

Production of Sculpture Using Waste Materials; a Tool for Addressing Environmental Degradation in Onitsha, Anambra State Nigeria

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Introduction

Background to the Study

Industrial and domestic activities generate dumpsites everywhere, so the streets and the immediate environments are littered with all sorts of waste materials. It has been noted that increasing urbanization and industrialization have greatly contributed to environmental degradation with its problems, with regards to Onitsha, Anambra State. According to Bazunu and Okwuosa (2013), the habit of littering appears to have been engraved in the life style of many Nigerians living in cities and suburbs. As a result, 'pure water' sachets, other polythene bags, plastic bottles and metal cans have become characteristic of Nigerian cities. Discussing the waste problem in Nigeria, Ezike (2016) observes that waste constitute the major environmental problem in Nigeria today. Some of these wastes are locally generated while others, mainly e-waste, are deliberately imported by Nigerians out of ignorance. Wastes are of different categories and classifications, and are from different sources: industrial and domestic. Wastes are generated every day and everywhere. Wastes are majorly classified into biodegradables and non-biodegradables. The degradable are mostly organic, food, paper and textile materials, while non-degradable are plastic, metal, glass, wood and bone. Their degradation time varies according to the materials and conditions of exposure to atmosphere. These wastes, mostly the non-degradable have been observed to form mountainous heaps in most parts of the Onitsha, and even some developing communities, thereby defacing the environment, and are hazardous to living organisms and human beings. These heaps of wastes and dumpsites found almost everywhere around us constitute a big problem that needs to be addressed by both the Government at all levels, and individuals wherever one finds himself. Okpala (2016) rightly asserts that:

In Nigeria, waste management is a big problem. Although there seem to be a new awareness among states like Lagos, Enugu and Rivers, much more needed to be done. Even so much of the garbage cleared from urban cities are being used to litter the rural setting and country sides close to the cities. (p 165)

Okoye (2016) observes that the Nigeria's waste management problems are different from other countries in terms of composition, density, political and economic framework, access to waste collection, and awareness and attitudes of waste generators. Waste management and control, therefore demands both government and individuals' effort. On the part of the government it is noted that the three tiers of government:

Federal, State and local are involved in waste management in Nigeria. Likewise, individuals are expected to contribute to waste management and control in our environment. However, not much had been achieved in waste management and

control in most cities and urban centers in Nigeria, including Onitsha, by both the government and individuals; rather the reverse is the case. The government agencies on waste management neglect their roles and responsibilities while the public capitalizes on the neglect, and mess up everywhere with litters and dumps of waste. Unmanaged waste defaces and pollutes our surroundings- air, land and water bodies or drains.

The problems of unmanaged waste in Onitsha environment, therefore calls for solutions from all quarters. Individuals, families, communities, industries and the government; each has its roles and responsibilities in management of waste in our environment.

Plastic and aluminum cans, among other non-degradable materials are not eco-friendly. Their degradation times or periods are relatively high, indicating that they don't rot or decay easily. This is the reason why plastic and aluminum constitute more waste that litter Onitsha environment because, contemporarily, most beverage and liquid containers are made of plastic and aluminum. In a bid to contribute to addressing the problems of environmental degradation, the research is aimed at production of sculptures using waste materials, mainly plastic and aluminum/metal containers. These materials are sourced from dumpsites, refuse bins, hotels, ceremony venues, along the streets, especially water drains after rainfall. Like scavengers, the process of picking and gathering them reduces their negative effect on, and upgrades our environmental sanitization and outlook.

These waste materials are transformed into sculptural works in line with the ideas, concepts and techniques required. In this way the researcher attempts to reduce, reclaim, reuse and reform waste materials into sculptural mix-media of the modern time. Intentionally and accidentally, the outcome of this research will serve aesthetic, functional, or both purposes in homes, gardens and public places. This research will explore and experiment avenues of transposing plastic and aluminum waste materials as sculpture media that will be appreciated in our environment. It will contribute to waste management in Onitsha in particular, and Nigeria as well as creation of awareness that 'waste' is useful.

The dynamic nature of the society and the growth of Onitsha urban city and industrialization have greatly contributed to the up-surge of waste glut in the environment. This constitutes the problems of environmental degradation and pollution of land, water, and air, thereby reducing the environmental quality. Generally, all categories of waste, degradable and non-degradable constitute great menace to the environment, and man.

All activities of man culminate in what people term waste. What some people regard as waste is useful to some other people and locations. For instance, what some developed countries discarded are shifted to developing countries where they become useful. These items may include automobiles, electronics, furniture, clothing among so many others. They are given all sorts of names such as fairly-used, secondhand, "tokumbo," "Wanjo" among others..

Specifically, non-degradable materials, especially plastic containers and metal/aluminum beverage cans have been observed to be the most common materials that litter everywhere due to their lightness. They are easily flown around by wind and drifted by running water. This is a very serious problem that demands everybody's attention and effort.

Aim of the Study

The study is aimed at the production of sculpture using waste materials; beverage plastic and aluminum containers which will be used to address the problem of environmental management in Onitsha.

Objectives of the Study

- i. To develop sculpture forms in mind.
- ii. To shape the plastic and aluminum cans to the researcher's intended forms.
- iii. To arrange and Fix the waste materials gathered.
- iv. To contribute to waste reduction and improvement of our homes and environment through the use of discarded waste materials as sculptural media.

Literature Review

Concept of Waste

Okpala (2016) states that waste in common parlance is refuse; that unwanted aspect of an entity that is deemed useless. Examples include municipal solid waste (Household trash / refuse). Wastes are unwanted materials, and are categorized into different types. In the society today, and particularly Onitsha environment, waste dumps and litters are very common, and constitute great nuisance to humans, animals and plants. Plastics and aluminum beverage containers, amongst other waste materials are found to litter Onitsha environment and form mountains of waste dumps in most part of the city and developing localities around. Ezike (2016) asserts however, that "waste constitute major environmental problem in Nigeria today". Some of these wastes are locally generated while others, mainly e-waste, are imported by Nigerians out of ignorance. Ezike further observes that our culture of consumerism is another factor that contributes to increase in waste found in our country which calls for effective management from various experts. Sharing the same observation with Ezike, Hammed and Sridhar (2016) state that:

Plastics occupy a very important place in the everyday life of Nigerians. They have replaced traditional metals such as copper, brass, aluminum, silver and other alloys. Unfortunately, the plastic films popularly called 'Nylon,' used for packaging 'pure water' or as shopping bags, have become nuisance in urban areas where they block the roads, choke the drains or fly around. Animals like goats and sheep swallow them, along with the feed and are sometimes choked to death. (p 299).

In definition of plastics, Hammed and Scridhar, (2016) explain that: The word plastic is derived from the Greek word *Plastikes*, which means to be capable of being shaped or moulded. It refers to their malleability and plasticity during manufacture that allow them to be cast, pressed, or extruded into a variety of shapes, such as films, fibers, plates, tubes bottles, boxes, and many more. Metals like aluminum also share these characteristics but they are not plastic, in the technical sense.

Concept of Up-cycling

According to Green Times (2017), Up-cycling is the method of reusing waste without destroying it. Viranova (2014), sees up-cycling as the process of converting waste materials or useless products into new materials or products of better quality or for better environmental value.

In up-cycling, old products are transformed into something new with a new purpose. According to Department of Environmental Affairs[DEA](2017), up-cycling which is in the most basic sense ‘reusing’ waste, is the second most preferred waste management option after ‘reducing’ waste. The concept of up-cycling is not just restricted to artists and art lovers. But with the knowledge of creativity, one can always venture into up-cycling.

Sculpture Production

According to Wikipedia, production is a process of combining various material inputs and immaterial inputs in order to make something for consumption. It is the act of creating output, a good or service which has value and contributes to the utility of individuals.

Artistically, art production involves a range of imaginative and critical thinking processes through which artists create images or objects. Furthermore, production is at the heart of making art. Art theorists have long acknowledged its importance as both an artistic action and idea to be explored.

Discussing sculpture production, Frank (2006) states that “Traditionally, sculpture has been made by modeling, casting, carving, constructing and assembling, or a combination of these processes” He further discusses each method and materials.

However, the one that apply to this study are construction, assembling (Assemblage) and installation, in his brief statement, thus:

Constructing and Assembling:

For most of recorded history, the major sculpting techniques in the western world were modeling, carving and casting. Early in the twentieth century, assembling methods became popular. Such works are called constructions. Assemblage is defined as sculpture using preexisting, sometimes “found” objects that may or may not contribute their original identities to the total content of the work.(p 182)

Installations:

Many artists now use the three dimensional medium of installation in an effort to tell a story visually. In installation artist transforms a space by bringing into it items of symbolic significance. This medium is most similar to constructed sculpture, but the artist construct an entire environment within the gallery. It is defined as a type of art medium in which the artist arranges objects or artworks in a room, thinking of the entire space as the medium to be manipulated. Also called environments. (p 189).

His other related discussion on methods and materials of sculpture production are as follows:

Kinetic Sculpture

Alexander Calder was among the first to explore the possibility of kinetic sculpture, or sculpture that moves. Marcel Duchamp named Calder’s Kinetic Sculpture

mobiles – a word Duchamp had coined for his own work in 1914. It is defined as art that incorporates actual movement as part of the design. (p 186).

Mixed Media

Today's artists frequently use a variety of media in a single work. Rather than being presented as a long list of materials, such combinations are often identified only as mixed media. It is defined as works of art made with more than one medium. (p 186).

From the views of the preceding authorities on the concepts of waste, up-cycling and art production for the research, it implies that this exercise is geared towards creating sculpture/ art production with waste materials (plastic particularly, and aluminum beverage containers) through a process of waste management known as up-cycling or re-use, or creative transformation.

Theoretical Framework

Theory of Sustainability

This study focuses on the theory of sustainability from an ecological perspective. This ecological model was spearheaded by Rolson. Within this model, there are two major ways of deciding goods to sustain. From an anthropological point of view, essential resources should be sustained, as should those ecological systems and regenerative process on which human system rely. From an ecocentric point of view, species should be sustained for the intrinsic value, as should ecological system as generation of creatures with intrinsic values. On policy as noted above, strong and weak views may converge. This study is however based on an anthropogenetic view point.

Relating this theory to the project the anthropological point of view of sustaining essential resources hinges on the re-use of essential waste in different dimensions and purposes. In the same vein, the ecocentric point of view of sustaining the lives of humans and species of creatures hinges on avoiding pollution of the environment: land, water bodies and air. In so doing, resources and lives are sustained from generation to generation.

Research Methodology

Research Design

Since the research is studio- based, it adopts the exploratory design method which encompasses intellectual and practical experiments. As the researcher works on waste, the main media are discarded plastic and aluminum cans and other materials that are compatible. The methods of execution and production are binding, assembling, construction, joining, welding and so on.

Sources of Data

The sources of data are primary and secondary. Primary sources are in oral forms like interviews, while the secondary sources are published literature like written materials which include textbooks, journals, thesis works, and internet.

Method of Data Analysis and Evaluation

The qualitative method is adopted for this study. The success or failure of the products of this research was assessed analytically based on their forms and meaning they convey. The evaluation is based on the successful use of the materials in question in improving the environmental quality in line with aesthetic and functional values of the existing works.

Area of Study

The study area is Onitsha metropolis. Onitsha is one of the major commercial Urban centres in Anambra State, Nigeria; and in West Africa. Other commercial and industrial centres in Anambra State include; Nnewi, Umuze, Ekwulobia and Igbo-Ukwu. Onitsha is located in the South-Eastern part of Nigeria, along the Niger River, in Anambra State whose capital is Awka. Anambra State is bounded on the North by Kogi State, on the South by Imo State, on the East by Enugu State, and on the West by Delta State. Onitsha, as an urban and commercial centre, is over populated, causing great drift of people and commercial activities to other commercial centres and environs in Anambra State. As a result of this, almost every corner in Onitsha environment and other commercial centres in Anambra State is characterized by dumpsites, landfills and littering all over the streets and homestead, thereby causing great menace to both human and animal lives; and also degrading our environment.

Production Processes

In this section, the method and technique processes of sculptural works to be produced for the project are discussed in stages.

Stage 1

Conception Stage, gathering and processing materials

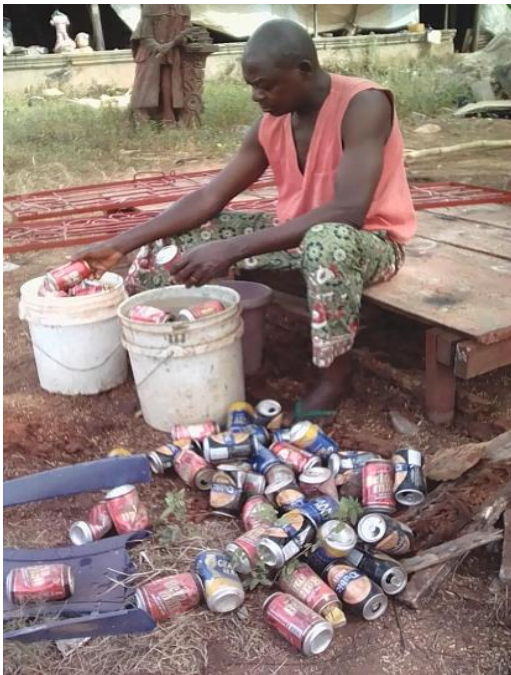


Plate 1: Gathering and washing and Flattening of Cans

© The researcher, 2018

Inspiration of creating a globe model, among other figures was informed by the researcher's desire to contribute to waste management and environmental degradation. However, the researcher attempted trial and error processes continually till the required success was achieved. Ideas came from observing waste items around and taking note of possible forms that can come from their arrangement in several forms.

It is important to note here that from stage 1 to the last, having decided to use the materials: plastic and metal/aluminum containers, gathering and flattening processes continued till the end of the project.



Plate 2: Slicing and Flattening Plastic Beverage Containers
© The researcher, 2018

Stage 2

Sketching and Taking Photographs

Sketching, collection and photographing of models were done in line with the ideas and concepts developed; and these guided the execution of Marquette and the production of the main project.



Fig 1: Sketch of a Globe
© The researcher, 2018

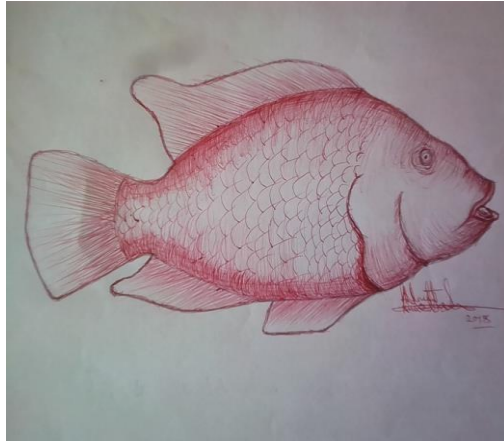


Fig 4: Sketch of a Fish
© The researcher, 2018



Fig 5: Sketch of an Eagle
© The researcher, 2018

Stage 3

Armature Stage

This stage needs serious caution and consideration as it is the foundational setting of the intended structure. Principles like proportion, balance and functional requirements were duly considered. Apart from paper sketches and photographs, sketches were made on the floor to the desired size to direct the shaping of the rods of metal used for armature construction.



Plate 5: Armature for the Globe. © The researcher, 2018

Measurement of the lines on the floor was taken and this guided the cutting of the rods to the exact size to achieve balance. A cylindrical cup of hard metal was sliced into two, matching the same size of two bearings as North and South poles that serve the axis that facilitates the function of rotation, and may hold the electric bulbs that can illuminate the globe at night. The longitudes were first measured, cut and shaped in line

with the arcs made on the floor and welded to the cups of North and South poles at calculated intervals. Likewise, the latitudes were welded, and the desired structure emerged.

The structure was well fortified before slicing the armature into two at the line of equator to create room for easy attachment of galvanized wire mesh, plastic and aluminum sheets that depict sky and water bodies and earth crust respectively.

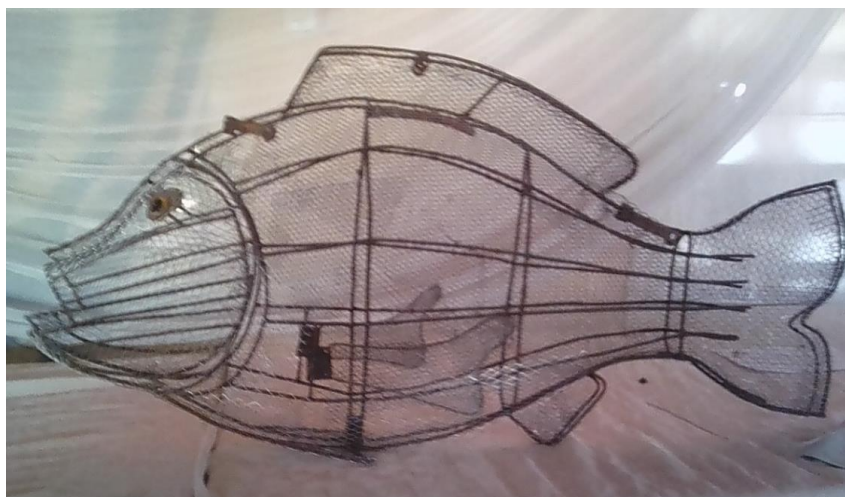


Plate 6: Armature for Tilapia. © The researcher, 2018

Stage 4

Covering the Armature with Galvanized Wire Mesh

The two sections of the armature were covered with galvanized wire mesh to take the required form and they would be re-coupled. And later, sheets of white cardboard were used in covering the whole entity. This enabled gridding and drawing of maps of the continents and oceans of the world accurately.



Plate 7: Covering the Armature of Globe with Galvanized Wire Mesh
© The researcher, 2018



Plate 9: Globe Armature Covered with White Cardboard Sheets
© The researcher, 2018

Stage 5

Attachment of the Sheets of Flattened Aluminum Beverage Cans

The aluminum beverage can sheets were attached on the continents' forms drawn on the papers according to their shapes. This was done with scraped electric copper wires cut to sizes unto the underneath galvanized wire mesh that depict the earth crust. The un-covered areas of the cardboard sheets remained the water bodies that depict the oceans and seas. The paper covering the areas of the water bodies were torn out and re-covered with sheets of flattered plastic material which, if illuminated at night would create a contrast between the earth and water bodies (continent and seas/oceans). Then the completed model of the globe have been successfully achieved. The white cardboard sheet of papers used in tracing were torn off.

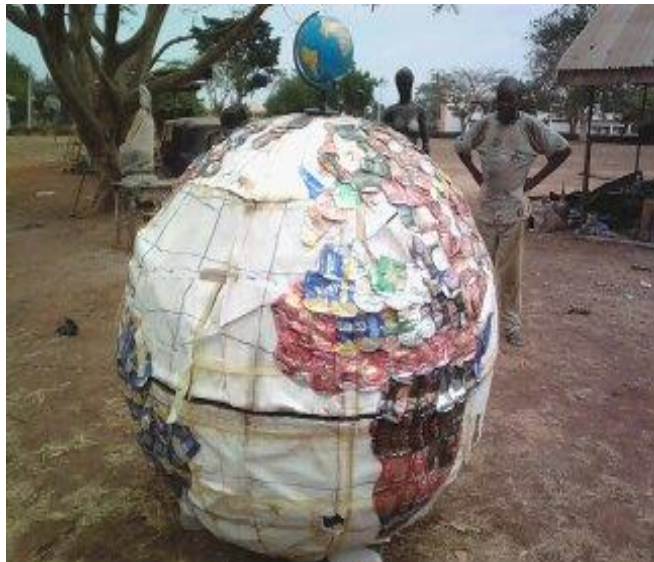


Plate 10: Completion of Attachment of Aluminum cans
© The researcher, 2018

Stage 6

Fabrication of Globe Stand

The globe stand was designed and fabricated through welding to the matching size and form. A bigger metal pipe was bent in line with the shape of a little bigger semi-circled arc with about 6 inches extended on both ends of the axes on which the globe model rotates manually. The stand arc was cut into two, but provision of re-joining the halves with bolts and nuts was made to facilitate dismantling and re-coupling for servicing and electrification if need be. This stage completed the production processes. Finally, areas that need painting were painted with oil paint to prevent rusting.



Plate 12 and 13: Designing and Welding the Globe Stand. © The researcher, 2018

Finishing

This study has proven to be successful on the side of sculptural production of forms. The finishing of the works depends on the final destination, being the site and places where they would be exhibited. Provision for their display depends on the purpose they serve; as floor, ceiling, wall and table were considered as the probable sites from conception stage.

Project Analysis

The production of Sculpture using Waste Materials is an attempt to create sculptural forms and figures with discarded materials, especially beverage aluminum and plastic cans for aesthetic purpose, functionality not totally disregarded. It is aimed at addressing the problem of waste management in our environment and to promote and diversify sculptural media sourcing from waste and disused materials. Few animal forms of interest and uniqueness are equally produced with the same materials as creatures on earth that are affected by environmental degradation, thereby improving our environmental quality.

The Globe

Plate 14: Finished globe model. © The researcher, 2018

The globe is produced to serve as an aesthetic model in public site. The choice of the size is determined by the purpose of sitting it in a public location. The size of the globe is according to the researcher's wish and it measures thus: Radius= 29 ¼" while the circumference is 178" (inches). The globe is made up of rods, metal cups and two bearing, galvanized wire mesh, sheets of flattened aluminum and plastic beverage cans. The form is characterized by roundedness, close to perfection, facilitating balance and manual rotation.

Considering the globe as the major sculpture concept in this research the researcher insinuates that the problem of environmental degradation is global and inevitable. This, therefore, calls for everybody's effort in finding solutions to this menace that affects all creatures of this earth directly or indirectly. Bearing this in mind, the researcher conceived the idea of representing sculpturally four representatives of the animal kingdom as related to avian, terrestrial, aquatic and amphibious animals affected by environmental pollution. All the creatures on earth, including human beings are affected by environmental degradation and pollution in one way or the other through deforestation, poisonous gas emission into the air, oil spillage, erosion, flooding, desertification and other.

The method of production involved sketching, construction, welding, assembling, binding, and ironing. The shapes or forms of the map on globe are created with aluminum beverage cans, perforated, attached and bound with scraped copper

wire. The intermixture of different coloured brands of the flattened aluminum beverage cans is intentional, and to simulate political areas of the world. The locations of the continents are also insinuated since the attached cans do not perfectly fall in line with the maps' contours. However, the locations of the maps were facilitated by the use of grids. The area not covered by the continents remains the water bodies (Oceans, seas and rivers), and sky. This water bodies and sky are created by attaching the flattened green plastic beverage containers on the areas not covered by the continents. The choice of green, instead of blue plastic containers was deliberate because gathering enough blue plastic beverage containers was difficult since the aim of the study is to produce sculptural works with waste.

At a close view the globe looks rough and tactile, but well blended from a distance. This globe can serve in the parks, gardens, street roundabouts and hotels as artistic geographical model of globe; and may radiate colourful light if illuminate and connected to electric power at night.

This globe is sliced into two hemispheres at equator, and it is dismountable and recoupable. This facilitates servicing and maintenance at any time required. Two openings are created, each on both hemispheres for easy change of bulbs, if connected to electricity.



Plate 15: Finished elephant model, 39 x 15 x 39 (Inches). © The researcher, 2018

The elephant is claimed to be the largest land animal on earth. It has unique features that are attractive that call for attention and interest, and is rarely seen or found in close environment, live, except in zoos, forest reserves, Films, pictures and photographs. Traditionally, elephant is one of the most animals that feature in folktales and it is attributed to be powerful. Elephant is an interesting animal that both old and young love to appreciate because of its size and imposing nature, and its regular featuring in most African traditional folktales, riddles and poems. This calls for the researcher's choice of elephant as one of the sculptural models of animals produced with discarded beverage cans.

In this project, elephant is chosen to represent the terrestrial animals that human activities on earth affect adversely through deforestation, bush burning, hazardous gaseous emission, and poaching for its meat and tusks.

The elephant model form measures as follows:

Length: 39 inches (96.5cm) without the trunk

Width: 15 inches (38cm) without the ears

Height: 39 inches (96.5cm)

The materials used in the production of this elephant model include rod, galvanized wire mesh, and electric copper wire, bulb, beads and beverage plastic containers. The method of production includes sketching, metal rod fabrication through welding, binding with builders' binding wire and electric copper wire, soldering, stitching, ironing and electrification.

The completed elephant model is produced to serve as floor light when connected to electric power source in Hotel lounge, public garden, park, junction or roundabout or any other convenient sites, including homes.

The significance of this elephant sculptural model is that what had constituted nuisance in the dumpsites in our environment has been transformed into functional and aesthetic sculptural form. This also implies that the interesting unique rare animals (elephant) that cannot be commonly found and appreciated, can now be sculpturally provided with plastic wastes and be appreciated in our close environment. It is also a model for play and study. In the African traditional folktales, riddles and poems, elephant exhibits the following characteristics and attributes: Imposition, power, arrogance, foolishness, simplicity and naivety.

The implication is that though the elephant is the largest terrestrial animal on earth with the attributes of power, imposition and arrogance, other little animals, especially the tortoise, can easily ridicule him, as in a popular Igbo song by Chief Mike Ejeagha that reads: "Nnam eze a pkata m enyi etc."

Tortoise



Plate 16 Finished Model of Tortoise, 36 x 28 x 15 (Inches). © The researcher, 2018

Tortoise has been described as a slow-moving four-legged land (and fresh-water) varieties of turtle with a hard shell animal that withdraws other fleshy parts

under the shell when threatened by dangerous or bigger animals. It has been observed that there are very many species of turtles / tortoises with different habitats. Some of them purely dwell on water or ground or both. The species that shares both water and ground is regarded as being amphibious in nature.

The structure of tortoise is aesthetically attractive and appealing, and its behavior is dramatic as it withdraws its fleshy parts into its shell as protective and defensive measures. Structurally and Characteristically, the shell consists of two parts: An upper part (carapace), and a lower part (plastron) that caged the fleshy part that comprises the body, four limbs and the head.

Traditionally, in most African folktales, riddles and poems, tortoise, in the animal Kingdom, is seen as being very trickish, cunning, clever, greedy and treacherous; and is regarded as the wisest and the leader of animals in matters of the mind and strategy.

Considering the fact that tortoise is one of the creatures on earth that are affected by environmental degradation, the researcher chose it to represent the amphibious creatures in this project, it is sculpturally produced. The choice of tortoise and other animal models is based on their characteristics and behavioural attributes in African traditional folklore as it relates to our sociopolitical lives, especially in Nigeria. The materials used in creating the tortoise model are the same materials used in other animal models and the same technique and method are also involved. However, the carapace is purely or totally plastic while the plastron is totally beverage aluminum can, cut open and attached so that the silvery surface faced up to reflect back the light from the electric bulb fixed inside, when powered. The dimension of the tortoise shell without the head and limbs is as follows:

Length: 36 inches (91.5cm)

Width: 28 inches (71 cm)

Height: 15 inches (38cm)

The completed tortoise model is created in a naturalistic form to serve as a model and as a floor light when connected to electric power source in any convenient public and private site like home, hotel lounge and environment, garden, park, junction and roundabout. The significance of this tortoise model is that its production with plastic and aluminum discarded containers contributed to Waste reduction in our environment and in turn contributed functionally and aesthetically to our environment. The model could be therapeutic in nature. The attributes earlier discussed about tortoise in the animal kingdom of our traditional folklore imply that mindless of the small size of tortoise, it can manipulate other bigger animals with great wits, as in the same Igbo song by Chief Mike Ejeagha that reads: “Nna m eze a pkata m enyi.....”

PERCH (Tilapia)

Plate 17 Finished Fish (Tilapia) Model, 51 x 8 ½ x 25 (Inches)
© The researcher, 2018

Tilapia is a unique fish mostly found in tropical waters. It belongs to the specie of fish with bony skeletons. Tilapia has one solid body without demarcated head with a neck. The whole body is covered by thin scales which overlap one another so that the free ends point backwards. The scales form a thin layer of exoskeleton which protects its inner fleshy body. There are seven fins that complement the body of the tilapia fish, three singles and two pairs. The fins enable the fish to swim and balance in the water. All these features give the tilapia aesthetic and attractive appeal.

Based on the above characteristics, the researcher conceived the idea of producing its sculptural model to represent other aquatic (fish) creatures whose lives are endangered by environmental degradation. The model so produced, would in turn contribute to uplifting the quality of our environment and serve as a biological model to all and sundry.

The proposed site for the model, as earlier discussed, could be any convenient place like homes, hotels, parks, gardens and public junctions. In homes and hotels, the model could serve as lounge chandelier; and could be mounted on the ground or floor in all. The main material under study in this project remains discarded beverage plastic containers while others include rod, galvanized wire mesh, scraped electric copper wire, electric wire and bulb; and beverage drinking straws, and beads.

The method of production includes sketching, fabrication of 1/4" rod through welding into the desired form binding with the builders binding wire and scraped electric wire, stitching, ironing and electrification.

The dimension of the modeled tilapia is taken as follows:

Length:	4ft 3inches (129.5cm)
Width:	8 ½ inches (21.5cm)
Height:	25 inches (61cm)

EAGLE



Plate 18 Finished model of a Flying Eagle, 48 x 8 x 84, (Inches)
© The researcher, 2018

Eagle is a special bird that patrols waterways and coasts in the air or sky looking for the opportunity to swoop and snatch fish and water birds; and other animals that fall prey. Its habitat is usually out of human reach on very high trees, mountains and dangerous cliff beaches. It is a unique, rare and valued bird in parts of the world, especially in Africa. Its brown colour gradually turns white as it grows into maturity. Its feathers and other parts are highly valued and cherished especially in African cultures. In Igala and Igbo Cultures, traditional titled men and native doctors value eagle feathers and other parts as they accord high respect and regards for those who officially have them in their costumes and paraphernalia. It is regarded as a royal bird with the attributes of power, purity, agility and swiftness; and meticulousness, among others.

Following all these qualities, the researcher was inspired to choose eagle as a sculptural model to represent the birds in the animal kingdom. Its uniqueness and nature make it rare and inaccessible, which necessitated its production as a model that would enhance the beauty of our environment.

The eagle model depicts one on flight, and it is meant to serve as a mobile lounge chandelier or ceiling mobile chandelier. The material used in this project include $\frac{1}{4}$ rod, used to fabricate the form, galvanized wire mesh, flattened plastic beverage containers, builders' binding wire and scraped copper wire, springs, and beads used for its eyes, like other animal models. The dimension of the eagle model with the wings spread out is as follows:

Length:	4ft (122cm)
Height:	8 inches (20 cm)
Width:	7ft (214 cm) with wings spread out.
Width:	11" inches (28 cm) without wings spread out.

The wings can be detached for portability and preservation. The method of production involves sketching, fabrication of $\frac{1}{4}$ rod, binding, stitching, ironing and electrification.

Visual and Technical Considerations

The need for improving environmental quality through waste management, demands the efforts of everybody, including artists, to devise ways of reducing waste in our society. Within this discourse, the researcher considered using waste from the environment to improve the environment, focusing mainly on plastic and aluminum beverage containers that are prevalent in our environment.

The sculptural production of the globe and other animal figurers demanded technicalities in terms of size, form, method and materials considering their aesthetic, functionality and semblance. All the products of this project demanded symmetrical structural balance to suit the purposes they serve respectively. The choice of translucent plastic and aluminum beverage containers for the project was to facilitate functionality, bearing durability in mind. Provisions were created for detachment and assembly in some of the projects to facilitate rotation, as in the globe; movement, as in the tortoise and eagle; and portability and servicing in all. The tilapia is designed to serve on the floor, ceiling and wall as lamp, while the elephant is meant for the floor lamp only.

Findings

The main finding made in the course of this study is that art materials (media) are unlimited especially in the field of sculpture, and that the understanding of the property and characteristics of the materials guides or directs the artist on the process and method of their usage.

It is also realized that ideas emanate when there is a problem, and this opens avenues of solution that spur up or generate creativity. In this study, the plastic and aluminum beverage containers that have defaced and polluted our environment, harming and killing the creatures on earth, have been successfully up-cycled into aesthetic and functional sculptural artworks, thereby contributing to the reduction of waste.

The malleability of plastic and aluminum materials used in this study boosts the durability of the artworks they are used in producing, since aluminum material does not rust and plastic does not easily decay.

Summary, Conclusion and Recommendations

Working in line with the topic of this project which is “Production of Sculpture Using Waste Materials: A Tool for Addressing Environmental Degradation in Nigeria.”, The works produced project the idea and feelings on the theme “The world and its creatures” using each to represent a group in a particular habitat that are affected by environmental pollution; and collectively composing them in line with some of our traditional folklore, their values and regards not neglected. The materials under this study evoked the concepts of forms and method regarding aesthetics and concern for function. The styles used in the production of these works are gathered from different fields of Endeavour.

The materials and items used in the production of the globe model and animal figures are a combination of both discarded and regular readymade materials. The understanding of the characteristics of the materials used, facilitated the method and techniques employed in the production of the works.

The terms waste, up-cycling and Art production, as discussed in this project simply connotes: Reusing what had been rejected and discarded in creating aesthetic, functional and valuable artworks. Believing this, the researcher's intention is to inform and redirect the notion that waste exists, no! What one rejects and discards may be useful and valuable to another. Sculpture as a course of study is classified as a branch of fine Art-art for beauty-but the researcher's focus is on aesthetic and function. The researcher has also chosen some unique and attractive animal models to demonstrate and remind the admirers of our fading traditional and cultural valued use of folklores in educating mankind through attribution of human characters and behaviours to certain animals. Intentionally, the researchers is of the opinion of sitting the works on strategic public places for communication in addition to aesthetic and function, thereby improving our environment and contributing to reduction of waste in the society.

In the course of this research, the researcher has been able to produce some sculptural models with discarded plastic and aluminum beverage containers. The works produced can fulfill both aesthetic and functional purposes. The exploration has supported and widened the desire for redirecting artists' focus, especially sculptors, from old traditional art media to the new ones, especially the discarded ones that deface our environment. Through production of sculpture with waste materials parts of our societal problems and needs have been met by the sculptor.

Concluding the sculptural production for the exhibition, all the created models were conceived to form or mean "The world (globe) and its creatures" that are affected by human activities of polluting and degrading our environment. It is also the responsibility of the human beings to maintain and sustain our ecosystem by changing and improving our environmental quality.

Recommendations

As a sculptor, it is realized that exploration yield ideas, materials, methods/ techniques and styles. The implication is that research and exploration bring about changes, positive results and improvement in all fields. The idea and the process of producing sculptures with waste (plastic and aluminum) beverage containers brought about changes from the old traditional materials and techniques to new ones since the material involved determines the approach for achieving the expected end-product. Artists and sculptors in particular are advised and encouraged to be inspired by the environment which provides almost the majority of their needs, recognizing that they, in turn, should improve the environment with aesthetic and functional artworks.

The government, through the ministry of education is advised to restructure the curriculum in line with the society's needs and demands as to equip the citizens in tackling our general problems.

Contribution to Knowledge

Artists and Sculptors have been producing sculptural works with the materials / media, techniques / methods and ideas / styles of their choice in all parts of the world.

The researcher focused mainly on discarded plastic and aluminum beverage containers as the materials, but employed several techniques of fabrication, welding, binding/sewing, ironing in the processes that yielded the respective works. The gap remained that no known sculptor had combined plastic and aluminum beverage containers, employing the technique the researcher initiated in their works, and on the themes that reflect our traditional folklore that are educative. Our social lives, behaviours and characters are directly or indirectly attributed to some animals in folklore in the African socio-cultural setting. In this way, issues bothering the society are corrected or addressed. This project contributes to knowledge in the direction of resourcefulness, composition and turning what had constituted a menace to usefulness.

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