

CIRCULAR ECONOMY IN NIGERIAN TERTIARY INSTITUTIONS: A CASE FOR PAPER UTILIZATION PRACTICES

By

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Abstract

The study explored the Circular Economy in Nigerian Tertiary Institutions practices in the area of paper utilization. Depending on secondary data obtained from recognized online and print resources. The study concluded that reduction in environmental degradation, cost savings and efficient resource utilization, promotion of sustainable campus management, enhancement of digital transformation, educational and behavioral development of students and staff, support for national and global sustainability goals, improvement in institutional image and competitiveness and job creation and industry linkages are some of the benefits of promoting paper circular economy in the Nigerian tertiary institutions. Also, the paper identified digitalization of academic and administrative processes, paper reduction policies and institutional guidelines, promotion of paper reuse practices, establishment of campus-based paper recycling systems, sustainable procurement of paper materials, environmental awareness and behavioral change campaigns, integration of circular economy into institutional governance and collaboration with government and private sector stakeholders as some of the management practices that will enhance support paper circular economy development in the tertiary institutions in Nigeria. Based on these findings,

the paper recommends several methods of approach to improve the economic management in tertiary institutions.

Keywords: Circular Economy, Tertiary Institutions and paper production

1.0 Introduction

In an era defined by escalating environmental challenges and dwindling natural resources, the concept of a circular economy has emerged as a strategic pathway toward sustainable development. Unlike the traditional linear economic model—which follows a “take-make-dispose” trajectory—a circular economy emphasizes resource efficiency, waste minimization, and the continual reuse of materials. In Nigeria, where educational institutions serve as pivotal centers for knowledge production and social change, the adoption of circular economy principles presents a compelling opportunity to transform resource management practices, particularly in the utilization of paper.

Paper consumption in Nigerian tertiary institutions remains significantly high due to academic activities such as printing lecture materials, administrative documentation, and student assignments. This intensive usage not only exerts pressure on limited forestry resources but also contributes to waste generation, improper disposal, and increased operational costs. Implementing circular economy strategies—such as paper reduction through digitalization, recycling initiatives, and sustainable procurement policies—can significantly mitigate these adverse impacts while fostering a culture of environmental stewardship among students and staff.

By exploring the potential for integrating circular practices into the paper life cycle—from sourcing and use to recovery and reuse—this paper examines how Nigerian tertiary institutions can align their operational frameworks with global sustainability goals. Such an approach not only enhances institutional efficiency but also positions Nigerian universities and colleges as leaders in sustainable innovation within the African educational landscape.

2.0 Conceptual Terms

2.1 Concept of Concept of Tertiary Institutions

Tertiary education encompasses specialized learning pursued beyond high school, including undergraduate and graduate credentials such as certificates, diplomas, and academic degrees. This form of education, which is non-compulsory, is provided by institutions like colleges, polytechnics, and universities. Tertiary education can be delivered through various modalities, including in-person, virtual, or distance learning (Top-hat, 2023). It is a structured and organized system designed to foster the holistic development of individuals and drive societal transformation

through comprehensive teaching, research, and community service (Ogunode, Edinoh & Okolie, 2023).

Tertiary institutions refer to post-secondary educational establishments responsible for advanced teaching, research, and community service. In Nigeria, they include universities, polytechnics, colleges of education, and other specialized institutions approved by regulatory bodies such as the National Universities Commission (NUC), National Board for Technical Education (NBTE), and National Commission for Colleges of Education (NCCE). These institutions play a critical role in human capital development, innovation, and national socio-economic growth by producing skilled manpower and knowledge for sustainable development (Federal Republic of Nigeria [FRN], 2014).

The goals of tertiary education are multifaceted and aimed at driving national development through the training of high-level manpower (Ogunode, Edinoh, & Olatunde-Aiyedun, 2023). These goals include providing accessible and affordable quality learning opportunities in both formal and informal settings to address the diverse needs and interests of all Nigerians. Tertiary education aims to offer high-quality career counseling and lifelong learning programs that equip students with the knowledge and skills necessary for self-reliance and success in the workforce. Additionally, it seeks to reduce skill shortages by producing skilled manpower that meets labor market demands, promote scholarship, entrepreneurship, and community service, foster national unity, and enhance both national and international understanding and interaction (FRN, 2013).

2.2 Concept of Paper Usage in Tertiary Institutions in Nigeria

Paper usage in Nigerian tertiary institutions remains extensive due to academic, administrative, and research-related activities. Common areas of consumption include lecture notes, examination scripts, student assignments, admission processing, official correspondence, and record keeping. Despite the growing adoption of digital technologies, reliance on paper persists because of inadequate ICT infrastructure, institutional bureaucracy, and limited awareness of sustainable practices. Excessive paper usage contributes to deforestation, waste generation, increased operational costs, and environmental degradation, thereby challenging the sustainability goals of tertiary institutions in Nigeria (Ogunode & Adamu, 2021; Akinwale, 2018).

2.3 Concept of Concept of Circular Economy

Circular economy is a systematic process focusing on services and goods production, its utilization practices, consumption behaviour and recycling or reuse of the resources to minimize waste and maximize the use of resources. Circular economy deals with an organized and planned actions and activities to ensure regeneration of waste resources and ensuring by-product and materials are reuse by recycling and regenerating natural systems for sustainable environment (Ogunode, 2025).

Circular economy is a system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources. The circular economy is based on three principles that includes; driven by design: eliminate waste and pollution; circulate products and materials (at their highest value) and regenerate nature (Ellen MacArthur Foundation 2025).

Circular economy is a model of economic development that aims to reduce waste and maximize the use of resources. It is based on the principles of recycling, reuse, and regeneration, and aims to create a closed loop system where resources are constantly cycled and reused rather than ending up in landfills. The concept of circular economy has gained popularity in recent years due to the growing concern over the environmental impact of traditional linear economic models. By utilizing circular economy principles, businesses, industries and educational institutions can minimize waste, reduce their carbon footprint, and increase efficiency. Some examples of circular economy practices include product redesign, reusing materials, and implementing closed-loop production systems (Ogunode, Ukozor, & Ayoko, 2025).

B- Benefits of Circular Economy of Paper Usage in Tertiary Institutions in Nigeria

The adoption of a circular economy approach to paper usage in tertiary institutions offers numerous environmental, economic, institutional, and educational benefits. By emphasizing reduction, reuse, and recycling, circular economy practices contribute significantly to sustainable campus management in Nigeria.

1. Reduction in Environmental Degradation

One major benefit of circular paper usage is the reduction in environmental degradation. Excessive paper consumption contributes to deforestation, loss of biodiversity, and increased carbon emissions. Circular practices such as paper reduction, reuse, and recycling help conserve forest resources, minimize waste generation, and reduce the volume of paper disposed of in landfills. This supports Nigeria's environmental sustainability and climate change mitigation efforts.

2. Cost Savings and Efficient Resource Utilization

Circular economy practices lead to significant cost savings for tertiary institutions. Reduced paper procurement, lower printing and photocopying expenses, and revenue generation from recycled paper can decrease operational costs. Efficient resource utilization ensures that limited institutional funds are redirected toward academic development, research, and infrastructural improvement.

3. Promotion of Sustainable Campus Management

Implementing circular paper usage strengthens sustainable campus management. Institutions that adopt paper reduction policies and recycling systems enhance operational efficiency and environmental responsibility. This contributes to cleaner campuses, improved waste management systems, and compliance with national and international sustainability standards.

4. Enhancement of Digital Transformation

Circular economy initiatives encourage the adoption of digital technologies in teaching, learning, and administration. Increased use of e-learning platforms, electronic records, and online communication reduces dependence on paper and accelerates institutional digital transformation. This improves access to information, administrative efficiency, and academic collaboration within Nigerian tertiary institutions.

5. Educational and Behavioral Development of Students and Staff

Circular paper usage promotes environmental awareness and responsible behavior among students and staff. Exposure to sustainable practices fosters a culture of conservation, accountability, and innovation. Graduates from such institutions are more likely to apply sustainability principles in their professional and personal lives, contributing to long-term societal development.

6. Support for National and Global Sustainability Goals

Adoption of circular economy practices aligns tertiary institutions with Nigeria's sustainable development policies and the United Nations Sustainable Development Goals (SDGs), particularly Goal 12 (Responsible Consumption and Production) and Goal 13 (Climate Action). Institutions become active contributors to national sustainability agendas and global environmental efforts.

7. Improvement in Institutional Image and Competitiveness

Tertiary institutions that implement circular economy strategies enhance their public image and reputation. Sustainable practices improve institutional credibility, attract environmentally conscious students, researchers, and development partners, and increase competitiveness at national and international levels.

8. Job Creation and Industry Linkages

Circular paper usage encourages collaboration with recycling firms and waste management industries. Such partnerships can create employment opportunities for students and local communities, support entrepreneurship, and strengthen town-and-gown relationships, thereby contributing to socio-economic development.

3.0 Method

Circular Economy in Nigerian Tertiary Institutions practices in the area of paper utilization is a position paper that adopted a systematic literature review-based method. The method allows to collect and review the related previous literature from various online sources. With the aid of digital platform, the researcher collected secondary information to generate knowledge on this topic from 2015-2025. The position paper followed qualitative narrative design method. The researcher has visited different online sites to collect the previous literature and analyze the Circular Economy in Nigerian Tertiary Institutions practices in the area of paper utilization. The previous findings are critically analyzed and presented in different themes as on Circular Economy in Nigerian Tertiary Institutions practices in the area of paper utilization (Adapted from Ogunode, 2025).

Inclusion and exclusion criteria

Inclusion

This output of the literatures on the Circular Economy in Nigerian Tertiary Institutions practices in the area of paper utilization presents an in-depth study and result that can infer conclusion on the topic. The study includes: online publication; conference paper, journals sorted from reputable international journals such as CEON, Elsevier, Hindawi, JSTOR, IEEE, Learn Techlib, SAGE, Nebraska and Springer (Adapted from Ogunode, 2025v).

Exclusion

Also, the literature review excludes information from edited books, preprints, monographs, information below 2015 and book chapters (Adapted from Ogunode, 2025).

4.0 Result and Discussion on strategies to Enhance Circular Economy of Paper Usage in Tertiary Institutions in Nigeria

The implementation of a circular economy approach to paper usage in Nigerian tertiary institutions requires deliberate institutional, technological, and behavioral strategies. These strategies should focus on reducing paper consumption, extending the life cycle of paper materials, and ensuring effective recovery and recycling processes.

1. Digitalization of Academic and Administrative Processes

One of the most effective strategies for enhancing circular paper usage is the digitalization of teaching, learning, and administrative operations. Adoption of Learning Management Systems (LMS), electronic submission of assignments, online examination platforms, e-record management, and digital communication can significantly reduce paper demand. Although infrastructural challenges exist, gradual digital transition supported by institutional ICT policies

can drastically minimize paper waste generation in tertiary institutions. The digitalization of academic and administrative processes is a key strategy for promoting a circular economy of paper usage in tertiary institutions in Nigeria. By implementing digital solutions, universities and colleges can reduce their reliance on paper-based processes and improve efficiency and sustainability. These strategies involve the use of digital technologies such as online document systems, electronic forms, and virtual communication tools. One major benefit of digitalization is the reduction of paper usage, which leads to a decrease in paper waste and associated costs for institutions. It also promotes a more environmentally friendly approach by reducing the need for paper production, which is a resource-intensive process. The use of digital platforms can streamline administrative processes, resulting in time and cost savings for both students and staff. Digitalization allows for easier access to academic materials, promoting a more inclusive learning environment. Students can access course materials and assignments online, reducing the need for physical handouts and printed materials. This also enables distance learning opportunities, making education more accessible for students in remote locations. Another advantage of digitalization is the ability to track and monitor processes, providing valuable data for decision-making and identifying areas for improvement (Ogunode, 2025). This can lead to more efficient resource allocation and a more sustainable use of resources.

2. Paper Reduction Policies and Institutional Guidelines

Tertiary institutions should develop and enforce paper reduction policies that regulate printing and photocopying activities. Such policies may include mandatory duplex (double-sided) printing, printing quotas for staff and students, discouragement of unnecessary hard copies, and prioritization of electronic documentation (Rezk, Piccinetti, Salem, Omoruyi, Santoro, 2024). Clear institutional guidelines can promote responsible paper consumption and embed circular economy principles into daily operations. Paper reduction policies and institutional guidelines are key strategies for enhancing circular economy of paper usage in tertiary institutions in Nigeria (Dunmade, Oyedepo, Fayomi, & Udo, 2019). These policies and guidelines aim to promote sustainable and efficient use of paper resources in these institutions. They provide a framework for reducing paper waste, increasing paper recycling, and implementing sustainable procurement practices. By enforcing these policies and guidelines, tertiary institutions in Nigeria can reduce their environmental impact and contribute to the circular economy model (Lebreton, van der Werf, & Wilcox, 2024.;Korhonen, Honkasalo & Seppälä, 2023) This involves the reuse, recycling, and repurposing of paper resources, rather than just disposing of them after use. Implementing these strategies can also lead to cost savings for these institutions, as they reduce the need for purchasing new paper products. Furthermore, promoting the circular economy of paper usage in tertiary institutions in Nigeria can also have a positive impact on the local community and economy, as it creates opportunities for small businesses and reduces the demand for raw materials (Rezk, Piccinetti, Salem, Omoruyi, & Santoro, 2024).

3. Promotion of Paper Reuse Practices

Encouraging the reuse of paper is a core circular economy strategy. Institutions can promote the use of single-sided printed papers for draft work, internal memos, tutorial exercises, and note-taking. Establishing designated collection points for reusable paper within faculties and departments can extend the lifespan of paper products and reduce demand for new paper (Ezema,, Suleman, & Okorigba, 2023; Ogunode, et al 2025).). The promotion of paper reuse practices is a crucial strategy that has the potential to greatly enhance the circular economy of paper usage in tertiary institutions in Nigeria. By implementing this strategy, we can drastically reduce the amount of paper used and wasted in our educational facilities, while also promoting a more sustainable and environmentally friendly approach to paper consumption (Lebreton, van der Werf, & Wilcox, 2024; Suleman,, Ezema, & Aderonmu, 2023Suleman, Ezema,&Aderonmu, 2023). One of the key benefits of promoting paper reuse practices is the reduction of paper waste. By utilizing strategies such as double-sided printing, digital note-taking, and encouraging students to use their own devices for assignments, we can greatly reduce the amount of paper that is discarded and sent to landfills. This not only has a positive impact on the environment, but it also saves institutions money in terms of paper and printing costs. Promoting paper reuse practices can also help to improve the overall quality of education in tertiary institutions. By utilizing digital note-taking and online resources, students and teachers have access to a wide range of up-to-date materials and can easily collaborate and share information (Ezeudu, & Ezeudu, 2019). This not only enhances the learning experience but also reduces the need for excessive paper consumption. By promoting paper reuse practices, we can also encourage a more circular approach to paper usage. This means that instead of constantly consuming new paper, we can find ways to repurpose and reuse paper that has already been used. This not only reduces waste but also helps to conserve valuable natural resources (Korhonen, Honkasalo, & Seppälä, 2023; Thapa,, Vermeulen,, Deutz,& Olayide, 2022).

4. Establishment of Campus-Based Paper Recycling Systems

Functional paper recycling systems are essential for closing the material loop. Tertiary institutions should partner with recycling firms or establish internal recycling units to collect, sort, and process waste paper (Andersen, Ogallo, & Diniz Faria, 2021L; Valverde, & Avilés-Palacios, 2021).. Clearly labeled recycling bins placed in strategic locations such as offices, libraries, hostels, and lecture halls can enhance participation. Revenue generated from recycling can support environmental sustainability programs within the institutions. The establishment of campus-based paper recycling systems has been proposed as a viable strategy to enhance the circular economy of paper usage in tertiary institutions in Nigeria. This innovative approach aims to reduce the environmental impact of paper usage by promoting recycling and reuse on campus (African Development Bank Group 2023). By implementing a comprehensive paper recycling program, tertiary institutions can not only decrease their carbon footprint, but also contribute to a more sustainable circular economy. This is achieved by diverting waste paper from landfills and

incineration, and instead creating a closed-loop system where paper is continuously recycled and reused. In addition to the environmental benefits, the establishment of campus-based paper recycling systems can also provide economic benefits by reducing the cost of paper procurement for tertiary institutions (Oyebode, 2022).

5. Sustainable Procurement of Paper Materials

Institutions can enhance circularity by prioritizing the procurement of recycled and environmentally certified paper products. Sustainable procurement policies that favor suppliers using recycled content or eco-friendly production methods help reduce pressure on virgin resources and encourage environmentally responsible supply chains (Abbas, Hassan, & Usman, 2022). The implementation of sustainable procurement practices for paper materials in tertiary institutions in Nigeria is crucial in achieving a circular economy for paper usage. This involves strategies that promote the environmentally-friendly procurement of paper materials, such as promoting the use of recycled paper, implementing paper reduction measures, and sourcing paper from sustainable sources (African Circular Economy Network 2022; Ogunsanwo, & Ayo-Balogun, 2020). These strategies not only contribute to the conservation of resources and reduction of waste, but also support the circular economy by creating a closed-loop system for paper production and usage. Furthermore, sustainable procurement of paper materials can also have a positive economic impact, as it can lead to cost savings and increase in demand for sustainable paper products (Ajibesin, 2023).

6. Environmental Awareness and Behavioral Change Campaigns

Behavioral change among staff and students is crucial for the success of circular economy initiatives. Regular awareness campaigns, workshops, seminars, and environmental clubs can educate stakeholders on the environmental impacts of excessive paper usage and the benefits of circular practices. Integrating sustainability education into the curriculum can further reinforce responsible resource use (Geissdoerfer, Pieroni, Pigosso, & Soufani, 2023).. The use of Environmental Awareness and Behavioral Change Campaigns is an effective strategy in promoting the Circular Economy of Paper Usage in Tertiary Institutions in Nigeria. These campaigns aim to educate individuals on the importance of reducing paper waste and encouraging them to adopt more sustainable practices (Goes&González-Torre, 2023).. Through these campaigns, institutions can raise awareness on the negative impact of excessive paper consumption and promote the adoption of alternative methods such as digitalization. This will not only reduce paper waste, but also save resources and contribute to a more sustainable environment (Gusmerotti, Testa, Corsini, & Bianchi, 2024).. Moreover, these campaigns can also focus on changing behavior towards paper usage by implementing policies and initiatives that promote responsible paper consumption. This can include setting up recycling programs, using recycled paper, and encouraging double-sided printing (Onungwe, Hunt, Jefferson, & Angelakis, 2023),.

7. Integration of Circular Economy into Institutional Governance

Embedding circular economy principles into institutional governance structures enhances sustainability outcomes. Establishing sustainability committees, green offices, or environmental management units can oversee policy implementation, monitor paper usage, and evaluate recycling performance. Institutional leadership commitment is essential for ensuring long-term success (Ganawi, 2025).. The integration of circular economy into institutional governance has been identified as a crucial strategy to enhance the circular economy of paper usage in tertiary institutions in Nigeria. This integration involves the implementation of policies and practices that aim to reduce waste and promote sustainable use of resources within academic institutions. By incorporating circular economy principles into institutional governance, tertiary institutions in Nigeria can effectively manage their paper usage and contribute to the overall goal of achieving a circular economy (Go Sharpener (2025).. This can be achieved through various strategies such as implementing recycling programs, promoting digitalization of documents, and encouraging the use of sustainable materials. These efforts will not only have a positive impact on the environment but also contribute to cost savings and improved resource management within the institutions (Geissdoerfer, Savaget, Bocken, & Hultink, 2017)..

8. Collaboration with Government and Private Sector Stakeholders

Partnerships with government agencies, non-governmental organizations, and private recycling companies can provide technical expertise, funding, and infrastructure support. Such collaborations can help overcome financial and technical constraints while aligning institutional practices with national environmental sustainability goals (European Union 2025; Wilson-Oshilim, & Efedhoma, 2025). The collaboration between government and private sector stakeholders is an effective strategy to enhance the circular economy of paper usage in tertiary institutions in Nigeria. This partnership brings together the expertise and resources of both sectors, allowing for more comprehensive and efficient implementation of circular economy practices in tertiary institutions (Ellen MacArthur Foundation 2025. Government involvement is crucial in creating and enforcing policies and regulations that promote sustainable practices in the paper industry. This includes measures such as promoting the use of recycled paper, implementing waste management systems, and providing incentives for institutions that adopt circular economy practices (Nzeadibe, & Anyadike, 2010; Mokuolu, & Timothy, 2021). Private sector stakeholders, such as paper manufacturers and distributors, play a critical role in developing and supplying sustainable paper products. This includes investing in research and development to create eco-friendly paper alternatives, as well as offering training and support to institutions on how to properly implement circular economy practices (Wilson-Oshilim, & Efedhoma, 2025). Collaboration between these two sectors also allows for the sharing of knowledge and best practices. This can lead to the development of innovative solutions and the continuous

improvement of circular economy strategies in tertiary institutions. In addition, such partnerships can help to raise awareness and educate the public about the importance of sustainable paper usage.

4.1 Conclusion and Recommendations

The study examined the Circular Economy in Nigerian Tertiary Institutions practices in the area of paper utilization. The study concluded that reduction in environmental degradation, cost savings and efficient resource utilization, promotion of sustainable campus management, enhancement of digital transformation, educational and behavioral development of students and staff, support for national and global sustainability goals, improvement in institutional image and competitiveness and job creation and industry linkages are some of the benefits of promoting paper circular economy in the Nigerian tertiary institutions. Also, the paper identified digitalization of academic and administrative processes, paper reduction policies and institutional guidelines, promotion of paper reuse practices, establishment of campus-based paper recycling systems, sustainable procurement of paper materials, environmental awareness and behavioral change campaigns, integration of circular economy into institutional governance and collaboration with government and private sector stakeholders as some of the management practices that will enhance support paper circular economy development in the tertiary institutions in Nigeria. Based on these findings, the paper recommends the following;

1. Adoption of Digital and Paperless Systems

Nigerian tertiary institutions should intensify the adoption of digital platforms for teaching, learning, administration, and assessment. The use of Learning Management Systems (LMS), e-examinations, electronic memos, and online submission of assignments can significantly reduce paper consumption and waste generation. Institutional policies should mandate “digital-first” documentation while reserving paper use for essential purposes only.

2. Institutional Paper Reduction Policies

Universities, polytechnics, and colleges of education should develop and enforce comprehensive paper reduction policies. Such policies may include default double-sided printing, print quotas for staff and students, and restrictions on unnecessary photocopying. Monitoring mechanisms should be established to track paper usage across departments to ensure accountability and continuous improvement.

3. Promotion of Paper Reuse Practices

Institutions should encourage the reuse of paper by establishing internal systems for collecting single-sided printed papers for reuse as draft materials, lecture notes, and internal communications. Offices and departments can introduce reusable notepads made from used paper, thereby extending the lifecycle of paper resources and minimizing waste.

4. Strengthening Paper Recycling Infrastructure

Tertiary institutions should invest in on-campus paper recycling facilities or partner with local recycling companies. Clearly labeled paper recycling bins should be placed in offices, libraries, lecture halls, and hostels to ensure proper segregation at source. Recycled paper products can be procured and reintegrated into institutional use, closing the loop in line with circular economy principles.

5. Sustainable Procurement of Paper Materials

Institutions should prioritize the procurement of environmentally friendly paper products, such as recycled paper, chlorine-free paper, and paper certified by recognized sustainability standards. Central procurement units should include sustainability criteria in tendering and purchasing processes to support circular supply chains.

6. Awareness Creation and Capacity Building

Regular awareness campaigns, workshops, and seminars should be organized to educate staff and students on the environmental and economic benefits of reduced paper use and recycling. Integrating circular economy concepts into general studies and environmental education courses will foster a culture of sustainability and responsible resource consumption.

7. Integration of Paper Waste Management into Campus Sustainability Plans

Paper utilization strategies should be embedded within broader institutional sustainability and waste management policies. Dedicated sustainability units or committees should oversee implementation, evaluation, and reporting of circular paper practices, ensuring alignment with national environmental policies and global sustainability goals.

8. Incentives and Recognition for Best Practices

Management should introduce incentive-based programs to reward departments, faculties, or student groups that demonstrate excellence in reducing paper use and promoting recycling. Recognition through awards or funding support can motivate wider participation and innovation in circular paper practices.

9. Collaboration with External Stakeholders

Tertiary institutions should collaborate with government agencies, non-governmental organizations, and private recycling firms to enhance technical capacity, access funding, and share best practices. Such partnerships can improve recycling efficiency and support research and innovation in sustainable paper utilization.

10. Monitoring, Evaluation, and Continuous Improvement

Institutions should establish data-driven monitoring systems to assess paper consumption, reuse rates, and recycling outcomes. Periodic reviews of paper utilization practices will enable institutions to identify gaps, refine strategies, and ensure continuous progress toward a circular economy model.

References

- Abbas, U., Hassan, S. U., & Usman, N. M. (2022, November 10). Sustainability Practices and Supply Chain Resilience in the Development of a Circular Economy: A Study of Nigeria. *Journal of Economics and Technology Research*, 3(4), p 30. <https://doi.org/10.22158/jetr.v3n4p30>
- African Circular Economy Network. (2022). Opportunities for an inclusive Circular Economy in Africa. Retrieved March 10, 2024, from <https://www.acen.africa/>
- African Development Bank Group. (2023). Nigeria Circular Economy Working Group (NCEWG). Retrieved March 10, 2024, from <https://www.afdb.org/en/topics-and-sectors/topics/circular-economy/nigeria-circular-economy-working-group-ncweg>
- Ajibesin, O. (2023). Unlocking Nigeria's future through the circular economy. Circular Innovation Lab. <https://www.circularinnovationlab.com/post/unlocking-nigeria-s-future-through-the-circular-economy>
- Andersen, M. M., Ogallo, E., & Diniz Faria, L. G. (2021, February 4). Green economic change in Africa – green and circular innovation trends, conditions and dynamics in Kenyan companies. *Innovation and Development*, 12(2), 231-257. <https://doi.org/10.1080/2157930x.2021.1876586>
- Akinwale, A. A. (2018). *Environmental sustainability and waste management practices in Nigerian universities*. *Journal of Sustainable Development in Africa*, 20(3), 45–58.
- Dunmade, I., Oyedepo, S., Fayomi, O., & Udo, M. (2019, December 1). Government Policies and Engineers' Roles in Facilitating Nigeria's Transition to Circular Economy. *Journal of Physics: Conference Series*, 1378(2), 022097. <https://doi.org/10.1088/1742-6596/1378/2/022097>
- Ezema, C., Suleman, I.A., & Okorigba, R. (2023, May 26). Perspective Chapter on Promoting Circular Design Strategies in Housing Delivery in Nigeria. *Future Housing* [Working Title]. <https://doi.org/10.5772/intechopen.110656>

- Ezeudu, O. B., & Ezeudu, T. S. (2019, October 21). Implementation of Circular Economy Principles in Industrial Solid Waste Management: Case Studies from a Developing Economy (Nigeria). *Recycling*, 4(4), 42. <https://doi.org/10.3390/recycling4040042>
- Ellen MacArthur Foundation (2025) Education and Learning of Circular Economy. <https://www.ellenmacarthurfoundation.org/resources/education-and-learning/overview>
- European Union (2025). Circular-economy-definition-importance-and-benefits <https://www.europarl.europa.eu/topics/en/article/20151201STO05603/circular-economy-definition-importance-and-benefits>
- Federal Republic of Nigeria (FRN). (2014). *National policy on education* (6th ed.). NERDC Press.
- Ganawi, N., K. (2025). Sustainable Development and the Circular Economy and Its Role in Achieving Environmental and Economic Development: Applied Study in the Netherlands, Finland, Sweden, and Japan, *American Journal of Education and Evaluation Studies*, 2(7), 346-360
- Go Sharpener (2025). From-Waste-to-Wonder-Integrating-Circular-Economy-Concepts-into-School <https://blob.gosharpener.com/blogs/801299/From-Waste-to-Wonder-Integrating-Circular-Economy-Concepts-into-School>
- 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.
- Geissdoerfer, M., Pieroni, M., Pigosso, D. C. A., & Soufani, K. (2023). Circular economy business models: A review. *Journal of Cleaner Production*, 145, 757–767.
- Goes, C., & González-Torre, P. (2023). Sharing economy practices and their implications for circular consumption. *Sustainability*, 15(1), 233–245.
- Gusmerotti, N., Testa, F., Corsini, F., & Bianchi, G. (2024). Drivers and barriers of consumer engagement in the circular economy: A focus on infrastructure and cultural contexts. *Journal of Sustainable Consumption*, 14(1), 34–50.
- Korhonen, J., Honkasalo, A., & Seppälä, J. (2023). Circular economy: The concept and its limitations. *Ecological Economics*, 143, 37–46.
- Lebreton, L., van der Werf, P., & Wilcox, C. (2024). The impacts of plastic waste on marine ecosystems and circular economy solutions. *Marine Pollution Bulletin*, 175, 113314.
- Mokuolu, O. A., & Timothy, R. S. (2021, March 1). Circular Economy and Waste Management Actions during the COVID-19 Pandemic in Nigeria. *Journal of Human, Environment, and Health Promotion*, 7(1), 1-5. <https://doi.org/10.52547/jhehp.7.1.1>

- National Environmental Standards and Regulations Enforcement Agency (NESREA). (2023). EPR Program. Retrieved from the official NESREA website.
- Nzeadibe, T. C., & Anyadike, R. N. C. (2010, September). Solid Waste Governance Innovations: An Appraisal of Recent Developments in the Informal Sector Niche in Urban Nigeria. *Geography Compass*, 4(9), 1284-1296. <https://doi.org/10.1111/j.1749-8198.2010.00385.x>
- Ogunsanwo, A., & Ayo-Balogun, A. (2020). Circular Economy: A Prototype for Sustainable Development in Nigeria. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3687567>
- Ogunode, N, J. (2025v). Inaugural Lectures in Nigerian Universities: Importance and Effects. *Best Journal of Innovation In Science, Research And Development*, 4(7),99-105.
- Ogunode, N. J. (2025). Integration of Circular Economy Programme into Tertiary Education Management in Nigeria. *Spanish Journal of Innovation and Integrity*, 45, 38–44. Retrieved from <https://sjii.es/index.php/journal/article/view/770>
- Ogunode N.J., Edinoh, K., & Okolie, R.C. (2023). Public Private Partnership model and implementation of tertiary education program in Nigeria. *AMERICAN Journal of Science on Integration and Human Development*, 01(06), 1-12.
- Ogunode, N. J., Ukozor, C. U., & Ayoko, V. O. (2025). Benefits, Practices and Factors that Support Implementation of Circular Economy in Nigerian Schoools. *American Journal of Alternative Education*, 2(8), 17–23. Retrieved from <https://scientificbulletin.com/index.php/AJAE/article/view/1155>
- Ogunode, N. J. (2025). Integration of Circular Economy Programme into Tertiary Education Management in Nigeria. *Spanish Journal of Innovation and Integrity*, 45, 38–44. Retrieved from <https://sjii.es/index.php/journal/article/view/770>
- Ogunode, N.J., Edinoh, K., & Olatunde-Aiyedun, T.G. (2023). Staff training in schools. *Journal of Innovation in Educational and Social Research*, 1(3), 192-207. <https://journals.proindex.uz/index.php/jiesr/issue/view/19>
- Onungwe, I, Hunt, DVL, Jefferson, I & Angelakis, A (ed.) 2023, 'Transition and Implementation of Circular Economy in Municipal Solid Waste Management System in Nigeria: A Systematic Review of the Literature', *Sustainability*, vol. 15, no. 16, 12602. <https://doi.org/10.3390/su151612602>
- Oyebode, O. J. (2022). Sustainable Waste Management Towards Circular Economy in Nigerian Context: Challenges, Prospects and Way Forward. *Green Energy and Technology*, 237-248. https://doi.org/10.1007/978-3-030-95820-6_20

- Suleman, T., Ezema, I., & Aderonmu, P. (2023, December). Challenges of circular design adoption in the Nigerian built environment: An empirical study. *Cleaner Engineering and Technology*, 17, 100686. <https://doi.org/10.1016/j.clet.2023.100686>
- Suleman, T., Ezema, I., & Aderonmu, P. (2023, October 16). Benefits of Circular Design Adoption in the Nigerian Building Industry. *The Eurasia Proceedings of Science Technology Engineering and Mathematics*, 23, 307-315. <https://doi.org/10.55549/epstem.1368273>
- Thapa, K., Vermeulen, W. J. V., Deutz, P., & Olayide, O. (2022, September 7). Ultimate producer responsibility for e-waste management—A proposal for just transition in the circular economy based on the case of used European electronic equipment exported to Nigeria. *Business Strategy & Development*, 6(1), 33–52. <https://doi.org/10.1002/bsd2.222>
- Valverde, J. M., & Avilés-Palacios, C. (2021, November 16). Circular Economy as a Catalyst for Progress towards the Sustainable Development Goals: A Positive Relationship between Two Self-Sufficient Variables. *Sustainability*, 13(22), 12652. <https://doi.org/10.3390/su132212652>
- Saint, W., Hartnett, T. A., & Strassner, E. (2003). Higher education in Nigeria: A status report. *Higher Education Policy*, 16(3), 259–281.
- Top-hat (2023). Meaning of tertiary education. <https://tophat.com/glossary/t/tertiary-education/>
- Rezk, M.R.A., Piccinetti, L., Salem, N., Omoruyi, T.U., Santoro, D. (2024). Nigeria's transition to a circular economy: challenges, opportunities and future perspectives. *Insights Into Regional Development*, 6(1), 11-23. [http://doi.org/10.9770/IRD.2024.6.2\(1\)](http://doi.org/10.9770/IRD.2024.6.2(1))
- UNDP (2023). What is circular economy and why does it matter? <https://climatepromise.undp.org/news-and-stories/what-is-circular-economy-and-how-it-helps-fight->
- Wilson-Oshilim, U., D. & Efedhoma, P., E. (2025). Circular Economy and Sustainable Consumer Behaviour in Edo State, Nigeria. *JOURNAL OF ACADEMIC RESEARCH IN ECONOMICS*, 17(1), 162-175