



**NEAR EAST UNIVERSITY
INSTITUTE OF GRADUATE STUDIES
DEPARTMENT OF ENVIRONMENTAL EDUCATION**

**LACK OF PROPER COMMERCIAL AND DOMESTIC WASTE
PRACTICES IN MONTSERRADO COUNTY ‘MONROVIA,
LIBERIA’**

MASTER THESIS

KORVAH FORLEH KARTAKPAH

Nicosia

January, 2023

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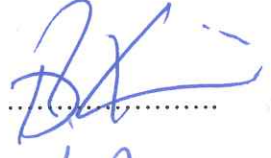


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Approval

We certify that we have read the thesis submitted by Korvah Forleh Kartakpah titled “**Lack of Proper Commercial and Domestic Waste Practices Management in Montserrado County**” and that in our combined opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Educational Sciences.

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Declaration

I hereby declare that all information, documents, analysis, and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of the Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Korvah Forleh Kartakpah

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Acknowledgments

I would like to thank all my instructors who guided me toward this path of knowledge and gave me the courage to complete this research. I am thankful for my supervisor Assoc. Prof. Dr. Engin Baysen, who helped me and supported me throughout this research. His kind behavior, patience, and guidance with his knowledge made this thesis possible. My thanks also go to the head of the department Assoc. Prof. Dr. Askin Kiraz for her motherly and inspirational advice when I had issues concerning my tuition and fees at the international office

I would like to thank SIRDAS Family for their financial support towards this journey, friends, and colleagues who always encouraged me and were always there to help me out and give suggestions for the completion and improvement of my work.

A special thanks to my beloved mother (Caroline Harris) and family for their unconditional love and support and for standing with me through thick and thin.

Korvah Forleh Kartakah

Abstract

Lack of Proper Commercial and Domestic Waste Practices in Montserrado County ‘Monrovia, Liberia’

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January 2023

Improper waste management practices are a global concern that is impacting the environment, health, and living conditions of households. The practices of corporations and households result in challenges that become evident due to inadequate waste management systems (David, Wenchaoa, Johna & Mmerekib, 2019). The considerations of the people regarding solid waste management can be elevated through spreading awareness of waste management. The awareness levels of the people reflect the practices of waste management that prevail within society. The reforms can be imposed on the people by enforcing compliance with corporations and the people (David, John & Hussain, 2020). The development of a sustainable infrastructure that includes machinery and systems to correct waste management practices is integral for society.

The research focuses on evaluating the lack of proper commercial and domestic waste practices in Montserrado County, Monrovia, Liberia. The challenges associated with waste management practices in low-income countries are higher because they lack the adequate infrastructure to support waste management practices (Almazán-Casali, Alfaro & Sikra, 2019). The damage induced on the people of low-income countries is also higher because people live near waste dumps and seek income through recycling waste. The awareness levels of the communities regarding waste management determine the practices adopted by the organizations and the people (Lloyd, Bhatt & Padhya, 2016). The method used for this research quantitative method. A structured close-ended questionnaire has been used for conducting a survey analyzing the awareness and practices of the people of Montserrado County. Four hundred respondents' replies were analyzed to better understand people's waste management awareness and habits. (Abramowitz et al.,

2015). The results reflect that people lack awareness of waste management and this reflects in their practices.

Keywords: household waste management systems, infrastructure development, sustainability, climate change, environmental challenges

Summary

An effective waste management system needs to be imposed on society to remedy the environmental and health issues that are prevailing. The low-income countries are vulnerable to challenges associated with waste management practices as they lack adequate infrastructure, machinery, and planning required to control the outcomes (Gibson, 2019). The awareness and practices of the people are coherent as they lack the environmental education required to cope with the challenges. The health of the people deteriorates with the spread of diseases and the systems imposed are inadequate to deal with the issues (Charles, Ngumbu, Toe & Sangodoyin, 2020). Cost-effective and sustainable practices of waste management are required to remedy environmental concerns and climate change problems. Globally waste management is a considerable challenge that requires infrastructure and funds to control the associated problems (Kumpel et al., 2016).

The commercial and domestic practices of waste management must be reformed and made compliant with local policies to benefit society are large. Community initiatives are required to be imposed on corporations to make them compliant and impose regulations on individuals to correct waste management practices (Stanturf, Goodrick, Warren Jr, Charnley & Stegall, 2015). Local committees must be formed to monitor the practices of the people and suggest remedial alternatives. Knowledge needs to be spread to increase awareness of the people with adequate compliance policies, investments, and types of machinery that enhance the sustainability of the communities (Famata, 2018). Reforms in the practices must be induced to correct the actions of the people and take effective actions of waste management (Voupawoe et al., 2021). Waste management systems need to be implemented that are cost-effective and align with the economic infrastructure of the countries.

Keywords: domestic waste, waste management, open field dumping, environmental issues

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CHAPTER I

This chapter includes critical information about the topic of the study. The identified sections in this chapter include a statement of the problem, the purpose of the study, the research question, the significance of the study, limitations, and the definition of terms that are critical to the topic.

Introduction

Liberia is progressing rapidly over the years, yet some sectors require the attention of the authorities. The civil war situation and internal conflicts in Liberia have put a halt to the development of the region in the past. Liberia's civil war ended in 2003, resulting in the growth of crucial areas of the country (David et al., 2019). The United Nations intervened in the development of the country and provided a solution to multiple problems that were underlying the country. The rapid development and progress in Liberia gave a rise to the commercial industries that increased the overall population. The urbanization and expansion of cities have been of significant concern to the solid waste management practices of the country (David et al., 2020). There are numerous gaps in the commercial and domestic waste practices that are being adopted by the country.

Waste can be described as unuseful material that is discarded from the industrial, commercial, and domestic industries of a country. The primary significance of a proper waste management system is to ensure a healthy environment, promote environmental quality, and focus on securing environmental sustainability (Almazán-Casali et al., 2019). Waste management is very important for economic growth and development as it contributes to resolving potential threats to the environment. The goal of building a solid waste management system is to provide a healthy environment, which can only be achieved by using appropriate waste disposal strategies. The environment can be made sustainable and healthy through the proper collection, storage, and transfer of waste that may contribute to recovery and recycling (Lloyd et al., 2016). Development of proper infrastructure in the country crafts a solution to dealing with challenges associated with waste management efficiency.

Statement of the Problem

This research aims at focusing on the challenges that are being faced by the authorities of Liberia in developing an adequate waste management system. There is a lack of proper commercial and domestic waste management practices in Montserrado County of Monrovia, Liberia. The study is destined to evaluate the reasons behind the lack of development of a waste management system in Liberia by analyzing information about the topic. Liberia's population increased dramatically after the end of the civil war. Liberia's population has eased dramatically after the end of the civil war. The lack of infrastructure in Liberia is causing challenges for the authorities to establish an adequate waste management system that is effective and sustainable (Gibson, 2019). The waste practices of the region need to be developed and improved for resolving loopholes that are being faced by the people.

Purpose of the Study

Waste practices and waste management is developed within an economy along with its infrastructure. The rapid increase in urbanization in Monrovia is increasing the trash generation potential of the city. Inadequate waste management practices are not equipped to meet the living standards of the people (Charles et al., 2020). The increasing urbanization, economic development, and changes in consumer habits are reforming their lifestyles. The need for a sustainable waste management system contributes toward environmental sustainability and the well-being of the people. Through this study, the commercial and domestic waste practices in Montserrado County will be analyzed (Kumpel et al., 2016). The progress of Liberia after the civil war and the initiatives that are sought to be implemented over the years are being reviewed in the study. The development of a country depends on the infrastructure layout that is designed by the authorities. The implementation of that layout is critical for the consistent progress of the country (Stanturf et al., 2015). An efficient waste management system is very important for the well-being and sustainability of an economy as it connects with the health and wellness of the people.

Research Question

The research question of the study is the following:

- what is the lack of proper commercial and domestic waste practices in Montserrado County of Monrovia, Liberia impacting society?

Significance of the Study

Monrovia is developing extensively over the years and this is leading to urbanization in the city. The rate of trash generation has increased over the years which contributes to increasing urbanization, economic development, greater living standards, and changes in consumer habits (Famata, 2018). The lifestyle of the people is also improving yet there are significant gaps in solid waste management practices. This damages the environment and impacts the health and well-being of the people. Liberia has experienced many Civil Wars in the past from the years 1990 to 2000 (Voupawoe et al., 2021). Poor governance, economic instability, increased violence, environmental havoc, and lack of infrastructural development have been a few challenges that have been faced by Liberia at large (World Health Organization [WHO], 2015). These challenges are linked with public health and environmental issues that are highlighting concerns for the economy.

Limitations

The limitations of the study that will be considered for this research will be outbreaks that have impacted on Liberian economy. Liberia has faced challenges with the ongoing civil war and worst outbreaks like Ebola that halted the economic growth of the country (Wardrop et al., 2017). Due to a lack of sanitation that led to cholera and diarrhea, one of Monrovia's biggest health problems has been solid waste management. This role of municipalities and garbage management will be analyzed but not from the perspective of outbreaks that were faced by the country (Frishkopf, 2017). The major factor that has caused issues with the waste management systems is not the outbreaks in the country rather rapid urbanization has increased the waste excretion in the country.

The infrastructure of waste management and sewage management is a major cause of waste-related issues and this research will focus on that perspective only. The practices of the people are a major concern that contributes to the increasing waste disposal issues (Todd Jr, 2016). Waste generation, disposal, government

initiatives, and industrialization are increasing which contributes to waste generation. An adequate stance toward the disposal and management of human well-being is integral to establishing a sustainable infrastructure in the country (Sandikie, 2015). The model infrastructure must be equipped to handle future development and progressive work plans need to be structured for meeting the future needs of the economy.

Definition of Terms

Commercial Waste

Waste generated due to industrialization from factories impacts the well-being of the people and the environment.

Domestic Waste

Waste generated from domestic use that cannot be recycled impacts the well-being of the people and the environment.

CHAPTER II

Literature Review

This chapter includes a literature review of the topic of waste practices in Liberia that are excreted on the commercial and domestic levels in the country. Details of the Montserrado county belonging to Monrovia are shared from a viewpoint of the increasing urban population in the city.

Introduction to Waste Management

Managing the waste that is excreted from domestic and commercial activities in a country is referred to as the waste management process. The entire waste management process involves waste collection, transportation, treatment, and disposal via controlled and supervised methods (Ali et al., 2021). There are many laws, technologies, and economic mechanisms that are applied to the waste that is excreted. The nature of the waste can be solid, liquid, or gas which requires different methods for disposal handling (Nansamba, 2017). The waste can be industrial, biological, household, municipal or organic. The more advanced nature of the waste is biomedical and radioactive waste that is excreted through various processes being performed in the country (Townsend, 2019). Irrespective of the nature of the waste these excretions are damaging to human health and give rise to health issues that impact the human being residing in the area either directly or indirectly.

The handling of the waste is very important as it can contaminate the water, soil, and food posing a direct threat to the people residing in the vicinity. Human activities are the major cause of waste excretion that can be linked to the extraction and processing of raw materials (Clement, 2019). The application of the waste management processes reduces the adverse effect of waste and at the same time takes initiatives to protect the health, environment, and aesthetics of the locality where the waste is being excreted (Shannon, 2016). The municipal waste management processes are applied to reduce the dangerous effects and at the same time tackle the complexities of industrial, commercial, and household activities (Karmbor-Ballah et al., 2019). There are variations in the waste excretion intensities that vary from

country to country based on levels of development, urbanization, and the magnitude of industries that are established within the country.

Effective waste management processes can be established by configuring infrastructure for the country that is equipped to tackle the waste excreted. Developing countries face this challenge regularly as their infrastructure is not prepared to meet the challenges of urbanization (Kulo, 2018). The application of waste management processes is fairly expensive and often exceeds the local municipal budgets. The role of governance is important in this case as the integrated model needs to be efficient, sustainable, and socially supported (Tarr-Attia et al., 2018). The municipal solid waste management practices are responsible for handling household, industrial and commercial activity. The implementation of policies and legislations within the country can control the amount of waste excretion and at the same time integrate a techno-economic mechanism that is equipped for effective disposal (Levy et al., 2018).

Developing countries lack the expertise and infrastructure for handling municipal waste. In some situations, the waste is not disposed of properly after the collection process. Mismanaging collection or burning waste through uncontrolled fires sabotages the environment leading to more pressing environmental challenges (Barker et al., 2020). Electronic waste has increased substantially over the years which requires implementing specific processes for handling e-waste in a country. Rapid technological and industrial progress necessitates public knowledge of the environmental consequences of inappropriate waste management. (Zorpas et al., 2015).

History of Liberia

Sierra Leone, Guinea, the Ivory Coast, and the Atlantic Ocean border the Republic of Liberia on the West African coast. The country has a population of around 5 million people reflecting a strong ethnic and cultural diversity (Sharma et al., 2020). The capital city is Monrovia where most of the economic activities take place. The country has faced immense internal challenges in the past after its inception in the 19th century (Knickmeyer, 2020). Liberia was formed after initiatives of the American Colonization Society that supported black people by acclaiming their need for freedom and prosperity. After the American Civil War in 1861, people born of black origin were freed and relocated to Liberia considering the challenges of

social and legal oppressions in the US. Liberia's independence was recognized in 1848 by the USA considering it a modern republic for black people (Babaei et al., 2015).

Liberia supported USA during the World War II and received American aid and investment in the form of infrastructure development. Liberia progressed in terms of establishing an international profile and becoming a member of the League of Nations, the United Nations, and the Organization of African Unity (Kaur et al., 2018). Political tension was at its peak resulting in a military coup as the native populace was excluded from their rights by the Americo-Liberian settlers. The Civil War continued in Liberia for more than two decades that ended with a peace agreement in 2003 (Stoeva & Alriksson, 2017). A democratic election took place in 2005 in which Ellen Johnson Sirleaf, a female candidate, became elected president of the country. The country began to gain traction toward stability that was later disrupted by internal conflicts and the outbreak of the Ebola virus from 2013 to 2016 (Mohee et al., 2015). A large population of the country was residing below the international poverty line as a result of the numerous challenges that were faced by the economy.

Economic History of Liberia

The Liberian economy saw a peak in its growth till 1979 but began to decline after 1980 due to economic mismanagement. The civil war accelerated the economic decline resulting in a reduction in GDP between 1989 and 1995 (Romani et al., 2018). The country's civil conflict ended in 2003, and the GDP began to rise, reaching 9.4% in 2007. The global financial crisis lowered GDP growth in 2009 to 4.6%. There was a massive increase in the export of rubber and timber that increased the agricultural sector giving a boost to economic development (Ali et al., 2017). A tiny domestic market, a lack of suitable infrastructure, and high transportation costs all contribute to economic development by weakening trade relations with neighboring countries. Inflation has impacted significantly the country resulting in a food and energy crisis (Pham et al., 2015). The external debt of the country also spiked numerous resulting in an overall GDP crisis. The economic decision-makers planned on gaining stability through the export of diamonds and timber which led to increased challenges in the future for the economy (Hebrok & Boks, 2017). The

major industries of Liberia are agriculture, mining, telecommunication, transportation, and energy.

Montserrado County, Monrovia

Montserrado County is in the northwest corner of the West African country of Liberia. The county is located in Monrovia, Liberia's national capital. Montserrado is one of 15 counties and sub-political districts that make up the first level of administrative division. (Kumar et al., 2017). This county is the most populous with Bensonville which serves as the capital for this county. It is the oldest county in Liberia established in 1847 forming borders with Bomi County to the west, Bong County to the north, Margibi County to the East, and the southern part of Montserrado lies on the Atlantic Coast (Inglezakis & Moustakas, 2015). The climatic condition of the county has dry and wet weather that creates weather fluctuations for the residents. This location is highly populous and has promoted urbanization in the region (Teigiserova et al., 2020). Farming and fishing are the major activities of the people with small exposure to trading.

The economic activity of the county is mainly dependent on large markets that sell consumer goods to the people. The marketplaces in this region include daily markets based on food products and weekly markets that act as distribution markets for incoming goods from rural Liberia. (Shafiee-Jood & Cai, 2016). The people lack formal employment and engage mainly in informal trading businesses. Most people indulged in self-employment with very few people aspiring toward salary-based incomes (Thi et al., 2015). The major income generators for the economy are small businesses that engage the households in activities of trade. The largest employer in the county is the national government which employs people not indulged in self-owned businesses. Agriculture, livestock, and commercial crops are mainly grown by the people (Khan et al., 2019). Rubber production and timber are mainly exported by the people as a good source of income generation.

The Central Bank of Liberia is located in Monrovia making Montserrado county a popular operating location for commercial banks. The county has access to the Freeport of Monrovia and air travel is available at Spriggs Payne Airport and Roberts International Airport (Abdel-Shafy & Mansour, 2018). Public transportation is very limited making it difficult for people to commute. The education sector is not developed with a very small percentage of people being able to gain quality

education (Nanda & Berruti, 2021). The major population of the county comprises Christians determining the cultural preferences of the region.

The infrastructure of the county is not developed to meet the growing levels of the urban population. The Liberia Water and Sewer Corporation provides water to the county with most of the water being extracted using wells and handpumps (Kaza et al., 2018). The healthcare comprises eight hospitals other than health centers and medical clinics. Most of the clinics developed after the end of the civil war. The accessibility to electricity is limited with a generation being supported by private generators (Ferronato & Torretta, 2019). Communication services are limited with no public communications companies and only privately owned companies.

Waste Management Practices in Liberia

Liberia as a country is progressing with time by introducing new projects that are contributing to the infrastructure of the country. The Liberia Country Program is launching new solid waste management projects that are sponsored and supported by the European Union. (Lohri et al., 2017). The objective is to help the communities and develop capacities that contribute toward collecting waste and converting it into energy. The implementation process of solid waste management requires implementing coverage and effectiveness of waste (Islam et al., 2019). The community needs to set standards of waste management on commercial and industrial levels to solidify the existing infrastructure of solid waste management. Feasibility studies have been established for strengthening the waste management systems in Monrovia along with the CBE system and recycling initiatives (Van et al., 2016). The infrastructure is being strengthened by improving operational capabilities in good practices, human resources, and financial management.

The management is taking initiatives of increasing the awareness of the communities about solid waste and preserving the environment. In 2019 the Country Program was organized to establish a clean-up drive (Leal Filho et al., 2016). They did this through radio programs, television broadcasts, and reaching out to the public at large. Spreading awareness of solid waste management to the people aims at spreading the word about reducing, reusing, and recycling waste and promoting climate-smart behavior in the people (Horodytska et al., 2018). The television broadcast was aired using national television channels aiming to target a large mass audience. The recent initiatives also include the World Coastal Clean-up Day in

September 2021 which took the scale of a country-wide program (David et al., 2019). The local schools and communities participated in a beach clean-up activity that was organized based on funding from the European Union. The objective of this intent was to create a visible statement in support of the environment and to change the mindsets of the people regarding waste excretion. The recent progress regarding domestic waste awareness has been started in eight schools that have started environmental clubs contributing toward the awareness of climate change (David et al., 2020). Spreading awareness on the topic is important to increase the resilience of the people to climate change and promote care for nature in the youth.

Liberia has taken into consideration that there is a waste on the streets that is harming the people. Liberia is taking the initiative of exporting charcoal which has its implications. Deforestation is affecting the climatic conditions of the country which marks a responsibility for everyone (Almazán-Casali et al., 2019). Initiatives of waste-to-energy innovation practices are also being started in Greater Monrovia. The project has been financed by the European Union for converting waste into energy. The project aims at tackling climate change by researching the important areas of application and at the same time testing innovative approaches for producing sustainable energy (Lloyd et al., 2016). The Cities Alliance completed the feasibility assessment that identified small-scale and community-based activities in Greater Monrovia in 2019. A pilot initiative was started for assessing the capacity of the selected CBEs that provided the data and gave insights into the renewable energy options (Abramowitz et al., 2015).

The pilot projects were successful and provided valuable information about the approaches to project implementation. Important information is being provided to the Monrovia City Corporation and the Paynesville City Corporation in order to plan and operate waste collection activities that permitted enumerating an understanding at the household level. (Gibson, 2019). The government has also installed eco-friendly home biogas units and toilets across Greater Monrovia to provide access to clean energy. These projects are important for integrating the waste disposal practice for handling the waste management life cycle (Charles et al., 2020). This aims at eliminating the problems linked with trash disposal and providing solutions through behavioral change. Humawe must be the main factor for handling waste disposal so that commercial and domestic waste practices procedures can be safeguarded in the Montserrado region (Kumpel et al., 2016). Collaboration must be developed between

the public and private settings for rectifying the issues of waste disposal and waste handling.

Montserrado County and Waste Management

Plastic waste can be threatening whether it is excreted from commercial or domestic waste practices. The waste chokes the waterways and impacts the salination of the Monrovia region. Montserrado county is facing challenges of disturbing waste exposure that is harming the well-being of the people (Stanturf et al., 2015). The practice of waste management recycling is supporting the disposal of this resource and converting waste into something useful. The UNDP is progressively expanding its operations and expanding disposal practices through re-imagining the businesses (Famata, 2018). The objective is to create jobs and avert the air pollution that is linked to burning plastic waste. The practice of collecting and disposing of waste in landfills has been converted into businesses where recycling practices are being implemented for preserving the adverse impact on the environment (Voupawoe et al., 2021). The plastic trash is collected and recycled into recyclable flakes in August 2021.

This initiative has solved the problem of plastic waste in Montserrado and allowed improving the lives of young Liberians. The recycling of plastic waste is a profitable business that stops the burning of plastic waste and allows reusing it for the betterment of the environment (WHO, 2015). The county realizes that the urban population of the region is expanding rapidly and the need for developing a strong waste management system is extremely essential. The authorities are taking notice of the waste disposal practices and are trying to upscale them by improving the life cycle (Wardrop et al., 2017). This is being done through technological advancement as certain areas of waste management cannot be implemented without implementing the technology. The focus of the authorities is on implementing the measures of trash disposal in society by making the people aware of the public and private actors (Frishkopf, 2017). The long-term behavioral changes are based on understanding the impact of waste generation, disposal, and management of waste to ensure the well-being of the people.

The lack of adequate commercial and domestic waste procedures in Montserrado county is underlined due to the rapid urbanization in the localities. People need to be educated about waste disposal practices for combining public and

private venues for the betterment of society (Todd Jr, 2016). The waste must be treated rather than dumped in different locations as it is damaging the infrastructure of the county. The authorities are aware of the fact that technology must be implemented for handling such a large amount of waste (Sandikie, 2015). This requires a sustainable strategy for handling commercial and domestic waste within the country so that the people don't fall subject to social damages (Ali et al., 2021). The waste management practices must be streamlined to meet the recent demographic challenges of the region and devise strategies for handling expanding infrastructure due to urbanization.

Theoretical Framework

This research identifies the lack of proper commercial and domestic waste practices in Montserrado county that are being tackled by the authorities. The major reason for this problem is the resolution of the civil war and the increase in urbanization in Liberia. The highlights of the research aim at understanding the political and historical scenario of Liberia at large along with the initiatives of authorities to improve the waste management processes in the country (Nansamba, 2017). New projects have been initiated for resolving the infrastructure and technological gaps in waste management.



Concept

The major assessment of waste management practices in Montserrado is linked with the gaps that Liberia has faced as a country. The historical events and the civil war had halted the development in the region which was further increased by the health-centered epidemics in the country. The people have faced many challenges over the years that limited the economic activities across the country (Townsend, 2019). The recent development in the country requires aligning the existing infrastructure with the required infrastructure that forms critical paths for the economy.

Related Research

Few types of research discuss the existing economic situation of the Montserrado region to be specific but extensive research has been conducted about the infrastructure development of Liberia as a country. The reason for the lack of development has been classified due to rapid expansion and urbanization within the country (Clement, 2019). New initiatives have been streamlined to launch projects that are backed by technological initiatives and innovation to resolve the issues of waste management. The objective of these initiatives is to meet the evolving needs of Liberia and curate ways to resolve the issues of waste management. Social well-being and environmental protection are the main objectives of these projects that aim at resolving the issues being faced by the country at large (Shannon, 2016). Educating the people is also important so that they learn to dispose of waste properly and contribute positively toward the well-being of society.

CHAPTER III

Methodology

This chapter includes the research methodology for the research strategy of the research that discusses the lack of proper commercial and domestic waste practices in Montserrado County. The research method will show an integrated methodology serving as a framework for measuring, collecting, and analyzing the research using quantitative data.

Research Design

Research design is the most integral part of a thesis as it provides the framework for research and aligns the information that pertains to the research findings. The research data is used for crafting the strategy that is chosen to integrate the different components of the study (Mohajanll-being, 2018). The alignment of the research components is done logically to acquire the results using the empirical finding methods. The information used for this research will be based on quantitative information that will provide blueprints for the collection and measurement of the data that has been accumulated (Pandey & Pandey, 2021). The major forms of quantitative research are comprised using descriptive analysis. The information relevant to this research will also be accumulated using the worksheet analysis technique that will allow aligning of the information and structuring of the research formation (Ranjit, 2020). The objective of structuring a research design is to align the research methods and select the most suitable technique for the research.

Participants/Population and Sample

The participants of the research are very important for data collection as it sets the momentum of the research and prescribes suitable techniques for structuring the research. The participants involved in this research will be required to fill out a structured close-ended questionnaire that will accumulate the responses of the participants (Mishra & Alok, 2022). These participants will respond to the demographic questions that are linked to the personal information of the respondents. The other segment of the questionnaire will evaluate the awareness of the households about solid waste management for understanding the level of awareness of the respondents regarding the handling of solid waste and disposing of it off properly

(Cr, 2020). Further assessment of the households will be done using the details of practices of solid waste management properly which is essential for awareness of all the households and commercial users. The alignment of this information is essential for marking the population and sample that relates to the research and allocates the findings (Snyder, 2019). The sample size will be four hundred respondents to evaluate the level of awareness of the people of Liberia about tackling the issues of solid waste management.

The research will accumulate the responses of four hundred respondents residing in Montserrado County, Monrovia, Liberia. The respondents will be required to answer a few basic personal information questions along with analysis questions (Mohajan, 2018). The analysis portion will be classified into two parts that will evaluate the awareness and practices of the people of Liberia. The first part will assist in understanding the awareness of households regarding solid waste management. The second part will analyze the practices of the people regarding Solid Waste Management. The compilation of all the parts of the questionnaire is important as it discusses the awareness and practices of the people (Pandey & Pandey, 2021). The responses from four hundred respondents will allow for analyzing the behavior of the people and the importance they give to waste management practices. Waste management practices must be developed in Liberia to improve the standards of living of the people and make them adopt sustainable practices related to waste management.

Data Collection Tools/Materials

The data collection tools and materials are important for structuring the alignment of the research. The goal and objective of the researcher will be to understand the quality of the results that are acquired. The solid waste management strategies that have been implemented recently along with the practices that have been used in the past for handling waste are important to be understood. The primary data relevant to the research will be accumulated using a close-ended questionnaire that will be divided into three sections (Zangirolami-Raimundo et al., 2018). The first section of the questionnaire will assess the personal information and demographic information of the responders. The second section will evaluate the awareness of households regarding the handling of solid waste (Säfsten & Gustavsson, 2020). The third section will evaluate the practices of households to mark the level of

importance of effectively handling solid waste. All three sections of the questionnaires have been designed to assess the practices of the households for measuring solid waste and suggesting practices that are efficient for effective handling (Bairagi & Munot, 2019). The primary information will be gathered using the questionnaire whereas the secondary information will be gathered through assessing the information available on various resources such as journals and articles. The combination of primary and secondary information will allow for aligning the information relevant to the research and mark the outcomes of the research in the findings (Patel & Patel, 2019).

The information will be gathered by acquiring responses using close-ended and structured questionnaires (Lai, 2018). The secondary information of research will be acquired through qualitative data that will be extracted from research, articles, journals, websites, and relevant media portals that publish the news regarding the waste management systems of Liberia (Babii, 2020). The goal of the research is allocated to align all the information and use it to understand the waste practices that are being followed in the Montserrado County of Liberia. The economic challenges of Liberia will be analyzed to understand the reasons for hindrances in establishing a sustainable waste management system in Liberia (Nayak & Singh, 2021). The economic challenges and political loopholes will be discussed using this information to measure the outcomes of Liberia.

Data Analysis Procedures

The data analysis procedure of the study will be linked with measuring the variables and acquiring the information that connects with the study. The objective of the study is to align all the information related to waste management practices in Liberia and analyze it from the perspective of Montserrado County (Ngozwana, 2018). The objective of these unique insights is to evaluate the research problems by interviewing the people and assessing the group of interests in the research field. The sampling technique will be used to gather information from people belonging to different demographic segments of Liberia (Mohajan, 2018). The students, women, family heads, and members of the Monrovia community will be approached for acquiring the responses to the questionnaire. The responses will be assessed as close-ended questions on the Likert scale to gain insights into the research problems (Pandey & Pandey, 2021). The assessment of the responses will be done using the

worksheet analysis method where charts and tabular representations of all the outcomes will be aligned for the research.

A quantitative method of research will be used for the analysis which includes evaluating quantitative data for the research. The data analysis will be done using the worksheet analysis method where the responses of the four hundred respondents will be classified (Rinjit, 2020). The responses will be structured using worksheets and graphs that will provide an assessment of the responses. The graphical representation will help in molding the data and analyzing the responses of the people (Mishra & Alok, 2022). The focus of the research is on Montserrado County, Monrovia, Liberia which will help in evaluating data from that specific perspective. The responses will be collected through online survey forms that will allow categorizing of the information (Snyder, 2019). The online survey forms will focus on the target audience of Montserrado County, Monrovia, Liberia so that the results are accurate and provide clarity about the waste management practices of Liberia. Waste management is an important aspect of society that requires consideration from the government (Dźwigoł & Dźwigoł-Barosz, 2018). The initiatives of the government and the scope of awareness of the people will be evaluated by analyzing the questionnaire.

CHAPTER IV

Findings and Data Analysis

The data analysis portion of the research is developed using a structured close-ended questionnaire. The method of testing used is the convenience sampling technique where the responses of four hundred respondents have been evaluated (Sharma et al., 2020). The data has been gathered through online surveys targeting the people of Montserrado County, Monrovia, Liberia. The objective of the research was to analyze the practices of the people regarding domestic waste. The commercial and domestic waste practices in the Montserrado County of Monrovia, Liberia have been analyzed for this purpose (Knickmeyer, 2020). The practices of the people and the lack of proper commercial and domestic waste are critically important for the people. Waste practices are important for the health and fitness of the people in society (Babaei et al., 2015). The lack of adequate disposal facilities can harm the health of the people and lead to societal problems that may challenge society.

Data Evaluation

The research focuses on evaluating the waste management needs of Montserrado County which help in evaluating gaps due to historical events. The challenges that Liberia has faced over the years have hindered the infrastructure development that halted the growth of the society at large (Kaur et al., 2018). The government is realizing these gaps and is working on initiatives to solidify the infrastructure. The role of the government is integral in making commercial and domestic waste practices effective and efficient (Stoeva & Alriksson, 2017). The consideration of health prospects with the adequacy of the waste disposal systems is critical for society at large. The trends of waste management are evolving with the growing focus on environmental sustainability (Mohee et al., 2015). The adequacy of waste management practices is important to maintain the infrastructure of the region. The consideration of challenges associated with waste management needs to be rectified for improving the lifestyle of the people (Romani et al., 2018). Providing adequate education regarding waste management is crucial for improving the practices of the people and spreading awareness of problems associated with inadequate disposal systems.

The questionnaire used for the analysis comprises three critical portions that evaluate the personal information of the respondents, the awareness of the people about waste management, and the practices of the people regarding waste management. The focus of the analysis is on the practices of the people of Montserrado county that dominate their actions as households (Ali et al., 2017). The commercial aspect of the research has been evaluated from the qualitative analysis that shows the role of corporations in Liberia. The commercial and domestic aspects of waste management practices of Montserrado County, Monrovia, Liberia is important to evaluate the major damage that is being inducted on the society (Pham et al., 2015). The commercial practices are required to be monitored by the government through macro initiatives and policies whereas the micro aspects of waste management require analyzing the domestic practices of the people (Hebrok & Boks, 2017). The policies need to be developed for both the commercial and domestic segments of Montserrado County so that a better waste management system can be provided to the people.

Personal Information

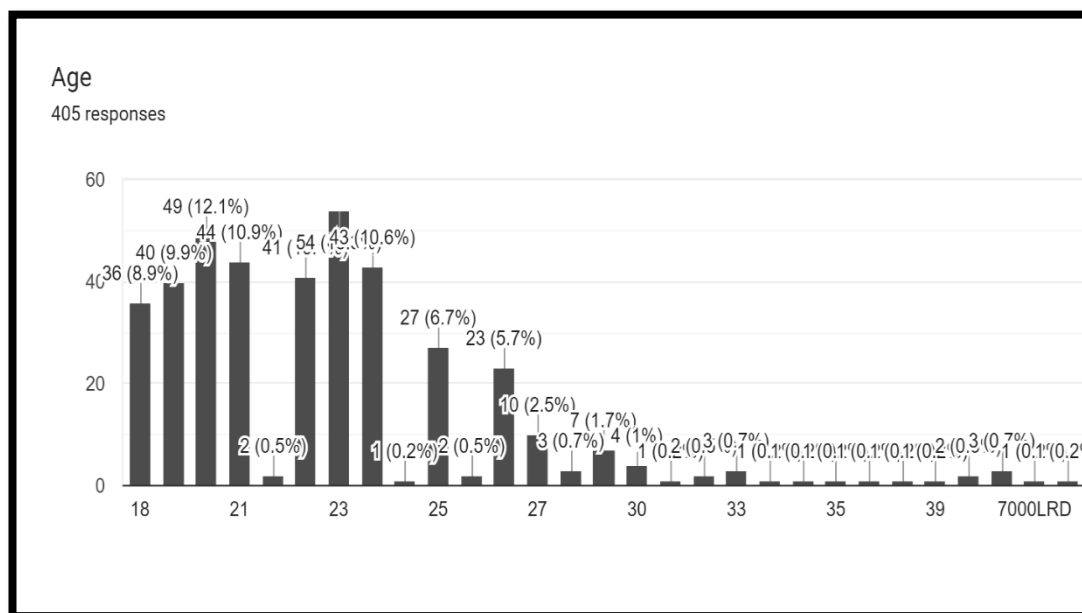
The first portion of the questionnaire is the personal information of the respondents. The demographics that have been assessed for the responses are important to understand the mindsets of the people.

Age

The age of the respondents was an open-ended question where the participants were free to enter their respective ages. This was done to specifically analyze the age of the participants and understand their levels of awareness about the importance of waste management systems.

The graphical representation is shown below:

Figure 1.

Age Range of Respondents

The major age segment of the respondents was from 18- 30 years of age. This showed that the respondents were mostly youth and adults who understand the importance of having an adequate waste management system. The youth are more aware of waste management practices as they are updated with the recent economic trends and understand the importance of having sustainable infrastructures.

Gender

The classification of the gender of the respondents showed that 230 respondents are male which accumulates to 57.5% of the total respondents and 170 respondents are female which accumulates to 42.5% of the total respondents.

The tabular representation is shown below:

Table 1.

Gender Classification

Gender	Male	230	57.5%
	Female	170	42.5%

Religion

The religion of the people is a depiction of their lifestyle and household standards. The practices of waste disposal of the people depend significantly on the religion they follow. The respondents were categorized from Islam 25%, Hinduism 1%, Christians 73%, and Buddhists 2%. This shows that a large segment of the respondents follows Christianity as their religion.

The tabular representation is shown below:

Table 2.

Religion

	Islam	99	24.75%
Religion	Hindu	2	1%
	Christian	291	72.75%
	Buddhist	8	2%

Marital Status

The marital status of the respondents shows that 27% were married, 58% were unmarried. So, it can be assumed that a huge number of respondents live alone at homes or in a shared space as they are unmarried.

The tabular representation is shown below:

Table 3.

Marital Status

	Married	107	27%
Marital Status	Unmarried	233	58%
	Widowed	7	2%
	Divorced	53	13%

Occupation

The classification of occupation of the respondents shows that people are working in different kinds of jobs. 25% of respondents are business owners, 21% of respondents have self-service roles while to other respondents work at other kinds of jobs.

The tabular representation is shown below:

Table 4.

Occupation of Respondents

Occupation	Govt job	53	13%
	Private job	67	17%
	Housewife	22	6%
	Business	98	25%
	Self-service	85	21%
	Other	75	19%

Education

The education level of the respondents shows that 27% are HSC and 30% are more than HSC. This reflects that most of the respondents are educated and aware of the basic requirement of waste management. The personal practices of waste management and hygiene shall be known to a large segment of the respondents.

The tabular representation is shown below:

Table 5.

Education Level of the Respondents

Education	No Education	43	11%
	Primary	35	9%
	Secondary	94	24%
	H S C	107	27%
	More than HSC	121	30%

Residential Status

The residential status of the people shows that 42% of people live in their own homes whereas 58% of people live in rented homes. The quantity of people living in rented homes is higher than respondents living in their own homes. The difference in the figures does not have a significant difference reflection on an unbiased research analysis.

The tabular representation is shown below:

Table 6.

Residential Status of the People

Residential Status	Own	168	42%
	Rented	232	58%

Types of Solid Waste

The types of solid waste that households dispose of include 59% recyclable waste, 40% non-recyclable waste, and 2% others. The quantity of recyclable waste is significantly higher in comparison with non-recyclable waste. The non-recyclable waste is an environmental hazard and harms the health of the people. This kind of waste needs to be reduced.

The tabular representation is shown below:

Table 7.

Types of Solid Waste that Households Dispose

Types of Solid Waste	Recyclable waste	236	59%
	Non-Recyclable waste	158	39.5%
	Others	6	1.5%

The Problem in Household Solid Waste Management

The respondents were asked about the problems with recent household solid waste management systems which showed that 45% consider that the waste disposal system is not good or effective while 25% of the people think that there is a lack of containers to collect waste at home. This reflects that the people are not satisfied with the existing system and consider that the system requires to be reformed.

The tabular representation is shown below:

Table 8.

Problem in Household Solid Waste Management

The problem in household solid waste management	There is no good System for the disposal of waste.	180	45%
	Cost is high	62	16%
	Irregular Service	60	15%
	Lack of Container to collect waste at home	98	25%
	Others	0	0%

Have You Any Training on Household Solid Waste Management?

The respondents were asked whether they had any training in household solid waste management. 40% of the people affirmed that they had adequate training and 60% disagreed that they had not received any training. This shows that there is a lack of awareness amongst the people regarding waste management systems and must be educated.

The tabular representation is shown below:

Table 9.

Training on Household Solid Waste Management

Have you any training on household solid waste management?	Yes	160	40%
	No	240	60%

The assessment of the personal information of the respondents shows that the people respondent is educated and working people. The sample is a mix of male and female respondents who are active households and aware of the importance of waste management (Kumar et al., 2017). The people consider that there is a need for change in the infrastructure of the waste management system as it is inadequate to meet the needs of the people. The respondents also consider that training on household waste management is necessary and must be provided to the people (Inglezakis & Moustakas, 2015). It is an important factor of consideration that a huge amount of the sample population has never received any training in waste management. The respondents are aware of the importance of waste management

and strongly think that the facilities that are being provided regarding waste management are inadequate (Teigiserova et al., 2020). This is impacting the efficiency of the entire infrastructure of waste management in Montserrado County and requires reforms.

Part 2: Awareness of Household Solid Waste Management

The awareness of households about solid waste management is important from a domestic level. The consumption patterns of the people and their awareness of solid waste management determine the outcomes of a clean society (Shafiee-Jood & Cai, 2016). The awareness of the households of Montserrado County regarding solid waste management is integral to understanding the practices of society. In this section of the research, four hundred respondents were asked about their awareness of solid waste management to analyze their outcomes (Thi et al., 2015). This will portray the role of the people and help analyze the situation of solid waste management in Montserrado County from an in-depth perspective.

Household Solid Waste Management Committees Are Needed in The Community. The respondents were asked whether there was a need for forming committees on a household level regarding solid waste management. The responses showed that 307 respondents which accumulate to 77% of the sample population agreed to form committees that monitored household solid waste management practices. 21% of respondents disagreed with the need of having committees monitor solid waste management practices.

The tabular representation is shown below:

Table 10.

Household Solid Waste Management Committees

Household solid waste management committees are needed in the community.	Yes	No	Don't Know
	307	85	8

This reflects that the people are aware of the importance of solid waste management practices and agree that committees are formed to monitor the practices of the people.

Every People Have to Know About Household Solid Waste Management.

The respondents were asked about people knowing about the importance of solid waste management practices. 287 respondents which accumulate to 72% people agreed that knowledge of household waste management practice was critically important. 26% of respondents disagreed about people being aware of solid waste management practices.

The tabular representation is shown below:

Table 11.

Know About Household Solid Waste Management

Every people have to know about household solid waste management.	Yes	No	Don't Know
	287	103	10

Local Authorities Have No Role to Play in Household Solid Waste

Management. The respondents were asked whether the local authorities have no role to play in household solid waste management. 195 respondents which accumulate to 49% of respondents agreed with this fact and 41% of respondents disagreed suggesting that the local authorities have a critical role in monitoring household solid waste management practices.

The tabular representation is shown below:

Table 12.

Local Authorities Have No Role to Play in Household Waste

Local authorities have no role to play in household solid waste management.	Yes	No	Don't Know
	195	163	42

Respiratory Distress, Diarrhea, and Many Other Diseases Arise Due to Improper Waste Management. Many diseases are associated with household solid waste management such as respiratory diseases and diarrhea. These diseases arise due to improper household solid waste management systems. 320 respondents which accumulate to 80% of the respondents agreed that diseases arise due to improper solid waste management and 16% disagreed with this fact.

The tabular representation is shown below:

Table 13.

Diseases Arise Due to Improper Waste Management

	Yes	No	Don't Know
Respiratory distress, diarrhea, and many other diseases arise due to improper waste management.	320	65	15

Household Solid Waste Can't Reuse or Recycle. The awareness level of the respondents was checked by asking them whether household solid waste cannot be reused or recycled. 43% of people agreed that household solid waste management cannot be reused, 38% said that it can be reused and 20% of respondents were unaware whether waste was recyclable or not.

The tabular representation is shown below:

Table 14.

Household Solid Waste Can't Reuse or Recycle

	Yes	No	Don't Know
Household solid waste can't reuse or recycle.	170	150	80

Everybody is Awarded for Electronic Household Solid Waste Management.

The respondents were asked whether everybody is awarded for solid waste management of which 33% replied yes, 48% replied no, and 19% were completely unaware of it.

The tabular representation is shown below:

Table 15.

Electronic Household Solid Waste Management

	Yes	No	Don't Know
Everybody is awarded for electronic household solid waste management.	132	191	77

Waste Disposal in Open Places Will Be Harmful to Human Health. The respondents were asked whether waste disposal in open places will be harmful to human health. 311 respondents which accumulate to 78% of the respondents replied yes and 19% of respondents replied with no as an answer. 3% of respondents said that they were unaware whether disposing of waste in the open air was or was not harmful to human health.

The tabular representation is shown below:

Table 16.

Waste Disposal

Waste disposal in open places will be harmful to human health.	Yes	No	Don't Know
	311	76	13

Community People are Awarded Any Legislation Which Governs Household Solid Waste Management. The respondents were asked whether community people are awarded any legislation which governs household solid waste management. 33% of the respondents affirmed it and 48% of respondents negated awareness of this fact. 20% of the people were completely unaware and declared that they did not have any awareness of this fact.

The tabular representation is shown below:

Table 17.

Community People are Awarded Any Legislation Which Governs Household Solid Waste Management

Community people are awarded any legislation which governs household solid waste management.	Yes	No	Don't Know
	132	190	78

All Streets Should Be Clean and Free of Waste. The respondents were asked whether all streets should be kept clean and free of waste all the time. 323 respondents accumulate to 81% people said that the streets should be clean and free of waste all the time. 16% of respondents replied that the streets should not be clean and free of waste and 4% replied that they did not know about the importance of cleanliness of the streets.

The tabular representation is shown below:

Table 18.

All Streets Should Be Clean and Free of Waste

All streets should be clean and free of waste.	Yes	No	Don't Know
	323	63	14

Incineration is an Effective Disposal Mechanism for Household Solid Waste Management. The respondents were asked whether incineration is an effective disposal mechanism for household solid waste management. 59% of respondents said that yes it was effective, 31% replied no it was not effective and 10% said that they did not know the answer.

The tabular representation is shown below:

Table 19.

Incineration is an Effective Disposal Mechanism for Household Solid Waste Management

Incineration is an effective disposal mechanism for household solid waste management.	Yes	No	Don't Know
	236	125	39

Delay in Household Solid Waste Disposal Causes Many Difficulties. The respondents were asked whether the delay in household solid waste disposal causes many difficulties. 299 respondents which accumulate to 75% agreed that delay in household solid waste disposal causes many difficulties, 20% disagreed. This shows that people are aware that delay in household solid waste disposal is a reasonable cause of many difficulties.

The tabular representation is shown below:

Table 20.

Delay in Household Solid Waste Disposal Causes Many Difficulties

Delay in household solid waste disposal causes many difficulties.	Yes	No	Don't Know
	299	79	22

I Am Always Concerned About Collecting and Disposing of The Spouse of Household Solid Waste Management. The respondents were asked whether they were always concerned about collecting and disposing of the spouse of household solid waste management. 75% of the respondents affirmed, 21% of the respondents negated.

The tabular representation is shown below:

Table 21.

Concerned About Collecting and Disposing Waste

I am always concerned about collecting and disposing of the spouse of household solid waste management.	Yes	No	Don't Know
	300	84	16

The analysis of the awareness of the respondents about household solid waste management shows that there are some aspects where people are aware of the importance of solid waste management whereas there are critical places where people are completely unaware. The lack of awareness of people can impact their practices of household waste management (Khan et al., 2019). The awareness levels

of the people need to be increased so that an adequate understanding of solid waste management can be developed.

Part 3: Practice Household Solid Waste Management

The practices of the people regarding household waste management are a reflection of society. The practices of the people determine the concerns of health and fitness aspects and the corrective actions that are required from the people (Abdel-Shafy & Mansour, 2018). The respondents were asked about their practices and their responses were analyzed using a Likert scale. The responses showed the behavioral patterns of the people and their practices regarding household solid waste management.

I Use Different Bins for Waste Disposal. The respondents were asked whether they use different bins for waste disposal. 20% responded that they never use different bins for waste disposal and 34% responded that they use different bins for waste disposal. This proves that people are actually aware of it to some extent but they choose to pay little or no attention.

The tabular representation is shown below:

Table 22.

Bins for Waste Disposal

I use different bins for waste disposal.	Never	Seldom	Sometimes	Often	Always
	80	45	137	64	74

I Throw Waste into The Drain. The respondents were asked whether they throw waste into the drain. 48% responded that they never throw waste into the drain, 17% responded that they seldom throw waste into the drain, 16% responded that they throw waste into the drain, 9% responded that they throw waste into the drain and 10% responded that they throw waste into the drain.

The tabular representation is shown below:

Table 23.

Waste into The Drain

I throw waste into the drain.	Never	Seldom	Sometimes	Often	Always
	192	68	62	37	41

I Use Our Kitchen Waste as Compost to Me for Gardening. The respondents were asked whether they use their kitchen waste as compost to me for gardening. 34,2% responded that they never use their kitchen waste as compost to make for gardening, 27.5% responded that they sometimes use their kitchen waste as compost for gardening.

The tabular representation is shown below:

Table 24.

Kitchen Waste as Compost

I use our kitchen	Never	Seldom	Sometimes	Often	Always
waste as compost to make gardening.	137	60	110	50	43

I Reuse Grocery Bags. The respondents were asked whether they reuse grocery bags. 31.75% responded that they never reuse grocery bags, 28.75% responded that they sometimes reuse grocery bags, this frequency shows that due to economic constrains people are unknowingly contributing to the reduction of plastics waste.

The tabular representation is shown below:

Table 25.

Grocery Bags

I reuse grocery bags.	Never	Seldom	Sometimes	Often	Always
	127	59	115	50	49

I Throw Waste into an Open Dump. The respondents were asked whether they throw waste into an open dump 17% responded that they often throw waste into an open dump and 48% responded that they always throw waste into an open dump.

The tabular representation is shown below:

Table 26.

Waste into an Open Dump

I throw waste into an	Never	Seldom	Sometimes	Often	Always
open dump.	48	30	62	68	192

I Throw Waste into The Open Field. The respondents were asked whether they throw waste into the open field. 23.25% responded that they always throw waste into the open field and 24% responded that they never throw waste into the open field.

The tabular representation is shown below:

Table 27.

Waste into The Open Field

I throw waste into the open field.	Never	Seldom	Sometimes	Often	Always
	96	59	75	77	93

I Collect The Waste in a Household Container Without Cover. The respondents were asked whether they collect the waste in a household container without cover. 26% responded that they never collect the waste in a household container without cover, 35% responded that they sometimes collect the waste in a household container without cover.

The tabular representation is shown below:

Table 28.

Collect The Waste in a Household Container Without Cover

I collect the waste in a household container without cover.	Never	Seldom	Sometimes	Often	Always
	104	49	140	61	46

I Collect the Waste in a Plastic Bag. The respondents were asked whether they collect the waste in a plastic bag. 24.5% responded that they sometimes collect the waste in a plastic bag, and 24.25% responded that they always collect the waste in a plastic bag.

The tabular representation is shown below:

Table 29.

Waste in a Plastic Bag

I collect the waste in a plastic bag.	Never	Seldom	Sometimes	Often	Always
	69	53	98	83	97

I Segregate Biodegradable (Paper, Banana Peels, Cardboard, and Vegetables) And Non-Biodegradable (Plastic Toys, Glass Steel, Rubber) Wastes at Home. The respondents were asked whether they segregate biodegradable (paper, banana peels, cardboard, and vegetables) and non-biodegradable (plastic toys, glass steel, rubber) wastes at home. 39% responded that they segregate biodegradable wastes at home, 15% responded that they segregate biodegradable wastes at home, 27% responded that they segregate biodegradable wastes at home, 10% responded that they segregate biodegradable wastes at home and 9% responded that they segregate biodegradable wastes at home.

The tabular representation is shown below:

Table 30.

I Segregate Biodegradable

I segregate	Never	Seldom	Sometimes	Often	Always
biodegradable (paper, banana peels, cardboard, and vegetables) and non-biodegradable (plastic toys, glass steel, rubber) wastes at home.	156	59	109	39	37

I Keep All the Garbage in One Garbage Container. The respondents were asked whether they keep all the garbage in one garbage container. 39% responded that they never keep all the garbage in one garbage container, 27.25% responded that they sometimes keep all the garbage in one garbage container,

The tabular representation is shown below:

Table 31.

I Keep All the Garbage in One Garbage Container

I keep all the garbage	Never	Seldom	Sometimes	Often	Always
in one garbage container.	97	61	73	75	94

I Use to Burn Solid Waste When I Have a Bulk Amount Of Solid Waste.

The respondents were asked whether they burn solid waste when they have a bulk amount of solid waste. 26% responded that they never burn solid waste when they have a bulk amount of solid waste, while 34.75% responded that they sometimes burn solid waste when they have a bulk amount of solid waste,

The tabular representation is shown below:

Table 32.

I Use to Burn Solid Waste When I Have a Bulk Amount of Solid Waste

I use to burn solid waste when I have a bulk amount of solid waste.	Never	Seldom	Sometimes	Often	Always
	104	49	139	59	49

I Dispose of Solid Waste Regularly. The respondents were asked whether they dispose of solid waste regularly. 54% responded that they never dispose of solid waste regularly and 18% responded that they sometimes dispose of solid waste regularly.

The tabular representation is shown below:

Table 33.

I Dispose of Solid Waste Regularly

I dispose of solid waste regularly.	Never	Seldom	Sometimes	Often	Always
	216	48	72	38	26

I Dispose of Solid Waste to a Waste Collector. The respondents were asked whether they dispose of solid waste to a waste collector. 24,5% responded that they always dispose of solid waste to a waste collector while 23.75% responded that they sometimes dispose of solid waste to a waste collector.

The tabular representation is shown below:

Table 34.

I Dispose of Solid Waste to a Waste Collector

I dispose of solid waste to a waste collector.	Never	Seldom	Sometimes	Often	Always
	69	53	95	85	98

The practices of the respondents have been analyzed by inquiring about methods of waste management systems that are adopted by the households. This section of the questionnaire focused on inquiring about the use of different bins for waste disposal (Thi et al., 2015). The practices of throwing waste and reusing the waste for compost were analyzed. The responses focused mainly on the practices of the respondents and assessing whether they reused grocery bags, and threw waste in the open dump or the open fields (Khan et al., 2019). The collection process of waste in containers without covers or plastic bags is reflected in regular practices. the segregation of biodegradable waste, collecting the waste, and burning solid waste was also inquired (Abdel-Shafy et al., 2018). The disposal intervals of the waste and disposal of waste to the waste collectors were also inquired.

The responses showed that the level of unawareness of the proper method required for disposing of the waste was lacking in the practices of the households. A huge number of people claimed that they were aware of the importance of waste management yet the practices they adopted were not satisfactory (Nanda & Berruti, 2021). The lack of resources and lack of consideration for the environment is a major concern for wrongly disposing of waste. The people were inconsiderate about the methods they used for waste management for many obvious societal and economic factors (Kaza et al., 2018). Domestic awareness of waste management is lacking in the household and the practices don't contribute to the well-being of the environment. This is a major challenge for environmental sustainability that impacts the overall standards of living of the people (Ferronato & Torretta, 2019). The resources that are being used in Montserrado County and the awareness levels of the people are insufficient.

CHAPTER V

Discussion

Numerous factors lead to waste management issues that must be remedied by the government to safeguard the precious lives of the people and the environment at large. Tackling the issues of waste management require adequate attention from the authorities to correct the infrastructure of the country and support sustainable environmental practices (WHO, 2015). The commercial and domestic practices within society need to be corrected and made compatible to sustain the growing problems associated with waste management. There are factors associated with poor waste management that need to be combated by discovering inefficiencies and remedying them (Wardrop et al., 2017). The most prominent issues are lack of public awareness, refusal to learn about compliance, insufficient investment in the waste management sector, and lack of infrastructure and machinery.

Combating Waste Management Issues

Combating waste management issues requires structuring the concerns and working on initiatives that address these concerns. Society and authorities need to work hand in hand to understand the impact of waste on society and devise ways to make the waste management system sustainable (Frishkopf, 2017). The prospects of the international communities are evolving with the realization that waste management is important for a sustainable livelihood. The future of waste management requires an adaptable change where the global leaders and local communities are aware and progressively working towards controlling the outcomes (Todd Jr, 2016). The throwaway culture of the people must be reformed by increasing education and awareness within society. The commercial and domestic practices of handling waste represent a broader challenge that is being faced by society (Sandikie, 2015). The human health, household livelihood, environment, and prosperity of the countries rely on understanding the importance of waste management.

Solid waste management is a universal issue that matters to all human inhabitants. Most of the waste is openly dumped and burned by the people, especially in low-income countries (Ali et al., 2021). Poor countries are the most vulnerable and

the most responsible for the inadequate adaptation of waste management. The disproportionate effect on society is witnessed due to a lack of environmental education and a lack of awareness of the people that reflects on their practices (Nansamba, 2017). The proportionate increase of landslides of waste dumps shows a lack of infrastructure to handle the growing excretion of waste. Commercial and domestic users contribute to the waste that is left untreated, resulting in people living in piles of waste (Townsend, 2019). The poor are affected the most as they live near the waste dumps with minimum awareness of the associated damages to health and wellbeing. The recycling system of society is supported through waste picking that acts as an income generator for the poor (Clement, 2019). This leaves the poor susceptible to serious health repercussions.

Remedying Solid Waste Management Problems

Solid waste management is a concern for everyone either on an individual level or a governmental level. The authorities responsible for waste management and the individuals must all ensure that proper waste management practices are developed within the society (Shannon, 2016). This is critical for the sustainable development goals that are required to be met internationally. The waste that remains untreated or unmanaged is either dumped or burned (Karmbor-Ballah et al., 2019). This harms human health and hurts the environment and climate resulting in hindering economic growth in poor and rich countries. Waste generation has increased at an alarming rate and countries are rapidly developing without adequate systems (Kulo, 2018). The changing waste compositions must be backed by infrastructural development for tackling the global waste challenges. Rapid urbanization, population growth, and economic development are factors that result in waste generation (Tarr-Attia et al., 2018).

The assessment of the problems that prevail in the Montserrado County of Liberia shows a lack of awareness of the people about the waste management issues that lead to a change in their practices. The commercial and domestic activities of the people are impacting heavily the entire system (Levy et al., 2018). The government lacks the resources to evolve the infrastructure and the lack of awareness of the people compiles the problems. The major challenges being faced in Montserrado County as evaluated shows the need for enhanced compliance and dynamic investment in reforming the machinery and infrastructure of the community at large

(Barker et al., 2020). This will remedy the commercial and domestic level challenges that are being faced by Liberia relating to solid waste management.

Lack of Awareness

Awareness is a primary issue of all the waste management problems that prevail in Montserrado County. The practices of the people at commercial and domestic levels influence the problems of society (Zorpas et al., 2015). The approach of the people needs to evolve to change the practices and make sure that adequate implementation is supported. The lack of awareness of the businesses and poor attitudes toward reforms dominate the worsening conditions of waste management (Sharma et al., 2020). Besides the emphasis on the commercial sector the domestic practices of the households also need to be reformed to remedy the outcomes of waste management challenges. The change in attitudes and consideration toward disposal requires inducing care and consideration in the people (Knickmeyer, 2020). Reformed behavior can correct many problems that prevail in society and improve the practices of the people.

The mindset of the people needs to be reformed to understand that if something has come to the end of its usefulness does not mean that the commodity needs to be disposed of or discarded. Proper disposal can benefit the planet whereas mismanaged disposal harms the planet (Babaei et al., 2015). Sustainability behind all the actions is a key factor that associates with the waste management strategy. The awareness of the people makes them change their practices and handle the associated issues with efficiency (Kaur et al., 2018). The environment and human health are crucial issues that require inducing time and effort in correcting waste management practices. The realization of organizations' damages associated with inadequate waste management can help them realize the benefits generated through waste management (Stoeva & Alriksson, 2017). The organizations can train their staff and educate them about the benefits linked with an adequate waste management strategy.

Implementing Compliance

Compliance is a major necessity of the organization that requires businesses to take responsibility for the environment and enforce policies that support the community. The rules and regulations of waste management must be enforced within the organizations to ensure compliance with waste management standards (Mohee et

al., 2015). This supports the communities and allows transferring waste to the registered waste carriers. The detailed assessment of the waste and preparing notes before disposing of the waste allows for managing the waste efficiently (Romani et al., 2018). The implementation of compliance policies on the commercial level and strengthening the local authorities to establish committees that monitor domestic waste outcomes are mandatory for implementing compliance.

Many regulations need to be in place to correct the practices of the people. The lack of awareness of the people about legislation and refusal to comply impacts the entire region (Ali et al., 2017). The exposure of legislation needs to be enhanced so that fines and jail time can be enforced on non-compliant organizations and individuals. Holding corporations and the people accountable through compliance regulates waste management practices and corrects the behaviors of the people. Adequate implementation and compliance can be done through the actions of the authorities that must be implemented on a state level (Pham et al., 2015). This changes the outcomes of society and benefits the entire system in the long run.

Insufficient Investment

The organizations remain non-compliant to save money which results in the disposal of waste to illegal sites or fly-tipping. The non-compliant practices are cheaper than legitimate waste disposals as they don't aim to conserve the environment (Hebrok & Boks, 2017). The lawful regulations are not imposed on the organizations so they don't consider managing the waste. The imposition of lawful compliance is necessary for corporations and domestic users (Kumar et al., 2017). The compliance methods imposed through regulating bodies and local committees can reform the practices of the people and promote investments in an adequate waste management system. These systems contribute to society and benefit the environment by remedying the associated challenges of adequate waste management systems (Inglezakis & Moustakas, 2015). Cutting costs on essential practices damage the fundamentals of society resulting in problems that cannot be foreseen immediately. Operating illegal waste sites and combusting the waste results in consequences that are beyond remedy for the entire society (Teigiserova et al., 2020).

Obsolete waste management machinery is a major hazard that fails to solve waste issues. The imposition of compliance is possible by imposing fines and making sure that the businesses are regulated so that adequate solutions can be provided

(Shafiee-Jood & Cai, 2016). Regular investments need to be made for upgrading the machinery and the infrastructure of the society to control the hazards and limit the severity of the damage. The punishment is faced by society when inadequate investments are made to reform infrastructural developments (Thi et al., 2015). Properly managing the waste and making investments in recycling can only be possible through consistent initiatives that work on improving the community practices at large.

Proper Machinery

The machinery required for waste management is costly and corporations seek to avoid excessive expenditures. The types of machinery such as balers and compactors are a necessity of the country for managing waste and preparing a strategy for recycling the waste excretion (Khan et al., 2019). Commercial and domestic users need to be made aware of the solutions so that these practices can become a part of the system. The machinery is capable of reducing the waste volume which guarantees easier transportation and storage (Abdel-Shafy & Mansour, 2018). This enhances the operational efficiencies of the businesses by dedicating waste management practices and selecting the spot for conducting these actions. The hygiene and safety of domestic residents will improve ultimately through handling waste in enclosed spaces (Nanda & Berruti, 2021). The health concerns of the people are a major concern that can be corrected through small initiatives on a commercial level. Effective management of waste on a commercial level will automatically correct the practices of the people on a domestic level, enabling a change process (Kaza et al., 2018).

Machinery and investment are key contributors to efficient waste management that require constant upgrades. The operating costs of the businesses will reduce with lesser trips to the landfills and reducing fly tipping which are illegal practice (Ferronato & Torretta, 2019). The waste management solutions seem costly in the beginning but with time they help in reducing the operating costs of the businesses and generate a revenue stream through recycling (Lohri et al., 2017). The safety of the people is amplified and allows for discovering better ways of handling waste.

Implementing Waste Management Strategies

Waste management strategies are a crucial part of commercial and domestic activities that require actions from the authorities. Spreading awareness and reforming the practices are critical for solving waste piling (Islam et al., 2019). The work standards need to be improved through regulations so that the health and safety standards of the community can be remedied. The increasing business cost and diminishing environmental sustainability factors can be corrected by implementing waste management practices (Van Ewijk & Stegemann, 2016). Adequate strategies provide solutions that enhance the efficiency of waste management practices. Effective recycling policies and introducing modern equipment to the infrastructure can reform the social well-being of the people (Leal Filho et al., 2016). These reforms benefit society at large and make their actions sustainable for the environment.

The implementation of solutions that are adequate for the industry segments needs to be developed. The waste management strategies must abide by the recycling policies of the community and suggest the procurement of machinery that can handle the waste excretion (Horodytska et al., 2018). The waste management strategy must be relevant to address the waste using cost-effective and quality machinery. Evaluating the business needs of waste management is crucial for implementing the desired strategy (David et al., 2019). The strategy that is developed must focus on environmental benefits considering the economic development of the region. The urban and rural waste classifications differ based on the quality of waste that is excreted (David et al., 2020). The demographic assessment of the region allows for planning sustainable, healthy, and inclusive policies that align with the waste management needs of the country. The strategies that are implemented in Montserrado County must be linked with the solid waste management needs of Liberia. The governmental role required for waste management must focus on sustainability and cost-effectiveness (Almazán-Casali et al., 2019). The budget of low-income countries is lesser so it must be considered that cost-effective strategies can reap long-term benefits.

CHAPTER VI

Conclusion and Recommendations

The assessment of the lack of commercial and domestic waste practices in Montserrado County, Monrovia, Liberia is evaluated through extensive research practices. The awareness and practices of the people and corporations have been analyzed using quantitative research methods (Lloyd et al., 2016). The role of the corporations and the people shows that people lack awareness of waste management that reflects in their practices. The community must realize the need for adequate waste management practices (Abramowitz et al., 2015). The reformed methods of living can correct society and provide solutions that are integral to the well-being of the people. Waste management is important for health concerns, conserving the environment, and remedying climate change (Gibson, 2019). Adequate implementation of strategies that correct the practices of the people requires environmental education, compliance, and machinery that matches the needs of the region.

Conclusion

Poor waste management systems are contaminating the world's oceans which are damaging aquatic life. The clogged drains cause floods during rains that transmit diseases that are beyond the control of poor community people within montserrado. 320 respondents which accumulate to 80% of the respondents agreed that diseases arise due to improper solid waste management and 16% disagreed with this fact while on the other hand, The religion of the people is a depiction of their lifestyle and household standards. The practices of waste disposal of the people depend significantly on the religion they follow. The respondents were categorized from Islam 25%, Hinduism 1%, Christians 73%, and Buddhists 2%. This shows that a large segment of the respondents follows Christianity as their religion. The respiratory problems increase with the burning of waste as there are insufficient measures for handling the waste that is being generated. The animals and livestock unknowingly consume waste that harms them and results in the death of animals. The economic development of the society also halts as the community resilience is deeply impacted. The youth are more aware of waste management practices as they

are updated with the recent economic trends and understand the importance of having sustainable infrastructures.

The emission of greenhouse gases from poor waste management is higher than the emission of gases from transportation in montserrado county.

After a careful review of published papers from neighboring countries it is also believe that the state of solid waste shows that the African region contributes to high numbers of aquatic and landfilled wastes the economic development in the region increases the waste generation coming from population growth and lower-middle-income countries. The high-income countries contribute to waste generation but a huge amount of waste is recycled and composted.

Recommendation

The global assessment of waste management and evaluation of the strategic implementation of policies to correct the waste management practices of the people is important. There should be economic viability of the plan imposed for correcting waste management practices. The waste that is left uncollected and poorly disposed of has significant health and environmental impacts. The cost of addressing the impact is considerably higher and requires the implementation of strategies that are adequate for the waste management system. The infrastructure development of this system must be over hall to aligned with the financial capacity of the governments proposing solutions that are effective and long-lasting. The strategic implementation and correction of waste management practices must be monitor properly or effectively to benefit the environment and human capital. Waste management practices that are cost-effective have the potential of serving the society for a longer time. The consideration of the areas of engagement is critical for the community helping reform the practices for the societal good.

Solid waste management concern everyone in society whether they are individuals or corporations. The actions of individuals and corporations are critical to ensuring effectiveness and proper solid waste management. The accomplishment of sustainable developmental goals is critical for correcting societal initiatives. There should be a financing of waste management systems within the country even though the costs are overwhelming. The rehabilitation of the people and imposing practices that enhance environmental sustainability are safeguarded through imposing an effective solid waste management system. There should be more recycling and reuse

of waste into constructive products to help the communities fight the challenges associated with solid waste management.

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Appendices
Appendix A
Research Questions

I use different bins for waste disposal

I dispose of solid waste to a waste collector.

I throw waste into the open field.

I use to burn solid waste when I have a bulk amount of solid waste.

Appendix B
Ethics Approval



NAER EAST UNIVERSITY
SCIENTIFIC RESEARCH ETHICS COMMITTEE

ETHICS APPROVAL

07.06.2022

Dear Korvah Forleh Kartakpah

Your application titled **“Lack of Proper Commercial and Domestic Waste Practices in Montserrado County ‘Monrovia, Liberia”** with the application number NEU/ES/2022/872 has been evaluated by the Scientific Research Ethics Committee and granted approval. You can start your research on the condition that you will abide by the information provided in your application form.

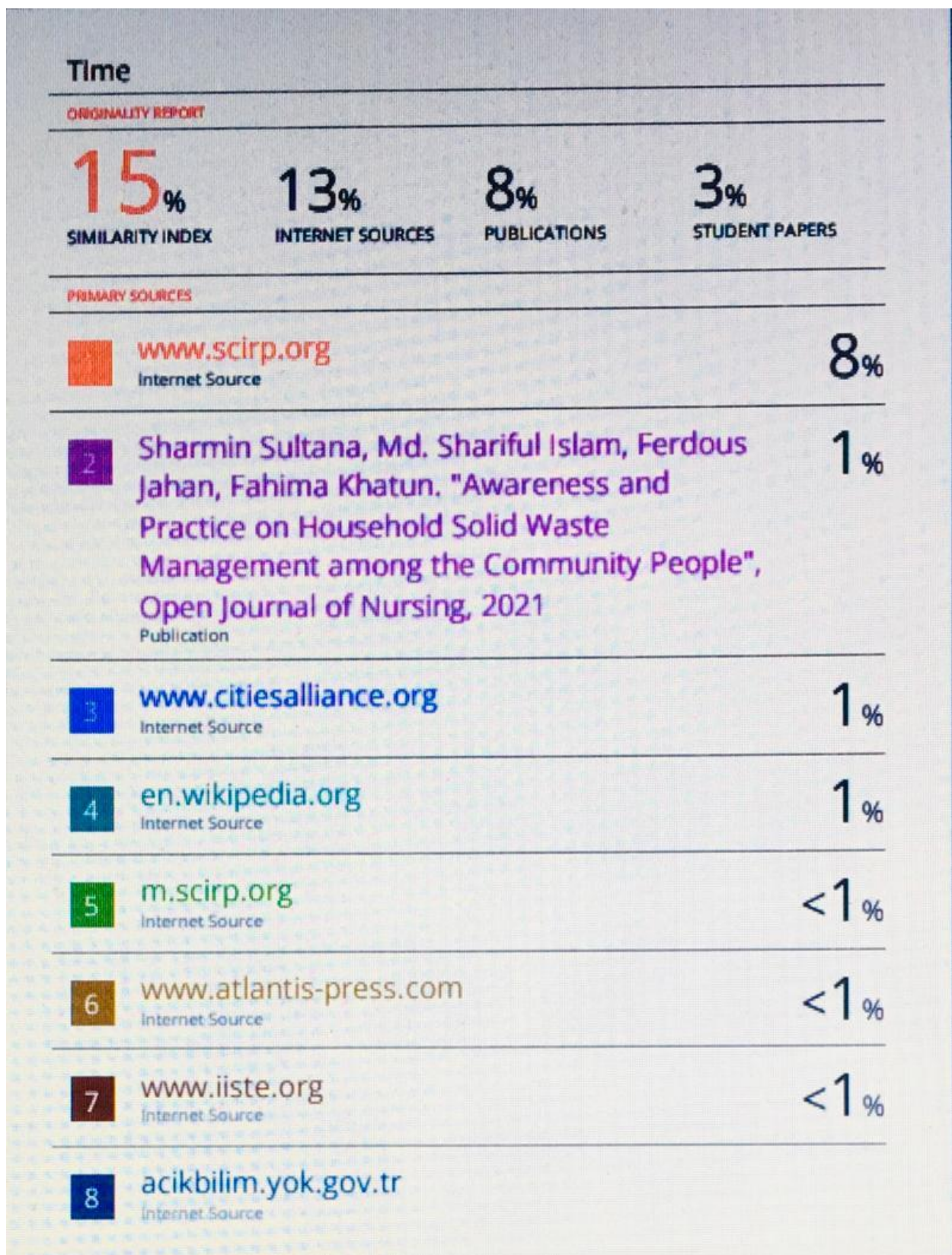
Assoc. Prof. Dr. Direnç Kanol

Rapporteur of the Scientific Research Ethics Committee

Note: If you need to provide an official letter to an institution with the signature of the Head of NEU Scientific Research Ethics Committee, please apply to the secretariat of the ethics committee by showing this document.

Appendix C

Turnitin Similarity Report



Appendix D

Resume

Curriculum vitae

Korvah Forleh Kartakpah
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 Northern Cyprus
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korvahforlehsr@gmail.com

Profile and Career Objective:

I am currently doing my Master in Environmental Education and a graduate of the University of Liberia I read Biology major and chemistry Minor
 A person who has worked as a youth leader for years and volunteered in other African countries, solution-oriented and more knowledgeable on culture exchange with the passion to motivate my work mate or peers to achieve any institutional objectives or goals for a particular project or work.

Skills and Qualification Summary

Computer knowledge
 Microsoft Basis
 Self-Efficient
 Solution Oriented
 Good Team Player

Education

2021 – 2023----- **Master's Degree**
 Near East University
 Northern Cyprus

2010 – 2017 ----- **Bachelor of Science**
 Major (Biology)
 University of Liberia
 Fendell Louisiana
 Monrovia Liberia

Work Experience

2013 – 2019 **Executive Director**
 Green Palace Social & Developmental
 Youth Organization
 Nippy Town Old Road

Monrovia Liberia

Responsibilities and Achievements:

- ❖ Under this role I was able to construct and renovate nine (9) new well within the Nippy Town Community.
- ❖ Speak directly to donors, government officials and members or leader of the community at any given event.
- ❖ Consider myself to be on duty at all times as a representative of the organization.
- ❖ Lead the fund rising department in setting up the annual income goals.

2013 – 2015**Logistic officer**

Sampson & Sons Incorporated
 Battery Factory Somalia Drive
 Monrovia Liberia

Responsibilities and Achievements

- ❖ Under this role I was able to oversee and coordinate various tasks in order to maintain adequate levels of goods for the corporation.
- ❖ Identify added logistic training requirement to attain high working standard.
- ❖ Design and develop standard operating methods to manage logistic operation efficiently.
- ❖

Language:**English (Native)****References:****Mr. Sampson O. George****Owner & Operator**

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Mr. T. Duah Karbeblee

Driver

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