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A REVIEW OF THE CIRCULAR ECONOMY IN NIGERIA

From rhetoric to enterprise development

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Introduction

The process of shifting to a circular economy (CE), which is commonly described as a combination of reducing, reusing, and recycling operations, differs for emerging economies. In the northern hemisphere, notably in Europe, there is a broader knowledge of circular processes supported by well-documented case studies of multinational corporations. Furthermore, CE discourse in the Global North focuses mainly on waste reduction, cost savings, product reinvention, and new business models (Desmond & Asamba, 2019). CE implementation in the Global North emerged from a top-down strategy beginning with policies to shape sustainable development and safeguard the environment from further degradation (Ghisellini & Ulgiati, 2020). In Germany, the concept of CE was adopted via a bottom-up strategy that began with a ban on waste dumping intended to encourage eliminating landfills by 2020 (Geng et al., 2013). In Japan, the transition to circularity began in 1991 with the enactment of the law for the efficient utilisation of recyclables. Preston and Lehne (2017) found that most CE initiatives take place in Europe, North America, and East Asia.

In contrast, in the Global South, many small-scale actors in the CE are driving the transition towards a CE with the goal of realising the potential for job creation and income generation in participating nations. With predicted population growth and the resulting increase in consumption, waste management has become a severe challenge in many nations. However, a significant portion of the waste generated in countries of the Global South is still sent to landfills. Also, in the lack of strategic legislation and policies in countries of the Global South, the transition to CE is influenced by several minor actors, multinational corporations, businesses, social enterprises, and informal waste pickers. In India, for instance, recycling and composting programmes cannot keep up with the growth of waste, even though small start-up companies and nongovernmental organisations (NGOs) are introducing new solutions ranging from high-tech waste processing to improved training and support for waste picker communities (Fiksel & Lal, 2018; Fiksel et al., 2021).

As with other countries in the Global South, in Africa the transition to CE is characterised by many small players, a lack of policies fuelling implementation at the national level, and clarity surrounding the concept of CE, which makes its implementation difficult. Although the practice

of CE is still at a forming stage, micro-level actors, multinational businesses, and nonprofit groups in Nigeria are driving the shift to a full CE. In contrast, countries in the Global North have implemented CE through a top-down approach typified by rules that reduce the amount of garbage sent to landfills. The growing popularity of the CE idea is primarily attributable to its influence on the sustainable development concept in two major areas: economic prosperity and environmental quality (Kirchherr et al., 2017). A CE may introduce novel methods of recycling products and resources in the future (Karell & Niinimäki, 2019). The novel methods can aid in conserving the environment in the fight against climate change (Esposito et al., 2017; Greyson, 2007). A CE has the potential to provide a waste-to-wealth pathway for economic growth (Lacy & Rutqvist, 2015) and a sustainable approach to health (Nanda et al., 2021), safety (Lia et al., 2021), and the environment moving the conversation of CE from mere rhetoric to action – leading to the formation of business entities whose major activities tend to close the loop presently evident in Nigeria.

Long before CE became an official word in Nigeria, waste pickers, scavengers, and other informal actors practised the concept of CE as a means of subsistence. In recent years, however, CE has gained popularity as an innovative approach to alleviating poverty and accomplishing SDGs in the country. The majority of these approaches are designed to combat plastic proliferation and to manage biodegradable waste (Ghosh, 2020).

There is the need to understand the specific catalysts of CE transition in the Global South. In this chapter, we examine Nigeria's CE transition because Nigeria, as a context, poses a rather interesting picture of the transition to a CE. We state that countries such as Nigeria seem to be implementing CE taking a bottom-up approach, which is unique and distinct from the top-down approach of the advanced countries (Russell et al., 2020). This chapter examines the CE transition in Nigeria through the reported lived experiences of nine owners of CE-inclined enterprises.

Context comparisons and synthesis: Circular economy as the tool for inclusive growth in Nigeria

Developing countries have strived to diversify to improve their national economic trajectories (Hamed et al., 2014). Most developing countries have achieved this diversification drive mainly in industrialisation, from primary production to industrial exportation (Gelb, 2010). Today, many developing countries are diversifying based on the idea of sustainability (Lee, 2005). The Sustainable Development Goals (SDGs) and the Africa Agenda 2064 have encouraged the creation of businesses and social enterprises that seek to advance ecological, social, and human progress rather than just for profit in some developing countries. It is essential to unearth why resource-rich countries such as Nigeria, with many natural resources (petroleum, natural gas, tin, iron ore, coal, limestone, niobium, lead, zinc, and fertile land) would contemplate circularity and sustainability in their diversification and transformation agenda. With many natural resources, Nigeria generally would prefer to diversify focusing on the exploitation of other resources, however, CE implementation requires the diversification into renewable resources. Countries such as Nigeria are learning from the environmental problems created by highly industrialised countries (Halog & Anieke, 2021). Lately, there has been a depiction of the advantages associated with the establishment of circular enterprises within CE (de Kock et al., 2020). Another reason for this shift is the promises of wealthier countries and other entities to set aside some funds to support environmental causes in Africa (Desmond & Asamba, 2019). Empirical evidence suggests that over 90% of Nigeria's waste is indiscriminately dumped or burnt (Agunwamba, 1998). Thus, circularity emphasises the creation of feeder loops that transform all the wastes into new inputs to be used for further production within the value chain (Fakunle & Ajani, 2021).

The goal of a CE is to eliminate waste while simultaneously encouraging the reuse of resources, which may in turn provide economic value. For instance, the waste glass may be recycled into new glass, and wastepaper can be recycled into new paper. This recycling process ensures a sufficient supply of materials of reproduction for shelter, warmth, and other essentials in the future; the consequence is that CE is the most viable option to achieve a situation where the waste will be avoided by more effective manufacturing and recycling of items and resources (Purchase et al., 2021).

Waste in Africa and its management

Africa is the second-highest populated continent and its people are growing at the fastest rate (Adeyeye et al., 2023). Some African nations are still plagued by poverty and a lack of resources like clean drinking water, food supplies, and electricity (Murshed & Ozturk, 2023). Socioeconomic changes on the continent are supported by development in Africa, which includes electrical energy production, agriculture, urbanisation, education, and infrastructure (Omwoma et al., 2017). Changes such as these will necessitate a sizable workforce, extensive planning, and efficient waste management as a result.

The amount of waste produced by Sub-Saharan Africa (SSA) countries increased by 55 million tonnes between 2012 and 2019 (Ayeleru et al., 2020), with an estimated population of 1.31 billion in 2019 and 244 billion tonnes of waste estimated by 2025 and an estimated population of 1.5 billion (UNEP, 2022). According to a report by the Water and Sanitation Program (WSP, 2012), annual costs of improper waste disposal for Nigeria and Ghana are USD\$3 billion and USD\$290 million respectively, equivalent to 1.3% and 1.6% of these countries' respective gross domestic product (GDP). According to the same report, annual indiscriminate waste disposal costs Zambia, Liberia, Madagascar, and Kenya USD\$195 million, USD\$17.5 million, USD\$103 million, and USD\$324 million respectively, amounting to between 0.9% and 2% of each nation's GDP. These figures suggest that waste disposal has a direct financial impact on the nations in SSA.

The massive amount of uncontrolled waste and the ineffectiveness of the current waste management system in most developing nations have unprecedentedly impacted environmental quality and human health (Marshall & Farahbakhsh, 2013). The push for sustainable waste management in Africa has resulted in the adoption of several laws and policies intended to boost the effectiveness of solid waste management strategies, particularly in South Africa. Nevertheless, despite the advancements made in South Africa's waste management systems over time, some problems and shortfalls remain.

To achieve sustainable development through the switch from a linear to a circular economic model, Africa's waste management industry needs to be modernised. In developing nations, landfills are still a common method of waste disposal. However, landfills produce methane gas, a greenhouse gas 21 times more potent than carbon dioxide (Couth & Trois, 2012), which degrades groundwater quality and poses a risk to both people and the environment. The lack of waste collection and disposal has resulted in waste buildup in public areas, on the streets, and at other unauthorised dump sites.

Ethiopia, Botswana, Nigeria, and Algeria are a few nations that lack national regulations governing the proper disposal of such waste. Due to the quick reduction of waste – up to 90% – as well as the generation of heat for boilers or other energy production, incinerating waste is frequently the preferred method of disposal. If the proper technologies are not used, this kind of method could possibly produce risky by-products like harmful emissions and residuals.

Although waste is viewed as a valuable resource (Debrah et al., 2022) in the SSA region, some nations, including Ghana, Nigeria, South Africa, Ethiopia, Kenya, Rwanda, Namibia, and Ivory Coast, either partially or fully practise recycling (Mayer et al., 2019) and some form of CE. In contrast, other nations, including Somalia, Congo, Sudan, and Zimbabwe, primarily practise linear waste management, or take-make-dispose. The SSA countries cannot fully recover waste materials and give them useful purposes due to the linear material flow economy and the partial waste management recycling practise. As a result, these nations are unable to recover useful resources from their waste and reintegrate them into the regional economy. Therefore, encouraging the local economy's growth becomes difficult.

According to Taherzadeh et al. (2019), the CE concept, which promotes sustainable waste management by turning waste materials into new products, is more effective at helping reduce the effect of waste on the continent. This is the ideal substitute. There are currently some firms, programs, and initiatives in Nigeria that are geared towards the development of a viable CE. In this chapter, we refer to these firms, programmes, and initiatives as micro actors.

Micro actors in the CE transition in Nigeria (some contemporary developments)

There seems to be a concentration of CE activities in 2 states out of the 33 states of Nigeria, Lagos, and Ogun. There are emerging actors playing a very crucial role in the nation's CE transition. In this chapter, we describe these emerging actors (which include small firms and initiatives) as micro actors.

'Circular Lagos', a project backed by the circular exchange innovation platform and the government of Lagos State, is an example of micro actors. This programme, meant to encourage the growth of circular business and investment activities in Lagos State was introduced in November 2022. Within the Circular Lagos Project are two other micro actors, LOOP Lab innovators and Circular Lagos Business Platforms. The LOOP Lab is an incubator designed to support long-lasting commercial and technical partnerships between young ventures and more established industry participants. The Circular Lagos Business Platform represents business interests and facilitates business development and investment opportunities for local and international companies that offer circular products and services (Raphael, 2022).

Businesses serve as the foundation of the shift to CE, in the absence of comprehensive waste management framework mechanisms, by developing innovations that address the unique difficulties of the Nigerian economy. One of these issues is the general public's lack of knowledge about the value of CE and its lack of waste segregation culture. Initiatives run by social entrepreneurs like Wecyclers support the culture of waste segregation in households by influencing them with incentives. Wecyclers is a social venture that operates drop-off locations in residential areas of big cities like Lagos State where people may dispose of their plastic waste in exchange for financial incentives. While another organisation, the electronics importing company Slot Nigeria, collaborates with the E-waste Producer Responsibility Organisation of Nigeria to promote waste segregation culture and remove electronic waste from the environment, Wecyclers focuses on the collection of plastic waste for recycling (Recyclepoints, 2022).

Education plays a significant role in fostering a culture of waste segregation and assisting the transition to CE. Organisations such as the Fabe International Foundation are crucial in raising awareness among communities about the significance of switching from a linear consumption model to a CE model. Fabe International Foundation works with communities to recycle waste materials into useful goods that can be sold to make money through their Tidy Nigeria programme. Another organisation, Susty Vibes, a youth-led community, promotes

environmental protection and the need to switch from a linear to a circular economic model (Fabe, 2022).

Aside from coalitions backed by the international community and the government, multinational corporations are also key players in Nigeria's transition to the CE through programmes like the Coca-Cola Foundation's initiative to empower collectors. The initiative attempts to enhance Nigeria's informal plastic waste collecting and recycling system. The Coca-Cola Foundation wants to improve aggregators' capacity throughout six Nigeria states by empowering 3,000 female collectors and micro-aggregators with effective collection techniques. Two separate categories of efforts in supporting the transition to CE in Nigeria – plastic waste management and agricultural waste management, largely by small businesses – are shown in an overview of the majority of multicultural corporations' actions (Falaiye, 2022).

The growth of small firms with creative business models centred on CE has been fuelled by education, incentives, and the backing of international organisations. Most of these companies operate at the value chain's collector end. In the nation, only few businesses recycle waste on a significant scale into useful products. One of the few companies embracing CE is the multinational Lafarge Geocycle, which turns waste into affordable building materials and electricity on a large scale.

Methodology

Research design

The study focuses on developing a framework to explain Nigeria's CE transition. This study was conducted by applying the phenomenological case study research approach to capture the experiences of nine entrepreneurs in the Nigerian CE space. The constructivist paradigm posits that people socially construct and influence meanings to events (Allen, 1994). Compared to a linear economy, CE is a global phenomenon involving actors building society in a way that reduces waste and leads to ecological sustainability. The transition to CE that we are witnessing on a global scale is a novel way of modelling waste management. Transitions to CE are responses to the possible need for a more sustainable society influenced by constructionist ideas of people. As Guba and Lincoln (1994) explain, all such phenomena are human inventions.

The purpose of applying the phenomenological case study design lies in examining and discussing phenomena from the viewpoint of individuals who "live" them (Van Wyk & Taole, 2015). Hence, the interpretive approach was adopted to understand the depths of the emotions and thoughts of the actors. Participants in the study are primarily those who founded CE-based businesses and are heavily involved in their management. We aimed at achieving a better understanding of the transitioning process by researching the concept of CE from the point of view of Nigerian CE entrepreneurs, focusing on waste management and the reuse of waste as their business models.

The study focuses on the representation of lived experiences of the object of study, in this case, the entrepreneurs involved with CE, and how they construct meaning out of the world around them (Husserl, 1981). The phenomenological perspective assumes that phenomena are always phenomena for someone and can, therefore, never be studied independently of how they appear to a particular consciousness. Husserl (1981) argues that phenomenology studies different structures of experience, including perception, ideas, feelings, desire, memory, and thought. This also posits that meaning emerges from human experience.

Ontologically, the phenomenon studied must be understood as it appears through the human experience. Like hermeneutics, phenomenology’s underlying truth theory is the coherence theory. The phenomenologist’s approach to theory is inductive, that is, theories are formulated based on iteratively assessing and reassessing the empirical data in a cyclical manner rather than the testing of theories (Morse, 1994).

Data collection

This section presents real-world case studies from Nigerian firms that developed along the lines of sustainability and circularity. Morse (1994) proposes that the phenomenological researcher enters into dialogue with participants to provide good details of their experiences. Different textbooks recommend various sample sizes for phenomenological research, but a sample of six to twenty individuals is acceptable (Dare, Ellis and Roehrig, 2018). In many qualitative studies, the sample size is frequently constrained by practical factors such as financing, time, and access to participants. That notwithstanding, the nine cases were specifically selected for this study because of their relevance to the study. The case organisations are start-ups that are making great strides in CE in Nigeria. They are also representative of the geographic blocks of the country. This provides the study with the diversity required.

The sampling method employed is criterion sampling. According to Korstjens and Moser (2018), criterion sampling is used in phenomenological research during which participants must satisfy predetermined criteria set in the research design. The participant’s familiarity with the phenomenon under study is the most important criterion. The researchers seek out participants who have had a similar experience but differ in terms of their personal histories and life experiences. Therefore, it was appropriate for the current study to contact the founders of the selected organisations, because they have lived through and experienced the phenomena of Nigeria’s state of circularity and the nature of enterprise development in CE from both a personal as well as an organisational frame. The data was collected through interviews with the firms’ founders. The authors transcribed the interview recordings. Other research associates verified the transcription for validity and reliability. The companies were: Environsafe Logistics, Pliris Waste Management Ventures, Afrique Eco Solutions, Garbage in Value Out (GIVO), Redivivus, Jumoke Waste Museum, Zimmacraft, Quadloop, and Scratop Nigerian Limited (Table 5.1 presents the details of the interviews conducted). The analytical approach took the hermeneutic phenomenological approach (Plager, 1994), which looked at the interpretation of the text (Laverty, 2003; Sloan &

Table 5.1 Schedule of interviews

<i>Code</i>	<i>Role</i>	<i>Organisation</i>	<i>Time and date of interview</i>
INT 1	Founder	Quadloop	5:00 p.m.–5:30 p.m.; September 5, 2022
INT 2	Founder	Scraptop Nigeria ltd	6:55 p.m.–7:55 p.m.; September 14, 2022
INT 3	Founder	GIVO	4:00 p.m.–4:30 p.m.; August 29, 2022
INT 4	Founder	Zimajcraft	3:00 p.m.–3:30 p.m.; September 5, 2022
INT 5	Founder	Waste Museum	3:30 p.m.–4:15 p.m.; September 2, 2022
INT 6	CEO/ Founder	Pliris Waste Management Ventures	7:00 a.m.–7:30 a.m.; September 5, 2022
INT 7	Founder	Redivivus	12:00 p.m.–1:00 p.m.; August 29, 2022
INT 8	Founder	Ifrique Eco Solutions	12:00 p.m.–12:30 p.m.; March 17, 2022
INT 9	Founder	Environsafe Logistics	3:00 p.m.–3:30 p.m.; March 11, 2022

Note

INT means interviewee.

Bowe, 2014). A thematic analysis of the data was conducted to find the principal and common issues that touch on the transition process.

Results

This section presents the study's findings. First, we provide a background of the case firms. Then, as expected of interpretive studies, we present the findings along with discussion and analysis.

Envirosafe logistics

Afamefuna Asoegwu founded Envirosafe Logistics in 2014. The company began as a part-time job and was inspired by an encounter he had while working in a recycling company in the United Kingdom. Afamefuna acquired additional training from several of the institutions with which he worked. In 2014, through a collaboration with the environmental consulting firm RSK, one of Europe's largest privately held environmental firms, Envirosafe Logistics became a reality.

In Nigeria, Envirosafe began as a church group collecting objects for recycling under a different company name before transforming into a consulting firm. The business began with a small truck. During its first two years, the company collaborated with larger companies to provide waste management and evacuation services. The company's other source of income was the rental of its lone compactor, and its financial base was expanded through environmental consulting, health and safety training, and additional equipment supply.

Envirosafe's main operations have since evolved to include the recycling of chemical and hazardous waste. According to Afamefuna, "the organisation was founded as a way for me to do something kind that would also benefit the neighbourhood and environment. The majority of organisations involved in waste management dealt with regular waste, leaving hazardous material unattended. Envirosafe began in an effort to assist in the management of such wastes" (interview March 11, 2022).

Pliris waste management ventures

Pliris composts biodegradable waste for fertiliser and manure to be used for environmentally friendly farming. According to Oluwayomi, the CEO, Pliris is on a quest to reduce the quantity of biodegradable waste disposed of in landfills in Lagos through collaboration with households, marketplaces, and organisations.

The organisation promotes compost manufacturing with the Bokashi Composting technique, a simple do-it-yourself composting technique and kit introduced to families and businesses. Pliris accomplishes this by collecting garbage from private businesses and decomposing it in composting facilities. Composting as a service to farms and other organisations assists with on-site composting. Pliris details several obstacles, including waste segregation culture, logistics, and government support.

The primary objective of the production process is to reduce biodegradable waste. To aid in food production, the production process reduces waste and sells the products to farmers. The organisation also manages these farmers' biodegradable waste. Pliris collects biodegradable waste from food markets and food processing companies throughout Lagos. Sawmills are the source of the sawdust used in the production of compost. The production cycle relies solely on natural processes. Diesel fuel is only used for crushing hard materials, such as coconut husks, which are extremely durable. However, this equipment is utilised sparingly, which lowers their carbon

emissions. The majority of the organisation's raw materials are biodegradable waste that is fully utilised in the production process; consequently, the organisation generates little to no waste. Raw materials are the only waste product of the production process. However, plastic caps are difficult to manipulate, and these recyclable wastes are outsourced to other businesses.

Ifrique Eco Solutions

Ifrique Eco Solutions is a start-up with a mission to solve the housing deficit in Nigeria with affordable building materials recycled from plastic wastes. The company upcycles plastic waste into interlocking tiles, eco-toilets tiles to curb open defecation in Nigeria. This organisation was born out of a passion to curb the problem of indiscriminate disposal of plastic waste in Nigeria. Plastic waste is not biodegradable and poses a serious health risk to Nigerians. The passion for curbing this waste in Nigeria led to the establishment of Ifrique Eco Solutions, which raises awareness of the dangers of disposing of plastic waste indiscriminately.

Since the rate of plastic use is continually growing and knowing that plastics can be sustained for thousands of years before decaying, Ifrique Eco Solutions found the need to not only educate people about the product but also to gather the plastic waste and make good out of them. Due to its efforts, the company believes that the collection of waste plastic in its catchment area is expanding at both a speedy and a very big scale; this indicates that the problem of waste plastic can be eliminated for an extended period of time. It appears to be a more workable and effective technique to find a solution to the problem of plastic waste.

Garbage in Value Out (GIVO)

The lack of data on the amount of plastic waste produced in Nigeria and the absence of a culture of waste segregation represent a common barrier to Nigeria's transition to CE. Victor, the founder of GIVO (Garbage in Value Out), saw the need to collect data on plastic pollution in Nigeria and founded a social enterprise to address the issue. Through plastic collection community hubs in and around Lagos, GIVO disseminates the philosophy that waste is useful to other families and communities. Through these plastic collection community hubs, the organisation collects data on the amount of plastic waste produced and provides community members with incentives to promote a culture of waste segregation. According to Victor, "In the absence of government entities dedicated to enforcing plastic pollution regulations, incentives and advocacy are crucial tools for influencing changes in household behaviour" (interview August 29, 2022). The information collected from the homes where the hubs operate is used to provide loans and insurance to the communities surrounding the hub. Statistics can also be used to persuade Nigerian policymakers of the need for effective legislation to combat plastic pollution. GIVO collects the necessary information via a mobile application.

In addition to data collection, GIVO uses plastic waste to create toys, furniture, and personal protective equipment (PPE). Utilising its manufacturing capabilities, the company overcame the lack of PPE equipment for frontline staff during the COVID-19 pandemic. The production process at GIVO is designed to generate minimal waste.

GIVO faces the same difficulty as other small businesses in Nigeria in securing sufficient capital for its plastic recycling plants and manufacturing centres. Numerous Nigerian businesses face this problem due to a lack of research and manufacturing capabilities in the country. Due to the naira's low value, machinery is expensive and admission fees are exorbitant. Victor has emphasised the need for more financial institutions to fund initiatives in the waste

management sector. In addition, legislation must be developed in Nigeria to ensure that local businesses have access to carbon credits and to enhance the institutional capacity of waste management agencies.

Redivivus

Redivivus, a recycling company headquartered in the eastern state of Anambra, began as an expert consultancy in small business development in Anambra. Through interactions with small businesses, Emeka, the business owner, observed a gap in the waste management system of Anambra State and devised a business model in response to a gap he observed in the waste management system of Anambra State. To go about solving the challenges he observed, he established a facility for waste recycling. To further solve the waste management challenges in the state, the company has transitioned from a typical recycling business to a manufacturing company that produces affordable building materials from plastic waste and also provides a solution to the housing deficit challenge in Anambra State. Utilising new waste management solutions for low-density polymers and polyethylene, write-offs adhere to the CE's waste reduction process. The prevalence of water sachets in Nigeria as a result of the state's lack of potable water makes the need for innovative solutions for low-density plastics in Nigeria all the more important. The organisation acquires its supplies from aggregators in Anambra. To preserve the integrity and quality of the output, approximately 28% of it is also composed of virgin materials.

The CEO admits that his recycling factories are not entirely eco-friendly, as they must use diesel generators to power the plants. The unreliable electricity supply in Nigeria necessitates the use of diesel generators in the waste management industry. Redivivus collaborated with the energy distribution agency in Anambra to address this issue of an unreliable power supply. The organisation employs a waste management strategy that generates minimal waste from the industrial process. The organisation faces the fundamental obstacle of a lack of statistics on Nigeria's waste production.

Jumoke Waste Museum

Passionate about CE, Jumoke founded the Waste Museum as a summer camp that teaches children how to transform waste into valuable materials. Jumoke, the organisation's founder, initially taught children to create art from waste. She began stockpiling art supplies from her summer classes and personal projects before establishing the waste museum. After a number of years, Jumoke opened the Waste Museum to the public and transitioned to using the museum as a vehicle for raising the awareness of CE.

The Waste Museum, one of the organisation's core services, educates individuals on the various uses of waste in an effort to change their behaviour from take-make and waste consumption to circular consumption. The Waste Museum demonstrates the viability of the CE to encourage its use in visitors' daily lives. "In the Waste Museum, humans, animals, and plants coexist without producing waste" (interview September 2, 2022). The museum contains over 150 plants and animal species. In addition, the museum teaches families how to use waste to cultivate their own gardens using the CE model. Before 2025, the museum intends to teach 10,000 families how to grow their own food. The primary products of the museum are household items created from repurposed materials. In the museum, materials are sorted at the source (houses and businesses), and contaminated waste is not utilised. The museum utilises a combination of solar and

regionally generated electricity for its production. The organisation intends to utilise biogas to power its facility in the future thanks to a bio-digester developed in collaboration with the International Institute of Tropical Agriculture (IITA).

The Waste Museum employs a system that does not generate waste. Animal waste is used to nourish plants, and plants in turn nourish the animals. Waste is disposed of using the standard procedure for waste disposal. A great deal of focus is given to the transition to a CE. According to Jumoke, there is a need to alter the consumption patterns of influential industry leaders to realise funding for entrepreneurs in the sector.

Zimmacraft

Zimmacraft manufactures and sells an alternative to charcoal made from rice processing by-products in Nigeria. The founder of Zimmacraft desires to combat climate change and deforestation in Nigeria's savannah region using her products. This idea was inspired by a desire to provide widows with a sustainable source of income. Zimmacraft teaches widows how to produce this alternative charcoal so that they can provide for their families.

Zimmacraft obtains its raw materials from western Nigerian rice farms and mills. Using a machine that transforms rice husks into the final product, Zimmacraft manufactures smokeless charcoal. The production process reduces carbon emissions and methane emissions. However, due to a lack of electricity, Zimmacraft uses diesel-powered machines in the production process; this form of power production contributes to environmental pollution. Despite this, most of the raw materials used in the production process are eco-friendly, and the small amount of waste is returned to the soil to enrich it.

Quadloop

The Nigerian e-waste management company Quadloop manufactures solar lamps and lanterns from recycled electronic waste. The solar lamps produced by Quadloop provide a cost-effective source of energy to households and hospitals in underdeveloped nations. Quadloop extracts valuable materials from electronic waste collected from Lagos's major electronic markets. Quadloop also assists large corporations in repairing and reusing solar batteries. Through this service, Quadloop assists these businesses in reducing expenses.

Chidozie, the founder of Quadloop, describes his production process a waste-free process, and the company depends on the power supply from the national grid. However, one of the key challenges Quadloop faces is obtaining sufficient raw materials for production since Nigerians do not readily dispose of their electronic waste. Another difficulty Quadloop faces is obtaining sufficient funding for the e-waste stream, given that this waste stream consists of hardware and that Nigeria lacks the skills necessary for the local production of hardware. Therefore, it is difficult to convince investors of the business's viability.

In Nigeria, it is also hard to find people with the technical expertise to design electronics from scratch. Consequently, Quadloop faces the difficulty of recruiting enough personnel with an understanding of electronic waste for the workshop. To address this issue, Quadloop trains young graduates as interns in its workshop then employs them as employees in its workshop. Since the level of environmental sensibility is low among consumers in Nigeria, people are not willing to pay more for environmentally friendly products. To address this problem, Quadloop collaborated with hospitals, which helped spread the word about the company's products to Nigerian households.

Scraptop Nigeria Limited

Scraptop Nigeria Limited is a social enterprise that purchases biowaste, food waste, fruit waste, and post-harvest losses, then converts them into Organic NPK fertiliser for crop production. The concept was developed during a Hult Prize competition for audacious businesses for a better planet. The CEO realised that biodegradable waste posed a challenge in Nigeria after speaking with local farmers about the need for organic fertiliser.

Currently, there is a high demand for organic NPK fertiliser, but not enough quantity is produced to meet this demand. To source for raw materials, the founder of Scraptop Nigeria collaborates with cassava farmers and food vendors, poultry farms, rice mills, and waste shops in the state’s major markets. Scraptop is an environmentally friendly company because it removes waste from the environment.

In the Scraptop production process, very minimal waste is generated during the manufacture of organic NPK fertiliser, and waste generated is used as fertiliser. As with the other entrepreneurs interviewed, energy supply poses a significant issue in the manufacturing process. Another major challenge is the lack of a waste sorting culture that makes the production process somewhat difficult. Other challenges Scraptop faces include multiple licenses, fertiliser regulations, and multiple taxation, which make it difficult for businesses to expand. Nigeria’s lack of a waste sorting culture makes the production process somewhat difficult. Nigeria requires additional education to influence the culture of waste segregation.

Analysis: A framework for transitioning from rhetoric to enterprise development

The interviews with the organisations led to development of a framework for explaining the transition from rhetoric among government and other stakeholders such as waste management organisations and the general public to active enterprise development in Nigeria. In the created framework, we describe at the individual firm level how the discussions on CE could lead to the establishment of enterprises (Figure 5.1).

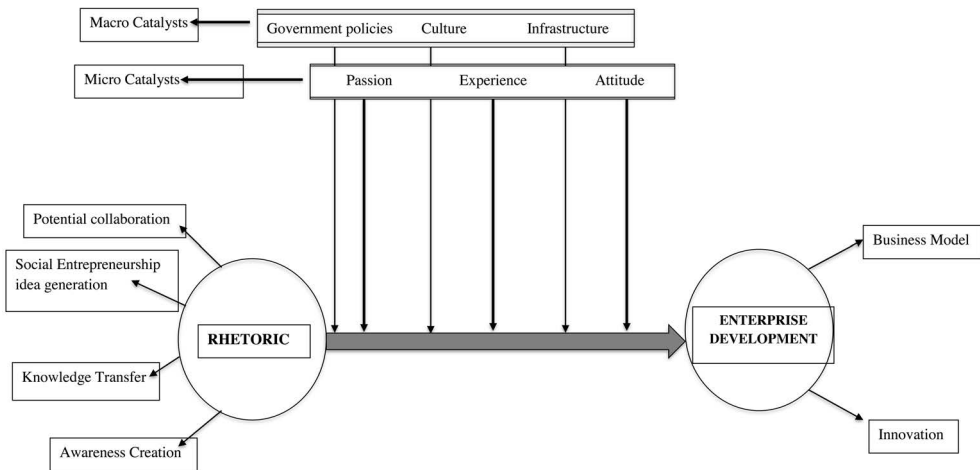


Figure 5.1 CE model.

Source: The authors.

First, the importance of the rhetoric about CE, meaning conversations about CE at the national and individual levels, cannot be underrated. This rhetoric results in awareness creation, knowledge transfer, social entrepreneurship ideas generation, and the potential for collaboration. Understandably, the rhetoric does not automatically lead to enterprise development. There is a need for some macro-level and micro-level catalysts, as identified from an analysis of the interviews. The micro-level catalysts identified after the thematic analysis were the respondents' passion, experience, and attitudinal change that led them to the establishment of their businesses. At the macro-level, it was found from the respondents that there is a need for government policies, national strategies, and enabling infrastructure on CEs that would enhance the activities of the CE players. The consequences of having enterprises developed along the lines of CE are estimated to be large, based on the interviewee responses. Business models, innovations, and CE collaborative enterprises are likely to be developed because of the catalysts' impact. These future developments were predicted to have national effects.

Key circularity catalysts in Nigeria

Macro-level catalysts

Macro-level catalysts refer to the national and institutional issues that enable CE development. An analysis of the interview data showed that the move from rhetoric to enterprise development requires macro-level catalysts, such as supportive government policies, culture, and infrastructure development. Although, thus far, most enterprises developed around the CE have been by private people, the government's role is felt to be imperative.

Government policies

According to the respondents, there are two things that must take place at the governmental level in terms of policy to promote a CE. First, the government policies put in place to handle the negative effects of production and consumption should be strategically developed. Pollution taxes should be set at a level higher than the detrimental effect of the same to deter polluters. While the respondents viewed the institution of taxes as a good thing, to ensure the progress of CE enterprise development, governments may compensate institutions that adhere to, for instance, segregation and proper gathering of waste, which will feed into CE enterprises as raw materials.

Second, the respondents require that the government would create an enabling environment for CE enterprises through the provision of funds. CE start-ups such as those interviewed for this research are growing at a slower rate as compared to larger businesses not focused on a CE. To allow for enough capacity to meet this escalating need, the government may support CE start-ups in the form of capital provision. According to one of the interviewee firms, "As a start-up, funds were limited for growing the business. Getting capital was a challenge as there are loans unavailable to support green manufacturing in Nigeria. Lack of capital has also hindered the expansion of the business" (see INT3). With government support, there would be the creation of many CE enterprises.

Since government agencies alone lack the capacity to handle the waste streams effectively, the participants viewed a comprehensive private-public partnership as being imperative. The government may provide an enabling environment for CE enterprises by partnering with them. Government partnership would then in turn help expand the base of the private CE enterprises.

Culture

The issue of culture was eminent in the responses received from the interview participants. One key among these catalysts is a change in the culture of waste disposal and its segregation. The respondents posit that there is a need for a change in the waste disposal and waste segregation culture of Nigerians. They further felt that most Nigerians are currently unaware or do not practice waste segregation or formalised waste disposal.

Additionally, the expansive and time-consuming nature of waste segregation makes it unattractive. Consequently, to promote a change in culture, respondents suggested that consumers would need to derive utility from the practice of waste segregation. Hence, a change in culture must first be promoted by focused education programmes to increase consumer awareness and interest in CE. These mass education intervention programmes could highlight the benefits of proper waste disposal and waste segregation at the grassroots level. This would require a broad planning and cooperation with multiple levels of social infrastructure. One of the interviewees lamented that “getting people to segregate their garbage voluntarily is quite difficult, as biodegradable waste stinks and pollutes the environment” (see INT4). Further suggesting that “more awareness is required to ensure waste segregation culture in Nigeria” (see INT4).

Infrastructure: Logistics and power

Infrastructure provision in the form of logistics is also critical to the development of CE enterprises. The respondents seem to have a convergent opinion on the need for logistical support, and this support would come from the government. Waste must be moved to various sites for recycling activities to be conducted, and to ensure this, there is heavy reliance on compartmentalised trucks, road sweeper machines, bulk refuse carriers, dumper placers, etc. These logistics are quite expensive for private CE entrepreneurs to acquire, so governmental support becomes necessary with logistical issues.

One of the interviewees proposed an alternative to the provision of logistics by suggesting a less expensive but viable alternative that would also reduce the pressure on dumpsites. He stated that “because biodegradable waste generates a foul odour, transporting it might be a chore depending on the situation. One possible answer to this problem is to build community composting sites to eliminate the need to transport waste from one location to another” (see INT1). Community compost sites could be a plausible alternative to logistical problems, yet again the development of a community compost site was seen to often be a part of the government’s infrastructure development agenda. Admittedly, community compost sites may solve local logistic issues, but other aspects, such as environmental impact, should be considered.

Apart from logistics, electric power is pertinent in most CE businesses. The following statement was echoed in many respondents’ interviews, “Access to energy is a major challenge to manufacturing firms in Nigeria. The unreliable power supply and the soaring cost of diesel needed for operating machines could lead to an increase in manufacturing costs and the price of the products” (see INT2). This unreliability in the power grid was seen to discourage the establishment of CE enterprises.

Micro-level catalysts

The micro-level catalysts refer to the individual-level dynamics that promote CE enterprise development. Individual passion, experiences, and attitudes were identified as the micro-level factors.

Passion

Data collected from the respondents shows that CE entrepreneurs usually have passion that is not only directed towards fellow humans, as in a close relationship, but also state they have a passion to the environment, which is inanimate. These entrepreneurs move with consistency, urgency, and a great desire to see their dream of waste management and circularity accomplished. This passion “represents the energy underlying such persistent involvement” (Vallerand et al., 2007, p. 506). Having a strong passion for something seems to motivate people to fully commit to it, which may enable them to persevere in the face of challenges and eventually achieve excellence.

According to Vallerand (2012, p. 1), “passion is defined as a strong inclination toward a self-defining activity that people like (or even love), find important, and in which they invest time and energy on a regular basis. Vallerand’s (2012) model proposes the existence of two types of passion: harmonious and obsessive”. All the CE entrepreneurs interviewed allude to the fact that they were driven by a passion “to see a change” (see INT 6), “to get the waste in Nigeria made useful” (see INT4, INT3, and INT1).

Experience

It is important to acknowledge the role of past experience of the CE entrepreneurs interviewed since most of them make reference to it. According to one respondent, “I worked with a company in the United States before coming back to Nigeria and that is where I learned about converting waste into something more useful” (note: Reference code restrained). The respondents talked about their exposure to CE firms they have worked with. This has become a motivating factor for them to establish their businesses. Apart from this kind of experience, the respondents revealed that they had experienced failures. They admitted that they have had to learn the hard way. Experience, therefore, can be characterised as an important catalyst for CE transition.

Attitudes

Attitude refers to the “a relatively enduring organisation of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events, or symbols” (Vaughan & Hogg, 2005, p. 150). According to Zhang et al. (2021), the attitudes of people in relation to sustainability are usually formed based on economic (e.g., price, income), psychological (e.g., different hierarchies of needs), anthropological (e.g., religion, culture), and marketing (e.g., perceptions) factors. For instance, people will respond positively to the culture of waste segregation based on the cost associated with it, the need that they assign to it, their religious leanings, and perceptions about the act.

Data gathered in this study shows that positive attitude towards sustainability will lead to more CE enterprises developed than a negative one (as we found in the interviews, people with sustainability tendencies tend to promote the establishment of CE-focused businesses). The enterprises are developed as they reflect the innate attitudes of the founders towards sustainability. Amoah et al. (2022) posit that, like all Africans, Nigerians have natural sustainability tendencies.

Enterprise development

From the data, it is clear that the deployment of the right micro and macro catalysts identified in this study will lead to the development of business enterprises that promote a CE in Nigeria.

The shift to a value-creating CE will lead to new business models, value chains, and product-service delivery mechanisms. The shift influences the design, production, usage, and disposal processes, and the gathering of products and materials for reuse. A transition to a CE also introduces new methods to facilitate, maintain, share, repair, upgrade, and remanufacture items (Russell et al., 2020).

The literature presents five types of business models and enterprises in CE. These models are named as follows: “(a) circular supplies, (b) resource recovery, (c) product life extension, (d) sharing platforms, and (e) product as a service” (Chen, 2020). Businesses formed around the circular supplies model reuse, reprocess, and renew inputs for productive use. Businesses formed around the second model of resource recovery develop closed-loop recycling and cradle-to-cradle designs with discarded products into new products (Li & Su, 2012). The third model, “product-life extension”, focuses on extending the life cycles of products’ assets. The fourth model makes products and assets accessible to most people by promoting a platform for collaboration among product users, both individuals and organisations. The fifth business model promotes the product as a service as an alternative to the buy and owns model.

Of the five business models, the businesses we examined in the Nigerian context have business models around circular supplies, product life extension, and resource recovery models. Few businesses have harnessed the opportunities that abound in the sharing platforms and product as service models. A large percentage of the players in CE are the waste pickers in the informal sector and formal recyclers (Morais et al., 2022).

Infrastructural challenges – especially around logistics – power availability, and machinery continue to hinder the development of enterprises in the resource recovery model. As one of our interviewees who produces tiles from plastic waste noted “production costs at my factory are high due to the poor power supply in the country” (see INT 9). Respondents stated that if they were to incorporate the cost of power and logistics into the product price, this would result in high, noncompetitive pricing. The incorporation of power and logistics costs poses a major challenge for the case firms. The respondents lamented how difficult it was to start and sustain a business in Nigeria, as a majority of consumers are unaware of the importance of sustainability; therefore, the respondents felt that the customers would only purchase products that are affordable for them. This challenge highlights the urgent need to develop local machinery and technological solutions that promote circular businesses in Nigeria. Innovation is especially needed for machinery to incorporate the infrastructural challenges prevalent in the country into the design of products.

Conclusions

This study examined the perspectives of nine Nigerian entrepreneurs involved in CE. Through the analysis of interview data, it was determined that there is a need to transition from rhetoric to enterprise development in the context of CE, which respondents believe has the potential to boost Nigeria’s national prosperity. The transition to a CE required a collaborative and concerted effort from all stakeholders, including entrepreneurs, government, social activists, researchers, policymakers, end users, and international actors.

The study highlights the significance of macro- and micro-level catalysts. It is evident that CE presents a promising opportunity for Nigeria to address environmental challenges while promoting economic growth, and the successful implementation of this transition will require a sustained and committed effort from all stakeholders.

Moreover, the study emphasises the importance of innovation and creativity in promoting CE practices in Nigeria. Entrepreneurs who successfully implemented circular business models demonstrated a high level of creativity and innovation in their approach. They were able to identify untapped resources, develop new products and services, and engage in collaborative partnerships to enhance their business models. These findings suggest that promoting innovation and creativity in the CE space could unlock significant economic and environmental benefits for Nigeria.

Additionally, findings from the study suggest the need for appropriate government policies that would encourage the establishment of CE businesses. Policymakers and stakeholders should prioritise creating an enabling environment for CE start-ups to thrive. This can be achieved through the provision of necessary support and infrastructure, such as tax incentives, grants, and favourable policies that encourage CE practices. The availability of waste management facilities, recycling plants, and renewable energy sources will also enable CE start-ups to operate effectively.

Founders of CE start-ups should prioritise developing passion, experience, and a positive attitude towards enterprise development. This can be achieved through acquiring relevant skills, seeking mentorship and guidance, and learning from successful entrepreneurs. A positive attitude towards enterprise development enables founders to overcome setbacks and challenges that come with enterprise development.

In conclusion, the transition from rhetoric to enterprise development in CE requires a collaborative effort from policymakers, stakeholders, and CE start-ups. By creating an enabling environment; prioritising education and awareness; fostering collaborations and partnerships; emphasising passion, experience, and attitude; and supporting research and development, CE start-ups can thrive and contribute to a more sustainable future.

Educational content

- 1 There is value in discussing the CE proactively as part of national discourse.
- 2 Can a CE occur without government support or intervention?

References

- Adeyeye, S. A. O., Ashaolu, T. J., Bolaji, O. T., Abegunde, T. A., & Omoyajowo, A. O. (2023). Africa and the nexus of poverty, malnutrition and diseases. *Critical Reviews in Food Science and Nutrition*, 63(5), 641–656. <https://doi.org/10.1080/10408398.2021.1952160>
- Agunwamba, J. C. (1998). Solid waste management in Nigeria: Problems and issues. *Environmental Management*, 22(6), 849–856. <https://doi.org/10.1007/s002679900152>
- Allen, J. A. (1994). The constructivist paradigm: Values and ethics. *Journal of Teaching in Social Work*, 8(1–2), 31–54.
- Amoah, N., Acquah, M. A., & Appiah-Konadu, P. (2022). Towards an Afro-Eco model of sustainability. In K. Ogunyemi, O. Atanya, & V. Bursal (Eds.), *Management and leadership for a sustainable Africa* (Vol. 1, pp. 15–35). Springer International Publishing. https://doi.org/10.1007/978-3-031-04911-8_2
- Ayeleru, O. O., Dlova, S., Akinribide, O. J., Ntuli, F., Kupolati, W. K., Marina, P. F., Blencowe, A., & Olu-bambi, P. A. (2020). Challenges of plastic waste generation and management in sub-Saharan Africa: A review. *Waste Management*, 110, 24–42. <https://doi.org/10.1016/j.wasman.2020.04.017>
- Chen, C.-W. (2020). Improving circular economy business models: Opportunities for business and innovation: A new framework for businesses to create a truly circular economy. *Johnson Matthey Technology Review*, 64(1), 48–58.
- Couth, R., & Trois, C. (2012). Sustainable waste management in Africa through CDM projects. *Waste Management*, 32(11), 2115–2125. <https://doi.org/10.1016/j.wasman.2012.02.022>

- de Kock, L., Sadan, Z., Arp, R., & Upadhyaya, P. (2020). A circular economy response to plastic pollution: Current policy landscape and consumer perception. *South African Journal of Science*, 116(5/6). <https://doi.org/10.17159/sajs.2020/8097>
- Debrah, J. K., Vidal, D. G., & Dinis, M. A. P. (2022). Environmental waste sustainability: Organic valorisation and socioeconomic benefits towards sustainable development in Ghana. In W. Leal Filho, D. G. Vidal, M. A. P. Dinis, & R. C. Dias (Eds.), *Sustainable policies and practices in energy, environment and health research* (pp. 425–437). Springer International Publishing. https://doi.org/10.1007/978-3-030-86304-3_24
- Desmond, P., & Asamba, M. (2019). Accelerating the transition to a circular economy in Africa: Case studies from Kenya and South Africa. In P. Schröder, M. Anantharaman, K. Anggraeni, & T. J. Foxon (Eds.), *The circular economy and the global South* (pp. 152–172). Routledge. <https://doi.org/10.4324/9780429434006>
- Fabe. (2022). Fabe foundation, Programmes. Fabe International. <https://fabeinternational.org/our-programs/> accessed on May 22, 2022
- Fakunle, S., & Ajani, A. (2021). An empirical study of community involvement in household solid waste management: A case study. *Insights into Regional Development*, 3(3), 114–127.
- Falaiye, H. (2022, June 7). *Coca-Cola Foundation boosts waste management*. Punch Newspapers. <https://punchng.com/coca-cola-foundation-boosts-waste-management>
- Fiksel, J., & Lal, R. (2018). Transforming waste into resources for the Indian economy. *Environmental Development*, 26, 123–128. <https://doi.org/10.1016/j.envdev.2018.02.002>
- Fiksel, J., Sanjay, P., & Raman, K. (2021). Steps toward a resilient circular economy in India. *Clean Technologies and Environmental Policy*, 23(1), 203–218. <https://doi.org/10.1007/s10098-020-01982-0>
- Gelb, A. H. (2010). Economic diversification in resource-rich countries. In *Beyond the Curse*. International Monetary Fund.
- Geng, Y., Liu, K., Xue, B., & Fujita, T. (2013). Creating a “green university” in China: A case of Shenyang University. *Journal of Cleaner Production*, 61, 13–19.
- Ghisellini, P., & Ulgiati, S. (2020). Circular economy transition in Italy. Achievements, perspectives and constraints. *Journal of Cleaner Production*, 243, 118360.
- Ghosh, S. K. (Ed.). (2020). *Waste management as economic industry towards circular economy*. Springer.
- Greyson, J. (2007). An economic instrument for zero waste, economic growth and sustainability. *Journal of Cleaner Production*, 15(13–14), 1382–1390. <https://doi.org/10.1016/j.jclepro.2006.07.019>
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of Qualitative Research*, 2(163–194), 105.
- Halog, A., & Anieke, S. (2021). A review of circular economy studies in developed countries and its potential adoption in developing countries. *Circular Economy and Sustainability*, 1(1), 209–230. <https://doi.org/10.1007/s43615-021-00017-0>
- Hamed, K., Hadi, D., & Hossein, K. (2014). Export diversification and economic growth in some selected developing countries. *African Journal of Business Management*, 8(17), 1.
- Husserl, E. G. (1981). *Pure phenomenology, its method, and its field of investigation*. Scott H. Moore.
- Karell, E., & Niinimäki, K. (2019). Addressing the dialogue between design, sorting and recycling in a circular economy. *The Design Journal*, 22(supl), 997–1013. <https://doi.org/10.1080/14606925.2019.1595413>
- Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation, and Recycling*, 127, 221–232. <https://doi.org/10.1016/j.resconrec.2017.09.005>
- Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1), 120–124.
- Lacy, P., & Rutqvist, J. (2015). *Waste to wealth: The circular economy advantage* (Vol. 91). Palgrave Macmillan.
- Laverty, S. M. (2003). Hermeneutic phenomenology and phenomenology: A comparison of historical and methodological considerations. *International Journal of Qualitative Methods*, 2(3), 21–35. <https://doi.org/10.1177/160940690300200303>
- Lee, D. R. (2005). Agricultural sustainability and technology adoption: Issues and policies for developing countries. *American Journal of Agricultural Economics*, 87(5), 1325–1334.
- Li, R. H., & Su, C. H. (2012). Evaluation of the circular economy development level of Chinese chemical enterprises. *Procedia Environmental Sciences*, 13, 1595–1601. <https://doi.org/10.1016/j.proenv.2012.01.151>
- Marshall, R. E., & Farahbakhsh, K. (2013). Systems approaches to integrated solid waste management in developing countries. *Waste Management*, 33(4), 988–1003.

- Mayer, A., Haas, W., Wiedenhofer, D., Krausmann, F., Nuss, P., & Blengini, G. A. (2019). Measuring progress towards a circular economy: A monitoring framework for economy-wide material loop closing in the EU28: Progress towards a circular economy in the EU28. *Journal of Industrial Ecology*, 23(1), 62–76. <https://doi.org/10.1111/jiec.12809>
- Morse, J. M. (1994). Designing funded qualitative research. In N. K. Denzin & Lincoln Y. S. (Eds.), *Handbook of qualitative research* (pp. 220–235). Sage Publications, Inc.
- Morais, J., Corder, G., Golev, A., Lawson, L., & Ali, S. (2022). Global review of human waste-picking and its contribution to poverty alleviation and a circular economy. *Environmental Research Letters*, 17(6), 063002. <https://doi.org/10.1088/1748-9326/ac6b49>
- Murshed, M., & Ozturk, I. (2023). Rethinking energy poverty reduction through improving electricity accessibility: A regional analysis on selected African nations. *Energy*, 267(126547), 126547. <https://doi.org/10.1016/j.energy.2022.126547>
- Nanda, P. K., Das, A. K., Dandapat, P., Dhar, P., Bandyopadhyay, S., Dib, A. L., Lorenzo, J. M., & Gagaoua, M. (2021). Nutritional aspects, flavour profile and health benefits of crab meat based novel food products and valorisation of processing waste to wealth: A review. *Trends in Food Science & Technology*, 112, 252–267. <https://doi.org/10.1016/j.tifs.2021.03.059>
- Omwoma, S., Lalah, J. O., Kueppers, S., Wang, Y., Lenoir, D., & Schramm, K.-W. (2017). Technological tools for sustainable development in developing countries: The example of Africa, a review. *Sustainable Chemistry and Pharmacy*, 6, 67–81. <https://doi.org/10.1016/j.scp.2017.10.001>
- Plager, K. (1994). Hermeneutic phenomenology: A methodology for family health and health promotion study in nursing. In P. Benner (Ed.), *Interpretive phenomenology: Embodiment, caring, and ethics in health and illness* (pp. 65–83). Sage.
- Preston, F., & Lehne, J. (2017). *A wider circle? The circular economy in developing countries*. Chatham House for the Royal Institute of International Affairs.
- Purchase, C. K., Al Zulayq, D. M., O'Brien, B. T., Kowalewski, M. J., Berenjian, A., Tarighaleslami, A. H., & Seifan, M. (2021). Circular economy of construction and demolition waste: A literature review on lessons, challenges, and benefits. *Materials*, 15(1), 76.
- Raphael. (2022, November 1). CEIP unveils circular business platform. The Sun Nigeria. Retrieved on June 10, 2023, from <https://www.sunnewsonline.com/ceip-unveils-circular-business-platform>.
- Recyclepoints. (2022). RecyclePoints harvests recyclables directly from post-consumers. <http://www.recyclepoints.com/how-it-works/>
- Russell, M., Gianoli, A., & Grafakos, S. (2020). Getting the ball rolling: An exploration of the drivers and barriers towards the implementation of Bottom-up circular economy initiatives in Amsterdam and Rotterdam. *Journal of Environmental Planning and Management*, 63(11), 1903–1926. <https://doi.org/10.1080/09640568.2019.1690435>
- Sloan, A., & Bowe, B. (2014). Phenomenology and hermeneutic phenomenology: The philosophy, the methodologies, and using hermeneutic phenomenology to investigate lecturers' experiences of curriculum design. *Quality & Quantity*, 48, 1291–1303.
- Taherzadeh, M., Bolton, K., Wong, J., & Pandey, A. (Eds.). (2019). *Sustainable resource recovery and zero waste approaches*. Elsevier Science.
- United Nation Environment Programme (UNEP). (2022). *Africa waste management outlook: The state of waste in Africa* (pp. 1–8). Retrieved August 30, 2022, from <https://www.unep.org/ietc/resources/publication/africa-waste-management-outlook>.
- Vallerand, R. J. (2012). The role of passion in sustainable psychological well-being. *Psychology of Well-Being*, 2(1), 1. <https://doi.org/10.1186/2211-1522-2-1>
- Vallerand, R. J., Salvy, S.-J., Mageau, G. A., Elliot, A. J., Denis, P. L., Grouzet, F. M. E., & Blanchard, C. (2007). On the role of passion in performance. *Journal of Personality*, 75(3), 505–533. <https://doi.org/10.1111/j.1467-6494.2007.00447.x>
- Van Wyk, M. M., & Taole, M. (2015). *Research design. Educational research: An African approach*. Oxford University Press.
- Vaughan, G., & Hogg, M. A. (2005). *Introduction to social psychology*. Pearson Education Australia.
- Water and Sanitation Program (WSP) Africa: Economics of Sanitation Initiative. (2012). Available online: www.wsp.org/content/africa-economic-impacts-sanitation (accessed on 1 August 2022).
- Zhang, B., Zhang, Y., & Zhou, P. (2021). Consumer attitude towards sustainability of fast fashion products in the UK. *Sustainability*, 13(4), 1646.

Appendix

INTERVIEW GUIDE

Introduction

- 1 Self-introduction of the interviewer
- 2 Explain the purpose of the meeting
- 3 Explain the general purpose of the study
 - a The study is basically to understand the reason for the move from rhetoric to the development of enterprises in CE.
- 4 Seek interviewee consent on recording
- 5 Assurance of confidentiality

Interview questions

- 1 How did your business start (please provide a historic background and what motivated you to start)?
- 2 What is your business into? (What role does your organisation play in the circular economy)?
- 3 How challenging has it been for you?
- 4 What challenges do you perceive as your business progresses?
- 5 How would you describe your ultimate goal as a business owner?
- 6 How do you think Nigeria can advance in its quest to enterprise development in CE (any workable recommendations)?