Pioneering Sustainable Waste Solutions for Environmental Stewardship

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ABSTRACT

Waste management is becoming one of the key focuses to solve the global climate change challenge. Many developing nations as well as civil society organizations are not taking the bull by the horns to pioneer waste management. This paper aims to examine the necessity of pioneering sustainable waste solutions by environmental and renewable energy experts, organisations and governments in transforming waste management practices. It advocates further the role of experts and practical activities required to maintain a clean and healthy environment through waste management. The paper adopts the doctrinal research method and analytical approach to appraise the significant impact of waste management on environmental sustainability and public health. This paper further explores her achievements, the benefits of waste management solutions and its potential to inspire change in the waste management industry. The paper makes useful recommendations to environmentalists, academia and stakeholders in energy and environmental sustainability.

Keywords: Pioneering, Sustainable Development, Waste Solutions, Environment.

INTRODUCTION

Waste management is a significant environmental challenge worldwide. In Africa, rapid urbanisation and population growth have led to an increase in waste generation, posing environmental and health risks. Sustainability takes into consideration all available resources like plants, water, and land and manages them ideally so that will always exist in future.

In October 1987, the Brundtland report also known as Our Common Future, published by the World Commission on Environment and Development, defined sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

For a sustainably responsible world, waste management is crucial. This does not only include disposal of garbage in landfills or recycling but also entails how to minimize and manage waste.

In the time past, the economy of waste management relied on a make-use-dispose model, whereby for instance, furniture makers made chairs and tables from bulk lumber, automakers sourced and bought new steel, batteries and wiring to build each new vehicles but sustainable waste management has caused a seismic shift from the linear economy narrative, it makes it more circular, bringing useful waste into production. Instead of starting with fresh raw materials for production, sustainable waste management begins with renewables.

Authors was contributed must work in sustainable waste management and have been instrumental in addressing these challenges.

ACHIEVEMENTS IN SUSTAINABLE ENVIRONMENT

Pioneering work in upcycling and recycling has transformed waste management practices. Many initiatives have empowered communities to adopt eco-friendly habits, reducing waste and promoting environmental sustainability. It is important to note that the training of scavengers and students on proper waste disposal practices, improves public health and environmental awareness.

In the area of waste management, pioneering force, driven by a vision to transform challenges into sustainable solutions. With over a decade of experience in the field, the challenges faced, and the innovative approaches in waste management bring close the possible solutions to the problems encountered thereby. Thus, the contribution of various researchers in the past was with the view of converting forest waste into wealth. Some have developed the idea towards handling hazardous waste like tyres, batteries, and pesticides.

Those who are environmental and renewable energy experts must seek to be dedicated and unwavering to finding holistic approaches to waste management. They must develop a vision that extends beyond conventional waste disposal methods, advocating for strategies that minimize environmental impact while harnessing the potential of renewable resources. This is because there many obstacles in this field and they are quite complex and diverse. Some of the key challenges include overcoming social taboos associated with waste collection, improving waste management education, dealing with the lack of functionally controlled landfills, addressing the shortcomings of recycling materials and technology, and providing adequate working tools. These hurdles have made it difficult for many in the waste management industry, to effectively manage waste and mitigate its impact on the environment.

Indeed, the core solutions in waste management centre around sustainable municipal solid waste practices, emphasizing upcycling and recycling. Upcycling, the process of reusing materials without degrading their quality, serves as a pivotal step in achieving sustainable waste management solutions.

To foster industry improvement, creating and enforcing regulations, involving system designers and stakeholders in municipal activities, and adjusting management systems based on waste characterization studies are required. Government involvement is key to promoting the waste management industry. Organizing training programs, and incorporating private sectors, entrepreneurs, and informal sector collectors, and processors into waste management initiatives can catalyze positive change. "Innovation plays a pivotal role in sustainable waste management. “We need to explore cutting-edge technologies and collaborations to create closed-loop systems that minimize waste generation," asserts Shittu. A forward-thinking approach to collaborative efforts among industries, governments, and communities will certainly drive impactful change. Intentional effort must be put in place for instrumental in spearheading community-based waste recycling programs, advocating for policy reforms, and fostering awareness campaigns to instil a culture of responsible waste management.

Economically, solid disposal sites. Cleaner environments lead to pollution-free surroundings, fostering economic growth through industrialization and diversification of the country's economy. Eco-policies implemented by the government further guide investments in waste management. Her potentials and research prowess is a catalyst for change in waste management, her insights and initiatives serve as an inspiration for individuals, industries, and policymakers alike. Her vision for sustainable waste solutions epitomizes the transformative power of environmental stewardship and underscores the imperative need to rethink our approach to waste management.

BIO-PLASTICS POTENTIAL IN AFRICA'S WASTE REVOLUTION

In the African context, where the challenges of waste management loom large, pioneering vision illuminates a transformative path paved with bio-plastics – an innovative solution poised to redefine waste management

paradigms. For those who are environmental and renewable energy experts, insights are required to shed light on the immense potential of bio-plastics in addressing Africa's pressing waste crisis.

Our daily lives involve the use of plastics in one way or the other and this ranges from electronics, plastic chairs and tables to water bottles and children's toys, there seems to be an insatiable demand for these products made from fossil fuel.

Africa's rapid economic growth and urbanization generate an ever-increasing tide of waste. Plastic pollution, in particular, poses a significant challenge, clogging landfills, littering waterways, and harming ecosystems. These challenges strains our environment and often leave traces of plastics in our soil and water body, which is injurious to the human body system.

Traditional solutions like incineration and open dumping have proven unsustainable and harmful. However, a promising seed of hope has sprouted in the form of bio-plastics, offering a potential game-changer for waste management in Africa. Bio-plastics are from renewable biomass sources like corn starch, sugarcane, or even cassava peels. Unlike conventional plastics made from petroleum, bio-plastics are biodegradable, meaning they decompose naturally under the right conditions. This significantly reduces their environmental impact and alleviates the burden on landfills. Several factors make bio-plastics a desirable solution for African waste management: Locally sourced materials: Africa is blessed with abundant agricultural resources, providing a readily available feedstock for bio-plastic production. This reduces dependence on imported petroleum and fosters local economic development. Composting potential: Bio-plastics can be composted along with organic waste, creating nutrient-rich fertilizer for agriculture. This closes the loop, minimizing waste and promoting soil health.

At the heart of sustainable waste management lies innovation, and bio-plastics offer a promising avenue for a circular economy," asserts Shittu (2019). Her insights underscore the transformative power of bio-plastics, not merely as an alternative material but as a catalyst for reshaping Africa's waste landscape. The bio-plastic industry has the potential to create new green jobs across the entire value chain, from farming and feedstock preparation to manufacturing and composting. This can empower communities and contribute to poverty reduction.

Despite their promise, bio-plastics face some challenges in Africa. The technology is still evolving, and production costs can be higher than conventional plastics. Additionally, infrastructure for collecting and composting bio-plastics needs to be developed. However, these challenges are not insurmountable. Governments, research institutions, and private companies are increasingly collaborating to address these issues. Investments in research and development are driving down production costs, and innovative solutions like community-based composting initiatives are emerging.

Bio-plastics represent a significant step towards a more sustainable future for Africa's waste management. By harnessing the power of innovation, collaboration, and local resources, bio-plastics can help African nations transition towards a circular economy, where waste is seen as a valuable resource rather than a burden. As this promising seed takes root and flourishes, it can blossom into a cleaner, healthier, and more prosperous future for generations to come.

The potential of bio-plastics extends beyond their biodegradability; they offer a closed-loop solution that reduces reliance on fossil fuels and minimizes the environmental impact during production and disposal. According to the United Nations Environment Programme (2019), a sustainable and healthy environment envisions a future where bio-plastics could be instrumental in creating local economies centred around sustainable material production and utilization. "Investing in bio-plastics isn't just an environmental decision; it's an economic opportunity for Africa. It could drive innovation, create jobs, and significantly reduce our dependence on traditional plastics," highlights Shittu. Her insights stress the need for strategic investments and policy support to harness the full potential of bio-plastics across the continent. Advocacy for a healthy

environment through bio-plastic production extends to fostering collaborations between governments, industries, and research institutions to accelerate the adoption and production of bio-plastics. Such initiatives required would aim to cultivate an ecosystem where research and development, sustainable manufacturing practices, and consumer education converge to promote bio-plastics as a viable solution.

SUSTAINABLE WASTE SOLUTIONS AROUND THE WORLD, INCLUDING THE UNITED STATES

Waste management is one of the biggest challenges facing cities in developing countries today. With rapid urbanization leading to overcrowded cities, growing mounds of waste clog streets and threaten public health. Sustainable waste solutions around the world, including the United States. The world generates 2.01 billion tonnes of municipal solid waste annually, with at least 33% not managed in an environmentally safe manner. Annual waste generation is expected to increase by 73% from 2020 levels to 3.88 billion tonnes in 2050. (World Bank 2019) High-income countries generate relatively less food and green waste, at 32% of total waste, and generate more dry waste that could be recycled, including plastic, paper, cardboard, metal, and glass, which account for 51% of waste. In high-income countries, about 19% of waste is recycled and composted, while in low-income countries, only 4% of waste is recycled. Poorly managed waste serves as a breeding ground for disease vectors, contributes to global climate change through methane generation, and can even promote urban violence. Effective waste management is expensive, often comprising 20%–50% of municipal budgets. Although the U.S. has not been mentioned in the statistics, the country has been actively promoting sustainable waste management practices, such as recycling and composting, and reducing food waste.

Environmental activists such as Omolara Shittu (2020) has made frontal efforts to tackle Nigeria's escalating waste crisis by promoting recycling and sustainability. In the dynamic scope of environmental resource management, some entities are driven by a passion for minimizing landfill waste and implementing effective waste segregation practices. This has been achieved through embarking on specialized training as an environmental resource specialist, focusing on reducing the environmental burden on land resources and preventing soil and water contamination.

Having improved their skills through training programs, seasoned experts in waste management have continued their commitment to continuous development as evident with a waste collection company. This is made possible with the introduction of the principles of the three Rs (Reduce, Reuse, and Recycle) in Management, emphasizing sustainable practices.

CONCLUSION

Sustainable waste management has had a significant impact on environmental stewardship and innovative approaches, dedication to developing solutions to a clean and healthy environment and commitment to community empowerment have made a lasting difference. This appears to be making changes to the waste management industry, promoting environmental sustainability and public health.

Beyond waste management and sustainable solutions towards a clean and healthy environment, this paperwork aligns with the United Nations Sustainable Development Goals, especially those related to affordable clean energy, sustainable cities and communities, responsible consumption and production and climate action.

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