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RECYCLING PATHWAYS TOWARD A SUSTAINABLE AND INCLUSIVE GREEN ECONOMY IN SOUTH AFRICA: A NARRATIVE REVIEW OF INSTITUTIONAL AND GOVERNANCE FACTORS

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ABSTRACT

South Africa faces persistent socio-economic and environmental challenges, including high unemployment, poverty, inequality, increasing waste generation, resource depletion, and growing pressure on municipal waste management systems. These challenges have strengthened interest in the green economy as a development pathway capable of advancing environmental sustainability, economic growth, and social inclusion simultaneously. Within this context, recycling has emerged as an important mechanism for improving resource efficiency, reducing environmental degradation, conserving natural resources, and creating employment opportunities. However, existing literature has largely examined recycling from technical and environmental perspectives, with limited attention given to the governance and institutional arrangements that shape developmental outcomes. This study addresses this gap by examining recycling through an institutional governance perspective. Drawing on Green Economy Theory, Circular Economy Theory, and Institutional Theory, the study investigates how municipal governance, informal waste reclaimers, Extended Producer Responsibility (EPR), and recycling value chains interact to influence inclusive green economic development in South Africa. A qualitative narrative literature review was undertaken using peer-reviewed journal articles, government publications, policy documents, legislation, and reports from recognised national and international institutions. The review focused on literature published between 2015 and 2025, supplemented by foundational theoretical works. The study's findings reveal that recycling contributes to resource efficiency, landfill diversion, greenhouse gas mitigation, employment creation, enterprise development, and poverty alleviation. However, these outcomes depend significantly on institutional effectiveness, governance quality, stakeholder collaboration, market development, and implementation capacity. The review further demonstrates that informal waste reclaimers are central actors within South Africa's recycling economy, while municipal governance remains the primary enabling institution for recycling performance. Although EPR has strengthened producer accountability and resource mobilisation, its effectiveness remains dependent on institutional coordination and implementation capacity. The study develops an Integrated Governance Framework that links municipal governance, informal waste reclaimers, EPR, and the recycling industry within a single analytical model. The framework demonstrates that governance quality mediates the relationship between recycling interventions and developmental outcomes. The paper concludes that strengthening municipal institutional capacity, integrating informal waste reclaimers, enhancing EPR implementation, expanding markets for recycled materials, and promoting collaborative governance are essential for maximising recycling's contribution to inclusive green economic development and South Africa's transition towards a resilient circular economy.

Key words: Recycling, Municipal Governance, Extended Producer Responsibility, Informal Waste Reclaimers, South Africa

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INTRODUCTION

South Africa faces persistent socio-economic and environmental challenges, including high unemployment, poverty, inequality, increasing waste generation, resource depletion, and growing pressure on municipal waste management systems [1-4]. These challenges have intensified interest in the green economy as a development pathway that promotes environmental sustainability, economic growth, and social inclusion simultaneously [5,6].

In this context, recycling has emerged as a strategic mechanism to improve resource efficiency, reduce environmental degradation, conserve natural resources, and create employment opportunities. Existing studies show that recycling contributes to landfill diversion, greenhouse gas mitigation, resource conservation, and economic development through the recovery and re-use of materials [7, 8, 13, 14, 15, 25, 43, 44]. Consequently, recycling is increasingly recognised as a key component of circular economy transitions and sustainable development strategies.

Despite these benefits, much of the literature examines recycling primarily from technical, engineering, or environmental perspectives. Comparatively less attention has been devoted to the governance and institutional arrangements that influence recycling outcomes. As a result, there is limited understanding of how recycling contributes to broader objectives such as employment creation, poverty reduction, social inclusion, and inclusive green economic development.

A further limitation is the tendency to analyse municipal governance, informal waste reclaimers, recycling industries, and Extended Producer Responsibility (EPR) as separate policy domains. This fragmented approach obscures the interactions among these components and limits understanding of recycling as an integrated governance system that generates environmental, economic, and social outcomes.

South Africa provides an important case for examining these relationships. The country's recycling economy depends heavily on informal waste reclaimers who recover substantial quantities of recyclable materials before municipal collection, thereby contributing significantly to landfill diversion, resource recovery, and livelihood generation [9, 10, 11, 49]. Municipalities remain responsible for waste collection, infrastructure provision, and policy implementation, while recent EPR reforms seek to strengthen producer accountability and resource recovery systems [12, 23].

Although South Africa has adopted an increasingly comprehensive waste governance framework, outcomes remain uneven across municipalities. Limited institutional capacity, inadequate infrastructure, fragmented governance arrangements, weak stakeholder coordination, and inconsistent implementation continue to constrain recycling performance [30,34, 35, 36]. These challenges

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suggest that legislative reform alone is insufficient to maximise recycling's developmental potential.

Against this backdrop, this study examines the contribution of recycling to inclusive green economic development in South Africa through an institutional governance perspective. Drawing on Green Economy Theory, Circular Economy Theory, and Institutional Theory, the study analyses the relationships among municipal governance, informal waste reclaimers, Extended Producer Responsibility, and recycling value chains.

This study contributes in three ways. First, it develops an Integrated Governance Framework that links municipal governance, informal waste reclaimers, EPR, and recycling value chains within the broader debates on the green and circular economy. Second, it synthesises contemporary evidence on the institutional drivers and constraints affecting recycling performance in South Africa. Third, it proposes policy recommendations to strengthen governance capacity, stakeholder collaboration, market development, and inclusive participation in recycling systems. By conceptualising recycling as an institutional governance system rather than merely a waste management activity, the study provides a more comprehensive understanding of its contribution to inclusive green economic development.

Conceptual and Theoretical Framework

Conceptualising Recycling within Inclusive Green Economic Development

Recycling has evolved from a conventional waste management activity into a strategic component of green economy and circular economy transitions. By recovering and reusing materials, recycling contributes to resource conservation, waste minimisation, greenhouse gas mitigation, and reduced dependence on virgin resources while creating economic opportunities across collection, processing, and manufacturing value chains [5,7,13-15].

Despite these benefits, recycling is often examined through environmental or technical perspectives, with limited attention given to the governance arrangements that shape developmental outcomes. In developing countries, recycling performance depends not only on technology but also on institutional capacity, policy implementation, stakeholder coordination, and market development. Consequently, recycling should be understood as a socio-economic and institutional system rather than merely a waste management process.

In the South African context, recycling is sustained through the interaction of four key components. First, informal waste reclaimers recover and supply recyclable materials while creating livelihood opportunities [10,11,19,31]. Second, municipalities provide the institutional environment through planning, service delivery, infrastructure, regulation, and stakeholder coordination [22,23,34]. Third,

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Extended Producer Responsibility (EPR) creates producer accountability and mobilises financial resources for waste recovery and recycling activities [12,23]. Fourth, recycling industries convert recovered materials into economic value through secondary production processes [13, 14, 15,18].

This study, therefore, conceptualizes recycling as an integrated governance system in which interactions among these components determine environmental, economic, and social outcomes.

Theoretical Foundation

This study is informed by Green Economy Theory, Circular Economy Theory, and Institutional Theory. Together, these perspectives provide a framework for understanding how recycling contributes to inclusive green economic development.

Green Economy Theory

Green Economy Theory argues that economic growth and environmental sustainability are complementary rather than competing objectives [5,6]. The theory emphasises investments in environmentally sustainable sectors that generate employment, reduce poverty, improve resource efficiency, and support long-term development.

Within this framework, recycling is viewed as a green economic activity that transforms waste into productive resources, generates economic opportunities, and reduces environmental impacts. However, Green Economy Theory also recognises that developmental benefits depend on effective governance, institutional capacity, and inclusive participation. The theory therefore provides a useful lens for assessing the extent to which recycling contributes to inclusive green economic development in South Africa.

Circular Economy Theory

Circular Economy Theory focuses on maintaining the value of materials and products through reuse, repair, remanufacturing, and recycling [8,13-15]. Unlike linear economic systems that follow a "take-make-dispose" model, circular systems seek to keep resources in productive use for as long as possible.

Recycling plays a central role in the circular economy by facilitating the recovery and reintegration of materials into production processes. Consequently, recycling supports resource efficiency, reduces waste generation, and contributes to sustainable industrial development. However, many circular economy studies focus primarily on technological and industrial dimensions, often overlooking governance, labour, and social inclusion considerations. This study responds to this gap by examining the institutional factors that influence circular economy outcomes.

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Institutional Theory

Institutional Theory explains how rules, norms, incentives, and organisational arrangements shape social and economic outcomes [21,22]. The theory emphasises that policy effectiveness depends not only on legislation but also on the institutions responsible for implementation.

Within recycling systems, municipalities, environmental regulators, Producer Responsibility Organisations, recycling enterprises, and informal waste reclaimer organisations collectively form the institutional framework through which recycling policies are implemented. Differences in institutional effectiveness help explain why municipalities operating under similar legislative frameworks often achieve different recycling outcomes.

Institutional Theory, therefore, provides a governance perspective through which variations in recycling performance can be understood. It highlights the importance of implementation capacity, stakeholder coordination, and institutional quality in achieving environmental and developmental objectives.

Integrated Analytical Framework

Drawing on Green Economy Theory, Circular Economy Theory, and Institutional Theory, this study develops an Integrated Governance Framework for understanding recycling and inclusive green economic development.

The framework positions informal waste reclaimers, municipal governance, EPR, and recycling industries as interconnected components of a broader recycling governance system. Informal waste reclaimers supply recyclable materials; municipalities provide governance and infrastructure; EPR generates financial support and producer accountability; and recycling industries transform recovered materials into economic value.

The framework further proposes that governance quality mediates the interaction among these components. Municipal capacity influences EPR implementation, stakeholder coordination affects the integration of informal reclaimers, and institutional effectiveness shapes recycling performance and market development. Consequently, successful recycling outcomes depend not only on infrastructure or technology but also on effective governance arrangements.

The framework suggests that well-functioning recycling systems generate multiple outcomes simultaneously, including:

- improved resource efficiency
- reduced landfill dependence
- strengthened circular material flows

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- lower greenhouse gas emissions
- employment creation
- enterprise development
- poverty alleviation; and
- enhanced social inclusion

By integrating environmental, economic, social, and institutional dimensions within a single model, the framework provides a more comprehensive explanation of how recycling contributes to inclusive green economic development than approaches that examine these factors separately.

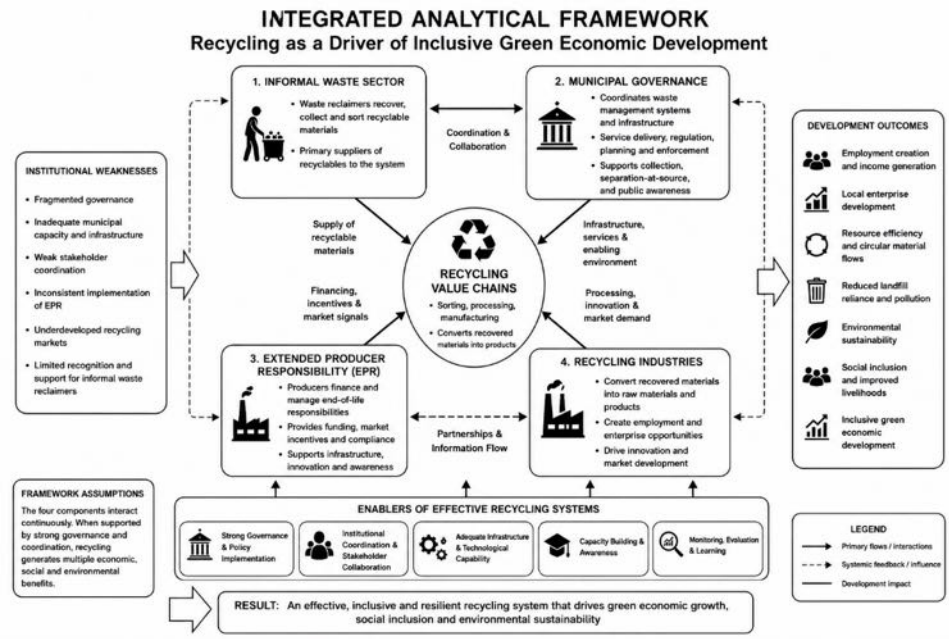


Figure 1: Integrated Analytical Framework for Recycling and Inclusive Green Economic Development

Source: Author's Own Compilation based on Green Economy Theory, Circular Economy Theory, and Institutional Theory

Literature Review

Recycling as a Pathway to Inclusive Green Economic Development

Recycling is increasingly recognised as a strategic mechanism for achieving environmental sustainability, economic development, and social inclusion. By recovering and reprocessing waste materials, recycling reduces pressure on natural resources, lowers greenhouse gas emissions, improves resource efficiency, and diverts waste from landfills [7,13-15,25]. These benefits have positioned recycling

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as a central component of both green economy and circular economy strategies. Contemporary studies further demonstrate that circular economy transitions can generate opportunities for green industrialisation, local economic development, resource efficiency, and sustainable production systems in South Africa and other developing economies [26, 27, 28, 50, 51, 52]. These studies emphasise that recycling contributes not only to environmental sustainability but also to economic diversification, innovation, and the creation of new value chains capable of supporting inclusive green economic development.

Beyond environmental benefits, recycling contributes to economic development by creating value from secondary materials, supporting enterprise development, stimulating innovation, and strengthening local value chains [17,25,44]. Recycling activities also generate employment opportunities across collection, sorting, processing, and manufacturing sectors, thereby contributing to livelihood creation and poverty reduction, particularly in developing countries [10,19,49].

However, the developmental benefits of recycling are not automatic. Evidence suggests that successful recycling systems depend on institutional capacity, governance quality, stakeholder collaboration, infrastructure provision, and market development [22,23,30,34]. Consequently, recycling outcomes should be understood as products of governance systems rather than purely technical processes.

Within South Africa, variations in recycling performance across municipalities suggest that governance effectiveness is critical to whether recycling contributes meaningfully to inclusive green economic development.

The Informal Waste Sector: From Marginalisation to Economic Recognition

The informal waste sector plays a central role in recycling systems throughout many developing countries. Informal waste reclaimers recover, sort, and supply recyclable materials to recycling industries, contributing significantly to landfill diversion, resource recovery, and circular material flows [19,31,40].

In South Africa, informal waste reclaimers constitute a critical component of the recycling economy. Studies indicate that reclaimers recover substantial quantities of recyclable materials before municipal collection occurs, thereby reducing disposal costs and increasing recycling rates [10,11,49].

Informal recycling also supports the livelihoods of individuals who are excluded from formal employment markets. Consequently, reclaimers contribute simultaneously to environmental sustainability and socio-economic development [10,31,49].

Despite these contributions, informal waste reclaimers frequently face poor working conditions, income insecurity, occupational risks, limited infrastructure, and social

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exclusion. As a result, significant debate exists regarding their integration into formal waste management systems. While some scholars advocate formalisation to improve working conditions and institutional support, others caution that excessive regulation may undermine the flexibility that characterises informal recycling systems [31, 32, 33].

The literature increasingly supports governance arrangements that combine institutional recognition with operational flexibility. Such approaches can enhance livelihood opportunities while improving access to infrastructure, training, safety measures, and markets. Evidence from South Africa indicates that informal waste reclaimers remain central to circular economy initiatives but continue to experience social and economic vulnerabilities. Studies on e-waste recovery and urban mining highlight the need for governance approaches that more effectively integrate reclaimers into resource recovery systems while improving livelihood security, skills development, and economic inclusion [54,58]. Similar observations are reported in broader international studies of waste recovery systems in developing countries, where informal workers provide substantial environmental services despite limited institutional support [39,41,42].

From a circular economy perspective, informal waste reclaimers should therefore be viewed as strategic actors within recycling systems rather than marginal participants.

Municipal Governance and Institutional Capacity

Municipal governance is widely recognised as a critical determinant of recycling performance. Municipalities are responsible for waste collection, infrastructure provision, policy implementation, planning, regulation, monitoring, and stakeholder coordination [22,23].

Institutional Theory suggests that policy outcomes depend not only on legislation but also on the effectiveness of institutions responsible for implementation. This perspective is evident within South Africa, where significant differences in recycling outcomes exist across municipalities despite a common national policy framework [30,34-36].

The literature further highlights the importance of collaborative governance. Effective recycling systems increasingly depend on partnerships among municipalities, recycling industries, Producer Responsibility Organisations, community organisations, and informal waste reclaimers. Such collaborations strengthen resource mobilisation, information sharing, and implementation effectiveness.

However, fragmented responsibilities, weak stakeholder engagement, and poor intergovernmental coordination continue to undermine recycling initiatives in many municipalities. Consequently, strengthening municipal institutional capacity remains

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essential for improving recycling performance and advancing inclusive green economic development.

Extended Producer Responsibility and the Circular Economy Transition

Extended Producer Responsibility (EPR) has become a key policy instrument for promoting resource recovery and implementing the circular economy. EPR extends producer accountability beyond production and consumption to include post-consumer waste management, thereby encouraging investment in collection, recovery, and recycling systems [12,23].

The logic underlying EPR aligns closely with Circular Economy Theory because it incentivises producers to reduce waste, improve product design, and support material recovery processes. International experience indicates that well-designed EPR systems can improve recycling performance, strengthen infrastructure development, and increase investment in recycling value chains [23].

In South Africa, mandatory EPR regulations have enhanced producer accountability and generated additional resources to support waste management and recycling initiatives [12]. However, implementation challenges remain evident. These include uneven compliance, governance weaknesses, limited transparency, fragmented institutional responsibilities, and inconsistent performance across sectors and municipalities [30,37].

A significant finding within the literature is that EPR effectiveness remains dependent upon municipal institutional capacity. Municipalities continue to perform critical functions relating to waste collection, infrastructure provision, local coordination, and regulatory oversight. As a result, municipal weaknesses may reduce the effectiveness of producer-funded initiatives.

The literature also highlights the limited integration of informal waste reclaimers within some EPR programmes. More inclusive approaches could improve collection efficiency while supporting social inclusion and livelihood development.

Contemporary South African studies further indicate that successful EPR implementation depends on transparent fee structures, effective stakeholder participation, and the inclusion of informal waste reclaimers within resource recovery systems [59,60]. Such measures strengthen the connection between producer responsibility initiatives and broader circular economy objectives by encouraging greater accountability, improved collection systems, and enhanced social inclusion.

These findings suggest that EPR should be understood as a collaborative governance system requiring effective coordination among producers, municipalities, Producer Responsibility Organisations, recycling enterprises, and informal waste reclaimers.

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South Africa's Recycling Policy Framework: Progress and Implementation Challenges

South Africa has developed an increasingly comprehensive policy framework to support waste management, recycling, and the implementation of a circular economy. Key instruments include the National Environmental Management: Waste Act, the National Waste Management Strategy, EPR Regulations, and the National Circular Economy Framework [2,12,37].

These policies increasingly recognise recycling as a mechanism for environmental sustainability, economic development, employment creation, and social inclusion. Policy frameworks also demonstrate a growing recognition of informal waste reclaimers as important contributors to resource recovery and recycling.

Recent South African circular economy scholarship emphasises the importance of context-specific definitions, circular bioeconomy development, e-waste governance, and social inclusion within policy frameworks [53,55,56]. These studies argue that successful circular economy transitions require governance approaches that recognise local socio-economic realities and institutional capacities. Household-level recycling behaviour has also emerged as an important determinant of successful recycling transitions, highlighting the need for public awareness and citizen participation in waste management programmes [57].

Despite these advances, implementation remains uneven. The literature consistently identifies a gap between policy intentions and practical outcomes. Financial constraints, inadequate infrastructure, weak monitoring systems, limited technical capacity, and fragmented governance arrangements continue to undermine the effectiveness of implementation [30,34-36].

The findings, therefore, suggest that South Africa's primary challenge lies not in the absence of policy but in the institutional capacity required to implement existing policies effectively. Greater emphasis should be placed on institutional strengthening, stakeholder coordination, and governance reform rather than additional legislative development.

Knowledge Gaps and Contribution of the Present Study

Several important gaps remain within the existing literature.

First, research on recycling is often fragmented across environmental, economic, governance, and social domains, with relatively few studies integrating these dimensions within a single analytical framework.

Second, studies on informal waste reclaimers frequently focus on livelihoods and social protection while paying limited attention to broader governance systems and institutional arrangements.

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Third, evaluations of EPR often emphasise compliance and collection targets while overlooking issues of governance quality, stakeholder collaboration, and social inclusion.

Finally, limited research has conceptualised recycling as an integrated governance system through which environmental sustainability, economic development, and social inclusion are jointly produced.

This study addresses these gaps by developing an Integrated Governance Framework that links municipal governance, informal waste reclaimers, Extended Producer Responsibility, and recycling value chains from the perspectives of the broader Green Economy, Circular Economy, and Institutional Theory. In doing so, it provides a more comprehensive explanation of how governance arrangements influence recycling outcomes and inclusive green economic development in South Africa.

RESEARCH METHODOLOGY

Research Paradigm

This study was conducted within the interpretivist research paradigm, which emphasises understanding social and institutional phenomena through the interpretation of contextual relationships and stakeholder interactions rather than through objective measurement alone [38]. The approach was appropriate because the study sought to understand how municipal governance, Extended Producer Responsibility (EPR), informal waste reclaimers, and recycling industries collectively influence recycling outcomes and inclusive green economic development in South Africa.

Research Design

The study employed a qualitative narrative literature review. A narrative review was considered suitable because the research problem spans multiple disciplines, including environmental management, governance, public administration, circular economy studies, and sustainable development.

Unlike systematic reviews that focus on narrowly defined questions, narrative reviews facilitate the synthesis of diverse evidence and theoretical perspectives. This approach enabled the study to examine recycling as an integrated governance system and to develop an Integrated Governance Framework linking municipal governance, EPR, informal waste reclaimers, and recycling value chains.

The review was guided by the following research question:

How do recycling systems, municipal governance, the informal waste sector, and Extended Producer Responsibility interact to promote or constrain inclusive green economic development in South Africa?

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Scope of the Review

The review focused on the governance dimensions of recycling and their contribution to inclusive green economic development in South Africa. Four interrelated themes were examined:

- municipal governance and institutional capacity
- informal waste reclaimers and livelihood generation
- Extended Producer Responsibility implementation
- recycling value chains and circular economy development.

The review primarily considered literature published between 2015 and 2025. Earlier publications were included only where they provided foundational theoretical insights relevant to Green Economy Theory, Circular Economy Theory, and Institutional Theory [5-8,21,22].

Literature Search Strategy

A structured literature search was conducted between January and April 2025 using the following databases:

- Scopus
- Web of Science
- ScienceDirect
- SpringerLink
- Google Scholar

Searches used combinations of key words and Boolean operators, including:

- “Recycling” AND “South Africa”
- “Green economy” AND “recycling”
- “Circular economy” AND “waste management”
- “Municipal governance” AND “waste management”
- “Informal waste reclaimers” OR “waste pickers”
- “Extended Producer Responsibility” OR “EPR”
- “Institutional governance” AND “recycling”
- “Inclusive green economic development”

The database search was supplemented by government publications, legislation, policy documents, and reports from recognised national and international organisations.

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The search process yielded approximately 312 records. After removing duplicates and screening titles and abstracts, 198 sources remained. Following full-text review, 121 publications were assessed for eligibility, and 87 sources were retained for final analysis.

Inclusion and Exclusion Criteria

Inclusion Criteria

Sources were included if they:

- addressed recycling, waste management, circular economy, governance, EPR, or informal waste recovery
- focused on South Africa or comparable developing-country contexts
- provided empirical, theoretical, or policy-related evidence relevant to the study
- were peer-reviewed articles, books, government publications, legislation, or reports from recognised institutions
- were published in English.

Exclusion Criteria

Sources were excluded if they:

- were unrelated to the study objectives
- focused solely on technical recycling processes without governance implications
- consisted only of conference abstracts
- lacked empirical or theoretical support
- duplicated already included sources
- lacked institutional credibility or methodological transparency.

Quality Assessment of Sources

To enhance rigour, all sources were assessed according to four criteria:

Credibility

Preference was given to peer-reviewed literature and publications from recognised institutions such as UNEP, OECD, World Bank, DFFE, CSIR, and SALGA.

Relevance

Sources were evaluated based on their contributions to understanding recycling governance, circular economy transitions, EPR, and inclusive green economic development.

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Methodological Quality

Empirical studies were assessed based on the clarity of their research design, analytical procedures, and evidential support.

Analytical Contribution

Priority was given to sources that offered theoretical, governance, or policy insights relevant to the study's objectives.

Data Analysis and Synthesis

The selected literature was analysed using thematic content analysis.

The analysis followed four stages:

Stage 1: Familiarisation

Relevant literature was read and reviewed to identify key concepts, arguments, and findings.

Stage 2: Coding

Recurring concepts were coded, including:

- municipal governance
- institutional capacity
- stakeholder collaboration
- informal waste reclaimers
- recycling value chains
- circular economy
- EPR
- environmental sustainability
- employment creation; and
- social inclusion

Stage 3: Theme Development

Related codes were grouped into broader analytical themes aligned with the study objectives.

Stage 4: Interpretive Synthesis

Findings were integrated across themes to explain how governance arrangements influence recycling performance and developmental outcomes. This process informed the development of the Integrated Governance Framework.

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Trustworthiness of the Review

The trustworthiness of the review was strengthened through the following measures:

Credibility

Evidence from peer-reviewed literature was triangulated with policy documents and institutional reports.

Dependability

A transparent search strategy and clearly defined inclusion criteria enhanced consistency and replicability.

Confirmability

Interpretations were grounded in published evidence and continuously compared across multiple sources.

Transferability

The review incorporated evidence from South Africa and comparable developing-country contexts, enabling broader application of the findings.

Ethical Considerations

The study relied exclusively on publicly available secondary sources and did not involve human participants or primary data collection. Consequently, ethical approval was not required.

Nevertheless, the study adhered to accepted principles of academic integrity, transparency, and responsible scholarship by accurately representing and acknowledging all sources.

RESULTS AND DISCUSSION

The findings indicate that recycling serves as an institutional mechanism to advance environmental sustainability, economic development, and social inclusion simultaneously. Consistent with Green Economy Theory, recycling contributes to resource efficiency, landfill diversion, employment creation, and economic opportunity. However, these benefits depend largely on the quality of governance rather than on recycling activities alone [5,6].

A key finding is that recycling outcomes are strongly shaped by institutional effectiveness. Municipalities operating under similar policy frameworks often achieve different outcomes because of variations in infrastructure, financial resources, leadership, stakeholder coordination, and implementation capacity [21,22,30,34-36]. This finding supports Institutional Theory, which emphasises that development outcomes depend not only on policy design but also on institutional capability.

The review further shows that informal waste reclaimers play a critical role in South Africa's recycling economy. Their contribution extends beyond material recovery to

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employment creation, poverty alleviation, and resource conservation [10,11,19,49]. Despite this contribution, many remain marginalised within formal waste management systems, highlighting the need for governance arrangements that combine recognition, protection, and operational flexibility.

Municipal governance emerged as the principal enabling factor influencing recycling performance. Effective municipalities provide infrastructure, coordinate stakeholders, implement policy, and facilitate partnerships that strengthen recycling systems. Conversely, weak institutional capacity constrains implementation and limits developmental outcomes [30,34-36].

Similarly, EPR has strengthened producer accountability and provided new financial resources for recycling initiatives. However, its effectiveness remains dependent on municipal capacity, institutional coordination, and stakeholder participation. More inclusive EPR arrangements, particularly those incorporating informal waste reclaimers, could enhance both efficiency and social inclusion [12,23,37].

These findings informed the development of the Integrated Governance Framework, which conceptualises recycling as a coordinated system comprising municipal governance, informal waste reclaimers, EPR, and recycling industries. The framework demonstrates that governance quality mediates the relationships among these components and ultimately determines the extent to which recycling contributes to inclusive green economic development.

The findings are consistent with recent South African circular economy research, which emphasises the importance of governance quality, social inclusion, market development, and institutional capacity in supporting resource recovery systems and recycling value chains [52-58]. Emerging evidence further suggests that strengthening circular economy markets can create new opportunities for green industrialisation, enterprise development, and employment creation, thereby reinforcing the role of recycling as a catalyst for inclusive green economic development [61].

Policy Implications

The findings suggest that South Africa's principal challenge is not the absence of policy frameworks supporting recycling, but weaknesses in implementation and governance. While the country has established a comprehensive legislative framework, institutional constraints continue to limit recycling's contribution to inclusive green economic development [2,12,37].

Strengthening Municipal Institutional Capacity

Municipal governance emerged as the most important determinant of recycling performance. Improving recycling outcomes, therefore, requires investments in:

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- recycling infrastructure and equipment
- separation-at-source programmes
- material recovery facilities
- waste information systems
- technical skills development; and
- monitoring and evaluation mechanisms.

Particular support should be directed towards rural and under-resourced municipalities that face significant financial and technical constraints [34-36].

Advancing the Integration of Informal Waste Reclaimers

Informal waste reclaimers play a critical role in material recovery and livelihood generation [10,11,49]. However, many continue to experience precarious working conditions and limited institutional support.

Policy interventions should promote their integration through:

- access to sorting and storage facilities
- protective equipment
- training programmes
- market access support
- inclusion in municipal planning processes; and
- support for cooperatives and representative organisations.

Integration efforts should balance institutional recognition with operational flexibility to protect both livelihoods and recycling efficiency [31-33].

Enhancing Extended Producer Responsibility

Extended Producer Responsibility has strengthened producer accountability and generated additional resources for recycling systems [12,23]. However, improving its effectiveness requires:

- stronger regulatory oversight
- improved transparency and accountability
- enhanced monitoring systems
- greater stakeholder participation; and
- stronger coordination between producers and municipalities.

More inclusive EPR arrangements that actively incorporate informal waste reclaimers would improve both collection efficiency and social inclusion.

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Expanding Domestic Markets for Recycled Materials

The long-term success of recycling depends on viable markets for secondary materials. Policies should therefore stimulate demand for recycled products through:

- green public procurement
- tax incentives for recycled-content manufacturing
- support for innovation and research
- investment incentives; and
- financing mechanisms for recycling enterprises

Market assessments indicate considerable opportunities for expanding South Africa's circular and waste economy through investments in recycling industries, secondary material markets, value-added manufacturing, and circular business models [61]. Strengthening these markets would improve the commercial viability of recycling activities while enhancing employment creation and industrial competitiveness.

Stronger domestic markets would improve the commercial viability of recycling and promote the development of the circular economy.

Promoting Collaborative Governance

Recycling systems involve multiple stakeholders, including municipalities, producers, recycling industries, informal waste reclaimers, communities, and regulators. Effective recycling therefore depends on collaboration and coordination among these actors.

Government should strengthen mechanisms that support:

- stakeholder participation
- information sharing
- joint planning
- collaborative investment; and
- coordinated monitoring and evaluation

Integrated governance arrangements are likely to produce more sustainable outcomes than isolated interventions.

Broadening Recycling Performance Indicators

Traditional measures of recycling performance focus primarily on recycling rates and waste diversion. However, recycling contributes to a broader set of developmental outcomes.

Future assessment frameworks should incorporate indicators relating to:

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- employment creation
- enterprise development
- poverty reduction
- social inclusion
- stakeholder participation
- institutional effectiveness
- market development; and
- greenhouse gas reductions

Such indicators would provide a more comprehensive evaluation of recycling's contribution to inclusive green economic development.

Policy Synthesis

The study identifies five strategic priorities for strengthening recycling governance in South Africa:

- Strengthen municipal institutional capacity
- Promote the inclusive integration of informal waste reclaimers
- Improve the effectiveness of Extended Producer Responsibility systems
- Expand domestic markets for recycled materials
- Enhance stakeholder collaboration through integrated governance arrangements.

Collectively, these interventions would strengthen South Africa's transition towards a more inclusive, resource-efficient, and circular economy.

CONCLUSION AND RECOMMENDATIONS FOR DEVELOPMENT

This study examined the contribution of recycling to inclusive green economic development in South Africa by analysing the relationships among municipal governance, informal waste reclaimers, Extended Producer Responsibility, and recycling value chains. Drawing on Green Economy Theory, Circular Economy Theory, and Institutional Theory, the study conceptualised recycling as an integrated governance system rather than a standalone waste management activity.

The review found that recycling contributes to resource efficiency, landfill diversion, environmental sustainability, employment creation, enterprise development, and poverty alleviation. However, these benefits depend on institutional effectiveness, governance quality, stakeholder coordination, and implementation capacity rather than policy frameworks alone.

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A key contribution of the study is the development of an Integrated Governance Framework that links municipal governance, informal waste reclaimers, EPR, and recycling industries within a single analytical model. The framework demonstrates that governance quality mediates the relationship between recycling interventions and developmental outcomes.

The findings further suggest that South Africa's principal recycling challenge is institutional rather than legislative. Existing policies provide a strong foundation, but weaknesses in municipal capacity, stakeholder coordination, infrastructure provision, and the integration of informal waste reclaimers continue to constrain outcomes.

The study concludes that strengthening municipal governance, enhancing EPR implementation, supporting informal waste reclaimers, expanding recycling markets, and promoting collaborative governance are essential for maximising recycling's contribution to inclusive green economic development.

Future research should empirically test the Integrated Governance Framework across municipalities and explore the governance mechanisms most strongly associated with successful recycling outcomes. Such research would contribute to a deeper understanding of how recycling can support South Africa's transition towards a resilient, inclusive, and sustainable circular economy.

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Conflict of Interest

None

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