PUBLIC PERCEPTION, ATTITUDES AND CHALLENGES TOWARDS SOLID WASTE MANAGEMENT IN MAYOM COUNTY

SOUTH SUDAN.

BY

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# DECLARATION

I hereby declare that this is my original work and have not been presented for academic award or qualification in any institution of higher learning. Appropriate referencing has been made where citation of other people’s work has been done. I take full responsibility for the unintended typographic errors and or any short coming that may be found in this proposal:

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# ABSTRACT

The study examined factors affecting solid waste management in Mayom County. Specifically, it sought to: (i) identify perceptions and attitudes of people and institutions towards solid waste management; (ii) ascertain the types of waste management practices the people of Mayom engaged in; (iii) examine the challenges confronting the people and institutions on solid waste management in the community; and (iv) recommend policy interventions to address the sanitation situation. The study dwell on the theory of reasoned action and the theory of planned behaviour as espoused by Martin Fishbein and IcekAjzen. The theory of reasoned action is a model for the prediction of behavioural intention that covers predictions of attitude and predictions of behaviour and the theory of planned behaviour which is a theory that predicts deliberate behaviour since behaviour can be deliberative and planned. Both qualitative and quantitative approaches was employed. Through a combined survey approach, 300 household heads were purposively selected and interviewed using structured questionnaires. Interviews was organized for the key informant like the NGOs, government offices, Business leaders and community leaders, waste management department. Focus group discussion was also organized on a selected number of people and analysis was done using SPSS safe ware.

**Results.**

The institutions and the people of Mayom County have positive attitude towards solid waste management. The type of solid waste management practices that the people of Mayom County are engaged in include: land filling (7.7%), recycling (28.3%) , and burning (60.7%).The challenges confronting people and institutions on solid waste management in Mayom County include: irresponsible behavious of individuals, poor government waste management policies, underfunding of the local authorities to manage wastes, professional incompetence, of waste managers, un willingness to pay for waste management services by individuals, low priority given by the state government to solid waste management and inaccessible road network.

**Recommendation.**

The following recommendations are made basing on the results

There is a need to build capacity for waste management at a local level

The state government should support waste management programs through funding

There is a need to sensitize the community about the consequences of poor waste management.

There is a need to provide the community with materials for waste management.

The central government should strengthen its policies on solid waste management.

The state government should conduct regular inspection of solid waste at the county level.

# ABBREVIATIONS AND ACRONYMS

**CES** Central Equatoria State

**CPA** Comprehensive Peace Agreement

**FGD** Focus Group discussions

**JICA** Japan International Cooperation Agency

**KII** Key Informant Interviews

**MOH** Ministry OF Health

**NEMA** National Environmental Management Authority

**SPLA** Sudan People Liberation Army

**SSR** South Sudan Radio.

**SSP** South Sudan Pounds.

**SP** Samaritan Purse.

**UN** United Nations

**UNEP** United Nations Environment Programs

**UNICEF** United Nations International Children‟s Emergency Fund

**USEPA** United States Environmental Protection Agency.

# CHAPTER ONE:

## Background

Solid waste disposal and management is both an urban and rural problem. Every person is a potential generator of waste and thus a contributor to this problem. To generate waste is one thing, the type of waste generated is another and yet also the way the generated waste is managed or disposed of is quite a different issue. It has more often than not turned out that the rate at which solid waste is generated is far higher than the capacity to responsibly manage this waste. Waste is generated by, and from different sectors; domestic, commercial, industry and others and in many instances; the waste management responsibility has been left to the government or administrative authorities – that is the town council.

There is growing consensus that the immediate stakeholders in the issue of solid waste (the generators of waste), in this case the residents need to join hands with the authorities in dealing with this problem that has far-reaching environmental and human health effects.

South Sudan is one of the countries in the world that rank low in urbanization but this notwithstanding, the urban population is growing. Actually, the urban population is growing faster and the implication of this growth is that pollution issues such as solid waste

Management and the provision of adequate safe water alongside acceptable levels of sanitation coverage will need closer attention (National Environment Management Authority (NEMA),2005).

As South Sudan urban areas increase in number and expand in geographical and population size, solid waste is swiftly emerging as a significant issue in environmental management.

Although there are established guidelines for solid waste management, there is need for clear legislation and preferably a national policy specifically on solid waste management (NEMA,2005).

Particularly, waste volumes have increased in urban area due to the growing urban population, concentration of industries, consumption of residents, and inadequate finance and facilities to manage waste collection and disposal (NEMA 2007). This state of affairs has led to the volume of solid waste generated to go beyond what the available facilities can accommodate.

One of the major factors that have contributed to poor waste collection and management in

South Sudan is limited community participation in solid waste management (NEMA, 2007). The limited participation has budded from co-ordination and collaboration problems that exist among the three stakeholders in solid waste management- the communities, the public (government) and the private sectors (NEMA, 2007).

A number of institutions have been recognized by some researchers as stakeholders interested in proper solid waste management. Those identified include, national and local governments (Shekdar, 2009); municipal authorities, city corporations, non-governmental organizations, households (Sujauddin et al., 2008); private contractors, ministers of health, environment, economy and finance (Geng et al., 2009) as well as recycling companies (Tai et al., 2011). Snel and Ali (1999) .In addition, results from a study by Guerrero et al. (2013), detected that educational and research institutions, political parties, police, religious leaders and the media are often less mentioned when speaking about stakeholders in waste management. These can all be grouped largely as public sector (government), whose role is to provide a regulatory framework and setup institutions.

## Statement of the Problem.

As would be appreciated in the waste management literature, although solid waste has received much attention, the information, according to Morrison et al. (2000) and Lutui (2001), has been sporadic and not comprehensive. Many of these studies have had to deal basically with recycling and ways of reducing waste which is often to the neglect of the perceptions, opinions and attitudes that underpin people’s behaviour towards waste generation and disposal.

In South Sudan like in many other developing countries, one to two thirds of the solid waste generated is not collected (Zerbock 2003). In Mayom town, there is a great problem in the households’ management of solid wastes in the rapid growing town of Mayom in South Sudan due to fast growing population and rapid urbanization.

The current population of the Mayom County is projected at 187,887 people According to the United Nations led Humanitarian Response Plan (HRP) for South Sudan in 2018.

Such conditions have been associated with increased occurrences of diseases like diarrhea, malaria, cough and cholera in the county. However, there is little or no documented data on public perception, attitudes and challenges encountered in solid waste management in Mayom County that can be used in planning. There is therefore an urgent need to document the public perception, attitudes and challenges related to solid waste management in the study area as a result the purpose of this research is to explore a sample of the people’s perceptions and attitudes regarding why they have been unable to manage the solid waste they generate.

## Research Objectives.

The main objective of the study is to examine the factors affecting the effective management of solid waste in Mayom County.

### The specific objectives are;

1. To identify people and institutions perceptions and attitudes towards solid waste management in Mayom County.
2. To ascertain the type of solid waste management practices that the people of Mayom County are engaged in.
3. To examine the challenges confronting people and institutions on solid waste management in Mayom County.
4. To recommend policy interventions to address the sanitation situation in Mayom County.

## Research questions:

1. What are the people and institutional perceptions towards solid waste management in Mayom County?
2. What types of solid waste management practices does the people of Mayom engage in?
3. What challenges does the people and the institutions have towards solid waste management?
4. What policy does the institutions have towards sanitation situation in Mayom County.?

## Justification of the study.

Mayom County is one of the most densely populated areas of northern Liech state in South Sudan with a projected population of 187,887 people according to the United Nations led Humanitarian Response Plan (HRP) for South Sudan in 2018. Accompanying this high population is the problem of solid waste management. It is believed that no better place could have been found to mirror the problems of solid waste management in South Sudan than Mayom County hence the decision to select it as the case study. This study is expected to help deepen the understanding of solid waste management in South Sudan as well as understand why the problem persists despite efforts to solve it. It is also anticipated to put forward some key recommendations and suggestions that will contribute to the nation’s ability to attain the sustainable development goal (SDG) which talks about environmental sustainability. The results will again compliment to the on-going efforts of different governments and development agencies to promote good solid waste management practices. The study will also serve as an academic literature for further interrogation and exploration by students. The study will enable the government authority in Mayom to address challenges generated by the poor waste management by providing services to the people since citizens pays taxes and therefore they may need good services in terms of solid waste management in the county

## Scope and limitations of the study

Geographically, the research covers Mayom County in Northern Leich state of the Republic of South Sudan.

### Scope.

The study was focused on the factors affecting the effective management of solid waste in Mayom County. This include looking at the processes of collecting waste, how the waste are transported, and the effect on the environment as well as the people perceptions and suggestions in addressing the factors hindering solid waste management.

### Limitations.

There were some limitations encountered during the research, literature on the topic was difficult to find especially within the local context. There was no fund to support the researcher in this research. Security was one of the major problem since most people in Mayom County are cattle keepers which involved in cattle raiding from other communities.

Despite the above mentioned limitations, there were some measures that were used to overcome them. The researcher was able search more information on the internet and others from government offices operating in Mayom County.

# CHAPTER TWO: LITERATURE REVIEW:

## Introduction

Management of solid waste in South Sudan and specifically in Mayom County have brought about quite a number of implications which affect the environment and public health. The management of solid waste which is acceptable environmentally has however become a global challenge due to the issues of rapid urbanization, limited resources and increase in population among others. This chapter seeks to review literature on solid waste management by examining key concepts of waste, public perception and attitude towards solid waste management, solid waste management practices in some selected countries, challenges of solid waste management and theoretical and conceptual frame work.

## Key Concepts of waste:

**Municipal Solid Waste.**

This is more commonly known as trash or garbage. which consists of everyday items we use and then thrown away such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances and batteries excluding materials that may also be disposed in landfills but are not generally considered municipal solid waste such as construction and demolition materials, municipal waste water treatment sludge and non-hazardous industrial wastes (U.S. Environmental Protection Agency).

**Solid Waste.**

The United States environmental protection agency described solid waste as any unwanted or discarded material with insufficient liquid content to be free flowing. Miller (1994) further defines solid waste as any unwanted and discarded material that is not liquid or gas. According To the Ghana Innovation Market Place (2009), solid waste is neither wastewater discharges nor atmospheric emissions, arising from domestic, commercial, industrial and institutional activities in an urban area. Solid waste is any material that arises from human and animal activities that are normally discarded as useless or unwanted (Tchobanoglous et al., 1993). Zerbock (2003) said solid waste includes non-hazardous industrial, commercial and domestic waste comprising household organic trash, street sweepings, and institutional garbage as well as construction wastes. All the definitions above establish that solid waste has been used and has been discarded after serving its purpose. However, there is no singular and acceptable definition of solid waste.

**Solid Waste Management.**

Solid waste management is concerned with how actors get organized for the collection, transportation and disposal, reuse, recycling, and composting of solid waste materials (Obirih-Opareh, 2002).

Othman (2002) also refers to solid waste management as the control of waste generation, storage, collection, transfer and transport, processing and disposal of solid waste consistent with the best practices of public health, economics, and finance, engineering, administrative, legal and environmental

Solid waste management is recognized as a major feature of the indigenous community organization and traditional home management; hence every house has a designed area for solid waste collection (Sanda, 2008).

## Classification of Waste

Every day, large quantities of waste are produced throughout the world. In order to treat this waste, it must be classified so that it can be directed toward the appropriate treatment facility. Gupta et al. (1998), argue that the composition of waste depends on diverse factors such as food habits, cultural traditions, lifestyles, climate and income, among others. The variations are due to factors found across different countries as well as across different regions within one country. However, the variations within region are not as marked as those across different countries. Variation also occurs within a region over the years as a consequence of economic and social changes. The department of Environment, Climate Change and Water of New South Wales tout that waste is classified by its source and by its components. They have six groups of waste which include special waste, liquid waste, hazardous waste, restricted solid waste, general solid waste (putrescible) and general solid waste (non-putrescible).

Special waste is a class of waste that has unique regulatory requirements. They include clinical related waste, asbestos waste and waste tyres. Liquid waste is any waste that has an angle of repose of less than 5 degrees above horizontal or becomes free-flowing at orpicked up by a spade or shovel. Hazardous waste includes coal tar pitch waste, lead–acid, lead paint among others whiles restricted solid waste contains asbestos. General solid (non- putrescible) are those that do not readily decay under standard conditions, does not emit offensive odours and does not attract vermin or other vectors (such as flies, birds and rodents) and general solid (putrescible) are those that contains organic matter capable of being decomposed by microorganisms and of such a character and proportion as to cause obnoxious odours and to be capable of attracting or providing food for birds or animals (NSW-EPA, 2014).

Tchobanoglous et al (1993), classified types of solid waste in relation to the sources and generation facilities as follows.

|  |  |  |
| --- | --- | --- |
| ***Sources and Types of Solid Waste* Source** | **Typical waste generators** | **Types of solid waste** |
| Residential | Single and multifamily dwellings | Food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, metals, ashes, special wastes (e.g. bulky items, consumer electronics, white goods, batteries, oil, tires), and household hazardous wastes. |
| Industrial | Light and heavy manufacturing, fabrication, construction sites, power and chemical plants | Food wastes, ashes, rubbish demolition and construction wastes, occasionally hazardous wastes. |
| Commercial/ Municipal | Stores, restaurants, markets, auto repair shops and medical facilities and institutions. | Food wastes, ashes, rubbish demolition and construction wastes, special wastes occasionally hazardous wastes. |
| Open areas | Streets, alleys, recreational areas, parks, vacant plots, playgrounds and beaches. | Special wastes, rubbish. |
| Treatment plant sites | Water, waste water and industrial treatment processes. | Treatment plant wastes principally composed of residual sludge. |
| Agricultural | Field and row crops, orchards, vineyards and farms. | Spoiled food wastes, rubbish, hazardous wastes. |

With all these differences in classifications, it is important for countries to note that the designation of materials into specific categories can differ by region and therefore organizations in charge must ensure that waste is separated according to local area by-laws**.**

## Solid Waste Management Practices in some Selected Countries.

Solid waste management is one of the tasks generally performed by local governments in a number of developing countries (Van Dijk, 2006). When this duty is properly carried out, it is often taken as an indicator of the success of urban reform (Van Dijk and Oduro-Kwarteng, 2007). According to Sujauddin et al. (2008), solid waste generation is regularly associated to the size of family, their level of education and the monthly income. This in turn affects the management of solid waste. South Korea, Malaysia, Nigeria and South Sudan are being reviewed to understand their mode of solid waste management practices.

Malaysia which is classified as an upper middle income country by the World Bank (2012) had its waste-generation rates increase averaging 1.2 kg per capita per day. The Malaysian government also spent almost 80% of its budget per year on urban solid waste services and management. To the World Bank, solid waste management is one of the major problems faced by Malaysian municipalities (World Bank, 1999). They are faced with a number of implementation problems such as low collection coverage on average owing to the inaccessibility by vehicles of some areas. Again, irregular collection services, inadequate equipment used for waste collection, crude open dumping and burning without air and water pollution control, institutional deficiencies, inadequate legal provisions and resource constraints affects Malaysia’s solid waste management with institutional deficiencies acknowledged as a major problem in solid waste management.

South Korea is classified under the high middle income countries (World Bank, 2012).

South Korea has historically had its municipal solid waste generated disposed of at open landfill sites (Korean Waste Movement Network 2001). Nonetheless, during the past ten years there has been recognition of the issues associated with environmental protection and as a result, poorly located and operated disposal facilities are being closed and replaced by modern regional disposal facilities (Korean Waste Movement Network 2001). Municipal solid waste is gradually viewed as a potential resource with a strong trend toward implementation of recycling, composting, and combustion technologies.

In South Korea, waste is managed through a dual system where local governments are responsible for the final disposal of municipal waste and dischargers are responsible for the final disposal of industrial waste (Korean Waste Movement Network 2001).

Municipal solid waste is managed using a Volume-Based Waste Collection System and the Extended Producer Responsibility System (GAIA Global Meeting, 2003).

To encourage South Korean citizens to reduce waste by requiring them to pay fees in proportion to the amount of waste discharged, the volume based waste collection system was introduced in 1995 (Korean Waste Movement Network 2001). Through the volume-based waste collection system, households or dischargers have to buy a designated plastic bag for waste collection. The five recyclable products which are electronic devices, fluorescent lamps, lubricating oil, tires and packaging material are separated and collected for free with the collection of all other waste charged according to volume (GAIA Global Meeting, 2003). The waste packed in the authorized bags are collected and sent to incinerators or other disposal areas by municipal vehicles. Recyclable products are sent to recycling companies. Under this system, waste packed in bags other than the designated bags are not collected (Korean Waste Movement Network 2001). In South Korea, recycling is a preferable method for waste disposal due to its efficiency in waste reduction.

Nigeria as a country is placed in the lower middle income bracket (World Bank, 2012). There are two major approaches to waste management in Nigeria (Uwadiegwu and Chukwu, 2013). They are private and public arrangements. With the private arrangements, an agreement is reached between the waste generators and an individual or group of persons who undertake waste disposal as a business venture. According to them, this system is common among the high and medium income households who can afford the charge. On the other hand, the public system is more conventional where the government establishes a waste disposal agency whose responsibility is to collect waste from waste generators and dispose them at a waste disposal site. Some cities adopt the combination of the two systems especially when the public system is unable to cope with the volume of waste generation; the private system is adopted to compliment the efforts of the public arrangement. The hybrid system has many attributes which support its adoption.

While the public system is under the control of government, the private system because of its profitability nature attempts to offer satisfactory service so as to get more customers and enlarge its area of operation. However, it not uncommon to see informal waste collectors using local vehicles (push carts) for collection services from door to door in some parts of Nigerian cities. The informal recycling sector is very active in waste management system in Nigeria (Tobore, 2012). They are either roving waste buyers or scavengers with their eyes set on valuable materials such as plastics, paper, used electrical equipment, glass and metal among others.

In South Sudan Due to many years of civil war (1955-1972 and 1983-2005) in South Sudan, basic sanitation infrastructure for solid waste management was not given importance as a result, Mayom town is lacking facilities to manage solid waste. Due to lack of garbage collection services, most people use roadsides, open spaces, football fields, river banks, drainage channels and even grave yards as dumping sites. Some wastes are burned in residential areas, on the streets, etc. leading to air pollution with probable potential health hazards. The situation was made worse by the return of refugees from the neighboring countries and IDPs from Sudan as well as the influx of migrants from Congo (DRC), Eritrea, Ethiopia, Kenya, Somalia, Sudan and Uganda when the CPA was signed in 2005 that brought relative peace and economic boom in the country.

## Solid Waste and Environmental Health

Solid waste has turned into a key public health and environmental problem in many developing countries as a result of the rapid urbanization which has heightened political awareness (Henry, Yongsheng and Jun, 2006). Human activities produce waste and it is the methods by which these waste are handled, stored, collected and disposed off which can pose dangers to the environment and public health ( Zurbrugg, 2003). Less than half of the solid waste generated in urban Africa is collected with about 95 per cent of that being neither contained nor recycled (Policy brief, Africa Institute of South Africa, 2012). The wastes are dumped indiscriminately on temporary sites, in gutters and virtually on any available space. These inefficient methods of solid waste disposal have grave health and environmental implications which spread beyond their places of origin polluting nearby water bodies and serving as grounds for breeding insects which in turn causes various diseases.

Health impacts basically include being exposed to deadly chemicals through the air, water and soil; contacting infections and other biological contaminants; being stressed due to exposure to odour, noise and insects; risk of fire outbreaks, explosions, spills, accidents and transport emissions (Dolk, 2002). Furthermore, a lot of the microorganisms found in compost are respiratory sensitizers that can lead to a range of respiratory symptoms including allergic rhinitis, asthma, and chronic bronchitis (Swan et al., 2003). Studies conducted by UN-Habitat indicate that in places where waste is not frequently collected, the incidence of diarrhoea is twice as high and acute respiratory infections six times higher than in areas where collection is frequent (UN-Habitat, 2009). Recycling also poses health and environmental risks. During sorting, workers are often exposed to high concentrations of dust, bio aerosols and metals which commonly cause them to experience itching eyes, sore throats and respiratory diseases (Gladding, 2002). Among the low-income economies, this situation is worse as there is abundant release of gaseous toxic substances into the environment which jeopardizes the health of scavengers as a result of burning. Through contacts with smokes from burning of solid wastes and gaseous discharge from dumpsites, quite a lot of diseases have been documented especially in Nigeria (Oyelola et al., 2009).

## Public perception and Attitudes towards solid Waste Management options.

In the world today, a number of waste management options exist to help curb the growing menace. They include recycling, re-use, reduce, composting, incineration, landfilling amongst many others. However, there are varying reactions concerning the usage of any of these methods.

Concerning landfilling, negative reactions are evident even without detailed knowledge because of the idea that things are going to be buried in the ground with stuffs popping up the earth surface especially plastic bags. Nonetheless, evidence abounds from the work of Pokhrel and Virarghavan (2005) that, local people in Nepal prevented trucks carrying solid waste from entering landfill sites to dispose off the waste due to the fact that it affected public life and tourism in the area. The landfill site was however closed for almost 2 years but was reopened and operated for a period of 3 years. The government then developed a sanitary landfill site about 26 kilometers away from the previous which is expected to operate for the next 50 years (Mishra and Kayastha, 1998). Mostly, people prevent landfills from being sighted close to them because of the stench and the environmental problems associated with it. This situation in Nepal can be elaborated further with the study performed by Oteng-Ababio in Kwabenya where he explained that residents prevented the construction of a landfill in the area. The residents went to the extent of even embarking on strings of demonstrations at the World Bank Offices in Accra whilst ill-treating officials who went to the site (Oteng-Ababio, 2011).

This supports what was stated by Zeiss (1991) that residents tend to show more negative attitudes to unfamiliar facilities of which they have no experience compared with similar facilities that already exist. Generally, peoples’ attitude and perception towards landfilling is bad.

Kumar and Nandini (2013) performed a study in Bangalore in India to find out the community’s attitude and willingness to solid waste management. A total of 400 households among the community were selected randomly. A focus group discussion, structured interviews and questionnaires were used to collect data. Results obtained showed that, 97.8% of households preferred daily collection of solid waste and 82.5% of the households desired to separate out the waste into different bins if the bins were provided by Government /Non- Government Organizations. A number of the households about 71% were willing to use recyclable products. However, when asked about the recycling of the waste only 5.5% of the households were motivated and involved in recycling whereas remaining 94.5% of the households were not recycling their waste because they were not aware and did not have time. 85.5% of households had no information on waste management and so disposed their waste as it is into the nearby open spaces.

## Government authority.

The Environment bill for South Sudan still remain unapproved and therefore all laws are based on the interim constitution of South Sudan 2011 and the Transitional Constitution of the Republic of South Sudan.(TCRSS) (2011).

The responsibility for solid waste management in South Sudan lies with local governments as specified in the South Sudan Interim constitution 2011.

According to NEMA (2005), there is a broad policy, legal and institutional framework for environmental management in place. However, though this framework has been in place for over ten years, there is still need for additional sectors or issue-specific policies especially solid waste management. The same is true for laws and regulations with regard to solid waste management in the country. Institutionally, the structure at local government level is still evolving. This means that the problems that prevail at the lower implementation and administrative levels have their roots in the absence of specific regulations in the national policy for environmental management.

Therefore, although the local governments may have the power to come up with by-laws on any issue in their areas of jurisdiction, it may still be difficult for them to come up with such when there is no guiding policy at national level.

NEMA (2005) notes that, amidst weak institutional structures, little has been achieved in ensuring people’s compliance with the range of environmental management policies and laws in South Sudan.

As such, the policies and laws continue to suffer continuous violation at the hands of the citizen.

Although Environmental Inspectors have been gazetted and trained to improve on enforcement, not much has been done to change the trend of environmental degradation and mismanagement.

The police and judiciary are also being made aware of their roles in environmental management, particularly the enforcement of environmental laws, hoping that this will change the way

South Sudanese will interact with the environment (NEMA, 2005). The problem however, is that the policies are always made with little attention put on the mechanism of enforcement. As a result, misconceptions and confusion arise with regard to the institution with the responsibility to enforce the policies and regulations. This falters the implementation of the policies.

The policy making process is also quite slow, for example UNEP has advised government to formulate a national solid waste management policy to facilitate the development of appropriate laws to govern the management of solid waste, but not much has been done to that effect. UNEP has also identified the need to revise both the National Environment Management Policy and the

National Environment Action Plan to accommodate emerging issues like solid waste management services (UNEP, 2015). One of the objectives for the suggested policy is to reduce, reuse and recycle materials and goods purchased. All these are suggestions in a bid to improve the waste disposal and management methods in the country, however, when such policies are delayed, the situation only gets more complex.

## Challenges of Solid Waste Management

The management of solid waste has increasingly become a formidable task for municipal assemblies in the country as a result of a myriad of problems.

The UN Habitat (2010) identified institutional, technical and financial constraints at the national and local levels as well as the private sector as challenges facing solid waste management. Boadi and Kuitunen (2004) pointed out that weak institutional capacity and lack of human and capital resources are challenges facing Ghana. To them, the collection of waste is restricted to high and some middle income areas while the poor are left to cope with the problem on their own. This often leads to indiscriminate dumping of waste in rivers, streams, gutters and absolutely anywhere which is not their home creating unsanitary and unsightly environments in many parts of the city. Laffont (2005) also maintains that flaws in institutions make regulation complicated in developing countries. Additionally, MLGRD (2004) gave an explanation of the challenges of solid waste management in Ghana as poor planning for waste management programs; inadequate equipment and operational funds to support waste management activities; inadequate sites and facilities for waste management operations; inadequate skills and capacity of waste management staff and negative attitudes of the general public towards the environment in general. Sujauddin et al. (2008) also talks about the unwillingness of users to pay for services of waste collection as a challenge facing waste management. Again, politicians ascribe little relevance to solid waste compared to other municipal activities (Moghadam et al., 2009). The type of waste management option subscribed to by the country for the people are often not relevant to the context. For instance, Shekdar (2009) argues that many composting plants have been shut down primarily because of the incompatibility of plant design and the characteristics of solid waste generated. Poor roads and number of vehicles for waste collection are a challenge (Henry et al., 2006). Finally, Tadesse et al. (2008), in analysing the factors that influence household waste disposal decision-making claimed that inadequate supply of waste bins and long distances to communal containers created a problem for waste management.

## Research Gaps:

From the review of the literature above, it can be acknowledged that behavioural studies of waste management have been dealt with. However, very few studies were conducted on attitudes, perceptions and challenges to solid waste management which can be identified as critical issues in the bid to manage waste. Again, various studies were conducted in developed countries with very few in developing countries. Furthermore, there are hardly any studies which have been conducted in Mayom County to assess peoples’ attitudes, perceptions as well as challenges regarding solid waste management and that make a study of this nature vital.

## Theoretical and Conceptual frame work.

. This section dwells on the theories of reasoned action and planned behaviour by introducing and explaining how they are used in the study.

### The Theory of Reasoned Action

Martin Fishbein and IcekAjzen (1980) developed the theory of reasoned action. It was derived from a previous research that began as the theory of attitude and behaviour. According to (Hale et al., 2002), the theory was “born largely out of frustration with traditional attitude-behaviour research, much of which found weak correlations between attitude measures and performance of volitional behaviours”. The theory of reasoned action is a model for the prediction of behavioural intention, which covers predictions of attitude and predictions of behaviour. This theory proposes that a person’s behavioural intention lies in the person’s attitude about the behaviour and the subjective norm. The theory has three general components which are behavioural intention, attitude and subjective norm.

To the proponents, behavioural intention measures a person’s relative strength of intention to perform behaviour. Attitude comprises beliefs about the consequences of performing the behaviour multiplied by his or her evaluation of these consequences.

Subjective norm is a combination of perceived expectations from relevant individuals or groups along with intentions to comply with these expectations (Fishbein and Ajzen, 1980). Fishbein and Ajzen however make a suggestion that attitudes and norms are not weighted equally in predicting behaviour. For instance, you might not be the kind of person who considers what other people think. If that is the case, the subjective norm would carry little weight in predicting your behaviour (Miller, 2005).

Miller (2005) defines the three components of the theory as follows making use of the example of embarking on a new exercise program for illustrations. According to him, behavioural intention is a function of both attitudes toward behaviour and subjective norms toward that behaviour which has been found to predict actual behaviour. That is, your attitudes about exercise combined with the subjective norm about exercise, each with their own weight will lead you to your intention. He defines attitude as the sum of beliefs about a particular behaviour weighted by evaluations of these belief. For instance, an individual might have the belief that exercise is good for his/her health and looks but it takes too much time and is uncomfortable. These beliefs can be weighted if one’s health issues are important than time and comfort. Finally, subjective norm according to Miller (2005) looks at the influence of people in one’s social environment on his or her behavioural intentions. For example, if your friends are ardent exercisers but your spouse is against it, the beliefs of these people weighted by the importance you attribute to each of their opinions will influence your behavioural intention to exercise or not.

Simply, this theory seeks to establish that a person’s attitude toward behaviour consists of a belief that a particular behaviour leads to a certain outcome and an evaluation of the outcome of that behaviour. If the outcome is beneficial to the person, he or she may actually participate in that particular behaviour. Also included in the person’s attitude.

Towards the particular behaviour is the concept of subjective norm which is a person’s perception of what others around them believe that the individual should do. People may also be inclined to participate or not in behaviour based upon their desire to comply with others. Laws or rules that prohibit a particular behaviour may have an impact on one’s attitude toward participating in a particular behaviour.

Consequently, the theory of reasoned action interprets social behaviour at the level of individual decision making. The study using the theory above will enable us understand if a person’s attitude and perception towards solid waste is based on the benefits he or she will gain, what the people they look up to engage in and approve of them to do or that it is established rules that shapes their perceptions and attitudes.

### The Theory of Planned Behaviour

The theory of planned behaviour was proposed by IcekAjzen in 1985 through his article “from intentions to actions. This theory is an extension of the theory of reasoned action because it has inculcated within it the concept of perceived behavioural control. IcekAjzenrealized that the theory of reasoned action was particularly valuable when one was describing people’s behaviour which were totally volitional. In the absence of practical constraints, an individual has total control to the adoption of a given behaviour. On the other hand, if the adoption of a particular behaviour requires resources or skills that are currently lacking, the individual has complete lack of control. The theory posits that performance of behaviour is a joint function of intentions and perceived behavioural control.

The theory of planned behaviour proposes three determinants of intention. The first is the attitude toward the behaviour and refers to the extent to which a person has a favourableor unfavorable evaluation of the behaviour in question. The second determinant is the subjective norm which refers to perceived social pressure to perform or not to perform a particular behaviour. The third is the perceived behavioural control which is defined as “the person’s belief as to how easy or difficult the performance of the behaviour is likely to be (Ajzen and Madden, 1986). The theory of planned behaviour is a theory that predicts deliberate behaviour since behaviour can be deliberative and planned.

This theory therefore is suitable to predict a person’s intent to participate in a particular behaviour in relation to solid waste management in the sense that it will enable us establish if the individual needs resources or skills in order to manage his or her solid waste or not or it is just an attitudinal problem. Again, as a framework in understanding, explaining and predicting behaviour, these theories are also useful as a guide for instituting policies to maintain or alter a particular behaviour.

**CONCEPTIONAL FRAME WORK.**

**INDEPENDENT VARIBLES**

PERCEPTION.

* Government will collect.
* Not our responsibilities.

ATTITUDES.

* Not willing to pay.
* Waste cant cause disease

GOVERNMENT AUTHORITY.

* Lack of policies.
* Funds.
* Facilities.
* Rules and regulations.

SOLID WAST MANAGEMENT

**DEPENDENT VARIBLES.**

Figure 1: Conceptual framework.

# CHAPTER THREEE: METHODOLOGY:

## Over view.

This section discuss about the Research design, the research approach the study area, the target population, sample size and sampling procedures, data types and validity and reliability of the research instrument.

## Research Design.

A cross sectional design of five (5) Payams were selected for the study due to the large number of Payams in Mayom County and also accessibility of the Payams.

The study intended to find out the level of public perception, attitudes and challenges towards solids waste management in Mayom County. Questionnaires with closed-ended questions were used to collect data.

## Research Approach:

The mixed method approach, which incorporates both qualitative and quantitative design, was employed in this study. This is to necessitate the fact that a single approach in a study such as this seemed inappropriate in covering extensively all that the study sought to achieve. The quantitative approach therefore became suitable in gathering much information on the subject matter from a wider section of the population within a relatively short time. The survey approach was used with the assistance of a structured questionnaire. This approach has been opposed by some scholars as not being entirely appropriate for studying human behaviour especially attitudes. This view is rooted in the argument human behaviour and for that matter, reality, cannot be well accounted for in numerical classifications which has been the norm in quantitative research. Considering this genuine challenge and the need for a more detailed understanding and appreciation of the problem under investigation (Agyeman, Brown and Awusabo-Asare, 1990), the study employed a qualitative research design. Qualitative approach is mainly descriptive and involved the collection and analysis of data that are concerned with meanings, attitudes and beliefs, rather than quantitative method that results in numerical counts from which statistical inferences can be drawn (Ogier, 2002). The qualitative design adopted was in-depth interviews, observation and focus group discussions (FGDs) to gather detailed information and seek for clarifications on themes that emerged in the survey.

## Study Area

The research was carried out in Mayom County of former Unity states which now belongs to Northern Liech state due to the creation of 32 states in South Sudan by presidential decree in 2016.

The Mayom County is one of the nine Counties of the former Unity State in the Republic of South Sudan. It borders Abiemnom County to the North, Rubkona County to the East, Koch County to the South, Tonj North and Gogrial East Counties to the South West, and Twic County to the North West.

According to the United Nations led Humanitarian Response Plan (HRP) for South Sudan in 2018, the Mayom County has a projected population of 187,887 and an area of 4,263 km². The County is mainly inhabited by the Bul Nuer population who are agro-pastoralists, living on subsistence farming, livestock keeping and fishing while Other groups of the people includes the Arabs,Dafurians who are mainly traders

The greater Mayom County is made up of ten Payams namely; Mankien, Riak, Ruathnyibol, Kueryiek, Kuerbone, Wangbour, Wangkai, Ngop, Pup and Bieh

The region is characterized by flat grasslands, with some shrubs, thorns, and patches of forest. The sandy and loamy soils are relatively fertile and in some areas the land is rocky. The area also receives relatively low rainfall compared to other regions of the former Unity State which limits crop cultivation to certain drought resistant varieties mainly sorghum. The rivers Kiir and Loll run through the County, converging near Mayom town, and the river Jur is located at the Southeast part of the County. Potential flooding areas include the banks of river Jur and around Mankien Payam.

## Population, sampling procedure and Data collection

### Target Population

The population for this study was household who had been in Mayom County for the last three months and also established institutions operating in Mayom County. The study targeted 300 households in the 5 selected Payams of Mayom County. The selected Payams were Mankien, Kueribona, Wangbour, Routhnyibol and Ngop.

### Sample size and Sampling procedures.

The study was purposively sampled because of the familiarity and access to the researcher.

A sample size for the research was determine using the formula below.

**Sample size calculation.**

N= Where:

N =desired sample size (population >10,000)

z= standard normal deviate. At 95% confidence level Z= 1.96

p= the proportion in target population estimate to have particular characteristic.

Since the figures in the population can’t be estimated P is taken to be 50%

q=1.0-p = 1-0.5 = 0.5

d= degree of accuracy required, set 5% or 0.05

Therefore:N=1.962\*0.5\*0.5/0.052 = 384.16, therefore a sample size of 300 respondents was taken for easy analysis of the data.

## Data collection method.

Both qualitative and quantitative methods of data collection were used because qualitative and quantitative method involved use of words and numbers respectively, questionnaires were used to collect data regarding public perception, attitude and challenges toward solid waste management .The researcher used both primary and secondary data source to carry out the study.

### Primary data.

Questionnaires were used to collect the primary data to find the public perceptions, attitudes and challenges on solid waste management in Mayom County.

The Primary data was collected using household interview and key informant interview that involved 300 respondents and 5 key informants. The five key informants were selected from the five selected Payams where the data was collected. The key informant people were from government representative, national and international organizations operating in Mayom county, Business group and community leaders.

### Secondary data.

The researcher got information from the review of documents about solid waste management and other relevance studies that have been conducted in South Sudan in relation to solid waste management, Ministry of Health, Environment and journals, magazines and other literature written by different knowledgeable scholars.

## Data analysis and interpretation.

Data obtained from the field in raw form is difficult to interpret. Thus, upon data collection; the questionnaire were sorted out to find whether all had been responded to, questions were coded and analyzed using SPSS.

## Quality control.

Research assistants (translators) were carefully selected and trained before data collection process. Also they were told to be presentable to the mothers to ensure correct understanding of the questions. The research assistants were help in explaining some areas where the participants did not understand. Data collection tools were pre-tested and necessary changes were made before the data collection process. All the questionnaires were well coded to avoid missing any information during data collection process. The researcher was consistently supporting and supervising the research assistants throughout the process for completeness and accurate filling of the questionnaires.

### Validity of the Research Instruments

According to Borg and Gall (1989), validity is the degree to which a test measures what it purports to. Content validity was used to validate the content employed in the instrument; expertise of the researcher was sought. The pilot study was carried out to improve face validity. Questionnaires were administered to ensured internal validity while generalization of the study findings was to ensure the external validity of the instrument.

### Reliability of the Research Instruments.

Reliability is a measure of consistency over time, over instruments and over similar samples. It is concerned with precision and accuracy. For research to be reliable, it must demonstrate that if it were to be carried out on a similar group of respondents in a similar context (however, defined), then similar results would be found (Louis, et al, 2001).

## Ethical considerations.

Ethical approval and clearance was obtain from Africa Centre for Project management studies (ACPMS) and county administrative office in Mayom Town. They were informed about the purpose of the study, importance and duration of the study in order to get their free time and prior informed consent for the survey.

Confidentiality was maintained and respondents were informed that participation could be voluntary and they could withdraw at any time from the study. The right of participants to anonymity and confidentiality was ensured by making the questionnaire anonymous.

# CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION.

# 4.0 Over view.

This chapter presents analyzed data according to demographic, wastes generation and waste management.

# 4.1. Demographic characteristics

# 4.1.1. Gender of the respondents.

According to figure 2 below, 58 % of the responds were female while 42% of the respondents were male.

**Figure** 2**: Gender of the respondents**

# 4.1.2. Age of the respondents

Majority of the respondents were between the age of 20-29 years (35.7%). 29% between 30-39 years, 17% between 40-49 years, 10% were below 20 years and only 8.3% were above 50 years. This results indicate that the majority of the respondents were middle aged.

Table 1: showing the age of the respondents

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| Category | | Frequency | Percent | Valid Percent | Cumulative Percent |
|  | <20 years | 30 | 10.0 | 10.0 | 10.0 |
| 20-29 years | 107 | 35.7 | 35.7 | 45.7 |
| 30-39 years | 87 | 29.0 | 29.0 | 74.7 |
| 40-49 years | 51 | 17.0 | 17.0 | 91.7 |
| 50> years | 25 | 8.3 | 8.3 | **100.0** |
| **Total** | **300** | **100.0** | **100.0** |  |

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## 4.1.3. Marital status.

As indicated by the results in figure 3 below, 55.% of the respondents were married, 30% were single, 5.7% were separated ,5.6% were widowed while only 3.7% were divorced.

This results shows that majority of the people in Mayom County are married and there are very few cases of divorced in the community.

Figure 3: Marital status.

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## 4.1.4. Size of the household.

The biggest household size in Mayom County had 4-7 persons (52.7%) and 1-3 persons (41.3%), 4.7% had 8-10 persons while 1.3% had more than 10 people. Results indicate that the families are relatively large which consequently generate larger volumes of wastes.

Table 2: Size of the household

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Category** | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
|  | 1-3 people | 124 | 41.3 | 41.3 | 41.3 |
| 4-7 people | 158 | 52.7 | 52.7 | 94.0 |
| 8-10 people | 14 | 4.7 | 4.7 | 98.7 |
| >10 people | 4 | 1.3 | 1.3 | 100.0 |
| **Total** | **300** | **100.0** | **100.0** |  |

## 4.1.5. Education level

As indicated by the results, a majority of the respondents had never attended any formal education (33%), 31% of them had stopped in primary, 18% reached junior high school, 9% reached senior high school, 6% reached tertiary level and only 3% had studied beyond tertiary level. These results indicate that the community of Mayom is low educated and this has a bearing impact on solid waste management

Table 3: Education level

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Category** | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
|  | No education | 99 | 33.0 | 33.0 | 33.0 |
| Primary | 93 | 31.0 | 31.0 | 64.0 |
| Junior high school | 54 | 18.0 | 18.0 | 82.0 |
| Senior high school | 27 | 9.0 | 9.0 | 91.0 |
| Tertiary | 18 | 6.0 | 6.0 | 97.0 |
| Others | 9 | 3.0 | 3.0 | **100.0** |
| **Total** | **300** | **100.0** | **100.0** |  |

## 4.1.6. Occupation.

A majority of the respondents were farmers (46.3%), 36.7% were self-employed, 9.7% were government employed and 7.3% were working with private sector. This indicates that people of Mayom are of low economic status and therefore cannot afford modern waste management standards and facilities

Figure 4: Occupation

**4.1.7. Duration of stay at the community.**

Results indicate that a majority of the respondents had lived in the same community for more than five years (51.3%) and five years (26.7%) only 3.7% lived in the household for less than 1 year. This implies that the residents of the area had stayed in the same place for quite a long time and therefore are familiar with waste management behaviors in the community.

Table 4: Duration of stay at the community

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Category** | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
|  | <1 year | 11 | 3.7 | 3.7 | 3.7 |
| 2 years | 11 | 3.7 | 3.7 | 7.3 |
| 3 years | 6 | 2.0 | 2.0 | 9.3 |
| 4 years | 38 | 12.7 | 12.7 | 22.0 |
| 5 years | 80 | 26.7 | 26.7 | 48.7 |
| >5 years | 154 | 51.3 | 51.3 | **100.0** |
| **Total** | **300** | **100.0** | **100.0** |  |

## 4.2. Waste generation.

As indicated by the results below, most households dispose of non-degradable i.e. the polythene bags because the polythene bags are common bags used in markets, shops and houses. Another common are food wastes (28.3%), garden waste (19.7%), papers (10.7%) and tin cans (4%). Most of the solid waste generated are from the households than offices.

Figure 5: Type of the waste generated at the household

## 4.2.1. Methods of waste storage

Results indicate that most of the waste is piled in the yard (39%), dugout/damp in the yard (22%), and dumping in the bush or river side (18%), these are the most common methods of waste storage in the community. Others which are used especially in the offices included open and closed containers which are (14% and 7%) respectively

Table 5: Methods of waste storage

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Category** | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
|  | Closed containers | 21 | 7.0 | 7.0 | 7.0 |
| Open containers | 42 | 14.0 | 14.0 | 21.0 |
| Pile in the yard | 117 | 39.0 | 39.0 | 60.0 |
| Dugout/damp in the yard | 66 | 22.0 | 22.0 | 82.0 |
| Dump in the river side | 54 | 18.0 | 18.0 | **100.0** |
| **Total** | **300** | **100.0** | **100.0** |  |

## 4.3. Management of wastes

Results also indicate that, 55.3%% of the respondents stated that they dump the waste, 32.7% said they burn, 7.3% said they burry it. Only 4.7% sated that they use other methods such as community waste management method.

This results indicates that most of the solid waste in Mayom County is poorly managed where people only dump them outside and hence will have a great impact on the health of the community.

Figure 6: Management of wastes

Best methods of disposing wastes.

Results have also pointed out that, the best method for waste management is by burning (60.7%). This is because most of the waste is polythene paper. Others is recycled (28.3%) such as plastic bottles, while others do land filling (7.7%).

Figure 7: **Best methods of disposing waste.**

Perceptions of the community regarding waste generated

Results point out that majority of the respondents believe that poor management of waste in the community is a major problem (83%). This implies that they are aware of the health impacts of poor management of the wastes to health however, still 4% of the respondents said there is no problem with poor management of waste.

Figure 8: Perceptions of the community regarding waste generated.

Waste collectors.

However, 83.3% of the respondents confirmed that there were no waste collectors in the community. This is an indication of poor management of wastes because people in the community resort to dumping which pollutes the environment

Figure 9: **Waste collectors.**

Accessing services of waste collectors.

For the waste collection services that are available, only 28% of the people can access while 72% cannot. This implies that waste collection is still poor and covering a very smaller areas. This make deposal also to be a challenge hence polluting the environment through dumping and pilling

Figure 10: Accessing services of waste collectors.

Persons responsible for collecting the wastes

As indicated by the results, adult females (72.7%) are the major persons responsible for waste collection in most of the households. This is so because women are always responsible for any domestic work which results into waste generation. This behavior compromises the standards of waste management which is supposed to be a collective responsibility of everyone in the household.

Figure 11: Persons responsible for collecting the waste

How often the waste is disposed.

Since the commonest method of waste disposal is dumping, this means it’s a daily act as indicated by the results. Polythene bags, food wastes and garden wastes are dumped into the yard on daily basis and this increases or over piles the wastes in the compounds.

Figure 12: How often the waste is disposed..

Waste handling is a health problem

The community of Mayom is well informed that poor waste handling is a threat to health since it can result into disease outbreak, accidents, injuries and infections. As described in the figure below.

Figure 13: **Waste handling is a health problem**

## 4.4. Challenges faced during waste disposal.

The following are the challenges stated by the respondents regarding waste management in Mayom County. Irresponsible behaviour of individuals, poor government waste management policies, underfunding of local authorities to manage wastes, professional incompetence of waste managers, un willingness to pay for waste collection services by individuals, financial constraints on the part of individuals, priority given by the state to waste management, and inaccessible road network in the Mayom county all contributed to poor solid waste management. These challenges are describe in the below table.

Table 6: Challenges faced during waste management

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Response** |  | **Strongly agree** | **Agree** | **I don't know** | **Disagree** | **Strongly disagree** |
| Due to irresponsible behaviour of individuals |  | 42.70% | 38.70% | 7.70% | 3.70% | 7.30% |
| Due to poor government waste management policies | | 15.30% | 11.00% | 9.00% | 39.70% | 25.00% |
| Due to underfunding of local authorities to manage wastes | | 8.30% | 77.00% | 6.30% | 6.70% | 1.70% |
| Due to professional incompetence of waste managers | | 4.00% | 10.00% | 6.70% | 61.70% | 17.70% |
| Due to un willingness to pay for waste collection services by individuals | | 2.70% | 65.00% | 4.00% | 13.30% | 15.00% |
| Due to financial constraints on the part of individuals | | 8.00% | 76.00% | 4.00% | 9.30% | 2.70% |
| Due to low priority given by the state to waste management | | 8.70% | 73.30% | 5.00% | 9.70% | 3.30% |
| Due to inaccessible road network | | 6.30% | 19.70% | 1.00% | 67.00% | 6.00% |

## 4.5. Ways of addressing the challenges of waste management.

The best approach of managing wastes on personal level is through education or sensitization of the community about the dangers of poor waste management as indicated by the results. Also training individuals on safer methods of handling wastes is paramount.

**By individual or community**

Figure 14: By individual or community

By local government

At local authority level, the wastes can be managed through conducting regular inspections to ensure compliance by the community(56.5%), by availing waste collection containers at strategic locations where the community can collect the wastes,(33.3%) and through training or empowering the community regarding waste management.(10.2%).

. Figure 15: By local government

By central government.

To improve on waste management, the central government needs to strengthen the policies governing wastes (25.3%), increasing the funding of the waste management programs (28%) and also ensuring regular inspections of waste at the state level. (46.7%)

**Table 7.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Category** | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
|  | Strengthening the polices | 76 | 25.3 | 25.3 | 25.3 |
| Financing the waste management programs | 84 | 28 | 28 | 53.3 |
| Conducting regular inspections | 140 | 46.7 | 46.7 | **100.0** |
| **Total** | **300** | **100.0** | **100.0** |  |

**By the NGOs.**

To improve on waste management, the NGOs needs to empower the community through trainings, increasing the funding of the waste management programs and also provide equipment for solid waste management.

Table 8.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Category** | | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
|  | Empowering the community through training | 120 | 40 | 40 | 40 |
| Funding the waste management programs | 69 | 23.0 | 23.0 | 63 |
| Providing equipment | 111 | 37 | 37 | **100.0** |
| **Total** | **300** | **100.0** | **100.0** |  |

CHAPTER FIVE: DISCUSSION OF RESULTS, CONCLUSIONS AND RECOMMENDATIONS.

# 5.0. Introduction

This chapter discusses the findings of the study, the conclusion and its recommendation. However, some literature has been used to enrich the discussion.

# 5.1. Discussion.

**Education level.**

As indicated by the results, a majority of the respondents had never attended any formal education (33%), 31% of them had stopped in primary. These results indicate that the community of Mayom is low educated and typical of a rural setting. Education is an important tool in development and this results implies that management of wastes especially using modern methods like incineration can be a challenge in Mayom County since the population is of low education level.

**Household level.**

Results, points out that most of the households dispose non degradable materials i.e. the polythene bags because the polythene bags are common bags used in markets, shops and houses. Polythene bags are the major and easy materials used to hold shopped items because they are light to carry and less expensive and this makes them to be the most used as pointed out by a members in the focus group discussion. However, polythene bags are the most destructive wastes to environment because they are non-biodegradable.

People of Mayom being a community with low income status, they prefer polythene bags for shopping to other expensive bags.

Results indicate that most of the waste is piled in the yard (39%), dugout/damp in the yard (22%), and dumping in the bush or river side are the most common methods of waste storage in the community. Others which are used especially in the offices included open and closed containers. According to the focus group discussion, it’s always tradition of the local people always, dumping or pilling of wastes especially food remains, garden wastes around the yard is a common practice.

**Methods of waste management.**

According to the results, the best method for waste management is by burning (60.7%). This is because most of the waste is polythene paper. Others is recycled (28.3%) such as plastic bottles, while others do land filling (7.7%). Nonetheless, evidence abounds from the work of Pokhrel and Virarghavan (2005) that, local people in Nepal prevented trucks carrying solid waste from entering landfill sites to dispose off the waste due to the fact that it affected public life and tourism in the area. The landfill site was however closed for almost 2 years but was reopened and operated for a period of 3 years. The government then developed a sanitary landfill site about 26 kilometers away from the previous which is expected to operate for the next 50 years (Mishra and Kayastha, 1998). Mostly, people prevent landfills from being sighted close to them because of the stench and the environmental problems associated with it. This situation in Nepal can be elaborated further with the study performed by Oteng-Ababio in Kwabenya where he explained that residents prevented the construction of a landfill in the area. The residents went to the extent of even embarking on strings of demonstrations at the World Bank Offices in Accra whilst ill-treating officials who went to the site (Oteng-Ababio, 2011).

Results have also pointed out that waste collectors were lacking (83.3%) in the community. This is an indication of poor management of wastes because people in the community resort to dumping which pollutes the environment. For the waste collection services that are available, only 48% of the people can access while 52% cannot. This implies that waste collection is still poor and covering a very smaller areas. This make deposal also to be a challenge hence polluting the environment through dumping and pilling.

Results point out that majority of the respondents believe that poor management of waste in the community is a major problem (83%) indicating a positive attitude. This implies that they are aware of the health impacts of poor management of the wastes to health. This findings are in line with the findings of Kumar and Nandini (2013) who performed a study in Bangalore in India to find out the community’s attitude and willingness to solid waste management. A total of 400 households among the community were selected randomly. A focus group discussion, structured interviews and questionnaires were used to collect data. Results obtained showed that, 97.8% of households preferred daily collection of solid waste and 82.5% of the households desired to separate out the waste into different bins if the bins were provided by Government /Non- Government Organizations. A number of the households about 71% were willing to use recyclable products. However, when asked about the recycling of the waste only 5.5% of the households were motivated and involved in recycling whereas remaining 94.5% of the households were not recycling their waste because they were not aware and did not have time. 85.5% of households had no information on waste management and so disposed their waste as it is into the nearby open spaces.

**Challenges in waste management.**

Challenges regarding waste management in Mayom County. 81.4% of the respondents agreed that the biggest challenge in waste management is due to irresponsible behavious of individuals. It’s not due to poor government waste management policies (64.7%). Due to underfunding of local authorities to manage wastes (85.3%). It’s not due to professional incompetence of waste managers (79.4%). Due to un willingness to pay for waste collection services by individuals (67.7%). Due to financial constraints on the part of individuals (84%). Due to low priority given by the state to waste management (82%). Not due to inaccessible road network (73%). Laffont (2005) also maintains that flaws in institutions make regulation complicated in developing countries. Additionally, MLGRD (2004) gave an explanation of the challenges of solid waste management in Ghana as poor planning for waste management programs; inadequate equipment and operational funds to support waste management activities; inadequate sites and facilities for waste management operations; inadequate skills and capacity of waste management staff and negative attitudes of the general public towards the environment in general. Sujauddin et al. (2008) also talks about the unwillingness of users to pay for services of waste collection as a challenge facing waste management. Again, politicians ascribe little relevance to solid waste compared to other municipal activities (Moghadam et al., 2009). The type of waste management option subscribed to by the country for the people are often not relevant to the context. For instance, Shekdar (2009) argues that many composting plants have been shut down primarily because of the incompatibility of plant design and the characteristics of solid waste generated. Poor roads and number of vehicles for waste collection are a challenge (Henry et al., 2006). Finally, Tadesse et al. (2008), in analysing the factors that influence household waste disposal decision-making claimed that inadequate supply of waste bins and long distances to communal containers created a problem for waste management.

# 5.2. Conclusion

The conclusion is made according to the results of the study basing on the objectives as follows:

The institutions and the people of Mayom County have positive attitude towards solid waste management.

The type of solid waste management practices that the people of Mayom County are engaged in include: land filling (7.7%), recycling (28.3%) and burning (60.7%).

The challenges confronting people and institutions on solid waste management in Mayom County include: irresponsible behaviors of individuals, poor government waste management policies, underfunding of the local authorities to manage wastes, professional incompetence, of waste managers, un willingness to pay for waste management services by individuals, low priority given by the state government to solid waste management and inaccessible road network

The following are the interventions to address the sanitation situation in Mayom County

**Individual level**

Education/sensitization and training of the community on the solid waste management practices.

**Local government level**

Provision of equipments to the community for the collection of solid waste

Training or empowering the community to enable them to manage solid waste.

Conducting regular inspections of solid waste at the community or public places.

**At central government level**

Strengthening the policies on solid waste management at the state and county level.

Financing the waste management programs to enable easy management of solid waste.

Conducting regukar waste management inspections at the state level.

**NGOs**

Empowering the communities through trainings on solid waste management.

Funding waste management programs at the community and national level.

Providing equipment for the collection, transportation and storing of solid wastes.

# 5.3. Recommendations

The following recommendations are made basing on the results

* There is a need to build capacity for waste management at a local level
* The state government should support waste management programs through funding
* There is a need to sensitize the community about the consequences of poor waste management.
* There is a need to provide the community with materials for waste management.
* The central government should strengthen its policies on solid waste management.
* The state government should conduct regular inspection of solid waste at the county level.

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# APPENDIX:

**Questionnaire**

I am **SimayaLadu James**, a student from Africa Centre for project management studies (ACPMS) who is carrying out a research on “**Public perception,Attitute and Challenges on solid waste management in Mayom County”**, this questionnaire has been designed for research purpose; feel free to answer the questions. The researcher and Africa Centre for project management studies (ACPMS) will preserve the identity and the rights of all respondents who will freely fill in these questions with fidelity.

Every information gathered here will **only** be used for academic purpose.

**A. SOCIO-DEMOGRAPHIC CHARACTERISTICS**

.1 Sex: Male ( ) Female ( )

.2 Age of respondent.....................

.3Marital Status: a) Single b) Married c) Divorced d) Separated e) Widowed

4 What is your highest level of education? No education ( ) Primary ( ) Junior High ( ) Senior High ( ) Tertiary ( ) Other (specify)..............................

.5 What is the size of your household? ................................

.6 What major occupation are you engaged in? ............................................

.7 For how long have you been living in this community? .................................

**B. WASTE GENERATION, ATTITUDE, PERCEPTION AND MANAGEMENT**

.1 What are the main types of the waste generated by your household:

a) Papers b) Food waste c) Garden waste d) Non degradable (polythene bags) e)Tin cans.

.2 Please describe (tick) how your household stores waste generated?

a) Closed container

b) Opened container.

c) Pile in the yard

d) Dugout/damp in the yard

e) dump in the river side.

3 How do you manage waste generated by your household?

1. Burn b) Bury c) Dump d) others (specify)…………………………………..

4 In your opinion what is the best method to dispose of waste a) Landfilling b) Recycling c) Burning d) Other (specify)

5 How do you perceive the level of waste generated in this community?

1. **Major problem. B) Slight problem. C) Minor problem. D) Not a problem at all**

6 Are there waste collectors in your community? Yes ( ) No ( )

7 If Yes, do you access their services? Yes ( ) No ( ) Give reasons.............................................................................

8 Whose responsibility is it to handle waste generated in your household?

a) Adult females

b) Adult males c) Young females d) Young males

9 How often do you dispose of waste in your household? a) Daily b) Weekly c) Bi-weekly d) Every other week e) other (specify) …………………………………….

10 In your opinion do you think waste handling is a major health problem in your household?

Yes ( ) No ( ). Give reasons for your answer.........................

1. **CHALLENGES IN WASTE MANAGEMENT**

Please state how well you agree with the following constraints affecting solid waste management in your community.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **NO** | **Constraint** | **I strongly agree** | **Agree** | **I don’t know** | **I disagree** | **I strongly disagree** |
| **1** | Irresponsible behaviour of individuals |  |  |  |  |  |
| **2** | Poor government waste management policies |  |  |  |  |  |
| **3** | Lack of appropriate |  |  |  |  |  |
| **4** | Under funding of local authorities to manage waste |  |  |  |  |  |
| **5** | Disrespect for waste management work |  |  |  |  |  |
| **6** | Professional incompetence of waste managers |  |  |  |  |  |
| **7** | Unwillingness to pay for collection services |  |  |  |  |  |
| **8** | Financial constraint on the part of individuals |  |  |  |  |  |
| **9** | Low priority given by the state to waste management |  |  |  |  |  |
| **10** | Inaccessible road networks |  |  |  |  |  |

2 What are some of the ways in which these challenges could be addressed by the various stakeholders?

1. Individuals./community.

**……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………**

1. Local Government

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1. Central Government

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1. NGOs

**……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………**

**KEY INFORMAT QUESTIONAIR.**

I am **SimayaLadu James**, a student from Africa Centre for project management studies (ACPMS) who is carrying out a research on “**Publicperception,Attitute and Challenges on solid waste management in Mayom County”**, this questionnaire has been designed for research purpose; feel free to answer the questions. The researcher and Africa Centre for project management studies (ACPMS) will preserve the identity and the rights of all respondents who will freely fill in these questions with fidelity.

Every information gathered here will **only** be used for academic purpose.

1. What is your assessment of the sanitation situation inMayom?
2. What are the major types of solid wastes inMayom County?
3. What are the people and institutional perceptions towards solid waste management in Mayom County?
4. What are the most common environmental and health issues that you face with respect to solid waste management?
5. What do you consider to be the most appropriate way for managing solid waste?
6. Does the waste management department engage the community in the decision making process on solid waste management?
7. What challenges does the people and the institutions have towards solid waste management?
8. How do they cope with these challenges?
9. What types of solid waste management practices does the people of Mayom engage in?
10. What policy does the institutions have towards sanitation situation in Mayom County.?