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Assessment of Rivers State Waste Management Agency's Communication Strategies for Waste Management in Port Harcourt Metropolis, Nigeria

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Abstract:

In recent times, there has been a concerted effort towards engaging members of the public in waste management. The Rivers State Waste Management Agency (RIWAMA) has adopted different methods in communicating waste management to the public, but littering and indiscriminate dumping of waste in unauthorized places still persistent in Port Harcourt metropolis. Given the need for environmental cleanliness and the agency's communication efforts, this work sought to evaluate the communication strategies of the agency in sensitizing and educating the public about waste management. The study applied the survey design, using cluster sampling technique. A sample size of 390 was drawn out of a population of 1,281,162 using Keyton's prescription. A set of questionnaire and an interview schedule were the instruments used for data collection. The data revealed that RIWAMA has adopted various communication strategies for communicating waste management to the public, which include the launching of a mobile application, the use of a combination of traditional and interpersonal media channels, as well as social media platforms in interfacing with the residents of Port Harcourt metropolis to sensitize and inform them on proper waste management. It is further revealed that the content of RIWAMA's communication messages are heavily focused on providing information on waste disposal, which were occasionally disseminated through the radio, television and interpersonal channels of communication. Based on the findings, the researcher concludes that RIWAMA's communication strategies for waste management to the public are not adequate to create sufficient education on waste management among members of the public. This is because the messages of the communication strategies concentrated on informing the public on how to manage the already generated wastes without educating and enlightening the public on waste management as enshrined in the Rivers State Waste Management Law. The researcher therefore recommends that RIWAMA should develop waste messages that go beyond merely disseminating information and define the contents of their waste messages according to the goals and objectives for which the agency was established.

Keywords: Communication strategies, waste management, environment

1 Background to the Study

The problem of protecting and sustaining the environment from depletion and devastation is an enormous task, since the conditions under which the present and future generations will live would depend on how current environmental problems are managed. Thus Nwabueze (2007) writes that the establishment of a healthy and functional plan to preserve and protect the environment has become the beginning of wisdom, given that the nature and prospects of the future are largely determined by how well today's environment is managed.

The Millennium Development Goal seven (7) now changed to Sustainable Development Goals (SDGs), talks about ensuring environmental sustainability. If we are to achieve what is contained in the Sustainable Development Goals (SDGs), we need to have a better and more conducive environment. A better environment, it is believed will contribute to combat malaria and other diseases, reduce child mortality and improve maternal health. It is only when one is alive that issues about eradicating extreme poverty and hunger, achieving universal primary education, combating HIV/AIDS, developing global partnership, promoting gender equality and empowering women, can be talked about. From the foregoing, it is obvious that environment occupies a key part of the SDGs.

In Nigeria, concern for the environment in general is a relatively recent phenomenon, dating back only to as recent as 1987. It was triggered by the hazardous waste dump in Koko, Delta State of Nigeria. According to Soola (2016), the then

military government promulgated the Harmful Waste Decree 42 of 1988. This further led to the establishment of the Federal Environmental Protection Agency (FEPA) Decree 58 of 1988, and Decree 59 (as amended) of 1989. As a country with critical waste management problems, there is need for the necessary authorities in the nation to come up with an innovative approach to its waste problems. In Rivers State, issues relating to waste collection, disposal and other related matters are within the purview of the Rivers State Environmental Sanitation Authority (RSESA), now the Rivers State Waste Management Agency (RIWAMA). One of the core functions of RIWAMA as enshrined in section 9(h) of the Rivers State Waste Management Agency Law is to educate the public on acceptable methods and practices of waste and its management.

For the waste management agency to educate the people, it has to communicate. Communication is critical to the development of a more sustainable waste management service. In line with the importance of communication for the development of a more sustainable waste management service, RIWAMA has adopted various communication strategies for communicating waste management to the public, with the primary aim of educating the public on acceptable methods and practices on waste management as enshrined in the law setting up the agency. The key broad objectives of RIWAMA's communication strategies as detailed within the Rivers State waste agency law are:

- Regulate waste generation, cleaning, separation, storage, collection, processing, treatment, recycling and disposal of waste, and facilities used for waste management with the aim of ensuring a safe, healthy and sustainable environment;
- Promote the provision of modern, efficient and affordable waste management services and facilities;
- Ensure efficient waste management practices taking into account current technologies to protect the environment from pollution;
- Introduce innovative services and facilities in line with waste management practices;
- Ensure that all residents have access to waste management services; and
- Protect the rights and interests of consumers of the services.

According to the Public Affairs Officer of the agency Comrade Tam Konacree, RIWAMA has adopted conventional and nonconventional methods in implementing its communication strategies. Under the conventional method, the use of billboards, print and electronic media (television and radio), have been deployed. Subsumed under the nonconventional method of communicating a cleaner society are the use of public orientation vans, meetings with market women, schools, local governments, civil servants, artisans etc.

Despite the laid down communication strategies of RIWAMA, littering and indiscriminate dumping of waste is still a persistent problem. It is on this background that this research work was founded. It is pertinent to evaluate the communication strategies of RIWAMA for waste management.

1.1. Rivers State Waste Management Agency (RIWAMA)

Rivers State Waste Management Agency is a waste management agency established by law to provide for the collection, treatment and disposal of waste and other related matters in Rivers State. It was formerly known as Rivers State Environmental Sanitation Authority (RSESA), which was created in 1984 to be in charge of traffic management and tackle municipal waste and other related issues. In 2013, the Rivers State House of Assembly created the Rivers State Waste Management Agency and it was assented by the state governor in July 2014.

1.2. Statement of the Problem

One of the greatest environmental problems that pose a great challenge to residents in Port Harcourt is waste disposal. Today solid wastes are seen littered all over the streets in Port Harcourt. Before now, Port Harcourt was known as the "Garden City of Nigeria" because of the neatness and overwhelming presence of vegetation and flowers all over the metropolis. This status has since changed, with the presence of refuse littered all over the city, one can say without doubt that Port Harcourt is now assuming the status of a "garbage city". It is common to see left-over foods, spoilt fruits, plastic bottles, pure water sachets, unwanted clothes, among others, haphazardly disposed within residential apartments, major roads and gutters. The blockage of drains with refuse have impeded the run off of rain waters, leading to flooding and presenting suitable breeding ground for mosquitoes and unending malaria attacks.

For effective waste management to be achieved, the public must be mobilized through sensitization and environmental education because the waste management agency alone, cannot effectively manage waste without corresponding positive collaboration of the public. The waste agency needs to reach out to the general public through communication to make the public accept the agency's plan and programmes for safe waste management. The Rivers State Waste Management Agency (RIWAMA) has adopted various communication strategies for communicating waste management to the public, but nevertheless, littering and indiscriminate dumping of waste in unauthorized places, such as median strip, junctions and street corners is still a persistent problem in Port Harcourt metropolis. Given the need for environmental cleanliness and the agency's communication efforts, there is the need to evaluate the communication strategies employed by the Rivers State Waste Management Agency (RIWAMA) in sensitizing and educating the public on waste management.

1.3. Aim and Objectives of the Study

The aim of this study is to evaluate the communication strategies of the Rivers State Waste Management Agency (RIWAMA) in sensitizing and educating the public about waste management. The specific objectives of this study are to:

- Find out the communication strategies adopted by RIWAMA in sensitizing the public on waste management;

- Examine the contents of RIWAMA's messages for implementing its communication strategies for waste management; and finally,
- Ascertain the responses of Port Harcourt residents to RIWAMA's waste management communication strategies.

1.4. Research Questions

From the objectives of this study, the following questions were formulated:

- What are the communication strategies adopted by RIWAMA in sensitising the public on waste management?
- What are the contents of RIWAMA's messages for implementing its communication strategies for waste management?
- What are the responses of Port Harcourt residents to RIWAMA's waste management communication strategies?

1.5. Significance of the Study

This study will serve to enrich the existing literature in the field of environmental communication. It will also help RIWAMA to know how appropriate their communication strategies are and fine-tune areas that need improvement, so that they can achieve the outcomes they seek. This research work will help explain the workability of the agenda setting theory, which explains the media agenda setting power.

1.6. Scope

This study focused on the Rivers State Waste Management Agency and the communication strategies of the agency in reaching out to the public on waste management. Furthermore, this study covered Port Harcourt metropolis. The choice of the city as the study area is based on the size of the city as a major industrial hub.

2. Theoretical Framework

This study was anchored on the Agenda Setting theory. This is because the basic assumption of the above mentioned theory is fundamental to the understanding of the research problem. Alawode (2015) submits that according to Amber (2012), agenda setting theory "originated in 1922 when Walter Lippmann wrote about agenda setting in his book, "public opinion", a work that would later be considered a classic" (pp. 320-321). He went further to say that Amber noted that although Lippmann never referred to it as agenda setting by name, however, "it was Maxwell McCombs and Donald Shaw who in 1972 formalised the theory after exploring the issue of media influence in the 1972 election" (p.321).

The major assumption of the theory is that the media set agenda for the public to follow. The theory sees the media as instruments used to influence public opinion by setting the agenda in public discourse. According to Daramola (2003), the agenda setting theory simply states that "the mass media has the ability to mentally order or organize the world for people" (p.61). Like other innovative frameworks of thought, the theory has been debated and criticized. Amber (2012) as cited in Alawode (2015) says that the most common criticism of agenda setting theory is that it is so broad and contains so many variables that are too difficult to measure. Despite the criticisms, it is one of the bedrock for the application of mass media effects.

As previously stated in the background to the study that RIWAMA makes use of the media (conventional method) in implementing its communication strategies for waste management to the public, the Agenda Setting theory provides a useful framework for identifying and analyzing how RIWAMA has used the media agenda setting power in educating and enlightening the public on waste management. Extrapolating from the ideology of this theory, it can be seen that RIWAMA can structure messages on waste management in the media, and frequently use the media to relay these messages to emphasize the importance of waste management issues in the public's mind.

2.1. Communication Strategy

A critical look at the concept of communication shows that no meaningful and sustainable development can take place without communication. Moemeka (2000) discusses two basic levels at which the strategies for implementing advocated social change or development can be considered. According to him:

The first is the socio-political level, which is concerned with establishing an effective and efficient rapport between the development communicator or the development agency and the target social system in order to create a conducive atmosphere for exchange of ideas about an advocated change. The second is the communication level, concerned with what to say, to whom, when and how, through what medium/media and by who. (pp. 114-115)

Effective communication requires effective strategy and a coherent plan of action. Kotler and Armstrong (2008) posit that strategy can be seen as a plan and a purposeful action. Angell (2007) described it as "a plan that guides the development of strategic messages" (p.21). She further notes that the plan must inform, build awareness, and influence the behaviour and beliefs of other people. A communication strategy according to Obuah and Okon (2017) also outlines the channels of information dissemination and the integration of these channels to achieve a common goal. A communication strategy is designed to help an organization communicate effectively and meet core organizational objectives. Good communication strategies can help waste management agencies with members of the public in discussions, and the issues raised can be used to address the problem of waste management. Clampitt, DeKoch, and Cashman (2000) describe an effective communication strategy as having the following characteristics: 1) linking to organizational goals, (2) legitimizing certain issues and delegitimizing others, (3) shaping organizational memory, (4) making sense of the confusing and ambiguous, (5) providing a proper point of identity, and (6) continuously evolving. Communication strategies are usually

formulated by communication professional. Not only can strategies be formulated by communication professionals, they also sometimes emerge from a pattern of actions. Strategies can develop in all kinds of unusual ways, as people interact. Various people can interact and so develop a pattern that becomes a strategy. Nevertheless, a well-developed communication strategy cultivates the kind of environment that is more accepting of change and innovation, (Clampitt, DeKoch, and Cashman, 2000)

Various communication strategies for social change have emerged. Communication strategies now include plans to reach the public not only through the regular mass media, but also through other communication approaches such as religious meetings, seminars etc. McPhail (2009) mentioned that more recently a major movement to combine media and social change has emerged. Countries plagued with problems such as HIV/AIDS, poor family planning, domestic violence and hunger have turned to various media to teach the public different ways of conducting themselves in order to bring about the changes that are needed to improve their society. He went further to say that "the concept of using media to push for social changes is referred to as entertainment-education (or in some cases labelled "edutainment")" (p.33). Campaigns and public education are also useful in informing and educating people about the consequences of littering, and in helping people develop proper waste disposal habits. The use of local language, can also be adopted in creating messages, so as to effectively reach out to people. The choice of an appropriate communication channel is dependent on the target audience and the message type. According to Hassan (2003), the channel is an important component of the communication process, because it is the vehicle through which messages are carried in the sender-receiver continuum. The most suitable communication channel can be chosen by determining to whom the message is being delivered to and what is the message aiming to do (Rogers, 2003). Cunningham and Cunningham (2008) report that United Nations Development Programme (UNDP) launched series of media campaigns to create awareness in the citizens to be mindful of the environment and sustainable goals to be achieved if the future generations are to survive. These campaigns were through the satellite network news, national and local radio and television news, newspapers, magazines, books, journals, conferences, seminars, workshops, traditional media, school debates and essay competitions.

2.2. Evaluating Communication Strategy

For a communication strategy to be effective and accountable in performing its functions alongside with organizational objectives, a measurement tool has to be employed to evaluate it. Macnamara (2002) reports that several surveys have revealed that practitioners across the world agree on the importance of evaluation and measurement of communication plans, but they do very little about actually conducting it. He further reports that communication evaluation has had a patchy track record throughout its history, because practitioners have been slow in accepting and using measurements tools; because their focus was primarily on measuring media clippings or relying on their 'gut feel' when making decisions.

A review from the literature on criteria for evaluating a communication strategy, shows that there is no standard and widely accepted guidelines for evaluating a communication strategy. Nevertheless, it can be deduced that some key criteria always come into play when evaluating a communication strategy. They are:

- The content of the message: It considers the time of airing the message, the manner of message presentation, how many people were exposed to the message, how easy the message is to understand and how much of the message is remembered. Was the message positive, or did it provide erroneous data? Is the message conveying the objectives of the communication strategy?
- Evaluating the content of the message in a communication strategy is key in evaluating a communication strategy. Smith (2005) opines that "it is far more important to analyse the content of a message than merely to count the number of newspaper clippings" (p.249).
- Message distribution: Measuring message distribution/ dissemination tells what an organization did to spread the message, but it doesn't measure its effectiveness or its impact. The evaluator focuses on the channels and tools the organization has employed in disseminating the campaign message. Cornelissen (2000) sees communication as a transmission process in which message travels across a space from one point to another. This author explains that the channel is the locus of communication, where research measures the actual channel and transmission effectiveness.
- Message cost: In this category, the evaluator analyses how much money an organization spent to present its message. The common standard of evaluating message cost when dealing with electronic media, is "cost per thousand". Cost per thousand according to Smith (2005) is an effective way to compare costs among various media, even print vehicles. He also pointed out that when comparing media costs, remember that the elements you are comparing may not be similar. The impact of various media and the amount of repeat presentation for messages to have an impact must be considered.

2.3. Empirical Review

Available studies have shown that recent efforts of some waste management agencies in Nigeria aimed at involving members of the public in waste management operations have not yielded positive response from the public. However, it is important to note that, factors which influences public response and participation in waste and environmental sanitation issues includes; the presence or absence of appropriate facilities, policies for waste disposal and low awareness of the problems associated with poor waste management. Consequently, bridging the information gap and understanding the challenges of the Nigerian public involvement in sustainable waste management practice will be helpful in developing appropriate measures including behaviour-modifying measures (Imam, Wilson, and Cheeseman, 2008). This approach may strengthen and complement the current sustainable waste management strategy in the country. Domestic

waste disposal is a problem in any African country. However, the use of the communication to bring about behavioural change is viable. Studies have shown that communication has helped to promote environmental behaviour. Keita (2016) in her research on factors influencing attitude, safety behaviour, and knowledge regarding household waste management in Guinea: A cross-sectional study, identified factors associated with practice, knowledge and safety behaviour of family members regarding household waste management and produced a remedial action plan.

Findings from her research show that the community residents had poor knowledge of the adverse health and environmental effects of improper waste disposal and so exhibit unsafe behaviour in relation to waste management. Her study provides evidence that household and community groups' waste disposal practice is careless with the environment. Giving a remedial action plan, she suggested that the promotion of environmental information and education of the public will enhance environmental friendliness and safety of the community. She also suggested that the government could create an environment where innovation and promotion of knowledge can flourish.

Available studies have also shown that many societies, even the advanced ones, are struggling with how to communicate waste-related issues to their people. They have come up with various communication strategies to tackle the issue of waste. In the light of this, Ojobor (2016) reports that the London Borough of Lambeth (2011) conducted a study on the subject and published a Waste Prevention and Recycling Communications Plan based on the principle that "effective communication is essential to the success of waste prevention and recycling services" (p.326).

The study according to Ojobor (2016), "also emphasized a clear, non-technical two-way dialogue; consistent, honest, positive and accurate message tone and the use of targeted communications on all groups" (p.326). Concerning the method of communication, The Borough's communication plan made room for the use of many possible methods in order to gain the maximum benefit. The communication methods include the use of the internet, intranet and other electronic tools, team briefs, training programmes, notice boards, letters, leaflets, newsletters, road shows, resident's associations, bus shelter advertising, school visits, posters, signage and so on.

Effective environmental communication is essential for managing waste. However, the identification of the right approach and means to channel information on waste management and other related issues to the public is a challenge. In a more recent study, Obuah and Okon (2017) carried out a research on the environmental communication strategies of the Rivers State Waste Management Agency (RIWAMA): Implications for sustainable waste management in Nigeria. The study sought to appraise the communication strategies of RIWAMA with a view of ascertaining their effectiveness in the light of compliance of residents. The objectives among others were to find out if residents are aware of the waste disposal schemes of RIWAMA in terms of when, where and how to dispose their solid waste. The peculiarities of the study necessitated survey design with the multi-stage cluster sampling as the sampling technique.

Findings from their study revealed that despite the high awareness of RIWAMA's campaigns by residents, there was no corresponding compliance to waste disposal procedures. The study therefore recommends amongst others, that since RIWAMA is a statutory agency of the government, its statutes especially those that boarder on fines and prosecution should be incorporated into its environmental communication strategy. This they noted will in the long run engender compliance of residents. This research work is different from the above reviewed studies because little work has been done to evaluate the communication strategies employed by a waste management agency in educating and sensitizing the public on proper waste disposal and other waste related issues. There is therefore a need to evaluate the communication strategies of RIWAMA, to know what they have been communicating in line with what is expected of them to communicate in achieving their core objectives as enshrined in the law that established it.

3. Methodology

The study adopted the survey method. Survey method is adopted because it is very suitable for studying a subject that has small or large population. Ihejirika and Omega (2011) note that the survey design involves the study of a sample taken from a population in order to know their major characteristics which can be generalized to the whole population.

The population of this study comprised the Sole Administrator of RIWAMA, the Public Affairs Officer and residents of Port Harcourt metropolis. From the 2006 census conducted by the National Population Commission (NPC), the population of Port Harcourt metropolis was put at 1000,908. With a national exponential growth rate projected by the National Population Commission at 2.5 percent per annum, the projected population growth of the metropolis is 1,281,162 by 2016. A sample size of 390 was drawn from the population using Keyton's prescription, which provides 95% confidence level and 5% sampling error. To reach the subjects of the study, the purposive sampling procedure was used for the interview. For the questionnaire, the researcher used the cluster sampling technique to select respondents. The researcher divided the Port Harcourt metropolis into various clusters, based on the zones in Port Harcourt metropolis as given by Akukwe (2014). There are thirteen (13) zones in Port Harcourt metropolis. They are: Mgbuoba, Eligbolo, Rumuepirikom, Mgbuosimiri, Diobu, GRA, Orogbum, Rumuodara, Rumuokwurushi, Elekahia, Rumuola, Woji and Town zones. From each of these zones, 30 respondents were drawn, using the systematic random sampling; where five streets from each zone were picked by balloting. Then six respondents were picked from each of the selected streets using alternate compound. The questionnaire and interview schedule were used as instruments for the study. The questionnaire was used to gather information from residents of Port Harcourt metropolis, while the interview was used to gather information from the Sole Administrator and the Public Affairs Officer of the Rivers State Waste Management Agency. The interview schedule contained three (3) questions which were derived from the research questions while the questionnaire contained sixteen (16) items on the five-point Likert scale.

In order to ascertain the validity of items on the questionnaire, the questionnaire items were derived from the research questions and the supervisors were consulted for a validity check. The comments and observations of the supervisors were helpful in improving on the content of the instrument prior to the administration. The reliability on the

other hand was carried out using Pearson's Product Moment Correlation Analysis, simply referred to as the Pearson r . The result of the reliability test was 0.85 correlation coefficient; therefore, the research instrument was considered reliable.

Qualitative method of data analysis which is largely descriptive was used to analyze the responses from the interview while quantitative method of data analysis where data are presented using statistical tools such as tables of frequency distribution, simple percentages and weighted mean score based on a five-point Likert Scale, was employed to analyze the responses from the questionnaire. In analyzing data from the five-point Likert scale items in the questionnaire, responses to the items was weighted as follows: Strongly Agree (SA) = 5 points, Agree (A) = 4 points, Undecided (U) = 3 points, Disagree (D) = 2 points, Strongly Disagree (SD) = 1 point. From these, the Criterion Weighted Mean Score (CWMS) was established at 3.00 (i.e. $5+4+3+2+1 \div 5$).. Any mean response which is equal to or more than 3.00 is accepted, while any mean less than 3.00 is rejected.

4. Data Presentation and Analysis

The responses to the interview were presented and analyzed alongside the responses from the questionnaire with respect to the research questions. A total of 390 copies of the questionnaire were distributed and 346 were returned. This represents a 96% return rate of the total copies of the instrument distributed.

4.1. Research Question 1

What are the communication strategies adopted by RIWAMA in sensitizing the public on waste management?

In response to the above question, the interviewees said that RIWAMA has adopted a combination of traditional and interpersonal channels, as well as social media platforms, with the primary aim of educating the public on acceptable methods and practices on waste management as enshrined in the law setting up the agency. Several messages and programmes that raise awareness and inform the public on how to bag their wastes, approved dumping time, where to dump their wastes, sanitation day, and cancellation of sanitation day and approved waste receptacles have been created to achieve the objectives of the communication strategy. According to the Public Affairs Officer of the agency, "RIWAMA occasionally organize sensitization programmes in market places, to enlighten the market sellers on how to dispose wastes generated in the market. Bags for bagging wastes are also distributed for free to the market women, to encourage them to comply to the agency's directives on waste management". The agency also sends some of their workers to secondary schools occasionally, to inform and enlighten the students on the waste management directives of the agency. In line with this, the Sole Administrator revealed that "there is a new focus in engaging the younger generation in waste management, so that they will possibly influence their parents and family". The interview responses also revealed that the agency has leveraged on the use of technology to inform and involve the public in waste management. The agency in 2016 launched a software application (App)- RIWAMA Mobile, that is currently available on the Android play store. The App is aimed at interfacing with the public to make the job of the agency more efficient. According to the Sole Administrator of the agency, "the software application is designed using modern programming tools in line with industry standards and global best practices. It has an interactive mapping component that allow users to search for nearest receptacles to a specified address, dump sites, as well as report defaulting service providers, illegal dumpsites, receptacles, and other waste related issues.

4.2. Research Question 2

What are the contents of RIWAMA's messages for implementing its communication strategies for waste management?

| S/N | Questionnaire Items | SA 5 | A 4 | U 3 | D 2 | SD 1 | Total 369 (100%) | Total Fx | WMS fx ÷ total | Remarks |
|-----|---|-------------|--------------|------------|--------------|-------------|------------------------|-------------|-------------------|----------|
| 1 | RIWAMA communicates how to use waste facilities provided by the agency to the public in its communication strategies. | 52 14.1% | 89 24.1% | 33 9.0% | 148 40.1% | 47 12.7% | 100% | 1058 | 2.87 | Rejected |
| 2 | RIWAMA communicates the health hazards of improper waste management to the public in its communication strategies | 44 11.9% | 84 22.8% | 21 5.7% | 142 38.5% | 78 21.1% | 100% | 981 | 2.66 | Rejected |
| 3 | RIWAMA communicates how to properly dispose waste (how to bag, where and at what time to dispose waste) to the public in its communication strategies | 98 26.5% | 187 50.7% | 21 5.7% | 46 12.5% | 17 4.6% | 100% | 1410 | 3.82 | Accepted |

| S/N | Questionnaire Items | SA 5 | A 4 | U 3 | D 2 | SD 1 | Total 369 (100%) | Total Fx | WMS fx ÷ total | Remarks |
|-----|---|-------------|--------------|------------|--------------|--------------|------------------------|-------------|-------------------|----------|
| 4 | RIWAMA communicates sanitation days to the public in its communication strategies | 62 16.8% | 151 40.9% | 36 9.8% | 86 23.3% | 34 9.2% | 100% | 1228 | 3.33 | Accepted |
| 5 | RIWAMA communicates the penalties of improper waste disposal as sighted in the Rivers State waste management law to the public in its communication strategies | 49 13.3% | 91 24.6% | 21 5.7% | 160 43.4% | 48 13.0% | 100% | 1040 | 2.82 | Rejected |
| 6 | RIWAMA communicates how to earn rewards for keeping a clean environment to the public in its communication strategies | 26 7.0% | 59 16.0% | 32 8.7% | 171 46.3% | 81 22.0% | 100% | 712 | 1.93 | Rejected |
| 7 | RIWAMA communicates the benefits of proper waste management to the public in its communication strategies | 49 13.3% | 81 22.0% | 19 5.1% | 154 41.7% | 66 17.9% | 100% | 1000 | 2.71 | Rejected |
| 8 | RIWAMA communicates how to recycle waste to the public in its communication strategies | 2 0.5% | 7 1.9% | 20 5.4% | 189 51.2% | 151 40.9% | 100% | 627 | 1.70 | Rejected |
| 9 | RIWAMA communicates the minimum standard of quality of service expected from a service provider to the public in its communication strategies. | 4 1.1% | 9 2.4% | 22 6.0% | 185 50.1% | 149 40.4% | 100% | 641 | 1.74 | Rejected |
| 10 | RIWAMA communicates how to petition service providers that fall short of the minimum standard of waste service expected to the public in its communication strategies | 1 0.3% | 4 1.1% | 19 5.1% | 191 51.8% | 154 41.7% | 100% | 614 | 1.66 | Rejected |
| | Average Weighted Mean Score | | | | | | | 931.1 | 2.52 | Rejected |

Table 1: Responses on the Contents of RIWAMA's Messages

Ten questionnaire items were generated in respect to the contents of RIWAMA's messages for implementing its communication strategies for waste management. Out of the ten items, only two have weighted mean score values that were above the criterion mean score to be accepted. Specifically, items 14 and 15 have mean score values of 3.82 and 3.33 respectively. Also in the above table, it can be seen that items 12, 13, 16, 17, 18, 19, 20 and 21 have mean scores below the bench mark of 3:00 and were marked "rejected". These findings are in harmony with the statement of the Public Affairs Officer of the agency who said that RIWAMA communicates how to bag waste, waste dumping time, sanitation days, legal receptacles and keeping the environment clean in general to the public.

The sole administrator of RIWAMA also said that the agency communicates cancellation of sanitation days, they correct wrong practices, such as the burning of tyres and they communicate reward programmes. As regards

communication of reward programmes, he said the last time they had such a programme, Emenike street in Diobu won. These findings are not in harmony with the data gotten from the questionnaire as presented in table 1. Extrapolating from the responses from the interviewees, it can be deduced that the contents of the agency's messages to the public is heavily focused on providing information on how to bag waste, where to dump waste, time to dump waste, without containing much on educating and enlightening the public on waste management. These findings are in harmony with the responses from table 1 above.

4.3. Research Question 3

What are the responses of Port Harcourt residents to RIWAMA's waste management communication strategies?

| S/N | Questionnaire Items | Sa 5 | A 4 | U 3 | D 2 | Sd 1 | Total 369 (100%) | Total Fx | Wms Fx÷ Total | Remarks |
|-----|--|-------------|--------------|-------------|--------------|-------------|------------------------|-------------|---------------------|----------|
| 11 | I bag my waste because of RIWAMA's communication strategies on waste management. | 56 15.2% | 101 27.4% | 28 7.6% | 130 35.2% | 54 14.6% | 100% | 1082 | 2.93 | Rejected |
| 12 | I dump my waste at designated waste receptacles because of RIWAMA's communication strategies on waste management. | 41 11.1% | 113 30.6% | 34 9.2% | 104 28.2% | 77 20.9% | 100% | 1044 | 2.83 | Rejected |
| 13 | I participate in sanitation exercise because of RIWAMA's communication strategies on waste management. | 54 14.6% | 122 33.0% | 36 9.8% | 104 28.2% | 53 14.4% | 100% | 1127 | 3.05 | Accepted |
| 14 | I keep my environment clean because of RIWAMA's communication strategies on waste management. | 57 15.5% | 129 35.0% | 37 10.0% | 99 26.8% | 47 12.7% | 100% | 1157 | 3.14 | Accepted |
| 15 | I am aware of the minimum quality standard expected from a service provider because of RIWAMA's communication strategies on waste management | 44 11.9% | 92 24.9% | 19 5.2% | 163 44.2% | 51 13.8% | 100% | 1022 | 2.77 | Rejected |
| 16 | I avoid littering of waste because of RIWAMA's communication strategies on waste management | 51 13.8% | 86 23.3% | 29 7.9% | 147 39.8% | 56 15.2% | 100% | 1036 | 2.81 | Rejected |
| | Average Weighted Mean Score | | | | | | | 1078 | 2.92 | Rejected |

Table 2: Residents' Responses to RIWAMA's Communication Strategies

As shown in table 2, six items were used to elicit responses for research question 5. In the six items used, the third and fourth items on the above table (items 24 and 25) had weighted mean scores of 3.05 and 3.14 respectively and were accepted. Items 22, 23, 26 and 27 were rejected because responses from the respondents had weighted mean score values that are below the criterion mean score of 3.00. In relation to the above, the interview respondents were fully in agreement that not all Port Harcourt residents comply to the directives of the agency. According to the sole administrator, "residents are aware of RIWAMA's waste management messages, but stubbornness on the part of the residents to obey seems to be the problem. Some members of the public still do not stay at home to observe sanitation days". He also mentioned that on the part of educating the residents on waste management and enforcement of the sanitation laws, the

agency has not done much. And that is why residents do not comply, because they know that offenders are hardly punished and the agency does not have monitoring teams that will get to their homes.

On the other hand, the sole administrator regretted that after 5 years of consistent announcements of dumping time, a lot of residents of Port Harcourt metropolis still default. This he attributed to the tendency of people wanting to take laws into their hands and the love of defaulting. Nevertheless, he said the agency has enjoyed about 50% of compliance from the residents, as some residents still comply to sanitation laws and act in positive response to their waste management messages. The interview responses agree with the questionnaire responses.

5. Discussion of Findings

Analysis of responses from the questionnaire and responses from the interview conducted were used to answer the research questions as shown below:

5.1. Research Question 1

What are the communication strategies adopted by RIWAMA in sensitizing the public on waste management?

The Rivers State Waste Management Agency has adopted a combination of traditional and interpersonal channels, as well as social media platforms, with the primary aim of educating the public on acceptable methods and practices on waste management as enshrined in the law that established it. The agency has other targets in addition to the objectives of the communication strategies, such as achieving a cleaner Port Harcourt city, thereby restoring the "Garden City" status of the city.

Several messages and programmes that raise awareness and inform the public on how to bag their wastes, approved dumping time, where to dump their wastes, sanitation day, cancellation of sanitation day and approved waste receptacles have been developed. The waste agency occasionally organizes sensitization programmes in market places, to enlighten the market sellers on how to dispose wastes generated in the market. The agency has also leveraged on the use of technology to inform and involve the public in waste management by launching a software application (App)- RIWAMA Mobile. It can be deduced that the App will help the agency for efficient and strategic planning, rather than rely completely on RIWAMA's staff for monitoring service providers and the public. This finding gives further support to the workability of the Diffusion of Innovation theory. The innovative use of a mobile application for waste management will not realize its full potential for effective waste management until it is diffused and disseminated to the target audience.

Findings from this study has revealed that RIWAMA's communication strategies are evolving and innovative. The agency's use of a mobile application to interface with the public on waste management issues shows that the agency adopted this communication strategy based on environmental trends. As Hobson (1995) suggests that although there are many strategies involved in keeping the urban environment clean, the type to be adopted should be based on findings from researching the environment and environmental trends.

5.2. Research Question 2

What are the contents of RIWAMA's messages for implementing its communication strategies for waste management?

From the responses in table 1 and interview question 2, the researcher gathered that the content of the agency's messages to the public is heavily focused on providing information on how to bag waste, where to dump waste, time to dump waste, cancellation of sanitation days, and sanitation days, without containing much on educating and enlightening the public on waste management. The content of the messages concentrated on management of the already generated waste to approved dumpsites; no messages on incentives to engage the public in waste minimization and management.

Extrapolating from these findings, it can be deduced that the contents of RIWAMA's messages are not adequate to create sufficient education on waste management among members of the public. The waste management agency seems to be more interested in the management of the already generated wastes, than educating the public on waste management, as the researcher gathered that service providers are heavily paid to move waste from approved receptacles to the state's dumpsites. There is therefore the need for RIWAMA to review the contents of its communication to the public, in order to achieve their core function of educating the public on acceptable methods and practices of waste and its management. In support of this, Keita (2016) in her research suggested that the promotion of environmental information and education of the public will enhance environmental friendliness and safety of the community.

Also from the responses gotten from the respondents, it was revealed that RIWAMA's messages on waste management to the public are simple and easy to understand, but nevertheless it is not developed entirely with the objectives of the agency in mind. Probably this is the reason why their communication strategies have not completely produced the expected positive transformation in the attitude of the public towards waste management.

5.3. Research Question 3

What are the responses of Port Harcourt residents to RIWAMA's waste management communication strategies?

From the data analysis presented in table 2 and responses from interview question addressing this research question, it was revealed however, that some residents of Port Harcourt metropolis do not comply to the agency's directives, as they do not stay at home to participate in sanitation exercises. Questionnaire responses also revealed that most residents rarely bag their wastes and dump their wastes at designated waste receptacles. It was also revealed from the interview responses that stubbornness on the part of the residents to obey seems to be the problem. This goes further to support the findings of Rukeh and Ogbemi (2008), that many residents of Port Harcourt do not have responsible environmental behaviour.

Furthermore, it was also deduced from the interview responses that on the aspect of educating the residents on waste management and enforcement of the sanitation laws, the agency has not done much. And that is why residents are stubborn to obey because they know that offenders are hardly punished and the agency does not have monitoring teams that will get to their homes. Little wonder did Tchobanoglous and Kreith (2002) mention that the government has failed in sanitation because of non-enforcement of sanitation through proper inspection.

6. Conclusion

The Rivers State Waste Management Agency has adopted various communication strategies for communicating waste management to the public, which include the launching of a mobile application, the use of a combination of traditional media channels and interpersonal, as well as social media platforms in interfacing with the residents of Port Harcourt metropolis to sensitize and inform the public on proper waste management. The contents of RIWAMA's communication messages are heavily focused on providing information on waste disposal, which were occasionally disseminated through the radio, television and interpersonal channels of communication.

Based on the findings of this study, we conclude that RIWAMA's communication strategies for waste management to the public are innovative but nevertheless, the message contents of the communication strategies are not adequate to create sufficient education on waste management among members of the public. The contents of the messages are not entirely aligned to the objectives of the agency as enshrined in the Rivers State Waste Management Law. This shows that there is a significant relationship between the content of the messages of RIWAMA's communication strategies and public understanding of waste management practices. Given the above, it is necessary for RIWAMA to develop waste messages that go beyond merely disseminating information on waste disposal, and create avenues that will bring about public education, interaction and participation in waste management.

7. Recommendations

Based on the findings of this study, the following recommendations were made:

- The Rivers State Waste Management Agency (RIWAMA) should come up with a deliberate well-articulated communication strategy that will be documented separately from the law that established it. This will help to guide the agency in contributing effectively to the realization of its vision, goals and core functions as enshrined in section 9(h) of the Rivers State Waste Management law.
- RIWAMA should make conscious efforts to develop waste messages that go beyond merely disseminating information and define the contents of their waste messages according to the goals and objectives for which the agency was established, according to the Rivers State Waste Management law.
- The Rivers State Waste management Agency should give the Rivers State Management laws wide publicity through the various media, so that the masses will know their responsibilities in waste management. This will enable the waste agency to effectively monitor and enforce the law, which will in turn bring about public participation in waste management.
- The agency's mobile application needs wide publicity through the various communication channels. Because having an innovation is not enough, the innovation has to be adopted by the public, so as to achieve the agency's communication objectives.

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