Sustainable Creations: Upcycling of Plastic Waste Materials into Wealth in Selected Lagos Secondary Schools

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Abstract

This study examined upcycling as a sustainable solution, transforming plastic waste into wealth through a school-based "Catch Them Young" initiative. The project combined workshops on upcycling discarded plastics into retail products (e.g., flower vases and wall art). Using a mixed-methods approach, data were analyzed via quantitative (chi-square tests - descriptive statistics) and qualitative (thematic analysis) techniques to evaluate waste management practices. Key findings revealed disparities in waste collection: 42% occurred on school grounds (exceeding the 33.3% expected baseline), while households lagged (25%). Weekly collection dominated (55%, +21.7% deviation), indicating systemic gaps in service frequency. Upcycled products, particularly jewelry and flower vases, generated income predominantly in the ₦12,001–₦15,000 bracket (59% of sales), though product type did not statistically influence income distribution. Efficiently, 84% of participants evaluated the workshops as "highly effective," and 78% said they learned new entrepreneurship skills. Eighty percent of participants recruited three or more peers, and peer involvement flourished through demonstrations, with a success rate of 65%. Upcycling can reduce plastic waste and encourage young people to start their businesses, according to the study. Instilling a "reduce, reuse, recycle" ethos cultivates environmentally conscious citizens while creating economic opportunities. Recommendations include policy reforms to prioritize residential waste collection and scaling school-based upcycling programs to align with Sustainable Development Goals (SDGs) on climate action and decent work.

Keywords: *Creative thinking, sustainable development, Upcycling, Waste management*

Introduction

In Lagos, Nigeria, a major environmental problem caused by plastic waste is the annual flooding between April and October. Flooding displaces thousands of people and spreads diseases such as malaria, typhoid fever, and immense property damage (Aligbe, 2021). Elaborating on this, (Naji 2015) states that single-use plastic generates tons of plastic waste daily, with only a tiny fraction recycled, leaving a more significant quantity in the environment. Industrial and commercial organizations in the area are also negligent about how consumers trash their empty products after use, and their containers are headed for landfills (Stahel, 2016). The indiscriminate dumping of plastics results in overwhelming

climate change. Ogwueleka (2009) stated that climate change is a universal problem, but it worsens in countries like Nigeria, where waste trash enters landfills and oceans. In Nigeria, plastic trash is a significant amount of non-biodegradable solid waste (approximately 69%). Over ten billion dollars of plastic products enter the Nigerian market each year, with over nine billion dollars worth, or over 90%, discarded as solid waste (Olanrewaju & Oyebade, 2019) Kofoworola, O. F. (2007). Above is an instance of the most extreme characteristics of plastic waste processing in Nigeria today, with Lagos being the worst affected city due to its large population. Lagos's population has grown tremendously, from just 1.4 million in 1970 to 21 million in 2022. Lagos generates 25% of Nigeria's gross domestic products, ranking as the 8th fastest-growing African city (National Bureau of Statistics, 2022).

Fig 1. Lagos Population 2022, Source: National Bureau of Statistics

The use and need for disposal of plastic waste in Lagos might double in the next twenty years. By estimation, by 2050, Lagos's population will double and rank as the third-largest city in the world, which indicates that if suitable measures are not taken, the solid waste crisis will affect the ecosystem even more. According to the Pew Charitable Trusts and SYSTEMIQ (2020) report, industry and governments can implement businesses that would minimize plastic that flows into the ocean annually. Pew Charitable Trusts and SYSTEMIQ opine that not paying attention to the problem might result in experiencing the triple flow of plastics into the ocean by 2040, which might result in about 29 million metric tons per year or 50 kg of plastic per meter of coastline worldwide.

To speedily resolve the ocean crisis, education on the global calamity and the need to "Reduce, Reuse, and Recycle" plastic waste must go beyond the theoretical (Omoreghe 2020). In line with this position, McDonough, W., & Braungart, M. (2002) state that efforts should also increase resource efficacy and sustainable product manufacturing, emphasizing "circular economy concepts," which relate to material fluxes in a closed-loop system. With the noticeable adverse effects of waste plastic buildup, there is a growing desire for circular economy methods. In line with this position, Rostek (2013) states that upcycling has acknowledged a circular economy's most sustainable waste management strategies. Recycling, repairing, reusing, and upgrading waste material inventively, "upcycling" has become a focused mediation to reduce company activities' energy and material consumption. It is rapidly gaining acceptance as a feasible strategy for shifting to a circular economy.

In addition, action-based, analytic, and critical learning enables students to apply their knowledge and reflect on a circular economy and sustainable development via upcycle workshops in schools. According to Wegener (2016) and Carney Almorth, B., & Eggert, H. (2019), upcycling transforms waste materials into products of higher quality and greater worth, referred to as "cradle-to-cradle," a study on environmental design, remaking the "Way

We Make Things." Thus, Has (2015) agrees that upcycling contributes to the circular economy and encourages sustainable creation and usage by extending the useful life of commodities and resources.

Upcycling disproves the assumption that an object loses value when abandoned or must be recycled before a new production and value creation cycle. According to Ibukun (2019) and Nnaji, C. C. (2015), the logic of mass production is disposal: "Mass production of items and their consumption is dependent on widespread acceptance and even enjoyment of exchangeability; replacing the old, broken, or out-of-style with the new." In agreement with Ibukun, Hopewell (2009) says that replacing items in a series allows one to discard them without concern.

The results from upcycling will aid businesses in achieving Sustainable Goal 12 of the United Nations, which focuses on conscientious production and consumption. Geng (2008) states that other benefits of upcycling include restricting the mining of raw materials and increasing reserve efficiency, minimizing the number of new material inputs, and minimizing carbon emissions connected to material and energy use. Therefore, this project is in alliance with Geng (2008) that the potential of upcycling can expedite the conversion from a linear to a circular economy, which will benefit local inhabitants, the ecosystem, and the economy during global economic turmoil.

Despite these benefits and the increasing global advocacy for sustainability, there remains a significant gap in applying upcycling knowledge practically among young learners in Nigeria. There is insufficient integration of circular economy practices into the educational system, especially through creative, hands-on approaches such as upcycling workshops. To address this, this initiative will introduce kids to upcycling as a way to minimize plastic waste, complete the loop on resources, and foster sustainable thinking. A fresh aesthetics and product design approach to plastic litter among youngsters is one of the main benefits of this study. The goal is to avoid resource loops through upcycling. The project taught children to view garbage as a resource and promote creative thinking and upcycling. Children participated in waste plastic upcycling and learned to close resource loops. This project revealed that upcycling processes and products would demonstrate how old and new are interwoven, even while dissolving 'old' and 'new' as distinct categories pertinent to our understanding of creativity. During the upcycling project, the past was embedded with waste plastic bottles in the present. At the same time, the future appeared in the shape of the product that the students imaginatively created from the old, as seen in the graph below.

Research Objectives

1. To examine the methods used by participants to collect plastic waste and assess the Frequency of collection.
2. To analyze the upcycling processes employed and determine the income levels associated with specific upcycled products.
3. To evaluate the effectiveness of training programs in promoting scalability and employment opportunities.
4. To identify the most successful peer engagement strategies in sustaining upcycling practices.

Literature Review

The literature review of this study explored and compared ideas of different authors from various sources to use as a foundation of what is common knowledge about upcycling. The review explored sub-topics related to the problem of plastic waste, upcycling, the advantages of upcycling, and the importance of teaching and imbibing the culture of upcycling in children early in life.

All three studies Jambeck et al. (2015), Plastic Europe (2014), and Lohr et al. (2017)—admit that total worldwide plastic manufacture has kept rising yearly from 225 million metric tonnes in 2004, reaching 288 million metric tonnes in 2012 and 311 metric tonnes in 2014. With roughly 50 enterprises in the sector, Chukwuone et al. (2022) traced the history of plastic manufacturing in Nigeria to the 1960s. According to their report, Nigeria gained the title of second-largest importer of plastic products in Africa from 1996 to 2017. The country accounted for 17% of Africa's total consumption of plastic, and there was a noticeable increase to over 3000 companies producing plastic products in 2013, with a capacity of over 100,000 tonnes of plastic per year. Unfortunately, little was done to address the issue of proper disposal or reuse.

Problems Related to Plastic Waste

The global quantity of garbage produced annually is rising because of changing consumer patterns. This has put a significant burden on the world's ecosystems. Waste loads increase due to inefficient manufacturing, distribution, and consumption and proper waste management control (European Commission Waste Prevention Handbook, 2012). According to the European Union Report on Waste Management (2010), consumers purchase more things since most products are designed with a shorter lifespan and innovative packaging. Many single-use and disposable items are on the market; furthermore, technological developments enable consumers to possess and utilize more personal items while changing

them frequently (Ayuba et al., 2013). This way of living may have increased garbage production while enhancing the quality of life on Earth (Vergara & Tchobanoglous, 2012). Mudgal (2011) asserts that current studies indicate significant amounts of plastic waste are destroying marine and other habitats. Yearly, 10 million tonnes of plastic waste find their way into the oceans, according to the European Commission on Plastic Waste (2013), where they devastate the marine and coastal environment and aquatic species. In 2020, Charitable Trusts and SYSTEMIQ warned that if nothing is done, the annual flow of plastic into the ocean will nearly triple by 2040 to 29 million metric tons per year or 50 kg of plastic per meter of coastline worldwide. Mudgal (2011) noted that the widespread presence of plastic garbage has caused several accounts of animals to become entangled in the ocean, causing choking, harm, reduced mobility, and, in certain situations, death. From the perspective of Mangizvo (2012), plastic waste's environmental issues stem from habitual burning, which residents believe reduces the environmental effects. However, the outcome is dangerous emissions of poisonous greenhouse gases, including dioxins and furans.

Presently, plastics are an essential component of modern life. Product designers progressively incorporate them into their creations due to their light weight, durability, chemical and water resistance, electrical insulation, and low production costs (Pal et al., 2009). In contrast, Jucyte et al. (2005) say that plastics have been connected to several long-term environmental issues, leading to increased plastic trash in landfills. Due to its extensive use, plastic garbage litter has become an environmental issue in most cities and villages throughout the globe, wreaking havoc on the cities and harming the environment. The indiscriminate use of plastic products necessitates plastic waste management since they generate a variety of societal issues. Agreeing with Jucyte, Lofowora (2017) states that plastics are not readily biodegradable because a simple plastic carrier bag that could be used for only five minutes could take as long as 500 years to decompose; hence, the advocacy of entrepreneurship of plastic waste to wealth through this project.

Upcycling and its Advantages

Upcycling was created in the 1990s to refer to material objects or trash; artists produce other goods of greater quality or value than the original. Wegener (2016) claims that Upcycling projects are shaped by the specific social, economic, and political setting in which they operate. The urge to satisfy fundamental human wants, like producing valuable items, drives upcycling. The availability of raw materials, the final objective, and the creative inspirations

and abilities that form the manipulation and repurposing of the materials are all affected by the cultural, economic, and geographic setting in which upcycling occurs.

As Sung (2015) confirms, upcycling has many advantages, such as minimizing new raw materials, preserving natural resources, lowering energy use, and cutting greenhouse gas emissions. Upcycling challenges new products. Because no product lines are moved, localized upcycling may be more environmentally favorable than industrialized. Upcycling is a decentralized, improved local recycling method that can conserve more embodied energy than centralized recycling. Gauntlett (2011) supports our viewpoint by saying that since handcrafted items have the creator's genuine and personal touch, creating and upcycling items could be gratifying as they produce something lovely and helpful. The last items are meant to be aesthetically pleasing and useful (Gauntlett, 2011; Parker, 2012). Some writers view upcycling as a journey or experience in which the method is usually more important and beneficial than the outcome. Gauntlett (2012) and Lang (2012) are the two instances.

The Importance of Teaching Children to Upcycle Waste

The formation of sustainable behavior among school-aged children has made minimal progress. While it is true that children find it incredibly challenging to comprehend the abstract and complex relationships involved in sustainable development, some authors like Davis (2009). have emphasized the importance of environmental education, with some arguing that environmental sustainability education should begin at a young age. In addition, Luff (2018). Childhood education is a significant component of long-term practice since it is believed to be when children's principal attitudes and values are formed initially. The experiences of young children impacting their current and future attitudes, values, well-being, and individual and social development are vital, as Davis (2009) recorded. In addition, children function as a bridge between the present and future generations (Chang et al., 2015). Luff (2018) argues that experiential learning is key to early childhood education, which is essential for children's education in sustainability. In agreement with Luff and MacDonald (2015). States that early learning is described as learning via active environment exploration and play. In addition, research shows that the link between preschools and families is essential for long-term benefits.

Students may engage with and interact with their local community and use the district's physical and social resources in this setting. This strategy is included in place-based education, where students learn to appreciate, respect, and care for their town's traditions, culture, and natural resources. "Children who have the chance to examine, engage with, and

appreciate their surroundings develop a sense of care for themselves, others, and the environment," writes the author (Luff, 2018). Children's engagement might include participating in local social and environmental projects and developing a deeper awareness of national and international issues." The study emphasizes providing children with environmental education opportunities that foster maximum participation and communication among teachers, students, and their families (Pollock et al., 2017).

In addition to the environmental and ecological benefits of creative waste transformation, Leal Filho (2019) documents that upcycling also provides several economic benefits. The possibility for success exists for businesses that upcycle materials. In line with Leal Filho, Sung (2019) says that upcycling increases employment opportunities for the impoverished and saves money otherwise spent on new materials or goods. Upcycling is a transformed sense of pride and purpose, new skills and knowledge acquisition, and a sense of empowerment, among other social and psychological benefits (Bridgens et al., 2018). Within the local economy, businesses, individuals, and communities can exchange incomes, talents, and rubbish (Leal Filho, 2019). Upcycling works because people develop cultural frameworks due to their interactions with various 'waste' objects. Arguing this point further, Caldera et al. (2022) opine that the switch to a better circular economy is an upcycling company model combined with a value proposition and innovation, which can increase sustainability and strengthen ties among entrepreneurs, upcycled items and customer involvement. Upcycled products influence consumer behavior since people seek personal, societal, and ethical benefits from their purchases (Santulli, 2013). This shift in consumer attitudes and perceptions of "waste," combined with the possibility of innovative material reuse, may persuade customers to reconsider throwing away some items (Bridgens et al., 2018). To sum it up, Sung (2019) states that upcycling at home and individual recycling may raise awareness and assist in sustainable trash management from the source because when an appealing and practical object is created with the creator's distinct and genuine touch, the result is a one-of-a-kind item; making upcycling a rewarding venture.

Methodology

Research Design

This study adopts an **explorative/experimental design** with a **case-study approach**, focusing on upcycling plastic waste into wealth and youth empowerment in Lagos State, Nigeria. The project integrates educational workshops, hands-on training, and participatory activities to assess the feasibility of converting plastic waste into marketable products while promoting environmental sustainability and economic self-reliance.

Target Population and Sampling

*Population**: Pupils/students from primary and secondary schools across Lagos State, with deliberate inclusion of children from the** Makoko slum area **due to its high exposure to plastic waste and socioeconomic vulnerability.*

*Sampling Method**: Purposive sampling **was employed to select schools and participants.*

*School Selection**: 30 schools **(mix of primary and secondary) across** 20 Local Government Areas (LGAs) **in Lagos State.**Case Studies**: Ten federal/state government schools were included as case studies.*

Makoko Focus: Schools in the Makoko slum were prioritized to address local environmental challenges and empower marginalized communities.

Participant Selection:

One thousand five hundred pupils/students participated, with consideration for **age, gender, developmental rhythms, and interests**.

Data Collection Instruments

Multiple methods ensured triangulation and comprehensive insights:

The items on the questionnaire titled "Upcycling Plastic Waste into Wealth and Youth Empowerment in Lagos Secondary Schools" were developed to collect demographic data and baseline awareness related to the study. The instrument's validation process is not explicitly described, but data collection methods such as participant observation, focus group discussions, videography/photography, and checklists were employed to complement and verify the information gathered, thereby supporting the instrument's content validity. The reliability scores of the different constructs are not provided. Through participant observation, researchers tracked students' involvement, inventiveness, and skill gain as they upcycled plastic garbage into useful objects like flower vases and kitchen utensils. The use of checklists allowed for the tracking of progress and the simplicity of attaining project milestones. In contrast, focus group talks were utilized for the evaluation of learning outcomes and alterations in attitude. Transforming trash into treasures was captured on film and in still images.

Process & Steps: Three distinct stages were used to complete the project:

Phase of the Presentation*: Introduced the idea of upcycling and tested the students' understanding of the subject. Designed to pique attention and facilitate participation based on individual preferences. Participants* ***in the workshop's hands-on*** *training phase made reusable items (such as vases and musical instruments) from recycled plastic. Customized lessons that take into account the ages and educational* ***backgrounds of the participants.***

Sustainability Education*: Integrated themes of environmental cleanliness, climate change, and income generation.* ***Evaluation Phase****: Assessed achievement of project goals using observation, focus groups, and product outcomes. Gathered evidence of behavioral changes and skill development.*

Ethical and Practical Considerations. **Inclusion**: Aligned with the UN Sustainable Development Goals (SDGs), it prioritizes marginalized groups like Makoko slum residents. **Environmental Impact**: Addressed plastic pollution while fostering income-generating skills. **Participant Safety**: Ensured safe handling of materials during workshops.

Data Analysis

Triangulation*: Cross-verified data from questionnaires, observations, and focus groups.* ***For ratings, responses were categorized into*** *high (4-5/5) and low (1-3/5).* ***Thematic Analysis****: Categorized findings into analytic themes aligned with the study's conceptual framework: Education for Sustainable Development (ESD). Environmental impact of plastic waste in Lagos. Economic empowerment through upcycling.*

Results

Question 1: How do waste collection methods and frequencies vary between school grounds, streets, and residential areas?

Table 1: Observed vs. Expected Frequencies

Category	Observed (%)	Expected (%)	Observed Count	Expected Count	Deviation
Waste Collection Locations					
School grounds	42%	33.3%	42	33.3	**+8.7%**
Streets	33%	33.3%	33	33.3	**-0.3%**
Homes	25%	33.3%	25	33.3	**-8.3%**
Frequency of Collection					
Daily	28%	33.3%	28	33.3	**-5.3%**
Weekly	55%	33.3%	55	33.3	**+21.7%**
Monthly	17%	33.3%	17	33.3	**-16.3%**

The above table shows that school grounds are the most reported (42%), but deviations are insignificant. Homes are the least reported (25%), suggesting potential gaps in service

coverage. Frequency of Collection shows that weekly collection is significantly dominant (55%), exceeding expectations by 21.7%. Meanwhile, monthly collection lags the most (17%), indicating potential underutilization.

Question 2: What upcycling processes and income levels are associated with specific products?

Table 2: Observed Frequencies of Income by Product Type

Product	**₦5,000 – ₦8,000**	**₦8,001 – ₦12,000**	**₦12,001 – ₦15,000**	**Total**
Flower Vases	12	12	35	**59**
Wall Art	12	12	35	**59**
Jewellery	12	12	35	**59**
Total	**36**	**36**	**105**	**177**

The table above indicates identical income distributions across all three product types (Flower Vases, Wall Art, and Jewelry), with no variation in observed frequencies. Notably, the ₦12,001 – ₦15,000 income bracket dominates for all products (35 out of 59 observations, ~59% of total sales). Lower income brackets (₦5,000–₦8,000 and ₦8,001–₦12,000) each account for only ~20% of sales. This uniformity suggests that this dataset does not differentiate product type by income level.

Question 3: **How effective are training programs in promoting scalability and employment?**

Table 3: Training Effectiveness Outcomes

Metric	Category	Frequency
Workshop Effectiveness	Highly Effective (4-5/5)	84%
	Less Effective (1-3/5)	16%
Workshop Satisfaction	Highly Satisfactory (4-5/5)	90%
	Less Enjoyable (1-3/5)	10%
Employment Skills	(Soft skills) Entrepreneurial Confidence	78%
	No Improvement	22%

The workshops were highly effective—84 % effective compared to 16%. Also, participants' satisfaction was very high—90 % compared to 10%. The employment skills of participants from the above table show 78% improved confidence.

Question 4: What peer engagement strategies are most successful?

Table 4: Chi-Square Analysis of Peer Engagement Strategies and Recruitment Success

Variable	Category	Observed Frequency (%)	Expected Frequency (%)
Successful Strategies	Peer Demonstrations	65%	33.3%
	School Clubs	22%	33.3%
	Social Media	13%	33.3%
Recruitment Success	≥3 peers recruited	80%	N/A

The above shows that Peer Demonstrations Dominate Success. Observed Frequency: 65% of successful engagements used peer demonstrations, far exceeding the *expected* 33.3%. Implication: Hands-on, interactive methods may resonate more effectively with peers, fostering trust and relatability. This aligns with literature emphasizing experiential learning

and role modeling in behavior change. School Clubs and Social Media Underperform, School Clubs: 22% observed success (vs. 33.3% expected). Social Media: 13% observed success (vs. 33.3% expected). School clubs may suffer from inconsistent participation or lack of visibility. Social media's low impact could reflect platform misalignment (e.g., TikTok vs. email campaigns) or superficial engagement compared to face-to-face interactions. High Recruitment Success ≥3 Peers Recruited: 80% of initiatives met or exceeded this threshold. Connection to Strategies: The dominance of peer demonstrations likely drove this outcome, suggesting a direct link between strategy effectiveness and recruitment success.

Findings of the Study

The study's findings, which are consistent with previous research, highlight significant developments in Lagos' upcycling and plastic waste management industries. Lower household involvement in plastic garbage collection is shown by the fact that schools account for 42% of primary collection locations, compared to households (25%). This bolsters the arguments made by Davis (2009) and Luff (2018) about the need for early environmental education in creating sustainable behaviors in institutional settings. Reiterating Mangizvo's (2012) worry about detrimental communal disposal behaviors like burning as a result of insufficient formal collection, the underperformance of household collection indicates deficiencies in infrastructure and public knowledge.

Lagos inhabitants' receptiveness to organized waste management is demonstrated by the fact that weekly plastic garbage collection (55%) was much higher than monthly (17%), which is in line with the European Commission's (2010) assessment of the necessity of regular collection in light of growing waste creation. However, reliance on institutional spaces suggests a need for more inclusive, community-based systems encouraging household responsibility, as noted by Jucyte et al. (2005) and Chukwuone et al. (2022).

The uniform acceptance of upcycled products across income levels contradicts economic segmentation and points to a shared value in sustainable consumption, supporting Santulli (2013) and Bridgens et al. (2018), who highlight the ethical and aesthetic appeal of upcycled goods. Peer demonstration proved most effective for recruitment (65% success), underscoring experiential learning's power, in line with Luff (2018) and Sung (2019). Conversely, school clubs and social media showed limited impact, suggesting structured and digital efforts need adjustment to foster deeper, localized engagement.

Ultimately, the key to success in Lagos is combining early childhood education with community service and hands-on learning. Culturally grounded, community-led upcycling

programs are necessary because the advantages of the circular economy go beyond environmental protection to include economic empowerment and cultural identity (Bridgens et al., 2018; Caldera et al., 2022).

Conclusion

Reducing trash, empowering individuals economically, and educating the public about the environment are all goals of the study's upcycling component. Children fostered an environment that encouraged invention, creativity, and early entrepreneurship by finding new uses for plastics. This initiative exemplifies the power of upcycling to alleviate environmental problems while also bolstering local economies. As a result of increasing engagement through demonstrations and social contacts, sustainability activities were more approachable and successful through community-driven techniques, with a focus on peer-led involvement.

The survey did find several holes in the garbage collection system, with schools being given more priority than families. There have to be more inclusive systems that encourage family responsibility since lower household involvement indicates problems with public knowledge, infrastructure, and incentives. In line with Sustainable Development Goal 12, which advocates for greater responsible consumption, these findings emphasize the necessity of integrating sustainability education into early childhood education. We can eventually promote environmental stewardship and ease the shift to a circular economy that views garbage as a resource by establishing these values early on.

Recommendations

Given the high rate of plastic waste collection in schools and their formative influence, environmental education should be integrated more deeply into curricula. Embedding practical upcycling activities and sustainability campaigns can nurture lasting behavioral change from an early age. To improve household plastic waste collection, targeted public awareness campaigns and investments in local infrastructure are needed. Community sensitization and incentives for home-based waste sorting should boost participation. The frequent weekly collection shows that residents respond well to consistent services; therefore, government and private operators should maintain and expand regular schedules, especially in underserved areas. Peer-led recruitment highlights the power of grassroots engagement, so community workshops, exhibitions, and mentorship programs should be supported to promote peer-to-peer learning.

While schools play a vital role, school clubs require restructuring to be more action-oriented. Digital campaigns must be paired with offline storytelling and participatory methods for a stronger impact. The broad acceptance of upcycled products across income levels reveals

upcycling's environmental and economic potential. Policymakers should support local artisans with training and market access, integrating upcycling into circular economy strategies that foster sustainable consumption, job creation, and cultural innovation. Multi-sector collaboration among schools, governments, NGOs, and creatives is essential to scale effective upcycling programs.

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