



"WASTE MANAGEMENT REGULATIONS: A LEGAL ANALYSIS OF THE CIRCULAR ECONOMY" IN INDIA

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INTRODUCTION

Rapid economic growth and changing urbanization trends have posed enormous challenges in waste management in India. The transformation that the nation aims for is a diversion from a linear "take-make-waste" approach to the circular model of the economy- reduce, reuse, recycle- and economy through which sustainable development can be made and adverse environmental effects can be prevented, all of which require shifts. A system has had to be established that keeps materials in use for as long as possible, extracts maximum value from them, and recovers and regenerates materials at the end of each service, an aspect of the circular economy in waste management.¹

BACKGROUND

Worldwide, the concept of a circular economy in waste management is gaining importance, and India is no exception. To promote a circular economy, especially in municipal solid waste and liquid waste management, several policies and projects were initiated by the government. Among them is the Swachh Bharat Mission-Urban (SBM-U), started in 2014, which has contributed significantly to enhancing urban India's capability to treat solid waste from 18% to 68% through the promotion of the 3R approach: Reduce, Reuse, and Recycle. Some states, like Chhattisgarh, have gotten the zero landfill status, while other cities such as Indore have already established source segregation of waste.²

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¹"India – Waste Solutions for a Circular Economy - Mitigation Action Facility" (*Mitigation Action Facility*, July 25, 2024) <https://mitigation-action.org/projects/india-waste-solutions-for-a-circular-economy/>

²Hitachi, Ltd., "Partnering India's Growth through Technologies That Recycle and Regenerate" *Social Innovation* (May 7, 2024) <https://social-innovation.hitachi/en-in/knowledge-hub/people-planet/recycle-technologies/>

CIRCULAR ECONOMY CONCEPT

The circular economy is designed to reduce waste and use resources as much as possible. It is all about optimum use through sustainability and efficiency. Unlike the linear economy, in which consumption is followed by disposal, the circular economy is restorative and regenerative, keeping products and materials in the use cycle for as long as possible.³

DEFINITIONS AND PRINCIPLES

Several key principles underlie the circular economy:

1. **Design out waste and pollution:** Designing products and systems to generate as little waste as possible from the initial design.
2. **Keep products and materials in use:** A strategy that includes sharing, leasing, reusing, repairing, refurbishing, and recycling to extend the life of products.
3. **Regenerate natural systems:** This principle focuses on restoring and enhancing natural ecosystems that provide a basis for biodiversity and ecological health.⁴

Although Reduce, Reuse, and Recycle often refer to core principles, this is not the complete framework; this model includes further elements like Recover (which can recover materials or energy from waste) and Regenerate.

ADVANTAGES OF CIRCULAR ECONOMY

1. **Environmental Sustainability:** A Circular economy brings a reduction of waste as well as pollution and helps mitigate and adapt to climate change, conserve biodiversity, and reduce greenhouse gas emissions.
2. **Economic Efficiency:** It facilitates resource efficiency, lowers the expenses of raw material extraction, and aids in creating new market opportunities as a result of product innovations and service models.
3. **Resource Conservation:** Materials keep circulating, requiring less extraction and processing and so protect natural resources, in the words of the circular economy.⁵

³ "Circular Economy Introduction" <https://www.ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>

⁴ "Get Acquainted with the Core Principles of a Circular Economy | Inogen" (*Inogen*, May 22, 2024) <https://www.inogenalliance.com/blog-post/core-principles-circular-economy>

⁵ "Social and Economic Benefits of CE - Circular Economy Month" (*Circular Economy Month*) <https://circulareconomymonth.ca/about-circular-economy-month/social-and-economic-benefits/>

COUNTRIES LEADING IN THE ADOPTION OF CIRCULAR ECONOMY

- 1. Europe:** The European Union is leading in implementing circular economy policies to reduce waste and improve recycling rates significantly. An example is the targets for recycling and reduction in waste within the EU Circular Economy Action Plan.⁶
- 2. Japan:** It has an efficient waste management system and has been applying several circular economy strategies, including high-technology recycling and the reuse of products.
- 3. Sweden:** A country where numerous circular economy initiatives have been undertaken, including a focus on bio-based economies and waste-to-energy systems, aiming to be carbon neutral by 2045.
- 4. China:** It has started many projects related to the circular economy, from establishing eco-industrial parks to promoting revolutionary recycling technologies. All these are intended to reduce pollution and improve resource efficiency.⁷
- 5. India:** India appreciates the rise in circular economy practices, especially in textiles and electronics, with companies opting to recycle and reuse to avoid waste and enhance sustainability.
- 6. United States:** Cities like San Francisco and New York practice circular economy strategies by shutting themselves off to zero-waste goals while increasing reuse.

CHALLENGES

Despite these achievements, India's waste management sector faces several challenges:

- 1. Lack of Waste Segregation:** As municipal solid waste is rarely separated at the source, recycling and resource recovery do not reach maximum effectiveness.
- 2. Insufficient Infrastructure:** Many cities lack adequate waste management infrastructure, including material recovery facilities and composting plants.⁸
- 3. Financial Constraints:** Waste management projects often struggle with funding, making it difficult to scale up operations.
- 4. Regulatory Enforcement:** Existing regulations are not always effectively enforced, leading to non-compliance by producers and municipalities.

⁶ "Circular Economy Action Plan" (*Environment*) https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

⁷ "Circular Economy: Definition, Importance and Benefits | Topics | European Parliament" (*Topics European Parliament*) <https://www.europarl.europa.eu/topics/en/article/20151201STO05603/circular-economy-definition-importance-and-benefits>

⁸ Shekhar P, "Solid Waste Management in India- Explained Pointwise" (*Free UPSC IAS Preparation Syllabus and Materials for Aspirants*, May 17, 2024) <https://forumias.com/blog/waste-management-in-india-status-challenges-and-solutions/>

The overview goes into detail about the circular economy in the management of Indian waste-a-policies extended producer responsibility (EPR), recycling targets, public-private partnerships, and recently introduced government initiatives.⁹

AN INTRODUCTION TO CIRCULAR ECONOMY IN WASTE MANAGEMENT

The paradigm shift concerning the circular economy concept is being propagated in India's waste management sector. In this respect, the model promotes reducing waste generation and rehabilitating and collecting resources from the waste. All this while, the government has been working towards such policy initiatives and schemes that take action towards the circular economy.

- 1. Extended Producer Responsibility:** Under this concern, the extended producer responsibility, which has become a basis for waste management plans in India, emerged as one of the key aspects of waste management under plastics and electronic waste. Hence, must be responsible for the waste generated from their products by EPR in the existing Plastic Waste Management Rules, 2022, with recycling and reusing targets for specific plastics categories. This can go up to 80% recycling and reuse by 2025 for some plastic types. EPR encourages producers to design sustainable products and manage waste throughout the whole life cycle of their products to promote a circular economy.
- 2. Recycling and Recovery Targets:** The target for recycling is presently set very high, especially for plastics. It seeks massive scale-up in recycling rates, with producers being made responsible for hazardous plastic waste generated by their products under the Plastic Waste Management Rules. It also simultaneously reduces waste and promotes resource recovery per the principles of circular economy.
- 3. Public-Private Partnerships (PPPs) for Waste Management:** The PPPs not only enable the increased coverage of waste management infrastructure and services but also allow for retrofitting existing units. "India - Waste Solutions for a Circular Economy" project, for example, comprises financial instruments such as grant funding and risk-sharing facilities designed to attract investments into waste management projects. This collaborative public and private effort enables building material recovery facilities and enhancing recycling capacities, as well as source segregation systems.¹⁰

⁹ Team NI, "Waste Management in India: Facts, Challenges & Solutions" (*NEXT IAS Blog*, September 12, 2024) <https://www.nextias.com/blog/waste-management-in-india/>

¹⁰ "Partnering India's Growth through Technologies That Recycle and Regenerate" *Social Innovation* (May 7, 2024) <https://social-innovation.hitachi/en-in/knowledge-hub/people-planet/recycle-technologies/>

RECENT GOVERNMENT INITIATIVES

- 1. Swachh Bharat Mission-Urban (SBM-U):** Launched in 2014, SBM-U was able to vastly increase the solid waste treatment capacity for urban India from 18% to 68% using the three R's—reduce, reuse, recycle. Some success stories from states include bringing Chhattisgarh to a zero-landfill status and cities like Indore, which has achieved a 100% source-segregating waste.¹¹
- 2. Waste-to-Wealth Mission:** This program looks to identify new technologies, develop them, and implement them for treatment methods for waste, recycling of materials, energy generation, and precious metals recovery from waste. This is in line with maximizing the recovery of resources with minimal disposal related to waste.
- 3. National Circular Economy Roadmap:** The government has put a roadmap for reducing plastic waste through a circular economy approach. This will include enforcing EPR to be enforced, promoting recycling, and banning single-use plastics.¹²

LEGAL ANALYSIS

Apart from these, some laws play an essential role in changing the waste management regime in their favor toward a circular economy. They are as follows:

- 1. Extended Producer Responsibility (EPR):** Plastic Waste Management Rules, 2022, require producers in India to take responsibility for managing waste generated from their products. This extends beyond the target for recycling or reusing certain plastic types.
- 2. Plastic Waste Management Rules, 2021:** These rules ban single-use plastic items smaller than 50 microns, promote recycling, and make waste segregation at the source mandatory.
- 3. Circular Economy Policies:** The Draft National Resource Efficiency Policy 2019 aims to further resource efficiency and increase the use of secondary raw materials.¹³

ISSUES IN THE CIRCULAR ECONOMY

For a circular economy in waste management to take full effect, a considerable amount of sorting needs to be done. Issues that arise here are:

¹¹ “Swachh Bharat Mission-Urban” (*Drishti IAS*) <https://www.drishtiiias.com/daily-updates/daily-news-analysis/swachh-bharat-mission-urban-1>

¹² Vibhour, “Swachh Bharat Mission 2.0 for Mains: Garbage-Free Urban India - Sleepy Classes IAS” (*Sleepy Classes IAS*, December 2, 2024) <https://sleepyclasses.com/swachh-bharat-mission-2-0-for-mains/>

¹³ Recykal_Wpapp, “A Guide to EPR Compliance in India” (*Recykal*, January 16, 2025) <https://recykal.com/blog/a-guide-to-epr-compliance-in-india/>

- 1. Clear Understanding of EPR Certificates:** There is an urgent need to develop guidelines that would facilitate the actual buying and selling of EPR certificates for the successful implementation of the EPR concept.
- 2. Minimum Use of Recycled Materials:** More specific use targets of recycled materials in manufacturing will give a sharper direction to this initiative.
- 3. Integration of Informal Sector:** The informal recycling sector forms an essential channel for waste disposal and management in India. Bringing this sector into a formal setup would enhance the efficiency and compliance of the systems.¹⁴

CURRENT SCENARIO

The present estimate of municipal solid waste generation for India is around 62 million tonnes, which is expected to rise significantly to roughly 165 million tonnes by 2030. Keeping this view of the increasing risk factor in perspective, the government has introduced a set of initiatives, one of which is the "India – Waste Solutions for a Circular Economy. “The vision for the ambitious project is to bring about a revolutionary change in waste management by not just making more investments but also by improving existing regulatory frameworks that govern waste management processes. The promotion of source segregation of waste, establishment of material recovery facilities, and an increase in recycling capacities, particularly in sampled model cities, are the main concepts of the project.¹⁵

LAWS THAT CAN BE APPLIED

Several laws and policies support the transition to a circular economy in waste management:

- 1. Environmental Protection Act, 1986:** This gives a general framework for protecting the environment, including waste management.
- 2. Plastic Waste Management Rules, 2022:** Requires EPR and encourages recycling.
- 3. Draft National Resource Efficiency Policy, 2019:** Encourages resource efficiency and the use of secondary raw materials.¹⁶

¹⁴ Shobhit Srivastava and Shobhit Srivastava, “Industrial Waste Circularity Is the Way Forward for Waste & Pollution Management, Decarbonisation” (*Down to Earth*, September 24, 2024)

<https://www.downtoearth.org.in/pollution/industrial-waste-circularity-is-the-way-forward-for-waste-pollution-management-decarbonisation>

¹⁵ “India Municipal Solid Waste Management Market Size | Mordor Intelligence”

<https://www.mordorintelligence.com/industry-reports/india-municipal-solid-waste-management-market>

¹⁶ “(Mitigation Action Facility, July 25, 2024) <https://mitigation-action.org/projects/india-waste-solutions-for-a-circular-economy/>

SUGGESTIONS FOR STRENGTHENING WASTE MANAGEMENT RULES

1. Improving the mechanisms for monitoring and emphasizing compliance
2. Waste management rules must be enforced more vigorously, with real-time monitoring and sanctions for non-conformance.
3. Tracking recycling and waste disposal through online platforms, aided by artificial intelligence for monitoring.
4. Strengthen the role of local bodies in ensuring compliance with State Pollution Control Boards (SPCBs).
5. Promote green businesses and startups for recycling.
6. Tax exemptions, subsidies, and low-interest loans should be given to companies practicing sustainable waste management.
7. These funds should be used to promote recycling and waste-to-energy projects.
8. Develop an autonomous Green Certification to promote ethical disposal practices.

CONCLUSION

As of now, the ambitious road of India, moving toward the development of a circular economy in waste management, is witnessing splendid action and initiative in the making and implementation of related policies. However, many of these hurdles remain unbridged, including recurring poor waste segregation, a lack of requisite infrastructure for waste management, and an array of financial hurdles. To push the conversion to the circular economy model that espouses reducing waste, conserving valuable resources, and providing sustainable development, India needs to act decisively. This could be done by enhancing legislative frameworks, making the public aware of and educating them about waste management processes, and including the informal sector in the formal waste management scheme. The framework of this paper is a comprehensive and detailed study of different waste management laws currently operating in the Indian context with specific reference to the circular economy theory. It captures the present state of affairs, analyzes existing legal provisions governing waste management within India, identifies various challenges facing this sector, and proposes measures through which improvements may be achieved. Through these directions, India may witness a significant improvement in reaching its environmental and broader sustainability goals.¹⁷

¹⁷ Gpc, "India Circular Economy Policies" <https://gpcgateway.com/common/regulation/Nw--/SW5kaWE-/MTA->

REFERENCES

1. Environmental Protection Act, 1986: This act is referenced as providing a general framework for protecting the environment, including waste management in India.
2. Plastic Waste Management Rules, 2022: These rules are mentioned in the context of requiring Extended Producer Responsibility (EPR) and encouraging recycling.
3. Plastic Waste Management Rules, 2021: These rules are referenced for banning single-use plastic items smaller than 50 microns, promoting recycling, and mandating segregating waste at the source.
4. Draft National Resource Efficiency Policy, 2019: This policy aims to further resource efficiency and increase the use of secondary raw materials.
5. Swachh Bharat Mission-Urban (SBM-U): This mission, launched in 2014, is referenced as a significant initiative that increased urban India's solid waste treatment capacity through the 3R approach (Reduce, Reuse, Recycle).
6. "India – Waste Solutions for a Circular Economy": The document references this project as an initiative by the government to bring about a revolutionary change in waste management by making more investments and improving existing regulatory frameworks.