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A Fact File on

CIRCULAR ECONOMY

for

Inclusive and Sustainable Development in the Global South

[A Joint Publication of the NAM S&T Centre and Universiti Kebangsaan Malaysia (UKM)]

FROM THE DG'S DESK

Warmest Greetings to all our Esteemed Readers!!

It is with great pleasure for me to bring to you another Fact File published by the NAM S&T Centre on a very important topic of **"Circular Economy for Inclusive and Sustainable Development in the Global South"**. This Fact File, jointly prepared by the Universiti Kebangsaan Malaysia (UKM), Selangor, Malaysia and the NAM S&T Centre, aims to shed light on the increasing importance of Circular Economy principles in promoting sustainable development, particularly in the Global South.

Circular Economy (CE) offers a sustainable path forward by focusing on reducing waste, reusing materials and recycling products. Unlike the traditional linear economy, which follows a 'take-make-dispose' model, CE promotes resource efficiency and economic resilience by extending the lifecycle of materials. This approach helps address critical issues like resource scarcity, environmental degradation and socio-economic inequalities in developing regions. In regions like the European Union, the Circular Economy Action Plan (CEAP) helped in integrating sustainability into various sectors, driving innovation, creating jobs and improving GDP.

However, challenges such as policy gaps, limited technology and financial constraints hinder implementation of CE in the developing countries. By overcoming these challenges, the Global South can lead in circular practices, contributing to global sustainability efforts and a long-term environmental and economic resilience.

We are grateful to Dr. Umawathy Techanamurthy, Senior Lecturer, Department of Engineering Education, Faculty of Engineering and Built Environment, UKM, Selangor, Malaysia for suggesting this important subject and contributing as the author and Scientific Editor of this Fact File. We are also thankful to the UKM Management for their kind permission to publish this Fact File as a joint initiative between the NAM S&T Centre and UKM.

I believe that this Fact File will provide valuable insights and foster greater understanding of the importance of the application of Circular Economy principles in the Global South.

Amitava Bandopadhyay

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Overview

The Circular Economy (CE) offers a transformative approach to fostering inclusive and sustainable development, particularly for the Global South. Unlike the linear economic model that follows a 'take-make-dispose' trajectory, CE focuses on resource efficiency through reducing waste, reusing materials and recycling products. This shift from resource-intensive practices to closed-loop systems aims to reduce environmental harm while promoting economic resilience. For many countries in the Global South facing pressing issues such as resource scarcity and environmental degradation, CE provides a framework for achieving sustainable growth while enhancing the longevity of natural resources and addressing socio-economic inequalities (Knäble, 2022). The Global South, however, faces unique challenges that complicate the implementation of CE strategies. These regions are characterized by high levels of poverty, inequality and vulnerability to the effects of climate change, all of which are exacerbated by rapid urbanization and unsustainable development practices. Access to infrastructure, effective waste management systems and dependence on extractive industries further hinder the transition toward Circular Economy. These challenges highlight the urgent need for tailored CE strategies that address environmental issues and create opportunities for social equity and economic inclusion in the region (Abubakar et al., 2022).

Introduction

The Circular Economy model is based on the principle of using limited natural resources while eliminating waste streams by promoting a closed-loop resource cycle. This aims to extend the lifespan of materials and products produced, minimizing the use of natural resources to create new products. For example, products are reintroduced to the market after use through value retention strategies, which include: repair, reuse, re-manufacturing and recycling (Ellen MacArthur Foundation, 2016).

Countries in the European Union (EU) already have over 315 policy initiatives related to the CE and sustainability (Brusselaers & Gillabel, 2024). The Circular Economy Action Plan (CEAP) launched in 2020 forms the foundation of the European Green Deal, which is a new agenda for sustainable development (O'Born & Heimdall, 2022). CEAP emphasizes waste reduction, improving recycling processes and fostering innovation in products and services that better meet sustainability needs. Among the main objectives of this policy initiative is to make sustainable products the norm in the EU, empower consumers and buyers regarding sustainable products and focus on sectors that use the most natural resources, as these sectors have the greatest potential for implementing the Circular Economy. These sectors include electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients. The principles of the Circular Economy are said to increase the EU's Gross Domestic Product (GDP) by 0.5% by 2030 and create approximately 700,000 new jobs (Ellen MacArthur Foundation, 2015).

According to previous studies, the concept of the Circular Economy (CE) refers to the idea from Boulding (1996) in his work, *The Economics of the Coming Spaceship Earth*, where he first proposed the idea of a cyclical ecological system capable of continuously producing all materials (Andrade et al., 2021; Ellen MacArthur Foundation, 2013). Boulding

(1996) stated that the Earth has limited natural resources and that pollution cannot be fully absorbed by nature (Andrade et al., 2021; Ellen MacArthur Foundation, 2013). Therefore, by shifting to a Circular Economy and sustainability model focused on the principles of reducing, reusing and recycling, we will be able to conserve resources by using recycled materials and reduced dependence on natural resources (Andrade et al., 2021; Ellen MacArthur Foundations, 2013). However, we need to do more than just recycle to ensure that the resources we have can be used for future generations.

The Principles

Circular Economy principles offer a promising framework for inclusive and sustainable development, particularly in the Global South, where traditional economic models often result in high levels of waste and environmental degradation. A Circular Economy promotes the efficient use of resources, emphasizing recycling, reuse and the regeneration of natural systems. Unlike the linear 'take-make-dispose' model, a Circular Economy reduces waste and extends the lifecycle of materials, thereby lowering ecological footprints. For nations in the Global South, where economic growth is often prioritized over environmental considerations, adopting circular practices can mitigate the adverse impacts of rapid industrialization, aligning economic development with environmental sustainability (Goyal, Esposito, & Kapoor, 2018).

The transition to a Circular Economy in the Global South also holds potential for fostering economic inclusion, as it encourages the development of small and medium enterprises (SMEs) focused on recycling, re-manufacturing and sustainable resource management. By shifting value creation from resource extraction to restorative processes, Circular Economy initiatives can create new job opportunities across diverse sectors, from agriculture to manufacturing. Additionally, it promotes resilience by reducing dependency on raw material imports. This is particularly relevant for low- and middle-income countries with limited access to resources but significant potential for innovation in material reuse and local circular supply chains (Patil, Struis & Ludwig, 2023).

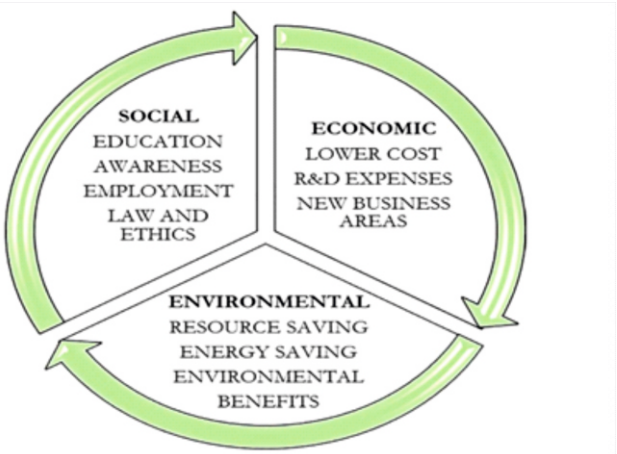
Principles of the Circular Economy

Source: Adeniyi & Ighalo (2021)

However, implementing Circular Economy principles in the Global South requires addressing unique challenges, such as limited access to technology and infrastructure, lack of supportive policies and the need for educational campaigns to shift public and industrial attitudes. International partnerships and investments are crucial to support technological innovation, capacity building and knowledge sharing tailored to local contexts. By overcoming these barriers, the Global South can position itself as a leader in sustainable practices, aligning economic growth with environmental stewardship. Such an approach not only benefits local economies and ecosystems but also contributes to global efforts in combating climate change, promoting a more equitable and resilient world (Death, 2014).

Benefits of Circular Economy

Socially, the implementation of Circular Economy (CE) has the potential to generate numerous employment possibilities for local communities. CE also opens the door to better public health and ecological consciousness. Environment friendly and safe products are becoming increasingly popular as people get more aware of the dangers of toxic ingredients. Furthermore, CE advocates for renting models across all industries, which allow businesses to learn more about their clients, meet their specific needs and provide them products at lower pricing. As a result, both societal worth and quality of life are enhanced.



Three Benefits of Circular Economy

Source: Smith & Thomas (2021)

Additionally, CE helps businesses save money and increase their profits. Sustainable supply chain and end-of-life management, reduced input prices and reduced environmental fines and waste generation, all contributing to cost reduction. Utilising the closed-loop model of supply chains, corporations can sell their trash rather than disposing it, thereby generating additional income. Consequently, garbage can be converted into raw materials for other enterprises, hence decreasing their material expenses and mitigating price volatility. Besides, CE provides new markets for recycling and re-manufacturing. The emergence of new markets and income streams enhances the profitability of established firms and confers a competitive edge over their rivals. Local governments and the public, alongside companies, can reduce their expenses. Municipalities can get supplementary revenue from the quantities they collect and subsequently sell to recycling enterprises. The public can gain from Circular Economy as their trash disposal costs are reduced.

Challenges

Institutional and Policy Barriers: Institutional and policy barriers present a significant challenge to the effective implementation of sustainable practices and circular economies. Weak governance structures, a lack of supportive policy frameworks and complex regulatory requirements often hinder progress. Abas and Wee (2014) found that bureaucratic inefficiencies and inconsistent enforcement of environmental policies are common obstacles in developing countries, where waste management frameworks often lack coherence and effective oversight. This lack of robust policy support limits the ability of industries and local governments to develop comprehensive waste management strategies, undermining sustainability goals. Additionally, inconsistent government interventions in waste policies can create

instability in the Circular Economy sector, as highlighted by Akinyemi (2023), who emphasizes the importance of a cohesive policy framework to incentivize sustainable practices.

Technological Gaps: The absence of advanced recycling and waste management technologies is another significant challenge to achieving Circular Economy goals. According to Ghisellini, Cialani and Ulgiati (2016), limited access to technology hinders efficient recycling processes and reduces the potential for reusing resources, especially in low- and middle-income countries. Emerging economies often struggle to adopt sophisticated waste processing equipments due to high costs and inadequate technical expertise. Several authors, including Suling, Zhang and Li (2022), highlight that the technological divide between developed and developing nations exacerbates the challenge, as advanced technologies remain largely concentrated in wealthier regions. This technological gap stifles innovation and restricts progress toward sustainable waste management solutions, suggesting a pressing need for global technology transfer and partnerships.

Financial Constraints: Insufficient funding and a lack of investment in green technologies present ongoing financial barriers that limit the adoption of sustainable practices. As noted by Kirchherr, Reike and Hekkert (2017), substantial investment is essential to support research and development of circular business models. However, financing often remains inaccessible, particularly for SMEs that could benefit from sustainable initiatives but lack the capital. The high costs of implementing environment friendly technologies can deter businesses, and potential investors may be hesitant due to perceived risks and uncertainties associated with green investments. These financial constraints are further compounded by limited incentives and subsidies, highlighting the importance of government support to alleviate funding challenges in sustainable innovation (Mathews & Tan, 2011).

Informal Economy: The informal economy, especially waste pickers and informal labor markets, plays a crucial yet often marginalized role in waste management. Informal laborers are frequently involved in collecting and sorting waste, contributing significantly to recycling efforts without the security of legal protections. While their work supports Circular Economy goals, they often face inadequate working conditions, lack access to social security and are subject to health risks due to limited safety measures. Medina (2000) points out that policies integrating informal sector workers could enhance waste management systems, yet such initiatives are rarely implemented. Integrating informal labor markets with formal systems could yield both social and environmental benefits, a view supported by Sembiring and Nitivattananon (2010), who argue that policy reforms should aim to improve the livelihoods of these workers while acknowledging their vital role in resource recovery.

Example of initiatives in Global South

Rwanda's Zero-Waste Initiatives:

Rwanda has become a leading example in Africa for implementing strict waste management policies aimed at achieving a zero-waste society. In 2008, Rwanda introduced one of the first nationwide bans on plastic bags, a move that significantly reduced plastic pollution and set a precedent for other African nations. This policy was part of Rwanda's broader environmental strategy, which includes the regular Umuganda community clean-up initiative, where citizens participate in cleaning activities across the country each month. Studies by Nduwayezu and Karamage (2017) highlight that these initiatives have contributed to cleaner public spaces, heightened environmental awareness and increased citizen participation in sustainable practices. Rwanda's approach reflects a model where government-led regulations and community engagement work together to reduce waste, creating a pathway toward sustainable urban living and setting an example for other nations aiming to achieve similar outcomes.

Practical Zero Waste Steps

Source: Vectorstock (Image #26510277 at VectorStock.com)

Kenya's Plastic Bag Ban and South Africa's Recycling Programs:

Kenya also made a significant impact on waste management through its ban on single-use plastic bags, implemented in 2017. This initiative aimed to curb the widespread plastic pollution that was choking urban and rural environments and affecting local ecosystems. Reports indicate that since the ban, plastic pollution in Kenya's urban areas has noticeably declined, although challenges remain in enforcing the law and providing alternatives for low-income communities. Meanwhile, South Africa has taken a more market-driven approach with its robust recycling programs. The country has successfully integrated Extended Producer Responsibility (EPR) laws, requiring companies to manage the environmental impact of their products. As a result, South Africa now boasts one of the highest recycling rates on the continent, especially for plastics and metals. These examples from Kenya and South Africa show how policy-driven and market-based approaches can both contribute to effective waste management, offering adaptable models that align with regional needs and resources.

Stopping Use of Single-use Plastic

Source: KAWIWA (Image #9165975 at pngtree.com)

Renewable Energy in Latin America:

Latin America has immense potential for renewable energy production due to its abundant natural resources, particularly hydropower, solar and wind energy. The region's renewable energy sector is rapidly expanding, driven by the need to transition away from fossil fuels and reduce greenhouse gas emissions. In a Circular Economy, renewable energy is critical in fostering sustainable development by reducing resource extraction and minimizing environmental impacts.

For Latin America, integrating renewable energy into Circular Economy models promotes a shift from linear resource usage toward more sustainable production and consumption practices, offering pathways to achieve the region's United Nations Sustainable Development Goals (SDGs).

Global Transition to Clean Energy

Source: Pch.vector at Freepik

Renewable energy not only contributes to environmental sustainability but also serves as a beacon of hope for inclusive economic development in Latin America. The renewable energy sector is a job creator, especially in rural and under served areas, thereby addressing unemployment and poverty. Circular Economy principles can further enhance these benefits by ensuring that renewable energy infrastructure is designed and managed with resource efficiency, waste reduction and lifecycle sustainability in mind. This approach fosters inclusive development by providing equitable access to clean energy, while also aligning with Latin American countries' aspirations to reduce their dependence on imported energy and transition towards locally-sourced, renewable towards locally-sourced, renewable energy solutions that benefit all segments of the society.

Conclusion

A Circular Economy approach promotes resource efficiency, enhances technological innovation and fosters community participation in decision-making processes. This not only mitigates environmental impacts but also ensures that the economic and social benefits of renewable energy are distributed more equitably across the region, aligning with the goals of inclusive and sustainable development in the Global South.

Quick Facts on Circular Economy

The Circular Economy (CE) is an economic model designed to minimize waste and maximize the efficient use of resources by adopting a closed-loop system. Unlike the traditional linear economy characterized by a 'take-make-dispose' approach where raw materials are extracted, used to produce goods and discarded as waste, CE aims to retain products, materials and resources in the system for as long as possible. This involves three core principles: reducing waste through innovative product design and sustainable production methods; reusing materials and products to extend their lifecycle and recycling components at the end of their use. By promoting resource efficiency, CE addresses environmental degradation, enhances economic resilience and offers a sustainable alternative to the finite extraction of natural resources (Kirchherr et al., 2023).

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