MULTIDISCIPLINARY RESEARCH TRENDS: A GLOBAL PERSPECTIVE

Editors

Dr. M.R. Vanithamani
Principal, STC

Dr. Antony V. Samrot
Director, RMC, MUCM

1st Global Innovation Summit 2024: Science, Technology & Humanities Converge

Published by

Sree Saraswathi Thyagaraja College
Palani Road, Pollachi - 642 107, Coimbatore Dist, Tamilnadu.

in association with

Manipal University College (Melaka Campus)
Palani Road, Pollachi - 642 107, Coimbatore Dist, Tamilnadu.

Multidisciplinary Research Trends:

A Global Perspective

(1st Global Innovation Summit 2024: Science, Technology & Humanities Converge)

21 November 2024

Organized Jointly by

SREE SARASWATHI THYAGARAJA COLLEGE (Autonomous)

Pollachi, Tamilnadu, India – 642107

And

MANIPAL UNIVERSITY COLLEGE MALAYSIA

Melaka, Malaysia

This edition has been published by Book Pen Publishing, Udumalpet, Tamilnadu, India

First Issue: November 2024

ISBN: 978-93-94874-59-6

Published by

Book Pen Publishing, Udumalpet, India

TRANSFORMING COMMERCE: CIRCULAR ECONOMY MODELS, CHALLENGES, AND PATHWAYS FOR ADOPTION IN INDIA

Dr . D. Divya [1], Dr .B .Mythili [2]

[1] Assistant Professor in M.Com IB, Nallamuthu Gounder Mahalingam College, Pollachi E-Mail ID: divyadngm@gmail.com

[2] Associate Professor & Head in M.Com, Sree Saraswathi Thyagaraja College , Pollachi , E-mail ID: mythili@stc.ac.in

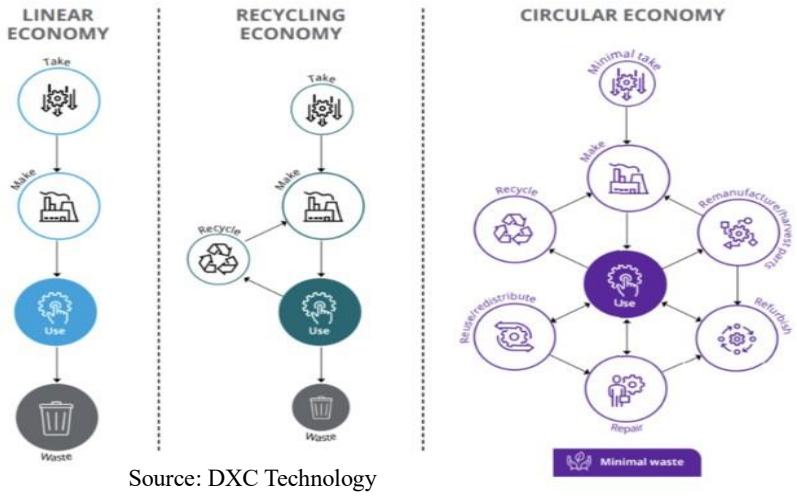
ABSTRACT

The Circular economy represents a paradigm shift from the traditional linear economy, in which products are made, used, and disposed of. The circular economy emphasizes the continuous use of resources, through strategies that prioritize sustainability, waste reduction, and resource efficiency. This study delves into the concept of the circular economy and examines real-world examples of successful circular economy adoption by prominent Indian and global corporations across various sectors, highlighting their innovative strategies, achieved outcomes, and the challenges encountered during implementation. Furthermore, the study investigates government initiatives and policies aimed at fostering circular economy practices, both domestically and internationally. Finally, it offers concrete recommendations to policymakers for creating a supportive environment and accelerating the broader adoption of circular economy models, addressing potential barriers, and maximizing positive impacts on businesses, society, and the environment.

Keywords: *Circular Economy, Sustainability, Government Initiatives, Challenges*

I. Understanding Circular Economy

In a circular economy, waste is eliminated and resources are circulated, limiting human impact on the environment and allowing natural regeneration. This involves reusing, repairing, refurbishing, and recycling products and materials. Circular Economy (CE) models transform traditional business practices, offering a sustainable alternative to the linear "take-make-dispose" approach. These models focus on resource efficiency, waste management, and energy conservation to create a more sustainable and resilient economic future (Shaharudin et al., 2024). It creates a closed-loop system in which resources are kept in use for as long as possible, thereby reducing the need for new raw materials and minimizing the environmental impact.



Source: DXC Technology

Figure 1: Linear Economy Vs Recycling Economy Vs Circular Economy

1.1 Objectives of the Paper

- To Explore the concept of the circular economy and to examine the real-world examples of circular economy adoption by corporations
- To Investigate the challenges in adoption and to examine the government initiatives and policies fostering circular economy practices.
- To Offer recommendations to policymakers for broader circular economy adoption.

II. Case Studies of Circular Economy Adoption in Major Corporations

Several major Indian conglomerates, including the Tata Group, Wipro Limited, Mahindra Group, and Godrej Group, as well as renowned global corporations such as Unilever, Nike, Dell, and Apple Inc, have incorporated circular economy principles into their business practices. These companies aim to boost sustainability and minimize their environmental footprint through these strategies. This section will explore the specific strategies these companies have implemented, the outcomes they have achieved, and the challenges encountered throughout this process.

2.1 Circular Economy Strategies and Challenges of Indian Conglomerates

2.1.1 Tata Group

The Tata Group, a conglomerate with interests in various sectors, including steel, automobiles, and consumer goods, has taken significant steps towards sustainability and circular economy practices.

Their strategies encompass waste reduction and material recovery, with Tata Steel pioneering a "zero waste" approach by maximizing scrap steel recycling. Sustainable transportation solutions are promoted through Tata Motors' investments in electric vehicles and battery recycling programs. Furthermore, water conservation is prioritized through the implementation of recycling systems across Tata's facilities.

While these initiatives have yielded positive outcomes like reduced waste and CO2 emissions, challenges remain. Limited access to advanced recycling infrastructure poses a significant obstacle, particularly in certain operational regions. Additionally, the inherent complexity of resource

management across diverse business sectors presents a challenge in maintaining consistent circular economy standards.

2.1.2 Wipro Limited

Wipro, a global information technology, consulting, and business process services company, has embraced circular economy principles in its operations.

Their strategies focus on sustainable IT solutions, such as energy-efficient data centers and cloud services, promoting resource efficiency through responsible e-waste management, and offering consulting services to guide clients towards circular business models.

Wipro has achieved significant reductions in water and energy consumption, alongside an enhanced brand reputation for sustainability leadership, challenges persist. The lack of a cohesive e-waste management infrastructure hinders effective recycling efforts, and limited customer understanding of circular IT solutions can impede adoption rates.

2.1.3 Mahindra Group

Mahindra Group, a multinational conglomerate with operations in various sectors, including automotive, aerospace, and agribusiness, has committed to sustainability through circular economy practices.

Their strategies include implementing water recycling and waste management systems in manufacturing, developing electric vehicles to reduce emissions, and promoting the use of agricultural waste for biofuel production.

These initiatives have yielded positive outcomes, such as substantial savings in water and energy costs and an increased market share in the EV sector. However, challenges remain. Developing efficient systems for collecting and recycling EV batteries is crucial for sustainable electric mobility. Additionally, establishing a robust network for collecting and processing agricultural waste into biofuels is essential for maximizing resource utilization.

2.1.4 Godrej Group

The Godrej Group is a diversified multinational conglomerate with interests in consumer goods, real estate, agriculture, and more. The company has adopted circular economy practices across its various businesses.

Their strategies include developing energy-efficient appliances, transitioning to sustainable packaging using recycled materials, and promoting agricultural innovation focused on efficient waste utilization.

As a result, they have achieved significant reductions in energy consumption and waste generation, while also enhancing consumer loyalty. However, challenges remain, such as the limited availability of eco-friendly packaging materials and the difficulty of persuading consumers in price-sensitive markets to pay a premium for sustainable products.

2.2 Circular Economy Strategies and Challenges of Global Corporations

2.2.1 Unilever (United Kingdom/Netherlands)

Unilever, a multinational consumer goods company, is a global leader in sustainability and circular economy practices, particularly in waste reduction and sustainable sourcing.

Their strategies include developing plastic refill stations, innovating in recyclable packaging, and promoting regenerative agriculture.

These efforts have resulted in reduced plastic waste, increased consumer engagement, a stronger supply chain, and a bolstered brand reputation. However, challenges persist, such as inadequate recycling infrastructure in key markets and the difficulty of scaling sustainable agriculture globally due to resource and knowledge limitations among diverse suppliers.

2.2.2 Nike (United States)

Nike, the American sportswear giant, has embraced circular economy principles to create a sustainable product lifecycle from design to disposal.

Nike actively pursues circular economy principles through initiatives like the Grind program, which transforms old shoes and manufacturing waste into new materials. They prioritize sustainable materials like recycled polyester and organic cotton, aiming for 100% usage by 2025. Furthermore, Nike promotes product longevity through refurbishment and repair programs.

These efforts have reduced reliance on virgin materials and landfill waste, while boosting customer engagement and brand loyalty. However, challenges remain, including the complexity and cost of recycling multi-material products and the difficulty of scaling circular product designs while maintaining quality, affordability, and supply chain readiness.

2.2.3 Dell Technologies (United States)

Dell, an American technology company, is committed to reducing electronic waste (e-waste) and promoting circular economy practices through recycling, repurposing, and sustainable materials.

Dell implements circular economy strategies by focusing on closed-loop recycling, sustainable packaging, and modular product design. They collect and recycle old products to create new ones, reducing e-waste and promoting resource efficiency. Sustainable materials like bamboo and recycled plastics are used in packaging. Products are designed for easy disassembly to enable component reuse and upgrades, extending product lifecycles.

These efforts have reduced e-waste, decreased reliance on virgin resources, and improved customer satisfaction, earning Dell recognition for sustainability leadership. However, challenges include limited e-waste collection networks in some markets and the higher cost and complexity of designing modular, recyclable products.

2.2.4 Apple Inc. (United States)

Apple, the technology giant, has implemented circular economy strategies aimed at reducing e-waste and using sustainable materials across its product range.

Apple actively promotes a circular economy through its product take-back program, robotic recycling technology, and the use of recycled materials in its products. The "Trade In" program encourages customers to return old devices for recycling, while robots like Daisy efficiently

disassemble devices for component recovery. Apple's increasing use of recycled aluminum, rare earth elements, and other materials reduces its environmental impact and reliance on mining.

These efforts have led to a significant reduction in mining impacts, increased consumer participation in recycling, and recognition for Apple as a sustainability leader. However, challenges remain, including the resource-intensive nature of robotic recycling and the difficulty of securing a consistent supply of sustainable materials.

III. Pathways for Adoption of Circular Economy in India : Government Initiatives

- **National Resource Efficiency Policy (NREP) - 2019 (Draft)**: Developed by the Ministry of Environment, Forest, and Climate Change (MoEFCC), it aims to enhance resource efficiency, reduce waste, and promote recycling.
- **Extended Producer Responsibility (EPR) - 2016 (E-waste) and 2018 (Plastic)** : Enforces responsibility on producers for the collection and recycling of e-waste and plastics to ensure sustainable product lifecycle management.
- **Waste Management Rules – 2016** : Introduced specific rules for managing plastic, e-waste, solid, and hazardous wastes to streamline recycling and waste reduction efforts.
- **NITI Aayog's National Strategy for Resource Efficiency – 2019** : Collaborating with the EU, NITI Aayog set out a national strategy for enhancing resource efficiency in key sectors such as steel, cement, and aluminum.
- **Swachh Bharat Mission (SBM) - 2014 and Swachh Bharat Mission 2.0 – 2021** : Initially launched to promote waste management and sanitation; SBM 2.0 includes specific goals for waste segregation, single-use plastic reduction, and composting.
- **Circular Economy Action Plan for Steel and Cement Sectors – 2021** : Developed by NITI Aayog and MoEFCC to promote material recycling and waste reduction in steel and cement production, aiming for energy and material efficiency.
- **Material Recovery Facilities (MRFs) – 2021** : Established as part of SBM 2.0 to support waste segregation, recovery, and recycling at a community level, minimizing waste to landfills.
- **Green Credit Programme – 2022** : Proposed under the Environmental Protection Act, this program provides tradable credits to industries that adopt circular economy practices, promoting sustainability in the private sector.
- **Sustainable Textiles for Circular Economy (STCE) Project – 2021** : Launched to drive recycling and reuse in the textile sector, promoting sustainable sourcing and production practices in the textile and apparel industry.
- **Circular Economy in Public Procurement – 2022** : Encourages the use of sustainable and recycled materials in government procurement to foster demand for circular products, especially in infrastructure and construction.

IV Recommendations

- Financial incentives, like tax breaks, subsidies, and green financing options, can reduce upfront costs and encourage companies to adopt circular practices.
- Government investment in recycling infrastructure and waste collection partnerships can help companies secure recyclable materials and reduce waste.
- Clear policies, Extended Producer Responsibility (EPR), and sustainable material standards provide companies with a structured framework for circular practices.
- R&D funding, public-private partnerships, and technology transfer initiatives foster innovation in recycling and sustainable product design.
- Consumer awareness campaigns and educational programs can drive behavioral changes needed for recycling and sustainable consumption.
- Streamlined supply chains and certifications for recycled materials make sourcing easier and encourage circular supply chains.
- Industrial zones and streamlined permits for recycling facilities can accelerate circular economy initiatives.
- Data collection and mandatory reporting standards provide transparency, helping companies measure progress and promote accountability in circular practices.

V Conclusion

Shifting from a linear to a circular economy is crucial for sustainability. This study examines how companies are adopting circular strategies, including recycling, sustainable sourcing, modular design, and waste reduction. Real-world examples from India and abroad showcase both successes and challenges, such as infrastructure limitations, costs, and supply chain complexities. Government support, through policies like Extended Producer Responsibility and public procurement reforms, is essential. Financial incentives, infrastructure investment, clear policies, and consumer awareness campaigns can accelerate the transition. Ultimately, collaboration across industry, government, and society is needed to create a sustainable future with continuous resource regeneration, minimal pollution, and environmentally responsible economic growth.

References

- *8 Ways the Circular Economy Will Transform Business: WEF*. (2023, March 21). Procurement Magazine. Retrieved October 31, 2024, from https://procurementmag.com/articles/8-ways-the-circular-economy-will-transform-business-wef
- *8 Ways the Circular Economy Will Transform how Business is Done*. (2023 , March 23). https://councilgreatlakesregion.org/8-ways-the-circular-economy-will-transform-how-business-is-done/
- Apple Inc. (2021). *Environmental progress report: Product take-back, recycling, and sustainable materials*. Retrieved from https://www.apple.com/environment

- Dell Technologies. (2021). *Closing the loop: E-waste recycling and sustainable design at Dell Technologies*. Retrieved from https://www.dell.com
- Godrej Group. (2021). *Green business and circular economy initiatives in consumer goods*. Retrieved from https://www.godrej.com
- Mahindra Group. (2022). *Sustainable practices in manufacturing and agriculture at Mahindra Group*. Retrieved from https://www.mahindra.com
- Ministry of Environment, Forest and Climate Change (MoEFCC). (2019). *National Resource Efficiency Policy (Draft)*. Government of India. Available from https://moef.gov.in.
- Ministry of Environment, Forest and Climate Change (MoEFCC). (2016). *Waste Management Rules*. Government of India. Available from https://moef.gov.in.
- Ministry of Environment, Forest and Climate Change (MoEFCC). (2022). *Green Credit Programme* (proposed). Government of India. Available from https://moef.gov.in.
- Ministry of Housing and Urban Affairs. (2021). *Swachh Bharat Mission 2.0 Guidelines*. Government of India. Available from https://swachhbharatmission.gov.in.
- Nike, Inc. (2020). *Nike Grind: Advancing sustainable practices in sportswear through recycled materials*. Retrieved from https://www.nike.com
- NITI Aayog. (2019). *National Strategy for Resource Efficiency*. Government of India. Available from https://niti.gov.in.
- Shaharudin, M. R., Abdullah, D., Zainoddin, A. I., Legino, R., & Wararatchai, P. (2024). The Evolution of Circular Economy: A Literature Review on Sustainability Transitions and Challenges. *International Journal of Research and Innovation in Social Science*, *8*(10), 102–115. https://doi.org/10.47772/ijriss.2024.8100009
- Tata Group. (2021). *Sustainability and circular economy practices across diverse sectors*. Tata Sustainability Report. Retrieved from https://www.tata.com
- Unilever. (2021). *Sustainable Living Plan: Plastic waste and sustainable sourcing goals*. Retrieved from https://www.unilever.com
- Wipro Limited. (2021). *Circular economy in the IT industry: Wipro's e-waste management and sustainable IT services*. Retrieved from https://www.wipro.com