SHREE SWAMINARAYAN ACADEMY

Teach through expounding of themes

IMPACT OF POOR WASTE MANAGEMENT ON BREEDING OF AEDES MOSQUITO: MOROTO SLUM, MOMBASA COUNTY

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INTRODUCTION

Mombasa, the second-largest city in Kenya, is experiencing rapid population growth, leading to an increase in slum areas. Tudor Moroto Slum, located strategically within Mombasa Island, is one of the largest and fast-growing slums in the city, which has resulted in major environmental challenges.

The aim of this study was to evaluate the impact of poor waste management on the breeding of mosquitoes in the slum area, identify the species of mosquito and investigate their effect on the population of Tudor Moroto slum.

This research project intends to create awareness and sensitize the local community on the impact of poor waste management practices on the breeding of *Aedes* mosquito as part of investigating the earth as a system.

RESEARCH QUESTIONS

1. Is there evidence of poor waste management within Tudor Moroto slum?
2. How does poor waste management contribute to the breeding of mosquitoes within Tudor Moroto Slum?
3. What are the prevalent species of mosquitoes present in the slum?
4. Are there any reported cases of dengue and chikungunya in Tudor Moroto slums?

MATERIALS AND METHODS

Survey of the study site

We carried out a survey using the Google Earth Pro Application to identify the largest slum within Mombasa County and thus identified Tudor Moroto Slum.

Through a series of field studies, we identified potential breeding sites, collected samples of water with mosquito larvae and used the GLOBE Observer App to identify the specie.

Using the Mosquito Protocol, we were able to identify the diseases associated with aedes mosquito which was prevalent within the area. We followed up with the Sub-County Hospital near the area to find out if there were reported cases of dengue, zika and chikungunya.

Equipment and Materials

1. Dropper
2. Paper towels
3. Bucket
4. Forceps
5. Magnifier /Hand lens
6. Macro pipette
7. Mobile device with GLOBE Observer Mosquito Habitat Mapper
8. A clip-on macro lens (60-100x)

Procedure:

i) Field Study

ii) Identification of mosquito breeding sites and collection of samples

iii) Identification of mosquito larvae

iv) Collecting data in Tudor Sub-County Hospital

RESULTS

The results of this research study showed that;

- There is poor waste management in Tudor Moroto Slum.
- Poor waste management, shortage of water and poor sanitation have led to breeding of *Aedes* mosquito within the slum.
- *Aedes* mosquito is the most prevalent specie in the slum.
- There was evidence of dengue fever recorded in the hospital.

Tables showing larvae identified from samples collected in the three visits

Mosquito breeding sites	Number of larvae	Positively identified *Aedes* larvae	Other types	unknown
Stagnant water from ditches	26	15	0	11
Water storage Jerricans	59	38	0	21
Plastic bottles	27	10	0	17

Mosquito breeding sites	Number of larvae	Positively identified *Aedes* larvae	Other types	unknown
Stagnant water from ditches	33	21	0	12
Water storage Jerricans	40	33	0	7
Plastic bottles	16	6	0	10

Mosquito breeding sites	Number of larvae	Positively identified *Aedes* larvae	Other types	unknown
Stagnant water from ditches	40	19	0	21
Water storage Jerricans	51	20	0	11
Plastic bottles	22	12	0	34

Larvae identification from GLOBE Observer App

Larvae features	
- Stout blunt siphon - Presence of pecten - Single tuft of hair above the pecten - Saddle does not completely encircle the tail - Comb scales present - Presence of anal brush	

Dengue cases recorded in Tudor Sub-County Hospital (Jan 2022 – Feb 2023)

Month	Tested Cases	Positives Cases
January 2022	13	10
February 2022	33	10
March 2022	0	0
April 2022	0	0
May 2022	7	1
June 2022	58	40
July 2022	27	18
August 2022	14	4
September 2022	12	4
October 2022	41	11
November 2022	14	7
December 2022	37	20
January 2023	13	9
February 2023	17	11
Total	**286**	**145**

CONCLUSION

The study highlights the challenges posed by the rapid population growth and the resulting increase in slum areas in Mombasa, Kenya. It identifies Tudor Moroto Slum as one of the largest and fastest-growing slums, where poor waste management, shortage of water, and poor sanitation have led to major environmental and health challenges.

The study found that *Aedes* mosquitoes largely breed within the Tudor Moroto Slum, and there were many positive cases of dengue recorded.

The study's recommends:

- Development of a sustainable waste management system in the slum.
- Regulation on the use and disposal of single-use plastic bottles and containers.
- Creation of industries that will help in reusing, recycling and reducing plastics.
- Creation of awareness in improving environmental management.
- Destruction of mosquito breeding sites.

Findings from our study show that it is important to work together to investigate the earth as a system. The data obtained from the Tudor Sub-County Hospital helped in explaining the effect of poor waste management and its impact on the health of the local community. Sharing this information with the local community, the health service providers and the local county government will help in finding solutions to better waste management in Mombasa County.