IS THE CONCEPT OF WASTE UNIVERSAL? HANDLING BUILDING DEMOLITION BY-PRODUCTS IN THE CITY OF KANO, NIGERIA

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ABSTRACT

While old and new studies such as the works of Henry Lewis Morgan in 1871 on kinship and Geert Hofstede in 1980 on management theories show that what works in one cultural setting may not work in another, the United Nation policies on environmental governance to-date tend to be a uniform approach for all nations irrespective of the differences in cultural orientation. This paper investigates and demonstrates that in the context of construction and demolition wastes, what may be considered as waste in one society may be a wealth in another society; and the waste management policies that work in one society may not work in another. Therefore the one-way traffic approach in international environmental governance whereby the waste management practices of the rich countries are considered as a perfect model to be emulated by the poorer countries may be wrong. In some instance, such as the building demolition management practices in Nigeria, the systems of the developing countries may even be more sustainable than what is obtainable in the rich countries. Instead of dismissing the systems of the developing countries as informal and inferior, such systems may be holding the key to the sustainable solutions for waste management that the world needs so much.

***Keywords*:** Building, Demolition, Waste, Nigeria, Sustainability

1. INTRODUCTION

Until the seminal works of Henry Lewis Morgan were published in the latter part of the 19th century, anthropologists expected an English equivalent from the society that was the subject of their study when describing kinship relationship. However, Morgan (1871) discovered that different societies adopt different naming schemes for relations, and these are influenced by the social structures and marital traditions of the peoples, which may be completely different from those of the English society. Morgan's seminal work opened a window into the different concepts and classifications of kinship and the use of terms to describe kinship relations (Maxwell, 1992; Morgan, 1871).

In another relatively more recent seminal work on management theories by Geert Hofstede (1980), a survey of over a hundred thousand employees of the same multinational corporation from 40 countries was conducted twice over a period of six years. The sample from each country was basically uniform in terms of age, gender, job description, and employer, with the only difference being their national culture. The responses to approximately 150 questions which predominantly related to the beliefs and values of the respondents coincided with the cultural orientations groupings. This finding prompted the researcher to conclude that

the management theories that work in one country may not work in another country owing to the differences in cultural orientations, beliefs and values (Hofstede, 1980).

The work of Morgan on kinship and that of Hofstede on management theories are not only a century apart, but addressed different subject areas; nevertheless, the two studies share a common theme. Both the studies show how the same subject can have different meanings and approaches in different societies owing to differences in beliefs, values and cultural orientations. Additionally, the two studies challenged the tendency of making generalized assumptions and interpretations across cultural boundaries. Nonetheless, concerning global environmental governance and sustainability policies initiatives, the tendency remains to formulate a common approach for all nations as in the Millennium Development Goals (MDG) and its successor, the Sustainable Development Goals (SDG) (Griggs, 2013).

As a typical example, one of the key mandates of the Nigerian National Environmental Standards and Regulations Enforcement Agency (NESREA) is "…enforcing compliance with provisions of international agreements, protocols, conventions and treaties on the environment to which Nigeria is a signatory" (Ladan, 2012; NESREA, 2013). The emphasis on issues that are identified as international should be noted as against local issues of priority that may be unique to the local environment. On the other hand, are the international conventions and protocols relevant in every local context?

The aim of this paper is to prove that the international convention whereby the by-products of building demolition may be considered as a category of waste that degenerates the natural environment as well as constituting a threat of exhaustion to the natural resources reserves may not be relevant in the Nigerian context, as the materials from building demolition are not considered as waste in this society. In the same manner that Morgan's work shows that the approach and terms used in describing kinship relationship in English society are not applicable in many other societies, and in the same way that Hofstede demonstrated why the American management theories may not be applicable elsewhere, similarly the concept of building demolition waste and waste management that works elsewhere may not work in the Nigerian context. The uniqueness of the Nigerian context of handling demolition by-products begins with a definition of what waste is.

2. THE CONCEPT OF WASTE IN CONSTRUCTION AND THE NIGERIAN CASE

As described by Hawkes (2011), the beginning of unsustainable architecture tallies with the start of industrialization. Industrialization gave rise to the culture of consumerism whereby society consumes manufactured goods and the materials are thrown away as waste at the end-of-service in a linear pattern (Leonard, 2010), otherwise described as cradle-to-grave consumption (McDonough & Braungart, 2009). There are alternative definitions of waste; nonetheless, the World Health Organization's (WHO) definition of waste, namely "…something which the owner no longer wants at a given place and time and which has no current or perceived market value" is adopted in this study as being a global agency and its emphasis being on "market value" (Royal Commission on Environmental Pollution, 1985).

There are different categories of wastes according to how it is generated, such as agricultural, household and mining wastes; or how it is handled, such as biodegradable, recyclable, and hazardous waste (Nowak et al., 2009; Royal Commission on Environmental Pollution, 1985). Nevertheless, the scope of this paper is limited to building demolition waste. In line with the WHO's definition of waste, materials from the demolition of buildings with no current or perceived market value and which are no longer wanted by the owner constitute an environmental and regulatory challenge in some societies, more especially in the industrialized nations of Europe and America. According to Osmani (2012) and the UK Green Building

Council (2013), 90 to 120 million tonnes of waste are associated with construction and demolition (C&D), with more than 10% being unused materials that are no longer wanted. Such a scale of waste generated from buildings in developed countries calls for efforts to reverse the trend towards more sustainable practices such as reusing building materials in construction, recycling aggregates in concrete, giving new life to old wood, the mission of the American Construction and Demolition Recycling Association, and efforts of private corporations (Brito & Saikia, 2013; Construction & Demolition Recycling Association, 2016; Fast, 2001; Kibert, 1993; Pacheco-Torgal et al., 2013; Sassi, 2008). Nevertheless, according to the findings of this research, the story is completely different in other societies such as Nigeria, where the by-products of building demolition are not perceived as waste, more especially if the WHO's market value definition of waste is adopted.

3. METHODOLOGY

This study is based on a descriptive study of a society in the Nigerian city of Kano. According to the official census figures, Kano is the most populated region in Nigeria (National Population Commission, 2016). Case study strategy is used in this inquiry considering the practice of handling demolition waste as a concurrent phenomenon and the concepts of sustainability and the industrial ecology as theoretical presuppositions. In this research, the investigator has no control over the variables in the building demolition waste management practices in the Nigerian cities. Case study is a synchronous study of situations whereby the subject is not distinct from the context with the lowest researcher's control over events (Yin, 1981, 2009). Moreover, a case study is considered convenient for exploratory and descriptive inquiries that seek to answer the 'How?' and 'What?' questions, and therefore considered appropriate for this study.

The unit of analysis in this research is the community of *Yangwangwan*, referring to the group of stakeholders dealing with salvaged building materials in the local Hausa language used in the city of Kano. Consequently, participants were selected on purpose from active players in the industry with first-hand experience in at least one building demolition project. Every person who could potentially supply information was selected and expected to identify the next three participants for the research in a snowball fashion; however, this could not be implemented in practice. Therefore, 12 out of the 16 research participants were selected directly by the researcher. According to the original design of the research, an equal quota of three participants from each of the seven stakeholder groups was expected to participate in the research. Nonetheless, the quota selection of participants could not be implemented in practice. This was partly owing to a number of the participants belonging to more than one stakeholder group and partly because of the uneven willingness and availability of the participants across the stakeholder groups. A total of sixteen people from across all the stakeholder groups participated in the research (see Figure 1).

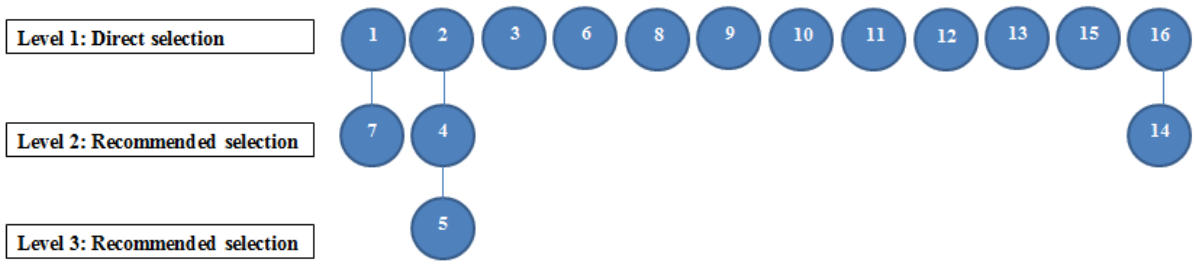

Figure 1. Research Participants' Selection

An in-depth semi-structured interview was administered to the participants guided by themes developed from the best practices of waste managements across different sectors with an emphasis on the lessons from natural ecological systems. Subsequently, the interviews were transcribed verbatim for analysis using the QDA Miner software.

1. ARE THERE MATERIALS FROM BUILDING DEMOLITION THAT ARE THROWN INTO THE LANDFILL?

From the response of the research participants there is virtually zero demolition waste that goes to the landfill when buildings are demolished in Nigeria. According to one of the participants:

"There are very negligible; including nails, nails are reusable or can be sold as scrap metal for recycling. Even timber that cannot be used in buildings can be used for firewood for cooking. This is yet another industry; there are people who specialize in that, getting timber from demolished building that cannot be used for anything but cooking. Everything is useable including the sand; you can use it for refilling or even in concrete work- i.e. as a recycled aggregate"(ENIE06).

These descriptions suggest that some materials from demolished buildings in Nigeria are taken for recycling, some are used as fuel to generate energy, and others are reused in another construction project. This method coincides with the prescription of the European Union Commission (EC) Framework directive on waste (Council Directive 75/442/EEC, 1975) known as waste hierarchy and the CIB principles of sustainable construction (Kibert, 2005). However, of particular notice are the statements that very negligible amounts of materials are deposited in the landfill.

In two studies by B. Nabegu (2008) and A. B. Nabegu (2010), solid waste was collected for three months from landfills in three different areas of Kano according to the Gordon guide for data collection in cities, and the samples were separated into groups for analysis. In the second study, secondary data was collected from the only government agency responsible for the management of municipal solid waste, the Kano State Refuse Management and Sanitation Board (REMASAB). The different classifications of the solid wastes in these studies include biodegradable matter, industrial waste, and non-biodegradable matter, including some glass and metals. However, there was no mention of demolition and construction waste whatsoever. The small pieces of glass and metals might likely have been from household items such as bottles and cans and probably a very insignificant quantity from building demolition. This buttressed the claim that negligible amounts of materials from building demolition are deposited in the landfill. However, the question remains as to what the fate of these materials is if not taken to the landfill.

According to the statement of another participant:

"Actually very few items may be taken to the refuse dump; even the ceiling boards were taken to the refuse dump because it was damaged by rainfall. Otherwise, it should have been marketable as it is useable for other purposes. Like the aluminium roofing sheets that are used for making cooking pots" (ENIE01)

This reveals that the materials from demolition sites are marketable commodities that may be taken to the market for sale. When the materials are taken to the market, they are either sold or reprocessed to produce other products such as the household items as mentioned by ENIE01 (see Figures 1, 2 and 3). This practice of reusing the unwanted materials from one process (building demolition) as raw materials for producing another product (household item) can be described as an industrial ecology. Industrial ecology is a biomimetic concept of organizing human industrial activities to resemble the natural ecological systems where there

is no waste. In natural systems there is no waste; the waste of one process becomes the raw material for another process. Industrial ecology was recognized as a highly sustainable system and was the main theme of the National Technology Strategy Policy of Clinton's administration in the US (Benyus, 1997). Additional information worthy of attention from the statement of ENIE06 is the existence of specialist stakeholders who specialize in dealing with the salvaged materials from building demolition.

Figure 1. Poultry Feeder from Salvaged Materials

Figure 2. Cooking Pots, Bread Moulds: Work in Progress

Figure 3. Coal Stove Made from Combination of Salvaged Roofing Sheets

These specialist stakeholder groups, collectively referred to as *yangwangwan* in the local Hausa language, perform the important task of handling the end-of-life management of buildings with virtually zero waste. As narrated by one of the participants who was a project manager for one of the decommissioned public buildings:

"When the community realized the structure was to be decommissioned, while the systematic demolition was starting, there was mass scramble, or rather mass participation by the people around, because of the need of the people to take the scraps and used them in their houses. A schedule that was to take about two weeks was finished in two days. We made a budget to pay for the decommissioning and package the salvaged materials aside and think of what to be done with it- rather to sell, auction, or give free to the people. I can assure you, we were unable to retrieve up to 5%; the people did the work, themselves! They removed all the rods (reinforcements), and all the components; the scene looked like one of the Nigerian festivals was going on there! The site became a market; a real market, people were removing roofing sheets, removing ceilings, packing it in different places, and in fact, there was a mini-market in the places. The needy people, those that wanted to use it (in personal properties) were packing it to their own homes; and some were packing it making stalls for sale" (ENIE13).

In demolition projects involving public buildings, salvaged materials are not recognized officially. The contractors are officially paid to cart away the debris from site; nonetheless, this is not practical as members of the public come to scramble for it (ENIE02, 2014). There are instances whereby interested parties pay the contractors or the truck drivers for the rubble to be delivered to their construction site. This practice is so popular among the locals that a term *Kwashale* in the native Hausa language is used to describe projects involving carting away the debris from sites (ENIE10). This is against the practices in the industrialised countries whereby the by-products of building demolition are often treated as waste, posing environmental challenges and necessitating several initiatives for finding solutions (DOE, 2012; Price et al., 2009).

The salvaged building materials market is an industry in the Nigerian economy with various categories of stakeholders. In addition to the basic stakeholders such as building owners whose engagement with the industry is only ad hoc and circumstantial, there are specialized operators in the salvaging of building materials that are divided into three categories. The first category are traders that buy and sell the salvaged materials in the locally

well-known salvaged materials markets located in different locations of the study area, the Kano metropolis (ENIE01; ENIE04; ENIE14).

The second category who refer to themselves as tinkers reprocess the salvaged materials into different products before they are resold on the market (ENIE07). Some of these products include cooking pots, kerosene stoves, coal stoves, bread moulds, poultry feeders, or even a freezer (See pictures 1, 2 and 3).

The third category of *Yangwangwan* are the self-employed scroungers who may engage with demolition sites to save as much of any valuable material, including breaking concrete elements to salvage the reinforcements.

The foregoing account has demonstrated that far from being waste, i.e. materials with no market value, salvaged building materials in Nigeria are merchandise as well as the backbone of an important industry in the economy. Moreover, "…when we close our books and pen our eyes…" (De Soto, 2001), we should be able to see that it is an organized industry comprising different layers of stakeholders performing different functions, while the market is as sophisticated as any other. If we can delve into the lives of the players in this industry, we should be able to see through their eyes that it is not waste but rather wealth; or rethink the concept of what is a waste and understand that sustainability may be universal (Goodland & Daly, 1996). However, the concept of waste is not universal.

5. CONCLUSION

As a countermeasure to the perceived unsustainable production and consumption and the resultant waste generated, "The Future We Want", the main document of the World Summit on Sustainable Development 2012 (Rio+20), recommends that all nations should advance policies, strategies, laws and regulation for sustainable waste management (United Nations Environment Programme, 2013). The United Nations' guideline assumed that, whilst 98% of the waste is collected in the rich countries, only 40% is reported to be collected in the poorer countries whereas most is dumped in open landfills (United Nations Environment Programme, 2013).

Moreover, the solid waste management system in the developed countries is often described as an organized "formal" sector, while that of the developing countries of Africa, Asia, and Latin America is referred to as the "informal" sector (Velis et al., 2012), despite the environmental, economic, and social benefits of such systems. The term 'informal' was defined as "…the informal solid waste sector refers to individuals or enterprises who are involved in recycling and waste management activities but are not sponsored, financed recognized or allowed by the formal solid waste authorities, or who operate in violation of or in competition with formal authorities"(Velis et al., 2012*).* The Oxford Dictionary (2015) defines the term 'formal' as "done in accordance with convention or etiquette" and "officially sanctioned or recognized".

Ironically, it was acknowledged that these informal players are sometimes capable of paying taxes, and are sometimes registered by the authorities (Velis et al., 2012). This supports the assertion earlier in this paper that there is a tendency in the global environmental governance to assume that any system that is not in conformity with the convention and etiquette of the economically advanced countries is informal and inferior. However, this paper argues that such generalized assumptions are not applicable to the Nigerian practice of handling building demolition by-products that are traditionally not considered as waste in every sense, but rather as a marketable commodity. Moreover, the Nigerian system is relatively more sustainable as it is more environmentally, economically, and socially friendly.

Contrary to the tendency of dismissing these systems as informal and inferior, these systems should be studied deeply and positively for potential inspiration on how to reorganize

the so called ‘formal sectors’ in the fashion of the otherwise ‘informal sectors’ in order to produce zero waste, thus becoming more sustainable. In the words of Benyus (1997), it is now an extraordinary time that the urban westerners should learn from the wisdoms of the pre-industrial societies how to live in harmony and sustainably on earth. The idea of getting inspiration for sustainable solutions from the wisdom of the pre-industrial societies is referred to as ethnomimicry, which is the subject of another discussion.

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