

# Utilization of Solid Waste (Used Straws) Involving Environmental Problems & Management in Awka

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***Abstract- Plastic straw waste, a component of urban solid waste is quite problematic, its presence is an indication of over consumption and that the materials are not being used efficiently. It is non-biodegradable and can stay in the environment for a longtime causing severe environmental degradation. Unless it is properly disposed and well utilized, environmental degradation is unavoidable. This research work scrutinizes the management of solid waste among the residents in Awka-south locality of Anambra state, Nigeria and aims at proper collection and utilization of plastic straw in production of creative fashion accessories. The researcher believes that the ultimate way of minimizing waste is through utilization and recycling. This will also help in controlling the danger of waste pollution in the society.***

## I. INTRODUCTION

### 1.1 Background of the Study

The environment is a subject that is currently receiving attention all over the world because its fast deterioration has become a global issue and calls for intervention from all, ranging from the school children, house wives, the smokers, the builders, the market women, corporate bodies, industrialists scientists, environmentalists, the Visual artists. This is because it has become apparent that the present generation has a responsibility to protect and replenish the fast deteriorating natural resources in order to preserve its environment for the future generation. Mitra (1991).

After the advent of industrial revolution, waste has come into existence with its different environmental impact, and has been simply defined as any unwanted or used materials which is discarded after its primary use, or any product or substance that has no further use or value for the person or organization which

will be discarded. However, what may be discarded by one party, may have value for another. Caulfield, (2009). It is daunting seeing the amount of plastic waste being generated in our locality, and its potential negative effect on the environment are matters of concern to the government and society at large.

### 1.2 Statement of the Problem

In today's environment, man's attitude towards his environment is disheartening and the major problem of those living around waste or polluted area is health problem. The Nigerian government being aware of both the aesthetic and health implications of improper management of solid waste in the nation, promulgated Decree 58 for the establishment of a Federal Environmental Protection Agency (FEPA) on 30<sup>th</sup> December, 1988. This led to the formation of a National Policy on the environment whose goals include amongst others: to secure for all Nigerians a quality environments adequate for their health and wellbeing.

However, the researcher haven witnessed the awful and disgusting sight of waste in the environment decided to investigate the various means through which those wastes, particularly straw wastes can be recycled and utilized in the fashion industry. The problem studied focused on how some of the things society see as waste can be best managed to prevent the problem that waste cause to the environment.

### 1.3 Purpose of the Study

Environmental problems are one of the main characteristic feature of urbancities. These problems appear mostly in the form of solid waste while there have been already, various efforts to raise awareness for the recycling of these solid waste, not much formal work has been carried out through the Visual arts.

This study sets out to examine the contributions or the role of Visual arts in solid waste management towards invention in the global problem of environmental degradation, specifically, the study undertakes to:

- i. Enumerate the nature of solid waste in Awka metropolis and the system of solid waste plastic straw disposal by Awka residents.
- ii. Ascertain Anambra state government's efforts in educating the residents of Awka metropolis on solid waste management.
- iii. Ascertain the ways the Visual arts contribute to solid waste management in Awka metropolis.
- iv. Introduction of new ideas through the Creative production of fashion accessories with the straw.

In the course of the study, the researcher will produce fashion accessories like bags, belts, shoes, necklaces and bangles.

#### 1.4 Scope of the Study

In the course of the study, the researcher aimed at the immediate (drinking) straw waste generated in most restaurants, bars and marketplaces. These are transformed and used in the production of fashion accessories like, hand bags, bangles, necklaces, shoes, sandals, belts, earring and purse.

#### 1.5 Significance of the Study

A sizable amount of waste is being produced by the plastic and fabric industries. Some are being used before being discarded while some are off cut piece. Accessories like bags, shoes, rings etc, can consequently be produced with them. This project therefore, divulges the usefulness or reuse of these waste items, to ease pressure on the land-fills and other places like streets, gutters and the society at large and also identifies that straw waste can be put back to use.

#### 1.6 Limitation

During the course of the study, the researcher encountered number of challenges which limited her ability to some extent like in the practical aspect of the project work. The researcher was not able to collect enough colours of discarded straw needed. Sometimes, the researcher would go to restaurant

shops and beer parlours in search of the materials. The researcher also encountered some financial problems.

## II. LITERATURE REVIEW

The review of the literature is done under the following headings: Environmental Degradation; Solid Waste Management; and Visual Arts.

### 2.1 Environmental Degradation

Activities of human have always generated waste in the society. When the human population was relatively small and nomadic, it was not a major issue but became a serious problem with urbanization and the growth of larger community and environment. Environmental degradation can be defined as the unfavourable alteration of our surroundings caused by the result of human activities. Jana (1991) stated that Environmental degradation is the deterioration in the quality of environment or the quality of component of its surroundings. Such deterioration in environmental quality affects adversely the health and longevity of human beings and other living organisms.

Mitra (1991), also stated that the environmental degradation is the change of environment due to a number of factors such as population explosion, pollution of air and water, exploration of natural resources and other physical, chemical and biological factors. The amount of waste that is being produced by the plastic industries is enormous of which one of them is "drinking straw" these straws are being discarded after its primary use. The improper disposal of straws and other waste items have led to earth pollution and environmental hazards.

### 2.2 Solid Waste Management

Waste according to Fantola (1997), can be defined as a material flow pattern that is rejected by the society. Globalization is known to affect people's consumption usage of solid materials that eventually results in huge solid waste. According to Liton et al, (2004), solid waste is defined as non-liquid or non-gaseous products (e.g trash, junk and refuse) of human activities that are unwanted. Magutu et al, (2010) defines solid waste as which includes all domestic refuse and non-hazardous waste such as

commercial and institutional waste, street sweepings and construction debris. According to Clark (2002), Solid waste management is defined as the branch of Solid waste engineering associated with waste control of generation, storage, collection and transfer, transportation, processing and disposal of solid waste in a manner that is in accordance with the best principle of Public Health Economics, Engineering Conservation, aesthetics and other environmental consideration.

Wastes in whatever form, when not properly managed, constitute a great threat to human health and the environment in general. Busari and Olaleye, (2007) citing UNEP, (1992) explains that a threat is any activity, process or event whether natural human induced, that may cause or is capable of causing an adverse effect upon the status or sustainability of any component of the ecological diversity. One of the greatest threats to the environment and human health in recent times in most Nigerian urban cities is the heaps of garbage (solid wastes) that pile up in neighbourhoods and its ineffective management (Uchegbu, 2002). Wastes are generally seen as unwanted or discarded materials from houses, streets, commercial, industrial and agricultural operation (Lawal et al, 1995; Ukpog, 2006).

It could also mean when something is surplus to requirement or any material which has been used and is no longer wanted, because the valuable or useful part of it has been taken out (Oyeniya, 2011; Akinbola, 2009). The generation of waste according to Akinbola, (2009) is a natural consequence of human ecological and industrial process which increases proportionately with the rate of consumption, and also with scientific and technological activities. These unwanted materials which are discarded as a result of human or animal activity are a complex mixture of different substances some of which are intrinsically hazardous to health (Rushton, 2003). Most commonly they are solids, semisolids or liquids in containers thrown out of houses, commercial or industrial premises and can be classified into domestic, industrial liquids, solid, gaseous or air borne, organic, inorganic, hazardous and non-hazardous wastes depending on their nature and effects (Akinbola, 2009).

Aside from the obvious aesthetic cost, the problem of solid waste goes deeper. This is because many of these consumer products that are thrown away especially plastics, non-returnable bottles, aluminum cans etc are very difficult to destroy in nature and constitute serious environmental pollution if they are not properly disposed of.

How do we manage these wastes and save our environment from degradation and pollution? Many environmentalists have offered several alternatives suitable for checking waste. Jonas et al (2014) in offering alternatives to checking waste in Tanzania, suggests the traditional way of getting rid of solid waste that is through incineration. Incineration on the other hand, has its own environmental implication. Harmful pollutants may be emitted into the air, land and water when plastics are incinerated. "The by products of plastic combustion are air-borne particles emission (soot) and solid residue ash (black carbonaceous colour).

In a publication by the Mumbai government, (2008), the different rates of decomposition are shown as follows:

Table 1: Decomposition Rates of Solid Wastes

Type of litter	Approximate time of degeneration
Organic waste such as vegetable and fruit peels, leftover foodstuff, etc	A week or two
Paper	10 -30 days
Cotton cloth	2-5 days
Wood	10-15 years
Woolean items	1 year
Tin, aluminum, and other metal items such as cans	100 -500 years
Plastic bags	One million years
Glass bottles	Undetermined

(Source: Publication by the Mumbai government, (2008)

Past generations like the hunter-gatherer societies had few problems with waste disposal because they lived within small communities and their wastes were dispersed over large expanse of land causing little or no adverse effect on the environment (Ukpog, 2006;

Okpoechi, 2007). Also, Okpoechi, (2007) citing Melosi, (1981) and Brown (1993) writes that it was the neolithic revolution that brought with it the first problems of waste management because of the sedentary lifestyles and increased wealth. As early as 500 B.C., the increasing volumes of waste generated by the residents of Athens, led to edicts being issued prohibiting the throwing of garbage into the streets.

RinkuVerma et al (2016), opts that as a result of incomplete combustion of PVC, doxins and other hazardous substances may be formed. Others given the environmental implication of incineration suggest the transformation of the state of the material to a more available state. These they consider as recycling.

Delen and Nasir (2009, 7 - 10) Science world journal Vol. 4 discussed on plastic waste recycling, the sample collection of plastic waste recycling and the PVC tensile strength. Pages 8 - 10 of the article contain results of tensile strength for LDPE lends, HDPE blends while the last page of the article contains how polymer can be recycled. According to the authors, "a bleeding ratio of 80 (v) to 20 (w) is strongly suggested for these plastic types, since this offers the highest tensile strength for each type and this will go a long way in reducing manufactures lost.

Okeke, E. A. (2017) views recycling as involving processing the used materials (discarded substances of waste) into new products, to check discarding of the potentially useful materials. Also to reduce the consumption of fresh materials, reduce energy source utility, then reduce water and air pollution.

Dickens (1865) is of the view that recycling of waste will reduce the amount of waste and cost. He further maintains that the most direct way of reducing the amount of waste is to prevent waste being generated, altogether in this he suggests that products that can result to waste be not produced at all. It is however, true that we cannot do without some of the products that results into waste as our society will always have use for some of the products. For instance, plastics which is needed in the production of most consumable items. Plastics can take many forms and serve many purposes. Plastic is the general common term for wide range of synthetic or

semi synthetic organic amorphous solid materials derived from oil and natural gas. The word plastic is derived from the Greek word "plastikos" meaning fit for moulding and plastos meaning moulded.

The littering of land by plastic bags and straws present an ugly and unhygienic scene. These results from lack of proper collection and management. Plastic goes into water bodies which are already polluted due to many source in the water bodies, fishes and other aquatic animals swallow these plastic garbage while mistaking them as food items. In this way, plastic become a nuisance because of its non-biodegradability. In recycling, human can put waste plastics to many different uses.

Waste plastics can be converted to art as an alternative media on its own or mixed with other media. Goueiér (1960) as cited by Ngwu (2005) observed that "recycling an alternative media, reveals everyday objects especially waste thrown away". Object of daily use are witnessed in most of the works of the artist working with waste items. These discarded objects usually come from waste bins, cars, construction sites, kitchen, bars and restaurants. As our society is noted for consumption of drinks ranging from alcoholic and nonalcoholic drinks, the use of plastic straw has greatly increased. The straw after use are found littered in many parts of our environment.

Bogner, et al (2007) discusses the policies and measures of waste management and long-term considerations and sustainable development. The book stated that "for developing countries, it is a significant challenge to develop and implement innovation, low-cost but effective and sustainable measures to achieve a basic level of improved sanitation".

According to Collins dictionary: plastic drinking straw is a long thin hallow paper or plastic tube used for sucking up liquid into the mouth. As cited in Fernandez C. (2017), "plastic drinking straws are the ultimate in human wastefulness". He further claims that adults who use them are no better than eight year old.

Used for straw became part of the global plastic pollution when discarded. Most after single use, it is estimated that about 500 million straws (close to 3 million pounds) [1. 4kt] are used daily in the United states alone. An average of 1 - 6 straws per capita per day made from polypropylene, mixed with colorants. Many plasticizers do not bio-degrade in the environment since the materials is strong, it can however be reused or recycled into other products. Waste straw in Uganda are collected from beer and soft drink depots, cleaned and woven into bags and mats for picnics. The introduction of these straws to fashion industry will save the society a great deal.

Table2: Solid Wastes in Awka Metropolis: Sources, Types and Description

SOURCE	TYPE	DESCRIPTION
Residential areas	Garbage Rubbish	Domestic refuse, wastes from preparation and cooking of food Pure water bags, cloths, polythene, tins, paper, plastics, empty cartons, glass, sticks, leather; enamel plate, ceramics, metals, leaves, grass, rubber, wood etc.
Market areas	Garbage Rubbish	Wastes from preparation and cooking of food, market refuses. Plastics, polythene, pure water,

		empty cartons, paper, wood; cloths, leather, tins, ash, rubber, leaves, grass, metals, ceramics, yard trimmings, bricks, glass, bottles.
School areas	Rubbish	Mainly paper, plastics, polythene, pure water and few food wastes
Hospital areas	Medical wastes	Laboratory wastes, surgery wastes, pathological wastes, maternity wastes, syringes, expired drugs and chemicals.
Municipal/Transportational (Streets, gutters, workshops)	Bulk waste Street refuse	Discarded large motor parts, large appliances, furniture, refrigerators, tyres, metal scraps Street sweepings, dirt, silt from gutters, leaves, content of refuse, cloths plastics, paper, pure

		water
Industrial/factory areas	Industrial refuse Construction and demolition wastes	Solid wastes resulting from industrial processes and manufacturing operations, wood, plastic and metal scraps, hazardous wastes, radioactive materials Roof scraping, lumber, conduit pipes, wire insulation scraps, nails, cement bags

(Table by Researcher)

### 2.3 Visual Arts

Art is an excellent experience and engagement that many can hardly resist. It encompasses a diverse range of human activities, creation and modes of expression including Music and literature.

The meaning of Art is explored in a branch of philosophy known as "aesthetic". Therefore, Art is the process or production of deliberately arranged elements in a way that appeals to the sense or emotions.

The focus of this research is to utilize waste drinking straw picked from the streets, marketplaces and along the road which litters the environment in production of fashion accessories of high aesthetic value. The ideas was developed in order to find a way to reused the discarded plastic straws that always end up in land fill which originated from the community through many firms including the plastic an straw manufacturing industries and the consumers.

Available literature indicates that about 8% of textile materials which can be seen as fashion materials which would have been sent to land fill, are recovered annually in the United States through recycling process such as resale of used textile materials, donation to charity and conversion to bags.

## III. RESEARCH METHODOLOGY

### MATERIALS AND TECHNIQUE USED

In the course of the study, the researcher indulged in practical studioexercise as most of the problem were in practical nature. This chapter discusses the materials and techniques used in this practical project. The artist produced fashion accessories using different materials of waste straw and fabric.

#### 3.1 Materials and Tools Used

These are the materials used in the project work:

- i. Straw
- ii. Sole
- iii. Thread
- iv. Evostick gum
- v. Macho
- vi. Lighter
- vii. Elastic thread
- viii. Twine and hook.

- Tools Used

- i. Needle
- ii. Scissors

- Straw

This is a hollow tube of plastic used for sucking drink from glass or bottle.

- Sole

This is the part of the shoe that protects the bottom of the feet from whatever surface you are treading upon. There are different types of soles which includes: Rubber sole, leather sole, the wooden sole and dollop sole. The researcher made use of wooden sole which are carved from wood. It gives sufficient protection to be used as safety foot wear without additional reinforcement.

- Thread

This is hand used material used for stitching the shoe.

- Evostick gum: This serve as the glue used in sticking together the shoe pad, on the sole to produce the shoe.

- Macho

This is a soft thin material stick with the sole of the shoe.

- Elastic thread

They are stretchable thread. It was used in making of bangle.

- Lighter

A portable device used to create flame and to ignite a variety of combustible materials such a cigarettes, gas stoves, firework, and candles. It was used to flame the edge of the basket, belt and the shoe.

- Twine

This is a light string or strong thread composed of two or smaller strands twisted together. The researcher used it in production of belt.

- Needle

This is hand used tool used in stitching the shoes.

- Scissors

They are used in cutting out something from its original place. They are hand operated shearing instruments used for cutting various thin materials such as paper, card board, metal foil, cloths, ropes and wire. There are different types of scissors which includes; kitchen, hair and nail scissors and general purpose scissors. The researcher used general purpose scissors because of its safety and sharpness.

### 3.2 Techniques used in the project practical

In the course of the practical work, the researcher used sewing, ironing, pleating and weaving techniques.

3.2.1 Ironing: This is a method of using hot iron to produce hand bangle.

3.2.2 Stitching: This is a method where fabrics were stitched to the straw.

3.2.3 Pleating: Belt holder are pleated.

3.2.4 Weaving: This is formed by interlacing of thread or yarns. The researcher used hand weaving technique to produce straw basket.

These methods were used by the researcher in order to create an artistic and decorative effect on the works and also make the works different both in style from the usual bags, shoes, necklace, bangle and earrings that is normally fashion designer and also make people to see the creativity in art.

## IV. VISUAL ARTS AND SOLID WASTE MANAGEMENT

The world culture of consumerism is a factor that contributes to increase in waste. This situation calls for effective management from various experts. It is important for the artist to create a medium for the conversion of this plastic wastes, hence straw waste into useful fashion accessories that are used by individuals to grace their outfits. Therefore, this chapter talks about conceptualization stage to the production and the finishing of the work.

### 4.0 Conceptualization Stage

Here, all planning and sketches were made, concept were generated and inspired by personal experience in the environment.

#### 4.1 Fashion

The word fashion, is a popular style or practice especially in clothing, footwear, accessories, makeup etc. fashion is a distinctive and often the style in which a person dresses, it is the prevailing styles in behavior and newest creation of textile designers. Accessories and clothing can indicate membership of a group, culture and beliefs. Fashion also influences our society to judge people by how they look and what they wear.

#### 4.2 Accessories

Fashion accessories and costume jewelry are items that are used to complement fashion. Accessories

help highlight a dress or apparel. They can also help to hide a weakness of a dress. Trends are continuously set by adding accessories to different outfits for example belts and shoes.

## V. FINDINGS, RECOMMENDATIONS, SUMMARY & CONCLUSION

This chapter focuses on the Findings, Recommendations, Summary and Conclusion of the Study.

### 5.1 Findings of Study

The Findings of the study are discussed below based on the major issues raised in the Objectives of the Study.

#### Nature of Solid Wastes in Awka Metropolis and the System of Solid Waste Disposal by Awka Residents

The study showed that the solid wastes in Awka metropolis can be classified into garbage and rubbish. Garbage is putrefied waste from food such as meat, fish, fruit and vegetable while rubbish is the perishable waste that are either combustible or non-combustible such as paper, carton, wood polythene, iron, glasses and ceramics. The wastes found in the residential areas and market areas were garbage like domestic waste and wastes from preparation and cooking of food. The rubbish included things like polythene, pure water packages cloth materials, tin, metals, leather, plastics, wood and rubber. Solid wastes in school areas were made up of rubbish which included paper, plastics, polythene, pure water and few food wastes.

In the hospital areas were found medical wastes which included laboratory wastes, surgery wastes, pathological wastes, maternity wastes, syringes, expired drugs and chemicals. In the municipal/transportation areas, bulk and street wastes were found which included discarded large motor parts, large appliances, furniture, refrigerators, motor tyres, metal scraps, street sweepings, dirt, silt from gutters, leaves, cloths, plastics, paper, pure water.

### 5.2 Recommendation

In using straw waste to produce fashion accessories, the artist suggests that improper disposal of straw

waste should not be overlooked but rather should be recycled and put back to use. The researcher therefore recommends that the government should set out an organized special centre for the dumping of straw waste whether from home, market or restaurant. This will enable the interested individuals to utilize and turn the waste straw into wealth. Again, drink sellers should be mindful of the way they dispose used straws.

Finally, with this project, artist and non-artist can better appreciate straw waste and other waste materials which have rendered help to our fashion world and society at large and have helped enormously in waste reduction.

### 5.3 Summary

Solid waste management has been an integral part of every human society and the city of Awka. The problem appears to have overwhelmed the authorities. This problem has been increasing with change in consumption pattern, increase in consumerism and unavailability of adequate waste management facilities. The study was embarked on because of the need to explore and examine the contributions of the visual arts in solid waste management in Awka metropolis. The basic ground of the involvement of the visual arts in sustainable waste management is anchored on the second option in integrated solid waste management hierarchy which is known as Reuse (Bruce, 1997; Edinburgh University Archery Club (EUAC), 2011; and Environmental Protection Agency (EPA), 2012). It requires an item that was to be disposed of being used again for the same or a different purpose.

### 5.4 Conclusion

Waste minimization is of great importance in decreasing pollution load and productive cost. This research work shows that various methods can be applied to reduce excessive wastage and minimize pollution. Waste is an input to economic activities and a by product of economic activities by business, government and households. The waste we discards have tremendous economic benefits for our society if the waste are recycled and introduced into the valuable chain.

The research has been carried out by the researcher to promote the efficient use of raw materials from time



to time to change behaviour towards waste management through knowledge sharing, education and awareness. This research work is to show that waste can also be recycled and made useful in other areas of art. The researcher produced accessories using straw waste from the streets, and beer outlet. This is to prove that waste materials can actually be recycled into fashionable accessories. Some art works produced from these straw waste are also analyzed by the researcher.

This research aims to contribute to the development of new eco-friendly technology with a decrease in manufacturing waste especially among the Awka residents and also implement the process of creating and developing fashion accessories using straw waste in the production line so that artisans in the community can have an income in their livelihood as well as their families.

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