ANALYSIS AND RAISING AWARENESS OF SOLID WASTE MANAGEMENT

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Introduction

Tanzania is developing country encountering critical concern and challenges on management of solid waste which is more observed in Business and commercial areas such as markets often used by people to sell and buy goods and commodities in absence of important infrastructures and improved social services. The most experienced solid waste countrywide are food and animal product remain, metals, garbage, bottles and plastics, and glasses.

The observed rapid urban development in Lindi region and countrywide, has provided essential benefits to people such as employment and social-economic development. However, the matter has brought out environmental problems and challenges mostly in business areas such as market areas that endanger public health. The insufficient sorting process of solid waste which causes improper collection, transportation, storage, treatment and final disposal is more observed within the country.

Improper and unsatisfactory management of solid waste countrywide is signified, that is mainly caused by either, lack of enforcement on environmental laws and policies, unwillingness and poor participatory of urban individuals to participate in management of solid waste, or contribute for waste management service charges. It has been a government duty to maintain conservation of environment and improve sanitation within the country as observed in the National Environment Management Council (NEMC) Act no. 19 of 1983 and The Environmental Management Act (EMA) No. 20 of 2004 insisting environmental conservation and sanitation.

Sample size determination

The sample size was determined basing on the formula for single population proportion:

$$n = (Z_a / 2p <1-p>)/ d^2$$

Where n = minimum sample size required for the research study,

$Z_a / 2 = 1.96$, standardized distribution curve value, 95% confidence interval

$p = 0.5$ (assumption made to achieve the maximum possible sample size value)

n = number of respondents to be questioned

$d = 0.05$ margin error degree

Total population < 10,000, hence using the formula,

$n = no/1 + no/N$ $n = 196$

Method

The research study employed an exploratory descriptive case study with different research approaches. It has involved quantitative and qualitative research approaches.

Sampling procedure

Purposive (intentional) sampling method was used to select the region and district, simple random sampling through lottery method was used to choose one out of two markets in Ruangwa district and convenient sampling technique was used to obtain the study respondents.

Data collection methods / tools

Semi-structured questionnaires which included four parts on awareness status about the presence of solid waste and awareness status on management of solid waste, was used to collect information from the research respondents. Structured questions having "Yes/No" responses and unstructured questions provide an opportunity for respondents to express themselves in writing. The questionnaires had both Swahili and English language to maximize opportunities to respondents.

The first part in the questionnaire had demographic information to be filled with respondents with four items including age, gender, education level and the duration of being in the market for vendors.

The second part had 20 items having "Yes/No" responses on awareness of solid waste for all respondents. Being aware on solid waste was defined in the research study as one of the important key factor for motivating people to promote positive or negative attitude towards an intervention. The "yes" response having 1 score mark signifying that the respondent was aware of the item and "No" had 0 score mark signifying that he/she was not aware.

This finalized the items having 20 score marks for "Yes" responses. The respondents having less than 10 score marks were defined as not aware of solid waste, respondents having above 10 score marks were considered to be aware. Example of the questions in the item shown in the photo below

Results

In order to achieve our research study, we decided to focus on the following criteria; one of the aims that our research study was to cover was,

• Characterizing and analysis of solid waste and how they occupy human life, quantity of carbon dioxide emissions from smokes in to atmosphere. This was achieved from the research findings as follows;

Types of solid waste

From the study the results showed that the types of solid waste observed in the market represented the types of items being sold and bought there. The solid waste observed were sorted into two categories Organic solid wastes (Livestock products, food remains, woods, and papers) and Inorganic solid wastes (plastic bags, bottles, buckets and iron scrapers) respectively. Findings of the research identified that organic solid waste were highly produced with maximum percentage (86%) and inorganic solid wastes were generated by (14%). The pie chart below shows the comparison of organic and inorganic solid waste generation.

The findings of the study came realize that most tools used for storing and handling wastes were containers without lids (88.3%), plastic bags (37.8%), and containers with lids (13.3%) then rubbish pits (12.2%). As shown in the table the study studied where the produced and generated wastes were final disposed. Damping sites happened to be a more common way used by people (80.1%) for disposing wastes, incinerators and burning were then used having (1.0%) and (18.9%) respectively.

(Photo showing students (left) and vendors (right) participating in solid waste management discussion and filling forms)

(Photo showing Swahili (left) and English (right) questionnaires)

Conclusion

From the research study findings we came to find out that majority of the research respondents were unaware of solid waste and solid waste management. Number of factors which were adversely affected included cleanliness, insufficient and improper allocation of the lidded containers in number and quality lead them to be overfilled and wastes to be scattered all over the market premises. The study also studied the insufficient provision of solid waste management services and poor supervision of proper solid waste collection, storage, tr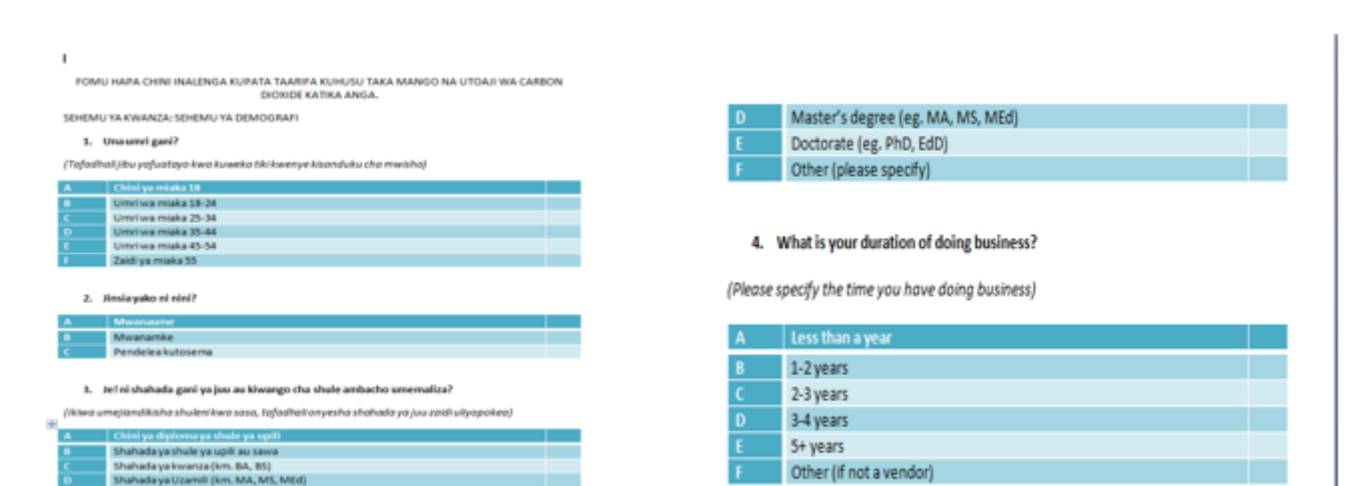ansportation and final disposal.