

ENVIRONMENTAL EDUCATION AND ENTREPRENEURSHIP: ASSESSING GREEN SKILLS AND WASTE-TO-WEALTH KNOWLEDGE AMONG YOUTH FOR SELF-RELIANCE IN NIGERIA

Stephen Satsi Shesunze

Department of Social Science & Environmental Education, Federal University Lokoja, Kogi State.

satsisteven@gmail.com

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ABSTRACT

Nigeria faces a dual challenge of escalating youth unemployment and pervasive environmental degradation, particularly in solid waste management. This study examined the integration of environmental education and entrepreneurship as a strategic pathway for assessing green skills and waste-to-wealth knowledge among Nigerian youth to foster self-reliance. The study adopted a quantitative descriptive survey design. Data were collected from 378 youth participants (out of 400 sampled) drawn from the Federal Ministry of Youth Development's Circular Economy Youth Empowerment Initiative (CEYEI) across five locations (four states and the Federal Capital Territory) using a structured questionnaire. Four research questions guided the study, and data were analysed using descriptive statistics (frequencies, percentages, means, and standard deviation). The findings revealed that while awareness of waste-to-wealth concepts is high among participating youth, practical green skills acquisition remains constrained by lack of startup capital, unreliable electricity, limited mentorship, and poor access to equipment. The results also indicated that youth who had completed the Waste to Wealth training reported higher self-reliance readiness scores than those still in training. An independent-samples t-test confirmed that the difference in overall self-reliance readiness was statistically significant ($t(376) = 6.04, p < .001, \text{Cohen's } d = 0.66$). The study concluded that integrating green skills into environmental education curricula and expanding hands-on waste-to-wealth training programmes may help to build youth self-reliance in Nigeria. It was recommended among others that the Federal Ministry of Youth Development, in collaboration with state governments and private sector partners, should scale up the Waste to Wealth initiative nationwide, embed green skills into the school curriculum, and establish dedicated green enterprise incubation hubs across the six geopolitical zones.

Keywords: Environmental education, green skills, waste-to-wealth, youth entrepreneurship, self-reliance, circular economy.

Introduction

Nigeria, as Africa's most populous nation with over 220 million people (National Bureau of Statistics [NBS], 2024), confronts a persistent crisis of youth unemployment and underemployment that undermines economic growth and social stability. According to the National Bureau of Statistics (2024), youth unemployment remains one of the most critical developmental challenges facing the country, with millions of young people entering the labour market annually without corresponding job opportunities. This challenge is compounded by escalating environmental degradation, particularly unmanaged municipal solid waste, which clogs drainage systems, exacerbates flooding, generates greenhouse gases, and degrades public health outcomes across urban and rural communities (Federal Ministry of Information and National Orientation, 2025). The intersection of these two crises—youth joblessness and environmental decay—presents both a profound challenge and a strategic opportunity for policy innovation and educational reform.

Environmental education has evolved from a narrow focus on awareness and conservation to encompass broader goals of sustainable development, green skills acquisition, and the cultivation of entrepreneurial mindsets that can transform ecological challenges into economic opportunities (Budiaman et al., 2026). The concept of "waste-to-wealth" has emerged as a practical manifestation of this evolution, emphasising the conversion of discarded materials into valuable products, thereby addressing waste management challenges while simultaneously creating livelihood opportunities for youth. This approach aligns with the circular economy paradigm, which seeks to move away from the linear "take-make-dispose" model toward systems that prioritise reuse, recycling, and repurposing of resources (Ellen MacArthur Foundation, 2013; Federal Ministry of Youth Development, 2025a).

The Federal Government of Nigeria, through the Federal Ministry of Youth Development, has launched several initiatives that operationalise the waste-to-wealth philosophy. The Circular Economy Youth Empowerment Initiative (CEYEI), unveiled in 2025, aims to train and empower 37,000 young Nigerians across the 36 states and the Federal Capital Territory over a two-year period. The flagship Waste to Wealth Project provides hands-on training in recycling, upcycling, green entrepreneurship, and sustainable livelihood development, with the objective of transforming participants from job seekers into job creators (Federal Ministry of Youth Development, 2025a). Similarly, partnerships between international organisations and Nigerian agencies, such as the UNICEF-African Reinsurance Corporation collaboration, seek to integrate climate change education and green skills development into national education systems, targeting over 4.8 million children and youth (UNICEF, 2025). These initiatives reflect growing recognition that environmental education, when coupled with entrepreneurial training, can produce self-reliant youth who generate economic value while addressing ecological problems.

However, despite these promising policy interventions, significant gaps remain in the empirical literature regarding the effectiveness of environmental education and entrepreneurship programmes in fostering genuine self-reliance among Nigerian youth (Adebayo & Ogunleye, 2020; Okonkwo & Nwosu, 2022). Furthermore, the integration of green skills and waste-to-wealth knowledge into formal education curricula remains uneven, limiting the reach of these interventions to youth who are not enrolled in targeted government programmes (Bundesinstitut für Berufsbildung [BIBB], 2025). The German Federal Institute for Vocational Education and Training (BIBB), which is supporting Nigeria's vocational training sector under the GIZ SKYE II programme, has highlighted the need for modular green skills courses and national

occupational standards that can institutionalize environmental competence within the technical and vocational education system (BIBB, 2025).

This study, therefore, examined the assessment of green skills and waste-to-wealth knowledge among Nigerian youth as a pathway to self-reliance. It investigated the level of awareness and participation in waste-to-wealth initiatives, assessed the green skills acquired by participating youth, identified barriers to effective participation and enterprise development, and compared the self-reliance readiness of youth who had completed the training with those still in training. By providing empirical evidence on these dimensions, the study contributes to policy discourse on how Nigeria can more effectively harness the potential of its youth population to address environmental challenges while achieving economic independence.

The study was guided by four research questions: (1) What is the level of awareness and participation of the youth in waste-to-wealth initiatives? (2) Which green skills have the youth acquired? (3) What barriers limit their participation and enterprise development? (4) Do youth who completed the training differ from those still in training in self-reliance readiness?

Literature Review

Conceptual Review: Environmental Education for Sustainability and Entrepreneurship

Environmental education for sustainability has undergone a paradigm shift from transmissive, knowledge-based approaches to transformative, action-oriented pedagogies that integrate entrepreneurial thinking with ecological literacy. Traditional environmental education focused on raising awareness about environmental problems and promoting conservation behaviours, but contemporary scholarship argues that awareness alone is insufficient to drive the systemic changes required for sustainable development (Budiaman et al., 2026). The integration of entrepreneurship education into environmental curricula creates what researchers describe as "eco-entrepreneurship education," which cultivates the competencies needed to identify environmental problems as opportunities for value creation. This approach draws on the work of scholars such as Lackéus (2015), who conceptualised entrepreneurial education as a process of value creation rather than merely business formation, where value can be financial, social, or environmental. Within this framework, sustainability is not an add-on to entrepreneurship but a core ethical and practical orientation that shapes how entrepreneurs identify opportunities, mobilise resources, and measure success (Schaltegger & Wagner, 2011). In the Nigerian context, where both environmental degradation and youth unemployment are acute, this integration offers a dual-impact strategy that addresses economic and ecological challenges simultaneously (Udoh & Ekpo, 2022).

Green Skills Development and the Circular Economy in Nigeria

The concept of green skills refers to the technical knowledge, practical abilities, and competences required to perform tasks that contribute to environmental sustainability, including recycling, waste management, renewable energy installation, sustainable agriculture, and eco-design (International Labour Organization [ILO], 2024b). In Nigeria, the demand for green skills is growing as the government pursues circular economy strategies that seek to formalize the waste management sector and create decent work opportunities within it. The German Federal Institute for Vocational Education and Training (BIBB), which is collaborating with Nigerian institutions under the GIZ "Skills Development for Youth Employment" programme, has developed a modular basic course on green skills and a national occupational standard for "Basic Environmental Technology" in partnership with the National Board for Technical Education (BIBB, 2025). These developments signal a shift toward institutionalizing green skills within the formal technical and vocational education and training (TVET) system, which has historically

been oriented toward traditional industrial and commercial occupations. However, the reach of these curricular innovations remains limited, and many young Nigerians continue to acquire green skills through non-formal, programme-based interventions rather than through accredited qualifications that are recognised by employers and financial institutions (BIBB, 2025). The challenge, therefore, is not only to develop green skills content but to ensure its widespread adoption across formal, non-formal, and informal learning pathways. Empirical studies on green skills development in Africa highlight the importance of integrating practical, hands-on training with theoretical instruction to enhance employability and entrepreneurial outcomes (Mwangi & Ouma, 2021; Okonkwo & Nwosu, 2022).

Waste-to-Wealth Initiatives: Empirical Evidence and Programme Models

Waste-to-wealth initiatives have emerged across Nigeria as practical demonstrations of circular economy principles in action, with the Federal Ministry of Youth Development's Circular Economy Youth Empowerment Initiative (CEYEI) representing the most prominent national programme. Launched in 2025, CEYEI operates through the flagship Waste to Wealth Project, which provides training in recycling, upcycling, creative craft, and green innovation to selected youth beneficiaries across multiple states (Federal Ministry of Youth Development, 2025a). The programme has expanded from a pilot in Katsina State to additional locations including Borno, Lagos, Enugu, Akwa Ibom, and the Federal Capital Territory, with implementing partners such as ActionAid, UpTex, Green Axis, Craftopia, and The Upcycle Architect providing technical support (Federal Ministry of Youth Development, 2026b).

Empirical research on the effectiveness of such programmes suggests that structured waste-to-wealth training can enhance participants' entrepreneurial intentions, self-efficacy, and awareness of green market opportunities (Ogunlade & Adebayo, 2021; Eze & Nnamdi, 2023). A study on ecological management concepts as predictors of entrepreneurial orientation among secondary school students in Kogi State found that students exposed to environmental entrepreneurship content demonstrated significantly higher innovativeness, proactiveness, and risk-taking propensity than those without such exposure (Achor et al., 2024). The study also found that hands-on ecological activities such as composting, nursery establishment, and water quality monitoring provided experiential learning opportunities that enhanced students' practical competence and entrepreneurial self-efficiency which emphasises that learning through direct experience is more transformative than passive reception.

Barriers to Youth Participation in Green Entrepreneurship

Despite the promise of waste-to-wealth initiatives, multiple barriers constrain youth participation and enterprise development in Nigeria's green economy. A primary barrier is inadequate access to startup capital and financial services tailored to the needs of young green entrepreneurs. While the Federal Ministry of Youth Development has introduced the Youth Cred Scheme in partnership with Credit Core to expand access to loans and lay the foundation for a Youth Bank and MSME Incubator (Federal Ministry of Youth Development, 2025a), many youth remain excluded from formal credit markets due to lack of collateral, limited financial literacy, and the perception among lenders that green enterprises are high-risk ventures (Ojo & Adeyemi, 2022). A second barrier is the limited availability of mentorship and technical support beyond initial training programmes. Research on entrepreneurship education consistently shows that training alone, without ongoing mentorship and access to networks, is insufficient to sustain enterprise creation and growth (Fauske et al., 2024). A third barrier is the lack of market linkages and consumer demand for recycled products. While awareness of environmental issues is growing among Nigerian consumers, the market for products made from recycled materials

remains underdeveloped, and many green entrepreneurs struggle to compete with cheaper, non-sustainable alternatives (Nwankwo & Eze, 2023). A fourth barrier is systemic problems such as unreliable electricity, poor transportation infrastructure, and regulatory uncertainty, which add operational costs and risks to green enterprises, making them less attractive than informal sector alternatives (Federal Ministry of Youth Development, 2025a; Nwankwo & Eze, 2023). Addressing these multi-layered barriers requires integrated policy responses that go beyond training to encompass financing, infrastructure, market development, and regulatory reform.

Environmental Education and Self-Reliance: Theoretical Perspectives

The relationship between environmental education, entrepreneurship, and self-reliance can be understood through multiple theoretical lenses. Human Capital Theory provides a foundational explanation for how education and training enhance individuals' productive capacities and earning potential. According to Becker's (1964) formulation, investment in education and skills development constitutes an investment in human capital that yields returns in the form of higher productivity, employability, and income. In the context of environmental entrepreneurship, green skills and waste-to-wealth knowledge represent specific forms of human capital that enable youth to identify and exploit economic opportunities within the circular economy. Experiential Learning Theory, developed by Kolb (1984), complements this perspective by explaining how individuals learn most effectively through concrete experiences, reflective observation, abstract conceptualisation, and active experimentation. Waste-to-wealth training programmes that incorporate hands-on recycling, upcycling, and product development activities create the experiential conditions for deep learning that translates into practical competence and entrepreneurial confidence. Social Cognitive Theory, particularly Bandura's (1997) concept of self-efficacy, offers a third theoretical lens, suggesting that individuals' beliefs in their capacity to succeed in specific domains predict their willingness to engage in entrepreneurial behaviour. Mastery experiences, vicarious learning through role models, social persuasion, and physiological states all contribute to entrepreneurial self-efficacy, which is a critical determinant of whether trained youth actually launch and sustain green enterprises. Together, these theoretical perspectives suggest that effective environmental entrepreneurship education must combine knowledge transmission with practical experience, mentorship, and confidence-building to foster genuine self-reliance. Based on these theoretical perspectives, the study proposes a simple conceptual model: environmental education → green skills → self-reliance, with barriers (capital, infrastructure, mentorship, market demand).

Summary of Literature and Gap

The reviewed literature demonstrates growing international and African interest in green skills, youth entrepreneurship, and waste-to-wealth initiatives. Studies have established that structured environmental entrepreneurship training can enhance entrepreneurial intentions, self-efficacy, and practical competences among youth (Achor et al., 2024; Ogunlade & Adebayo, 2021; Eze & Nnamdi, 2023). However, significant gaps remain. First, most existing studies focus on secondary school students or urban youth, with limited attention to participants in government-led vocational training programmes such as CEYEI. Second, there is a paucity of empirical research on the specific barriers that constrain the transition from training to enterprise creation among Nigerian youth. Third, the relationship between programme completion and self-reliance readiness has not been rigorously tested in the Nigerian context. This study addresses these gaps by examining green skills acquisition, barriers, and self-reliance readiness among youth participants in the CEYEI Waste to Wealth programme across five locations in Nigeria.

Methodology

This study adopted a quantitative descriptive survey research design. The descriptive survey design was considered appropriate because the study sought to describe the current state of green skills acquisition and waste-to-wealth knowledge among youth participants, as well as to examine differences between programme completers and current trainees on self-reliance indicators, without manipulating any variables or establishing causal relationships. According to standard research methodology conventions, descriptive survey designs are well-suited for studies that collect data from a sample in order to describe characteristics, attitudes, or behaviours of a population (Creswell & Creswell, 2018).

The study population comprised youth participants in the Federal Ministry of Youth Development's Circular Economy Youth Empowerment Initiative (CEYEI) across five locations (four states and the Federal Capital Territory) where the Waste to Wealth training programme has been implemented: Katsina, Lagos, Enugu, Borno, and the Federal Capital Territory. The population at each location was approximately 200 trainees, giving an estimated total population of 1,000 programme participants. These locations were selected because they host active CEYEI training cohorts, providing access to a defined population of programme participants, and because they represent the geographic and ecological diversity of Nigeria.

The sample for the study consisted of 400 youth beneficiaries selected through stratified random sampling across the five programme locations, with 80 participants drawn from each location. This equal allocation was adopted to give each of the five locations equal representation and to ensure sufficient statistical power for comparison. The sampling frame was the CEYEI registration list at each location. Stratification was by training cohort and gender. A sample size of 400 was deemed adequate based on Krejcie and Morgan's (1970) guidelines for a population of approximately 1,000, which recommends a sample of 278; the larger sample was chosen to account for non-response and to enhance generalisability.

The instrument for data collection was a researcher-developed questionnaire titled "Green Skills and Waste to Wealth Questionnaire (GSWWQ)," which contained five sections corresponding to the four research questions plus demographics. Section A collected demographic information; Section B assessed awareness and participation in waste-to-wealth initiatives; Section C measured green skills acquired through training; Section D identified barriers to participation and enterprise development; and Section E measured self-reliance readiness (confidence to start a green business, ability to generate income from waste materials, willingness to pursue self-employment, knowledge of pricing recycled products, and readiness to train others). The questionnaire was validated by three experts in environmental education, entrepreneurship, and measurement and evaluation, and a pilot test conducted with 30 non-sample participants yielded a Cronbach's alpha reliability coefficient of 0.84 for the full instrument (0.81 for awareness, 0.79 for green skills, 0.83 for barriers, and 0.86 for self-reliance readiness), indicating acceptable internal consistency.

Data were collected through direct administration of the questionnaire to participants at their training centres between 15 September and 30 October 2026, following the completion of the one-month training programme that began on 31 August 2026. The response rate was 94.5 percent (378 returned questionnaires). Data were analysed using descriptive statistics including frequencies, percentages, means, and standard deviation, with a criterion mean of 2.50 adopted for interpreting item responses on a four-point Likert scale. Rating bands were defined as: 3.50–4.00 = Strongly Agree; 2.50–3.49 = Agree; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree. An independent-samples t-test was used to compare self-reliance readiness scores

between youth who had completed the training and those still in training. All analyses were conducted using SPSS version 26.

Results and Discussion of Findings

Demographic Characteristics of Respondents

The demographic profile of respondents provides essential context for interpreting the findings. Table 1 presents the distribution of respondents by gender, age, educational qualification, and participation status in the Waste to Wealth programme.

Table 1: Demographic Characteristics of Respondents (N = 378)

Demographic Variable	Frequency (f)	Percentage (%)
Gender		
Male	189	50.0
Female	189	50.0
Age Range		
18–24 years	142	37.6
25–30 years	156	41.3
31–35 years	80	21.2
Educational Qualification		
Secondary School Certificate	148	39.2
OND/NCE	136	36.0
HND/Bachelor's Degree	94	24.9
Training Status		
Completed Waste to Wealth Training	218	57.7
Currently in Training	160	42.3

Source: Field Survey, 2026

The data in Table 1 indicate that the sample was evenly balanced by gender, with equal representation of male and female participants. The Ministry has stated its commitment to inclusion (Federal Ministry of Youth Development, 2026a), but an equal gender split in a survey sample cannot prove this. The largest age cohort comprised participants aged 25–30 years (41.3%), followed by those aged 18–24 years (37.6%), indicating that the programme attracts predominantly young adults in the early-to-mid stages of their working lives. Educational qualifications were distributed across secondary, diploma, and degree levels, suggesting that the programme is accessible to youth with diverse educational backgrounds. More than half of respondents (57.7%) had completed the training programme, while the remainder were still in training at the time of data collection, providing a useful comparison between programme completers and current trainees.

Table 1b: Respondents by Location (Planned vs. Returned)

Location	Planned (n)	Returned (n)	Response Rate (%)
Katsina	80	76	95.0
Lagos	80	75	93.8
Enugu	80	76	95.0
Borno	80	75	93.8
FCT	80	76	95.0
Total	400	378	94.5

Source: Field Survey, 2026

Awareness and Participation in Waste-to-Wealth Initiatives

Table 2 presents findings on respondents' awareness of waste-to-wealth concepts and their participation in related activities.

Table 2: Awareness and Participation in Waste-to-Wealth Initiatives (N = 378)

Item	Mean	SD	Decision
I am aware that waste materials can be converted into valuable products	3.68	0.54	Strongly Agree
I know about the Federal Government's Waste to Wealth Programme	3.42	0.71	Agree
I can identify at least three types of waste that have economic value	3.24	0.76	Agree
I have participated in a waste recycling or upcycling activity	3.15	0.82	Agree
I am aware of where to sell recycled or upcycled products	2.41	0.89	Disagree
I know how to access funding for a waste-to-wealth business	2.18	0.94	Disagree

Criterion Mean = 2.50; Rating bands: 3.50–4.00 = Strongly Agree; 2.50–3.49 = Agree; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree. Source: Field Survey, 2026

The findings in Table 2 reveal a pattern of high awareness but moderate to low practical knowledge. Respondents strongly agreed that they are aware waste can be converted into valuable products (mean = 3.68) and agreed that they know about the Federal Government's Waste to Wealth Programme (mean = 3.42). They also reported having participated in recycling or upcycling activities (mean = 3.15) and being able to identify economically valuable waste types (mean = 3.24). However, respondents disagreed with items concerning awareness of market outlets for recycled products (mean = 2.41) and knowledge of how to access funding for waste-to-wealth businesses (mean = 2.18). These findings suggest that while the awareness-raising component of environmental education has been relatively successful, the transition from awareness to enterprise creation is hampered by insufficient knowledge of market systems and financial access. This pattern is consistent with the observation that training programmes often excel at imparting conceptual knowledge but fall short in providing the practical business development support necessary for enterprise sustainability (BIBB, 2025).

Green Skills Acquired Through Waste-to-Wealth Training

Table 3 presents the distribution of green skills acquired by respondents who had completed or were currently undergoing training.

Table 3: Green Skills Acquired Through Training (N = 378)*

Green Skill	Frequency Acquired	Percentage (%)
Plastic recycling and processing	286	75.7
Organic waste composting	241	63.8
Paper recycling and craft production	218	57.7
Metal sorting and recovery	194	51.3
Textile upcycling and fashion	178	47.1
Glass recycling and repurposing	156	41.3
Business plan development for green ventures	148	39.2
Eco-friendly packaging production	134	35.4
Digital marketing for eco-products	126	33.3

Renewable energy (biogas, solar)	112	29.6
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**Note: Multiple-response item; percentages do not sum to 100.*

Source: Field Survey, 2026

The data in Table 3 show that the most commonly acquired green skills were in plastic recycling (75.7%) and organic waste composting (63.8%), followed by paper recycling (57.7%) and metal sorting (51.3%). Renewable energy skills (29.6%) were acquired by fewer than one-third of respondents, and digital marketing skills (33.3%) by exactly one-third. The relatively low acquisition of digital marketing skills is particularly significant given the importance of online platforms for market access and networking in the contemporary economy. The Waste to Wealth Project has launched a dedicated online platform to serve as a hub for registration, networking, investment access, and market expansion (Federal Ministry of Youth Development, 2025a), yet the survey measured only digital marketing training (33.3%), not digital competence, so this link is a guess and not a finding. The gap between the availability of digital infrastructure and the skills to use it effectively represents an important area for programme enhancement. Additionally, the finding that only 39.2% acquired business plan development skills raises concerns about the adequacy of entrepreneurial training within the programme, since business planning competence is a critical determinant of enterprise viability (Ojo & Adeyemi, 2022).

Barriers to Participation and Green Enterprise Development

Table 4 presents respondents' perceptions of the barriers that constrain their participation in waste-to-wealth activities and the development of green enterprises.

Table 4: Barriers to Participation and Green Enterprise Development (N = 378)

Barrier	Mean	SD	Decision
Lack of startup capital	3.52	0.63	Strongly Agree
Unreliable electricity supply	3.34	0.69	Agree
Inadequate mentorship and follow-up support	3.28	0.72	Agree
Limited access to recycling equipment and tools	3.16	0.78	Agree
Poor market demand for recycled products	3.04	0.81	Agree
Insufficient training duration	2.87	0.86	Agree
Lack of recognition for green skills in formal employment	2.76	0.88	Agree
Family opposition to waste-related work	2.42	0.91	Disagree

Criterion Mean = 2.50; Rating bands: 3.50–4.00 = Strongly Agree; 2.50–3.49 = Agree; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree. Source: Field Survey, 2026

The findings in Table 4 identify lack of startup capital (mean = 3.52) and unreliable electricity supply (mean = 3.34) as the most severe barriers, followed closely by inadequate mentorship (mean = 3.28) and limited access to equipment (mean = 3.16). The rejection of the item on family opposition (mean = 2.42) suggests that family opposition was not a problem for these participants, who had already chosen to join the programme; there is no earlier data to show that stigma is declining. The prominence of infrastructure-related barriers, particularly electricity, highlights the embeddedness of green entrepreneurship within broader economic systems. Recycling and upcycling activities often require reliable power for processing equipment, and the absence of stable electricity increases operational costs and reduces competitiveness (Nwankwo & Eze, 2023). The finding on inadequate mentorship aligns with research suggesting that training alone, without sustained guidance and support, is insufficient to enable enterprise creation and growth (Fauske et al., 2024). The identification of poor market

demand as a barrier also points to the need for demand-side interventions that stimulate consumer awareness and preference for recycled products.

Comparison of Self-Reliance Indicators by Training Status

Table 5 presents a comparison of self-reliance indicators between respondents who had completed the Waste to Wealth training and those who were still in training.

Table 5: Comparison of Self-Reliance Indicators by Training Status (N = 378)

Self-Reliance Indicator	Completed Training (n = 218) Mean (SD)	In Training (n = 160) Mean (SD)	Mean Difference	t-value	p-value	Cohen's d
Confidence to start a green business	3.42 (0.61)	2.98 (0.74)	0.44	5.92	< .001	0.65
Ability to generate income from waste materials	3.28 (0.68)	2.76 (0.82)	0.52	6.48	< .001	0.69
Willingness to pursue self-employment over salaried job	3.15 (0.75)	2.84 (0.81)	0.31	3.89	< .001	0.40
Knowledge of how to price recycled products	2.96 (0.79)	2.54 (0.88)	0.42	4.82	< .001	0.50
Readiness to train others in waste-to-wealth skills	3.38 (0.66)	2.92 (0.77)	0.46	6.12	< .001	0.64
Overall self-reliance readiness score	3.24 (0.58)	2.81 (0.71)	0.43	6.04	< .001	0.66

Source: Field Survey, 2026

The data in Table 5 reveal a consistent pattern: respondents who had completed the Waste to Wealth training reported higher scores on all self-reliance indicators than those still in training. An independent-samples t-test confirmed that the overall difference in self-reliance readiness was statistically significant ($t(376) = 6.04$, $p < .001$, Cohen's $d = 0.66$), indicating a moderate to large effect. The largest differences were observed in ability to generate income from waste materials (mean difference = 0.52) and readiness to train others in waste-to-wealth skills (mean difference = 0.46). The smallest difference was in willingness to pursue self-employment over salaried employment (mean difference = 0.31), suggesting that while training enhances specific technical and business competences, it may have a more modest effect on fundamental career orientation. These findings provide empirical support for the proposition that structured environmental entrepreneurship training may improve self-reliance readiness, in line with Human Capital Theory (Becker, 1964) and the growing body of evidence on green entrepreneurship education (Achor et al., 2024). However, the cross-sectional nature of the data means that causality cannot be definitively established, as it is possible that individuals with higher pre-existing self-reliance inclinations are more likely to complete training programmes. The consistency across indicators does not remove this problem, because all the indicators come from the same respondents.

Conclusion

This study assessed the level of green skills and waste-to-wealth knowledge among Nigerian youth as a pathway to self-reliance, focusing on participants in the Federal Ministry of Youth Development's Circular Economy Youth Empowerment Initiative. The findings revealed that while most of Nigerian youth are aware of environmental problems such as indiscriminate waste disposal, flooding and pollution, their practical knowledge of converting waste to wealth remains low. Environmental Education, where taught, is mostly theoretical and often not enough to equip youths with the hands-on green skills needed for entrepreneurship. This gap between awareness and practical competence has limited their ability to become self-reliant through green entrepreneurship. The study concludes that environmental education, when integrated with entrepreneurship training and practical waste-to-wealth skill development, has the potential to contribute meaningfully to youth self-reliance in Nigeria. However, realising this potential requires addressing the structural and financial barriers that currently limit the transition from training to enterprise creation. The study relied on self-reported data, which may be subject to social desirability bias. The comparison group comprised youth still in training rather than non-participants, so time in the programme and drop-out cannot be fully ruled out as explanations for the observed differences. Self-reliance items measured perceived readiness, not actual income or business starts. The cross-sectional design precludes causal inference.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are made:

1. The Federal Ministry of Youth Development, in collaboration with state governments and private sector partners, should scale up the Waste to Wealth initiative to reach more states and local government areas in phases, with particular attention to ensuring that training content includes not only technical recycling skills but also business plan development, digital marketing, and financial literacy (linked to Table 2 and Table 3 findings on low business and digital skills).
2. The Ministry should establish dedicated green enterprise incubation hubs in each of the six geopolitical zones, equipped with recycling equipment, reliable power sources, and mentorship resources, to provide post-training support that enables graduates to transition from trainees to entrepreneurs (linked to Table 4 findings on equipment and mentorship barriers).
3. The Youth Cred Scheme should be expanded with a dedicated green enterprise window that offers concessional loans and grants to youth-led waste-to-wealth ventures, with simplified application procedures and collateral requirements appropriate to small-scale green businesses (linked to Table 4 finding that lack of startup capital is the top barrier).
4. The Federal Ministry of Education, in collaboration with the National Board for Technical Education and the Nigerian Educational Research and Development Council, should integrate green skills and waste-to-wealth knowledge into the basic education and TVET curricula, ensuring that environmental entrepreneurship is not confined to non-formal programme participants but reaches all Nigerian youth (linked to Table 2 finding on high awareness but low practical knowledge).
5. Future research should employ longitudinal designs to track the career trajectories of Waste to Wealth programme graduates over time, providing stronger evidence on the long-term impact of environmental entrepreneurship training on self-reliance and enterprise sustainability.

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