

The Health and Economic Impacts of Waste Recycling for Sustainability in Nigeria

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Abstract

The health and economic impacts of waste recycling are greatly felt on both local and national scale in Nigeria. Through our literature review and participant observation, we have discovered that there is an urgent need to educate communities about climate change mitigation for sustainable development in Nigeria. Waste recycling is one of those climate change mitigation strategies which involves the reduce, reuse and recycling of waste materials to ensure that our environment is a cleaner, healthier and greener place to live in. There is a great need for communities in Nigeria to come together in unity in order to devise the means of ensuring a cleaner and healthier environment by proper waste management and recycling strategies which will help to guarantee a sustainable future where our economy can thrive and good health is fostered across every border. This paper seeks to draw the attention of policymakers in government, non-governmental organizations and passionate individuals to the need to seek for innovative ways of educating communities about waste recycling for sustainable development in Nigeria. It further explores the effective methods of bridging the communication gaps through efficient information dissemination, intensive awareness outreach and use of educational blogs and poems to help ensure that communities are adequately educated and efficient in their task of waste recycling for sustainability in Nigeria. This paper vividly explores the green entrepreneurial opportunities in waste recycling for sustainable economic growth and development in Nigeria.

Keywords: Climate Change; Health; Mitigation; Recycling

Introduction

Waste is defined as any unavoidable material resulting from domestic activity or industrial operation for which there is no economic demand and which must be disposed of (or wastes) is unwanted or unusable materials [1]. Waste is any substance which is discarded after primary use, or is worthless, defective and of no use. Examples include municipal solid waste (household trash/refuse), hazardous waste, wastewater (such as sewage, which contains bodily wastes (feces and urine) and surface runoff), radioactive waste, and others [2]. According to the Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and Their Disposal of 1989, Art 2(1), "Wastes are substance or objects, which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law" [3].

Recycling is the process of converting waste materials into new materials and objects. It is an alternative to "conventional" waste disposal that can save material 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 [4].

Waste Recycling is a process of converting waste materials into new products to prevent waste of potentially useful materials, partly supplement the consumption of fresh raw materials, reduce energy usage (almost 70% less energy is required in recycling), reduce air pollution from incineration and water pollution from land filling by reducing the need for "conventional" waste disposal, and lower greenhouse gas emissions [3]. The idea or philosophy of waste recycling is to bring into the fore the idea of re-using the resources or materials that has been used for renewed use again. We may not guarantee the neutrality of these resources again as they were in their originality, however; we can re-engage the use of it again for continuity. A great percentage of materials are being

recycled and are being used as household products and their number is increasing by the day. The most common recyclable material is plastic. Many plastic products and bags are in use nowadays. Plastic recycling serves as a solution to the earthly pollution. Plastics are polymers and are resinous and they are melted down to make other products. Most importantly plastic containers like water bottles, beverage containers, milk bottles, soap boxes, etc., are recycled [3].

Waste recycling can also be defined as the process of breaking down and re-using waste materials that would otherwise be thrown away as trash. The materials that can be recycled include glass, aluminum, polyethylene (shopping bags, laundry bags, pure water sachets, yoghurt wrappers, soft poly bags, hospital drip bags, popcorn wrapper, bread wrapper, cellophane), plastic water bottles, metal scrap, different kinds of paper, electronics – computers, cellular phones, keyboards, batteries and other small electronic equipment, textile, wood, wire, cables, plastic product, rubber, etc. Apart from this industrial recycling, all the leaves, food leftovers, waste, twigs and other garden waste are decomposed by worms and converted into fertilizers [3]. There are numerous benefits to waste recycling and with the introduction of the green technology, even more materials are now recyclable. In this study, we shall explore the health and economic impacts of waste recycling and the need to educate communities in Nigeria on the benefits of waste recycling for sustainability in Nigeria.

The Health Implication of Waste Recycling for Sustainability in Nigeria

There are a variety of wastes, liquid or solid, emanating from human activities (domestic), agricultural or industrial activities (neither domestic nor hazardous) and hazardous or special. Feces, indeed is also included in solid wastes. Among the liquid wastes, sullage, sewage, livestock and industrial wastes are known among communities. It is very important to understand the wastes, their nature, the problems associated with them, and how to dispose them off hygienically. Waste recycling is a climate change mitigation strategy as well as a waste management measure which can help to reduce the spread of airborne and waterborne diseases in the community.

Waste management presents problems in big cities like Lagos, and other major Nigerian cities which are linked with economic development, population growth and the inability of municipal councils to manage the resulting rise in industrial and domestic waste. Haphazard industrial planning, increased urbanization, poverty and lack of competence of the municipal government are seen as the major reasons for high levels of waste pollution in major Nigerian cities. Some of the 'solutions' have been disastrous to the environment, resulting in untreated waste being dumped in places where it can pollute waterways and groundwater. In Nigeria, liquid wastes are managed in an indiscriminate manner [5]. There are no sewage treatment plants. Sullage gets into drains and flows into rivers and streams. Human excreta are managed separately through ventilated improved toilets, pit toilets or septic tanks [6].

In some areas like markets and other public places, excreta are mixed up with solid waste, thus creating nuisance in the recycling facilities. Solid waste management is the discipline associated with the control of generation, storage, collection, transfer and transport, processing, and disposal of solid wastes in a manner that is in accord with the best principle of public health, economics, engineering, conservation, aesthetics and other environmental considerations.

According to the Wikipedia, there are many waste types defined by modern systems of waste management, notably including:

- Municipal waste includes household waste, commercial waste, and demolition waste
- Hazardous waste includes industrial waste
- Biomedical waste includes clinical waste
- Special hazardous waste includes radioactive waste, explosive waste, and electronic waste (e-waste).

Arising from increase in population and urbanization in major cities in Nigeria, the practice of recycling of waste disposed of such as plastics, pure water sachet and many other waste materials, has remained a health challenge and environmental concern both to the general public and the various tiers of government [7].

This development appears to have become a topical issue in the sustainable environment agenda of the Federal Government and Government at other levels like the State and the Local Government Areas [8]. One of the major tasks of this study is to understand how to safeguard the health of Nigerian communities through the practice of recycling of waste materials and the health implications of recycling on the environmental sustainability in our communities. In many developing countries like Nigeria, indiscriminate dumping of waste materials and uncontrollable burning of these materials such as pure water sachet, plastic rubber that has been used and discarded, has been blamed on poor management of the process by the government [9]. The environmental and human right risk of dumping of waste in Nigeria has also been noted [10]. There is therefore the need for proper waste management through recycling to help ensure a healthy society.

The health implications of recycling on the environmental sustainability of communities in Nigeria can be grouped into the positive and negative implications

They are as follows:

A) The Positive Implications

The recycling of waste disposed into renewed products minimizes the risk that comes with incineration option. When plastics are burnt, it releases toxic substances such as greenhouse gas into the atmosphere there by increasing the force of pollution of the environment. But with recycling, the potential threats to existential realities are minimized and the given community is exonerated for environmental sustainability. Waste recycling reduces the chances of an outbreak of diseases. Thus, it becomes the platform of disease control. Waste recycling exonerates the people in communities from air, water and land pollutions. It reduces the practice of open-air burning and landfill fires.

Recycling is a major source of entrepreneurial revolution not only in Nigeria but around the World. In Nigeria, arising from the continued proliferation of underemployed and unemployed youths in major cities and rural dwellings, these youths have taken the platforms of the waste recycling business to better their income and to reduce the risks of their various survival adventures. Waste recycling is a platform for employment generation, income and engine room for socio-economic development when harnessed more.

B) The Negative Implications

In the course of recycling a product, if not properly harnessed, becomes a platform for contaminations. Sometimes these materials recycled are not properly carried out and their hygienic integrity is always questioned. It is usually a vehicle for the spread of diseases. The technologies used in recycling are often not cost effective and therefore, becomes a barrier to development especially, in developing countries.

The Economic Implication of Waste Recycling for Sustainability in Nigeria

While health concerns are a major issue with waste management and recycling, the economic implications of waste recycling which is a climate change mitigation strategy cannot be over-emphasized. Financial abundance and ample profits are added advantages for the few audacious and courageous individuals that can see the business opportunity in collecting the wastes which go beyond striving to keep their environments clean.

When collecting recyclable waste, the savvy individuals in the business filter exactly what they want. You can decide to collect only plastic waste, only aluminum can wastes, only rubber wastes, any other type, or all of them. Executing recycling business ideas that focus on the collection of a particular type of waste keeps the recycler's business streamlined, makes waste collection easier, and increases the chances of profitability [11].

All over the world, the idea of recycling has been welcome as an engine of socio-economic development because it has been seen as the route for employment generation and its broad public appeal and obvious environmental advantages [9].

If waste recycling is carefully implemented, environmental pollutions, degradations and other human activities that are detrimental to the nature and environment will be reduced to its barest minimum and this will help to achieve the United Nations Sustainable Development goals of zero poverty. Studies have shown that there are entrepreneurial opportunities in waste recycling for sustainability in Nigeria. There's nothing more exciting than having fun and making money while at it. When it comes to waste recycling, it's about of keeping your environment clean and generating income at the same time. Recycling is the perfect example to use when stating that people see gold right in front of them, yet they do not know it. Recycling business ideas and opportunities are largely overlooked because of the low awareness surrounding the industry in Nigeria [11].

Economic Benefits of Waste Recycling includes

1. Waste recycling conserves energy as recovered materials use less energy in the recycling plant compared to that needed for products obtained from virgin materials. This conserves energy in terms of electricity or fuel.
2. If materials such as metals, paper, glass and plastics are recovered from solid waste, they become a source of valuable raw materials to industries, thereby reducing foreign importation for countries dependent on those materials, while excess production could be exported.
3. Waste recycling reduces the waste disposal costs.
4. Waste recycling prevents the emission of excess greenhouse gases and water pollutants. It also helps to reduce greenhouse emissions that lead to global warming.
5. Waste recycling reduces litter which makes communities look untidy and thereby attracts more foreign investors to the communities.
6. Waste recycling if carefully and properly organized can be a source of livelihood to unskilled workers in a developing country, as it creates employment.
7. Waste recycling can be cost beneficial to the economy of the nation by increasing the country's gross domestic product (GDP).

Green Entrepreneurial Opportunities in Waste Recycling for Sustainable Economic Growth in Nigeria

Entrepreneurs are individuals who conceive new business opportunities and take on the risk required to convert those ideas into reality [12]. Entrepreneurs play an important role as the engine of change in a market based economy since they are responsible for introducing innovation, adaptation and new ideas. Afolabi explained that the Global Economic Monitor indicates that nations with higher levels of entrepreneurial activity enjoy strong economic growth [13]. Green Entrepreneurial practices are those activities that are related to products or processes that are involved in reducing, reusing and recycling of resources for economic, environmental and social sustainability [14].

According to Greent Project, Green entrepreneurship is the activity of consciously addressing an environmental/social problem/ need through the realization of entrepreneurial ideas with a high level of risk, which has a net positive effect on the natural environment and at the same time is financially sustainable. Green entrepreneur is someone who starts and runs an entrepreneurial venture that is designed to be green in its products and processes from the very moment it is set up [15].

Green entrepreneurs are valuable assets across various communities in Nigeria today. The Green entrepreneur sees the problems caused by climate change, environmental pollution and global warming; He/she also perceives the business opportunities in waste recycling and takes on the risk of engaging the process of waste recycling to ensure a sustainable environment and the sustainable economic growth of his community and nation.

The Need to Educate Communities on Waste Recycling for Sustainability in Nigeria

There is great need to educate communities including institutions and companies in Nigeria on waste recycling. This is vital as waste recycling will help to reduce the risk of climate change. According to the “World Health Organization (WHO) Director-General on the World Health Day 2008,” Climate change is one of the greatest challenges of our time. Climate change will affect, in profoundly adverse ways, some of the most fundamental determinants of health: food, air, water. In the face of this challenge, we need champions throughout the world who will work to put protecting human health at the centre of the climate change agenda [16].

Climate mitigation is any action taken to eliminate or reduce the long-term risk and hazards of climate change to human life, property and the society. The International Panel on Climate Change defines mitigation as: “An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases” [16]. According to the World Health Organization (WHO) Director-General on the World Health Day 2008. Every event and every voice on every occasion is needed to give new energy and commitment to making the fundamental changes that will both stabilize the climate and prevent human suffering [15].

Thus, the greatest challenge facing the Governments in the developing countries like Nigeria is the difficult task of reconciling economic growth, resource management and climate change mitigation and adaptation. Though, there abounds multiplicities in adverse effects inherent in climate change, the following approach could be deployed towards maximizing the economic opportunities in Waste recycling which is a climate change mitigation strategy in Nigeria:

- i) Radical awareness approach of information disseminations. The emergence of information communication and technology (ICT) around the world to a large extent has proven as very effective and efficient vehicle of letting people becoming aware of opportunities and benefits in waste recycling. These information dissemination platforms besides the internet include radio, television and telephone.
- ii) The government at all levels in Nigeria should provide enabling environment and sustainable fund in form of grants and loans to the teeming unemployed and underemployed Nigerian youths who may want to be involved in the waste recycling businesses in their different capacities. This approach when incorporated into long term policy planning in climate change mitigation in Nigeria will go a long way in reducing unemployment among the youths in the country.
- iii) The use and involvement of non-governmental organizations that are environmental driven and climate change sensitive can go a long way in providing green entrepreneurial opportunities for a lot of individuals in Nigeria. Awareness of the economic opportunities in waste recycling can be made known to communities and cities through the various outreaches, seminars and workshops initiated by this environmental sustainability driven NGOs in Nigeria.
- iv) Annual National budgetary allocation towards maximizing economic opportunities in waste recycling should be increased.
- v) Building the capacity of the locals through adequate sensitizations, through the use of traditional and religious institutions in reaching the people through training and retraining of farmers and green entrepreneurs towards adapting to the opportunities in waste recycling for sustainability in Nigeria.
- vi) Educational blogs can be used to inform, enlighten and educate researchers, entrepreneurs and interested individuals in Nigeria especially the internet literate ones about waste recycling. These blogs which are meant to be highly interactive allows individuals to contribute their ideas, suggestions and feedback to the environmental sustainability driven educators and green bloggers.

vii) Poetry has also been discovered as a great tool which can be used to educate individuals in Nigeria about the health and economic benefits of waste recycling. The Project Green Initiative which is an arm of the Benjy Poetry and Music Global Concepts, a company registered in 2017 with the corporate affairs commission, is a good example of a social enterprise which is very passionate about educating the communities in Nigeria about the green entrepreneurial opportunities in climate change mitigation and adaptation which includes waste management and waste recycling for sustainable economic growth in Nigeria.

Below is a poem advanced by the Benjy Poetry and Music Global Concepts which further helps to illustrate how poetry can be used efficiently and effectively in educating communities in Nigeria about waste recycling for sustainability in Nigeria:

Poem: Reduce, Reuse and Recycle

Reduce, recycle and reuse

Accentuate our sustainable development

Environmental pollution we must refuse

To help ensure our world's betterment.

Reduce, recycle and reuse

Keep our environment clean and green

Green entrepreneurship let us use

To give our youths a livelihood means.

Reduce waste, recycle and make some gains

Financial abundance is the promise

For those who engage to regain

Waste recycling is a venture wise.

Waste can be a detriment to health

Inflicting diseases and conflicts

Waste can be turned into wealth

Waste recycling is a venture of profits.

Recycling conserves natural resources

And helps protect the environment

Recycling is a good income source

An engine room for socio-economic development.

Recycling gallantly reduces emissions

Of excess greenhouse gases

Recycling creates job provisions

For the unemployed and underemployed masses.

Reduce, recycle and reuse

A breath of fresh air to the community

Now health and wealth can be induced

With the hope of a brighter future we see.

Case Study: Poem “Reduce, Recycle and Reuse” Review by Barr. James Hope

The title of the poem “Reduce, Recycle and Reuse” has suggested the very important words and relevant tools in curbing the menace of climate change for sustainable development globally. Just recently, some team of girls (senior division winners, Team Cantavits from Eedo Delhi, India), at the 2018 Tecnovation World Pitch Summit in Silicon Valley, were able to develop an app to track and dispose of electronic waste in an Eco-friendly manner, the app provides an end-to-end connection between e-waste producers and authorized recyclers. According to statistics, 81% of people dispose of their e-waste in an improper manner, not realizing its consequences. E-waste comes back to them in the form of toxic fumes and polluted water.

The sustainability of the environment is favorable to the system of reusing, recycling, reducing and repairing of waste and materials used from day to day consumption. It will amount to a waste of energy and resources from both consumers and producers, if materials are discarded and thrown away after use, when they can be recycled, reduced and reused. Benjamin Anabaraonye, using a simple and amazing poem, was able to identify some benefits of reducing, recycling and reusing to include:

- To prevent environmental pollution of any form.
- To save energy.
- To generate income and resource for youth empowerment.
- To save cost.
- To reduce amount of waste in the environment.

- Products will be well utilized and enjoyed.
- Reduce green house gas emissions.
- It conserves natural resources.

A look at the author's poetic techniques identifies:

1. Theme: The theme of the work is centered on the importance and benefits of reducing, recycling and reusing of waste.
2. Tone: The tone of the writer is explanatory, approving, hopeful and demanding.
3. Mood: The writer's mood is inviting, candid, urging, emotional and very passionate about the subject matter.
4. Imagery: Imageries were also used, such as "A breath of fresh air to the community"; "An engine room for socio-economic development", etc.
5. Style: The poem contains seven stanzas with each stanza having an end rhyme of ABAB. The poet exhibited a style of capitalizing each beginning line.
6. Techniques:

The use of Repetition "Reduce, recycle reuse"

The use of Conjunction "To keep our environment clean and green"

The reviewer adopts stanza seven (7) and recommends it as a boost for the actualization of the sustainable development goals. It is also helpful for the purpose of ensuring a sustainable, attractive and healthy environment [18].

Further Recommendation and Conclusion

Educating communities in Nigeria on waste recycling which is a climate change mitigation strategy is an important and urgent task which needs to be undertaken by governmental agencies, NGOs, community leaders, and passionate climate change professionals for our sustainable development in Nigeria. Nigeria which is one of the developing countries should establish and promote public policies within their borders to increase the awareness of waste recycling for environmental sustainability [19-24]. Leadership summits on climate change mitigation and waste recycling, intensive awareness outreach, Waste recycling poems and blogs, are also recommended as important tools which can be used in educating communities in Nigeria on climate change mitigation for sustainability locally, nationally and globally. Communities, Companies and various institutions in Nigeria can make the task of waste recycling easy by placing labeled containers in the open for public use, or providing bins for home and business owners for strategic waste disposal and waste collection for recycling. Since everyone is involved in one way or the other in production of waste, everyone's effort is needed to ensure a cleaner, greener and healthier environment for sustainable development both locally, nationally and globally. Waste management and recycling education will bring about behavioral change and public participation which is said to be the key to a functional waste management system. Our planet needs to be preserved for future generations and its inhabitants are in the best position to do that. Let's join hands today to make our world better for our future and that of our children tomorrow [25-32].

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