Effectiveness of Mass Media in Creating Public Awareness on Proper Solid Waste Management: A Case of Kawangware, Nairobi County

Monica Kerubo A. Morara[1] Dr. Chongombe Djongana[2] & Dr. Quin Elizabeth Awuor[3]

St. Paul's University
Email: macsnrb625320@spu.ac.ke

St. Paul's University
Email: Fchongombe@spu.ac.ke

United States International University- Africa
Email: qawuor@gmail.com

Abstract

Lack of information and awareness on proper solid waste management technologies is a precursor to global climate change and environmental degradation. This can threaten human well-being and stability management. Mass media provides an engagement platform for creating awareness and providing information to enable their audiences make informed decisions. However, the potential of mass media in articulating environmental degradation to bring about behavioural change among the residents of informal settlements has not been fully studied. The present study sought to assess how mass communication on solid waste management can create awareness among residents of Kawangware slums in Kenya. The study employed a descriptive research design, targeting a population of 367,177 residents of Kawangware. A sample size of 399 people, proportionately distributed across the three strata in Kawangware was obtained using the clustered random sampling technique. Quantitative data were collected using structured questionnaires and analysed by both descriptive and inferential statistics. The results show that awareness campaigns (β = .193, Sig.=.002<.05), extent of mass media contribution (β = .175, Sig.= .014<.05), solid waste management messages (β = .483, Sig.=.000<.05) and strategies used by mass media (β =.924, Sig.= .000<.05) significantly influenced awareness creation on solid waste management by mass media. Communication by mass media is effective in creating public awareness on solid waste management in Kawangware slums in Nairobi County. It is recommended that media houses carry out solid waste management awareness campaigns through a variety of channels and strategies in order to create awareness on solid waste management.

Keywords: Awareness Campaigns, Messages, Contribution, Strategies

1.0 Introduction

The world currently faces the challenge of solid waste management because of the ever-expanding human population in the informal settlements. This has resulted from improper disposal, transport, collection, and treatment of solid waste which has become a high public health concern, due to unaesthetic and associated health effects (Rugamba *et al.,* 2019). Consequently, awareness on proper solid waste management practices and technologies is required to prevent deterioration of human and environmental health and preserve natural resources in the face of climate change coupled with extreme weather vulnerabilities (Hopwood *et al.,* 2017; UNHABITAT, 2020).it is worthwhile to consider that emission of greenhouse gases during combustion or decomposition of inappropriately disposed solid wastes contributes to global warming (UNEP, 2019). Solid wastes cause land, air and water pollution, and clog drainage systems leading to flooding during rainy seasons and spread of infectious and non-communicable food and water-borne diseases; as well as the suffocation of marine life (Urban Africa Risk Knowledge Organisation (UARKO), 2018).

The recent increase in garbage production is driven by changing lifestyles and consumption patterns and rapid urbanization attributed to population growth (Ardusso *et al.,* 2021). Quite recently, the challenge of solid waste disposal has been exacerbated by the COVID-19 pandemic which, resulted in the massive production and widespread use of personal protection equipment (PPE) such as face masks, face shields, and gloves to curb the transmission of the disease worldwide (Silva *et al.,* 2020). Consequently, disposal of PPE became a new threat to the environment due to widespread plastic pollution that attracted scientific and policy interest from all the concerned stakeholders (Prata *et al.,* 2020; Ardusso *et al.,* 2021). With increased population pressure, the Nairobi County alone generates an estimated 2,400 tons of solid wastes and this generation is likely double due to increased human activities with a population of 4.4 million reported in the 2019 census (World Bank, 2020. However, only 45 percent of this garbage is recycled, repurposed or transformed into a useable form which is below the National Environment Management Authority's recommended target of 80 percent (NEMA, 2018).

Poor solid waste disposal coupled with the increasing population pressure, has led to increase the risk of environmental degradation. This might be because the country lacks appropriate solid waste management systems resulting to significant long- and short-term effects on human health and the environment (Njoroge et al., 2018).

According to UNHABITAT (2020), managing solid waste in the country's urban informal settlements such as Kawangware slums has become complicated due to improper disposal of solid wastes in open dumpsites or landfills which are adjacent to these settlements. More than 70% of solid waste is disposed in open dumpsites that are largely unmanaged (UNHABITAT, 2020). The remaining household waste is dumped in any available space outside their compounds or burned causing air pollution (Odero, 2019). There is need for effective media coverage on how challenges such as lack of infrastructure and improper disposal of solid wastes in unregulated dumping of solid wastes should be addressed (Kapoor, 2019; UNEP, 2019).

Mass media plays a crucial role in creating awareness and imparting knowledge to their audiences which changes their perceptions and attitudes towards various anti-social activities (Hogan, 2018; Otinga & Ngigi, 2018; Kapoor, 2019). However, few or no studies have assessed the role of mass media in creating awareness and promoting behavioural change among the slum dwellers through environmental education (Otinga & Ngigi, 2018; Karasneh *et al.*, 2021). Hence, the present study was aimed at assessing the effectiveness of mass media communications in creating awareness among the public on the proper management of solid waste in Kawangware slums in Nairobi County. To achieve this overall objective, the study presumed that solid waste management awareness campaigns, solid waste management communications, the perceived value of solid waste management messages as communicated, and strategies used by mass media to influence household perception towards solid waste management do not significantly contribute towards awareness creation on solid waste management in Kenya.

2.0 Literature review

According to the United Nations Environment Programme (UNEP, 2019), unregulated disposal of solid waste is one of the major environmental concerns facing developing countries. A bulk of the solid wastes is generated by Asia Pacific and East Asia regions accounting for approximately 23% of the global solid waste generation. Nevertheless, it has been projected that garbage production from developing countries in Sub-Saharan Africa and countries in Southern Asia, Middle East and North Africa will double and even quadruple because of rapid urbanization and exponential population growth (UARKO, 2018). The Sub-Saharan Africa, South Asia and the Middle East regions dispose more than 50% of their garbage in open dumpsites (World Bank, 2022a). It is estimated that the Sub-Saharan Africa region alone generates about 62 million metric tonnes of solid wastes per year with an average per capita production of 0.65 kg per day (UNEP, 2020). Lack of awareness on appropriate solid waste management technologies has been identified as one of the main factors contributing to improper disposal and management of solid wastes in most developing countries (Lokhandwala, 2017; Njoroge *et al.,* 2018; NEMA, 2018; UNEP, 2019).

Mass media have traditionally imparted knowledge which contributes to informed decisions and changing attitudes, behaviors and perceptions of their audiences towards corporate and individual social responsibility (Otinga & Ngigi, 2018; Kapoor, 2019). This has enhanced community participation and increase public responsibility towards protecting the environment (UNEP, 2019). However, the potential of mass media in creating awareness on issues pertinent to the environment and contributing to desirable behavioural change among the slum dwellers in Kenya is yet to be fully explored (Otinga & Ngigi, 2018; Kapoor, 2019). The aspects that this study sought to explore include the types of solid waste generated and how households and estates manage solid waste in terms of collection and dumping. Several studies have assessed the effectiveness of mass media in creating public awareness. For instance, Anwar et al. (2020) employed the cross-sectional design to study the involvement of mass media efforts and communications on public health in the COVID-19 pandemic.

The findings indicated that the adoption of safe health practices led to an increased trend in the promotion of health and hygiene practices geared towards the control of COVID-19 pandemic such as social distancing, use of face coverings, increased hand washing and proper disposal of protective gear including gloves and face masks among other PEE. The study was however conducted in the United States context, and therefore the findings may not be directly generalizable to the Kenyan context, hence the present study.

At the University of Rajasthan, Jaipur et al. (2011) used a descriptive methodology to investigate the habits, attitudes, and knowledge of chosen dormitory students on trash management. The findings suggested moderate, less, and low favorability in practice attitude and knowledge, respectively; while there was no association between attitude and knowledge, there was a significant correlation between knowledge and practice. While the study showed a linkage between attitudes and waste management, there was no reference to the role of mass communication in awareness creation, hence the present study.

Karuku and Kathura (2021) studied rapid urbanization, a solid waste management challenge in MSMEs in Kenya with reference to Kawangware Ward in Nairobi. Adopting the descriptive design, the study sampled 370 SMEs. The results demonstrated a negative significance between rapid urbanization and solid waste management. The study did not however link waste management to mass media communication, creating a gap for the present study.

Otinga (2014) investigated the function of the media in raising environmental consciousness in Kenya. The study employed the media framing theory to demonstrate how frames like content, audience preferences, and timing, influence how environmental themes on television are received by viewers. According to the results of this survey, many of the participants are knowledgeable of some of the current environmental challenges impacting Kenya, and the majority of this information comes from the media. The study was however narrowly focused on TV, leaving out other mass mediums in the country, hence the present study. It is therefore imperative to assess the role of mass

media communication in creating awareness among the public on proper management of solid waste in Kawangware slums in Nairobi County.

3.0 Research Methodology

The study was conducted in Kawangware slums located in Nairobi City County, Kenya. The study used a descriptive research design that seeks to describe the role of mass media communication in creating public awareness on effective solid waste management in Kawangware, Nairobi County. The target population comprised of all residents of Kawangware, Nairobi County, whose population according to the 2019 national census by the Kenya National Bureau of Statistics (2019) is 367,177. The study was particularly interested in households who have lived in Kawangware for at least one year, with the assumption that this duration is adequate to determine mass media impact. To obtain the desired sample size from the target population of 367,177, the Yamane formula (Yamane, 1967) was used in this investigation, as shown below:

$$n = \frac{N}{1 + N(e)^2}$$

Where: **N**=total population= 367,177; ***n*** = required sample; *e* = margin of error=0.05.

$$n = \frac{367,177}{1+367,177(e)^2}$$

n= 367,177 / [1+367,177 $(0.05)^2$] 399.58 ~ 399 (due to 3-way division by cluster)

n = 399 (sample)

This formula yielded a representative sample of 399 people, which was spread proportionally among the three strata as presented in Table 1.

Table 1: Sample

Cluster	Sample Size	% Proportion
Kawangware	133	33.3
Kamitha	133	33.3
Gatina	133	33.3
Total	**399**	**99.9 ~ 100.0**

The study employed probability sampling using the clustered random sampling methodology to obtain the sample. According to the UNHABITAT (2020), Kawangware

slums comprise three major villages, namely Kawangware, Kamitha, and Gatina. As such, the three major villages formed the clusters in which random sampling was used for each cluster to ascertain that each population member has an equivalent probability of inclusion in the sample. Individual respondents were then randomly selected for response. The research relied on primary data gathered through structured questionnaires.

Data was analyzed using both descriptive and inferential statistics. Descriptive statistics such as mean, standard deviations, the percentages, frequency distributions were used to compare the data. The Pearson's correlation was performed using multiple linear regression analysis model that was employed in inferential analysis:

$Y= \alpha +\beta_1 X_1 +\beta_2 X_2+\beta_3 X_3+ \beta_4 X_4+\varepsilon$

Y = Awareness creation

α =Constant term

β = Beta Coefficients

X_1 = Public Awareness Campaigns

X_2 = Extent of Mass Media Contribution

X_3 = Solid Waste Management Messages

X_4 = Strategies used by mass media

ε = Standard Error

4.0 Results

This section presents the results as obtained from the field. It is structured into two main parts, including descriptive analysis of the main study variables; and inferential analysis which comprises regression analysis culminating in hypothesis testing.

4.1.1 Solid Waste Management Awareness Campaigns

The study sought to establish how mass media conduct solid waste management awareness campaigns in Kenya. To address this objective, pertinent statements were posed against which respondents were asked to rate the extent to which they agreed to each. Table 2 gives a representation of the results

Table 2: Descriptive Statistics on Solid Waste Management Awareness Campaigns
Source: Survey Data (2022)

	Mean	Std. Deviation
Commercials	3.168	1.209
Daily programmes	4.305	0.535
News bulletin	4.360	0.615
Interviews	4.439	0.566
Special features (documentaries, print)	4.113	0.719
Composite	**4.077**	**0.729**

The findings presented in Table 2 depict an overall mean of 4.077 (SD=0.729), meaning that most of the participants agreed to a large extent to most of the questions posed regarding solid waste management awareness campaigns. Many of the participants approved to a great extent that the most common mass media awareness campaigns are conducted through interviews (4.439); followed by news bulletins (4.360); then daily programmes (4.305); and finally special features (4.113).

4.1.2 Mass Media Contribution towards Awareness Creation

The study also sought to assess the extent to which mass media communications contribute towards awareness creation on management of solid waste in Kenya. To address this objective, relevant statements were posed using the five-point likert scale, against which respondents were asked to rate the extent to which they agreed to each. Table 3 presents the outcomes.

Table 3: Mass Media Contribution towards Awareness Creation

	Mean	Std. Deviation
I have learnt about proper solid waste disposal practices from mass communication	4.387	.690
I have learnt about the environmental implications of poor solid waste management from mass media	4.046	1.142
I have learnt about the health implications of poor solid waste management from mass media	4.134	.723
I have learnt about my role in generation of solid waste, from mass media	4.201	.613
I have learnt about my role in managing solid waste from mass media	4.241	.835
Composite	**4.202**	**0.802**

Source: Survey Data (2022)

The findings presented in Table 3 concur with Otinga (2014), that many respondents gain knowledge from mass media. They show that most of the participants learnt about proper solid waste disposal practices from mass communication; they had learnt about their role in managing solid waste from mass media; and that they had learnt about the environmental implications of poor solid waste management from mass media.

4.1.3 Perception of Messages on Solid Waste Management

The study further set out to determine the perceived value of solid waste management messages as communicated by the mass media in Kenya. Table 4 gives a representation of the results on the perception of messages on SWM.

Table 4: Perception of Messages on Solid Waste Management

Mass media messages on solid waste management are:	**Mean**	**Std. Dev**
Informative	4.211	.516
Educative	4.250	.681
Thought provoking	4.326	.507
Entertaining	4.085	.707
Call people to action	4.152	.591
Composite	**4.205**	**0.600**

Source: Survey Data (2022)

The findings in Table 4 with an overall mean of 4.201 (SD=0.651), imply that most of the participants approved to a great extent, the questions posed regarding the perceived value of solid waste management messages as communicated by the mass media in Kenya. A majority particularly affirmed that to a great extent, mass media messages on solid waste management are thought provoking (4.387); educative (4.250); and call people to action (4.134).

4.1.4 Strategies Used by Mass Media

The study sought to examine the strategies used by mass media to influence household perception towards solid waste management in Kenya. Table 5 gives a representation of the results.

Table 5: Strategies Used by Mass Media

	Mean	Std. Dev
The mass media gives due prominence to awareness on solid waste management (frequency, duration, positioning etc.)	4.018	0.935
The mass media provokes discourse on solid waste management	4.326	0.507
The mass media employs thought provoking headlines, images and statistics to prompt people to action on solid waste management	4.085	0.707
Mass media mobilizes the general public towards behaviour change pertaining solid waste management	4.152	0.591
Composite	**4.146**	**0.685**

Source: Survey Data (2022)

From the above findings most respondents confirmed that to a great extent, mass media provokes discourse on solid waste management (4.326); and mobilizes the general public towards behaviour change pertaining solid waste management (4.152).

4.1.5 Awareness on Solid Waste Management

A descriptive computation of awareness creation on management of solid waste by mass media was conducted based on a "five-point Likert scale. To achieve this objective, pertinent statements were posed against which respondents were asked to rate the extent to which they agreed to each'. Table 6 gives a representation of the results.

Table 6: Awareness on Solid Waste Management

	Mean	Std. Dev
I am aware of proper solid waste disposal practices	4.052	.885
I am aware of the environmental implications of poor solid waste management	3.991	.670
I am aware of the health implications of poor solid waste management	4.012	.734
I am aware of my role in generation of solid waste, from mass media	3.820	.857
I am aware of my role in managing solid waste from mass media	3.675	1.096
Composite	**3.910**	**0.848**

Source: Survey Data (2022)

The findings presented in Table 6 show that a majority with an aggregate average of 3.910 (SD=0.848) particularly affirmed that to a great extent, they are aware of proper solid waste disposal practices; they are aware of the health implications of poor solid

waste management; and that they are aware of the environmental implications of poor solid waste management.

4.2 Regression Analysis

Regression analysis was carried out while keeping all other variables constant in order to show the impact of each determinant variable on the outcome variable and so evaluate the hypotheses. The results of the regression values were based primarily on their statistical validity in order to test the stated hypotheses. The results are shown in the tables below in 7, 8 and 9.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.560[a]	.314	.305	2.51745

a. Predictors: (Constant), Strategies used by mass media, Awareness Campaigns, Extent of Mass Media Contribution, Solid Waste Management Messages

The output in Table 7 showed a strong linear relationship with a correlational coefficient (R) of 0.560, between awareness creation by mass media and strategies used by mass media, awareness campaigns, the extent of mass media contribution, and solid waste management messages. Additionally, an R^2 value of 0.314 was noted, suggesting strategies used by mass media, awareness campaigns, the extent of mass media contribution and solid waste management messages jointly account for 31.4% of awareness creation on solid waste management by mass media, and the remaining 68.6% attributed to other factors that the regression model used in this study did not take into account. An ANOVA test was also generated from the regression analysis, as shown in Table 8.

Table 8: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	936.469	4	234.117	36.941	.000[b]
	Residual	2047.031	323	6.338		
	Total	2983.500	327			

a. Dependent Variable: Awareness Creation

b. Predictors: (Constant), Strategies used by mass media, Awareness Campaigns, Extent of Mass Media Contribution, Solid Waste Management Messages

Results of the ANOVA test, as shown in Table 8 indicate that the regression model adopted in the study was significant in explaining the response variable (F = 36.941, Sig. < 0.05). The results also show that considering the sum of the total square (2983.500), the 95 percent confidence level regression squares sum was 936.469. The residual squares total is 2047.031, which indicates that 68.6 percent of the dataset's variability is unaccounted for, and this indicates that the regression model accounts for about 31.4 percent of the dataset's variability. Regression analysis also produced a regression coefficients table presented in Table 9.

Table 9: Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	8.725	1.344		6.491	.000
	Awareness Campaigns	.234	.074	.193	3.152	.002
	Extent of Mass Media Contribution	.217	.087	.175	2.482	.014
	Solid Waste Management Messages	.595	.160	.483	3.728	.000
	Strategies used by mass media	1.363	.171	.924	7.980	.000

a. Dependent Variable: Awareness Creation

Table 9 reveals that awareness campaigns (β = .193, Sig.=.002<.05), extent of mass media contribution (β = .175, Sig.= .014<.05), solid waste management messages (β = .483, Sig.=.000<.05) and strategies used by mass media (β =.924, Sig.= .000<.05) significantly influence awareness creation on management of solid waste by mass media at 95% confidence level.

5.0 Discussion

The study sought to establish how mass media conduct awareness campaigns on management of solid waste management in Nairobi, Kenya. The findings show that most respondents (mean = 4.202, SD=0.802) highly approved the questions asked regarding awareness campaigns on management of solid waste. Therefore the awareness campaigns by mass media on management of solid waste are significantly associated with awareness

creation on management of solid waste in Kenya. The results have provided sufficient evidence to disprove the underlying hypothesis that solid waste management awareness campaigns by mass media do not have a significant effect on awareness creation on management of solid waste in Kenya.

The findings imply that awareness campaigns on management of solid waste by mass media have a significant effect on awareness creation on management of solid waste in Kenya. Among the most common mass media awareness campaigns on management of solid waste are conducted through interviews, news bulletin, daily programmes and special features including documentaries and print. The results are consistent with Anwar et al. (2020) who found that since the novel coronavirus disease surface in December 2019, mass media has promoted the adoption of safe health and hygiene practices around the world such as social distancing, use of face coverings, increased hand washing and proper disposal of protective gear including gloves and face masks among other PEE.

The study also sought to assess the degree at which mass media communications contribute towards awareness creation on management of solid waste in Kenya. An overall mean of 4.202 (SD=0.802) was recorded implying that most of the participants agree that mass media communications contribute significantly towards awareness creation on solid waste management in Kenya. Solid waste management communications by mass media were significantly associated with contribution towards awareness creation on solid waste management in Kenya as supported by the study of Umwamwezi (2018) which shows a linkage between awareness creation and attitudinal change on SWM.

The findings further indicated that solid waste management communications by mass media significantly contributed towards awareness creation on solid waste management in Kenya. This is because mass media has been instrumental in contributing towards awareness creation on management of solid waste in the country. Consequently, most respondents learnt about proper solid waste disposal practices , about their

responsibility in managing solid waste which have been generated from media communication .

The finding agrees with Banjo *et al.* (2009), who reported that TV and radio were the most accessible and effective sources of environmental information. This shows that the potential of media, especially TV and radio, in creating public awareness on environmental and public health issues is largely underutilized. The finding however differs from Idamah (2015) who reported that illumination through broadcast media programs on management of solid waste were inconsistent and ineffective in all these jurisdictions.

The perceived value of solid waste management messages communicated by mass media was significantly associated with contribution towards awareness creation on solid waste management in Kenya ($\beta = .483$, $p = .000$). This corroborates with the finding of Ayesha (2011) which showed that the general population believes that media, particularly newspapers have previously done well in reporting and coverage that was most often useful in restoring the situation.

The study also sought to examine the strategies used by mass media to influence household perception towards solid waste management in Kenya. An overall mean of 4.146 (SD=0.685) shows that most of the participants indicated high level of approval in the questions asked concerning the strategies used by mass media to influence household perception towards solid waste management in Kenya. Strategies used by mass media to influence household perception towards solid waste management was significantly associated with contribution towards awareness creation on solid waste management in Kenya ($\beta = .924$, Sig.= $.000 < .05$).

These findings imply that strategies used by mass media to influence household perception towards solid waste management significantly contribute towards awareness creation on solid waste management in Kenya. The mass media uses a variety of strategies to influence the household's perception of solid waste management in the country. The results agree with the study findings of Abroms and Maibach (2008) which

indicate that interventions in the media that aim to directly impact people by unswervingly targeting those who are affected by a public health issue of concern have a higher likelihood to result in the adoption of the recommended behavior.

6.0 Conclusion

From the findings, the study concludes that the management of solid waste awareness campaigns by mass media has a significant effect on awareness creation on the management of solid waste in Kenya and specifically in Kawangware. Among other avenues, awareness on the management of solid waste by the mass media is ideally created through expert interviews with professionals from the field of solid waste management; through news items and stories during bulletins; and in daily programmes.

It is also concluded that mass media is very effective in creating awareness of solid waste management in Kawangware and the country at large. Through the mass media, the public is made aware of proper solid waste disposal practices; their contribution to managing solid waste from mass media; their contribution to the generation of solid waste; the environmental implications of poor solid waste management from mass media; as well as on the health implications of poor management of solid waste.

The study further concludes that the perceived value of management of solid waste messages as communicated by mass media significantly contributes toward awareness creation on the management of solid waste in Kenya. Management of solid waste messages as communicated by the mass media in the country is to a large extent perceived by the masses as thought-provoking, educative, informative, and entertaining as well as a call for people to action.

The study also concludes that strategies used by mass media to influence household perception towards the management of solid waste significantly contribute towards awareness creation on the management of solid waste in Kenya. Various strategies are applied by the mass media aimed at influencing household perception towards the management of solid waste in the country. Among the most notable strategies

used include the provocation of discourse on solid waste management; and the use of thought-provoking headlines, images, and statistics to prompt people to action on solid waste management.

7.0 Recommendations

The study recommends that media houses should carry out the management of solid waste awareness campaigns through a variety of channels to further create awareness of the management of solid waste. It is also recommended that media houses should intensify management of solid waste communications using frames that focus on among others, proper solid waste disposal practices; households' role in managing solid waste; as well as households' role in the generation of solid waste.

It is further recommended that media houses should use messages on the management of solid waste that are thought-provoking, educative, informative, and that call people to action. The study also recommends that media houses employ a variety of strategies, using the social marketing theory including provocation of discourse on the management of solid waste; and giving due prominence to awareness of management of solid waste.

The study further recommends that a policy be formulated to make it mandatory that media houses have 'Green' policies that include highlighting such environmental issues as the management of solid waste as part of their corporate social responsibility. This will ensure that media houses place prominence on awareness creation on the management of solid waste through its incorporation in regular programmes.

In addition, Kenya has recognized the importance of sustainable waste management and thus passed the Sustainable Waste Management Bill, 2021 which recommends the integration of waste management into the school curricula. This study, therefore, recommends this as an area to explore. Once the children are taught proper management of solid waste practices from school, they tend to be aware as they grow up and continue to practice proper waste disposal techniques. Hence this study is imperative for promoting sustainable climate change, environment and health.

References

Abroms, L. C. & Maibach, E. W. (2008). The Effectiveness of Mass Communication to Change Public Behavior. *Annual Review of Public Health,* 29(1): 219–34

Agbede, O. A. & Ajaigbe, W. O. (2009). Solid waste management in southwestern Nigeria. In Ekara, E. G. and Ekpene, I. (Eds). *International journal of environmental issues*. Development Universal Consortia. 2(2): 92-97.

Ardusso, M., Forero-López, A. D., Buzzi, N. S., Spetter, C. V. & Fernández-Severini, M.D. (2021). COVID-19 pandemic repercussions on plastic and antiviral polymeric textile causing pollution on beaches and coasts of South America. *Sci. Total Environ,* 76(3): 144-265.

Arora, L. & Agarwal, S. (2011). Knowledge, Attitude and Practices regarding Waste Management in Selected Hostel Students of University of Rajasthan, Jaipur, I*nternational Journal of Chemical, Environmental and Pharmaceutical Research,* 2(1): 40-43.

Ayesha, S. (2011). Public Perception of Media Role. *International Journal of Humanities and Social Science.* 1(5): 228-236.

Banjo, A. D, Adebambo, A. A. R. & Dairo, O. S. (2009). Inhabitants' perception on domestic waste disposal in Ijebu Ode, Southwest Nigeria. *African journal of basic & applied sciences,* 1(4): 62-66.

Hopwood, B., Mellor, M., & O'Brien, G. (2017). Sustainable development: Mapping different approaches. *Sustainable Development*, 13(4): 38–52.

Idamah, A. P. (2015). Influence of Broadcast Media Enlightenment Campaigns on Solid Waste Management in South-South of Nigeria. *New Media and Mass Communication*, 39 (2): 10-62.

Kapoor, N. (2019). Role of mass media in promotion of environmental awareness along with skill development among the rural peoples. *Journal of Journalism & Communication Studies*, 6(2): 264 -268.

Karuku, L. C. & Kathula, D. N. (2021). Rapid Urbanization, a Solid Waste Management Challenge in Micro, Small and Medium Enterprises in Kenya: A Case Study of Kawangware Ward in Nairobi. *Stratford Peer Reviewed Journals and Book Publishing Journal of Project Management, 5(2): 84-96.*

Media Council of Kenya (2021). *About us.* Available at https://www.mediacouncil.or.ke/en/mck/index.php/about-us/who-we-are

National Environment Management Authority (NEMA) (2018) *Communication Strategy for Education for Sustainable Development* Nairobi: NEMA.

Njoroge, B., Kimani, M., Ndunge, D. (2018). Review of Municipal Management of solid waste: A Case Study of Nairobi, Kenya. *Int J Engineer Sci* 4: 2319-6483.

Odero, J. (2019). *University of Nairobi Redesigning Solid Waste Flows for a Clean and Sustainable Nairobi City, Kenya*. Unpublished Master's Thesis, University of Nairobi

Otinga, C. S. (2014). *Media and Environmental Awareness in Kenya: The Case of Tv*. Unpublished Master's Thesis, University of Nairobi.

Otinga, C. S. & Ngigi, S. (2018). Media and Environmental Awareness in Kenya: A Case of TV. *New Media and Mass Communication*, 67(1):1-26.

Prata, J. C., Silva, A. L. P., Walker, T. R., Duarte, A. C. & Rocha-Santos, T. (2020). COVID-19 pandemic repercussions on the use and management of plastics. *Environ. Sci. Technol.* 5(4): 7760–7765

PwC. (2017). *Annual report, 2017*. Retrieved from Pwc UK: https://www.pwc.co.uk/who-weare/annual-report.html

Rugamba, A. D., Mberia, H. K. & Mulyungi, P. (2019). Role of the Broadcast Media on Solid Waste Management in the City of Kigali Rwanda. *International Journal of Science and Research (IJSR),* 8(5): 1177-1181

Silva, A. L. P., Prata, J. C. Walker, T. R., Campos, D., Duarte, A. C., Soares, A. M. V. M., Barcelò, D. & Rocha-Santos, T. (2020). Rethinking and optimising plastic waste management under COVID-19 pandemic: policy solutions based on redesign and reduction of single-use plastics and personal protective equipment. *Sci. Total Environ*, 74(2): 140565

UNEP. (2019) *One Planet Many People: Atlas of our Changing Environment.* United Nations Reproduction Center.

UNHABITAT, (2020). *Informal Settlements' Vulnerability Mapping in Kenya: The Case of Kawangware Slums.* Available at https://unhabitat.org/sites/default/files/2021/08/the_case_of_kawangware_final.pdf. Accessed on 21st October 2021

Urban Africa Risk Knowledge Organisation. (2018). *Urban Africa Risk Knowledge Organisation of 2018.*

World Bank (2022). Trends in Solid Waste Management. Available at https://www.worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management. Accessed on 7th April 2022.

World Bank (February 11, 2022). Solid Waste Management. Available at https://www.worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management. Accessed on 7th April 2022.