

WASTE MANAGEMENT IN NIGERIA: COMPARATIVE SOCIOLOGICAL PERSPECTIVES FROM GERMANY AND SWEDEN

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ABSTRACT: The significance of waste management in populated countries like Nigeria cannot be overemphasised because of its associated health, safety, environmental, land use and socioeconomic challenges. Hence, this study aims to describe the methods of waste management in Nigeria, the challenges of waste management in Nigeria, the strategies employed in waste management in Germany and Sweden, and the lessons learned from these strategies. Furthermore, this study distinguishes itself by adopting and triangulating contemporary sociological thoughts on waste management. More so, the desk review method was used in order to provide a comparative picture of waste management in Nigeria, Germany and Sweden. The study revealed that waste management in Nigeria is not in good condition due to the increasing generation of waste, inadequate funding, poor policy implementation, etc. In addition, the study established that waste management in Germany and Sweden are in better condition due to alternative source of funding, door to door system of collection, strong rules and regulations, high recycling rate etc. the study concluded that for Nigeria to have a better condition of waste management, government must ensure that waste management policies are fully implemented through prosecution of offenders involving in unlawful dumpsite, formalization of informal methods of waste management and the three arms of government and the private sector must contribute some percentage of their income to the funding of waste management.

Keywords: Environment, Waste, Waste management, Waste disposal, Refuse, Solid Waste

INTRODUCTION

Waste management has been interpreted by scholars from different perspectives. However, the common variable in these perspectives is that waste management constitutes the reduction of waste generation. For instance, Ukala, Ifeanyi and Owamah (2020) define waste management as the proper ways of reducing and reusing discarded materials generated from industries, commercial places or homes which are no longer of any economic value. Waste generation and management is a global phenomenon. And population growth and economic development are a major contribution to solid waste generation in urban areas (World Bank, 2021). According to the United Nations Environment Program (2024), municipal solid waste generation is predicted to grow from 2.1 billion tonnes in 2023 to 3.8 billion tonnes by 2050. In 2020, the global direct cost of waste management was an estimated USD 252 billion. When factoring in the hidden costs of pollution, poor health and climate change from poor waste disposal practices, the cost rises to USD 361 billion. Without urgent action on waste management, by 2050, this global annual cost could almost

double to a staggering USD 640.3 billion. The report's modelling shows that taking waste prevention and management measures could limit net annual costs to USD 270.2 billion by 2050. However, projections show that a circular economy model, where waste generation and economic growth are decoupled by adopting waste avoidance, sustainable business practices, and full waste management, could in fact lead to a full net gain of USD 108.5 billion per year.

Environmental challenges arising from improper disposal of waste are now major issues in many Nigerian urban cities and rural communities. This is a result of huge increases in waste generation following the increase in population and urbanisation. As humans engage in their daily activities to meet their basic human needs, a lot of unwanted materials, often referred to as waste, are generated. Wastes generated by homes, industries, organisations, schools and businesses generate wastes that are not properly disposed of. Wastes which emanate from industrial and residential activities, generally, consist of unused or leftover food, plastic, metal, paper, textile, glass, among others (Ukala, Ifeanyi & Owamah, 2020)

The motives of waste management in Nigeria include economic, social and environmental as briefly explained. Economic advantage: When markets are established for recyclables, consumption-efficient practices in product design, production, and consumption are brought about. New job opportunities are also being created for citizens of the country. Social advantage: The reduction of the negative impact of solid waste on public health as a result of proper management practices can result in more appealing settlements with new sources of employment for the previously impoverished and unemployed people. Environmental advantage: Removal of the negative effects of waste on the environment can provide improved air and water quality and help in the reduction of greenhouse gas emissions (Eleje, Anienwelu & Adebayo, 2017).

According to Nnaji (2015), more than 50 percent of residents of Maiduguri in Northern Nigeria and Ughelli in Southern Nigeria dispose of their waste in open dumps. Although the open dumpsite disposal method is a commonly adopted method of disposal in Nigeria and other developing countries, which involves people disposing of their waste on open grounds most often indiscriminately, they are generally unsanitary, unsightly and smelly, attracting rats, insects, snakes and flies (Udoh & Inyang, 2016). In order to reduce the consequences of inadequate waste management in Nigeria, successive governments formulated National Environmental Protection Management of Solid and Hazardous Waste Regulations S.I.15 of 1991, National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations S.I.9 of 1991; Federal Environmental Protection Agency Act, 1992, National Environmental Protection Management of Solid and Hazardous Waste Regulations S.I.15 of 1991; 2007 (NESREA Act) The Harmful Wastes Special Criminal Provision Act No42 of 1998, Environmental Impact Assessment Act of 1992, National Environmental (Sanitation and Wastes Control) Regulations, S.I No.28 of 2009, The National Environmental (Electrical/Electronic Sector) Regulations 2011, The National Oil Spill Detection and Response Agency Act 2005 (NOSDRA Act), National Environmental (Base Metal, Iron and Steel Manufacturing/Recycling Industries Sector) Regulations, 2011, National Policy on Municipal & Agricultural Waste Management, 2012 (Draft), National Environmental (Pulp and Paper, Wood and wood Products sector) Regulations, S.I 34 of 2013, National Environmental (Motor Vehicle and Miscellaneous Assembly Sector) Regulations, S.I 35 of 2013, Merchant Shipping Act, 2007, Merchant Sea Dumping Regulations, 2013 and Nigerian

Maritime and Safety Administration (NIMASA) Act, 2007 (Federal Government of Nigeria, 2020). Despite these governmental policies on waste management in Nigeria, waste generation is on the increase due to inadequate waste management strategies, following the prevalence of pollution and health consequences. It is against this standpoint that this paper seeks to critically examine the challenges of waste management in Nigeria through a sociological lens, drawing comparative lessons from Germany and Sweden to propose a theoretically informed and policy-relevant reform agenda.

Objectives of the Study

The objectives of this study are to discuss waste management in Nigeria in the context of comparative analysis from the German and Swedish experiences on waste management. Hence, the specific objectives are to describe the methods of waste management in Nigeria, examine the challenges of waste management in Nigeria and find out the strategies of waste management in Germany and Sweden, as well as the lessons from strategies of waste management in Germany and Sweden.

Empirical Review

Olanrewaju and Ilemobade (2009) revealed in their study the success of the Ondo State Integrated Waste Recycling and Treatment Project (OSIWRTP) in transforming the waste generated in the state to valuable products using the concept of sustainability, environmental protection, economic development, and technical and technological improvement as a baseline. According to Olanrewaju and Ilemobade (2009), waste recycling methods eliminated the problems associated with open dumpsites, which were unhygienic and inefficient, posing a lot of harm to the people of Ondo state. Similarly, Nzeadibe (2009) revealed the informal recycling of solid waste in Enugu state, which consists of scavengers/waste pickers, artisans, middlemen who recover plastics, metals, soles and textiles from landfills and illegal dumps within the state. Awopetu et al. (2013) revealed the perception of the public at Makurdi, North Central Nigeria, on the waste minimisation strategy option, which consists of waste reduction, reuse and recycling, of which, more than 80% of the sampled population were in support of this strategy and indicated interest as a more sustainable approach to managing waste as compared to other traditional strategies. As willing as the respondents were towards this strategy, Awopetu et al. (2013) found out that the infrastructure and societal means needed to promote this strategy were limiting factors that prevented its actualisation. Olukanni et al. (2018) also identified other major constraints in implementing this strategy, such as the cost of having a material recovery facility and technical expertise. However, Olukanni et al. (2018) established that the major key to a successful Waste minimisation strategy was adequate waste characterisation. Olukanni et al. (2018) in their study identified the benefits of the minimisation strategy to the economy through composting. The study, which was carried out in six South-Western states in Nigeria, recommended composting of biodegradable waste in the region as a waste management strategy which will benefit the economy as well as agricultural production.

Amusana et al. (2023), in their study on evaluating waste management challenges, practices and habits for circular economy and green growth in Nigeria where they adopted purposive sampling

of major landfills in Lagos, Ogun, Oyo, Osun, Ondo, Ekiti States and waste generation pattern using structured questionnaires (210) on spatial variation, challenges and prospect of waste management practices. The findings revealed that waste Habits of Nigerians were 57.0% organic, 27.0% plastics, 5.0% glass, 5.0% metal and 4.0% others, ending up mostly in landfills/dumpsites. Only 28.1% separated waste at source, and 46.2% used private collection services. The major waste management challenges were pollution and health risks (69.1%), limited resources (44.8%), a lack of technical skills (23.8%), and inadequate management skills (18.1%). As part of waste management practices, 95.2% were willing to participate in the circular economy, 94.3% supported the polluter pays principle and 96.2% supported the dissemination of public information on Waste-to-Energy. Waste management challenges significantly influenced health issues and pollution ($p=0.048$).

Several studies on waste management have reliably been rising in Nigeria (Nnaji, 2015; Udoh & Inyang, 2016; Olukanni et al., 2018; Amusana et al., 2023). The little efforts to address the effectiveness of waste management, praiseworthy as they are, also suffer from the absence of adequate policy direction. Hence, this study examined the waste management strategy in Germany and Sweden. In order to provide lessons that will ensure the effectiveness of waste management in Nigeria. Again, studies on waste management are lacking adequate theoretical analysis. Thus, this study dissected waste management by adopting contemporary sociological theoretical thoughts to gain a better understanding of the method and challenges of waste management in Nigeria, Germany, and Sweden.

METHODOLOGY

This study adopts a desk/literature review as it sought to examine waste management in Nigeria. Therefore, this study uses secondary data to dissect its objectives of the study. For instance, data from articles, books, journals, magazines and newspapers have been used in the understanding of waste management in Nigeria. The desk/literature review was adopted due to convenience and economic reasons. This is because primary research is a costly undertaking and with the retrenchment of funding opportunities. The desk review is considerably cheaper to use since the focus is on existing data rather than collecting new data. More so, it is convenient for comparative purposes by expanding the scope of the paper, since the study was geared toward understanding the strategy of waste management in Germany and Sweden.

LITERATURE REVIEW

This section reviews existing literature in relation to the issue under investigation, so as to bring out the extent of academic scholarship. Thus, the review encompasses the methods of waste management in Nigeria, the challenges of waste management in Nigeria, the strategies of waste management in Germany and Sweden, and the lessons learned from these strategies.

Methods of Waste Management in Nigeria

In England, landfills were responsible for 49% of methane outflows in 2007 (Burnley et al., 2011). Landfill is an informal form of waste management, the cheapest and easiest technique for waste

disposal. And the subsequent environmental effect of landfills is colossal, yet could be alleviated if sanitary precautionary measures are embraced, and waste reduction is upheld. In Nigeria, there are several methods governing waste management. For instance, the practice of open dumpsites as a method of waste disposal in many developing countries like Nigeria is far from the standard recommendation (Mull, 2005; Adewole, 2009). Similarly, the existing practice of urban or municipal waste management in Nigeria is open dumping in any available open space, while the incineration technique is rarely put into practice. Incineration is the cheapest urban waste disposal option, which is from time to time used in Nigerian clinics where medicinal waste is burnt at a nominal scale (Ogwueleka, 2009).

Also, urban solid waste is being disposed of using several formal methods of waste management. However, the methods used are incineration, composting, anaerobic digestion and recycling (Abila & Kantola, 2017). Meanwhile, an important method of waste management is the prevention of waste material being created, also known as waste reduction. Methods of avoidance include the reuse of second-hand products, repairing broken items instead of buying new, designing products to be refillable, encouraging consumers to avoid using disposable products, packaging and designing products that use less material. Waste hierarchy refers to the '3 Rs': reduce, reuse and recycle, which classify waste management strategies according to their desirability in terms of waste minimisation. It is aimed at extracting the maximum benefits from products and to generate the minimum amount of waste, as illustrated in the pyramid of waste hierarchy (Amadi et al., 2012b). Furthermore, the source reduction approach is unique because it prevents the huge generation of solid waste and provides for resource conservation. It is also more economical, environmentally safe and legally sound. Source reduction involves modifying a process by substituting easily biodegradable materials for those that are resistant to degradation or replacing products that generate a large amount of waste with those that do not. Incineration is a disposal method in which solid organic wastes are subjected to combustion in order to convert them into residue and gaseous products (Amadi et al., 2012b). Additionally, recycling, which is an environmentally friendly disposal method, has no place in policy guidelines in Nigeria. Consequently, the issue of the formal recycling sector in Nigeria will not arise. Waste is recycled casually by scavengers who purchase unutilised valuables from individuals and furthermore go to lawful and unlawful dumpsites looking for materials that can be reutilised (Ogwueleka, 2009).

Challenges of Solid Waste Management in Nigeria

According to Guerrero et al (2012), some challenges associated with SWM include: increasing generation of waste, burden posed on municipal budget as a result of high costs of waste management, lack of understanding over the diversity of factors that affect the different stages of waste management and linkages necessary to enable the entire handling system to function. Okot-Okumu (2012) traced the primary source of poor urban solid waste management practices to insufficient and lax policy. This is clearly evident in government failure; absence of the private sector's passion to invest in Universal Scrap and Waste Management (USWM) service conveyance (framework); uncoordinated institutional capacities; low political will, low capacity to discharge duties, poor data for planning, negative attitude of waste generators, among others. Adequate and updated waste management policy with a strong regulatory system is a sole success factor in any reform management.

According to Bako (2014) apart from these obvious hindrances, one of the most important factors identified as a factor affecting waste management is the ambiguity in the Nigerian environment law on the authority (i.e. state government or local council) vested with the responsibility of collecting and disposing of wastes in the states. Unlike Malaysia, solid wastes are by and large classified into three main classifications, and every class is under the jurisdiction of a particular government division. Mbah and Nzeadibe (2017) lamented that at the core of the problems of solid waste management is the absence of adequate policy and enabling legislation. Government policies related to waste management are piecemeal, where they exist, and are poorly implemented. Udoh and Inyang (2016) reported some of the solid waste collection problems which include; singular dumpsite in the study area resulting to inherent routing issues, singular type of waste receptacle used for all categories of waste, size of bins not considered for overpopulated areas leading to opened receptacles, and overflow of waste which subsequently serves as a breeding ground for rodents, fleas and vermin. On the other hand, (Olukanni et al., 2016) as well, identified local factors affecting solid waste collection ranging from poor management infrastructure, people's attitude to waste management, weak policies, lack of sufficient funds to power the waste management sector, household economic status and ad hoc location of facilities. Ayantoyinbo and Adepoju (2018) identified a problem peculiar to solid waste transportation and logistics, which is that street traffic, especially in urban areas, affects waste logistics. However, they noted the roles the government and the private sector could play for the effective management of solid waste.

Strategies of Waste Management in Germany

Germany is considered to be at the forefront of waste management in Europe—credit to the country's high recycling rate, efficient waste-to-energy system, advanced and widespread use of biological methods for treating organic waste, as well as relatively high quality of waste segregation at source (China Integrated Waste Management, 2019). Again, every year around 340 million tonnes of waste are generated (without double counting). The vast majority of this waste is construction and demolition waste that is reused for construction measures. Around two-thirds of the approximately 50 million tonnes of municipal waste are recycled (Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, 2023).

According to BMU (2018), one of the major focus points of the current policies is plastic waste and, in particular, single-use plastics. In 2018, Svenja Schulze, German Federal Minister for the Environment, Nature Conservation and Nuclear Safety (BMU), presented five measures to reduce plastic waste, to strengthen the application of its alternatives and to improve recycling. The plan combines obligatory and voluntary measures, and will be carried out with a promotional campaign called “No to disposable plastic society” under the motto “Less is better”. The key elements of the strategy are as follows:

Reducing unnecessary plastic products and packaging: The federal government supports a Europe-wide ban on disposable plastic products. At the national level, a dialogue with handlers will be launched to achieve voluntary commitments to reduce the number of plastic bags and the volume of packaging.

Eco-friendly design of packaging and products: The government considers an increase in the participation fee for the dual system. The companies/dealers that use packaging that is easy to recycle or consists of recycled materials will pay less than the companies/ dealers that use less environmentally friendly materials. BMU also proposes a new Eco-design system in accordance

Improvement of recycling: From 2019, the target for the recycling rate for plastic packaging has been raised to 58.5% from the previous 36%. In 2022, it shall reach 63% as defined by the Packaging Act. BMU will begin a new recycling plan to increase demand for secondary raw materials.

Improvement of biowaste use: Under the framework of the “Germany Biowaste Bin Campaign” (Aktion Biotonne Deutschland), BMU will support local communities with waste management advice to promote high quality waste segregation at source, and this way, to avoid plastic ending up in the biowaste bin as well as to prevent biowaste being thrown into the bin for residual waste. Currently, almost 50% of biowaste ends up in residual waste bins, while plastic bags, glass, and other materials are thrown into the biowaste bin, contaminating organic waste and making the recovery process more complicated and less efficient. “Germany Biowaste Bin Campaign” also targets the market for the biowaste treatment product, including the development and application of stricter regulatory measures for the quality of compost.

International engagement against marine litter and for sustainable use of plastic: At the international level, Germany calls to tackle the issue of marine litter and improve resource efficiency. In particular, BMU plans to allocate a total of 50 million EUR to support developing countries in implementing practical measures to reduce plastic pollution of the marine environment.

Strategies of Waste Management in Sweden

Historically, Sweden has shown a strong commitment to environmental protection initiatives and policies, particularly in the area of waste. Already by 1969, the Environment Protection Act imposed far-reaching environmental obligations on new waste treatment facilities. Several regulations came into force during the 1990s, including the increasing importance of producer responsibility and a concentrated effort on measures to reduce landfilling of waste. The Environmental Code of 1999, replacing the previous Environment Protection Act, integrated 15 previously existing environmental laws and formed an umbrella legislation governing all environmental impacts within the framework of a sound, sustainable development for Sweden. Waste management is particularly regulated by the Waste Ordinance of 2011, together with a number of specific ordinances covering different waste streams and extended producer responsibility (BiPRO and CRI, 2015).

Swedish MSW management is governed by the principle of waste minimisation as a top priority in accordance with the waste hierarchy found in the Waste Framework Directive (2008/98/EC). In 2005, Sweden’s Waste Plan, A Strategy for Sustainable Waste Management, laid down the future direction of waste management, based on the Swedish Environmental Objectives, which were

enacted by the government in the same year (SEPA, 2005). The current National Waste Management Plan (NWMP) was adopted in 2012 and is valid until 2017 (BiPRO and CRI, 2015).

Swedish MSW management is characterised by a clear division of responsibilities for all involved actors. Municipalities bear the responsibility of collecting and disposing of household waste, except for product categories covered by producer responsibility. Municipalities also have the right to choose how to organise waste management within their territory. In 2014, private contractors carried out waste collection in 71 % of municipalities, whereas in 25 %, the municipalities carried out collection themselves. In the rest, a combination of private contractors and municipal collection services was used. Waste treatment is undertaken either by the municipality/municipal enterprise itself, or by an external contractor, which may be another municipality, municipal enterprise or private company. (Avfall Sverige, 2015).

Since 1991, municipalities have been obliged to establish a waste management plan to reduce the amount and hazardousness of waste, based on national environmental objectives and strategies (BiPRO and CRI, 2015). The plans are coordinated by the County Administrative Board, which then analyses the waste treatment capacity and ensures there is sufficient treatment capacity within the region (ETC/SCP, 2009). Municipalities may issue local regulations on household waste management, including fees (ETC/SCP, 2009). Overall, municipal autonomy is extensive and the municipalities may choose to develop waste management differently. Households are responsible for separating and depositing waste at the various available collection points maintained by the municipalities. Households are also responsible for complying with municipal waste management regulations. Lastly, producers are obliged to take care of waste arising from their products (Avfall Sverige, 2011). In Sweden, producer responsibility has been established for end-of-life packaging, cars, tyres, paper, batteries and electrical and electronic products (SEPA, 2005).

The formal collection system caters for all households in Sweden. Mixed municipal (residual) waste is collected by a door-to-door system, and part of the population is also serviced by door-to-door collections of some waste types separated at source. The waste types included in door-to-door collections and the organisation of services vary greatly. Some examples of door-to-door collection of source-separated waste include multi-compartment bins for up to 8 different waste types, colour-coded bags which are optically separated in dedicated plants and a two-bin system for the separation of bio-waste only. In addition, all households have free-of-charge access to collection points for waste covered by the producer responsibility schemes – newsprint, paper packaging, glass, plastic and metal. There are approximately 5,800 such collection points in Sweden, and the collection services are complemented by 630 civic amenity sites operated by municipalities. A deposit-refund system is in place for polyethylene terephthalate (PET) and glass bottles, and aluminium cans. All municipal waste for recycling is collected as source-separated. (Gibbs et al., 2014a)

The municipal waste services, both door-to-door collections and civic amenity sites, are funded by the fees billed by municipalities. Generally, waste collection fees cover the total cost of municipal waste management, but deficits may be funded through taxation. The fee is typically fixed and variable. Several municipalities, 30 in 2014, have introduced weight-based charges under which households pay an additional fee per kilogram of waste collected, in addition to the basic fee. In

some municipalities, the fee for food waste collection is lower than for residual waste, or zero. A weight-based fee or equivalent funds the collection of waste types covered by producer responsibility schemes. For example, for packaging waste, there are packaging fees that producers pay for the collection, and are typically passed on to consumers through the purchase price (Naturvårdsverket, 2016; Avfall Sverige, 2015; Gibbs et al., 2014a). Commercial waste, similar to household waste, is collected in the same manner as household waste. The fee paid by businesses depends on the collection frequency and the bin size (Gibbs et al., 2014a).

Food waste is digested or composted in 170 out of 290 Swedish municipalities. The main treatment method for mixed municipal waste is incineration. There are 33 incineration plants for household waste in Sweden, producing 16.6 terawatt-hours of energy in 2014, mainly for district heating. Even though incineration capacity already exceeds the domestic availability of combustible waste, the number of plants is expected to grow. In 2014, 1.4 million tonnes of waste were imported for energy recovery, primarily from Ireland, Norway and the United Kingdom. There are 45 active municipal landfill sites in Sweden (Avfall Sverige, 2015), but the share of waste landfilled is very low.

The generation of Municipal Solid Waste (MSW) in Sweden peaked in 2008, reaching 4.46 million tonnes. In the following years the generation fell, to 4.27 million tonnes in 2011 and further to 4.25 million tonnes in 2014. It has been argued that one possible explanation for the reduction is the economic recession, as reduced consumption inevitably leads to reduced waste (Avfall Sverige, 2009). The amounts of generated and treated MSW reported to Eurostat have been equal since 2001 (Eurostat, 2016).

The overall treatment of municipal solid waste in Sweden is characterised by an equal share of recycling and incineration, more than 49 % each, while landfilling has been diminished to around 0.6 % of generated MSW in 2014. Recycling rates were already high in 2001 at 39 % and by 2014, they had reached almost 50 %. Sweden will most likely be able to fulfil the 2020 50 % target set out in the Waste Framework Directive. A landfill tax, which came into force on 1 January 2000, played a vital role in the diversion of MSW from landfill to recycling and incineration. Consecutive increases in the tax level in 2002, 2003 and finally in 2006 instigated a continuous reduction of landfilling MSW. In addition to the landfill tax, other instruments such as producer responsibility, milestone targets for food waste recycling and investments in anaerobic digestion have been particularly important in improving recycling rates. A landfill ban on sorted combustible waste in 2002 and a landfill ban on organic waste in 2005 were catalysts for the diversion of MSW from landfills. Since 2012, Sweden has had two milestone targets for waste, including a target of better resource management in the food chain and a recycling target for construction and demolition waste. A tax on incineration was introduced in 2006 in order to boost further material and organic recycling, but was repealed in 2010 (EEA, 2016).

Functionalist Theory

The essence of functionalism is to visualise particular social structures as having effects on the viability of the social organism in its environment. Furthermore, the Proponents of functionalism are Comte, Durkheim, Spencer, Talcott Parsons, Robert Merton, among others. The central

assumptions include the following: Social systems are composed of interrelated part. These systems reveal both internal and external problems of adaptation to their environments that must be resolved if the system is to endure. Whether from external or internal sources, these problems of survival and adaptation can be visualised as a system's needs or requisites that must be met. An understanding of social systems as a whole and their constituent parts is only possible by analysing the needs or requisites of the system that any given part of a society (Turner, 2014).

Robert Merton and Middle-Range Functionalism

Robert K. Merton was one of many leading mid-twentieth-century sociologists who were critical of Parsons' abstract style of theorising. He was one of Parsons' earliest students at Harvard University, where in 1936 he received his PhD. Since the early 1940s, Merton was on the faculty of Columbia University, where he collaborated extensively with Paul K. Lazarsfeld in numerous research projects. He died in 2003.

Social Structure and Anomie

Merton's theory of anomie and its effects in motivating deviant behaviour is probably his most frequently cited middle-range theory (Merton, 1968:185 – 248). His basic contention is that various forms of deviant behaviour in American society result from a discrepancy for some segments of the population between the material and occupational success goals that our culture emphasises and the institutional means that are provided for achieving these goals. The American emphasis on equality and achievement (Parsons' universalistic achievement pattern) encourages all members of society to aspire to high levels of occupational and financial success, regardless of their social and economic class background. The stories of poor immigrants who gradually moved up the socioeconomic ladder in the American "land of opportunity" and the heroic status of successful "self-made" entrepreneurs express such ideals. But despite these culturally prescribed ambitions, opportunities for success are not equally distributed. Some segments of the population do not have access to the legitimate means for achieving these ends in culturally approved ways and so experience the frustrations of anomie. This discrepancy between goals and means is thus dysfunctional for those segments of the population that have internalised the culturally prescribed goals but lack the opportunities to achieve them through legitimate means. The result is often some form of deviant behaviour. The assumptions of social structure and anomie can explain the challenges of waste management in Nigeria and the conditions of waste management in Germany and Sweden. This is because there is no adequate compliance with waste disposal, as well as poor implementation of policies on waste management in Nigeria. Again, literature has established that Nigerians prefer illegitimate methods of waste management, like landfills and open dumpsites, as against legitimate methods like an organised door-to-door system of collection, an organised recycling method and composting, which are common in Germany and Sweden.

Symbolic Interactionism Theory

The proponents of symbolic interactionism theory include George Herbert Mead, Charles Horton Cooley, and Herbert Blumer, among others. Symbolic interactionism may be summarize in the following principles: human beings, unlike lower animals, are endowed with capacity for thought;

the capacity for thought is shaped by social interaction; in social interaction, people learn the meanings and symbols that allow them to exercise their distinctively human capacity for thought; meanings and symbols allow people to carry on distinctively human action and interaction; people are able to modify or alter the meanings and symbols the use in action and interaction on the basis of interpretation of the situation; people are able to make these modifications and alterations because, in part, of their ability to interact with themselves, which allows them to examine possible courses of action, assess their relative advantages and disadvantages, and then choose one; and the intertwined patterns of action and interaction make up groups and societies (Ritzer & Stepnisky 2014).

Charles Horton Cooley: Primary Groups and the Looking-Glass Self

Charles Horton Cooley (1864–1929) was born in Michigan and was associated with the University of Michigan for all of his professional life. Like Mead, his ideas also contributed to the development of symbolic interaction theory. His perspective on the relation between a person's self-concept and face-to-face interaction within primary groups is expressed in his frequently cited concept of the "looking glass self" (Cooley [1902] 1964). This metaphor refers to the way one's identity is formed from the reflections one sees of oneself in the reactions of others. This concept is clearly parallel to Mead's insights regarding the social origins of one's self-concept. More than Mead, however, Cooley stressed the importance of our emotional reactions to these responses. When we perceive the reactions of others as indicating either approval or disapproval, we feel pride or shame as a result.

Cooley ([1902] 1964) also pointed out that our identity may extend beyond ourselves to include our family, friends, and primary group relationships. To speak of "my family" or "my group" is to expand our sense of self to include these relationships. The groups with which we identify most strongly in this way are likely to be primary groups. Such groups differ from secondary groups in that they are characterized by intimate face-to-face relationships. It is through primary groups (especially the family) that individuals are bound together with a sense of unity and cohesiveness that finds expression in the mutual regard (or sympathy) they have for one another in their common life. Cooley's assumptions are suitable in describing and assessing the condition of waste management in Nigeria based on the realities and reactions of waste management strategies in Germany and Sweden. In Germany for instance, emphasis is placed on high rate of recycling with annual target, segregation of waste for easy management and implementation of incentives for compliance and fines for irresponsibility. For Sweden, waste management is governed with collective responsibilities, door to door point of collection, adequate funding aided by taxation among others. These standards from Germany and Sweden have created the identity of proper waste management. And this signifies that waste management in Nigeria is yet to meet the proper standard of waste management. This is due to increasing usage of landfill and open dumpsite, lack of funding, lack of compliance and poor implementation of policies on waste management.

Conflict Theory

In virtually all social systems, resources are distributed unequally. Some get more of whatever is valued than others whether money, power and authority, honour and prestige, health, knowledge,

or any resource. Inequality almost always generates some tension between those who have abundant resources and those who have comparatively few resources, and this tension will, under specific conditions, lead to conflict between the advantaged and disadvantaged. This basic fact of life was recognized by the early figures in sociology, particular Karl Marx, Spencer, Max Weber, Randall Collins and Georg Simmel, Ralf Dahrendorf, but each approached the topic of conflict in somewhat different ways (Turner, 2014). Authority Relations and Conflicting Interests:

Ralf Dahrendorf's Contributions

The conflict perspective developed by German sociologist Ralf Dahrendorf contrasts with Coser's conflict functionalism in that Dahrendorf began with the opposing Marxist perspective. His intention was to modify Marx's theory to make it relevant for an analysis of modern "industrial" societies as well as the early capitalism of Marx's time. Ralf Dahrendorf was born in 1929 and so experienced the rise of Nazism in his youth. After World War II, he became heavily involved in West German political affairs in addition to his academic career, even serving as a member of the West German Parliament. His academic influence extended far beyond Germany, and he was eventually appointed director of the prestigious London School of Economics.

Dahrendorf's conflict theory had a strong appeal to American sociologists following the publication of the revised English edition of his major book, *Class and Class Conflict in Industrial Society*, in 1959. In contrast to Marx's portrayal of the early years of unregulated entrepreneurial capitalism, Dahrendorf pointed out that modern industrial societies are dominated by corporate forms of capitalism that not only operate on a much larger scale but are also more firmly institutionalised in the overall social structure. A key feature of modern industrial societies is that socioeconomic class conflict has been largely contained through various mechanisms that have been developed to reduce and regulate it. As a result, the chances that major disruptive conflicts will erupt and threaten to escalate into an intense revolutionary struggle are far less than Marx had envisioned. Instead, conflict leads to gradual evolutionary change that actually reinforces and strengthens the system.

Dahrendorf focused a great deal of attention on conflict within "imperatively coordinated associations" (formal organisations or "corporate actors" in Coleman's terms) in industrial societies, both capitalistic and socialistic. He regarded conflicts as inevitable because of the divergent class interests of those at different levels in the hierarchies of power and authority in these organisations (Dahrendorf, 1959:36– 71). However, he felt that Marx's explanation of class formation and class conflict was relevant only to the early stages of capitalism, not to a "post-capitalist" industrial society. In contrast to Marx's focus on ownership or lack of ownership of the means of production, Dahrendorf argued that control is the crucial factor, not ownership. As capitalism has gradually been transformed into a "post-capitalist" society, legal ownership and effective control have been separated to a considerable degree. Ownership is widely dispersed among numerous stockholders, while effective control is exercised by professional managers and executives in corporate structures. Although high-level managers and executives often own large amounts of stock, their control is not based on this ownership but on their positions of corporate authority. Professional managers or executives are themselves subject to the oversight of a board of directors, whose members are also likely to be major stockholders, even though not actively

involved in day-by-day control. Dahrendorf's emphasis on the degree of control as a predisposing factor for conflict and social problems like waste management is suitable in explaining the condition of waste management in Nigeria, Germany and Sweden. This is because the high degree of control in Germany and Sweden through the implementation of policies on waste management, strong rules and regulations on waste disposal, enforcement of fines and incentives, provision of adequate funding, among others, has improved the condition of their waste management. Unlike Nigeria, where poor implementation of policies, uncoordinated institutional capacities, lack of adequate funding and so on have worsened its condition of waste management.

Lessons from the Strategy of Waste Management in Germany and Sweden

The above standpoints on the challenges of waste management in Nigeria indicate that waste management remains inadequate in terms of effectiveness and efficiency. This is because there is an increasing generation of waste without commensurate principles and practices of waste management. Unlike in Germany, where a high recycling rate has been prioritised through policy centred around improvement of recycling with annual targets attached with short and long-term performance indicators on waste generation and waste management. While in Sweden, strong rules and regulations on environmental protection initiatives, especially on reducing waste generation through land filling, have been enacted for adequate waste management. This is similar to Merton's theory of social structure and anomie, which stipulates discrepancy for some segments of the population between the material and occupational success goals that our culture emphasises and the institutional means that are provided for achieving these goals. This means that increasing waste generation is influencing illegitimate means of waste disposal in order to prevent the immediate negative consequences of waste generation, like bad odour, pollution, contamination, etc and indirectly entertaining the possible long-term negative consequences of the illegitimate means of waste disposal, like climate change, land degradation, among others.

Furthermore, adequate and proper waste management in Nigeria has been mitigated through poor data and planning, low political will and uncoordinated institutional capacities. This is not the case in Germany, where the government has established a waste management institution through an energy system that involves the use of biological methods for treating organic waste. More so, in Sweden, the government formulated policy according to the waste hierarchy. For instance, Sweden's waste management revolves around the division of responsibilities for all actors, where municipalities are saddled with the responsibility for collecting and disposing of household waste. Furthermore, the problem of waste management in Nigeria can be traced to the prevalence of a single medium of waste disposal. This is not the case in Germany, where there is a principle and practice of segregation of waste at source in order to ensure efficient and effective recovery processes of waste management. This segregation of waste in Germany is synonymous with the division of responsibilities in Sweden, where actors have different functions in the web of waste management. This is similar to the contributions of Dahrendorf to the conflict perspective, which laid emphasis on the degree of control as a predisposing factor for conflict and social problems like waste management. This signifies that when the organisation is saddled with the responsibility of waste management, it is effective and efficient, the negative consequences of waste generation will be mitigated. However, when the organisation saddled with the responsibility of waste

management is not effective and efficient, waste generation will create more environmental crises in society.

Inadequate funding is also a constraint on waste management in Nigeria. However, in Germany, inadequate funding has been addressed through fines. For instance, companies that apply recycled materials in production activities will pay less than those that apply environmentally friendly materials. Similarly, waste management in Sweden was funded by billed municipalities, but deficits are funded through taxation. For instance, landfill tax played an important role in diverting municipal solid waste from landfills to recycling and incineration. In addition, Sweden encourages a door-to-door system of collection and is free of charge at collection points for waste covered by the producer responsibility schemes, where producers are obliged to take care of waste arising from their product. While in Nigeria, this strategy of waste management within the context of a door-to-door system of collection, free of charge and producer responsibility on waste management is not prevalent in Nigeria. This is in congruence with Cooley's looking glass self-theory, which stressed the importance of our emotional reactions to responses. When we perceive the reactions of others as indicating either approval or disapproval, we feel pride or shame as a result. This is because fines and prompt collection of waste are responses by the government, organisation, community or group of individuals, which signifies that inappropriate waste disposal is allowed in Germany and Sweden. However, when such responses are ineffective in a given society, then the reaction is inappropriate waste disposal, which is one of the factors responsible for increasing waste generation in Nigeria.

Conclusion

From the above standpoints, waste management in Nigeria is not in good condition due to the increasing generation of waste without close monitoring, inadequate funding, poor policy implementation, bad leadership, weak institutions, weak environmental regulations and so on. However, the above standpoints established that waste management in Germany and Sweden is in better condition due to alternative sources of funding, a door-to-door system of collection, composting, collective responsibilities, strong rules and regulations, a high recycling rate, segregation of waste and so on. Hence, for Nigeria to have a better condition of waste management, lessons must be learnt from Germany and Sweden, and these lessons must be used to complement the existing strategy of waste management in Nigeria.

Recommendations

The study recommends the following:

Government agencies like the Federal Ministries of Environment and Water Resources should be empowered to formulate policies, implement the policies and prosecute offenders. Necessary legislation should be enacted to ensure that future landfills in the area meet the minimum standards for soil and groundwater protection before construction.

Formalisation of informal methods of recycling waste must be adopted through partnership. Households must emphasise a 'zero waste' society, whereby all the waste generated is recycled

and reused. Organic waste materials, such as food leftovers, animal dung, and vegetal wastes, should be utilised for bioenergy generation through anaerobic digestion and organic fertiliser production through composting.

The three arms of government and private firms must share responsibilities of waste management and must seek alternative source of funding either through tax or fines from environmental offenders. This initiative will provide the availability of funds for the smooth facilitation of waste management.

Through an intensive awareness program, the community can be sensitised and educated on the best practices to adopt so as to ensure that everyone is carried along in issues concerning Solid waste management. This can be achieved through mass media programs.

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