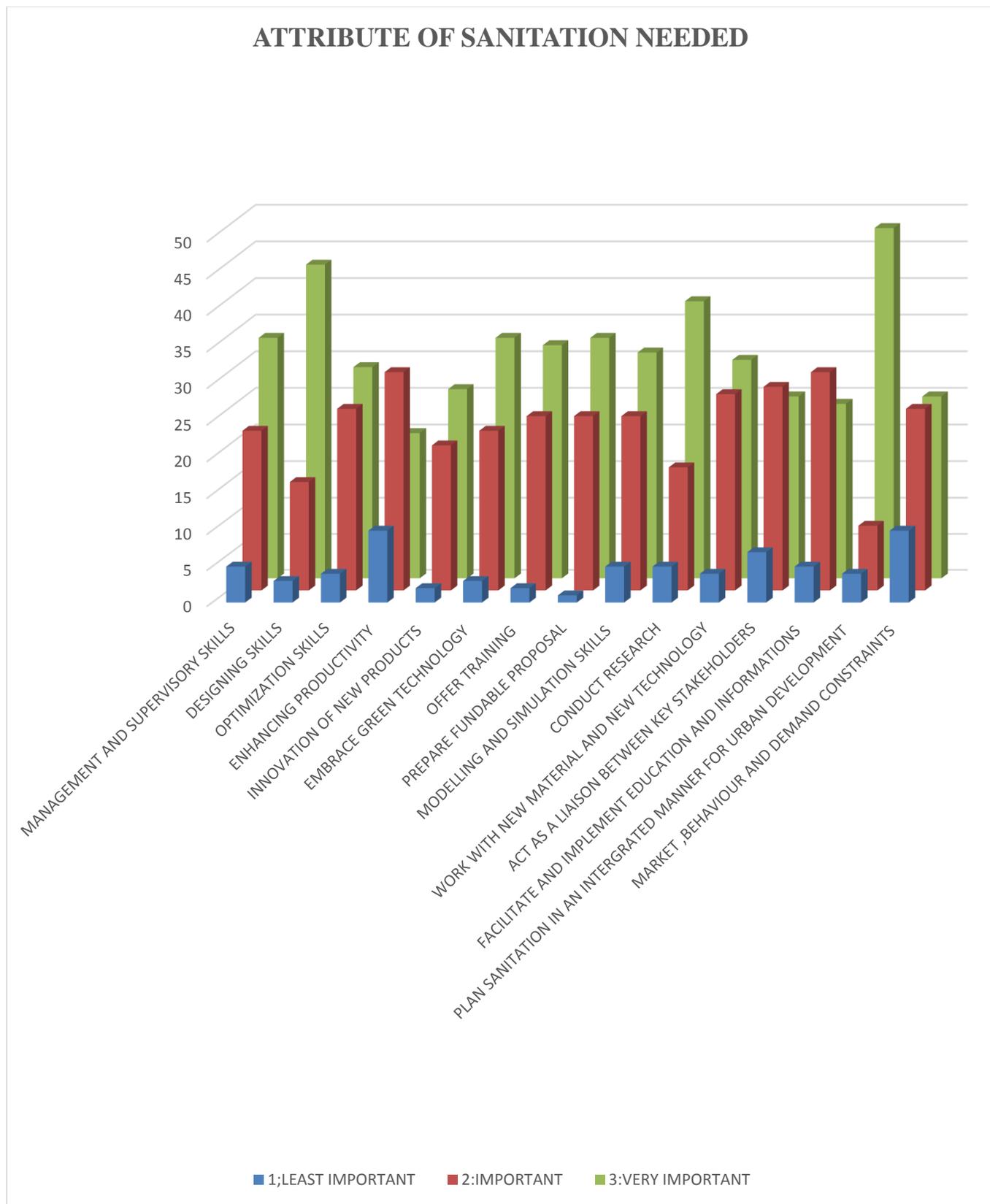
Stakeholders indicated the high need of having the PhD Programme in sanitation Tanzania whereby approximately 92% agreed with the idea of forming a PhD programme at the University of Dar es Salaam.

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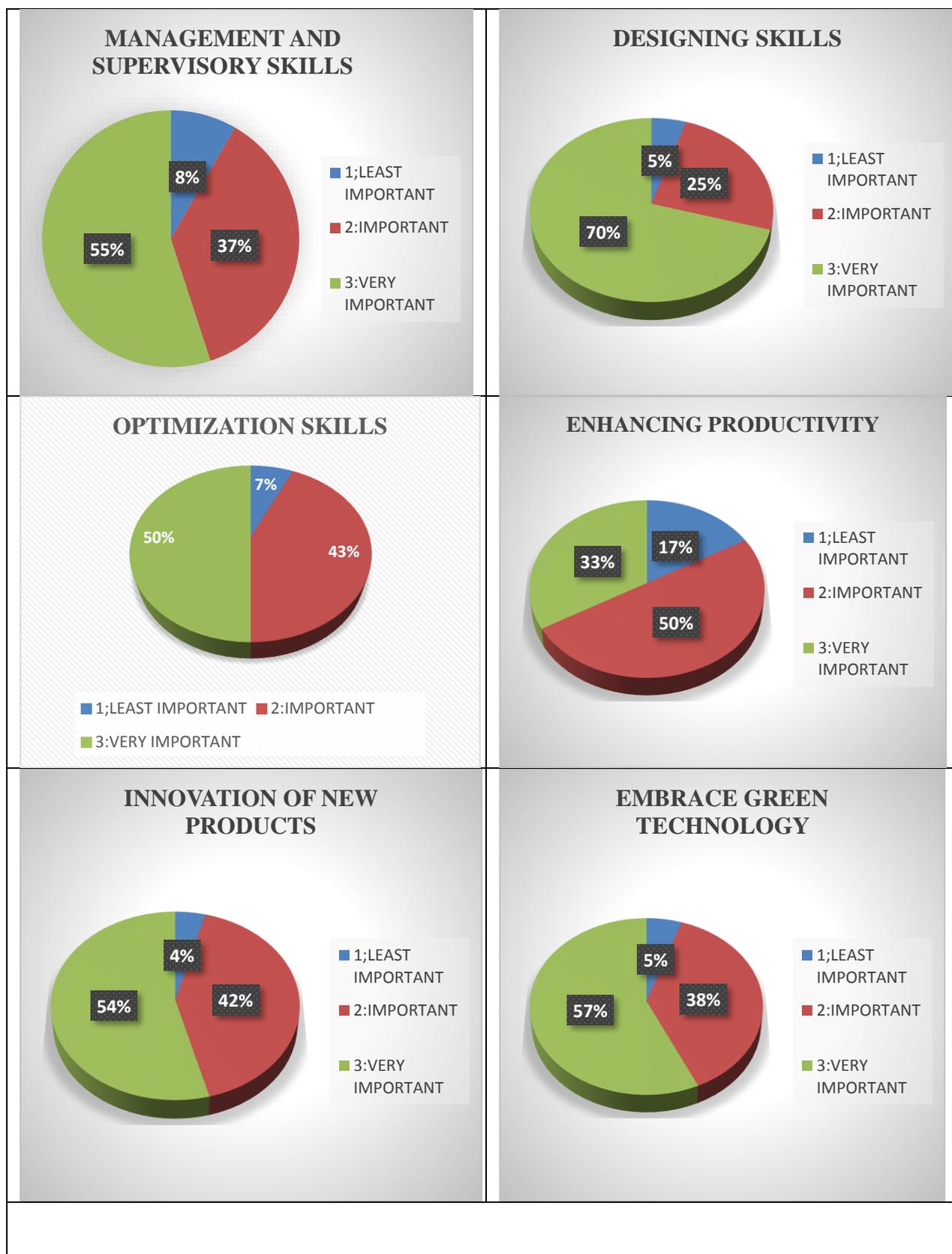


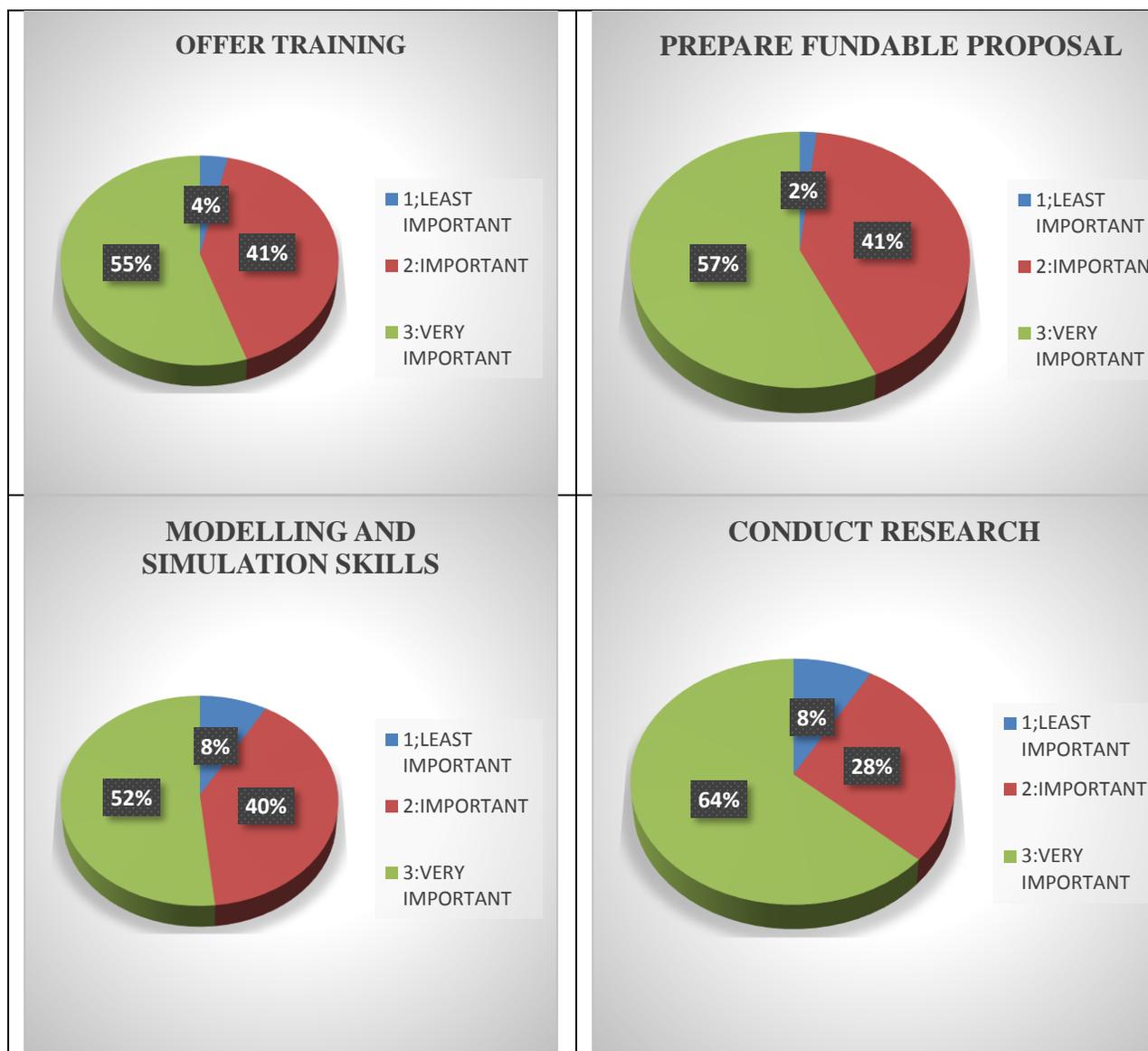
#### B: ATTRIBUTE FOR SANITATION

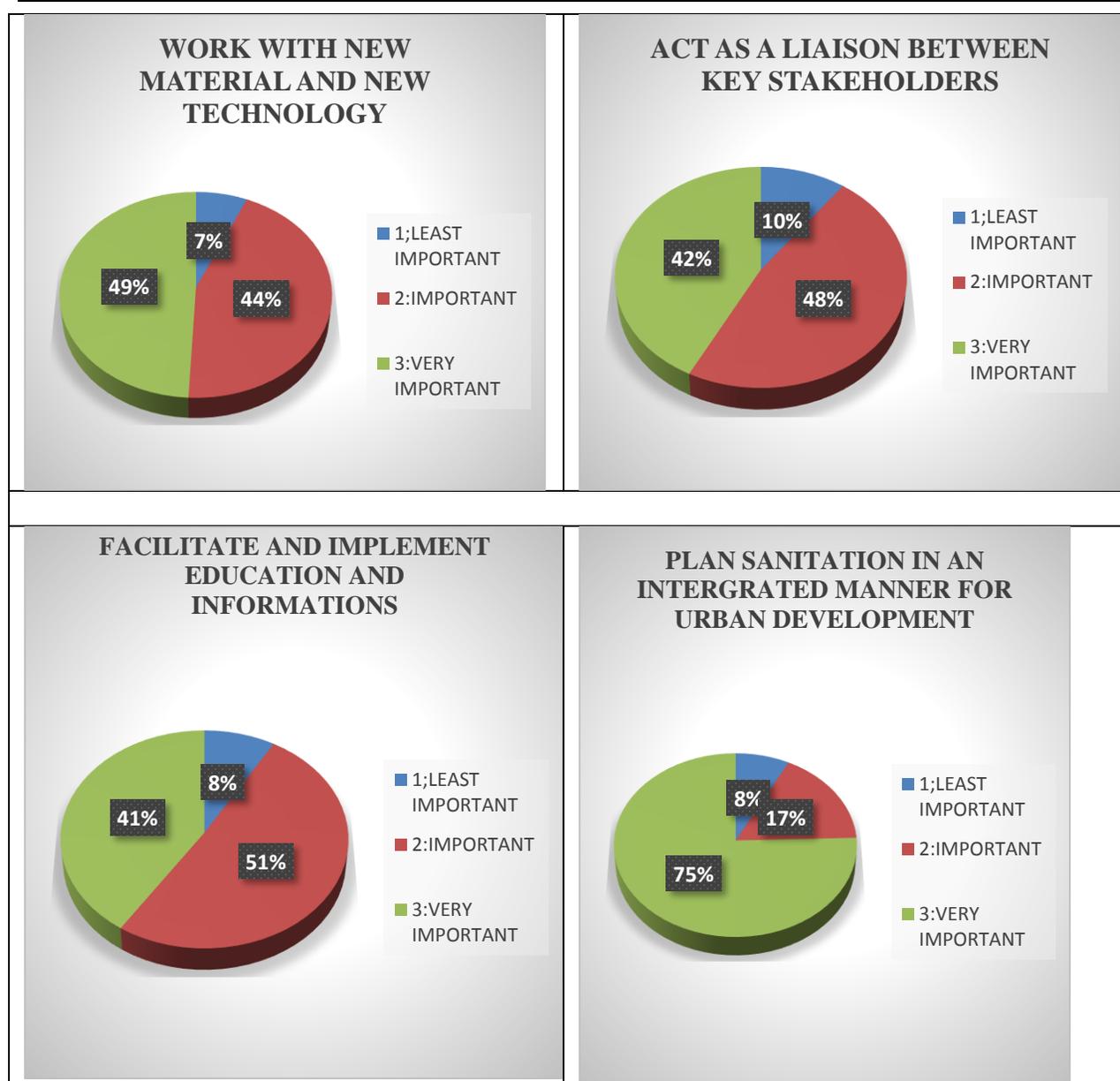
Different attributes were proposed to be main areas to concentrate on in the sanitation PhD programme. The entire proposed attribute were seen to be very important by the stake holders but important to different percentages.

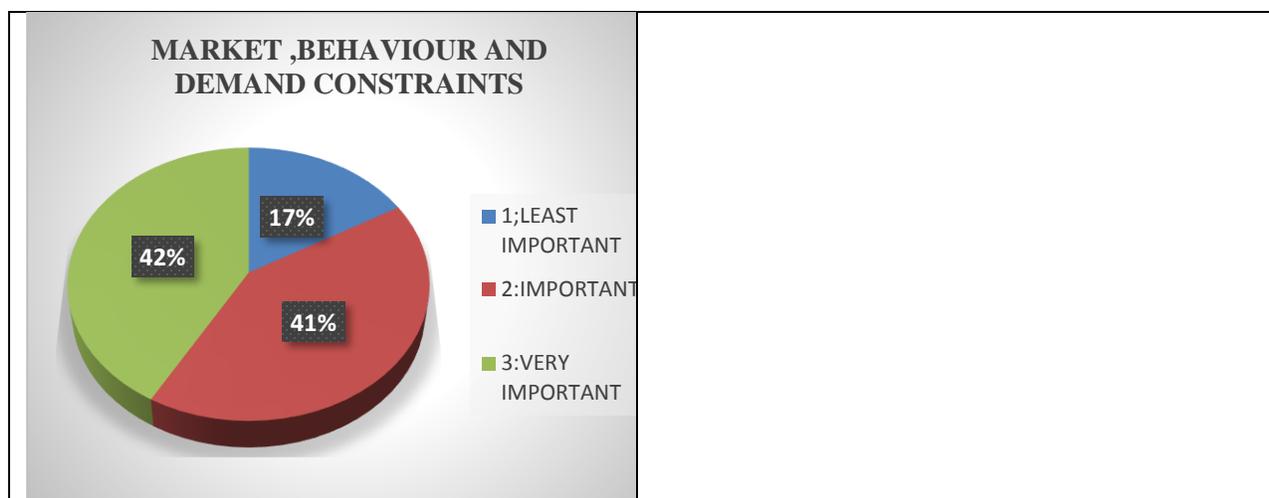


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## SUGGESTION OF AREA TO FOCUS ON

Together with the attributes that were given, the stakeholders were given a room to give out their view on what areas of sanitation need special attention and some of the areas include:

- Embrace environmental conservation.
- GIS-experts, pollution control & environmental conservation.
- Influence policy on sanitation issues, programming skills, statistical analyses.
- Learning from experiences elsewhere, field work for real practical's
- Modeling and construction skills, maintenance skills, development of simple technologies, Consultancy skills.
- Infrastructure planning town in sanitation, all performance treaties of waste water to receiving body, generally sanitation legal services.
- Advanced improvement of rural toilet(sanitation), sanitation legal in public services
- Micro finance, demand creation ,sanitation policy
- Surface water pollution ,ground water pollution ,isotope hydrology
- Inclusion of climate change in planning for sanitation ,Ecosan technologies & marketing options,
- Application of remote sensing & application of remote sensing and GIS in sanitation

**COURSES, TOPICS AND CONTENTS TO BE FEATURED IN PhD PROGRAMME IN SANITATION**

- Waste water and solid waste material design
- Sewage handling, sewage treatment sewerage and public environment
- Energy production from waste
- Sanitation infrastructure management, solid waste and liquid waste management.
- Sanitation management, designing of waste water treatment facilities, environmental health and occupation health, integration of water supply and waste water management
- Environmental health, sanitation related technologies focusing on low cost technologies for rural communities, resources mobilization since sanitation infrastructures require resource allocation.
- Appropriate sanitation technology.
- Solid waste disposal, waste water engineering and management, public health, water treatment management, water supply engineering and management, open channel hydraulics .
- Hydrological measurements, environmental management. Engineering mathematics, research and report writing skills, modeling and software utilization on sanitation.
- Waste water treatment ,design of sanitation options ,economic costs of sanitation ,sanitation and environment, re-use of excreta and grey water, waste water irrigation practices
- Sanitation provision for unplanned informal settlement ,low cost waste water collection and treatment ,sanitation in relation to ground water pollution