

All systems go Africa

Session: Safe, usable and profitable toilets: systems, management, institutions, and regulatory frameworks for safe toilet management in public places

All systems go Africa

19-21 October 2022



Presentations and panelists

Presentations:

- The business model of SEMiLLA Sanitainer - **Peter Scheer (CEO - Semilla Sanitation)/Charles Okrah (African Bagg**
- **Health and safety practices among pit and septic tank emptiers - Godfrey Tamba (Treta Tech)**
- Open Defecation: The Shit Business - **Racheal Ogundipe (Programme Officer, Bread of Life Development Foundation**

Panelists:

- Julienne Tiendrebeogo (General Manager of the Sanitation Department – National government WASH/Burkina Faso)
- Martha Naigaga (Sanitation Coordinator - Ministry of Water and Environment/Uganda)
- Prosper Ayande (Monitoring and Evaluation - Safi Sana)
- Lavuun Verstraete (Urban Water Sanitation and Hygiene (WASH) Manager, UNICEF Ethiopia)
- Theodora Adomako-Adjei (Head of Extension Services at Community Water and Sanitation Agency)

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Presentation: the business model of SEMiLLA Sanitainer

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From shipping container to circular sanitation solution in Ghana ?

The business model of SEMiLLA Sanitainer

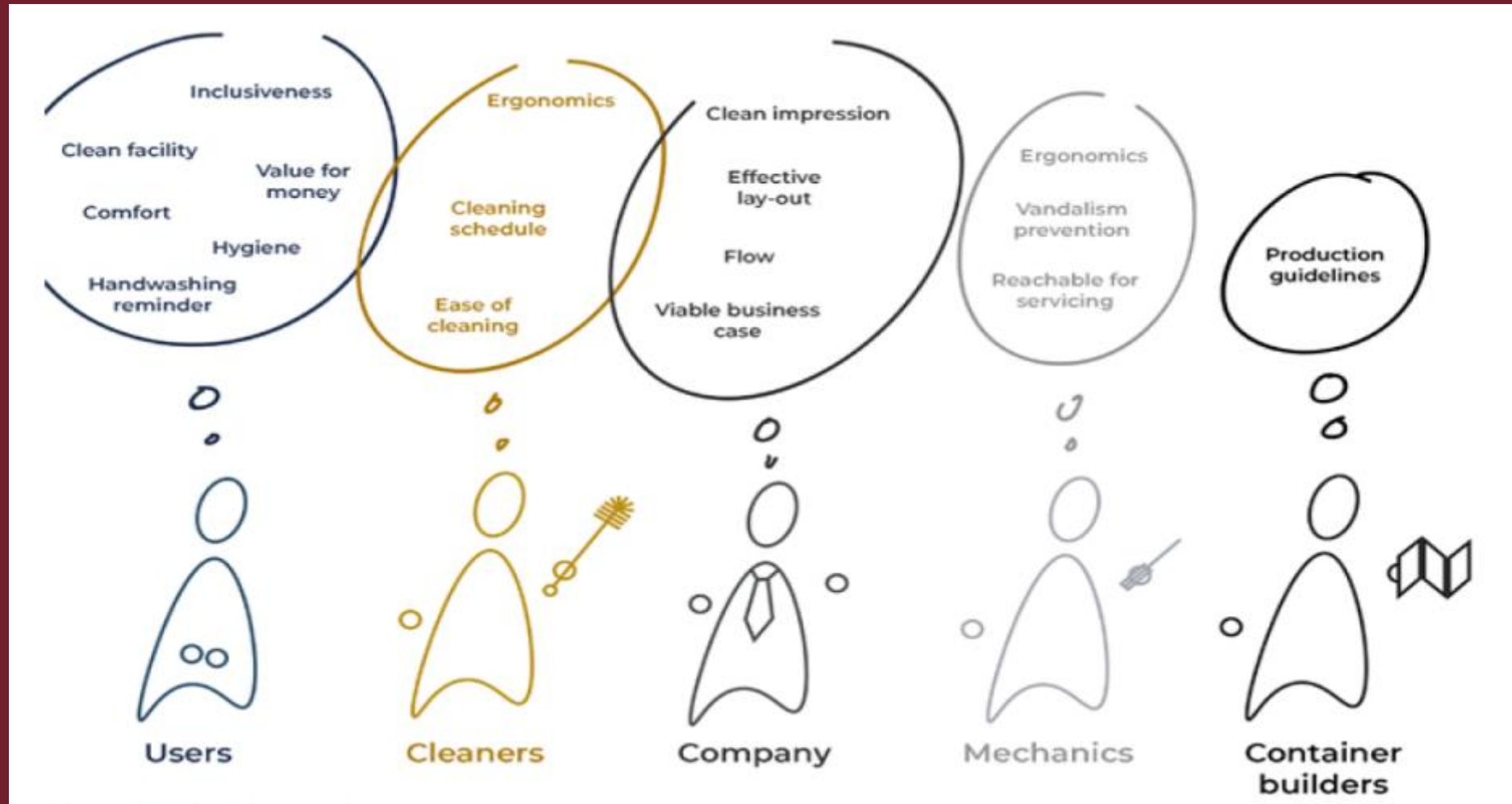
Content of Presentation



- Stakeholders towards Design
- Rental solution
- Entrance Fee should cover OPEX costs
- Biogas – Electricity - Trees – Carbon Credits
- Other focus: Mediloo – for health

The business model of SEMiLLA Sanitainer

Stakeholders – toward design



The business model of SEMiLLA Sanitainer Rental Solution



- Technical: containerized, plug and play
- Economical: Mobile parts are financed by Nijhuis Saur Industries.

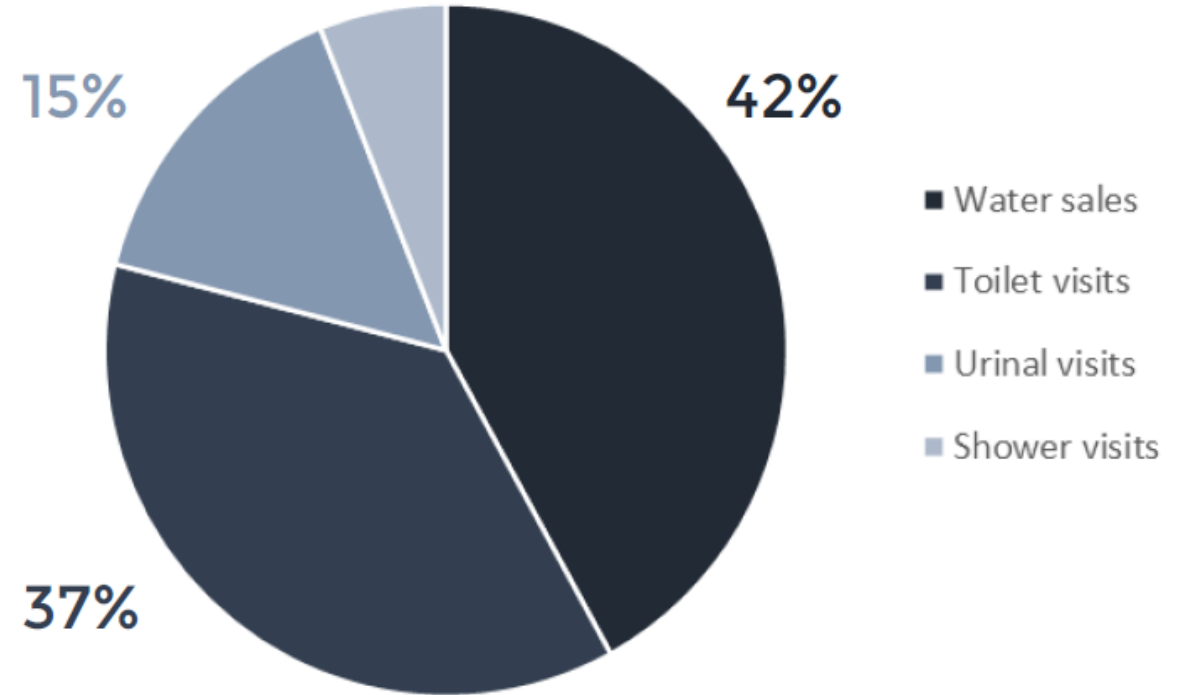
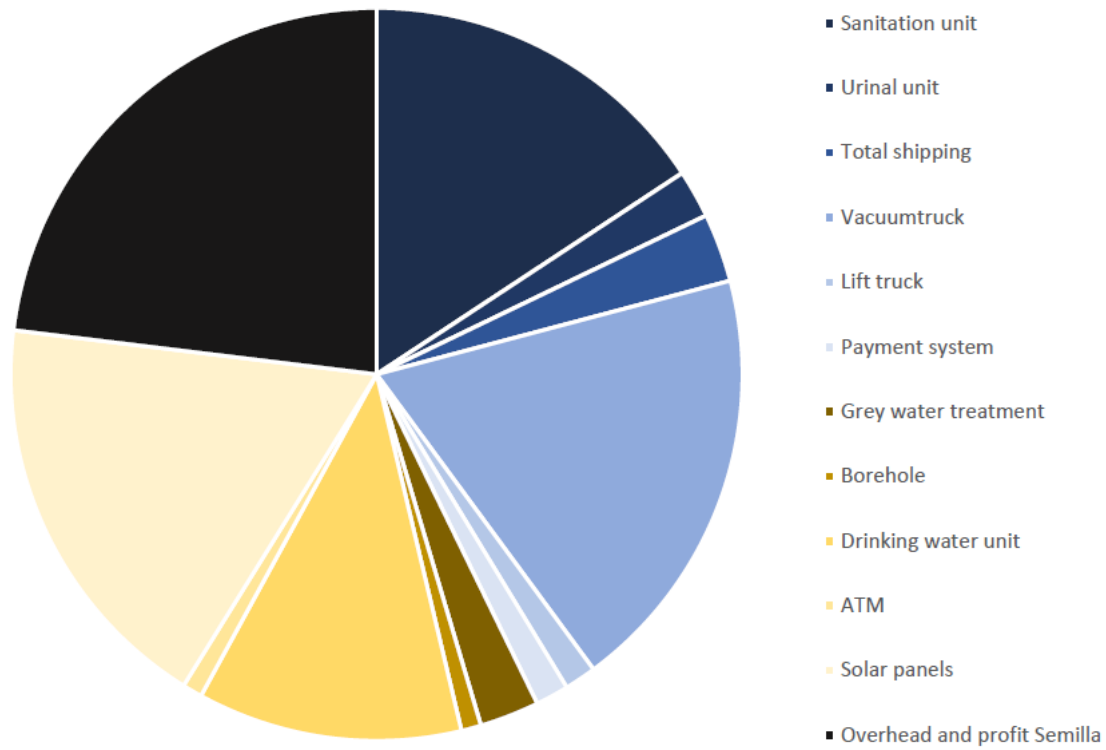
The business model of SEMiLLA Sanitainer

Entrance Fee should cover OPEX costs

- Costs of Employment/management
- Depreciation
- Others

The business model of SEMiLLA Sanitainer

Entrance Fee should cover OPEX costs



The business model of SEMiLLA Sanitainer

Entrance Fee should cover OPEX costs

Clean sanitation

It is estimated that the toilets in the facility are visited 894.250 times every year. The urinals will be visited 876.000 times and the showers 73.000 times.

Toilets

A total of 2.450 people can make use of a clean toilet every day. On the most crowded days, 15.000 people visit the market in Techiman. This means that during their visit, 16.3% of the visitors can visit a clean toilet.

Urinals

2400 men can use a urinal during their visit to the market every day. Assuming half of the visitors are male this means 32% of men visiting the market can visit the urinals during their visit.

Showers

A total of 1.400 people can shower once per week because of the implementation of the Semilla Sanitainer.

The business model of SEMiLLA Sanitainer

Entrance Fee should cover OPEX costs

#	type	entrance fee (ghs)	fee (euro)	#users per day per unit	# users per sanitary facility per day	Time per visit (min)	total Euro pd	total euro per year	total ghs per year
6	urinals men	0,2	€ 0,03	400	2400	2,7	€ 72,00	26.280,00	175.200,00
1	showers men	1	€ 0,15	100	100	10,8	€ 15,00	5.475,00	36.500,00
2	toilets men	0,5	€ 0,08	350	700	3,086	€ 52,50	19.162,50	127.750,00
3	handwash men	0	€ -	1033,33	3100	1,045	€ -	-	-
1	shower women	1	€ 0,15	100	100	10,8	€ 15,00	5.475,00	36.500,00
5	toilet women	0,5	€ 0,08	350	1750	3,086	€ 131,25	47.906,25	319.375,00
2	handwash women	0	€ -	875	1750	1,234	€ -	-	-
							Total	€ 104.298,75	695.325,00

The business model of SEMiLLA Sanitainer

Entrance Fee should cover OPEX costs

Business case Semilla Sanitainer, no external investments									
Income per year	Employee costs	Recurring costs	CAPEX from OPEX	Costs container	Costs urinal unit	Extra CAPEX costs			
180.948,75	32.187,03	22.469,47	40.082,61	53.821,81	7.247,77	280.849,37			
Profit year 1	Profit year 2	Profit year 3	Profit year 4	Profit year 5	Profit year 6	Profit year 7	Profit year 8	Profit year 9	Profit year 10
- 255.709,32	86.209,63	86.209,63	86.209,63	86.209,63	86.209,63	86.209,63	86.209,63	86.209,63	86.209,63
Total money year 1	Total money year 2	Total money year 3	Total money year 4	Total money year 5	Total money year 6	Total money year 7	Total money year 8	Total money year 9	Total money year 10
- 255.709,32	- 169.499,69	- 83.290,05	2.919,58	89.129,22	175.338,85	261.548,48	347.758,12	433.967,75	520.177,38

The business model of SEMiLLA Sanitainer Biogas – Electricity – Trees – Carbon Credits



The business model of SEMiLLA Sanitainer

Other Focus: Mediloo – for health



MEDiLOO® Application

Integration Semilla Sanitation project Ghana



MEDiLOO®

Where public Health and Technology meet

Initial Concept
Smart eSOS toilet
for emergencies

Sensor:
Diarrhoea
Detection

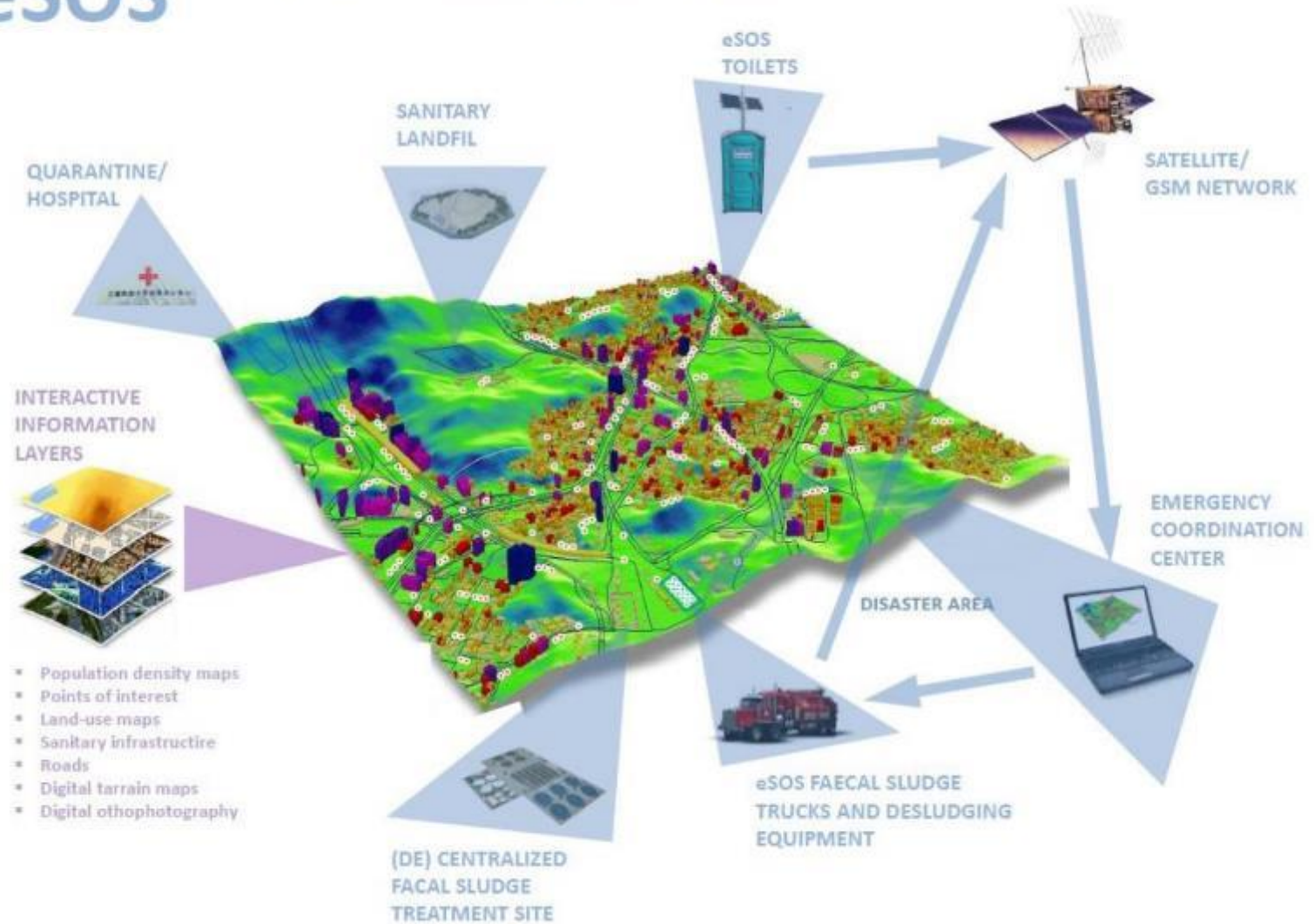
MEDiLOO® Concept
Anonymous data
for preventive measures

Initial concept

Smart eSOS toilet for emergencies

Brdjanovic D., Zakaria F., Mawioo P.M., Garcia H.A., Hooijmans C.M., Pean T.Y., Setiadi T., (2015) eSOS® - emergency Sanitation Operation System. *Journal of Water, Sanitation and Hygiene for Development*, 5(1):156-164.

eSOS® Emergency Sanitation Operation System



Smart eSOS toilet Prototype Experimental Field Testing in Kenya



<https://www.viawater.nl/projects/esos-smart-toilet-kenya>

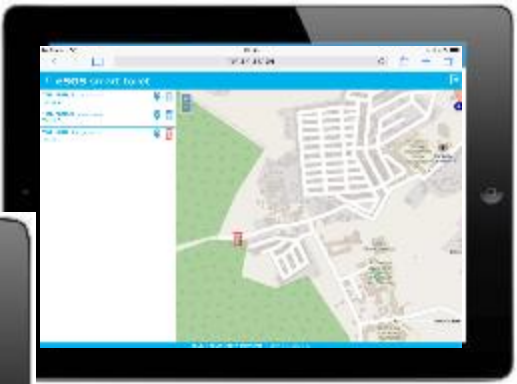


Smart eSOS toilet Prototype

Remote monitoring



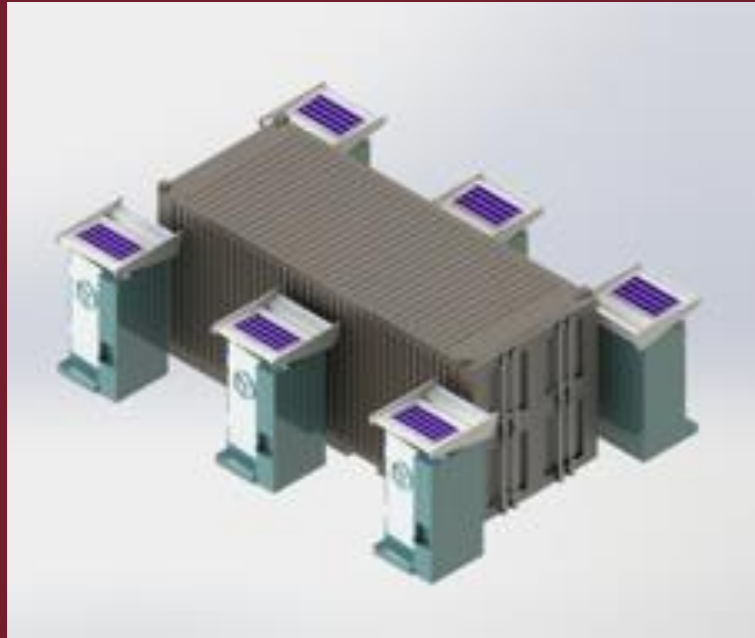
Diarrhoea Detection



MEDiLOO®

Concept development

Applied Research
Two Patents
Launching Customer



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HEALTH AND SAFETY PRACTICES AMONG PIT AND SEPTIC TANK EMPTIERS

Presented by Godfrey Tamba (Treta Tech)

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19-21 October 2022



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Supporting water sanitation
and hygiene services for life

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Introduction:



Photo by USHA

- About 90% of the urban population in Uganda rely on on-site sanitation facilities (septic tanks and pit latrines).
- The government is promoting safe disposal of faecal sludge into treatment plants
- Less focus has been placed on the safety of workers, yet the prevalence of manual, semi-mechanised and fully mechanised emptying is very high.



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Introduction:



This research was conducted in the USAID-Uganda Sanitation for Health Activity (USHA) Central West (CW) and Central East (CE) regions, including Kampala in Uganda.

Main objective of USHA:

To increase access to improved and sustainable water, sanitation and hygiene services to households, communities, schools and health facilities in 21 districts of Uganda.

Photo by USHA

Research Objectives



Photo by USHA

Main:

To assess health and safety practices among pit and septic tank emptiers as well as to comprehend the impact of health and safety measures on pit and septic tank emptiers.

1. To identify the kind of hazards the emptiers are exposed to due to their nature of work.
2. To identify health and safety practices performed by emptiers.
3. To identify the barriers to health and safety practices among emptiers.
4. To determine the effect of health and safety measures on the emptiers.

Respondents:

- The study used a quantitative research method, purposively sampling 19 emptiers.
- Three types of emptiers –11 were manual, 6 - semi-mechanized, and 2 - fully mechanized
- 6 participants were from Kampala, 11 from Jinja and Kayunga in Central East and 2 from Masaka in Central West



Variable	Percentage (100%)
SEX	
Male	95%
Female	5%
AGE (years)	
19-30	63%
31-45	32%
Above 45	5%
EDUCATION	
No school	10%
Primary	53%
Secondary	16%
University	16%
Vocation	5%

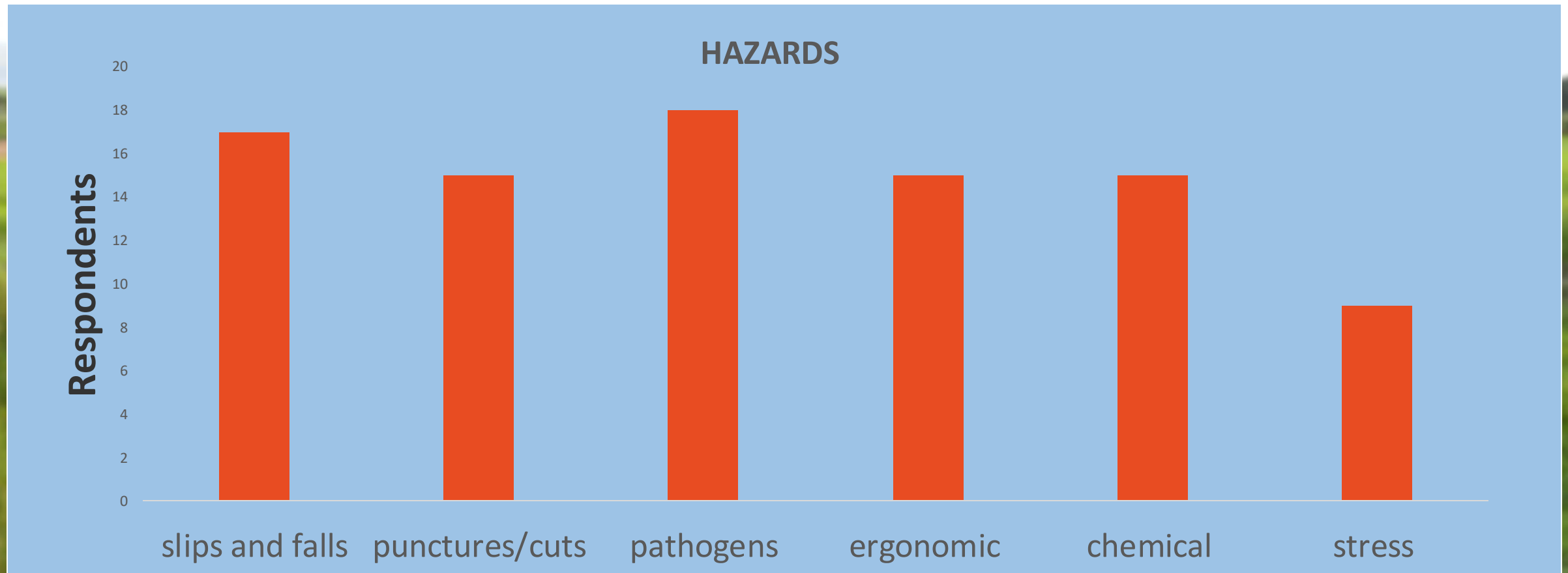
Current Health and safety practices:



practice	Manual emptiers	Semi-mechanized	Fully mechanized
Workforce	In groups of 2-3 people	2-3 people	2-3 people
Tools used	Buckets Jerricans Spades Ropes	Hooks Barrels Gulpers	Hooks Hose pipes
Working period	Night	Day	Day
PPE	Do not use	Wear incomplete PPE	Do not use
Disinfectants	Paraffin/petrol mixed with detergent and water	Paraffin/petrol mixed with detergent and water	Paraffin/petrol mixed with detergent and water



RESULTS: HAZARDS FACED BY EMPTIERS:



RESULTS: HEALTH AND SAFETY PRACTICES

- ❖ 53% emptiers are not aware of any health and safety policy.
- ❖ 58% have never received any training on health and safety.
- ❖ 90% wear incomplete PPE.
- ❖ 87% Seek treatment on a weekly (5%), monthly (26%), quarterly (42%), or annual (10%) basis.

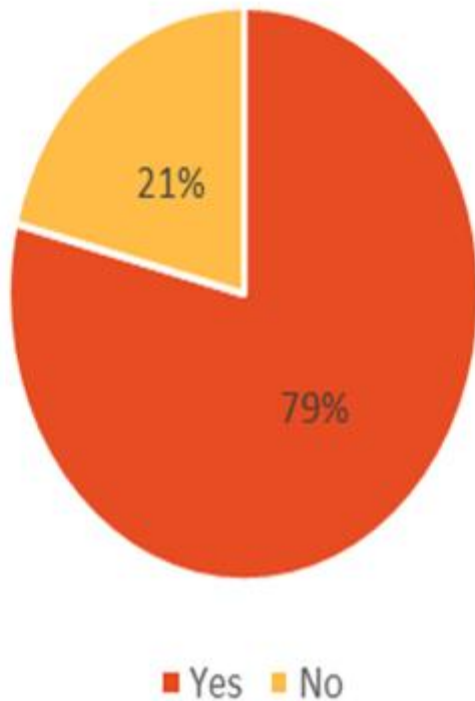
In form of;

- milk consumption,
- deworming,
- hepatitis B, tetanus, and typhoid vaccinations.



HEALTH AND SAFETY PRACTICES:

DISINFECTANT USE

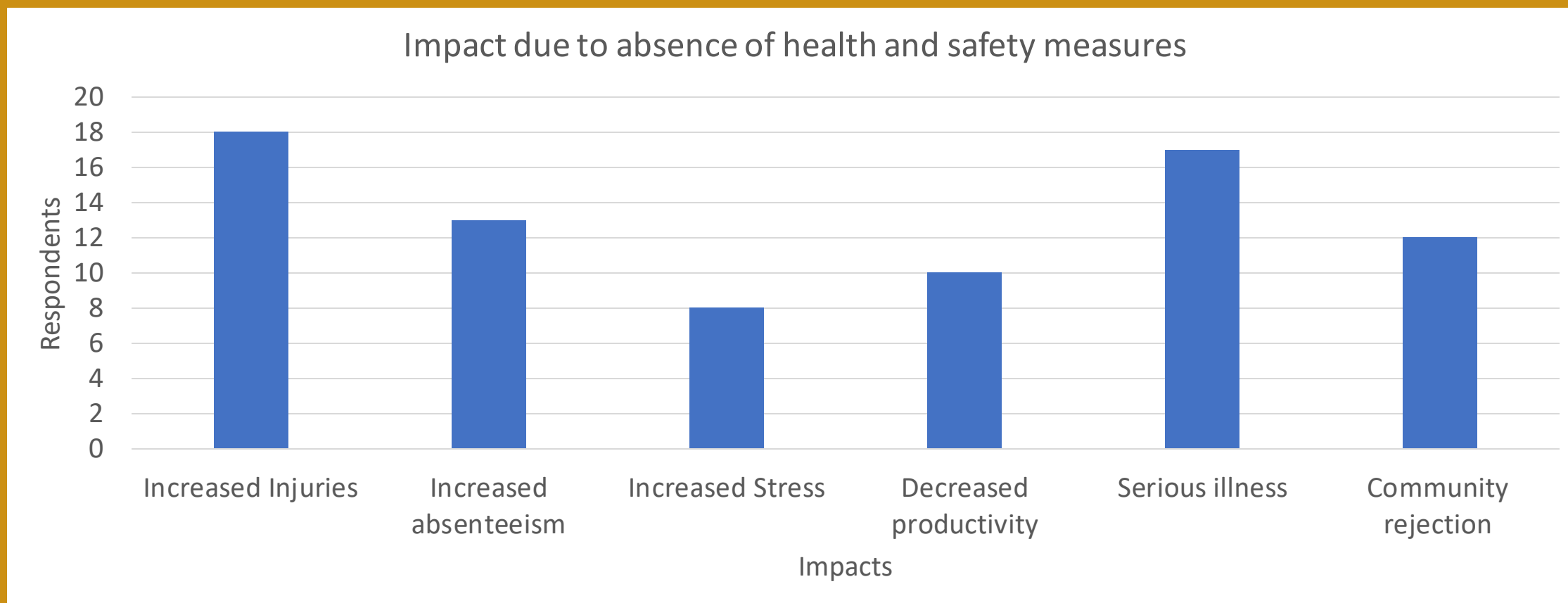


Disinfectants used;

- Detergents
- Paraffin and petrol

Detergent is used for cleaning up when mixed with water and often mixed with paraffin or petrol to form a disinfectant solution which is poured into the pit.

EFFECT OF HEALTH AND SAFETY PRACTICES ON EMPTIERS.





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RECOMMENDATIONS



The USHA project has;

- Disseminated policies,
- Trained emptiers on health and safety practices,
- Provided PPE to emptiers,
- Dignified emptiers under a common brand called Clean pit.

However, more effort is needed in

- Regulation,
- Medical treatment awareness

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Find out more

www.ircwash.org/all-systems-go-africa



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Open Defecation: The Shit Business

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Foundation**

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Financing Sanitation: Bread of Life Development Foundation



WATER SUPPLY AND SANITATION
SECTOR REFORM PROGRAMME
(WSSSRP) III



Farewell to Open Defecation

Project funded by the European Union



Bread of Life
Development
Foundation

Implemented by:

Ekiti State Small Towns Water Supply and
Sanitation Programme (STWSSP)
Gbonyin LGA
Ekiti West LGA

Contents

1. Background -Statistics
2. Potential business opportunities in Open Defecation
3. Shit business: commercially managed communal toilets case study in Nigeria
4. Conclusion



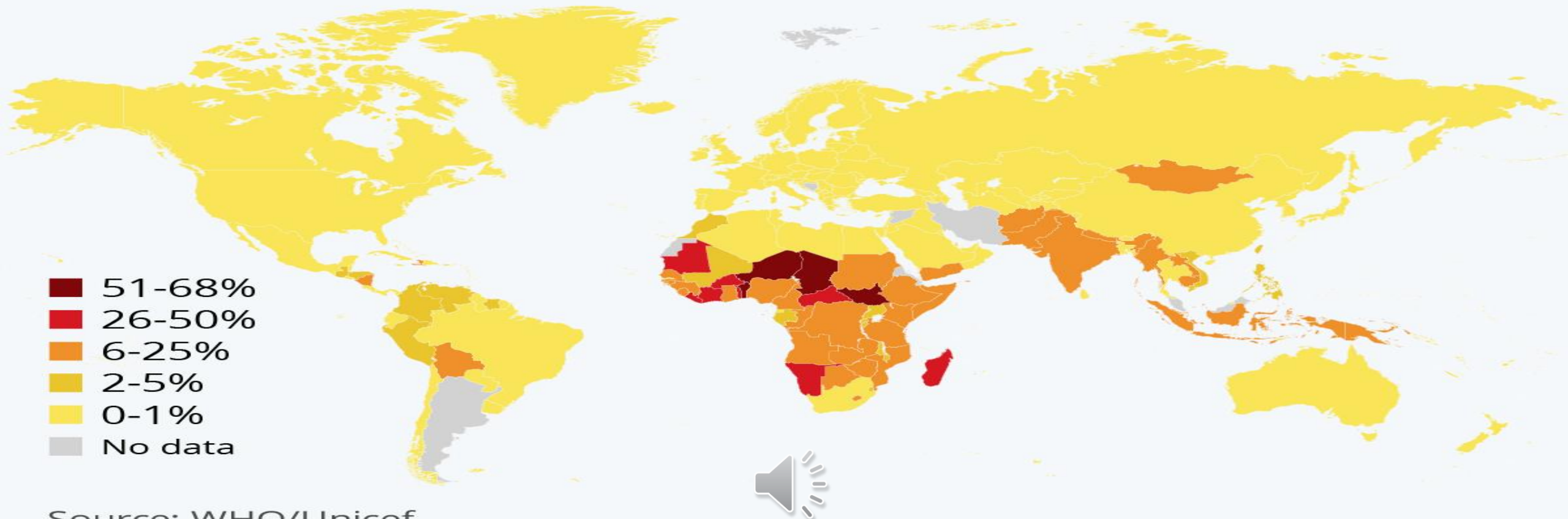
Background

- In 2020, 494 million people (6.3%) of the world still defecate openly
- Around 196 million out of the 494 million are from Sub-Saharan Africa
- With West and Central Africa accounting for 24% of global open defecation
- 46 million people in Nigeria still practise open defecation



494 Million People Still Defecate Outdoors

Share of the population practicing open defecation in 2020, by country



Source: WHO/Unicef

Products of Open Defecation

- Depending on diet each person excretes around 1.5 litres of urine and a 250g of faeces per day.
- Translating to an average value of 500 litres of urine and 90kg of shit per capital and per year respectively.
- 494million people defecating openly (globally), makes over 40 million tonnes of shit per year
- It is a good business opportunity to construct commercially run toilet to manage shit

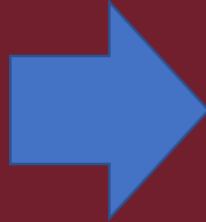


Shit management is Big business, Shit Business is good business



This man makes N10,000 (13\$) daily from managing Shit in Mubi Cattle market

Financing Sanitation: Bread of Life Development Foundation



 **WATER SUPPLY AND SANITATION
SECTOR REFORM PROGRAMME
(WSSSRP) III** 

Farewell to Open Defecation

Project funded by the European Union

Implemented by:

 **Bread of Life
Development
Foundation**

- Ekiti State Small Towns Water Supply and Sanitation Programme (STWSSP)
- Gbonyin LGA
- Ekiti West LGA

Open Defecation in Ekiti State



- About 1.4 million population out of over two million residents of Ekiti State were engaging in the unhealthy habit of open defecation
- This is due to poorly managed toilet or the absence of public toilets in the state
- One of the solutions is commercially managed communal toilets
- This encourages sanitation and hygiene and also provides a source of income for the community



Farewell to open defecation project

- Bread of Life Development Foundation, implemented the “Farewell to Open Defecation” project under the European Union Water Supply and Sanitation Sector Reform Programme (WSSSRP) III
- This project beneficiaries were 14 small towns in Gbonyin and Ekiti West LGAs, Ekiti state.



Farewell to open defecation project

- The action has resulted in the construction of an integrated Sanitation Demonstration Units (SDUs) in public places in both LGAs
- Comprising 2 blocks of 2 compartment water flushed toilet, urinal, handwashing facility, bathing room, laundry, car wash, a sanitation centre, solar powered motorised borehole, and public water points.
- Presently, these are the best functional public toilets in Ekiti state that has the 2nd highest level of open defecation in Nigeria.



Technical specifications of the facility



- 1no block of gender sensitive (male and female) comprising 2 compartment water flushed toilet, 2no urinals (male only), 2no handwashing facility, a bathroom, laundry space and septic tank/soakaway)
- Each block also contains two burglary metal doors with knocks for main entrance, two fabricated metal windows with burglary for front windows, 4 full fabricated doors for laundry and bathroom, 4 fabricated half metal doors for toilet compartments, and 8 fabricated metal windows with burglary.



Technical specifications of the facility



- A solar powered borehole reticulated into 1no 4000 litres overhead concrete tank resting on four pillars at a level 6m above ground level. Drilling of a borehole according to Geophysical survey approved by Bread of Life Development Foundation
- Original Grundfos SQF 2.5-2 Solar Submersible pump with following accessories: cable joint kit; drop cable 2.5mm² x 3 core; uPVC rise pipes 1 1/4 x 3m, solar modules 200w (6 for each site); and solar switch were securely installed
- 4 taps for public water supply and 3 for car wash. 5m x 5m car port mounted on fabricated galvanized steel poles, curved supporting poles, with additional double front poles for security.



Facility Commissioning



One of the Ekiti State toilet facilities constructed by Bread of Life Development Foundation, Erio-Ekiti



Facility Commissioning



A Traditional Ruler testing the facility during commissioning



Facility Maintenance



Constructed WASH facilities is being operated and maintained sustainably through Public private partnerships supervised by the community and operation and maintenance cost will be recovered from the following user fees:

- a. User fees from use of water flushed toilets
- b. User fees from use of urinals
- c. User fees from use of bath showers
- d. Revenues from car wash services
- e. Revenues from rent of laundry space
- f. Revenues from water sales



Business Model – Cash Flow



A. Income streams	Daily users	Tarriff Naira	Daily turnover	Monthly turnover	Annual turnover
Toilet	25	20	500	15,000	180,000
Urinals	30	10	300	9,000	108,000
Bathroom	15	20	300	9,000	108,000
Handwashing	x	Free	0	0	0
Car wash	5	200	1,000	30,000	360,000
Water kioks	10	20	200	6,000	72,000
Laundry services	5	100	500	15,000	180,000
Total revenues			2,800	84,000	1,008,000
B. Expenses			Daily expense	Monthly expense	Annual expense
Leasing fee			333	10,000	120,000
O and M Detergents			200	6,000	72,000
Salary: 1 Part time Attendant			666	20,000	240,000
Total expenses			1,199	36,000	432,000
C. Profit (A-B)			1,601	48,000	576,000

Impacts

- 456,700 people in 14 towns access safe toilets
- 456,700 Nigerians ending Open Defecation
- 14 local entrepreneurs directly employed
- 70 toilet workers indirectly employed
- N500,000 naira generated from leasing fees
- 11 Bank accounts opened for Sanitation Fund
- Ondo and Plateau state governments replicating project for about 5m people
- Replicable in Africa, Asia, and Latin America

6 CLEAN WATER
AND SANITATION



3 GOOD HEALTH
AND WELL-BEING



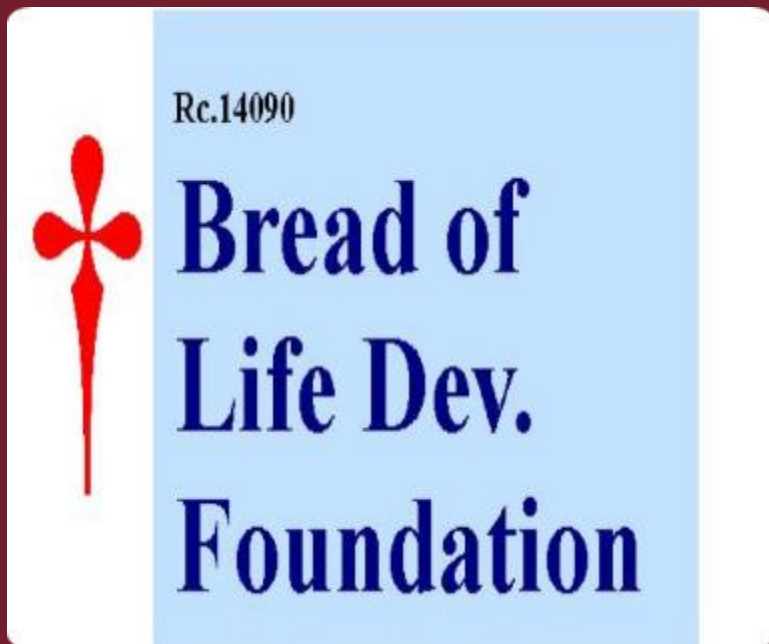
9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



Conclusion

- It cost Bread of Life about 7.5 million Naira to construct one facility
- Which yields about 576,000 Naira yearly
- This project was constructed in small towns, turnover will be higher in urban areas
- Shit business is best done on a commercial basis in urban areas, may not be profitable in other areas





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