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CREATIVE UPCYCLING OF PLASTIC WASTE MATERIALS AS AN INNOVATIVE ARTISTIC TECHNIQUE FOR ENVIRONMENTAL SUSTAINABILITY, ENVIRONMENTAL AESTHETICS AND ENTREPRENEURIAL AVENUES IN THE KOKROBITE AND BORTIANOR COMMUNITIES IN ACCRA

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ABSTRACT

Plastic waste continues to be an environmental nuisance globally. In the case of Ghana, where only 5% of plastic waste is recycled, there is an urgent need for organizations and individuals to develop innovative strategies in creatively re-using plastic waste materials, and transforming them into valuable products. This exploratory qualitative study that utilizes a creative and arts-based research approach discusses the innovative artistic technique employed by one of the burgeoning contemporary Ghanaian artists, Samuel Prophask Asamoah who uses plastic waste materials that have been an age-long environmental challenge in the Kokrobite and Bortianor communities in Accra where he resides. The study reveals that the creative upcycling undertaken by Asamoah has opened another entrepreneurial opportunity and enriched his art practice. Interestingly, Asamoah has used his new innovative artistic technique to offer some of the local community members job avenues in the collection, cleaning, and cutting of plastic waste materials for his artistic productions. Through tactful exhibitions of his plastic waste innovative projects, Asamoah engages important stakeholders such as the Accra Metropolitan Assembly, private and public schools in the vicinity, fisher-folks, market women, and Nature Conservation and Environmental sustainability NGOs to partake in the discourses on ways of arresting the canker of plastic pollution. An immersive community sensitization exhibition that attracted a large audience, devoid of binary distinctions, was organized at the Kokrobite plastic deposit center. An exhibition organized in a panoramic style provided egalitarian attention amongst the exhibits and a platform for diverse conversations that inspired new ideas from the audience. The study asserts that when artists and other individuals take up creative upcycling projects using plastic waste materials, it will offer another layer of employment for them and many others in their communities while protecting the environment and its rich biodiversity.

Keywords: creative upcycling; environmental aesthetics; environmental sustainability; plastic waste; innovations in art

INTRODUCTION

In this post-colonial era where the increase in human population, urbanization, industrialization, and concomitant waste generation are among the most talked about, the acceleration of global plastic waste has raised global concerns due to its non-biodegradability nature. The associated adverse impacts on both fauna and flora have shifted global attention from the inherent properties that make it a preferred material, especially for various packaging activities. Poor management of plastic waste and its allied pollution presents a threat to human life, the environment, and its rich biological diversities (Musah, Peng, and Xu, 2021). However, in the quest for the best form of management of plastic waste, environmentally friendly and sustainable methods are the most preferable. Unfortunately, recycling which is considered to be most sustainable and environmentally friendly among the waste management approaches applied for plastic waste is pegged around 9% globally and 5% in Ghana (Chamas *et al*., 2020). However, there is undeniably a need for innovative recycling strategies created by both organizations and individuals in various fields that would possibly transform discarded plastics into valuable products (UNEP, 2018) to change the narrative of what is perceived to be waste, for the sake of sustainability.

Amid diverse views that have created controversies around the concept of waste, this research takes a stand through the exploration of the innovative and artistic approach to sustainable plastic waste management. The perception of waste as a medium, through an artistic lens is not new in the field of art, as it resonates with the standards of various art movements, contemporaneous with the Euro-American modernism. An Example of such movements is; Neo-Dadaism notably practiced by artists such as Robert Rauschenberg and Jasper Johns. Another art movement that reflects the concept of repurposing is the Fluxus art movement with key figures being; Yoko Ono, George Maciunas, and a few others. Moreover, the Pop Art movement is also characterized by this concept and is associated with artists such as; Andy Warhol, Claes Oldenburg, and Roy Lichtenstein. In this contemporary era, creative reuse or upcycling is being practised by some contemporary artists around the globe (Daltry, 2021), hence, has been endorsed as a smart and better waste management approach for post-consumer plastics (Zulkernain *et al*., 2021; Okan *et al*., 2019).

This approach to artistic creation has environmental, social, as well as economic benefits. It provides entrepreneurial prospects and results in poverty alleviation (Gutberlet, 2018) while enhancing the aesthetics of the environment, resulting in building sustainable communities (Adiyoso, 2020). Moreover, innovative artistic projects rooted in this concept convey psycho-visual messages as sensitization mediums that can result in massive social change - through the incorporation of sustainability ideals - in the community where such project is carried out (Polfus *et al*., 2017; Yuliastuti *et al*., 2019; Evode *et al*., 2021; Eshun & Donkor, 2022). More elaborately, this creative approach would play a very significant role in the achievement of some Sustainable Development Goals such as; health and well-being (SDG 3), Provision of clean water and sanitation (SDG 6), Responsible consumption and production (SDG 12), Climate change (SDG 13), Sustainability of life below water (SDG 14), Sustainability of life on land (SDG 15). Despite the widespread of this concept in contemporary art practice, few Ghanaian artists have adopted the repurposing of discarded materials as an artistic approach, thus, making it less recognized locally as an ideal form of plastic waste management.

Kokrobite and Bortianor communities in Accra are among the communities in Ghana faced with the challenge of plastic pollution. The situation has been attributed to the negligence of hygiene, poor plastic waste disposal mechanisms, and lack of sensitization among community members on the need to eschew behavioural tendencies that harm the environment and biodiversity (Asamoah *et al*., 2022). To provide a pragmatic solution to plastic waste accumulation, and allied pollution, this study first seeks to identify specific problems facing community members as a result of plastic pollution. The study moreover, sought to produce innovative installation art with discarded plastic items picked from these adjoining communities as a medium. After the execution of the innovative projects, the exhibition would be organized as a medium for sensitization to showcase the entrepreneurial and environmental prospects of upcycling as an alternative approach to plastic pollution. The research objectives that drove the study were:

1. Examine the adverse impacts of plastic pollution in the socio-cultural environment of Korkrobite and Bortianor in Accra
2. Design and execute installation art from discarded plastic materials for public sensitization on the potential of upcycling as a plastic waste management strategy
3. Mount an exhibition with the upcycled plastic installation art for public sensitization, and assessment
4. Examine the perspectives of the participants on aesthetic, economic, and environmental benefits of creative upcycling as an alternative management strategy for post-used plastics

STUDY AREA

Kokrobite and Bortianor are two adjoining communities known for coastal tourism, and fishing as the main source of revenue. They are both located in the Ga South municipality in the Greater Accra Region of Ghana. They are among coastal communities on the stretch of the Atlantic Ocean (Figure 1). These twin towns have a total population of 41.350, according to the 2010 National Population and Housing Census (GSS, 2010), share a very attractive sandy beach, and are surrounded by hills. These communities have been a destination for domestic and foreign tourists for the past few decades (Boafo *et al* 2014), hence, making it a good location for businesses such as; hotels, and restaurants, as well as art and craft marketing. Unfortunately, due to the recent acceleration of plastics and other solid waste materials accumulation on the beach and the marine body, tourism and fishing which were the major sources of income for the community members have faced a constant decline.

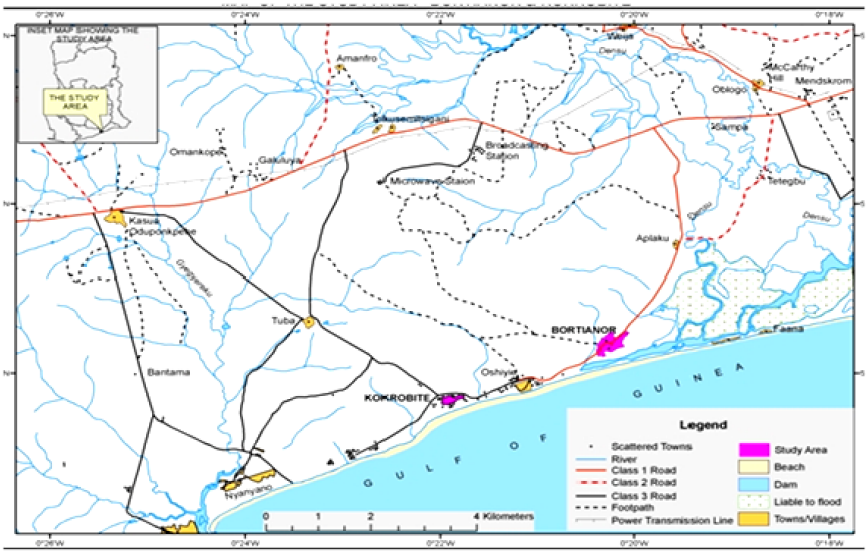

Figure 1: Map showing the locations of Kokrobite and Bortianor

Figure 1: Map of Kokrobite and Bortianor Communities, Accra

Source: (Boafo *et al*., 2014)

METHODS

Jones and Leavy (2004) revealed that any social research that integrates creative arts in any of the stages including; data collection, analysis, interpretation, or dissemination could be classified as creative and art-based research. In such qualitative research, various art genres could be used in different dimensions, such as aesthetics, communication, and for many other purposes (Franz, 2010). These two mentioned purposes for the integration of art in a social inquiry are among the rationale for the choice of the creative and art-based research method for this study. The study also sought to find a proactive and sustainable management method for post-consumer plastics in the study area which also makes it fit within the framework or align with the concepts of eco-innovation theory. Fussler and James (1996) stated that eco-innovation theory acknowledges products and methods that prioritize the health of the environment. Moreover, Oltra and Saint Jean (2009) further detailed that eco-innovation could be a new or modified system, practices, processes, or products with a focus on environmental health. Furthermore, the recent research by Debref (2018) also established that any innovative piece that results in a positive environmental impact could be classified as eco-innovation.

The procedural steps for the interpretation and description of reality in this qualitative inquiry, from the perspectives of the participants selected via the use of the snowball and purposive sampling designs undeniably place it in the confines of phenomenology research design (Strauss and Corbin, 2008; Levitt, 2017). In-depth information on the adverse impacts of plastic pollution in the study area was garnered through the use of semi-structured interviews, focus group discussions, and non-participant observation data collection strategies. These data collection instruments

assist the researcher in eliciting in-depth non-numerical information as required for qualitative research (Goyal, 2022). This approach provides insight into a phenomenon based on the perspectives of the study participants and the researchers. An interview guide and an observation checklist were developed and pre-tested on a small section of the study participants in the study area who were not drawn from the original sample. Their views helped in the revision of the instruments before their final administration. The perspectives of the fisherfolks, market women, and other indigenes of diverse professions (such as hotels, restaurants and handicraft shop owners), as well as environmentalists, teachers, and students, were sourced, transcribed, and analysed. Although the target population for the study was 100 respondents, the data reached saturation point when information was taken from 69 participants. Any attempt by the researchers to elicit views of the remaining population yielded results in resonance with the data already gathered. However, 69 respondents were used as the sample size as detailed in Table 1.

Table 1: Sample Description

Both communities	Fisher-Folks	Market women	Hotel, Restaurants and Handicraft Shop owners	Environmentalists	Students	Teachers
Male	20	0	7	3	6	2
Female	0	11	5	5	8	2
Total	20	11	12	8	14	4

Source: Authors' construct, 2023.

Thematic qualitative analytical procedure was followed rigorously to contextualize, categorize, and summarize the research findings in that regard. The practical aspect that involved the execution of art installations followed the procedural steps adopted by Yuliastuti *et al*. (2019) which were brainstorming, exploration, evaluation, and exhibition (Table 2) and in addition, post-project evaluation.

Table 2: Procedural Steps for the Art Installation Project

Brainstorming	Conception of various ideas, and transforming them into visible elementary compositions through sketches.
Exploration	Idea development, and the experimentation of the medium with diverse approaches.
Evaluation	Reflections and discussions of the works produced in progress
Exhibition	Display of the finished artistic projects for public assessment
Evaluation (post-project)	Discussions on the relevance in the context of environmental sustainability, aesthetics, and entrepreneurial prospects

Source: Adapted from Yuliastuti *et al*. (2019)

Brainstorming

Since this study was a co-creation project, the community members were involved right from its initial stages. The idea conceived by the artist was discussed with selected community members and stakeholders to elicit their creative ideas on the intended project. All the diverse opinions were evaluated, influencing the mental pictures of the designs for the project. Although the transformation of these intangible or abstract ideas into tangible forms was solely dependent on the lead artist who is the first author of the paper, the opinions of the community members as well as the socio-cultural practices in the study areas became a source of inspiration.

Exploration

This stage involved a thorough investigation of the characteristics of plastic material as a medium for art. Thus, an examination of how different plastic materials respond to various conventional as well as invented approaches was carried out. Some conventional and hybrid forms were achieved through experimentation. The resulting compositions ranged from realistic representations to abstract representations. The community members played significant roles in the preparation of the materials, including washing, cutting and the application of heat energy, while the lead author created the compositions from the prepared discarded plastics.

Evaluation

This stage involved critical analysis of the works of art during their execution phase. The selected community members were invited to the artist's studio occasionally to share their opinions concerning the elements in the work and how they related to the socio-cultural environment in the study areas. Moreover, there was an interesting generation of new ideas from these constant and consistent discourses with the community members that influenced the forms that were eventually created.

Exhibition

After the execution of the artistic installations, the next stage was the exhibition of the artworks produced from the prepared plastic waste materials. The process involved the selection of the venue to showcase the artistic projects for public sensitization, and assessment. The necessary preparation of the space was carried out, and the works were mounted. The target audience for the project were fisherfolks, market women, and other indigenes with diverse business specialties (hotels, restaurants, and handicraft shop owners). It was also focused on environmentalists from the Ministry of Environment Science Technology and Innovation (MESTI), as well as environmentalists from the Ghana contingent of the Global Vision International (GVI). There were also teachers and students from schools in these adjoining communities as well as tourists.

Post-Project Evaluation

This evaluation was carried out during the exhibition of the finished artistic installations. The study participants shared their opinions based on aesthetic (environmental aesthetics), economic (entrepreneurial prospects for poverty elevation), and environmental (environmental sustainability) contexts. This stage provided an avenue for learning through interactions with the artist, other researchers, and the artworks, and also for a deeper understanding, and appreciation of the sustainability, aesthetics, and entrepreneurial prospects of the upcycled projects.

RESULTS AND DISCUSSION

To attain the research objectives, semi-structured interviews, and focus group discussions were used for gathering data on the adverse impacts of plastic pollution in the socio-cultural environment of Kokrobite and Bortianor in Accra. The sample population included some indigenes of these adjoining communities and stakeholders. The researchers also took a non-participant stand to observe the detrimental effects of post-consumer plastics in various habitats, including; aquatic, and terrestrial environments in this geographical area.

The participants who were recruited for the study included; fisherfolks, market women, and other indigenes who are in diverse professions, students, and teachers from two schools. There were also environmentalists working under the Ministry of Environment Science Technology and Innovation, as well as the Ghana contingent of the Global Vision International. The demographic information of the participants is detailed in Table 3. The reason for this sampling diversification is to capture perspectives of a diverse population that extend beyond age, class, gender, and other disparities to ensure the reliability of the research findings.

There were 69 participants with 38 males and 31 females. Fisher-folks numbered 20 (male=20), who also doubles as elders in the communities. There were 11 market women and 12 other indigenes, who were hotels, restaurants and handicraft shop owners (male=7 and female=5). The total number of environmentalists was 8 (male=3 and female=5). Selected students from the two schools numbered 14 (male=6 and female=8) and teachers were 4 (male=2 and female=2). The adult and student participants were engaged in separate discussions.

Table 3: Demographic information of the respondents

Both communities	Fisher-Folks	Market women	Hotel, Restaurants and Handicraft Shop owners	Environmentalists	Students	Teachers
Male	20	0	7	3	6	2
Female	0	11	5	5	8	2
Total	20	11	12	8	14	4
Percentage	28.98%	15.94%	17.39%	11.59%	20.28%	5.79%

Source: Authors' construct, 2023.

Adverse impacts of plastic pollution in the socio-cultural environment of Korkrobite and Bortianor in Accra

This stage of the research was focused on the collection and theorization of the impacts of plastic pollution in various habitats in these adjoining communities. The perspectives of the participants recruited as well as the researchers' observations were categorized into four:

- *Blockage of drainage systems as a result of land pollution*
- *Pollution of the marine body*
- *Decline of tourism, and other related businesses*

Many of the participants shared various unfortunate incidents over the years as a result of flooding. Although there are drainage systems in these communities that normally connect to the sea, due to blockage caused by non-biodegradable solid materials, mostly plastics, their experience in the rainy season becomes unbearable. Some of the respondents revealed:

"Some people dump their refuse in the gutters especially when it is raining, to be carried into the sea. Not all can get to the sea. They sometimes chock the gutters which makes the rainwater flow over anytime it rains." (Hotels, restaurants and handicraft shop owners - 2, 3, 6, and 8, Personal communication 15th April, 2022)

The statement above proves that the main cause of consistent floods in the communities is the disposal of waste, mainly plastics in various drainage systems out of negligence. Although their ultimate aim is to transport them to the sea which is equally improper, along the way, some of these items get stacked. This action constantly results in a complete or partial blockage of drains, impairing the free flow of any form of water (Boucher *et al*. 2019).

Some questions were posed by the researchers to unveil what happens to the waste in the dry season since some people carelessly prefer disposing in the drains to be carried into the sea. This yielded conversations on air pollution. Many participants revealed that since plastics do not decompose even when buried, people prefer incineration, especially in the dry season. This age-long waste management strategy equally has numerous health implications for the atmospheric and terrestrial inhabitants, such as; skin and eye irritations, respiratory problems, and visual impairments. The discussions herein give a clear indication that there is a need for a safer or sustainable alternative management strategy for dicarded plastics. Although disposal of waste in the marine body has been an age-long practice in these communities, the fisherfolks revealed their awareness of the negative implications on the aquatic inhabitants, therefore, a dent in the fishing profession. They expressed displeasure with this unsustainable and unhealthy practice:

"Dumping plastic waste in the sea is not good for our business. That is gradually spoiling the beach, and killing the fishes. We don't catch fishes like we used to, meanwhile, that is the main job for most of the men here" (Fisher-folk- 1, 5, 6, 8, 9, and 12, Personal communication 20 May 2022)

This statement resonates with many other indigenes who are into other businesses such as; guest houses, restaurant operators, craft shop owners et cetera. Apart from fishing, these communities rely on tourism. However, when the beaches become untidy, all the businesses with tourists as the main clients are negatively affected (Boafo *et al*., 2014). All the conventional waste management practices mostly applied in these communities, discussed above had not been beneficial, however, the participants expressed their readiness to embrace and support any alternative strategy that will put sustainability at the forefront.

Designing and execution of the installations from discarded plastic materials for public sensitization on the potential of upcycling as a plastic waste management strategy

Some of the community members played a very crucial role in the execution stage. They were recruited and paid for the collection and preparation of the discarded plastics, used as a medium for the upcycled artistic works. Others also voluntarily availed themselves, for brainstorming, and idea development

process, which helped the artist to create concepts that could be appreciated by the community members, while inculcating some sustainability concepts for sensitization. The processing of the post-consumer plastics for the upcycled installations went through chronological stages such as; washing, cutting, and shaping before fixing on the support (Figures 2, 3, 4 and 5). The support which is a wooden panel was also shaped, covered with canvas and primed (Figure 6).

After the preparation of the support, the processed discarded plastics that came out in different dimensions were juxtaposed and superimposed on the support with the help of fixatives and fasteners until a desired form was achieved. The themes cut across portraiture, scenery, and abstract expressions. Due to the different approaches used during the processing of the discarded plastics, including, cutting, and the application of heat energy to transform the physical structure (Figures. 3 and 4), the artist was able to achieve hybrid forms that swing between relief sculpture and collage. Figure. 7 is a close-up photograph detailing the textural effect of one of the exhibits. Each piece consists of items of diverse sources, shaped in different dimensions, firmly fixed on the support. The discarded items used include fishing nets, post-consumer packages for foods and beverages, as well as cosmetics such as perfumes, detergents, et cetera. The merger of animal and human imagery in the pieces (Figures; 9 and 11) conveys a sense of harmonious coexistence, which is key to unlocking the door to sustainable development. Likewise, the concept of harmonious coexistence is reflected in the portrayal of the three compartments of the ecosystem (atmospheric, terrestrial, and aquatic compartments) in some of the pieces created.

Figure 2: Washing of post-consumer plastic waste

Source: Photographed by Evelyn Asamoah, 2022

Figure 3: Post-consumer plastics being cut.

Source: Photographed by Evelyn Asamoah, 2022

Figure 4: Post-consumer plastics being shaped.

Source: Photographed by Evelyn Asamoah, 2022

Figure 5: Preparation of support for the upcycled plastic waste installation art

Source: Photographed by Evelyn Asamoah, 2022

Figure 6: Upcycled plastic work, under execution,

Source : Photographed by Evelyn Asamoah, 2022

Exhibition of the upcycled plastic works for public sensitization and assessment

After the execution of the artistic works, an outdoor exhibition was organized at the community plastic deposit center, a project by Global Vision International, located in Kokrobite. This community sensitization exhibition co-curated by the authors, was carefully planned and fixed in the month of July 2022, a period when the "Homowo" festival is celebrated in these communities. This period was chosen because of the temporary ban on fishing, and as a fishing community, that is when many community members stay at home. Due to that, there was a large audience for the exhibition. The theme for the exhibition was "Creative upcycling for sustainability", however, all the exhibits were selected based on their relevance, and coherence, in relation to the theme. This was moreover, to ensure that they fit together well and create a unified consistent whole when mounted at the venue.

The venue mentioned herein was chosen because of the shared objective of the study, and Global Vision International, which also aligns with the United Nations Sustainable Development Goals (UN SDGs). The Kokrobite plastic deposit centre was created by the Ghana contingent of Global Vision International to collect plastic waste from both domestic and industrial spaces in the community and beyond. After the collection of plastic, sadly, no further management strategy is used to process the waste, turning the centre into a mere landfill site for plastic waste. Since the core objective of this study is to process this waste into artistic works, it becomes an extension of the objective for the creation of the mentioned plastic deposit centre. Based on that, this exhibition becomes an eye opener for both the community members and the management of the centre to aim beyond collection.

The exhibits were mounted on easels and the walls that fenced the deposit centre, leaving the centre of the space open. At the centre of the exhibition space were seats for the audience as they engaged in diverse conversations in relation to the project. This style of exhibition resonates with the panoramic exhibition, a setup that was popular in the 19th century, and aimed to immerse viewers in a 360-degree experience of the event. The exhibition setup created egalitarian attention amongst the exhibits in a manner that gave no particular work more prominence than the others. This ideology also resonates with harmonious coexistence which is fundamental for sustainability.

The target audience was the community members as well as visitors who were there for various recreational and other activities. The audience spans across gender, age, class, and other binary specifications or dispensations. All the audience impartially were engaged in a participatory mental exercise, in the form of dialogue, to test their ingenuity in connection with the concept of the exhibition and the project in general. Their views as detailed in the next chapter were analysed and categorised based on the aesthetic, economic, and environmental benefits of creative upcycling as an alternative management strategy for post-used plastics.

The overarching concepts underpinning the projects executed, in terms of the contribution to knowledge in the field of art, and the role in sustainability were classified into two, (Table. 4), and were geared towards:

- Innovations in terms of artistic technique
- Contribution to the achievement of some United Nations Sustainable Development Goals (UNSDGs)

Table 4: concepts underpinning the projects executed

Innovations in terms of artistic technique	• The material, approach, as well as the hybridity of forms created. • The forms created from the discarded plastics swing in between collage, sculpture, and many other art genres. • The themes cut across portraiture, scenery, and abstract expressions.
Contribution to the achievement of some United Nations Sustainable Development Goals (UNSDGs)	The significance of the project in the achievement of the SDGs is based on the prioritization of the health of the environment through the physical reduction of plastic waste accumulation in various habitats. This concept aligns this upcycle project with SDGs such as: • The health and wellbeing (SDG 3) • Provision of clean water and sanitation (SDG 6) • Responsible consumption and production (SDG 12) • Climate change (SDG 13) • Sustainability of life below water (SDG 14) Sustainability of life on land (SDG 15)

Source: Authors' construct (2023)

Exploration and analysis of the perspectives of the participants on aesthetic, economic, and environmental benefits of creative upcycling as an alternative management strategy for post-used plastics

Although there were hundreds of people in attendance, the data reached a saturated point where the perspectives of 69 participants were sourced, as detailed above (Table 3). There was sampling diversification, extending beyond age, class, gender, and other disparities to ensure the inclusivity and reliability of the research findings (see Table 3). This post-project evaluation stage provided an avenue for learning through interactions with the artist and the artworks, and also for deeper understanding, and appreciation. The researchers as well as the environmentalists in attendance provided elaborate information on the significance of such an innovative alternative approach to plastic waste management. The discussion was focused on the environmental as well as the socioeconomic impacts of upcycled art. Cook *et al*. (2023) revealed that any plastic upcycling or recycling in general, that involves a thermal process results in the emission of carbon compounds that negatively impact the biophysical environment. However, in comparison with other recycling management strategies, especially those that involve thermal processes, this artistic production does not leave any carbon footprint. Aside from carbon compound emissions, chemical additives and residual monomers that the workers in various recycling industries are exposed to, are potential etiological factors for cancerous diseases as well as respiratory and cardiovascular problems (Landrigan *et al*., 2023). To avoid these hazardous implications associated with the conventional recycling of discarded plastics, the processing of the materials for this artistic project was devoid of chemical additives. The conclusion drawn clearly indicates that the benefits of upcycling discarded plastics into artistic projects of this kind outweigh that of the other waste management strategies.

As a response to that, the inspired participants also expressed their opinions on how this ideology can further be developed in the context of sustainability, aesthetics, and entrepreneurial prospects (See table. 5). As concisely categorized and tabulated (table. 5), based on the mentioned thematic areas revolving around the central theme of the study, many brilliant ideas emerged in this dialogic phase of the study. Some of the ideas extend beyond art, however, touching diverse aspects of science and technology. These include how corrosive parts (corrosion-prone materials) of their architectural structures and some professional equipment could possibly be replaced with processed discarded plastics to mitigate the impacts of the sea breeze. Some participants suggested how the effectiveness of such initiatives could be improved through the intensity of social engagement and accessibility of upcycled plastic projects. Other interesting areas discussed were the economic impacts through entrepreneurial prospects and the reduction of the public sector's expenditure on sanitation. Figures; 7, 8, 9, 10, and 11 are some photographs taken at the exhibition.

Figure 7: Executed plastic waste installation,

Source: Photographed by Evelyn Asamoah, 2022

Figure 8: Exhibition of plastic waste installation, conversation with some audience,

Source: Photographed by Evelyn Asamoah, 2022

Figure 9: Exhibition of plastic waste installation,

Source: Photographed by Evelyn Asamoah, 2022

Figure 10: Exhibition of plastic waste installation, some audience,

Source: Photographed by Evelyn Asamoah, 2022

Figure 11: Harmonious Edifice, 240cm X 240cm in diameter,

Samuel Prophask Asamoah, **discarded plastic on panel,** 2022,

Source: Photographed by Evelyn Asamoah, 2022

Table 5: Some Responses from the participants during the post-project evaluation,

Environmental Sustainability through sensitization	
Replacing plastic as an alternative material for roofing sheets, and other equipment used locally that are conventionally from wood and other natural sources.	*"Metal roofs in this community rust easily because of the sea breeze. However, if there is a possible way of using plastic waste, that would be better. Canoes and other tools for fishing that are wood can also be replaced with plastic to save the forest".* *(Fisher-folk-3, 4 and 7; Environmentalist-2 and 3, personal communication, 9th July, 2022)*
To ensure a sustainable solution, this project should not be limited to only these two communities.	*"The sea is joined with rivers and other water bodies, however, other communities should also be educated. If the rivers that flow into the sea are free of plastics, and we also stop dumping in the sea, the problem would be solved completely"* *(Teachers- 2, and 3; Hotels, restaurants and handicraft shop owners -5 and 6, personal communication 10th July, 2022)*
Environmental Aesthetics through sensitization	
There should be several of these projects mounted in the community for aesthetics and sensitization.	*"If possible, there should be more of this project mounted in schools, and other areas. It is very beautiful, and people must see that all over".* *(Hotels, restaurants and handicraft shop owners -1, 3 and 4; students-1 and 5, personal communication, 10th July, 2022)*
Recommendation of workshops for students and mobile exhibitions.	*"We will suggest that there would be periodic workshops for community members and students. Exhibitions could also be organized in different venues from time to time to enlighten people on the significance of plastic waste."* *(Environmentalist, personal communication, 9th July, 2022)*
Entrepreneurial Avenues	
Miniature products could be made out of plastic waste to boost the local and the national economy.	*"Even apart from the big products, people can venture into miniature products for visitors for economic gains."* *(Hotels, restaurants and handicraft shop owners -1 and 2, personal communication, 10th July, 2022)*
Poverty elevation is all about enlightenment and innovation.	*"This can create several job opportunities to reduce poverty. It is all about enlightenment, and innovation."* *(Teachers-1, 3 and 4, personal communication, 9th July, 2022).*

CONCLUSION AND RECOMMENDATION

This project was aimed at investigating the negative implications posed by plastic pollution in the Bortianor and Kokrobite communities in the Greater Accra Region of Ghana. To ensure the novelty and significance of the project, a thorough investigation was conducted to find out from the community members their awareness of the negative impacts of plastic waste and allied pollution. It was discovered that although the community members are not ignorant of the detrimental effects of plastic pollution on various habitats in the study adjoining communities, the most management methods for plastic pollution had been open dumping and incineration, which have various repercussions on the inhabitants of the terrestrial, atmospheric, and aquatic environment. However, their ignorance of alternative and sustainable management strategies has resulted in sole reliance on these conventional strategies.

Due to the unsustainability of the conventional strategies mentioned herein, as evidently emanated from the various experiences shared by the respondents, there was undeniably a need for a more sustainable and pragmatic approach. Upcycling plastic into installation art projects which falls under a broad recycling management method, that is considered, the most sustainable among the ones discovered globally, was perceived as embraceable by the community members and stakeholders.

However, with the assistance of the selected community members, some discarded plastic items were collected, and used as a medium for installation art, after being through various preparation procedural stages. These artistic installations reflected various ideas shared in discourses by the artist and volunteers before and during the execution. They were rendered in realistic and abstract forms. Aside from the primary role of mitigating the quantity of accumulated plastics in the environment, the unconventional approaches adopted, the hybridity of forms created, and the novelty of the philosophical underpinnings of these upcycled installations, contribute greatly to the expansion of the boundaries of art.

After the successful execution, an outdoor exhibition was organized at the community plastic deposit centre, recently established by Global Vision International. Diversified audiences were invited for sensitization and post-project evaluation. This final stage of the project provided an avenue for sensitization on the essence of the project.

In reciprocity, these diversified audiences also shared their rich and novel ideas with the artist based on various concepts of the project for possible future development. These views of the accessible population of 69 were categorized under the context of; Environmental Aesthetics, Environmental Sustainability, and Entrepreneurial Avenues/ prospects.

In the context of Environmental Aesthetics, it was established that upcycled plastic installation art projects can play a very significant role in the enhancement of the aesthetics of various spaces, while also serving its sensitization purpose as it gains more audience. Moreover, they also suggested the need to expand the project beyond the borders of the studied communities. These should include both indoor and outdoor, public and private spaces. To make this successful, The Ministry of Sanitation and Water Resources can collaborate with the Ministry of Environment Science Technology and Innovation, and the Ministry of Tourism, Art and Culture to embark on such projects in various indoor and outdoor public spaces across the country.

In the context of Environmental sustainability, it was acknowledged that upcycled discarded

plastics could be a better alternative management strategy for plastic waste. This strategy is more beneficial due to the dual role it plays, thus, for environmental sensitization and the physical reduction of the quantity of plastic items accumulated in the environment. However, they recommended that such projects should be expanded beyond the boundaries of art, through experimentation on some functional products, such as roofing panels, fishing canoes, etc. To make this possible, the government and other stakeholders can establish factories that will utilize a large quantity of post-used plastics for larger products. In addition to that The Environmental Protection Agency under the Ministry of Sanitation and Water Resources should intensify advocacy for repurposing, as a better alternative and more sustainable management strategy for plastic pollution, and should be adopted. This can be enhanced with upcycled installation art projects. Moreover, Environmental and Sanitation laws should be enforced to ensure a deserving punishment for those who carelessly dispose of plastic waste in unauthorized locations.

In the context of Entrepreneurial avenues, the two areas discussed above would aid in job creation as people would be needed to assist in the production of more discarded plastic installation art in various spaces in different communities. Aside from that, there were recommendations for workshops for interested individuals including students at various academic levels to broaden their creative abilities to come up with a variety of products for economic benefits. This will enhance entrepreneurship and aid in poverty elevation. To inculcate this in the younger generation, the Ministry of Education and Ghana Education Service should introduce a course related to upcycling in the creative art curriculum at various levels. Future researchers could explore other solid waste materials for projects aimed at, aesthetics, sustainability, entrepreneurship, and contribution to knowledge in the field of art.

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Declaration of Conflict of Interest

The authors declare that there are no conflicts of interest for this study as well as for the manuscript.

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