



Sustainable Management of Solid Waste in Nigerian Urban Centres

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Abstract

Solid waste disposal the world over has become a matter of grave concern that need urgent attention. This paper therefore investigated the extent to which environmental adult education influences sustainable solid waste disposal in Nigeria urban cities. The paper x-rays the key concept that is central in the academic discourse viz: waste, solid waste, sustainable solid waste and environmental adult education. It also look at forms of environmental adult education and types of solid waste. The paper further focuses on factors responsible for unsustainable solid waste disposal. It also x-rayed the role of environmental adult education in sustainable solid waste management. Conclusion was finally drawn urging all members of the human society to put their hands on deck in order to sustainably manage waste in our environs. The paper recommended that the government at all levels should adopt better methods of disposing waste as well as enforcing appropriate environmental legislation and environmental waste education should be included in the school curriculum.

Keywords: sustainable management, solid waste, urban cities, environmental adult education

Introduction

The magnitude of waste generated on a daily basis especially in our urban centres is becoming quite alarming. Solid waste management in the past three decades has become one of the major environmental problems in urban centres across the globe and particularly in Nigeria. Several billion tons of solid waste are generated each year in Nigeria urban cities such as Aba, Onitsha, Owerri, Lagos, Port Harcourt, Kaduna, Calabar, etc. The principal source of this waste generation, consist of agricultural waste, industrial waste and municipal waste.

Man's unguided development and ineffective solid waste management, the rapid growth in urban population and the growing level of industrial activities especially in the urban centres are serious threat to solid waste management. This ugly situation has resulted in the degradation of the environment and outbreak of disease such as cholera and diarrhea (Uchegbu, 1998).

We all produce waste in nearly everything we do. Thus, waste generation and management is everyone business. The government and non-governmental organization has made frantic effort in recent times to manage waste in some urban cities in Nigeria. This attempt do not seem to have yielded positive impact as most major cities are littered with solid waste in strategic locations like market and streets. Most residence in urban cities is not conscious of the consequences of improper solid waste disposal to man and the environment. Thus, it has become imperative to properly educate all the urban dwellers on the consequences of improper waste disposal to the environment and man. Environmental adult education seems to be the answer to this clarion call since it is the only aspect of education that can impart knowledge to adult and youths in school as well as those who are out of school. It is based on the above that this paper seeks to investigate the role of environmental adult education in sustainable management of solid waste in Nigerian urban cities.

The concepts waste, solid waste and waste management

Waste could be defined as any unavoidable material resulting from domestic or industrial operation for which there is no economic demand which must be disposed of. Waste are materials which though may no longer be needed here, may become a feed stock or raw material elsewhere. Wastes according to Odocha (1994) are those materials which are generated as a result of normal operations over which we have control in terms of their production disposal or discharge. Waste is any substance, solid liquid or gaseous that remain as residue or an incidental by-product of the processing of a substance and for which no use can be found by the system that produces it, waste therefore do not apply or means worthless substance.

Solid waste is any useless, unwanted or discarded material that is not liquid or gaseous. Solid waste include house hold garbage or rubbish, commercial refuse, industrial waste, street sweeping, construction and demolition debris, sanitation residue, abandoned automobile and dead bodies, Anijah-Obi (2001).

Lawal, Aniah, Uche, Animashaim and Anijaobi-Idem (2010) see solid waste as unwanted or discarded waste materials from houses, street, commercial, industrial and agricultural operations. They are made up of countless different materials such as dust, food wastes, papers, leaves, metals, plastics, glass, discarded clothing, garden wastes, construction and pathological wastes.

The concept of waste management

The concept waste management could be described as the appropriate method of disposing wastes safely in such a way that makes it less harmful. It could come in form of treatment and energy conservation. It refers to the process of collecting and treating solid waste. It also offers solutions for the recycling items that do not belong to garbage or trash. Solid waste management consists of all the activities required to manage waste from its inception to its final disposal.

The concept of sustainable solid waste management describes the basic principles and recent advances for handling solid waste in an environmentally sustainable way. It refers to efficient, safe, treatment and disposal of hazardous and other waste. It is a strategy for achieving environmental quality in both the developing and developed world.

The concept environmental adult education

Anthony (2014) defined environmental adult education as a type of education which aim at developing a world population that is aware and is concerned about the environment and its associated problems and which has the knowledge skills, attitudes, motivations and commitment to work individually and collectively toward solution of current environmental problems and the prevention of new ones.

According to Clover (2003) environmental adult education could be seen as a hybrid outgrowth of environmental movement and adult education combining an ecological orientation with a learning paradigm to provide a vigorous educational approach to environmental concern. In a layman palace environmental adult education refers to the effort of teaching environmental issues and how individual and groups can manage or change their life styles and ecosystems to live sustainable. It is a type of education which takes place in both formal non-formal and informal education setting. It is an educational

typology in which the educator listens and respects the views, opinions and inputs of the learners and all participants concerning environmental issues

Forms of environmental adult education

Eheazu (2016) identified three forms of environmental adult education namely: Formal, non-formal and informal environmental adult education. According to him formal environmental adult education is provided within an institutional setting. The curriculum of formal environmental adult education consists of both theoretical and practical element geared toward developing the learners' knowledge on the forces affecting ma's surrounding. It adopts the participatory approach which is learner centered and anagogical in nature. The non-formal environmental adult education is an alternative to the school or institutionally based system. It is not systematized or hierarchically arranged like a school curriculum but addresses commercial, organizational, industrial and societal needs. It helps in creating awareness of environmental issues and challenges and provides solutions to such problems. The non-formal environmental adult education would take the form of awareness creation, seminars, conferences, workshops and short skills training programmes. It could take place in places of employment, town halls, village squares, fishing ports, and market squares.

Informal environmental adult education is that form of environmental adult education that learning outcomes take place unintentionally, spontaneously and accidentally. It takes place outside a school setting but it very informative. It could take place anywhere and anytime. There is however no uniformity in content delivery and methodology between one mode of informal education and another. The objectives to be achieved determine the contents, materials and the methods to be used. Informal environmental adult education provides adult populace ample opportunity to learn about their environment and to develop commitment to participate in the solution to environmental problems. The radio, television, bill boards, mobile phones posters, and town criers helps to impact knowledge on environmental issues informally.

Types of solid waste

Lawal et al (2010) categorized solid waste into three types – residential, instrumental and commercial, municipal and transportational and industrial solid waste. According to them residential and commercial solid waste include: Garbage, rubbish which include papers, cardboard wood, bones, plastics, clothes, rubbers, leaves leather which are purely

combustible and noncombustible solid waste which include, metals, tins, cans, bricks, ceramics glass, bottles and residues from cooking. Municipal and transportational waste are bulk waste found in the streets. They include discarded large motor parts, tires, refrigerators, furniture's, palm fronts and stumps and large appliances. Industrial solid waste according to them include industrial refuse, construction and demolition wastes, sewage treatment residues, animal and agricultural waste and special waste – hazardous waste pathological waste, explosives, radioactive materials, security wastes.

Anijah (2001) identified two types of solid waste (a) industrials solid waste and (b) commercial and domestic solid wastes. Industrial solid waste according to her are waste materials generated in the course of manufacturing process, while domestic solid wastes are the by-products of house activities and consumption such as wrapping papers, vegetable, empty cans, bottles or containers.

She further distinguish those industrial and domestic wastes into those that can be rapidly decomposed by natural processes or engineering systems such as leaves bones, cotton rags etc. otherwise known as biodegradable waste and non-biodegradable waste which is the opposite. None biodegradable waste cannot be broken down or decomposed by natural means but they can be recycled.

Cunningham, Cunningham and Saigo (2005) also categorized solid waste into industrial waste and municipal waste. According to them industrial solid waste include waste generated from mining and mineral production, while municipal solid waste is a combination of household and commercial refuse.

Factors responsible for unsustainable solid waste management

Enger and Smith (2000) stress that lack of space for dumping of solid waste has become a major problem for many large metropolitan areas throughout the world. They also added that increase population in urban towns and cities across the globe, lack of suitable land available for landfills as well as increase financial burden on communities are the major factors responsible for unsustainable solid waste management.

Uchegbu (1998) identified tremendous urban growth as a result of the rural-urban draft as a major factor responsible for unsustainable solid waste management. According to him the growth in population has given rise to the rising mountains of garbage which now characterize most of our towns and cities. He further stressed that in the case of refusal, its

collection and disposal have become the most glaring problem in urban towns and cities, since Nigeria independence that have defied solution. He further maintained that of the problem if solid waste management in developing countries including Nigeria could be attributed to myriad of factors which include, inadequate funding, inappropriate technology, lack of or ineffective implementation of government policies, behavioural pattern of the populace and lack of awareness.

Lawal, Aniah, Uche, Animashughn and Anijah-Obi (2010) stressed that large population which generate complementary high volumes of wastes that cannot be easily disposed is one of the major factors responsible for unsustainable solid waste disposal. Other factors according to them include; apathy on the side of urban dwellers; bureaucratic bottlenecks that don't give way for easy sourcing of funds, adequate manpower and functional tools required for managing waste; the role of waste management authorities and the huge amount of money involved in waste management.

Uchendu, Anijahobi-Idem, Jaja, Obi and Inyang-abia (2010) identified factors responsible for unsustainable solid waste management to include. Institutional problems, delay or unwillingness to enact new laws to bring environmental management as closely as possible as it is the practice in develop countries, lack of or inadequate staff training and man power development, poor strategies adopted to manage waste and financial support.

The role of environmental adult education in solid waste management in Nigeria

The role of environmental adult education in solid waste management cannot be over emphasized. Hoba and Musaruwa (2011) stress that for equitable and sustainable development to strive they must be continuous learning process based on respect for all life. Such education they added, must contribute to human and societal transformation and ecological preservation. In order to address the problem of unsustainable waste management in Nigeria urban cities environmental adult education should:

- a) Build a network of environmental adult educators from civil societies, people or organizations and government who can act as catalyst in brining about changes in their respective communities.
- b) Facilitate dialogues between people and government for effective solid waste disposal.
- c) Work for capacity building of people to understand and respond to the impact of improper solid waste disposal.

Anthony and Awhen (2012) maintain that environmental adult education play a potent role in helping people put positive attitudes toward the environment, assist them to have a strong feeling and concern for the environment and motivate them to actively participate in its protection. By changing the attitudes of people towards the environment they will adopt various strategies such as recycling incineration open pit dumping, composting, sanitary land fill etc to reduce waste within their locality.

Environmental adult education, no doubt, helps in creating awareness amongst the public on the negative impact of improper solid waste disposal. Anthony (2012) identified various programmes through which public awareness could be raised. They include:

- ❖ Formal campaign through the radio television and the print media.
- ❖ Formal and informal discussions among residence.
- ❖ Jingles and television discussion
- ❖ Printing of posters and hand bills to educate and inform the public on the ills if unsustainable waste management.
- ❖ School debates on solid waste disposal
- ❖ Publication of articles and editorials in relevant journals.
- ❖ Organization of seminars
- ❖ Formation of conservation clups in schools and colleges and organizing environmental games to display the effect of improper solid waste disposal.

Lawal, Aniah, uche, Animagham and Anijah Obi-Idem (2010) stressed that education (formal and informal) has very serious implication on waste management. According to them such education should aim at developing positive environmental attitude and action among people and seek to stimulate people's awareness about their consumptive patterns and how best to get involved in waste management activities.

Sustainable solid waste management requires education that is capable of changing people's misconception and attitude about the environment. Environmental adult education has over the years developed as a distinct field of study which combines principles and theories to provide practical educative experiences, thereby inculcating in the adult learners positive attitudes, skills and knowledge. People behavioural patterns have to change if the amount of solid waste they generate have to be reduced. This is due to the fact that the problem of waste disposal is not only caused by industries but also by everyday behaviour of people at home, work and on the streets. The knowledge of environmental adult education therefore, will help the adult learners harmoniously

interact with the environment and sustainably manage solid waste within our surroundings (Eheazu, 2016).

Through environmental adult education learners and social groups could be assisted to acquire knowledge and a variety of experiences on solid waste management. The knowledge acquired could help the citizens to realize the irreversible damage of improper solid waste disposal to man and the environment. Thus, the knowledge acquired through environmental adult education would also help urban dwellers to regularly evacuate their dustbins and waste bins. It will also help waste management agencies to adopt various strategies such as open dumps, ocean dumping, land-fills, incineration, recycling, composting and reuse strategies (Anthony & Awhen, 2017).

According to Anijah Obi (2001), one of the key areas of concern of environmental education is to help individuals and social group develop a sense of responsibility regarding environmental problems to ensure that appropriate action is taken to solve these problems. Through environmental adult education therefore people at all levels could be empowered to actively participate in waste management programmes that would help to reduce or sustainably manage waste our urban towns and cities. More so, adult are more involve in the depletion of the environment. Thus if there are allowed to participate in decision making on solid waste management it will help to reduce the volume of waste in our localities.

Anthony (2003) maintains that environmental adult education assists people to become literate about problems and negative changes currently taking place in the human environment. He further stressed that environmental literacy whether formal, informal, and semi-formal or non-formal has serious implication in maintaining environmental quality. Literacy open our eyes and make us to become conscious of the negative impact of human action on the environment when an adult citizen become conscious of the impact of man activities on the environment he will stop dumping waste anywhere and anyhow, make sure that he carry out different waste management strategies to properly managewaste and will also help to educate other people within the neighbourhood on the negative implication of improper waste disposal. This could be achieved by establishing adult education centres in all communities in order to help every member of the society to become environmentally literate.

Conclusion/recommendations

There is no doubt that huge amount of solid waste is generated daily in our urban towns and cities. This ugly development could be attributed to man's unguided development, rapid population growth, the growing level of industrial activities, ignorance, poor attitudes of people towards the environment, illiteracy, lack of or adoption of proper waste management strategies lack of commitment and poor supervision by waste management agencies.

Waste has serious detrimental effect on man's health as well as the environment if it is not properly dispose. Since waste disposal is every man's business we should therefore not seat on the fence and wait for only the government agencies to evacuate waste. We must all put our hands on deck to ensure that solid wastes within our residential areas are properly dispose. Moreso, environmental waste education should be taught in schools and colleges in all urban towns and cities were volume of waste are generated on a daily basis. Finally, the government at all levels should adopt better methods of disposing waste as well as enforcing the pollutant's pay principles on defaulters and carrying out positive measures on defaulters.

References

- Anijah-Obi, F. N. (2001). *Fundamentals of environmental education and management*. Calabar: Clear lines publications.
- Anthony, G. B. (2003). Sustainable development through environmental adult education in G Umoren, N. U. Ntia, and I. Bo.... readings in adult education: Calabar: Glad Tidings Press Ltd.
- Anthony, G. B. & Awhen, V. O. (2003). Environmental adult education: A Veritable tool for combating global warming and climate change. *The LEAJON: An Academic Journal of Interdisciplinary Studies*. Calabar Jocharisam Publishers, 4(1).
- Anthony, G. B. (2012). Awareness creation through environmental adult education as a mean for combating the problem of deforestation in Cross River State. *International Journal of Educational Administration, Planning and Research (IJEAPR)*. A publication of the Department of Educational Administration and Planning, 5(1) <http://www.grceembopomfound>.

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- Anthony, G. B., Essien, C. K. & Tawo, C. N. (2014). Environmental adult education: An important tool in curbing the problems associated with mining. *International Journal of Adult Education and Developmental Studies (IJCEDs)*, 2(3).
- Clover, O. E. (2003). Environmental adult education: Critique and creativity in a globalizing world. *New direction for adult and continuing education* (99). Retrieved from <http://www.3interscience.wiley.com/journal/104558497/abst>.
- Cunnigham, P. M., Cunnigham, M. A. & Saigo, B. (eds) (2005). *Environment science: A global concern*. New York: McGraw-Hill companies Inc.
- Enger, E. D & Smith B. P. (2000). *Environmental science: A study of interrelationships*. New York: McGraw-Hill.
- Eheazu, B. A. (2016). *Situational challenges of environmental degradation in Nigeria: Adult education as a response*. Valcdictory lecture at the University of Port-Harcourt, Nigeria.
- Hoba, I & Musaruwa, J. H. (2011). *Fighting climate change through knowledge*. Adult education and development.
- Lawal, M. B., Aniah, E. J., Uche, S. C., Animashaun, I. A. & Anijah-Obi-Idem (2010). *Education for sustainable development*. Lagos: Macmillan Nigeria Publishers Limited.
- Odocha, J. N. K. (1994). "Green revolution and management in a depressed economy. In S. N. Uchegbu, 1998. *Environmental management and protection*. Enugu: Precision Printers and Publishers.
- Uchegbu, S. N. (1998). *Environmental management and protection*. Enugu: Precision Printers and Publishers.
- Uchendu, V. C., Anijah-Obi-Idem, F. H., Jaja, S. O., Obi, F. B. & Inyang-Abia, M. E. (2010). *Planning and process in environmental education*. Lagos: Macmillan Nigeria Publishers Limited.