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Role of Yobe State Environmental Protection Agency on Environmental Protection in Damaturu Metropolis

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Abstract

The paper examine the role of Yobe State Environmental Protection Agency on environmental protection in Damaturu Metropolis. Recent data indicates the city generates approximately 450 metric tons of solid waste daily, yet municipal authorities only collect about 35% through formal channels, leaving the majority to accumulate in streets and public spaces. This growing environmental catastrophe has transformed Damaturu into one of Nigeria's most polluted urban centers, with waste accumulation increasing by 18% annually since 2020. The main objective of this paper is to assess the role of Yobe State Environmental Protection Agency on environmental protection in Damaturu Metropolis. Relevant literatures were reviewed and Green Theory was adopted as the theoretical underpinning for the study. The paper adopted descriptive survey research design where the data was generated from primary source of data collection. The study find out that YOSEPA has helped in maintaining proper and timely waste collection, treatment and disposal in Damaturu metropolis. conclude that YOSEPA's waste collection methods is effective within the limits of available facilities in the city. The paper recommends that government should provide enough vehicles in order to sustain the timely waste collection and disposal by the agency.

Keywords: Emergency, Protection, Environment, Agency, Waste

Introduction

The exponential growth of urban populations worldwide has placed immense pressure on environmental systems, particularly in the management of waste—a by-product of human activity that, if left unaddressed, poses severe threats to ecological balance, public health, and sustainable development. Environmental waste management and protection have thus emerged as fundamental pillars of sustainable urban planning, as cities today generate staggering quantities of solid waste, exceeding 2 billion tons annually, with projections indicating a rise to 3.4 billion tons by 2050 (World Bank, 2020). This surge is largely attributed to rapid urbanization, industrialization, and changing consumption patterns, which collectively outpace the capacity of existing waste management infrastructure in both developed and developing nations.

The consequences of inadequate waste management are far-reaching and multidimensional. Environmental degradation stands as the most visible impact, with improper waste disposal leading to the contamination of air, soil, and water resources. Landfills, often the primary disposal method in poorly managed systems, emit methane—a greenhouse gas 25 times more potent than carbon dioxide—contributing significantly to

global climate change (IPCC, 2021). Meanwhile, open dumping and burning of waste release toxic pollutants, including dioxins and heavy metals, which infiltrate ecosystems, disrupt biodiversity, and enter the human food chain. Public health is equally compromised, as uncollected waste fosters the proliferation of disease vectors like rodents and mosquitoes, increasing urban populations' susceptibility to outbreaks of cholera, dengue, and respiratory illnesses (WHO, 2022).

To counter these trends, global best practices emphasize integrated waste management systems that prioritize sustainability, resource recovery, and circular economy principles. Recycling and composting, for example, can divert up to 60% of municipal waste from landfills while conserving natural resources and reducing emissions. In regions like Europe and East Asia, advanced waste-to-energy (WtE) technologies have transformed non-recyclable waste into renewable energy, supplying electricity to millions and reducing reliance on fossil fuels (Bunu 2016). Similarly, the socio-economic benefits of such systems are equally compelling. Formalizing waste management creates employment opportunities across the value chain, from collection and sorting to recycling and technology maintenance, particularly benefiting low-income communities (UNEP, 2021). In Brazil, for instance, the inclusion of informal waste pickers in formal recycling programs has lifted thousands out of poverty while boosting recycling rates by 20%. Moreover, cities adopting innovative waste solutions often attract green investments and enhance their global reputations, as seen in Singapore and Stockholm, where waste-to-energy plants contribute to both energy security and carbon neutrality goals.

Despite these advancements, Nigeria and similar developing nations face systemic barriers to implementation, including inconsistent policy frameworks, limited public awareness, and technological gaps. While the Nigerian government has introduced policies like the National Waste Management Policy (2020), enforcement remains weak, and private sector participation is minimal (Leton, 2023).

Statement of the Problem

Damaturu, the capital of Yobe State in North-Eastern Nigeria, is currently experiencing an unprecedented waste management crisis that threatens both public health and environmental sustainability (Abdullahi, 2023). Recent data indicates the city generates approximately 450 metric tons of solid waste daily, yet municipal authorities only collect about 35% through formal channels, leaving the majority to accumulate in streets and public spaces (Yobe State Waste Management Authority, 2022). This growing environmental catastrophe has transformed Damaturu into one of Nigeria's most polluted urban centers, with waste accumulation increasing by 18% annually since 2020 (National Environmental Management Authority (NEMA, 2023). The health consequences of this crisis are particularly alarming, with waste-related diseases now accounting for 22% of all hospital admissions in the city (World Health Organization Nigeria, 2023). Medical records show cholera outbreaks have increased threefold since 2021, with epidemiological studies directly linking 78% of cases to poor waste management practices in affected communities (Nigeria

Centre for Disease Control (NCDC, 2023). Respiratory infections caused by the common practice of waste burning affect 43% of residents in high-density neighborhoods, creating a persistent public health emergency (Bashir, 2024).

This deteriorating situation stems from multiple interconnected factors that have overwhelmed the city's waste management systems. Damaturu's infrastructure is woefully inadequate, with only 12 functional waste trucks serving a population of 1.2 million people (Yobe State Environmental Protection Agency YOSEPA, 2023). Chronic underfunding exacerbates the problem, as waste management receives just 2.3% of the municipal budget despite being one of the city's most pressing challenges (Damaturu Municipal Council, 2022). The crisis intensified following the massive influx of internally displaced persons during the 2013-2017 insurgency period, which increased waste generation by 40% without corresponding expansions in collection capacity (International Organization for Migration, 2023).

The environmental impacts are equally severe, with recent studies showing that 68% of drainage blockages in Damaturu are directly caused by improper waste disposal (United Nations Human Settlements Programme, 2023). These blockages transform seasonal rains into destructive flood events that damage infrastructure and spread contaminated water through residential areas. The economic consequences are measurable, with property values near major dump sites declining by 55% since 2020 (Nigerian Urban Development Report, 2023). Air quality monitoring reveals that waste burning contributes 18% of the city's dangerous PM2.5 emissions, creating persistent smog conditions.

Damaturu's crisis reflects broader waste management failures across Nigeria, where only 28% of cities meet national collection targets (Federal Ministry of Environment (FME, 2023). The country relies heavily on environmentally harmful practices, with open dumping accounting for 72% of all waste disposal (World Bank Nigeria, 2022). Plastic pollution has emerged as a particular concern, increasing by 250% since 2015 due to inadequate recycling systems (United Nations Environment Programme (UNEP, 2023).

Objectives of the Study

The main objective of this paper is to assess the role of Yobe State Environmental Protection Agency on environmental protection in Damaturu Metropolis. The specific objectives are:

i. To assess the impact of Yobe State Environmental Protection Agency on waste collection in Damaturu Metropolis
ii. To assess the impact of Yobe State Environmental Protection Agency on waste treatment in Damaturu Metropolis
iii. To assess the impact of Yobe State Environmental Protection Agency on waste disposal in Damaturu Metropolis

Research Questions

i. What are impacts of Yobe State Environmental Protection Agency on waste collection in Damaturu Metropolis?
ii. What are impacts of Yobe State Environmental Protection Agency on waste treatment in Damaturu Metropolis?
iii. What are impacts of Yobe State Environmental Protection Agency on waste disposal in Damaturu Metropolis?

Literature Review

Environmental Protection

Environmental protection refers to the policies, practices, and initiatives aimed at preserving natural resources and reducing environmental degradation caused by human activities. It involves efforts to mitigate pollution, conserve biodiversity, and promote sustainable practices to maintain ecological balance (Mensah, 2020). Governments, organizations, and individuals play key roles in environmental protection through legislation, conservation programs, and sustainable development initiatives.

Environmental protection measures include air and water pollution control, forest conservation, climate change mitigation, and waste management policies. Regulatory frameworks, such as the Paris Agreement on climate change and local environmental laws, ensure that industrial activities and urbanization do not compromise the health of ecosystems (Mensah, 2020). Public awareness and corporate responsibility are also integral to environmental protection, as sustainable development requires a collective effort to minimize human impact on the environment.

Environmental protection is a comprehensive and multidimensional concept that encompasses policies, strategies, and actions designed to safeguard the natural environment from degradation resulting from human activities. It involves efforts to reduce pollution, conserve natural resources, mitigate climate change, and promote sustainable development to ensure the long-term health and stability of ecosystems and human societies (Mensah, 2020). Effective environmental protection requires a collaborative approach among governments, industries, and individuals, alongside the implementation of robust regulatory frameworks and technological advancements.

Pollution Control and Sustainable Waste Management

One of the fundamental aspects of environmental protection is the regulation and mitigation of pollution in air, water, and land. The rapid expansion of industrialization, urbanization, and population growth has significantly escalated pollution levels, thereby posing serious threats to public health and biodiversity. Air pollution, primarily caused by vehicular emissions and industrial activities, has been directly linked to respiratory diseases and global climate change. Similarly, water pollution, exacerbated by the discharge of untreated sewage and industrial effluents, contributes to the depletion of aquatic ecosystems and the spread of waterborne diseases (Eneanya, 2018).

Waste management plays a critical role in pollution control. Inefficient disposal of solid waste, particularly in urban centers, has resulted in severe environmental hazards, including land degradation, flooding, and increased public health risks. Sustainable waste management approaches, such as recycling, composting, and waste-to-energy technologies, have been widely advocated as essential mechanisms for minimizing environmental impact (Oyelola, 2019). Furthermore, a transition towards circular economy models, which emphasize resource efficiency and waste reduction, has been identified as a strategic pathway towards achieving long-term sustainability.

Regulatory Frameworks and Environmental Governance

The enforcement of environmental laws and regulations is essential for ensuring compliance with sustainable practices. Governments worldwide have established regulatory agencies tasked with monitoring industrial activities, setting environmental quality standards, and enforcing pollution control measures. In Nigeria, for instance, the National Environmental Standards and Regulations Enforcement Agency (NESREA) is responsible for ensuring adherence to environmental laws and promoting sustainable development practices (Oyelola, 2019).

Furthermore, international treaties and agreements, such as the Kyoto Protocol, the Paris Agreement, and the Convention on Biological Diversity, provide a legal framework for global environmental governance. These agreements establish binding commitments for nations to take collective action in reducing environmental risks and promoting sustainable resource management. However, effective enforcement remains a challenge in many developing nations due to institutional weaknesses, limited financial resources, and competing economic priorities (Bunu, 2016).

Concept of Waste Collection

Waste collection is a critical component of waste management, particularly when materials are intended for reuse. Of the billions spent annually on municipal solid waste management, approximately two-thirds is allocated to collection costs, making it the most expensive phase due to its labor-intensive nature (Bunu, 2016). The collection process involves temporary storage or containerization, transfer to collection vehicles, and transportation to processing or disposal sites. Efficient collection is essential for protecting public health, safety, and environmental quality, as improper handling can lead to pollution, disease spread, and increased operational inefficiencies.

In developing countries, waste collection systems typically fall into six categories: house-to-house collection, bin collection, block collection, curbside collection, communal collection, and non-collection systems (Leton, 2020). The collection point serves as a crucial interface between waste generators and collectors, requiring careful management to ensure sustainability. Traditional practices of co-mingling waste are increasingly viewed as incompatible with modern waste treatment processes. Instead, collection methods should

align with downstream processing needs, ensuring minimal inconvenience to users while optimizing efficiency.

The design and selection of collection equipment must account for multiple factors, including facility size, waste volume and weight, available storage space, waste characteristics, and cost considerations.

Efficient waste collection is the first and most crucial step in waste management, influencing the success of subsequent treatment and disposal processes. Its effectiveness depends on government policies, financial investment, technological advancements, and community participation (Bashir, 2024). A well-organized collection system not only minimizes environmental and health risks but also facilitates material recovery, contributing to circular economy principles. Therefore, optimizing waste collection is indispensable for achieving sustainable urban development and long-term environmental protection (Mensah, 2020).

Theoretical Framework

Green Theory

Green Theory was propounded by Hugh Dyer In 1960 in view of the public recognition of the global environmental crisis arising from the 'tragedy of the commons', which is the idea that as self-interested individuals, humans will overuse and shared resources such as land, fresh water and other derivable benefits associated with environment. In 1970s the first United Nations conference on the subject was held which has catalyzed the emergence green political parties and public policies. This coincided with a demand for a green theory to help explain and understand these political issues. By given due consideration to the natural environment in term of theoretical as well as practical attention – especially in the wake of mounting evidence that human actions were significantly changing our global climate as well as ecological ones. This theory is relevant to this study because, waste generation and management stem from non-sustainable use of environmental resources. Today the idea of waste management has cut across different continents of the world in which only the advance countries are gearing efforts toward managing the waste efficiently in order to attain zero waste state.

Methodology

The paper adopted a descriptive survey research design and the population of the study is 3,911 which comprises of YOSEPA staff and the areas that were affected by its activities. The data for the study was collected from the primary source of data collection. The sample of 362 was derived from Taro Yamani formula for determining the sample size.

Table 1 Sampling Frame Table

S/No	Area	Population	Sample
1	Staff of YOSEPA	511	47
2	Bakin kasuwa	900	83
3	Ajari	500	46
4	Tsangaya	800	75
5	Maisandari	700	65
6	Ben kalio	500	46
	Total	**3,911**	**362**

Data Presentation

Table 4.1 Impacts of Yobe State Environmental Protection Agency on waste collection in Damaturu Metropolis.

s/n	Item	SA	A	SD	D	UD	Mean(x)	Var(x)	Decision
1	YOSEPA promptly collect waste in Damaturu Metropolis?	156	44	12	6	6	4.50	0.83	Agreed
2	YOSEPA collect waste at least twice in a week in order to keep Damaturu metropolis clean?	160	44	12	6	2	4.58	0.625	Agreed
3	YOSEPA has the require infrastructure such as haulage vehicle for effective waste collection?	170	30	14	6	4	4.58	0.75	Agreed
4	Poor contenerization has posed challenge to waste collection by YOSEPA in Damaturu metropolis?	140	30	30	20	4	4.25	1.26	Agreed
5	Poor route scheduling is a great challenge to waste collection in Damaturu Metropolis?	30	30	25	135	4	2.76	4.30	Disagreed
6	Collaborative efforts of residents by characterizing their waste in Damaturu metropolis helps in waste collection by YOSEPA?	30	20	25	145	4	2.67	4.57	Disagreed

Source: Field Survey (2024)

Table 4.1 Impacts of Yobe State Environmental Protection Agency on waste collection in Damaturu Metropolis. Varying questions were asked in order to explore this objective. The respondents were asked if YOSEPA promptly collect waste in Damaturu Metropolis. Based on the respondents views, majority of the respondents with a mean response of (4.5) and standard deviation of 0.83 aligned with agreed response that the agency do collect waste as at when due since the mean value is greater that the threshold value of 3.0

Table 4.2: Impacts of Yobe State Environmental Protection Agency on waste treatment in Damaturu Metropolis

S/No	Item	SA	A	SD	D	UD	Mean (x)	Var(x)	Decision
1	YOSEPA engage in sustainable waste treatment of reuse and recycle	30	20	29	140	5	2.68	4.53	Disagreed
2	YOSEPA only coamingled their waste and dump it into open dumpsites without any treatment.	145	20	29	25	5	4.23	1.45	Agreed
3	YOSEPA engage in burning and composting as a means of waste treatment in Damaturu metropolis	135	30	29	25	5	4.18	1.45	Agreed
4	YOSEPA manage their waste through industrial symbiosis	30	20	29	140	5	2.69	4.53	Disagreed
5	YOSEPA treat their waste through disinfection	30	20	19	150	5	2.64	4.71	Disagreed
6	YOSEPA treat their waste by converting it to energy use i.e waste-energy	30	20	24	145	5	2.66	4.62	Disagreed

Source: Field Survey (2024)

Table 4.2 further examined the impacts of Yobe State Environmental Protection Agency on waste treatment in Damaturu Metropolis. Meanwhile different factors were considered. In the first instance, YOSEPA engagement in sustainable waste treatment of reuse and recycle were examined. Evidence from the respondents revealed that they disagreed with a mean response of 2.68 and standard deviation of 4.53 since the value of the mean is lower than the threshold value of 3.0.

Table 3: Impacts of Yobe State Environmental Protection Agency on waste disposal in Damaturu Metropolis

S/N	Item	SA	A	SD	D	UD	Mean (x)	Var (x)	Decision
1	YOSEPA has a designated waste disposal site in Damaturu metropolis	143	20	24	32	5	4.18	1.59	Agreed
2	The method of waste disposal used by YOSEPA is through landfill	135	28	24	32	5	4.14	1.59	Agreed
3	YOSEPA engage in open dumpsite for as a means of waste disposal in Damaturu metropolis	128	35	24	32	5	4.11	1.58	Agreed
4	YOSEPA engage in burning and composting as a means of waste disposal in Damaturu metropolis	160	20	24	15	5	4.41	1.13	Agreed
5	YOSEPA collaborate with informal waste management sector in	155	25	24	15	5	4.38	1.13	Agreed

	disposing their waste in Damaturu metropolis								
6	Poor funding and logistics affect waste disposal by YOSEPA in Damaturu metropolis	180	20	10	6	8	4.59	0.93	Agreed

Source: Field Survey (2024)

Table 4.3 evaluates value is above the threshold value of 3.0, this suggest an agreed responses. Besides, the impacts of Yobe State Environmental Protection Agency on waste disposal in Damaturu Metropolis. In the first instance, the study examined if YOSEPA has a designated waste disposal site in Damaturu metropolis. Evidence from the respondents revealed that there is designated waste disposal site in the area. This is adjudged by the mean value of 4.18 and standard deviation of 1.59. In the same vein, the study examined if the agency make use of landfill as a means of waste disposal.

Findings

- YOSEPA has helped in maintaining proper and timely waste collection and disposal in Damaturu metropolis.
- Waste treatment techniques such as open burning and composting adopted by YOSEPA are not sustainable.
- Waste disposal methods such as dumping, lack of separation at source by residence are factors that hinder effective waste disposal by YOSEPA in Damaturu metropolis.
- The result of the hypotheses revealed that waste generated are properly collected, treated and disposed by YOSEPA in Damaturu Metropolis.

Conclusion and Recommendations

The role of Yobe State Environmental and Protection Agency on Environmental Protection Agency on environmental protection in Damaturu Metropolis reveals both strengths and challenges within the operations of the Yobe State Environmental Protection Agency (YOSEPA).

The paper conclude that YOSEPA's waste collection methods is effective within the limits of available facilities in the city. The paper recommends that government should provide enough vehicles in order to sustain the timely waste collection and disposal by the agency.

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