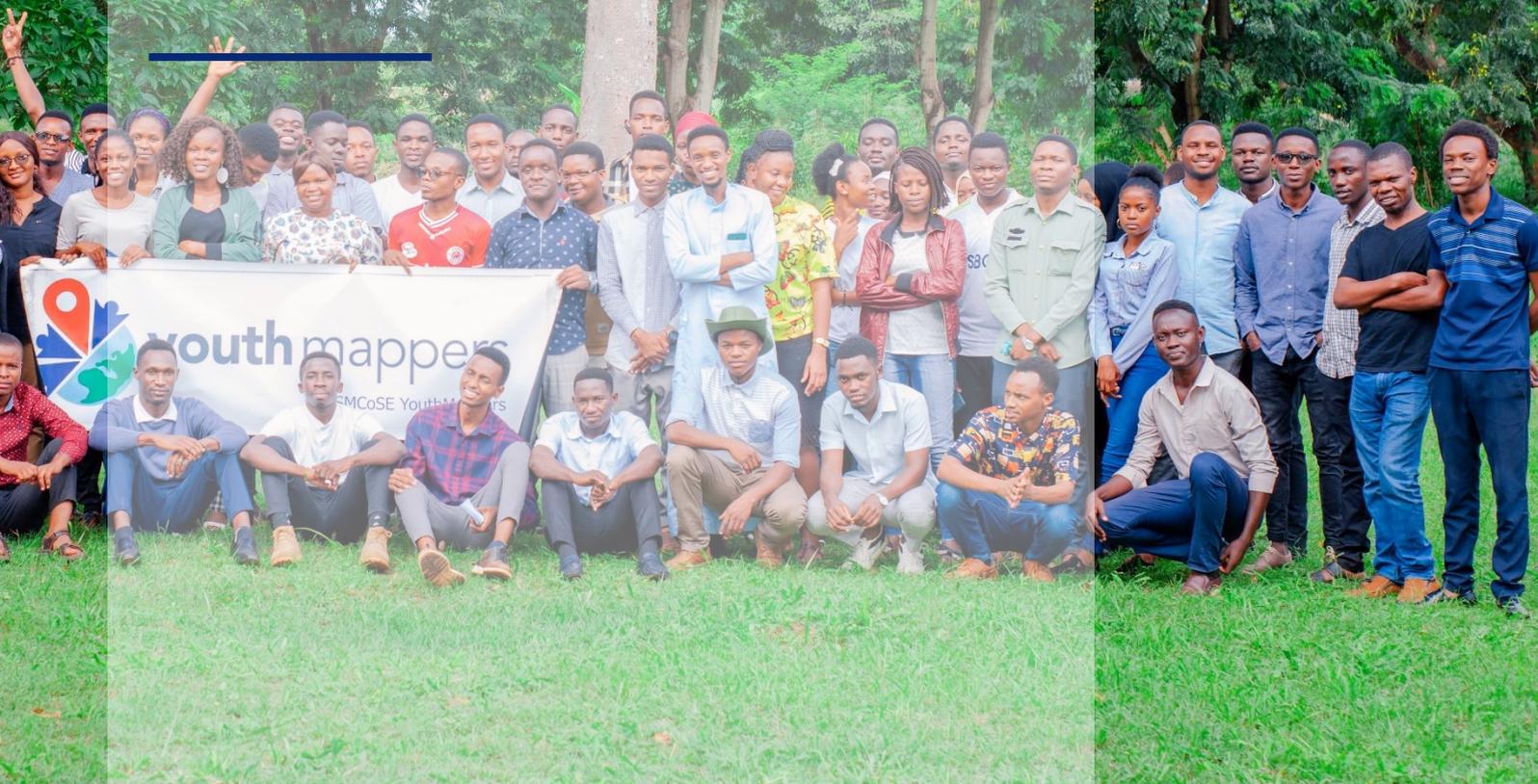


Solid Waste (Plastics) and Siltation Level in Storm Drainage: Data Collection Feedback.



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SMCoSE Youthmappers

Authored by: Frank Anderson & Gideon George Sway

Presented by: Gideon George Sway



1 INTRODUCTION

SMCoSE Youthmappers Chapter is the single definitive and inclusive representative group for YouthMappers at the Sokoine University of Agriculture (SUA). SMCoSE Youthmappers Chapter is affiliated with the global network of YouthMappers, (www.youthmappers.org). The purpose of YouthMappers shall be to grant students the opportunity to improve skills in the field of mapping and create open geographic data and analyses that address locally defined development challenges worldwide. Our vision is to cultivate a generation of young people to become leaders in creating resilient communities and empowering them to define their world by mapping it. The organization will strive to exchange and collaborate with other YouthMappers chapters and youth groups worldwide while also offering themselves as a resource and service to Sokoine University of Agriculture, student organizations and our local community to add value through mapping.

Following the call of proposal of Community Impact Microgrants – 2021 from Open Map Development Tanzania (OMDTZ) which involved community-based organizations and youth groups, the OMDTZ organization were able to fund SMCoSE Youthmappers Chapter proposal aimed at collecting solid waste datasets specifically plastic waste in areas near drainage systems or within drainage systems itself. The community impact microgrant has involved data collection in all areas that historically experienced floods in Morogoro urban with the purpose of increasing knowledge on field data collection among the youth mappers chapter members and other students but also to contribute to the government on the availability of data to support data driven decisions. The data collected will give the baseline information to the urban planners so as to architect the best layout of drains while considering plastics waste as a main source of clogging drains. Also, the community impact program will give rise to availability of more data which can aid in predictive analysis of the region to the near future under the consideration and engagement of sustainable development goals 2030, goal number 11 (Sustainable cities and community).

2 METHODOLOGIES

Kobo toolbox was used as a data collection tool, enumerators depart into the field to collect plastic bottles information as they appear in the storm drainage systems. Plastic bottles were recorded as one point however, in the event where many plastics bottles are present together, a degree of 50m was recorded as single point. Recording the level of siltation was trick. The project used the conceptual framework based on confidence of measure of enumerators. The project creates three conceptual arguments: (i) if the base of the ditch is seen, then is classified as low level of siltation (ii) if the base of the ditch is not seen, then is classified as medium level of siltation (iii) and if the siltation level is either near or overtopping the ditch, then is classified as high level of siltation. The project acknowledged the uncertainty would have been raised due to subjectivity of enumerators. The project involved another group of enumerators (same people who collected data from site) and sample the dataset in random order so that each enumerator can validate the information collected by another enumerator. This may have reduced the level of subjectivity in the dataset. The data cleaning and quality checks was observed at the onset up to the end of the data collection and validation.

3 RESULTS

The total number of over 9190 data points was collected with over 40 variables. The dataset covers all storm drainage system for 13 wards in Morogoro Urban. The Wards include: (i) Mazimbu, (ii) Mwembesongo, (iii) Kingo, (iv) Mbuyuni, (v) Sabasaba, (vi) Uwanja wa Ndege, (vii) Uwanja wa Taifa, (viii) Sultan Area, (ix) Kichangani, (x) Mafiga, (xi) Boma, (xii) Mji Mpya, (xiii) Mji Mkuu. The following are the meaning of each variable:

Table 1: Descriptions of Variables

Name of Variable	Type	Description of Variable
Name of enumerator	string	Name of the enumerator
Length of enumerator (inch)	Numeric	Length of enumerator measured in inch, to allow conversion of depths information

		into meaningfully number
Gender of enumerator	string	Gender information conform with data diversity standards in term of subjectivity by gender
Location of drain	Geometry	Location of points
_Location of drain_latitude	Geometry	Location of points
_Location of drain_longitude	Geometry	Location of points
_Location of drain_altitude	Geometry	Location of points
_Location of drain_precision	Geometry	Location of points
Type of drainage system	String/categorical	It is known that, there are different types of drains. The variable captures such information
Category of surface drainage system	String/categorical	Mostly, Morogoro Urban is rich with Surface drainage. Other type of drains was not recorded and hence remained with only type.
Type of drainage point	String/categorical	As long as enumerator were collecting point of interest (POI), then it is must to record if the POI mark the end of drain, beginning or continuing.
Shape of the surface drainage system	String/categorical	Drainage can be U-shaped, V-shaped and etc
Depth of surface drainage system from the base of ditch	Numeric	Depth of the ditch measured in term of length of enumerator.
Occurrences of siltation	String/categorical	Visual inspections of the occurrence of siltation, if YES or NO

Depth of surface drainage system from the base of siltation	Numeric	Depth of siltation was measured based on conceptual framework of confidence measurement of enumerators.
Source of sediment transport	Numeric/categorical	Identification of possible sources of transportation agents
Source of sediment transport/Wind	Numeric/categorical	
Source of sediment transport/Water	Numeric/categorical	
Source of sediment transport/human being	Numeric/categorical	
Is there any obstacle that trap sediments	String/categorical	Identification of obstacles that trap sediments
is it NATURAL or ARTIFICIAL made obstacle	String/categorical	Is the identified obstacle naturally occurred or artificial
Presence of culvert	String/categorical	Presence of culverts
Type of culvert	String/categorical	Types of culverts
Is it blocked ?	String/categorical	Is the culvert blocked
Source of blockage	Numeric/categorical	ly YES, which are the sources of blockages
Source of blockage/Plastic bottle	Numeric/categorical	
Source of blockage/Siltation	Numeric/categorical	
Source of blockage/Other solid waste (please specify)	Numeric/categorical	
Other solid waste (please specify)	String/categorical	
Picture of plastics bottles in the respective drain	Media	ID for pictures captured at every POI
Picture of plastics bottles in the respective drain_URL	URI	Link to pictures captured at every POI
Counts of plastics bottles	Numeric	Total number of plastics present at each POI
_id	Numeric	Identification number of POI
_uuid	Numeric	Universally Unique Identifiers for each POI
_validation_status	String/categorical	Status of validation
_notes	String	Additional notes recorded during field data collection

_status	String	Status of the POI
_tags	String	Tags recorded during field data collection
_index	Numeric	Unique index of POI
_submission_time	Date	Time the POI was submitted

Follow the following link to access the datasets

<https://drive.google.com/drive/folders/1ccZkaiYILK2II-ccOFRxvclQlwahK8jY?usp=sharing>

