PLASTIC WASTE WEAVING AS A POSSIBLE SOLUTION TO ENVIRONMENTAL POLLUTION

Mohammed Isiaka Adeleke
Department of Fine and Applied Arts
Ladoke Akintola University of Technology,
Ogbomoso, Nigeria.
iamohammed40@Lautech.edu.ng

Introduction

Innovation in any aspect of art and technology has been of concern especially in weaving art research practice in Nigeria. This has continually opened new grounds in textiles and weaving derivation. Plastics has been mainly utilized in Nigeria, especially for beverages and drinks storage, and commercial purposes. Innovative use of waste plastics for weaving images and objects are nascent. Attention to the systematic use of plastics weaving art and formation of images are also important in the study of textile weaving and its practices in Nigeria. This study examined the use of wastes especially wastes from plastic drinks bottles and it screw caps. The study was conducted with the aim of determining techniques and methods of plastic weaving, with a view to providing a scientific model of operation. There are documents concerning weaving arts and it techniques, but there is scanty of literature on plastic weaving as a solution to environmental pollution in Nigeria and since Nigeria is battling with plastic environmental degradation, therefore this study is appropriate at this time.

Bernard (1989) states that the arts of weaving are ancient and so important that every culture involve in the weaving art with use of animal Fibre yarns and vegetable source. Ogunduyile (2005) states that the composition of vertical and horizontal looms with threads interlace to weave. Danto (2006) noted the innovations in weaving from manual techniques waving to mechanized woven techniques. Danto pays attention to equipment and operations as they concern interpretation of motifs and meanings in weaving with use of machine. Baregheh *et. al* (2009) conducted a comprehensive research on the definitions of innovation and they reported over (60) sixty different definitions of innovations. In summary of their definitions; Innovation is a system of introducing novel ideas for the benefit of society from waste resources.

Springman, (2011) stressed that creating something new is the goal of most innovation and initiatives which solve certain problem. Screw cap plastic weaving and wastes for plastic weaving art has evolved to solve problems of environmental degradation since the plastic wastes has now been used for weaving of various objects and utilities.

Ndon, (2013) reports that, wastes are discarded, unwanted and thrown away items. Recently, most wastes materials (Plastics, Fabrics, Woods, Papers, Nylons) and others were usually combusted and puts the environment in danger. Khan and Malik, (2013) maintained that, carbons evaporation from the wastes items make human and non-human being cells to malfunction and cause allergies to human body and non-human body. Their document calls for urgent measures to control waste items to save lives.

Kalilu (2013) argued that innovation irrespective of scholarship definitions and interpretations given to it, innovation must rescue the society from hardship and therefore canvases for innovations in all spheres of arts and technology, which this study addresses.

Paul (2018) affirmed that technology and methods in weaving keep that to time and traditional weaving art in Nigeria is an old art which dates to thousands of years with various yarns. The upcycling and recycling of plastic wastes into weaving is a novel idea which this study attempted in other to solve the challenges of environmental pollution.

Al-Hayat (2018) sees hand woven arts as a craftsmanship in nature and materials adapted from region to region, group to group, and that the art can be done with thousands of materials. This is applicable to the plastic arts weaving in Ogbomoso and Oyo towns.

Seyi – Gbagbayau and Ajayi, (2019) maintain that waste items whether papers, plastics, woods and other source of wastes are referred to as junk or garbage that emanate from factories, offices, homes and other places where human beings reside.

Berruezo *et .al* (2020) studied the weaving art pattern on micro plastic from fabric. The trio was aimed to determine the influenced of some parameters related to design of fabric and relationship between micro plastic items of weaving arts, and submitted that plastic weaving needs to be introduced into institution of learning. Obede and Adamu (2020) posed that plastic wastes in Nigeria is now one of the biggest environmental challenges of this present generation, and submitted that discarded plastic holds on in our environment for long period of years than other forms of waste which causes natural disaster plus hormonal distortion.

Babangida *et.al* (2022) identify plastic pollution in Nigeria as a cankerworm that needs urgent attention and submitted that every profession must come out to find a lasting solution to plastic pollution in Nigeria. This is another angle of justification for this study. Ajuzie, (2023) study was on waste repurposing for other useful materials for textiles. Though, Ajuzie study was on waste textile materials not plastics wastes, but Ajuzie's document reiterate that waste items could be used to create new things for the use of human beings and of course control environmental degradation that our nation is seriously facing today.

Methods and Sites

The consumption of drinks and beverages stored in plastics has been on the rise in Nigeria and Ogbomoso and Oyo towns are not left out. The population of Ogbomoso according to 2023 UN World Urbanization Projection (UWUP) was estimated at 628,682 while Oyo town is estimated to 471,000 (www.worldpopulationreview). Ogbomoso and Oyo townships are situated in the vegetation transitional belt between the forest and the savannah areas of Nigeria. Both towns are significant in events which usually calls for drinks packed in plastic bottles, which are later discarded after use. The age bracket of the plastic wastes weavers ranges between 7years to 15years. They used the plastic screw rings and plastic screw caps made bottles between 750mle and 350mle (Plates 1 - 2) Other materials adopted by the plastic weavers are: hand needles, scissors, cap nail (*Eso Alade*) rubber band, twine, and razor blades. The weavers remove the screw rings, and plastic caps gently and manually, to avoid damage to the weaver's body (Plate 1 and 2) and washes the screw caps and rings (Plates 3, 4, 5 and 6). The washed plastics were then separated for weaving arts. Plates 7 and 8.

Plate 1: Discarded plastic bottles. *Photograph from field research*

Plate 2: Discarded plastic bottles packed. *Photograph from field research*

Plate 3: Discarded plastic bottle covers. *Photograph from field research*

Interviews and observations are primary techniques used for data collection and it was in form of structured and unstructured questionnaires for a census of creative activities using purposive sampling techniques were used. The research questions were adopted to test the research aim. Qualitative approach was used as a tool of investigation in order to establish the relationship between traditional weaving and plastic weaving. Interviews were conducted to establish cultural, social ecological and aesthetic value.

Plate 4: Discarded plastic ring cover removed. *Photograph from field research*

Plate 5: Discarded plastic bottle covers emulsified. *Photograph from field research*

Plate 6: Discarded plastic bottle ring covers emulsified. *Photograph from field research*

Plate 7: Discarded plastic covers finished emulsified. *Photograph from field research*

Plate 8: Discarded plastic rings finished emulsified. *Photograph from field research*

Plate 9: young boy posed with discarded weaving plastic cross bag. *Photograph from field research*

Plate 10: A boy posed with discarded plastic rings weaving in progress. sandals. *Photograph from*

Plate 11: Discarded plastic rings woven slippers. Photograph from field research

Plate 12: Discarded plastic bottle yarns woven. Photograph from field study.

Plate 13: Discarded plastic key holders woven. *Photograph from internet*.

Plate 14: Discarded plastic covers woven bag. *Photograph from internet*.

Plate 15: Discarded plastic weaver in action. *Photograph from field research.*

Plate 16: Discarded plastic weaver in action with woven skipping rope. *Photograph from field research*

Plate 17: A lady posed with discarded plastic woven bag and pouch. *Photograph from field research*

Plate 18: A boy posed with discarded plastic woven bag. *Photograph from field research*

Plate 19: Sample of Discarded plastic bottle. *Photograph from field study*

Plate 20: Splitting of the sample bottle to form an object. *Photograph from field study*

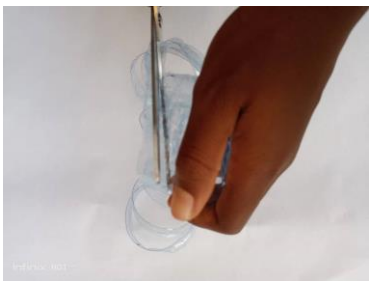
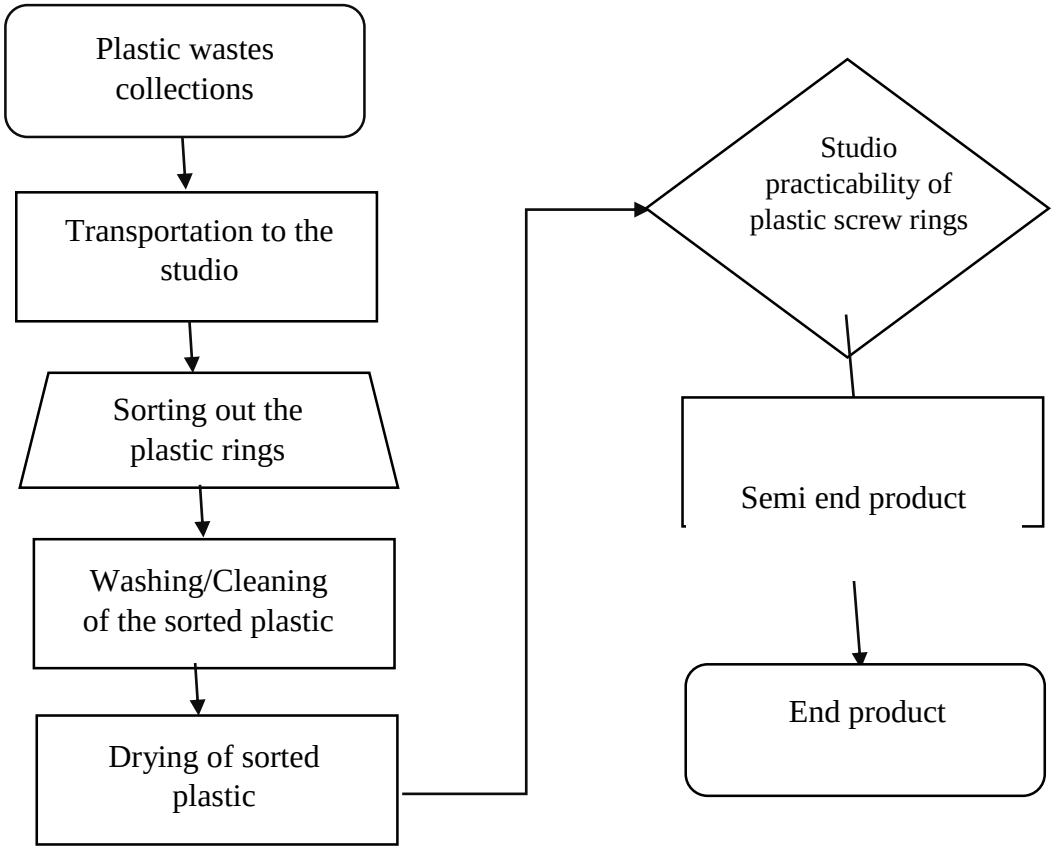


Plate 21: Cutting of the discarded empty bottle for weaving. *Photograph from field study*.

The plastic wastes weaving studio techniques used by the weavers for this study were illustrated in flow chart in Figure 1



Plastic Arts Weaving Techniques

The plastic waste arts involved plaiting and assemblage techniques. Plaiting is a technique adopted in twisting the plastic caps to shape, while assemblages is a method to bend the assembled plastic screw rings and covers to form images (Plates 12, 15 and 20). The artist, as a creator, produces works not only for aesthetics purpose but also and primarily to express his feeling virtually. Crown nail (*Eso Alade*) is usually used for the two techniques, while scissors were used to cut the wastes drink bottles into yarns for weaving: Plates 19 and 21. Thus, there has always been a search for newness in this direction. Also, the screw rings were used to create belts of various sizes for males and females, sandals, bags, pouches, slippers, skipping ropes, flower and lamp holders, (Plates 9,10,11,16,17 and 18). Plastic bottles caps were upcycling and reassembling to form bags (Plate 14). Pouches, bags of diversity size, were also produced from waste screw ring plastic bottles. Waste management through art is germane to control environmental degradation. Plastic wastes generally has potential uses in sculpture, ceramic and all aspect of arts. The study revealed eight processes as follows: searching for discarded plastic, transportation, sorting of the plastic into groups (covers, rings, and bodies), cleaning, drying, weaving (studio practicability), semifinal products and final productions as illustrated in chart 1. The tension of the plastic plaiting is usually checked after plastic thread is placed in the hand of weavers. Then using the surplus warp plastic as weft, the weaver weaves several centimeters to test the weave. The final weave of plastic was at-times closed with burning of the edges in a light manner.

Colour Determination

The weavers of plastic in this study has little control of colours determination because the weavers depend on the wastes plastic colours already coloured by the producers of the plastic. The most prominent colours in the woven objects with wastes plastic are all the classes of colours identified in plates 10, 11, and 14. White and black colours are scanty in most of the products and when white or black colour lids and rings were used it serves as barricades for other colour as it was observed by Joan and Laura (1995) that colours were at times used by the artist to serve a boundary for other colours. Plastic weavers value plastic for being easy to secure, inexpensive, and needed no additional colours to perfect their woven objects. It does not shrink with moisture and pliable enough to weave.

Conclusion

Waste is everywhere. Waste items must not be solved with burning off alone. Carbon resulted from burning is harmful to humans. The recycling of plastic waste for weaving art require global understanding from developing nations. This study recommends that adequate publicity should be given to the arts, and that young plastic weavers should be encouraged to further their studies in line of recycling technology. Plastic waste today forms a great proportion of solid waste that is giving the government concern. Therefore, there must be a solution on how to manage the plastic waste. Innovation in plastic weaving helps. This can be incorporated into school system from primary level to tertiary level and the end products needed to be patronized by the citizenry because it would have a better finishing if not the best. These would ultimately sanitize and enhance our environment as plastic waste would greatly reduce, if not totally controlled.

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List of Plastic Weavers Interviewed

Alamu Sunday Atolagbe. Age: 12 years Sex: Male Qualification: J.S.S. 2 Location: Iseke Area of Oyo Town Oyo State 22/10/2022

Samuel Adeola Age: 10 years Sex: Female Qualification: J.S.S. 1 Location: Elewura, Apake Ogbomoso. 22/01/2022

Adigun Sulaiman Age: 10 years Sex: Male Qualification: J.S.S. 2 Location: Location Oniyo Akata Daodu Area, Ogbomoso 10/10/2022

Ramota Lateef Adeola Age: 12 years Sex: Female Qualification: J.S.S. 3 Location: Ajalaruru Compound, Isale-Oyo, Oyo State 22/02/2022

Omo Aje Samuel Age: 15 years Sex: Male Qualification: J.S.S. 3 Location: Bolodeoku, Oja-Jagun, Ogbomoso 20/01/2023

Areo Lateefat Age: 17 years Sex: Female Qualification: S.S. 1 Location: Oke-Agbede, Ogbomoso, Oyo State. 10/10/2023

Kehinde Johsnson Isola Age: 15 years Sex: Male Qualification: S.S. 2 Location: Olounfemonle Area, Oyo, Oyo State. 12/05/2023

Aderenle Taofik Age: 12 years Sex: Male Qualification: J.S.S. 3 Location: Iyaji Akesan area Oyo, Oyo State. 12/04/2023

Saka Wakeelu Age: 10 years Sex: Male Qualification: J.S.S. 1 Location: Aremole Compound, Saja Area, Ogbomoso 13/2/2023

Jafaru Ibraheem Age: 10 years Sex: Male Qualification: J.S.S. 2 Location: Olode Ijeru, Ogbomoso, 13/4/2023