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"Geospatial Information for a Smarter Life
and Environmental Resilience"

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Assessment of Waste Management and Sanitation Services at the District Level

Role of Survey and Mapping

By
E. A. A. Kwesi, L. C. Hlorvor, J. K. Annan and K. Tenadu

OUTLINE OF PRESENTATION

❖ Introduction

❖ Study Area

❖ Materials/Methods

❖ Results/Discussions

❖ Conclusions/Recommendations

INTRODUCTION

❖ **Waste management presents formidable challenges in Ghana and other countries. Examples;**

❖ **Improving waste collection, disposal and environmental sanitation to meet national and international goals.** (e.g. achieving 50% waste collection by 2015 and phasing out inappropriate disposal methods)

❖ **MMDAs collect just about 40% of refuse generated, leaving about 60% to pile up within the communities. Waste collection is also limited to few selected areas.**

❖ **Most disposal sites are unsafe regarding public health and environmental safety, with little or no measures to control negative impacts** .

INTRODUCTION (CONT')

❖ **Above waste management problems or challenges have spatial dimensions, requiring spatial information and analyses to address them effectively.**

❖ **Integration of Survey and Mapping into existing management methods can help assess and improve   situation.**

❖ **Present paper/discussion looks at the role of Surveying and Mapping in assessing waste management at the Local (District) Level.**

❖ **A case study approach is used with TNMA and PHMA of Ghana as the study area.**

STUDY AREA

❖ **Study Area** is within the Tarkwa-Nsuaem and Prestea-Huni-Valley Municipal Areas (TNMA and PHMA) of Ghana with **Tarkwa** as the main **center and capital.**

❖ **Famous mining centre** with many companies and people from the Ghana, Africa and the world.

❖ **Important commercial and transit centre** linking the western and coastal towns to other parts of Ghana and West Africa.

❖ **Rapid urbanization**, high population growth rate and **Waste Disposal** are major issues.

Fig. 1
Map Showing
the Location of
Study Area

(Sources:
Ghana Mineral
Commission;
Kwesi *et al*, 2014)

MATERIALS AND METHODS

❖ **Field materials:-** hand-held GPS receivers, tapes, field books, digital cameras and interviews.

❖ **Office materials:-** computers, scanners, printers, etc.

❖ **Software:-** microsoft office suite, photoshop CS4, ArcGIS.

❖ **Data:-** coordinates of the waste dumps, town layout plans, topographic maps, field photos and extracts from interviews, documents and other observational records.

❖ **Methods:-** *review of relevant literature and documents*, interviews and discussions with relevant stakeholders, *field visits and observations*, construction of cartographic database, *generation of sanitation maps*, and assessment of waste management services.

RESULTS/DISCUSSIONS

Results Presentation

- **Classified and analyzed under 5 classes:**

  i.   **Approved verses Unapproved Dump Sites**

  ii. **Accessible verses Inaccessible Dump Sites**

  iii. **Collected verses Uncollected Dump Sites**

  iv. **Public verses Private Waste Dumps or Sites**

  v.   **'Managed' verses 'Unmanaged' Waste Dumps**

RESULTS/DISCUSSIONS (Cont')

Table 1 Sample of the Point and Attribute Data on Waste Dump Sites

Location/ Area	Coordinates (m)		Remarks/Attributes
	Eastern	**Northern**	
Kamponase	610845	585524	Large waste dump. Inaccessible by road. Active but not well managed.
Main Station	611282	586406	Wastes are kept in containers. Easy road accessibility. Overspills.
UMaT Area	610447	585932	Wastes are kept in waste bins. Accessible by road. Well Managed.
Nsuta	613173	583349	Waste are kept in containers in an enclosed platform. Well managed.
Low Cost	611298	585119	Community waste dump. Not managed and not accessible by road
Akyinpim	610337	581608	Survey Control Pillar (SGW1205 3A)) for Accuracy Check
Bogoso Junction	613195	589516	Survey Control Point and Road Junction for location identification

Fig. 2 Example of Solid Waste Management Practices in Study Area

MAP OF WASTE DUMPS IN TARKWA TOWNSHIPS

Legend

- Unmanaged Waste Dumps.csv Events
- Managed Waste Dumps.csv Events
- corrected-Controls.csv Events
- Railway
- STREAMS
- SANITARY
- OPEN SPACE
- Tarkwa-setlement
- Locations
- Tarkwa-Street

Fig. 5 Example of the Sanitation Maps Generated from Database (Tarkwa Central
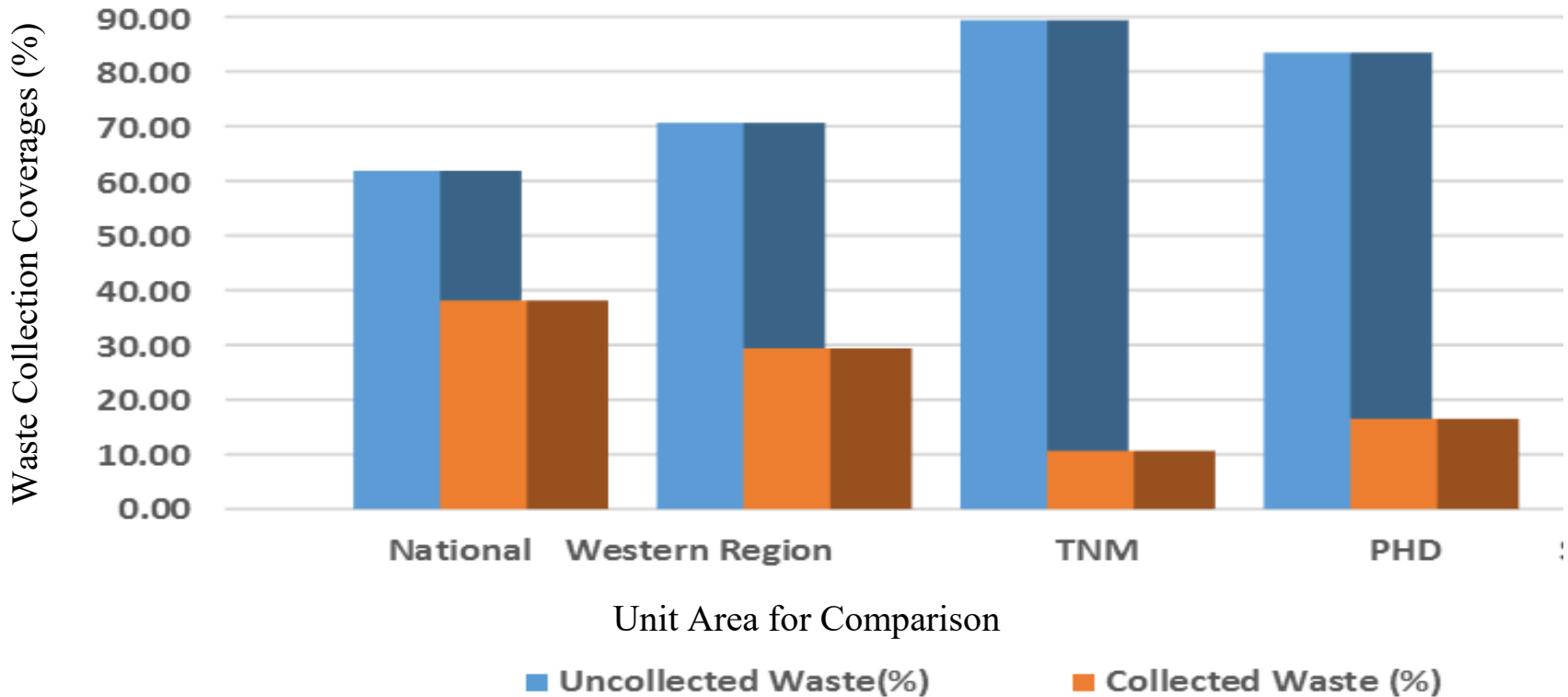
Fig. 3 Waste Collection Coverage at National, Regional and Municipal Levels
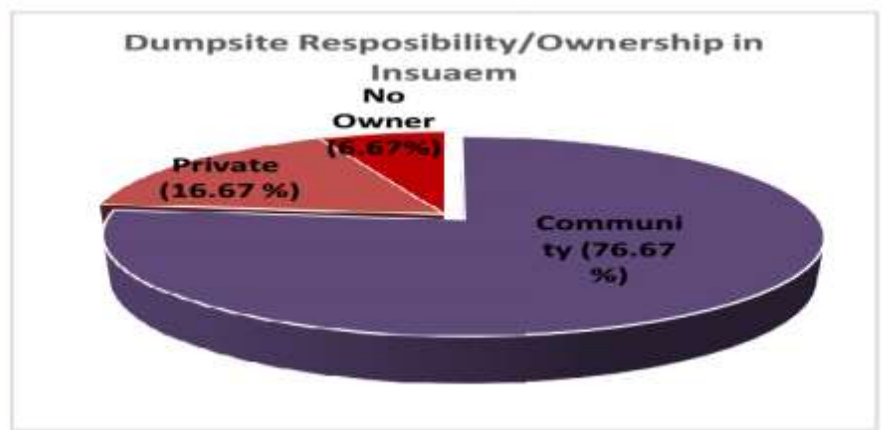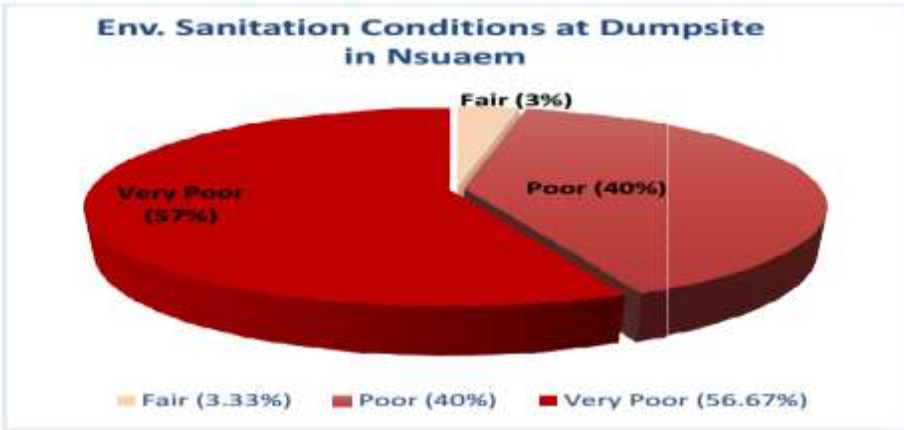
Fig. 4 Waste Disposal Site Conditions

RESULTS/DISCUSSIONS (Cont')

❖ **Dump sites** were mostly located around marshy areas, undeveloped plots and public places of convenience. **About 53% were found to be at unsafe locations.**

❖ **About 60% were road accessible** but there were no waste collection services at most of these sites. **About 40% of the sites were inaccessible by road.**

❖ **Over 50% had very poor sanitation** conditions with no efforts to manage them. **Open dumping and burning** were the common practices at most of the sites.

❖ **Approved sites** are concentrated on just small portions of the maps. **No engineered landfill site is available.**

CONCLUSIONS

❖ **Study/paper has demonstrated some important roles survey and mapping can play in assessing waste management and sanitation at the local (district) level.**

❖ **Production and use of sanitation maps and spatial database to analyze the locations and distributions of disposal sites and facilities is one key role.**

❖ **This study shows waste collection is limited to the central parts around Tarkwa, covering just about 10% of the area. Unsafe and poorly managed disposal sites and practices still dominate in the study area.**

❖ **The 2015 WMGT Targets are thus yet to be achieved.**

RECOMMENDATIONS

❖ **Attention to spatial data collection and analysis can help improve** planning, distribution and assessment of **WMGT** services and intervention efforts at the local levels.

❖ **Integration of survey and mapping**, sanitation maps and cartographic analysis into existing **WMGT** systems at the local levels **is strongly recommended**.

❖ **Geomatics Professionals/Technicians** are best to handle spatial aspects of **WMGT** problems.

END OF PRESENTATION

THANK YOU

QUESTIONS/SUGGESTIONS?