

ASSESSMENT OF PERFORMANCE OF KOGI STATE SANITATION AND WASTE MANAGEMENT BOARD IN LOKOJA, KOGI STATE NIGERIA

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ABSTRACT

The issue of reduction of solid wastes from our cities has remained a major challenge to urban beautification of cities and safety of the entire urban landscape. In spite of the formulation of Federal Environmental Protection Agency and a national environmental policy in Nigeria, the environment has not been adequately protected. This paper aims at assessing the performance of Kogi State Sanitation and Waste management board in Lokoja, Kogi State. Structured questionnaire was administered used for data collections using a Simple Random Sampling technique to get the sample size of the study, 280 questionnaires were recovered for the analysis. Four wards were selected; Lokoja ward A, Lokoja ward B, Lokoja ward C and Lokoja ward D. Descriptive statistic was used for the analysis of the data. On the type of waste generated, the results show that most of the waste generated are ashes through residential houses accounted for 87.5%. Also from the result 52.5% of the respondents acknowledged of not aware of Kogi State Sanitation and Waste management board activities in the study area. Moreover, irregular visit by Kogi State Sanitation and Waste management board was also noticed in the study area as 66% admitted from the result; while 52.5% of the respondents revealed that waste collection points are grossly inadequate, also 66% of the respondents indicated that refuse is not cleared completely by the agency. Therefore, 64% of the respondents rated Kogi State Sanitation and Waste management board activities performance in the area to be 20%. The study recommends that; Kogi state sanitation and waste management board should as a matter of urgency encourage individual, public and private partnership in solid waste collection, transfer and disposed in Lokoja Township for sustainability clean environment and better living conditions through awareness campaigns, public lectures and active participation to ensure a better way of living in the area.

Key words: Assessment, Performance, Waste, Sanitation, Waste Management Introduction

1 INTRODUCTION

The issue of waste management has been a serious concern to both developed and developing countries. In the past few decades, solid waste management systems in Europe have involved complex and multi-faceted trade-offs among a plethora of technological alternatives, economic instruments, and regulatory frameworks. These changes resulted in various environmental, economic, social and regulatory impacts in waste management practices which not only complicate regional policy analysis, but also reshape the paradigm of global sustainable development [1]. Municipal solid waste if not properly managed is capable of de-facing the aesthetic value of urban centres as is the case of Rio de-Jenero in Brazil [2]. Municipal solid waste management involves Collection, Transportation, Treatment and Disposal of waste materials [3]. Managing these waste materials requires reducing effect on health and environment as well as recovering resources from it and providing support for economic activity. Waste, when not managed properly, can pose serious health hazard [4]. When constant material consumption is encouraged and seen as economic progress, the “buy and discard” mentality results in huge amounts of solid waste being generated [5]. As

landfills start filling up and space for open dump is becoming scarce, governments have started searching for a more effective and efficient solid waste management system. Developed countries generally rely on land filling to overcome the problem of waste accumulation [6]. The landfill seems to have a special attraction for municipal waste managers because it offers a cheap and convenient option for waste disposal compared with other strategies such as reuse, recycling and energy recovery [7]. In fact, with the exception of few countries like Austria, the Netherlands and Denmark who recycle substantial proportions of their waste, most countries in Europe and North America still dump the bulk of their municipal solid waste in landfills [8]. For instance, In May, 2008, the inadequacy of waste disposal land created mayhem in the Italian city of Naples when the streets became laden with waste, blocking traffic and causing nuisance and hazards [9]. The European Commission's thematic strategy on the prevention and recycling of waste called for life-cycle thinking in waste policies and moving towards a recycling society [10]. This has in turn highlighted the opportunities for improved coherence between policies on waste and those on climate change and resource efficiency (European Environment Agency (EEA) [11]. Recent studies in Africa have shown that the problem of waste management has become intractable and threatens to undermine the efforts of most city authorities. Kirondi observed that the city environment in most developing countries is characterized by heaps of garbage, overflowing waste containers, choked drains, clogged streams and stinking gutters [12]. Hardoy, Mitlin and Satterthwaite have, therefore, aptly described the Third World urban environment as among the most health and life threatening of all human environments. Scavenging has become a major feature of waste management in many cities in developing countries [13]. [14] Although some developed countries have institutionalized waste management policies, in many African countries solid waste management policies either do not exist or at best are fragmentary. For example, Cameroon with a population of around 14 million of which half is living in towns does not have door to door solid waste collection programme. Thus, in many cases, solid waste disposal points are spontaneously created along the most accessible roads around the areas. Depending on the performance of the official collecting system, the disposal points are more or less important. Traditionally, organic waste is also used for feeding domestic animals and as fertilizer in gardening (composting). At times, fire is used to burn heaps of waste. This creates toxic smoke, which is detrimental to health [14]. Despite the increase in awareness, waste management system in many third world cities is seriously challenged [15]. In the late 1990s, it was estimated that each person in the world generated 200 kg of solid waste per year [16] and this was expected to increase with the growth in population. It is estimated that in 2006 the total amount of municipal solid waste generated globally reached 2.02 billion tonnes, representing a 7% annual increase since 2003. It is further estimated that between 2007 and 2011, global generation of municipal waste would have risen by 37.3%, equivalent to roughly 8% increase per year. Based on report from the Basel Convention estimated that about 318 and 338 million tonnes of hazardous and other wastes were generated for 2000 and 2001 respectively [17]. Rapid growing population, economic growth, and rise in community living standards have accelerated the generation rate of municipal solid waste, thereby causing its management to be a major worldwide challenge [18, 19]. The situation is not different in Lokoja a rapid growing urban center. As the city expands in size, population and economy, its streets eventually became characterized with backlog of un-cleared refuse and garbage existing daily on the streets. These refuse heaps, apart from constituting eye sore to residents and visitors alike, also threatens the health of the citizens through diseases spreading vectors. Therefore, this work assesses the performance of Kogi state sanitation and waste management board (KSSWMB) as a waste management agency in the area with the view; to identify the types of waste generated within the study area and to examine the agency's waste management system. Therefore, waste management is an important issue that needs effective solution.

2 MATERIALS AND METHOD

2.1 The Study Area

Lokoja is the administrative capital of Kogi State and the Confluence Town of River Niger and Benue. Lokoja is the capital city of Kogi State. It is located in Kogi State and lie between Latitude $7^{\circ} 45' \text{N}$ and $7^{\circ} 51' \text{N}$ of the Equator and Longitude $6^{\circ} 41' \text{E}$ and $6^{\circ} 45' \text{E}$ of the Greenwich Meridian. It shares political boundaries with the Federal Capital Territory to the North; Benue and Nassarawa

states, to the East; Niger and Kwara states; to the west, Edo and Enugu states to the south. It falls between the tropical wet and dry climate (Aw) according to Koppen’s climatic classification scheme with 6 months’ dry season from November to April and 6 months’ wet season from May to October. The annual rainfall amounts to 1000mm-1500mm with a mean annual temperature scarcely falling below 27.7°C and a relative humidity of 30% in the dry season and 70% in the wet season. It stands on an elevation of 45-125 meters above sea level and lies in the western bank of the River Niger. [20], [21]. The cretaceous and quaternary sediment overly uncomfortably the crystalline rocks while alluvium covers the area around Rivers Niger and Benue. Generally, Lokoja is overlain with crystalline rocks of the Precambrian basement complex. The drainage is dendritic, well drained with many rivers and streams which are tributaries of Rivers Niger and Benue. Lokoja is generally low-lying with few locations above general level. The soils are generally hydromorphic with light grey colour, sand and patches of clay around the Fadama area. The soil is highly permeable with high infiltration and low runoff. The climatic climax vegetation is of guinea type characterized by leafy shrubs and grasses [22]. The dominant primary activities are fishing, farming, trading, hunting with a low percentage of tertiary activities. Lokoja is the capital city of Kogi State and has been experiencing an accelerated shift of population from rural to urban areas. Record has shown that, Lokoja as a state capital has a population of 282,245 in 2006. It was estimated that the population of the city as a state capital will increase to 391,498 by the year 2020 [21]. Kogi State has an average maximum temperature of 33.2°C and average minimum of 22.8°C. Lokoja the State capital is generally hot throughout the year. The State has two distinct weather viz dry season, which lasts from November to February and rain season that lasts from March to October. Annual rainfall ranges from 1016mm to 1524mm. The vegetation of the state consists of mixed leguminous (guinea) woodland to forest savannah. Wide expanse of fadama in the river basin and long stretches of tropical forest in the Western and Southern belt of the state [23].

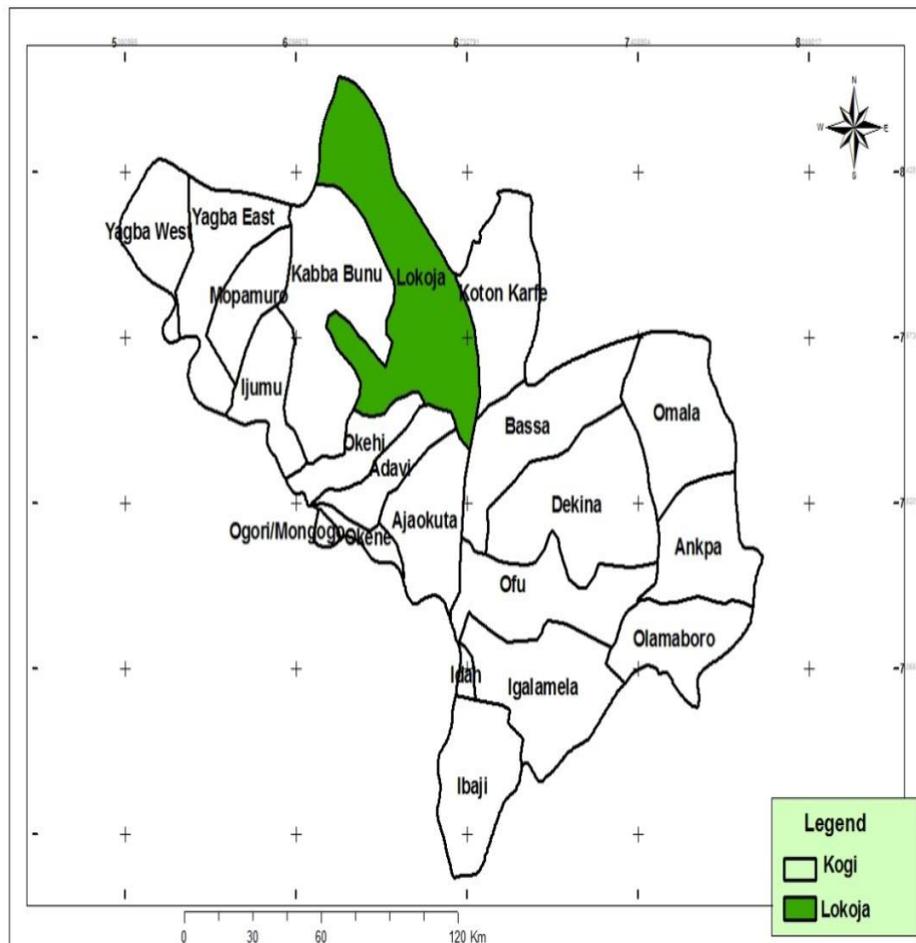


Figure 1. Kogi Showing Lokoja and other Local Government Areas in Kogi State, Source: Geography Department, Nasarawa State University, Keffi 2019.

2.2. Methodology

2.2.1 Data Sources

The data of this research were source from both the primary and secondary sources. The Primary data for were obtained directly from the field through observation, field surveys and the use of questionnaire. While the secondary was obtained from already existing sources which includes textbooks, journals, seminar papers and internet. Secondary sources provide information from documented sources for literature review and showed the existing body of knowledge about the field of study. The instrument used in the collection of the data at various levels of the field study includes; questionnaires and direct observation. The questionnaire was designed to collect information on various aspect of the study. **Section ‘A’** contains information on waste generation and management while **section ‘B’** contains information on the general assessment of KSSWMB.

2.2.2 Population and Sample Size of the Study

The population of the study is the aggregate of the total number of people in each of the four selected wards. Hence, a total of 3,344 people formed the sample population of the study [24]. The sample size selected is a percentage of the total number of people of Lokoja ward A, Lokoja ward B, Lokoja ward C and Lokoja ward D. Hence 10% of the people were selected each from wards in Lokoja which issuing a Simple Random Sampling to get the sample size of the study. The household population represents the population of this research. From this population households were sample at 5% level of significance based on MC Donald’s (2006) formula for sample size determination.

$$n = (Z^2PQ) / D^2 \tag{1}$$

Where Z=1.96, P = Number of household by total population, Q = 1 and, D = Level of Significance sample size of respondents.

Table 1. Projected Household Size by town, Sample Size and Sample Intervals

| Study communities | No of household (projected, 2015) | Sample size | Sample Interval (Sample Ratio) |
|---------------------|--------------------------------------|-------------|--------------------------------|
| Phase I | 2,188 | 58 | 1:37 |
| Phase II | 1,506 | 27 | 1:55 |
| Worker Village | 1,522 | 28 | 1:54 |
| Lokogoma | 1,316 | 21 | 0.084722222 |
| Adankolo | 1,443 | 25 | 1:57 |
| Karaworo | 1,363 | 22 | 0.084027778 |
| Shaba Yagi | 1,428 | 25 | 1:57 |
| Cantonment quarters | 1,903 | 44 | 1:43 |
| Kwatakoto | 1,997 | 49 | 1:40 |
| AngwaMasara | 1,189 | 27 | 1:44 |
| Angwa Hamza | 3,177 | 82 | 1:38 |
| Kukundufi | 5,749 | 19 | 1:30 |
| Yashi | 2,053 | 48 | 1:42 |
| Bishop Crowther | 1,396 | 26 | 1:53 |
| Attah Area | 6,571 | 22 | 0.248611111 |
| AngwaRimi | 2,122 | 52 | 1:40 |
| Yaragi Area | 2,738 | 34 | 0.097222222 |
| InuwaLenge | 1,342 | 20 | 0.088194444 |
| Angwa Power | 1,122 | 15 | 0.093055556 |
| Angwa Kura | 2,190 | 82 | 1:26 |
| TOTAL | 42,405 | 707 | Average =629 |

Source: Fieldwork, 2019

The mean sample interval for the twenty communities that make up the four sampled wards is 629. However, sample interval calculated for each ward was used for analysis. A total of Three Hundred and Thirty-Five (335) questionnaires were administered to the respondents while 280 were recovered for the analysis. The result is presented in tabular form and was analyzed using descriptive form of statistics; such as table and simple percentage. The data were analyzed from the questionnaires administered.

Table 2. Waste Generation Information

| S/N | Variable | Class | Score | Percentage (%) |
|-----|----------------------------|--------------------|-------|----------------|
| 1 | Type of land use | Residential | 45 | 87.5 |
| | | Commercial | 33 | 12 |
| | | Industrial | 0 | 0 |
| | | Others | 2 | 7 |
| 2 | Living duration | 1 – 5 years | 157 | 56 |
| | | 6 – 10 years | 60 | 21 |
| | | 11 – 15 years | 47 | 27 |
| | | 16 and above | 16 | 6 |
| 3 | Type of waste generated | Ashes | 17 | 42 |
| | | Garbage | 87 | 31 |
| | | Rubbish | 31 | 11 |
| | | Others | 45 | 16 |
| 4 | Type of waste containers | Metal | 65 | 23.2 |
| | | Bucket | 52 | 18.5 |
| | | Plastic Containers | 92 | 33 |
| | | Cartoons | 18 | 6 |
| | | Others | 54 | 19.3 |
| 5 | Source of waste generation | Farm products | 23 | 8 |
| | | Domestic activity. | 213 | 76 |
| | | Others | 44 | 16 |
| 6 | Refuse disposal | Open space | 92 | 32.8 |
| | | Backyards | 79 | 28.2 |
| | | Drainage | 38 | 13.6 |
| | | Others | 71 | 25.4 |

Source: Author’s Field Survey (2019).

Analysis in table 2 shows that most of the areas where the research was conducted are residential houses constituting about 87.5% of the respondents while 12% are for commercial purposes. This finding is in line with Batool, S.A, that municipal wastes are generated from homes and commercial sites [25]. Further analysis also shows that 56% of the respondents confirmed that they have lived there for about 5 years. Others; 6-10 years 21%, 11-15 years 27% while 16 years and above, 6%. On the type of waste generated, investigations carried out shows that most of the waste generated are ashes. This could be attribute that most wastes are burnt. Garbage 31%, rubbish 11% and others 16%. The result also shows that most of the respondents are using plastic containers representing about 23.2%. Metal containers were also found in some areas representing about 33%. this could also be attributable to the fact that the activities of KSSWMB is more pronounced in Lokoja ward C were some of their metal waste bins are found in the area. Sixty six 66% of the respondents admitted that refuse is not cleared completely by the agency. This high percentage further agrees with the findings that most areas are for residential purposes. This is followed by other activities with 16%, and only 8% are from farm products. The result in table 2 further shows that most of wastes are disposed openly constituting 32.8% of the respondents. Barckyards, 28.2%, drainage, 13.6% and others 25.4%. The implication is that most of their waste generated are being disposed everywhere in the area. This indiscriminate dumping of this refuse seems to buttress the research position that enough waste bins are not provided at specific points/locations by the agency.

Table 3. Assessment of Kogi State Sanitation and Waste Management Board

| S/N | Variable | Class | Score | Percentage (%) |
|-----|--|-----------|-------|----------------|
| 1 | Are you aware of the activities of KSSWMB | Yes | 147 | 52.5 |
| | | No | 133 | 47.5 |
| 2 | Are disposed refuse ever collected by the agency | Yes | 147 | 52.5 |
| | | No | 133 | 47.5 |
| 3 | Collection points provided by the agency | Yes | 80 | 25.6 |
| | | No | 200 | 71.4 |
| 4 | Number of collection points recorded | 5 points | 11 | 4 |
| | | 10 points | 28 | 10 |
| | | 15 points | 49 | 17.5 |
| | | 20 points | 9 | 3.2 |
| | | None | 183 | 65.3 |
| 5 | Visits recorded by KSSWMB | Weekly | 5 | 2 |
| | | Monthly | 14 | 5 |
| | | Yearly | 77 | 27 |
| | | Never | 184 | 66 |
| 6 | Assessment of KSSWMB activities | 20% | 180 | 64 |
| | | 40% | 44 | 16 |
| | | 60% | 36 | 13 |
| | | 80% | 15 | 5 |
| | | 100% | 3 | 2 |

Source: Author's Field Survey

Result of the analysis of Kogi state sanitation and waste management board (KSSWMB) is presented in table 3. From the table, 52.5% of the respondents indicates that they are not aware of KSSWMB activities. The table further reveal that 52.5% of the respondent admitted that refuse is not collected regularly as expected. This is not far from the reasons why heaps of refuse are noticed in many parts of the city. 71.4% of the respondents admitted that collection points are grossly inadequate as shown in table 3. This inadequacy could be attributable to the fact that most refuse are being disposed through burning in most of the areas. Moreover, Irregular visit by KSSWMB was also noticed in the study area. The table revealed that 66% of the respondents admitted that refuse is not cleared completely by the agency. Only 2% of the respondents shows that refuse is collected weekly. This also seems to agree with the findings of Adegoke, in the previous review, were he discovered that wastes collection is irregular and is only restricted to the major cities [26]. On the assessment of KSSWMB activities in area, majority 64% of the respondents rated them 20%, others respondent 16%, 13%, 5% and 2% rated their activities 40%, 60%, 80% and 100% respectively. This implies that KSSWMB performance is very poor in the study area. That is why there has been poor waste management in the area, because refuse is not dumped at the appropriate places or dumpsites as confirmed by this study in table 3.

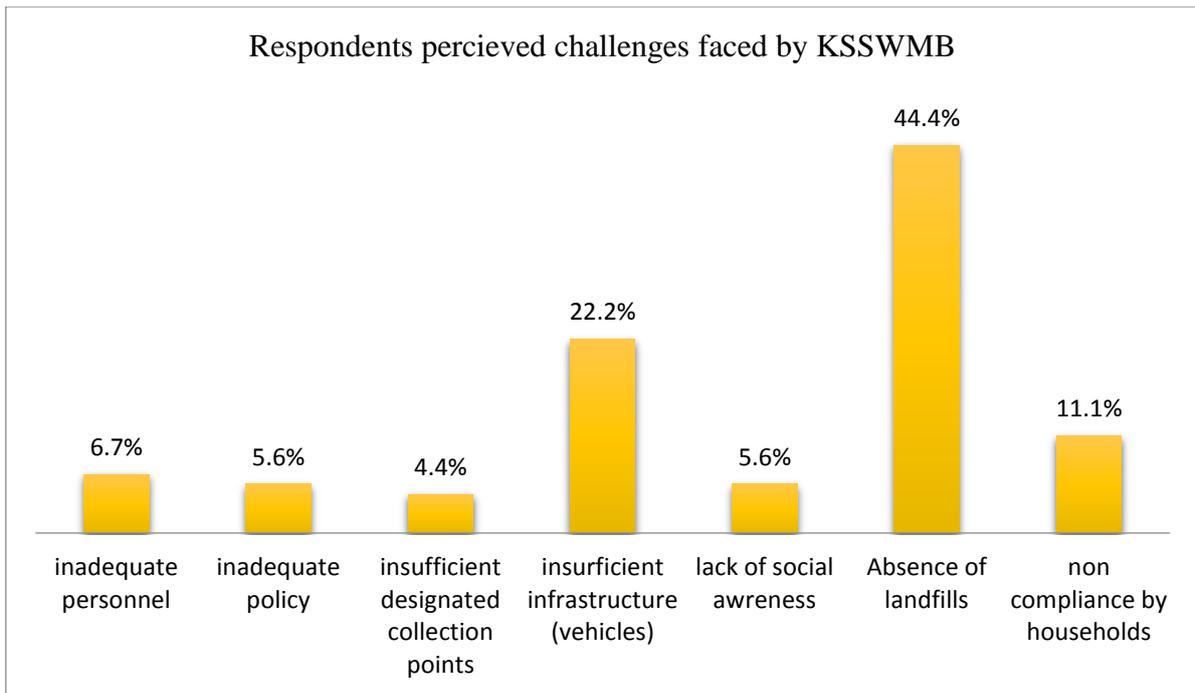


Figure 2. Wastes Collection and Disposal Challenges (Source: Field Survey, 2019)

Figure 2 indicate that 30 respondents constituting 6.7 % identified the problem of inadequate personnel as hindrance to waste collection and disposal in the study area; 25 respondents 5.6% identified inadequate policy as the problem; 20 respondents 4.4% identified insufficient designated waste disposal points as the problem of waste management and 100 respondents 22.2% identified insufficient infrastructure as the problem. Furthermore, 25 respondents 5.6% attest to lack of social awareness; 200 respondents 44.4% identified the absence of landfill while 50 respondents 11.1% identified non-enforcement of environmental laws as the perceived challenges faced by KSSWMB in waste collection and disposal in the study area. This implies that majorities of people in the study area has a challenge of Landfill where this waste can be deposited and collected by the KSSWMB. This is in line with principles of municipal solid waste management, as identified by Schubeller, P. *et al.*, [27]. Also according to Tevera *et al.*, despite the increase in awareness, waste management system in many third world cities is seriously challenged [28].

3 CONCLUSIONS

The issue of reduction of solid wastes from our cities has remained a major challenge to urban beautification and safety of the entire urban landscape. Therefore, a concerted approach to waste avoidance, minimization and reduction through modern methods of waste management and disposal using the right mix of strategies sustainable in our environment must be put in place. There remains an urgent need for sustainability of a clean environment, better living conditions through awareness campaigns, public lectures to ensure a better way to live. This paper appraises the performance of Kogi State Sanitation and Waste Management Board as a waste management agency in Lokoja. From the general assessment of the study, open dumping and burning had been observed to be the methods of waste disposal in Lokoja, Kogi State. The non-visitation of health inspectors from this agency in waste collection and disposal activities were found to be capable of impacting socio-economically on the lives of all the people living in the area. It was also discovered that there are no designated dumpsite/collection point provided by Kogi State Sanitation and Waste Management Board as most waste was dumped indiscriminately. Refuse lie uncollected in the open places, in the gutters and on streets, making the environment untidy. Privatization and/or combination of both privatization and commercialization must be embarked upon. Also levies must be imposed on all residential polluters towards meeting the cost of waste generated, collected, transferred and disposed. The actual collection, processing and management should be handled by licensed private firms rather than by only quasi-public agencies. The efforts of the government agencies like Kogi state sanitation and

waste management board and Ministry of Environment, in charge of waste management should focus on how to improve the prevailing conditions and sharing decision making process, with individuals, neighborhood group and organizations at the grass roots level in Lokoja. Greater participation of individuals, families and the populace should be achieved through mobilization and education. They should be involved in all deliberation and activities connected with all aspects of solid waste management within their environments. The attitudes of individuals and the general public needs to change and to accept the fact that it is better to pay for the services rendered that guarantee the quality of life for all towards ensuring sustainable development including the quality of the environment than sticking to the belief that government can provide everything even when the resources are not available. Kogi state sanitation and waste management board should as a matter of urgency encourage individual, public and private partnership in solid waste collection, transfer and disposed in Lokoja Township. Also roads should be constructed and rehabilitated particularly in high populated areas. In addition, effective penalties must be invoked and culprits punished, so that the enforcement of proper practices are not left to area wide waste management authorities alone. An effective chain in the cycle of timely clearance to designated landfills, dump sites, for incineration, compacting and composting should be integrated into energy and the land reclamation schemes envisioned in the future.

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