



**LAND MANAGEMENT, ENVIRONMENT & SOLID-WASTE:
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MICRO-CREDENTIAL

**CIRCULAR ECONOMY
FOR LAND AND WASTE MANAGEMENT**

12. – Economic and Social Dimensions

***Economic and Social Aspects of Circular Economy
PDF W12***



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1. SUMMARY OF KEY IDEAS

Under the linear model, economic growth has historically been coupled with rapid resource depletion and the externalization of social and environmental costs. Studies show that a circular economy mitigates these externalities by fundamentally redesigning how value is created, captured, and delivered through innovative circular business models. These models shift the market paradigm from product ownership to the economy of functionality and servitization. Furthermore, data indicate that this systemic transition drastically reshapes the labor market. It stimulates the creation of "green jobs" and necessitates the "greening" of existing professions, demanding comprehensive adaptations in human resources management and vocational skills training. In the context of transition and developing economies, the circular economy must also confront the complex reality of the informal waste sector. It has been observed that millions of informal waste pickers perform the crucial labor of resource recovery, yet they frequently endure severe social, health, and economic vulnerabilities. Integrating these marginalized populations into formal circular supply chains is recognized as a prerequisite for inclusive sustainable development. Finally, research suggests that the ultimate success of the circular economy relies heavily on societal acceptance. Consumer behavior must overcome established norms of hyper-consumption to embrace models based on sharing, reuse, and long-term resource stewardship..

2. LEARNING OBJECTIVES

Upon successful completion of this core module, it is expected that learners will be able to:

- Identify and evaluate the primary architectures of circular business models, distinguishing between strategies that extend product value and those that extend resource value.
- Analyze the impact of the circular transition on the global and regional labor markets, differentiating between green jobs and the greening of traditional employment sectors.
- Assess the socio-economic role of the informal waste sector in transition economies, formulating strategies for the equitable integration of waste pickers into formalized circular systems.
- Examine the socio-cultural barriers and drivers of circular economy acceptance, specifically regarding consumer behavior, the sharing economy, and environmental justice.
- Synthesize economic and social dimensions to perform comprehensive stakeholder analyses for proposed circular economy interventions.

3. INTRODUCTION

Within contemporary academic discourse on sustainability, the circular economy is frequently examined through the perspectives of material sciences, industrial ecology, environmental engineering, and public policy. Considerable scholarly attention has been devoted to topics such as recycling technologies, resource efficiency, waste management systems, renewable materials, and low-carbon industrial

processes. However, although these technological and environmental dimensions are critically important, the circular economy is fundamentally rooted in economic structures and social organization. The transition toward circularity therefore cannot be understood solely as a technical adjustment to production systems; rather, it represents a profound socio-economic transformation that challenges the dominant logic of modern industrial capitalism and reshapes the relationship between production, consumption, labor, and natural resources.

The prevailing linear economic model—commonly summarized as “take—make—dispose”—has historically supported industrial growth and rising levels of material consumption through the continuous extraction of virgin resources, mass production systems, and accelerated product turnover. This model has created a socio-economic paradigm characterized by several interconnected structural features: intensive resource extraction, globalized supply chains, planned obsolescence, disposable consumer culture, and the systematic externalization of environmental and social costs. Under linear economic systems, economic success is often measured primarily through indicators such as production output, consumption levels, and gross domestic product (GDP) growth, while ecological degradation, waste accumulation, pollution, biodiversity loss, and long-term social inequalities remain insufficiently reflected in market prices and economic accounting systems.

Research increasingly demonstrates that such linear development trajectories are ecologically unsustainable because they rely on finite material and energy resources while generating environmental pressures that exceed planetary boundaries. Climate change, land degradation, water scarcity, ecosystem collapse, and rapidly increasing waste streams collectively indicate that traditional growth models cannot continue indefinitely without severe environmental and socio-economic consequences. As a result, the circular economy has emerged as a strategic framework aimed at decoupling economic prosperity from resource depletion and environmental degradation. Decoupling refers to the ability of economies to generate value, employment, and societal well-being while simultaneously reducing material throughput, waste generation, and ecological impact.

Achieving this form of decoupling, however, requires much more than improved recycling systems or isolated technological innovations. It necessitates a comprehensive restructuring of market dynamics, industrial systems, business incentives, consumer behavior, and cultural values. Circular economy transitions therefore involve the reconfiguration of entire socio-economic systems, including how products are designed, how services are delivered, how ownership is conceptualized, and how societies define value and prosperity. In this context, the circular economy functions not merely as an environmental strategy, but also as an alternative economic paradigm emphasizing regeneration, resource stewardship, long-term resilience, and systemic efficiency.

The economic dimension of the circular economy is particularly dependent on the emergence of innovative business models capable of generating economic value without relying on the continuous extraction and consumption of virgin materials. Traditional linear business models typically depend on maximizing production volume and increasing product sales, often encouraging short product life cycles

and repetitive consumption patterns. In contrast, circular business models seek to maintain the value of products, materials, and resources within the economy for as long as possible through reuse, repair, refurbishment, remanufacturing, sharing systems, recycling, and service-based approaches.

4. CIRCULAR BUSINESS MODELS

Economic Foundations of the Circular Economy. The circular economy is fundamentally rooted in economic transformation. While environmental protection and resource conservation are central objectives, the practical implementation of circularity depends heavily on the restructuring of economic systems, production models, and market incentives. The traditional linear economy operates according to a model in which economic growth is strongly coupled with increasing levels of material extraction, energy consumption, and waste generation. Under this system, profitability is frequently achieved through high production volumes, rapid product turnover, and continuous consumer demand for newly manufactured goods. Such an economic structure encourages intensive exploitation of natural resources while simultaneously generating significant environmental externalities that remain insufficiently reflected in market prices.

The circular economy seeks to establish an alternative economic framework in which value creation is increasingly decoupled from virgin resource extraction. Rather than maximizing short-term throughput of materials, circular systems attempt to preserve the functional and economic value of products, components, and materials for the longest possible period. This transition requires economies to move away from models centered exclusively on ownership and mass production toward systems emphasizing service provision, resource efficiency, maintenance, reuse, remanufacturing, and material recovery.

Within circular economic systems, waste is reconceptualized as a potential resource stream rather than a final disposal problem. Secondary materials recovered from products at the end of their use phase become economically valuable inputs for new production cycles. This shift creates opportunities to reduce dependence on finite natural resources, improve resource security, and stabilize supply chains vulnerable to fluctuations in global commodity markets. At the same time, circular strategies can reduce costs associated with landfill disposal, environmental remediation, and pollution management.

The economic logic of circularity is also closely linked to resilience. Linear globalized supply chains often depend heavily on long-distance transportation, concentrated extraction regions, and vulnerable geopolitical relationships. Circular systems, by contrast, encourage more localized production and recovery systems capable of strengthening regional economic stability and reducing vulnerability to external disruptions. As a result, the circular economy is increasingly viewed not only as an environmental necessity but also as a strategic economic approach capable of improving long-term competitiveness and adaptive capacity.

Circular Business Models and Market Transformation. A successful circular transition requires the emergence of innovative business models capable of generating economic value without relying on

continuous material consumption. Traditional linear business models are typically based on maximizing product sales and accelerating replacement cycles. In many industries, profitability is closely tied to planned obsolescence, where products are intentionally designed with limited lifespans in order to stimulate repeated consumption. Such systems encourage excessive resource extraction and rapidly increasing waste generation. Circular business models fundamentally challenge this approach by shifting economic incentives toward product longevity, reparability, modularity, and resource efficiency. One of the most important circular strategies involves product-service systems, in which companies provide access to services rather than transferring full ownership of products to consumers. Under such systems, businesses may lease, rent, or maintain products while retaining responsibility for their long-term functionality and recovery. Because producers remain economically connected to products throughout their lifecycle, they gain incentives to improve durability, reparability, and material recovery potential. (Figure 1).



Figure 1. Materials flow within the circular business model

Sharing economy platforms constitute another important example of circular market transformation. Through digital technologies and collaborative consumption systems, products such as vehicles, tools, office spaces, or accommodation can be utilized by multiple users instead of remaining underused in private ownership systems. This increases the intensity of resource utilization while reducing demand for additional material production.

Repair, refurbishment, and remanufacturing industries also play a critical role within circular economies. Instead of discarding products after minor technical failure or cosmetic degradation, circular systems encourage restoring products to functional condition and reintroducing them into economic use cycles. Remanufacturing processes are particularly important in sectors such as electronics, machinery, automotive production, and industrial equipment, where high-value components can be recovered and reused with substantially lower energy and material requirements than primary manufacturing.

The development of circular business models also stimulates innovation in logistics, digital technologies, and material tracking systems. Reverse logistics networks become increasingly important because products and materials must move not only from producers to consumers, but also back into systems of collection, repair, disassembly, and recycling. Digital product passports, tracking technologies, and material databases therefore emerge as essential tools for managing increasingly complex circular supply chains.

At the market level, the circular economy requires new forms of economic valuation that recognize environmental and social costs traditionally excluded from financial calculations. Governments increasingly support this transition through economic instruments such as carbon pricing, landfill taxes, green public procurement policies, and financial incentives for circular innovation. Such measures attempt to correct market distortions that currently favor resource-intensive linear production systems over regenerative alternatives.

Employment and Labor Market Transformation. The circular economy transition has significant implications for labor markets, employment structures, and workforce development. One of the most frequently discussed social benefits of circularity is its potential to generate employment opportunities across multiple sectors. Circular activities such as recycling, repair, remanufacturing, composting, sustainable construction, renewable energy deployment, and ecosystem restoration generally require higher levels of labor input than highly automated extraction industries or landfill-based waste systems.

As a result, circular transitions may contribute to the creation of local employment opportunities while simultaneously strengthening regional economies. Repair and maintenance sectors, for example, often rely on skilled technical labor that cannot easily be outsourced or automated. Similarly, recycling and remanufacturing industries can support job creation across collection, sorting, processing, logistics, engineering, and quality control systems.

Small and Medium Enterprises (SMEs) are particularly important within circular labor markets because many circular activities operate effectively at local or regional scales. Community-based repair services, material recovery enterprises, composting initiatives, and sharing platforms can stimulate entrepreneurship while increasing economic diversification. In rural and peripheral regions, circular economy projects may also contribute to reducing economic dependency on extractive industries and resource-intensive activities.

However, the circular transition also creates significant socio-economic risks. The restructuring of industrial systems may lead to economic contraction within sectors dependent on linear production models, including extractive industries, fossil fuel sectors, single-use manufacturing systems, and landfill operations. Workers employed in these sectors may face unemployment, declining income, or regional economic instability if adequate transition mechanisms are not implemented.

Consequently, the concept of a “just transition” has become increasingly important within sustainability policy and circular economy discourse. A just transition emphasizes that environmental transformation must occur in socially equitable ways that protect workers, vulnerable communities, and economically dependent regions. This requires comprehensive policy support, including labor retraining programs, educational investment, social protection systems, and long-term regional development strategies capable of supporting workforce adaptation.

Educational systems therefore play a central role in circular economy transitions. The implementation of circular systems requires new forms of interdisciplinary expertise involving environmental science, engineering, industrial ecology, digital technologies, logistics, sustainable design, and systems thinking. Universities, vocational institutions, and professional training programs must therefore adapt curricula to prepare future generations capable of managing circular economic systems effectively.

Social Equity and Community Impacts. The social dimension of the circular economy extends beyond employment generation and industrial restructuring. Circular transitions also influence broader issues of social equity, access to resources, public health, and community resilience. Although environmental and economic aspects of circularity receive substantial academic and political attention, social sustainability remains comparatively underdeveloped within many circular economy frameworks.

One of the key concerns involves the distribution of costs and benefits associated with circular transitions. Without inclusive governance, circular economy implementation may unintentionally reproduce or intensify existing social inequalities. Vulnerable populations often experience disproportionate exposure to environmental hazards such as pollution, waste disposal facilities, contaminated land, and industrial emissions. Consequently, circular governance increasingly incorporates principles of environmental justice aimed at ensuring that no particular social group bears an unequal environmental burden.

At the same time, circular economy systems can strengthen community resilience by encouraging more localized and participatory economic structures. Community repair centers, cooperative recycling initiatives, urban agriculture systems, and local sharing networks can improve access to resources while

fostering social cohesion and collective participation. Such systems may reduce material poverty, strengthen local economies, and increase adaptive capacity during periods of economic or environmental instability.



Studies show that circular economy activities such as repair, remanufacturing, and recycling can create significantly more jobs per ton of material than landfill disposal or incineration. Repair and maintenance sectors are especially labor-intensive because they require skilled human work that cannot be fully automated.

5. GREEN JOBS AND SKILLS

The transition toward a circular economy is increasingly recognized as a major driver of structural transformation within modern labor markets. Unlike the traditional linear economic model, which is primarily based on large-scale extraction, mass production, and disposal, circular systems depend heavily on human-centered activities that maintain, recover, and regenerate value over time. As a result, the circular economy is considered substantially more labor-intensive than the linear economy.

Shift from extraction to value retention. In a linear economy, economic growth is strongly linked to the extraction of virgin materials and the rapid turnover of products. Production systems are often highly automated and geographically centralized, requiring significant capital investments but relatively limited long-term local employment. In contrast, the circular economy focuses on extending product lifespans, reducing waste generation, and recovering materials through repair, refurbishment, remanufacturing, recycling, and reuse. These processes require skilled human labor at multiple stages of the value chain.

Activities such as product maintenance, equipment diagnostics, dismantling, sorting of secondary materials, refurbishment of components, and quality control during remanufacturing cannot be fully automated. Consequently, circular systems create more geographically distributed employment opportunities and support local economic resilience.

Localization of economic activity. One of the defining characteristics of circular systems is the localization of material recovery and maintenance loops. Products that are repaired, reused, or recycled often remain within regional or national economies instead of being discarded or exported as waste. This creates opportunities for local enterprises, municipal recycling systems, repair workshops, and service-based business models.

Academic research suggests that such localization can partially counterbalance the long-term employment losses associated with industrial offshoring and deindustrialization. Regions that previously experienced declining manufacturing activity may benefit from the development of new circular industries connected to waste management, urban mining, secondary material processing, and sustainable land restoration.

Expansion of service-oriented employment. The circular economy also promotes a transition from product ownership toward service-oriented business models. Instead of focusing exclusively on selling products, companies increasingly provide maintenance services, leasing systems, product-sharing platforms, and take-back programs. These systems generate additional demand for technicians, logistics operators, digital platform managers, repair specialists, and customer-support services.

In sectors such as electronics, construction, agriculture, textiles, and waste management, circular business models create employment opportunities that combine technical knowledge with environmental expertise. The growth of these sectors contributes not only to job creation but also to the diversification of regional economies.

Academic literature commonly distinguishes between two major categories of employment associated with the ecological and circular transition: “green jobs” and “greening jobs.” Although both contribute to sustainability objectives, they represent different dimensions of labor market transformation.

Green jobs. Green jobs refer to entirely new professions that emerge directly from the transition toward sustainability and circularity. These occupations are specifically created to support renewable energy systems, resource efficiency, circular production models, environmental monitoring, and sustainable infrastructure development.

Examples of green jobs include renewable energy engineers, industrial symbiosis coordinators, circular economy consultants, waste valorization specialists, life-cycle assessment analysts, sustainable packaging designers, and experts in secondary raw material logistics. In addition, new digital professions connected to circular systems are also emerging, including material flow analysts, circular data managers, and environmental monitoring specialists.

These occupations require interdisciplinary competencies that combine engineering, environmental science, economics, policy analysis, and digital technologies. As circular systems become more technologically advanced, the demand for highly specialized expertise continues to increase.

Greening traditional professions. In addition to creating entirely new occupations, the circular economy also transforms existing professions by integrating sustainability principles into conventional work activities. This process is commonly described as the “greening” of jobs.

Traditional roles in procurement, manufacturing, logistics, construction, urban planning, agriculture, and supply chain management increasingly require workers to understand circular concepts and environmental performance indicators. Product designers, for example, must now consider durability, reparability, modularity, and recyclability during the design phase. Procurement specialists are expected to evaluate suppliers according to environmental criteria and resource efficiency standards. Supply chain managers must integrate reverse logistics systems capable of recovering products and materials after use.

Similarly, professionals in construction and land management are increasingly required to work with material passports, circular building strategies, soil restoration practices, and sustainable resource

planning. Thus, the circular transition does not only generate new employment sectors; it also reshapes the competencies required across nearly all areas of the economy.

Transformation of workplace culture. The distinction between green jobs and greening jobs also reflects broader organizational and cultural changes within enterprises. Sustainability is no longer viewed as a separate environmental activity but is gradually becoming integrated into everyday operational decision-making. Employees across multiple departments are expected to contribute to resource efficiency, waste prevention, and environmental performance objectives.

As a result, sustainability competencies are becoming increasingly valuable even in professions that were previously considered unrelated to environmental management.


Reflect

How could the transition toward a circular economy affect employment in your region?

Consider:

- which traditional industries may decline,
- which new professions could emerge,
- and what new skills future workers may need.

The transition toward a circular economy requires not only technological innovation but also a profound transformation of workforce management, education systems, and professional training structures. Human capital is increasingly recognized as one of the most critical enabling factors for the successful implementation of circular economy strategies.

Green human resources management. Organizations adopting circular economy principles must redesign their human resources management practices to align workforce development with sustainability goals. This approach, commonly referred to as Green Human Resources Management (Green HRM), integrates environmental considerations into recruitment, employee training, performance evaluation, and remuneration systems.

Companies are increasingly expected to recruit employees with sustainability competencies, provide environmental training programs, and encourage resource-efficient workplace behavior. Environmental performance indicators may also become integrated into employee evaluations and corporate incentive systems.

Green HRM supports the development of organizational cultures in which sustainability is embedded into daily operations rather than treated as a separate responsibility of environmental departments.

Emerging skills requirements. One of the major barriers to circular economy implementation is the growing mismatch between existing workforce skills and the competencies required by circular systems. Circular business models rely on interdisciplinary knowledge that combines technical, environmental, managerial, and digital capabilities.

Workers increasingly require competencies in eco-design, reverse logistics, material flow analysis, waste valorization technologies, life-cycle thinking, industrial symbiosis, and environmental impact assessment. In many industries, digital skills are also becoming essential due to the growing use of data-driven resource management systems, smart monitoring technologies, and circular supply chain platforms.

The rapid evolution of sustainability regulations and technological innovation further increases the demand for continuous professional adaptation.

Role of higher education and vocational training

Higher education institutions and vocational training centers play a central role in preparing society for the circular transition. Traditional educational systems, which often separate engineering, economics, and environmental sciences into isolated disciplines, are increasingly viewed as insufficient for addressing complex circular economy challenges.

There is a growing need for interdisciplinary curricula that integrate sustainable business management, industrial ecology, environmental engineering, land management, waste systems, and circular design principles. Universities are also expected to strengthen collaboration with industry to ensure that graduates develop practical competencies relevant to emerging labor market demands.

Vocational education is equally important, particularly for training technicians, repair specialists, recycling operators, and professionals involved in waste recovery and sustainable infrastructure maintenance.



Choose one traditional profession (for example: engineer, designer, supply chain manager, construction specialist, or waste operator).

Identify:

- two new circular economy skills this profession would require,
- one way the job could become “greener,”
- and one training or educational program that could support this transition.

Lifelong learning and workforce retraining. Because circular economy transformation affects both new and existing professions, lifelong learning is becoming a fundamental requirement. Workers employed in traditional linear industries may need retraining to adapt to changing technologies, production systems, and environmental regulations.

Retraining programs are particularly important in regions dependent on extractive industries or sectors vulnerable to automation and resource transition policies. Continuous professional development enables workers to remain employable while supporting social stability during economic transformation.

Consequently, the development of a circular economy depends not only on infrastructure and policy reforms but also on the capacity of societies to build a skilled, adaptable, and sustainability-oriented workforce capable of operating advanced resource-efficient socio-technical systems.

6. INFORMAL SECTOR AND WASTE PICKERS AND SOCIAL ACCEPTANCE OF CE

The Reality of the Informal Waste Economy. While circular economy frameworks are frequently modeled on highly formalized, technology-driven European systems, their application in developing and transition economies must account for drastically different socio-economic realities. It is widely acknowledged that in regions across Asia, Africa, and Latin America, municipal waste management is heavily supplemented—or entirely operated—by the informal sector. Informal waste pickers, itinerant buyers, and unregistered recycling networks perform the overwhelming majority of material collection, sorting, and initial processing, particularly for high-value recyclables such as plastics, metals, and electronic waste.

Socio-Economic Vulnerabilities and Risks. Although the informal sector achieves substantial rates of resource recovery and effectively functions as the backbone of the recycling supply chain in developing regions, it has been observed that this workforce endures extreme marginalization. Waste pickers typically operate in precarious conditions without legal recognition, occupational health and safety protections, or social security. Furthermore, the informal processing of complex goods, particularly e-waste, frequently involves highly toxic methodologies—such as open burning to extract copper—which expose workers and surrounding communities to severe environmental and health hazards. From a sociological perspective, waste picking is deeply stigmatized, intertwining the physical management of discarded materials with severe poverty and social exclusion.

Inclusive Circular Integration Strategies. Research suggests that attempting to implement formal circular economy policies—such as automated material recovery facilities or strict Extended Producer Responsibility (EPR) schemes—without accounting for the informal sector inevitably leads to social displacement and the loss of livelihoods. Consequently, contemporary circular economy governance mandates the equitable integration of waste pickers into formalized supply chains. Data indicate that successful initiatives involve organizing informal workers into recognized cooperatives, providing them with training, protective equipment, and fair-market compensation for the environmental services they render. By recognizing informal workers as legitimate environmental stakeholders, municipalities and private enterprises can synthesize grassroots logistical capabilities with safe, formalized processing infrastructure, ensuring that the circular transition drives inclusive social growth.

Consumer Behavior and the Sharing Economy. The operational success of circular business models depends entirely on social acceptance and the transformation of consumer behavior. It is known that in

mass consumer societies, personal identity and social status have historically been linked to the ownership and rapid accumulation of newly manufactured goods. Shifting this paradigm represents a profound cultural challenge. However, the advent of Web 2.0 and the proliferation of digital platforms have facilitated the rise of the sharing economy, positing the new sociological premise that "we are what we share".

Studies show that the sharing economy accelerates the circular transition by normalizing the temporary access to goods over permanent possession. Car-sharing networks, peer-to-peer equipment rental platforms, and second-hand clothing marketplaces effectively intensify the usage rates of existing physical assets, thereby preventing the extraction of virgin materials required to manufacture new ones. Nevertheless, it has been observed that these models face "Moore's chasm"—the difficulty of expanding adoption from ecologically convinced early adopters to the broader mass market, which often prioritizes convenience and cost over sustainability.

Environmental Justice and Community Impacts. The social dimension of the circular economy also encompasses the spatial impacts of resource management on local communities. While recycling and waste-to-energy infrastructure are vital components of the circular transition, they remain industrial facilities with physical footprints, emissions, and logistical traffic. It is known that the siting of these facilities frequently generates localized social resistance, commonly referred to as the NIMBY (Not In My Back Yard) phenomenon. Furthermore, historical data indicate severe issues of environmental justice, where toxic waste disposal sites and highly polluting heavy industries have been disproportionately located near marginalized, low-income communities. Ensuring social acceptance of the circular economy therefore requires transparent, participatory governance. Communities must be actively engaged in spatial planning through rigorous Social Impact Assessments (SIAs) to guarantee that the ecological benefits of resource recovery do not inflict localized socio-economic harm.

Shifting Social Norms Towards Sobriety. Ultimately, research suggests that the highest level of social acceptance regarding the circular economy requires a profound cultural shift toward "frugality" or "happy sobriety". True circularity questions the hegemony of infinite capital accumulation on a physically finite planet. Reassessing the societal definitions of prosperity—moving away from the accumulation of disposable objects towards community well-being, ecological balance, and shared services—is the fundamental social transformation required to make the circular economy a lasting global reality..

7. CONCLUSIONS

It is concluded that the transition to a circular economy cannot be effectively realized if treated exclusively as an environmental or technical engineering challenge. The integration of robust economic and social dimensions is absolutely fundamental. It has been demonstrated that modifying the trajectory of global consumption requires the widespread adoption of circular business models that successfully uncouple revenue generation from resource depletion, shifting markets toward the economy of functionality and extending product lifespans.

Furthermore, data indicate that this economic reconfiguration acts as a powerful catalyst for labor market transformation, generating vital new green jobs while necessitating the comprehensive upskilling of the existing workforce. Crucially, the transition must prioritize social equity. In developing and transition economies, it is observed that establishing formal circular supply chains must be executed inclusively, ensuring the protection, formalization, and fair compensation of the millions of informal workers who currently manage municipal waste. Finally, the long-term viability of the circular economy is inextricably linked to societal acceptance. Fostering environmental justice, promoting the sharing economy, and shifting cultural norms toward sustainable consumption are mandatory prerequisites for building a resilient, circular socio-economic paradigm.

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