UKR Journal of Economics, Business and Management (UKRJEBM)
Homepage: https://ukrpublisher.com/ukrjebm/
Email: submit.ukrpublisher@gmail.com
Volume 2, Issue 9, 2026
ISSN: 3049-429X (Online)

Sociological Perspectives on Waste-to-Wealth Innovations and Resource Management: Harnessing the Circular Economy for Sustainable Development

Ukpong-Umo, R. E.

Brainspec Research Group, Nigeria.

***Corresponding Author**: Ukpong-Umo, R. E.

DOI: *https://doi.org/10.5281/zenodo.22843215*

Article History

Original Research Article

Received: 16-07-2026

Accepted: 25-08-2026

Published: 19-09-2026

Citation: Ukpong-Umo, R. E. (2026). Sociological perspectives on waste-to-wealth innovations and resource management: Harnessing the circular economy for sustainable development. UKR Journal of Economics, Business and Management, 2(9), 184-191.

Abstract

Waste-to-Wealth Innovations and Sustainable Resource Management for Commercialization: Harnessing the Circular Economy Business Model investigated waste recovery and resource mobilization, waste processing and recycling innovation, circular-economy practices and sustainable resource management, waste-to-wealth commercialization opportunities, and constraints affecting waste-to-wealth enterprises.

The study population comprised relevant stakeholders involved in waste generation, collection, recycling, processing, and related waste-to-wealth activities. A sample of 150 respondents was used for the study with the adoption of a descriptive survey research design. Data were collected through a structured questionnaire designed on a four-point Likert scale and analyzed using frequency counts, percentages, mean scores, and ranking.

The findings showed that respondents generally perceived waste recovery and resource mobilization as important mechanisms for transforming waste into productive resources. Respondents also agreed that recycling technologies, appropriate processing technologies, and skills development improve the economic value and usefulness of discarded materials. Circular-economy practices were perceived to promote resource conservation, reduce dependence on virgin raw materials, minimize environmental waste, and improve sustainable resource management. The findings further indicated that waste recycling provides opportunities for income generation, employment creation, manufacturing, and enterprise development. Major constraints identified included high operating and energy costs, inadequate infrastructure, inadequate government support, inadequate finance, and lack of modern processing equipment.

The study concludes that waste-to-wealth innovation represents a viable pathway for promoting sustainable resource management and commercialization within the circular economy. The study recommends improved access to finance, investment in modern recycling technologies and infrastructure, reduction of energy-related production costs, skills development, strengthened government support, and improved market access for recycled products.

Keywords: *Waste-to-Wealth, Innovation, Circular Economy, Sustainable Resource Management, Commercialization.*

1. Introduction

The sudden explosion in waste generation resulting from urbanization, industrialization, population growth, and changing consumption patterns has become a significant global environmental challenge. According to the World Bank, global municipal solid waste generation exceeds 2.5 billion tons annually, with developing countries experiencing the highest growth rates (ADB, 2022). Recent Sub-Saharan Africa municipal solid waste generation estimate is approximately 174 million tons annually, while

average collection coverage is only 44% (Adedara, Taiwo and Bork, 2023).

Nigeria faces particularly severe waste management challenges and these challenges are not merely environmental concerns but are deeply embedded in social structures, institutional arrangements, consumption patterns, and governance systems.

From a sociological perspective, waste represents a product of consumer culture, a manifestation of social inequality, and an outcome of institutional inefficiency. Axiomatically, the traditional linear economic systems contribute significantly to resource depletion and environmental degradation. In contrast, the circular economy (CE) promotes resource efficiency, recycling, reuse, remanufacturing, and waste recovery, thereby transforming waste into valuable economic resources (Geissdoerfer et al., 2017; Nnaji, 2015).

Waste-to-wealth innovations have emerged as practical manifestations of circular economy principles. These innovations involve converting waste materials into economically valuable products such as recycled plastics, compost, biofuels, industrial raw materials, and renewable energy (Ghisellini et al, 2016; Atelge, et al 2020). Beyond environmental benefits, such initiatives create employment opportunities, generate income, reduce poverty, and promote social inclusion (Hoornweg and Bhada-Tata, 2012).

Despite growing interest in circular-economy practices, adoption remains limited in many developing countries due to weak institutions, inadequate infrastructure, insufficient financing, and low public awareness (Medina, 2018; Geissdoerfer et al., 2017).

Consequently, this study investigates the sociological dimensions of waste-to-wealth innovations and examines how circular economy practices can contribute to sustainable resource management and sustainable development in Nigeria.

Specifically, the study aims to:

Examine the role of circular-economy practices in waste management;

Evaluate the economic and environmental benefits of waste-to-wealth innovations;

Identify challenges and opportunities associated with scaling waste-to-wealth initiatives;

Explore the sociological factors influencing participation in circular economy activities

2. Literature Review

2.1 Circular Economy and Sustainable Resource Management

The circular economy is a regenerative economic system designed to eliminate waste and maximize resource utilization through recycling, reuse, repair, remanufacturing, and recovery processes (Geissdoerfer et al., 2017).

Unlike the traditional linear economy, which follows a "take-make-dispose" model, the circular economy seeks to maintain materials and products within productive cycles for as long as possible.

The concept has gained prominence as a sustainable development strategy capable of addressing environmental degradation, resource scarcity, and economic inefficiencies. According to Geissdoerfer et al. (2017), circular economy practices contribute significantly to sustainable resource management by improving resource productivity, reducing environmental impacts, and promoting long-term economic resilience.

Waste-to-wealth innovation represents one of the practical applications of circular economy principles and refers to the process of converting waste materials into economically valuable products, energy, or resources through recycling, reuse, recovery, and other technological or entrepreneurial interventions.

This is supported by waste-to-wealth and circular economy literature including Alao, et al (2020), which views waste as a resource that can be transformed into products with economic value.

A few examples of waste to wealth innovations include the conversion of plastic waste into Low Density Polyethylene (LDPE) and High Density Polyethylene (HDPE) flakes, organic waste into compost, agricultural residues into biofuel, and electronic waste into recoverable metals.

2.2 Waste-to-Wealth Innovations: Opportunities and Challenges

Waste-to-wealth initiatives create multiple socio-economic and environmental benefits. They contribute to employment generation, poverty reduction, environmental protection, resource conservation, and economic diversification. Medina (2018) argued that recycling activities not only create income opportunities but also promote environmental justice and social inclusion.

In Nigeria, increasing attention is being directed toward circular economy initiatives. Lagos State for instance, has introduced policies encouraging recycling and resource recovery, while national programs such as the Circular Economy Youth Empowerment Initiative (CEYEI) seek to promote youth participation in green entrepreneurship (Atelge, et al 2020; Anyanwu, 2025).

Though awareness of circular economy principles is increasing, several barriers continue to impede effective implementation as adoption remains constrained by

inadequate infrastructure, weak policy enforcement, limited access to finance, and technological deficiencies. Adelopo et al. (2022) identified weak governance structures, policy inconsistency, and insufficient investment as major barriers to circular economy adoption in Nigeria.

2.3 Theoretical Perspectives

Two theories - Ecological Modernization Theory and Resource Efficiency Theory have been integrated to properly explain waste to wealth innovation and the circular economy model.

Ecological Modernization Theory

The Ecological Modernization Theory (EMT), though conventionally attributed to earlier pioneers including Joseph Huber and Martin Jänicke, was developed by Spaargaren and Mol (1992) who argued that environmental protection and economic development can be pursued simultaneously through technological innovation, institutional reforms, and sustainable production systems.

The theory suggests that environmental problems can be addressed through modernization processes that improve resource efficiency, reduce pollution, and promote environmentally sustainable economic activities. In the context of waste-to-wealth innovation, EMT provides a framework for understanding how waste can be transformed into economic value through technological advancements and institutional support.

Resource Efficiency Theory

Resource Efficiency Theory, associated with Von Weizsäcker, Lovins, and Lovins (1997), emphasized maximizing value from available resources while minimizing waste generation and environmental impacts. The theory advocates efficient resource utilization throughout production and consumption processes and supports the principle of doing more with fewer resources. In waste-to-wealth innovation, Resource Efficiency Theory explains how discarded materials can be recovered and transformed into valuable economic resources, thereby reducing dependence on virgin materials and promoting sustainable development.

3. Methodology

3.1 Research Design

The study adopted a descriptive survey research design which was considered appropriate because the study sought to obtain and describe the perceptions of respondents regarding waste-to-wealth innovations, recycling practices, sustainable resource management, commercialization opportunities, and challenges affecting waste-to-wealth enterprises. Data was collected from respondents through questionnaire and summarized using descriptive statistical tools based primarily on frequencies, percentages, mean scores, and ranking.

4. Data Presentation, Analysis and Discussion of Findings

4.1 Introduction

The analysis focuses on the socio-demographic characteristics of respondents, their participation in waste-management activities, perceptions of waste-to-wealth innovations, resource management practices, commercialization opportunities and the contribution of circular economy practices to sustainable development. A total of 150 valid responses constitute the analytical sample.

Table 1: Socio-Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage (%)
Sex	Male	120	80.0
	Female	30	20.0
Age	18–27	55	36.7
	28–37	50	33.3
	38–47	30	20.0
	48–57	10	6.7
	58+	5	3.3
Education	**Frequency**	**Percentage (%)**	
None	57	38.0	
Primary	48	32.0	
Secondary	30	20.0	
Tertiary	15	10.0	

Enterprise/Occupation		
Collection	50	33.3
Sorting	20	13.3
Recycling	25	16.7
Processing	30	20.0
Trading	15	10.0
Manufacturing	10	6.7
Total	150	100.0

Source: Field Survey, 2026.

Interpretation

Table 1 shows that the waste-to-wealth sector is predominantly male, constituting 80.0% of the respondents compared with 20.0% females. In terms of age, respondents aged 18–27 years constituted the largest group (36.7%), followed by those aged 28–37 years (33.3%). Collectively, 70.0% of respondents were below 38 years, indicating substantial involvement of young adults in waste-management and waste-to-wealth activities.

Educationally, 38.0% had no formal education, 32.0% had primary education, 20.0% had secondary education and 10.0% had tertiary education. This suggests that participation in the sector is not strongly dependent on formal educational attainment and may rely considerably on practical knowledge, apprenticeship, informal skills and experience.

With respect to enterprise/occupation, collection had the highest representation (33.3%), followed by processing (20.0%), recycling (16.7%), sorting (13.3%), trading (10.0%) and manufacturing (6.7%). The relatively small proportion engaged in manufacturing is critical because manufacturing represents one of the major points at which recovered waste can be converted into higher-value commercial products.

4.2: Analysis of Waste-to-Wealth Innovation Activities

Likert scoring: SA = 4, A = 3, D = 2, SD = 1.

Decision rule: Mean ≥ 2.50 = Accept; Mean < 2.50 = Reject.

Table 2: Waste Recovery and Resource Mobilization

S/N	Statement	SA	A	D	SD	Mean	Decision
1.	Waste collection provides an important source of recyclable materials.	70	40	28	12	3.12	Accept
2	Proper sorting improves the economic value of recovered waste.	65	37	28	20	2.98	Accept
3	Waste materials can serve as alternative sources of productive resources.	75	35	27	13	3.15	Accept
4	Poor waste segregation reduces the value of recyclable materials.	75	45	18	12	3.22	Accept
5	Improved waste recovery can create employment opportunities.	79	59	6	6	3.41	Accept

The results indicate a generally high level of agreement that waste recovery and resource mobilization contribute toward waste-to-wealth activities.

Improved waste recovery and employment creation recorded the highest mean (3.41), indicating very strong agreement that effective recovery of waste can generate employment opportunities.

Poor waste segregation reducing the value of recyclable materials also received strong agreement (3.22).

Respondents agreed that waste materials can serve as alternative productive resources (3.15).

Waste collection as a source of recyclable materials recorded a mean of 3.12.

Proper sorting improving the economic value of recovered waste recorded the lowest mean (2.98), but this is still above the 2.50 benchmark and therefore indicates agreement.

Table 3: Respondents' Perception of Waste Processing and Recycling Innovation

S/N	Statement	SA	A	D	SD	Mean	Decision
1.	Recycling technologies improve the usefulness of discarded materials.	55	55	27	13	3.01	Accept
2.	Processing waste into usable materials increases its economic value.	45	80	15	10	3.06	Accept
3	Innovation can transform plastic waste into commercially useful products.	40	80	20	10	3.00	Accept
4	Access to appropriate technology is necessary for effective waste processing.	60	55	30	5	3.13	Accept
5	Skills development can improve the productivity of waste processing enterprises.	58	54	25	13	3.05	Accept

All five statements have means above the 2.50 decision benchmark, with means ranging from 3.00 to 3.13. This indicates that respondents generally accepted all the statements concerning waste processing and recycling innovation.

The highest mean, 3.13, was recorded for the statement that access to appropriate technology is necessary for effective waste processing. This suggests that respondents strongly recognize technology as an important requirement for converting waste into useful and economically valuable materials.

This was followed by processing waste into usable materials increases its economic value, with a mean of 3.06, and skills development can improve the productivity of waste processing enterprises, with 3.05.

The lowest mean was 3.00, for the statement that innovation can transform plastic waste into commercially useful products. Although it was the lowest, it remains well above the 2.50 benchmark and therefore was still accepted by the respondents.

Overall, the findings suggest that respondents perceive technology, processing innovation, skills development, and recycling as important mechanisms for increasing the usefulness and economic value of waste.

Table 4: Circular-Economy Practices and Sustainable Resource Management

S/N	Statement	SA	A	D	SD	Mean	Decision
1.	Recycling reduces the quantity of waste disposed of in the environment.	70	80	0	0	3.47	Accept
2	Reuse of waste materials contributes to resource conservation.	60	69	13	8	3.21	Accept
3	Circular-economy practices reduce dependence on virgin raw materials.	65	65	10	10	3.23	Accept
4	Waste recovery contributes to environmental sustainability.	60	70	15	5	3.23	Accept
5	Circular production can improve the efficiency of resource use.	59	59	20	12	3.10	Accept

All five statements have means above the 2.50 benchmark, so all are accepted.

The highest-rated statement is “Recycling reduces the quantity of waste disposed of in the environment”, with a mean of 3.47. This indicates very strong agreement that recycling contributes to reducing environmental waste.

This is followed by the view that circular-economy practices reduce dependence on virgin raw materials and that waste recovery contributes to environmental sustainability, both with means of 3.23.

Overall, the findings indicate that respondents have a positive perception of circular-economy practices as mechanisms for sustainable resource management, waste reduction, resource conservation, and environmental sustainability.

Table 5: Waste-to-Wealth Commercialization Opportunities

S/N	Statement	SA	A	D	SD	Mean	Decision
1.	Waste recycling provides opportunities for income generation.	70	79	1	0	3.46	Accept
2.	Processed waste can serve as raw material for manufacturing.	75	70	4	1	3.46	Accept
3.	Waste-to-wealth enterprises can create employment.	101	49	0	0	3.67	Accept
4.	Government support would improve commercialization of recycled products.	95	45	9	1	3.56	Accept
5.	Access to finance would increase the scale of waste-to-wealth enterprises.	100	50	0	0	3.67	Accept
6	Market access is important for the sustainability of recycling enterprises.	60	69	15	6	3.22	Accept

All six items remain Accepted, since every mean is above 2.50.

Table 6: Waste to Wealth Constraints and Rankings

S/N	Constraint	Frequency	Percentage (%)	Rank
1	High operating/energy cost	140	93.33	1st
2	Inadequate infrastructure	135	90.00	2nd
3	Inadequate government support	130	86.67	3rd
4	Inadequate finance	118	78.67	4th
5	Lack of modern processing equipment	100	66.67	5th
6.	Inadequate technical skills	85	56.67	6th
7	Poor access to market	80	53.33	7th
8	Poor waste segregation	70	46.67	8th

Interpretation

The results show that high operating/energy cost was the most prominent constraint, with 140 respondents (93.33%), ranking first. This was followed by inadequate infrastructure, with 135 respondents (90.00%), and inadequate government support, with 130 respondents (86.67%).

Inadequate finance ranked fourth, with 118 respondents, representing 78.67% of the respondents. The least reported constraint was poor waste segregation, with 70 respondents (46.67%), ranking eighth.

5.1 Summary of Findings

The study examined waste-to-wealth innovations and sustainable resource management for commercialization within the framework of the circular economy.

The findings revealed that respondents generally agreed that waste recovery and resource mobilization are important for waste-to-wealth development. Waste collection was perceived as an important source of recyclable materials, while recovered waste materials were considered alternative productive resources. Respondents also agreed that poor waste segregation reduces the value of recyclable materials and that improved waste recovery can create employment opportunities.

The study further found that waste processing and recycling innovation improve the usefulness and economic value of discarded materials. Respondents agreed that recycling technologies improve the usefulness of waste materials and that processing waste into usable materials increases its economic value. Access to appropriate technology and skills development were also identified as important factors for effective waste processing and improved enterprise productivity.

The findings on circular-economy practices and sustainable resource management indicated that recycling reduces the quantity of waste disposed of in the environment. Respondents further agreed that the reuse of waste materials promotes resource conservation, while circular-economy practices reduce dependence on virgin raw materials. Waste recovery was also perceived as contributing to environmental sustainability and improved resource-use efficiency.

Regarding commercialization opportunities, respondents agreed that waste recycling provides opportunities for income generation and that processed waste can serve as

raw materials for manufacturing. Waste-to-wealth enterprises were strongly perceived as capable of creating employment. Access to finance, government support, and market access were also identified as important factors for the growth and sustainability of waste-to-wealth enterprises.

The major constraints identified were high operating and energy costs (93.33%), inadequate infrastructure (90.00%), inadequate government support (86.67%), inadequate finance (78.67%), lack of modern processing equipment (66.67%), inadequate technical skills (56.67%), poor access to markets (53.33%), and poor waste segregation (46.67%).

5.2 Conclusion

The study concludes that waste-to-wealth innovation has considerable potential for promoting sustainable resource management, environmental sustainability, employment generation, and economic development. The findings demonstrate that materials traditionally regarded as waste can be recovered, processed, recycled, and transformed into economically valuable products and manufacturing inputs.

The descriptive findings indicate a generally positive perception of waste recovery, recycling innovation, circular-economy practices, and commercialization opportunities among respondents. However, the effective development and commercialization of waste-to-wealth enterprises are constrained by high operating and energy costs, inadequate infrastructure, limited government support, inadequate finance, and insufficient access to modern processing technologies.

Therefore, the transition from a linear model of waste disposal towards a circular-economy model requires coordinated investment in infrastructure, technology, skills, finance, and market development. Waste should increasingly be viewed not merely as an environmental burden but as a potential economic resource capable of generating employment, income, industrial raw materials, and sustainable development outcomes.

5.3 Recommendations

Based on the descriptive findings, the following recommendations are made:

Government should provide stronger institutional and policy support for waste recycling and waste-to-wealth enterprises through incentives, supportive regulations, and public-private partnerships.

Access to finance should be improved through low-interest loans, grants, cooperative financing, and specialized funding programs for recycling and circular-economy enterprises.

Investment in modern waste-processing and recycling technologies should be increased to improve efficiency, product quality, and the commercial value of recovered materials.

Infrastructure supporting waste collection, segregation, transportation, processing, and recycling should be improved.

Measures should be introduced to reduce high operating and energy costs, including access to renewable or alternative energy sources where feasible.

Training and skills-development programs should be provided to improve technical capacity and productivity among individuals involved in waste processing and recycling enterprises.

Waste segregation should be promoted at source, particularly in households, markets, institutions, and industries, to improve the quality and value of recyclable materials.

Market access for recycled products should be strengthened through product standards, awareness campaigns, government procurement policies, and private-sector partnerships.

5.4 Contribution to Knowledge

The study contributes to knowledge by providing descriptive empirical evidence on how respondents perceive waste recovery, recycling innovation, circular-economy practices, commercialization opportunities, and constraints within the waste-to-wealth sector.

The study also demonstrates that waste-to-wealth should be understood as an integrated process involving:

Waste Collection, Recovery, Segregation, Processing, Recycling, Production and Commercialization.

The study further highlights the importance of finance, technology, infrastructure, skills, energy, government support, and market access in translating recovered waste materials into commercially viable products.

References

1. Adedara, M. L., Taiwo, R., & Bork, H.-R. (2023). Municipal solid waste collection and coverage rates in Sub-Saharan African countries: A comprehensive systematic review and meta-analysis. Waste, 1(2), 389–413.
2. Adelopo, A. O., Osobajo, O. A., Oke, A., Olusanya, S. O., & Adegbite, E. (2022). Drivers, barriers and policy implications of circular economy adoption in Africa. Business Strategy and the Environment.

3. African Development Bank Group. (2022). African circular economy facility country assessments. African Development Bank.

4. Alao, M. A., Ayodele, T. R., Ogunjuyigbe, A. S. O., & Popoola, O. M. (2020). Multi-criteria decision based waste-to-energy technology selection using entropy-weighted TOPSIS technique: The case study of Lagos, Nigeria. Journal of Energy

5. Anyanwu, S. (2025, August 19). FG unveils Circular Economy Youth Empowerment Initiative to drive jobs and climate action. Federal Ministry of Information and National Orientation.

6. Atelge, M. R., Krisa, D., Kumar, G., Eskicioglu, C., Nguyen, D. D., Chang, S. W., & Unalan, S. (2020). Biogas production from organic waste: Recent progress and perspectives. Renewable and Sustainable Energy Reviews.

7. Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy: A new sustainability paradigm? Journal of Cleaner Production, 143, 757–768.

8. Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. Journal of Cleaner Production, 114, 11–32.

9. Hoornweg, D., & Bhada-Tata, P. (2012). What a waste: A global review of solid waste management (Urban Development Series Knowledge Papers No. 15). World Bank.

10. Medina, M. (2018). The world's scavengers: Salvaging for sustainable consumption and production. AltaMira Press.

11. Nnaji, C. C. (2015). Status of municipal solid waste generation and management practices in Nigeria. Environmental Quality Management, 24(1), 53–62.

12. Spaargaren, G., & Mol, A. P. J. (1992). Sociology, environment and modernity: Ecological modernization as a theory of social change. Society and Natural Resources, 5(4), 323–344.

13. Von Weizsäcker, E. U., Lovins, A. B., & Lovins, L. H. (1997). Factor four: Doubling wealth, halving resource use. Earthscan Publications.