

THE IMPACT OF RECYCLING BASICS OF WASTE MANAGEMENT IN REVAMPING THE NIGERIAN ECONOMY THROUGH SCIENCE AND TECHNOLOGY

Yohanna Samuel Adamu

Department Of Estate Management And Valuation, School Of Environmental Design And Technology (Sed&T), Federal Polytechnic Oko, Anambra State

adamsnoble4vina@gmail.com 08034571482

Abstract

The paper looks at the impact of recycling basics of waste management in revamping the Nigerian economy. Recycling is a controversial issue due to the increased landfill waste occasioned by poorly managed waste disposal system that hampers conservation of natural Resources. Recycling is the process of collecting unwanted materials and reusing them elsewhere. The study aims at evaluating how recycling can revamp the economy, impacts our environment and the quality of our lives. Sadly, a lot of people are not aware how recycling of waste can help revamp the Nigerian economy through science and technology. This study is limited to the view of a sample size of waste management professionals and a select number of home owners. From the literature review, a survey research method is the appropriate approach for a study of this kind. The method used to collect data were questionnaire and interview while the data collected were subjected to descriptive statistical analysis using percentage and mean score. Analysis of responses show that many are inclined to recycling because recycling reduces waste in landfills, reduces energy consumption, decreases pollution and reduces cost and thus revamp the economy. Findings indicate that Continuous improvements to recycling of waste using the 5"Rs" of waste management process will have a positive impact in revamping the Nigerian economy. It was recommended that Nigerians be encouraged to use the 5 "R" strategies of recycling basics and typical recycle service options such as all-in-one pickup, pick up sorted and self service to deliver their recyclables.

Key words: Impact, Recycling basics, waste management, Revamping, Economy.

1.0 Introduction

The generation and disposal of waste is an intrinsic part of any developing or industrial society. Waste, both from domestic and commercial sources has grown significantly in Nigeria over the past decade.

According to Vijayyalaxmi (2019), recycling is crucial and even the smallest step can have significant benefits for the environment. A better understanding of the advantages of recycling can ensure that it becomes a natural and important part of your life. Every time a householder shops at the store and open market he contributes to the mountain of waste. It is possible to quote figures which

show that the production of waste amounts to millions of tons.

The percent of Nigeria's population living in cities and urban areas has more than doubled in the last 15 years. The cities and urban areas experience continuous growth which contributes enormously in the generation of solid and liquid waste. The management of waste is a matter of national and international concern. The volume of waste does not actually constitute the problem but the ability or inability of governments, individuals and waste disposal firms to keep up with the task of managing waste and the environment.

In the words of Wilfred (2008), waste generated by human activities can be controlled by source reduction, reuse and recycling. There is no doubt that a dirty environment affects the standard of living, aesthetic sensibilities, health of the people and thus the quality of their lives. The corollary is that improper disposal or storage of this waste can constitute hazards to the society through the pollution of air, land and especially water. In this research, the attention would be focused on domestic waste. The study will highlight some of the problems which have attended the management of this category of waste in today.

One of the most important things a person can do to live green, is to follow the time tested practice of recycling. Recycling is easy, extremely helpful, and once you have created a system takes very little time to get started to a greener future. (Chasing Green 2019).

It will be seen that Nigeria has not done well in the direction of tackling the menace of domestic waste. This is even in the face of advanced management strategies existing today for domestic waste management which have been adopted in many places. The study will proffer suggestions that may assist in addressing this issue that seems to be aborting most efforts of International organizations, the federal government, city authorities, states and professionals alike. Recycling depends on waste materials which cannot be reused directly but can be converted to new product or raw material through the processes of transformation. For instance, used paper is recycled into files, envelops and cards. Energy is recovered through recycling.

1.2 Statement of problem

Wastes pose serious environmental and health problems, promote insect vectors like Yohanna Samuel Adamu

mosquitoes and flies , rats and mice, cause fire hazards, flooding of streams, development of aquatic weeds, odour problems, nuisance, and so on. Waste management is a multidimensional problem that requires technology, economics, and socio cultural and political activities to go hand in hand.

Absence of modern day recycling techniques impacts negatively on the economy and environment which can be clustered into six categories which include: global warming, photochemical oxidant creation, abiotic resource depletion, acidification, and eutrophication. Some of these problems are related to their major constituents. It is on these premises that the study intends to investigate the impact of recycling basics that will aid in revamping the Nigerian economy through science and technology.

1.3 Aim and Objective of the Study

The aim of the study is to investigate the impact of recycling basics of waste management in revamping the Nigerian economy through science and technology.

The objective to be pursued is:

1. To identify strategies for improving recycling basics to revamp the Nigerian economy through science and technology.

1.4 Research Question

1. What are the strategies for improving recycling basics in revamping the Nigerian economy through science and technology?

1.5 Methodology

The study was based on a survey research method. A survey research method was used to derive information use for the study. The survey research design assesses the impact of recycling basics of waste management in revamping the Nigerian economy through science and technology. The study used literature search, structured questions and

oral interview for households and waste collectors. The research presentation adopted both quantitative and qualitative methodology. Both primary and secondary data collection methods were utilized. The population of the study comprises households and waste collectors. The questionnaire was administered to selected households by means of the systematic random sampling. This was to ensure proper representation of all households. A good number of households do not maintain record of contemporary waste management strategies. As a result, a sample size of 100 households and waste collectors was selected.

The Purposive samplings was used because they are ideal when developing interview schedules used only for a small proportion of the population on a wide range of phenomenon under investigation.

1.6 Data analysis

The research presentation adopted both qualitative and quantitative methodology to depict the impact of recycling basics as an appropriate modern means of waste management in revamping the Nigerian economy. The analytical technique adopted a 5-point likert scale to determine the level of acceptance or non-acceptance of responses calculated using the mean score method. The ratings used are as follows: Very Highly beneficial VHB= (5), Highly beneficial HB= (4), Moderately beneficial MB= (3), Strongly beneficial SB= (2) and Not at all beneficial NB= (1)

2.0 Literature Review

2.1 Recycling Basics and the Environment

According to Vethaiya B. (2019), the term environment refers to anything that is immediately surrounding an object and exerting a direct influence on it. Our environment refers to those thing or agencies which though distinct from us, affect our life

and or activity. That is, the environment by which man is surrounded and affected by factors which may be natural, artificial, social, biological and psychological.

According to a study by the United States Environmental Protection Agency (2018), recycling is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products. Recycling can benefit your community and the environment. It is the process of converting waste materials into new materials and objects. It is an alternative to "conventional" waste disposal that can save materials and help lower greenhouse gas emissions.

Recycling can prevent the waste of potentially useful materials and reduce the consumption of fresh raw materials, thereby reducing: energy usage, air pollution (from incineration), and water pollution (from land filling). Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse, and Recycle" waste hierarchy.

According to Vijayalaxmi (2019), Recycling is crucial and even the smallest step can have significant benefits for the environment. A better understanding of the advantages of recycling can ensure that it becomes a natural and important part of people's life.

Recycling is a great way to reduce your ecological footprint. He said recycling refers to collecting a waste product and reprocessing it so that it can be consumed once again. Recycling can also be defined as returning a resource to a previous stage in its cyclic process. For example, recycling could entail collecting a large quantity of aluminum cans, melting them into aluminum and finally, to produce new cans or other aluminum products out of the renewed material.

A report by the Guides network (2019), stated that Recycling is one of the best ways for you to have a positive impact on the world in which we live. Recycling is important to both the natural environment and us. We must act fast as the amount of waste we create is increasing all the time. The amount of rubbish we create is constantly increasing because:

1. Increasing wealth means that people are buying more products and ultimately creating more waste.
2. Increasing population means that there are more people on the planet to create waste.
3. New packaging and technological products are being developed, much of these products contain materials that are not biodegradable.
4. New lifestyle changes, such as eating fast food, means that we create additional waste that is not biodegradable.

The benefits of recycling in the environment are summarized thus:

1. Reduces the amount of waste sent to landfills and incinerators
2. Conserves natural resources such as timber, water and minerals
3. Increases economic security by tapping a domestic source of materials
4. Prevents pollution by reducing the need to collect new raw materials
5. Saves energy
6. Supports Nigeria's manufacturing and conserves valuable resources
7. Helps create jobs in the local recycling and manufacturing industries in Nigeria

2.2 Waste Management Issues in Revamping the Nigerian Economy

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It was Jerry (2020), who said **waste management** is the collecting, treating, and disposing, of solid material that is discarded because it has served its purpose or is no longer useful. Improper disposal of municipal **solid waste** can create unsanitary conditions, and these conditions in turn can lead to **pollution** of the **environment** and to outbreaks of vector-borne disease. That is, diseases spread by **rodents** and **insects**. Furthermore, this is a problem that we created ourselves and therefore we must fix it together. The facts are striking and shameful. Hopefully they make you rethink your waste management.

According to Fahzy (2020), as a nation, we are generating more garbage and we don't know what to do with it. Ineffective or irresponsible disposal of this waste can pollute the environment, pose a public health risk and hampers revamping of the Nigerian economic development. We are running out of space in existing landfills. Citizens are discovering that there is no easy way to get rid of the garbage they once assumed could be buried or burned and forgotten.

In the words of Annelide (2020), we live in a society where we are allowed to part with our waste at the dustbin and it becomes someone else's responsibility. Waste today either ends up in landfill sites, incinerators or recycling centres. Landfill sites are the most common however, this method of waste disposal takes up space; causes seepage into soil and ground water; releases environmentally harmful methane gas during decomposition; and can result in sporadic fires.

The factors affecting such a high rate of change in waste generation includes things such as population growth, changing lifestyles, income growth, increasing use of disposable materials, excessive packaging of

items, and consumer habits. Despite the several investment opportunities that waste management offers with a very high return on investment for public and private sectors, most developing countries, including Nigeria, have waste management issues which are different from those found in industrialized countries in regard to composition, density, political and economic frameworks, quantity of waste, access to waste for collection, awareness, and attitude.

In the words of Arokiaraj et'al (2019), waste management is the biggest problem for the present as well as the future world. The world is moving towards revamping economies, urbanization and industrialization. This growth and development have created a major impact on the built environment by causing land, water, air, and noise pollution through heaps of waste reduced air quality, polluted water, global warming, greenhouse gas, acid rain, etc. Dumping of huge plastic waste causes drought, as it reduces the chance of rainfall.

Unfortunately, people in many developing countries (including Nigeria) have, until recently, regarded the issue of proper waste management as trivial, which may have diverted attention away from the most urgent and serious problem of achieving a fast rate of economic growth. This attitude stems from the belief that waste generation is an inevitable price for sustainable future.

According to a report by the Tasmanian Rethink Waste (2020), rethink Waste provides the tools and resources you need to help you reduce waste and rethink the way you think about waste to revamp the Nigerian economy. From learning easy ways to reduce waste at home, such as composting and simple non-toxic alternatives, to paying attention to your purchasing habits and understanding what it means to buy local, we

can all take steps towards the same goal: reduce, reuse, recycle, and rethink.

Rethink is about considering how our actions affect the environment. A rethinking of the problem should start with an examination of waste management in revamping the economy across the full product life cycle from manufacture to disposal. Rethink Waste encourages our community to rethink what we do with our waste to improve our collective efforts to reduce, reuse and recycle. Rethink Waste can significantly reduce the amount of waste ending up as landfill, thereby reducing the impact of waste on the built environment.

It's time to stop wasting resources and start thinking about the planet and its future, your future, our future. Rethinking of the problem should start with an examination of the ecological impact and economics across the full product life cycle from manufacture through use, reuse, recycling, and disposal. The economic incentives for the various industry players must also be considered, including original equipment manufacturers (OEMs), retailers, service providers, remanufacturers, recyclers, and waste management companies.

Every industry has a unique set of players; for each of them, the costs and benefits vary considerably, and are sometimes at odds. This insight provides a starting point for thinking strategically about reshaping the industry value chain in ways that increase profits while reducing environmental impact. Such rethinking can be employed by business executives to seek out new profit pools or, alternatively, by regulators to alter the profit pools and enhance overall societal benefits.

3.0 Result and Discussion

Recycling has been a common practice for most of human history through reuse or salvage of many products or materials into new materials destined for manufacturing new products. The findings of the study from

the research question reveals in the strictest of sense that recycling of a material would produce a fresh supply of the same material and thus revamp the Nigerian economy and save the environment. The results and discussion is analyzed using the research question below:

3.1 Research Question one: What are the strategies for improving recycling basics in revamping the Nigerian economy through science and technology?

Table 1: Strategies for improving recycling basics to revamp the Nigerian Economy

S/No	Revamp Strategies	VHB	HB	MB	SB	NB	M/S	Ranking
1.	Rethink Strategy	280	76	39	24	0	4.19	1
2.	Refuse Strategy	120	132	57	32	2	3.43	2
3.	Reduce Strategy	210	52	63	10	6	3.41	3
4.	Reuse Strategy	55	156	57	46	8	3.22	4
5.	Recover Strategy	100	80	135	4	0	3.19	5

Source: Field Survey, 2022

From table 1 above, **4.19** of respondents accepted that Rethink strategy is very highly beneficial and appears the most appropriate of the six recycling strategy in revamping the Nigerian economy through science and technology as it captures the idea that human behavior is a critical component of sustainable actions. Rethink waste helps reduce waste and rethink the way people think about waste. A rethinking of the problem should start with an examination of the ecological impact and economics across the full product life cycle from manufacture through use, reuse, recycling, and disposal. This insight provides a starting point for thinking strategically about reshaping the industry value chain in ways that increase profits while reducing environmental impact. Such rethinking can be employed by business executives to seek out new profit

pools or, alternatively, by regulators to alter the profit pools and enhance overall societal benefits. Rethink Waste encourages our community to rethink what we do with our waste to improve our collective efforts to reduce, reuse and recycle. Rethink Waste can significantly reduce the amount of waste ending up as landfill, thereby reducing the impact of waste on the environment.

The range also indicates that **3.43** of respondents agreed that **Refuse strategy** is highly beneficial and a good fit for revamping the Nation’s economy through science and technology. This strategy defines refuse as refusing to accept or support products or companies that harm the environment i.e. Say no to what you don’t need or saying “no” to waste in the forms of single-use disposables like bags, straws, cutlery, cups, as well as to junk mail,

promotional freebies and other short-lived non-necessities that have a one-way ticket to the garbage bin. One way to do this is to refuse items that are over-packaged or packaged in plastic. While it is difficult to refuse all plastic items, being more conscious can help change people's habits. Saying no is a valuable skill with implications for our lives more generally. A thoughtful explanation might be the catalyst for motivating real change in the people with whom you interact.

A big part of this strategy also involves saying "yes" to sustainable goods and services that is beneficial in revamping the Nigerian economy. Say "yes" to package-free purchases at bulk-shops and farmers markets, to free water refills of your trusty water bottle, to cafés that accept reusable coffee cups and to restaurants and shops that will fill one's reusable containers for environmental sustainability.

The table also showed that **3.41** respondent agreed that the **Reduce strategy** is moderately beneficial and an appropriate technological strategy in recycling waste in revamping the Nigerian economy. Reduce means to minimize the amount of waste we create. By recovering, reusing, and recycling materials/items/components, we can actually reduce the use of natural resources like water, oil, energy, fuel, metals, gas etc. Significantly, the most effective way to reduce environmental negativity is to better design a product for the prevention of waste.

There are a lot of advantages in reducing the usage of new resources and reusing recovered items. First of all, it helps to avoid using virgin products and preserves natural resources. Secondly, it facilitates the usage of recovered components or parts over and over again. Thirdly, it reduces the procurement expenses by cutting down on new resources. Fourthly and the most importantly it avoids

unwanted wastes, avoids land filling and also brings down the pollution level. Finally, it helps to build a sustainable future through the environment, economy, and society in revamping the Nigerian economy.

3.22 of respondents indicated that the **Reuse strategy is strongly beneficial and one good technological strategy to be applied in revamping the Nigerian economy.** Reuse refers to using items more than once. The reuse strategy looks at how you can use certain items again and save money too (ideally multiple times) before replacing them. The reuse strategy is premised on these ideas:

1. Refill a water bottle with water from home instead of buying a new one.
2. Update your computer rather than throwing it out and getting a replacement.
3. Ditch plastic bags and choose reusable, environmentally-friendly bags instead.

The trend equally showed that the **Recover strategy** account for **3.19** of positive response even though it is "a not at all beneficial" item but the response indicate that it is suitable recycling strategy in revamping the Nigerian economy. **Recover** refers to the practice of putting waste products to use. Every product has its own end-stage; some parts can be recovered for the purpose of reuse. The waste materials are usually recovered at the end of the product lifecycle, and they can be used for recycling. These recovered items can be recycled and reused in the production process. This process can ultimately avoid virgin product and avoid unnecessary expenditure on procurement and improves national development. It has monetary benefits to the company by limiting virgin products. It is considered one of the

best ways to avoid land filling and to reduce the environmental impact on our globe.

Conclusion and Recommendations

Recommendations

Recycling aims at revamping the Nigerian economy by substituting raw material inputs into and re-directing waste outputs out of the economic system. The study therefore emphasized the need for every household to begin by contacting nearest recycling center to determine what services they offer as services will vary by location. Typical recycle service options recommended such as **All-in-one pickup** (the easiest option for the consumer), **Pick up sorted** (the most common option picks up recyclables at homes) but will require households to sort the items out into major categories such as plastic, glass, etc. and **Self Service** for families who live in an area that requires

them to deliver their recyclables. It takes a little more effort but is absolutely worth the extra energy.

CONCLUSION

Recycling is very important as waste has a huge negative impact in revamping the Nigerian economy and natural environment. Harmful chemicals and greenhouse gasses are released from rubbish in landfill sites. Recycling helps to reduce the pollution caused by waste. Habitat destruction and global warming are some of the effects caused by deforestation. Recycling basics using the five recycling strategies reduces the need for raw materials so that the rainforests can be preserved. Huge amounts of energy are used when making products from raw materials. Recycling basics of rethink, refuse, reduce, reuse and recover strategies requires much less energy and therefore helps to revamp the Nigerian economy and preserve natural resources.

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