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'Garbology' as a Determinant of Social Class Stratification, Living Standards and Domestic Waste Foot Print in Selected Urban and Peri-Urban Centers in Uasin Gishu County in Kenya

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Abstract:
Garbological audits of a given society can reveal both past and present lifestyles, living standards, professions and health status. That what people have owned and thrown away can speak more eloquently, informatively, and truthfully about the lives they lead than they themselves ever may. Garbology depends on the primary premise that one can conclude a considerable amount of information about an individual or group through the composition of their trash receptacles. The material leftovers of past human activity can exemplify on the lives of individuals that disposed of the items that include; paper, clothing, magazines, books, diaries, minutes of meetings, anniversary brochures, food remnants, fast-food packaging, disposable diapers, and grocery bags. This work examined the role of Garbology as a possible domestic waste foot print, social class and living standards indicator in a classical African urban centre by examining House-hold waste from various neighborhoods. The present study considered Garbology as a means of evaluating the socio-economic profile of residents in selected urban and peri-urban centers in Uasin Gishu County in Kenya. In this study 40 subject respondents were purposefully identified and interviewed using a stratified questionnaire to establish their responses in Garbology as a tool to project socio-economic stratification of a given society based on the nature and quantities of waste they dispose. The respondents were classified socio-economically as: -[(Upper class, 45%; middle class, 32.5%; Lower class, 22.5%)]. Data were mainly collected through in-depth interviews. The Garbological audit from the respondents show the following information about the people who disposed the waste:-[(Travel preferences, 26%; Health status, 32%; Household demographics, 86%; Religious convictions, 60%; Profession/career, 25%; Consumer habits/income levels, 92%)].The findings indicate that Garbological audits are effective in determining and projecting socio-economic indicators of a society past and present.

Keywords: Garbology, waste foot print, social class, living standards, Uasin Gishu County, Kenya

1. Introduction

1.1. Concept of Garbology

The detailed study and analysis of garbage to understand the socio-economic status of a society has been described as 'Garbology'. The scientific study of trash was introduced by William Rathje in 1987 at the University of Arizona (Rathje *et al.,* 1992; Rathje, 1986). The nature and quantities of trash disposed by a household or society can give an accurate reflection of the lifestyle and consumption taste (Hunter and Yates, 2011; Black, 2007; Halkier *et al.,* 2011). Waste is an unavoidable consequence of human activities and recent improvements in living standards and economic development has led to the generation of complex wastes (Barbalace, 2003; Bloom, 2011). Industrial diversification and expanded provision of health care have introduced substantial amounts of hazardous and biomedical waste into the waste stream (Miller, 2009; Humes, 2012; Molander and Lenihan, 2007). An adept analysis of domestic waste shows that the major composition comprise mainly of food waste, paper, plastic, metals and glass (Strasser, 2009; Barnard, 2011; Rathje, 1992). Other components of domestic and community waste includes ; electric light bulbs, used medicines, chemicals, batteries, leather, compound wastes, wood, special wastes e.g. damaged consumer electronics, oil, tires and other bulky goods (Evans, 2011a). In Kenya, waste collection and transfer is majorly labour intensive and undertaken by personnel from the County Governments and privately owned garbage collection entities. Waste collection and disposal is undertaken by unsophisticated methods i.e. handcarts and tractor trailers from communal bins to designated dumpsites (Rathje and Murphy, 1992). The garbage collection and disposal chain is relatively inefficient resulting in inefficient collection and disposal system. This is additionally constrained by lack of technical expertise that considerably limits the efficiency of waste management in the towns and cities in Kenya. Other drawbacks in garbage collection and disposal includes shortage of storage bins, collection vehicles, traffic congestion and lack of public compliance in stipulated waste management legislation. This results in unsatisfactory waste collection rates (Scanlan, 2005). Across the developing world heaps of refuse are often left uncollected and waste is dumped on open land, canals and drains (Cooper, 2008; Rathje, 1986). In the current study, garbage disposed from households in major urban and peri-urban centers in Uasin Gishu County in Kenya was analysed in order to determine the social stratification, living standards and profile the County domestic waste foot print.
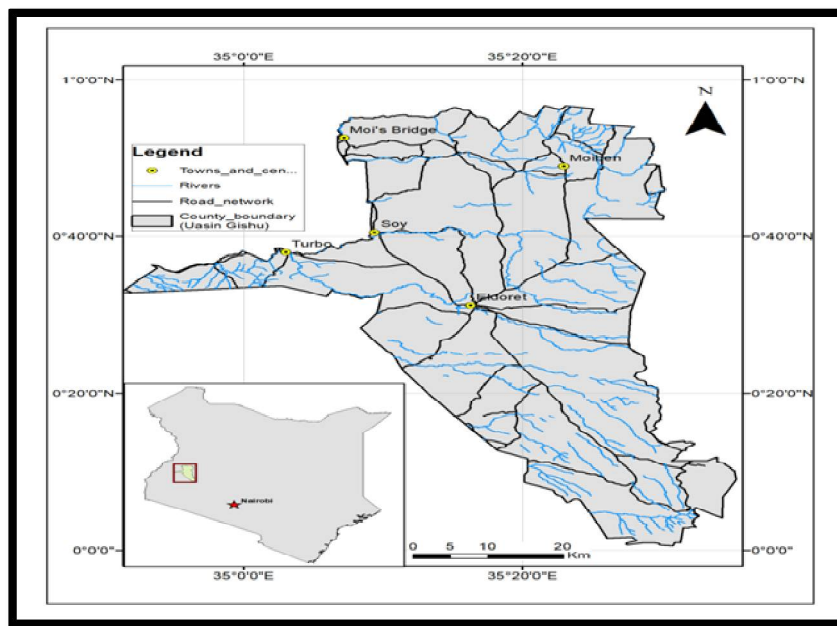
Figure 1: Map Detailing Urban and Peri-Urban Centers in Uasin Gishu County, Kenya

The map in Figure 1 shows the study area i.e. urban and peri-urban centers in Uasin Gishu County of Kenya where local Garbological audits were done from domestic wastes generated from households.

1.2. Garbology and Archaeology

There exists a relationship between Garbology and Archaeology. In recent times a new field of archeology i.e. Garbology that studies garbage to analyse information has emerged comprising diverse disciplines e.g. economics, sociology and archaeology (Miller, 2009; O'Brien, 2007). In archaeology, garbage provided a gold mine of information. Archaeologists in their studies sample waste quantitatively, package, weigh, measure volume, label and chemically analyse its composition in order to extract information. The data extracted establishes links between waste and human activity. Waste endures longer and acts as physical evidence of human existence (Scanlan, 2005; Hawkins, 2006, Hunter and Yates 2011). Most of the information gathered from archaeology and Garbological audits has been determined from examining the spatial distribution and material composition of garbage dumpsites (Rathje*et al.,* 1992). Garbology is unique since it adapts archaeological procedures to examine consumption patterns among targeted households through the material shadow of consumption namely that of waste. According to Rathje*et al.,* (1992), waste was a uniquely situated as a means to explore the behaviour and norms of contemporary populations, waste was taken to be an inevitable result of human activity. The waste disposed can accurately predict waste disposal habits and norms (Sassman, 2005; Thomas, 2012). Waste symbolically represented the value interacting with perceptions of social prestige, order and usefulness. Garbology combines the theory and methods of archeology and material studies with ethnography providing a full picture of material and social lives formed. In that sense waste can be seen to explain the value systems of the households that dispose the waste (Rathje *et al.,* 1992; Rathje and Murphy 1992; Olsen, 2010). Archaeology uses the lasting material aspects of past human activity i.e. garbage disposal to extract information about the society under study. Archaeologists generally use various methods to identify the social dynamics of the societies they study. These lines of evidence can be used by an archaeologist to determine if any and what type of social stratification was practiced by a particular group whose remains are being studied archaeologically (Wilk and Rathje, 1992).

1.3. Garbology in Ancient Societies

The ancient Egyptians during some of the earliest dynasties kept detailed records of family lineages and individual ties to its past leaders. In other cultures around the world records of taxations, business transactions, laws and literature provided useful information on socio-economic dynamics (Miller, 2009).Several cultures however did not keep written records leading to loss of information or damage. Some traditional societies made inscriptions in clay and on stone buildings and stelae (inscribed upright stone markers) that survived for several millennia (Hunter and Yates, 2011). Other materials upon which information was saved and passed on to future generations include papyrus and other perishable organic materials. In African traditional society, waste disposal included funerary remains, coins, and other cultural artefacts and regalia (Hunter and Yates, 2011). The remains of the garbage disposed provide a report on the economic, political and social activities of the people who at one point inhabited the African continent.

1.3.1. Ethnicity and Garbology

Membership in a specific cultural group is defined by common language, religion and other cultural traits. However linking archaeological evidence to a specific ethnic group is a challenge. Some of the indicators archaeologists use to identify ethnic communities based on retrieved trash include pottery and other materials (Miller, 2009). Excavations in Mesoamerican city of Teotihuacan have uncovered distinctive pottery styles and burial practices associated with the

Zapotecs in Oaxaca (Shove and Warde, 1998). Archaeologists reported that this site reflects a community of Oaxacan Zapotec immigrants living in Teotihuacan. However much of the information uncovered so far concerning ethnicity has been obtained from written records (Thomas, 2021; Miller, 2009). Despite the availability of the documents, it remains difficult to relate people's ethnicities and differences in their social stratifications unless there is some kind of obvious delineation as evidenced in Teotihuacan.

1.3.2. Ethnicity and Archaeology

Anthropologists and archaeologists analyse garbage from a targeted community to understand the social and cultural roles and relationships assigned to each biological sex i.e. male and female. Gender roles and ethnicity can be determined from documents and representatives of daily life, rituals and customs for some ancient cultures, but much of that information is not preserved. Despite the challenges associated with interpreting the archaeological data to understand ethnic groups and gender roles of past cultures, the potential discoveries are worth the effort and benefit from current new technologies (Shove and Warde, 1998; Halkier, 2009). A Viking burial that was first excavated in the 1870s was recently re-analyzed, and archaeologists discovered that a highly ranked warrior uncovered during those early excavations was not a man, as had always been assumed, but was a woman (Shove and Warde, 1998). An assessment of the excavated remains, none of the objects in the burial were typically associated with women in Viking culture. Archaeologists and anthropologists have speculated in equal measure that this grave may suggest a transgender warrior, although researchers have advised against trying to interpret the site through such a narrow lens. Archaeologists recognize that gender roles within a culture are unique and that we cannot apply terminologies and categories from Western cultures to ancient civilization, consumption and practices (Miller 2009).

2. Literature Review

2.1. Consumer Habits and Income Levels

In the modern society, wealth is directly correlated to economic status i.e. lower class, middle class and upper class. Some individuals acquire wealth and status through inheritance; however most earn it through personal effort (Douglas and Isherwood, 1980). The urban and peri-urban centers are places where social stratification is evident through the distinctive anonymity of urban life (Gregson *et al.,* 2010a).In this setting, class distinctions are more affluent and evident through 'conspicuous consumption'. With excessive consumption of consumer products comes a lot of waste. The waste in the various dumpsites reflects the consumer habits and income levels of the individuals who produced the waste i.e. waste items signify socio-economic status such as luxurious items, clothes and luxury foodstuffs e.g. sea food, bottled water, butter, sausages, mayonnaise, tomato sauce, chocolates etc. (Hetherington, 2004; Graeber, 2001; Edwards, 2005). In contemporary Anthropology waste was directly linked to consumption patterns (Drackner, 2005).

2.2. Professional Careers

The garbage disposed from a household reveals critical information concerning the professional career of the members of the household. Items such as letter heads, official letters, envelopes bearing logos, receipts, pens bearing work places, architectural plans, disposed sachets and tins containing agrochemicals, motor vehicle used parts (Drackner, 2005).

2.3. Religious Convictions

Waste generated may contain materials that indicate the religious convictions of the individuals who disposed them.

The presence of 'illicit' materials such alcohol containers, cigarette butts and pornographic literature may point to a non-religious individual (Rathje and Murphy 1992).The conspicuous presence of items in the garbage such as vegetarian diet products, halal products, religious literature material, expired calendars, religious artifacts such as rosaries, crucifixes, religious service programmes, turbans and attires can suggest the religious views of the household that has disposed the items to the dumpsite (Drackner, 2005).

2.4. Household Demographics

Garbological audit of trash from the dumpsite may reveal information such as the approximate age of the individuals, sex, marital status and the estimated population (Rathje and Murphy 1992; Rathje, 1986). Additional items that indicate household demographics according to the type of waste discarded included the following consumer products; used toys, clothes, lipstick, eye shadows, stockings, jewelry, shower caps, toiletries, hair braids wrappings, baby formula tins, children story books, cigarette lighters, used shaving kits (shaving cream) ,

2.5. Health Status

There exists a correlation between waste disposed and the Public health of individuals in the community. According to Cooper (2008) anthropological principles and theories relating to waste and sanitation are applicable to the nature of waste disposed that defines culturally mediated norms and beliefs regarding dirt and waste. Garbological audits revealing presence of used/unused medications in dumpsites and garbage bins can indicate the state of health of the individuals producing the waste. Analysis of sewerage systems can reveal certain medical indicators profiling the health status of the community (Larsen *et al.,* 2021). In recent times, surveillance of wastewater (i.e. toilet, shower, sinks) that

contain human decal waste has been used as a tool to monitor infections present in the community. The Centers for Disease control and prevention (CDC) initiated a National Wastewater Surveillance System (NWWSS) in response to emerging pandemics. Testing of sewerage water has been used to detect diseases such as polio and COVID-19 (Farkas *et al.,* 2020). Remnants of various anti-retroviral drugs have been detected in wastewater in various locations worldwide (Ngumba *et al.,* 2016). Quantitative measurements of sewerage waste water is a leading indicator of seasonal variations in disease burden within a society. In 1993, a study looked at the possible causes of tooth decay using dietary information from waste produced (Scanlan 2005; Gill *et al.,* 2008). The state of dental health can be analysed by a Garbological audit of used tooth brushes discarded by individuals of a community (Scanlan 2005).

2.6. Travel Preferences

Waste disposed in the form of receipts and tickets obtained from individuals using public transportation (buses, taxis and motorbikes), aeroplane flights, subway, trains, trams, ferry and cable cars reveal the mode of transportation preferred by the community from which the tickets have been obtained (Apel and Pharaoh, 1985; Whitelegg, 1993; Wickham and Lohan, 1999). Parking tickets obtained from spaces within shopping malls would reveal outlet preferences defined by social stratification (Rogers, 1997). Seasonal tickets from theatre, cinema and musical theatres and choice of transportation modes directly indicate the preferences and income levels of the individuals.

3. Research Methodology

3.1. Research Questions

The research study intended to evaluate the role of Garbology in determining the social stratification, income levels and waste footprint of the population under consideration.

3.2. Research Design

In this study, a total of 40 respondent subjects (male and female) were purposefully identified and interviewed. The instruments of data collection were in-depth interviews and use of a stratified questionnaire. Data was collected by asking respondents questions (Kothari, 2004). The survey identified both male and female respondents considered head of households across select urban and peri-urban centers in Uasin Gishu County. The research study combined both descriptive survey and naturalistic design, applying both qualitative and quantitative approaches in research (Kombo and Tromp, 2006). Statistical procedures were used to sort, analyze and summarize the data into frequencies and percentages. The information obtained was then reported in themes, frequencies and percentages using MS Word.

4. Results and Discussion

4.1. Gender Classification of Respondents

The respondents interviewed were categorized according to their gender to provide a various interpretation of the research subject. A total of 40 subject respondents were interviewed and their demographical distribution is shown in Figure 1 below.
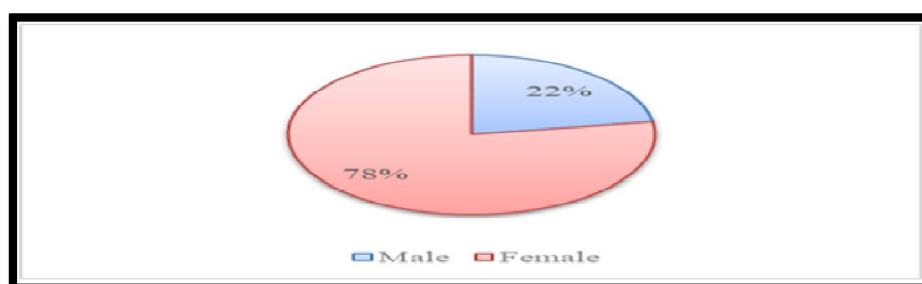

Figure 1: Composition of Respondents by Gender

The findings reveal that more females respondents (78%) participated in the study compared to their male counterparts (22%). Out of the total 40 respondents, 9 males and 31 females took part in the survey. The statistics obtained indicate that the data collected was reliable. It represented the perspectives of both gender i.e. male and female. This disparity represented a variance of (56%). Notably a large number of potential female respondents declined to participate in the study citing confidentiality concerns. From figure 1, the views submitted by the respondents is highly biased towards the female gender.

4.2. Social Stratification of the Respondents

The respondents were categorized into 3 social classes i.e. upper class, middle class and lower class as shown in Figure 2 below:-
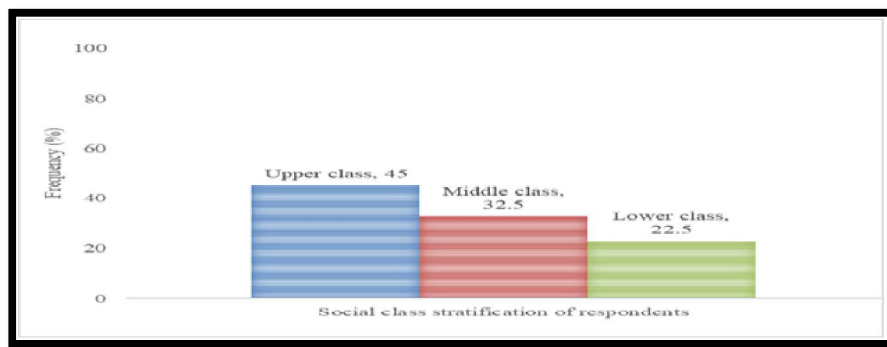
Figure 2: Distribution of Respondents by Social Class

From figure 2, the respondents were classified by social stratification as follows: [(upper class, 45%; middle class, 32.5% & lower class, 22.5%)]. The results show that middle class respondents were more enthusiastic in participating in the survey. This cluster of respondents was determined to have advanced educational qualification as shown in figure 3. The upper class respondents had achieved degree, masters and doctorate qualifications i.e. 17 respondents. In this study, the willingness to participate in the survey had a direct relationship to the level of education achieved.

4.3. Highest Educational Qualifications of the Respondents
The findings in figure 3 below indicate the highest educational qualifications for the respondents interviewed in this study.
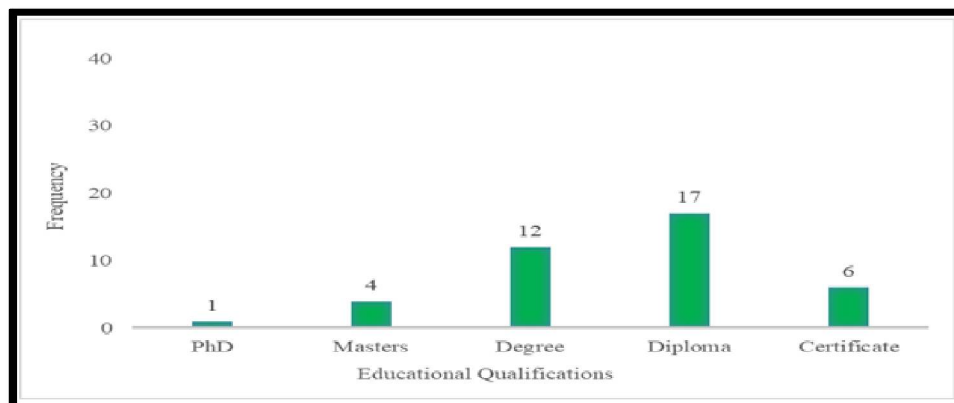

Figure 3: Categorization of Respondents by Highest Educational Qualifications Attained

The findings in figure 3, shows the majority of respondents (17 subjects, 42.5%) that participated in this study held at least a diploma level training. However only (1 subject, 2.5%) reported holding a doctorate degree. Those with a basic certificate education were (6 subjects, 15%). From the findings (34 subjects, 85%) of all respondents were sufficiently literate and understood the subject matter under study. It can be concluded that the concept of Garbological audit as a tool to analyse living standards was well conceptualized by increased literacy levels.

4.4. Garbology as a Determinant of Social Class Stratification, Living Standards and Domestic Waste Foot Print
Figure 4 below summarizes the respondents' views on the significance of Garbology as a determinant of the socio-cultural profile of the communities under study.
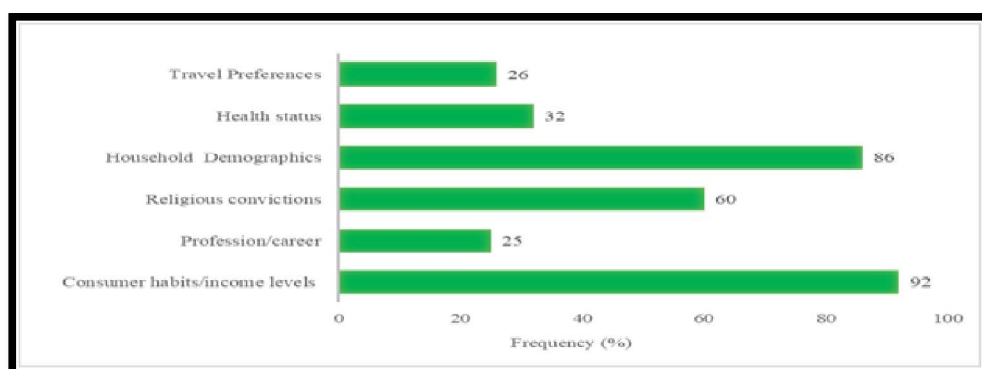

*Figure 4: Garbological Audits as a Determinant of Social Class Stratification,
Living Standards and Waste Foot Print*

The findings shown in figure 4 show that all the respondents reported a favourable assessment of Garbology as a critical tool in analyzing the living standards of a community from which trash is disposed. The majority of respondents (92%, 37 subjects) reported that Garbology audits reveals trends in consumer habits/income levels. In relation to the determination of careers/profession from analysis of trash disposed (25%, 10 subjects) reported a favourable response. The respondents additionally reported the significance of Garbological audits as follows;-[(Travel preferences – 26%, 10 subjects); Health status – 32%, 13 subjects; Household demographics – 86%, 34 subjects; Religious convictions – 60%, 24 subjects)].

5. Conclusions

The findings show that the nature and quantity of garbage disposed by a community reveals intricate information on the living standards and social stratification. Additionally, the study of disposed trash i.e. Garbology is a critical determinant in tracing domestic waste foot print of a community under study.

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