

LEVERAGING THE POTENTIALS OF ENVIRONMENTAL ADULT EDUCATION IN MITIGATING IMPACT OF GROCERY WASTE IN RIVERS STATE

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ABSTRACT: This paper examined the impact of grocery waste in Rivers State and highlighted Environmental Adult Education strategies and programmes that could be adopted in mitigating such impacts. Some of the impacts of grocery waste in Rivers State as pointed out on this paper include; environmental impacts such as greenhouse effect due to release of methane, flooding due to blocked drains, air and water pollutions resulting from decomposing grocery wastes. Emission of foul odour and easy spread of diseases by vectors are listed as healthy impacts of grocery waste disposal. Economic impacts include financial and economic loss on the part of individuals, food producers and government due to huge investment towards waste management. Grocery waste contributes to the challenges of food insecurity, hunger and poverty which can be tagged as social impacts. While grocery waste affects human directly, the aesthetic challenges posed by grocery waste disposal cannot be overemphasized. It leads to aesthetic defacement and creates an uninhabitable environment. This paper also highlighted effective strategies that would aid in curbing effects of grocery waste as awareness creation through environmental literacy, environmental stewardship, waste management and consumer adult education. Imbibing sustainable practice such as waste re-use, refuse and reduce through composting and recycling programmes. Other EAE strategies for effective grocery waste management and increase in collaboration and partnership with both private and government agencies for financial and technical support in promoting EAE strategies.

Keywords: Environmental Adult Education, Strategies, Potentials, Impact, Grocery waste.

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INTRODUCTION

Human existence is largely associated with production and consumption of commodities which may impact the society or environment either positively or negatively. The challenges faced with food security and conservation cannot be treated without carefully providing solutions to the issue of waste management. Food and Agricultural Organization (2019) stated that tones of grocery wastes are being dumped indiscriminately, thereby causing environmental hazards.

Grocery waste management is an environmental concern which can lead to environmental problems. Mbalisi (2019) cited environmental issues as activities that have the potentialities of causing environmental hazards, which are capable of causing environmental problems. Indiscriminate grocery waste management poses great danger to the ecosystem therefore the need to adopt contemporary best principles. In curtailing the effect in the society.

However, grocery waste management in Rivers State, Nigeria is a significant issue. The increase in generation and disposal of grocery waste in the state can be traced to pace of urbanization, increase in population growth rate, in industrialization, entrepreneurship, branding, innovations and consumption patterns. Buttressing the background to grocery waste generation can be curled from Oyebamigii, Olumati and Nwogu (2016), that the environment in Rivers State is being placed under increasing pressure from a growing population, lifestyles and improvement in living standard. Sharing the same view is Igoni and Harry (2017), they stated that Rivers State is one of Nigerians most populous states with over 5 million estimated dwellers, generates a large amount of waste, which leads to expenditure of over ₦500 million in management of 60,000 metric tons of waste from the four local government areas in Port Harcourt city.

Several efforts have been put in managing waste in Port Harcourt such as the establishment of (RIWAMA), Rivers State Waste Management Agency, yet, the generation of grocery waste is on the increase and places more challenge on the environment. Therefore, the need for a wholistic and proactive approach to curtailing effect of grocery waste leveraging the potentials of environmental adult education; which is the thrust of this paper.

Concept of Grocery Waste

Any food and food related item typically for household use, purchased from a shop, supermarket, grocery shops, restaurants are referred to as groceries. examples of groceries include perishable foods such as fruits and vegetable; meat and dairy products; processed; canned or packaged foods in different materials and household items such as cleaning supplies, paper products and so on. Production and distribution of these groceries takes several processes that create avenue for waste generation. Producers and sellers often dispose goods that are not useful, damaged, or expired. While, consumers too, often dispose empty used cans, plastic bottles, bags, spoilt food sources, such as rice, beans, garri, fish, meat, vegetables, food wraps and peels. All these are considered to be grocery waste. They are termed waste because they are no longer useful, or can no longer serve the purpose for purchase. Though, wastes can still be used for other purposes, but once commodity losses its immediate value, it is considered a “waste”. Different scholars have defined waste differently.

Ijah (2016) defined waste as anything that is no longer valuable to the owner and therefore must be disposed of. This emphasizes the need for a commodity to serve value in order to remain relevant. This definition also stresses the point that a commodity can loss value for a person at a particular time, yet useful to another at same time. May be to serve a different purpose. Okorie (2022) and Wani et al. (2024) shared same view on definition of waste as objects marked for disposal and products and substance which is no longer suited for its intended use. However, any food item or packaging materials used in making food items appealing and preserved that are no longer usable or has need to be disposed is referred to as grocery waste. They include expired or spoiled food stuff (fishes, meat, eggs, vegetables, fruits), unsold food due to over stocking, Packaging waste materials such as plastic cans, bottles, boxes, wraps, cellophane bags, paper bags and so on.

Therefore, sources of grocery waste include:

- **Households:** This can be as a result of poor consumer behavior, poor meal planning and lack of proper food storage or inadequacy of storage facility as identified by Secondi (2019).
- Food service establishments such as restaurants, fast food centres, canteens, road side “bukers” or “mama put” joints etc. usually generate lots of grocery waste due to low patronage, spoilage and over preparation.
- Grocery shops and retail outlets. Teller (2018) stated that grocery stores generate waste due to overstocking, damaged and expired goods, especially in the markets.
- Agricultural wastes: Tons of grocery waste are dumped daily by fish, plant and vegetable farmers, birds or poultry farms due to poor storage of farm produce, over-harvesting, death of animals such as, goats, pigs, fishes, and chicken.
- Parties and social events: These amongst others are sources of grocery waste. Whatever their sources may be if not properly disposed or managed can lead to environmental challenges. Current pattern of grocery waste disposal in Rivers State is very poor as dwellers practice the following unsustainable approaches to waste management as pointed out by Ephraim (2014), as littering (this is throwing out of wastes to the streets from a moving van or from homes, open burning and open dumping. Wastes are seen dumped at the streets, major roads, motor parks, roundabouts in Port Harcourt. From Choba, Rumuolumeni, Rumuokwuta and so on, grocery wastes are being piled up. This is a major waste challenge at the heart of the city. Dumping into gutter, this is a common sight during the rainy season. This is more pronounced by traders and dumping in any available space or bush.

The Rivers State Waste Management Agency (RIWAMA) is responsible for managing waste, especially in the urban cities such as Obio-Akpor and Port Harcourt Local Government Areas, but due to several challenges such as inadequate infrastructure, poor public enlightenment, insufficient funding and lack of will power grocery waste management suffers great set back (Nkere & Iwunze 2024). This has created avenue for private companies to venture into waste collection which is sometimes not regular and inefficient.

IMPACT OF GROCERY WASTE DISPOSAL IN RIVERS STATE

Grocery waste has a massive impact on society and the entire ecosystem. Such impacts can be categorized as environmental impact, economic and social impacts:

1. Environmental impact:
 - Release of methane which will lead to greenhouse gas. This is as a result of food waste decomposing on landfills and unauthorized areas.
 - Flooding as a result of dumping of refuse in gutters and water ways.
 - Pollution: Air pollutions and water pollutions due to decomposing grocery waste
 - Blocked drains.
2. Health impact

- a. Haka as stated by Ijah (2011), summarized health effects of poor waste disposal as:
 - Emission of foul odour
 - Outbreak of disease through breeding of rodents such as rats also flies that acts as vectors. Succinctly put, it leads to spread of malaria, typhoid and cholera. In the same view, Ike, as stated in Okorie (2022), cited Port Harcourt as one of most polluted cities in the world. Also, Ezimah in Woha (2023), has it that the quality of the human environment determines the quality of life of the people.
3. Economic impact: Grocery waste have significant impact on the economy such as;
 - It leads to economic or financial loss. If food waste could be well managed, it will lead to cost-reduction for families. People will be able to manage their limited resources to the benefit of the family. While the saved income will be used to finance other projects. Friman and Hyytia (2022) explained that grocery waste reduction also benefits the agriculture and food production sector including tourism.
 - Loss of foreign exchange, as a result of low export rate. When tons of food supply are being wasted and disposed indiscriminately, certainly, there is going to be a huge drop in exportation of goods.
 - Loss of government revenue due to high rate of investment in waste disposal.
 - Reduced property value, Nkere and Iwunz (2024), stated that the Rivers State Government shells out over ₦500 million monthly to manage around 60,000 metric tons of waste from four local government areas.

However, grocery waste represents significant economic losses. Reducing grocery waste could have a positive impact on total output, G.D.P, and employment UNEP (2021), acknowledged reducing food waste as a high level policy target, incorporating it into the Sustainable Development Goals (SGDs) for 2030.

4. Social impact: Grocery waste has social effect of promoting food insecurity and leading to increase in hunger and poverty. Several households are food starved, while records of food wastage during parties, funerals, celebrations are one the increase. Certainly, reducing grocery waste can help address food insecurity and promote actualization of Sustainable Development Goal 2: (Zero Hunger). (Tchonkovang et al., 2023)
5. Aesthetic impact: Grocery waste can have a significant impact on aesthetics, contributing to a negative visual environment and affecting community appearance. Often times the Choba /NTA road, Rumuokoro, East/West road, Rumuola, Ikwerre road, Iwofe road, Mile 3 market axis are usually sighted with ugly waste materials such as discarded packaging rotting food, vegetables, and so on. Creating an eyesore. Indiscriminately dumped food waste defaces the aesthetics of any community and works if less desirable. Any environment that is characterized by litter; debris and overflowing trash cans degrades the beauty of an environment and makes it uninhabitable. This leads to reduced property values and lacks a pride of place.

Dekor and Amiye (2023), on a study conducted on “Environmental Waste Management Practices Among Food Merchants in Diobu Markets of Port Harcourt”, observed that

indiscriminate disposal of waste by food merchants has robbed the city off her name “The Garden City”. This is to say that indiscriminate grocery waste disposal leads to aesthetic defacement and diminishes tourist potentials of a city.

POTENTIALS OF EAE IN MITIGATING GROCERY WASTE

Environmental adult education is crucial for effective grocery waste management. Ephraim (2014) emphasized the role of EAE in sustainable waste management such as exposure to knowledge, skills and attitudes necessary to manage waste sustainably.

It is germane to clarify the concept of Environmental Adult Education in order to present a clearer picture of its potentials, strategies and benefits of leveraging on its potentials.

ENVIRONMENTAL ADULT EDUCATION

Environmental Adult Education (EAE) is a discipline that combines the principles of environmental education with those of adult education to provide a sustainable and wholistic solutions to environmental challenges. Adult education help adults to become fully equipped to adjust to changes and tackle challenges in their society. Therefore, the necessity to incorporate these principles that targets the adults for social change. In handling environmental concerns, the adult becomes the target audience for the following reasons:

- Woha (2023) identified adults as both actors and villains (subject and object) of environmental concern. That is to say, that adults play active role in generating man-made environmental challenges.
- Adults are major decision makers in the society and will be able to make an informed decision when sensitized.
- They constitute major work force of any society, therefore, impact on the environment through socio-economic activities.

Further on the definition of environmental education, Mbalisi (2016) defined it as the application of the theories, principles, programmes, methodologies, approaches and resources (human and materials) of adults education in educating adults about the environment and its associated resources with the conscious intention of developing in them knowledge, attitudes and skills required to generate a sense of responsibility and commitment toward resolving present environmental problems and preventing future ones. This definition is encompassing and touches every feature of sustainable education. The goal of E.A.E is to equip the adults with necessary skills and will-power to deliberately live in harmony with forces of nature as they interact with elements of nature for daily survival.

In the same vein, UNESCO in Eheazu and Ibanga (2019), aptly defined EAE as a learning process which increase people’s (adults’) knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters the right attitudes, motivations and commitments to make informed decisions and take responsible actions. The platforms of EAE covers the three basic forms of education; namely, formal (schools and institutions), informal (everyday life experiences, media and so on) and non-formal (workshops, seminars, conferences).

From the foregoing some of the potentials of EAE in mitigating grocery waste in Rivers State include:

- Raising awareness and knowledge of the environmental, social, economic, health and aesthetic impacts of grocery waste.
- Learning about sustainable food systems, food recovery and redistribution.
- Recognizing the importance of food planning, storage, and preparation.
- Changing behaviours and attitudes by adopting mindful consumption habits, such as buying only what is needed.
- Reducing food waste by using up leftovers and composting grocery waste for agricultural manure.
- Embracing sustainable food choices, like buying locally sourced and seasonal produce for optimal satisfaction
- Fostering community engagement and cooperation through food-sharing ideas and interventions.
- Establishment of local food banks for ease of redistribution

EAE STRATEGIES FOR MITIGATING THE IMPACT OF GROCERY WASTE

The impact of grocery waste in Rivers State cannot be overemphasized. Therefore, the need to designing and utilize appropriate environmental adult education programmes to cushion the effect of food waste and forestall future indiscriminate food waste disposal practices. Challenges associated with grocery waste management needs prompt action, therefore the need to adopt EAE programmes and strategies that are need oriented and life-long. EAE strategies for mitigating impact of grocery waste includes the following; raising awareness, engaging local community, and collaboration.

Raising Awareness: This is the first step involved in combating effects of grocery waste. This is because most people who are involved in waste generation and indiscriminate disposal of waste have little or no knowledge of the environment and damages done to the environment are acts of ignorance. Therefore, with proper knowledge of the environment, citizens will be able to make informed decisions. Ononeze et al. (2018) also emphasized the relevance of awareness creation and its possible effect of bringing to the consciousness of citizens the consequences of grocery waste to the environment, how they contribute to it and how grocery waste affects them in return.

EAE raises awareness in the people through the following programmes environmental literacy education, environmental citizenship education / stewardship programme, waste management education programmes and consumer adult education programmes.

Environmental Literacy Education Programme

Basically, an environmental literate person is anyone who is able to consciously observe and understand environmental challenges around him/her and is able to take a decisive action in managing same. Along this grain of thought, Dissinger and Ruth in Eheazu (2013) suggested that environmental literacy is essentially the capacity to perceive and interpret the relative health of environmental systems and take appropriate action to maintain, restore, or improve the health of those systems. This definition of Dissinger and Ruth portrays the environmentally literate citizen

to possess the ability to do a need assessment on their environment, gather relevant information as to ascertain the cause of the problem, take necessary actions as to restore, and improve on the health of the environment.

Environmental Citizenship Education/Environmental Stewardship

Citizenship participation in environmental concerns is of great importance to building a sustainable environment. Having full knowledge of their environment, associated challenges and responsibilities as citizens will foster the pace of sustainable grocery waste and promote easy mitigation the effect of grocery waste.

In connection to this, Dokubo and Elemuwa (2021) opined that citizenship participation in developmental processes leads to self-reliance, self-direction and spurs the spirit of patriotism and selflessness towards actualizing a general concern.

Environmental stewardship according to Woha (2023), involves active, conscious actions in preserving, protecting and conserving the environment. In the same vein, Ijah (2015) summarized environmental stewardship as activities of an individual, organization, or other entities with respect to protecting the environment through recycling, conservation, regeneration and restoration, while taking responsibilities for their choices and the environment. Through citizenship/environmental stewardship education programmes, citizens are made to be aware of their individual and collective impact in waste generation and empower them to become environmentally conscious.

Waste Management Education Programme

Waste management education is necessary in promoting environmental sustainability and responsible waste generation, treatment and disposal in Rivers State. Components of waste management education include, awareness of “the how of waste generation”, understanding of its effect on the environment, and inculcation and empowerment of special skills required for effective waste reduction, recycling and disposal. In an attempt to proffer solution to impact of waste in the society, Ephraim (2014), stated that waste management education is paramount for promoting sustainable solid waste management practices through behavioural changes.

Consumer Adult Education Programmes

Most household grocery wastes are generated by consumers due to lifestyle and unhealthy consumption pattern. It is necessary to sensitize, inform and enlighten adults on the danger of poor purchasing and consumption, with relevant options on how to imbibe prudent consumption habits to foster grocery waste reduction. Ijah (2016) pointed out food contamination as a contributory factor grocery waste generation. Therefore, suggests the need for proper consumer adult education to promote food storage and preservation.

CONCLUSION/RECOMMENDATIONS

This paper has extensively discussed the impacts of grocery waste on the environment and how EAE programmes and strategies can be adopted [in mitigating impacts of grocery waste and mismanagement. It is imperative to state that leveraging in EAE on the subject matter will lead

to reduction in grocery waste generation and its huge negative environmental impacts, lead to improved community awareness and participation in waste processing, increase in environmental protection and improvement in living standard, food security and aesthetics.

Based on the above, the following recommendations are made:

- Stakeholders, NGOs, government at all levels must support and pull together resources to implement EAE initiatives and programmes.
- Training on food preservation should be taken seriously.
- Emphasis on the three Rs, refuse, re-use and reduce.
- Publicity should be a top priority, leveraging the potentials of the media such as radio, television, internet sources.
- Involvement of local campaigns that emphasizes the use of local language in addressing grocery waste management.
- More of private involvement in waste management as well creates job opportunities.
- Facilities for food storage and preservation should be made available by the government.
- Rules and regulations guiding grocery waste disposal should be localized and tailored toward community's peculiarity.
- Establishment of local sanitation officials at designated places such as the markets, abattoirs, garages etc.
- Regular inspection of local communities and public places should be pertinent.

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