



Theme: Innovations for Sustainable Development in a Changing World

***Title: African Pathways to the Three Zeros: Operationalizing Yunus Social Business
Principles for Sustainable Development***

Joyce Momanyi Nyangweso, Moses Kanyambindwa

Tangaza University Nairobi Kenya



Abstract

Globally, persistent poverty, food insecurity, climate vulnerability, environmental degradation, and widening inequality demonstrate the limitations of fragmented approaches to sustainable development. Although the Sustainable Development Goals (SDGs) and Muhammad Yunus's Three Zeros—Zero Poverty, Zero Hunger, and Zero Carbon Emissions—provide complementary visions, a significant research gap remains concerning how these aspirations can be operationalized through locally embedded economic systems. This study addresses this gap by examining how Yunus Social Business principles can be integrated with circular economy practices, waste valorization, sustainable livelihoods, and climate-smart agriculture. A qualitative conceptual research design was employed, combining systematic analysis of recent literature, institutional evidence, and African case illustrations from Kenya, Rwanda, Nigeria, Uganda, and Ethiopia. Systems Theory, Social Business Theory, and Sustainable Development Theory were used to guide the interpretation and construction of the proposed framework. Findings indicate that waste valorization can function as a strategic development mechanism linking employment generation, food production, resource recovery, and carbon mitigation. Evidence from African cases demonstrates that social enterprises and informal workers can contribute substantially to circular transitions when supported by appropriate institutional arrangements, finance, markets, and participatory governance. The study further finds that composting and other organic-resource recovery practices can strengthen climate-resilient agriculture and food security. The principal contribution is the development of an integrated **African waste–food–climate social business framework** that translates the Three Zeros from global aspirations into operational pathways. The study therefore positions social business as a potential institutional mechanism for connecting circularity, inclusion, climate resilience, and sustainable development.

Keywords: Three Zeros; Yunus Social Business; Circular Economy; Waste Valorization; Sustainable Development; Climate Resilience; Social Enterprise; Africa.



1. Introduction

Sustainable development is increasingly understood as a complex system challenge rather than a collection of independent policy objectives. Poverty, food insecurity, climate change, environmental degradation, unemployment, and resource scarcity interact through reinforcing social, economic, and ecological relationships. Consequently, interventions that address one problem while ignoring its connections with other systems frequently produce limited or temporary outcomes.

The global waste crisis provides a particularly important illustration of this problem. Municipal solid waste generation continues to increase with urbanization, population growth, consumption, and economic transformation. The World Bank estimates that global municipal solid waste generation could reach approximately 3.4 billion tonnes annually by 2050 if current trajectories persist (Kaza et al., 2018). More recent global assessments emphasize that waste management is not simply a sanitation challenge but an issue of climate mitigation, resource productivity, public health, employment, and social inclusion (UNEP, 2024).

The African context is particularly significant. Rapid urbanization is occurring alongside institutional and infrastructural constraints, resulting in considerable dependence on informal waste collection, recovery, and recycling. Research increasingly demonstrates that informal workers are not merely marginal participants in waste systems; they perform important environmental and economic functions that formal institutions frequently cannot provide effectively (Surchat et al., 2024; Koromaa et al., 2025). Yet their contribution remains insufficiently integrated into formal circular-economy policy.

At the same time, Africa faces considerable climate-related pressures on agricultural production and food security. Climate variability, drought, changing rainfall patterns, land degradation, and extreme weather events disproportionately affect smallholder producers and low-income



communities (Zougmore et al., 2021; Abegunde & Obi, 2022). The result is a convergence of environmental, economic, and food-system vulnerabilities.

These conditions create an important theoretical and practical opportunity. Rather than treating waste, poverty, agriculture, and climate change as separate policy domains, they can be approached as components of an interconnected development system. Yunus Social Business offers one possible institutional mechanism because it places social problem-solving at the centre of enterprise activity while requiring financial sustainability and reinvestment of surplus into social objectives (Yunus, 2010).

The Three Zeros vision provides the normative destination: **Zero Poverty, Zero Hunger, and Zero Carbon Emissions**. The SDGs similarly establish an integrated global development agenda, particularly through SDGs 1, 2, 8, 11, 12 and 13 (United Nations, 2023). The unresolved question is therefore not whether these goals are desirable, but how they can be connected through practical systems capable of generating simultaneous social, economic, and environmental value.

This study responds to that challenge by examining how Yunus Social Business principles can be operationalized through waste valorization and climate-smart agricultural linkages in African contexts.

2. Problem Statement

Fragmentation as the central development problem

The principal problem identified by this study is the **fragmentation of systems addressing poverty, food insecurity, waste, and climate change**. Waste management policies frequently emphasize collection and disposal, poverty-reduction programmes emphasize income generation, agricultural programmes emphasize productivity, and climate policies emphasize emissions and



adaptation. Although these interventions address legitimate objectives, their institutional separation limits opportunities for achieving synergistic outcomes.

Recent African research demonstrates the persistence of this problem. Studies of circular-economy transitions in Kenya identify financing constraints, weak regulatory structures, limited awareness, and institutional fragmentation as significant barriers to moving from circular-economy policy to implementation (Mulindwa et al., 2024). Research on Sub-Saharan Africa similarly identifies institutional, financial, technological, and infrastructural limitations as constraints on effective circular waste management (Debrah et al., 2022).

The problem is therefore narrower than inadequate waste management alone. It concerns the absence of an operational mechanism capable of connecting **waste resources, livelihoods, food production, climate resilience, and social enterprise** within a single development architecture.

Research question

The study addresses the following question

How can Yunus Social Business principles be operationalized through waste valorization and climate-smart agriculture to contribute simultaneously to Zero Poverty, Zero Hunger, and Zero Carbon Emissions in African development contexts?

Research hypothesis

The study was guided by the following proposition

H₁: Integrating Yunus Social Business principles with waste valorization and climate-smart agriculture generates mutually reinforcing social, economic, and environmental outcomes that contribute to the Three Zeros.



This proposition does not assume that social business alone can achieve the Three Zeros. Rather, it proposes that social business can function as an institutional mechanism for coordinating resources, actors, markets, and reinvestment around these interconnected objectives.

3. Literature Review

Waste management and circular economy in Africa

The conventional waste-management model remains predominantly linear: resources are extracted, consumed, discarded, collected, transported, and ultimately disposed of. Such systems are increasingly incompatible with resource constraints and climate objectives.

Circular economy scholarship instead conceptualizes waste as a potential input into subsequent production processes (Geissdoerfer et al., 2017; Kirchherr et al., 2017). In African settings, this transition has particular significance because resource recovery can create economic opportunities while addressing environmental pressures.

Recent African scholarship provides evidence of emerging circular practices. Research from Uganda documented businesses applying circular principles across plastics, agriculture, textiles, carpentry, and packaging, demonstrating that circularity can extend beyond conventional recycling (Buda, 2022). Research from Kigali has similarly examined the circularity of waste-management and recycling enterprises, illustrating the emergence of institutional experimentation around resource recovery (Mulindwa et al., 2024).

However, evidence also shows that circularity is not automatically socially inclusive. The expansion of circular enterprises may reproduce existing inequalities unless informal workers, women, and marginalized communities are incorporated into decision-making and value creation. Recent research from Rwanda demonstrates the importance of recognizing the experiences of female and male waste workers in designing socially just circular systems (Surchat et al., 2024).



Social business and inclusive development

Yunus's Social Business concept challenges the assumption that enterprises must prioritize shareholder profit maximization. Its central proposition is that enterprise can be organized around solving social problems while maintaining financial sustainability and reinvesting returns to expand social impact (Yunus, 2010).

The relevance of this model to African development lies in its potential to bridge two limitations: the dependency associated with purely donor-funded interventions and the exclusion that can accompany purely commercial models. A social business can create market-based revenue while retaining an explicit social mission.

Recent research on social enterprises in East Africa shows that enterprises increasingly combine economic, social, and environmental objectives, although their circular strategies remain constrained by finance, technology, institutional support, and market access (Cau & Ciambotti, 2024). This evidence supports the argument that the challenge is not the absence of entrepreneurial activity but the absence of institutional systems that enable such enterprises to scale.

Informal waste workers and inclusive circularity

Informal waste workers represent an important but historically marginalized component of African waste systems. They collect, sort, transport, and sell recoverable materials, frequently performing functions that reduce municipal waste-management costs.

Recent research emphasizes that waste pickers make substantial contributions to urban sustainability while simultaneously experiencing economic insecurity, stigma, gender inequality,



and weak social protection (Koromaa et al., 2025). Rwanda provides an especially useful illustration: research involving waste workers shows that biowaste recycling can generate employment and environmental benefits but that worker experiences must be incorporated into circular-economy design (Surchat et al., 2024).

The literature therefore suggests that inclusion should not be treated as an additional benefit of circularity. It should be considered a **design principle**. A socially inclusive circular economy requires workers to participate in governance, benefit from value creation, develop skills, and gain improved access to markets and institutional recognition.

Waste, agriculture, and food security

The relationship between organic waste and agricultural productivity provides a second important pathway. Compost and other forms of organic-resource recovery can improve soil structure, nutrient availability, water retention, and agricultural resilience.

Evidence from Ethiopia is particularly relevant. Teklu, Simane and Bezabih (2024) found that adoption of climate-smart practices including compost, crop-residue management, and agroforestry was associated with improvements in food and nutrition security. Their findings provide empirical support for the proposition that resource recovery from organic materials can contribute to food-system resilience.

The broader African literature similarly emphasizes climate-smart agriculture as a mechanism for strengthening resilience under changing climatic conditions (Zougmore et al., 2021; Abegunde & Obi, 2022). However, the waste–agriculture connection remains insufficiently integrated into development policy.

The research gap



The literature reveals considerable progress in three areas: circular economy, social enterprise, and climate-smart agriculture. The weakness lies in their **limited integration into a unified institutional framework**.

Three specific gaps emerge.

First, circular-economy research often emphasizes resource efficiency without sufficiently explaining how circular systems can be structured around poverty reduction and social inclusion.

Second, social-business research has historically concentrated on poverty, finance, health, and essential services, with comparatively less attention to environmental-resource systems.

Third, climate-smart agriculture research has established the importance of resilience and resource management but has rarely positioned municipal and community waste systems as an institutional input into agricultural transformation.

This study addresses these gaps by connecting the three domains through Yunus Social Business principles and the Three Zeros framework.

4. Theoretical Framework

Social Business Theory

Social Business Theory provides the **institutional mechanism** for the proposed model. Its role is to determine how economic activities can be organized around social and environmental objectives.

Three principles are particularly important: social purpose, financial sustainability, and reinvestment. Applied to waste management, these principles imply that revenue generated through recovered materials should not simply maximize private returns but should contribute to



expanding collection systems, worker development, environmental restoration, and community services.

Thus, Social Business Theory determines **who benefits, how value is distributed, and how financial returns are reinvested.**

Systems Theory

Systems Theory provides the **analytical lens**. It directs attention away from isolated interventions toward relationships, feedback loops, interdependencies, and unintended consequences (Meadows, 2008).

Under this perspective, waste is simultaneously an environmental output, an economic resource, an agricultural input, and a potential livelihood source. A discarded organic material can therefore be understood as a lost economic opportunity, a potential methane source, and a potential agricultural input depending on the system in which it is located.

Systems thinking consequently informs the design of pathways connecting waste collection, processing, agriculture, markets, employment, and climate outcomes.

Sustainable Development Theory

Sustainable Development Theory provides the **normative framework**. It establishes the requirement that economic development, social inclusion, and environmental protection must be considered together.

The Three Zeros operationalize this normative dimension by linking poverty, hunger, and carbon reduction. The SDGs reinforce the same principle through their interconnected architecture (United Nations, 2023).



The integrated theoretical logic

The three theories therefore perform different but complementary functions:

Social Business Theory determines the institutional and economic model.

Systems Theory explains relationships among actors, resources, and outcomes.

Sustainable Development Theory establishes the desired social, economic, and environmental outcomes.

The resulting theoretical architecture is therefore:

Social Business → institutional mechanism

Systems Thinking → analytical mechanism

Sustainable Development → normative objective

This integration provides the foundation for the study's conceptual framework.

5. Methodology

Research design

The study employed a qualitative, conceptual, and integrative research design. This design was selected because the principal objective was not to estimate a causal effect statistically but to construct and critically assess an operational framework connecting concepts that are usually investigated separately.



The study synthesizes peer-reviewed literature, international institutional reports, African case evidence, and theoretical scholarship on social business, circular economy, waste management, climate-smart agriculture, and sustainable development.

Source selection

Priority was given to literature published between 2020 and 2025 in order to reflect contemporary African policy and research debates. Earlier foundational sources were retained where they were necessary to establish the theoretical origins of circular economy, systems thinking, sustainable development, and Yunus Social Business.

Sources were considered relevant when they met at least one of four criteria: African geographical relevance; direct examination of circular economy or waste systems; empirical examination of social enterprise or informal workers; or analysis of climate-smart agriculture and food security.

Case-informed analysis

The framework was informed by documented cases from Kenya, Rwanda, Uganda, Nigeria, and Ethiopia. These cases were not treated as a statistically representative sample of Africa. Rather, they were selected as **illustrative cases** demonstrating different components of the proposed system.

Kenya provides evidence of emerging social-business and circular-economy acceleration. The Yunus Environment Hub reports that its Kenyan accelerator supported social businesses seeking to combine economic viability, environmental responsibility, and social impact (Yunus Environment Hub, 2023). Rwanda provides evidence regarding informal biowaste workers and socially inclusive circularity (Surchat et al., 2024). Uganda provides examples of enterprises implementing circular practices across different sectors (Buda, 2022). Ethiopia provides empirical



evidence connecting compost and climate-smart agricultural practices with food security (Teklu et al., 2024).

Analytical procedure

The analysis followed four stages. First, existing linear waste-system limitations were identified. Second, relationships among waste, livelihoods, food systems, and climate outcomes were mapped. Third, Yunus Social Business principles were applied to identify possible institutional mechanisms. Fourth, the resulting relationships were organized into strategic pathways linking inputs, processes, outputs, and Three Zeros outcomes.

Limitations

The study is conceptual and therefore does not claim to establish causal relationships between social business interventions and the Three Zeros. The case illustrations provide evidence of component relationships rather than experimental validation of the complete framework.

Consequently, future research should test the framework through longitudinal case studies, comparative field research, social-return measurements, carbon accounting, livelihood indicators, and agricultural productivity assessments.

6. Findings

Waste can be repositioned as a productive development asset



The first major finding is that waste should not be conceptualized exclusively as an environmental liability. Organic materials, recyclable products, and other recoverable resources possess economic value when appropriate systems exist for collection, processing, and market integration.

This finding is consistent with African circular-economy evidence. Studies in Uganda have documented enterprises that transform waste and residual materials into productive inputs across agriculture, plastics, textiles, and other sectors (Buda, 2022). Research in Rwanda similarly demonstrates the potential for biowaste recycling to contribute to green employment and environmental sustainability (Surchat et al., 2024).

The significance of this finding extends beyond recycling. Waste valorization changes the economic meaning of disposal. Instead of paying to move waste from communities to dumpsites, communities can potentially generate value from the same material through compost, recycled products, biogas, and other resource-recovery activities.

The proposed system therefore treats waste as an **economic asset within a circular development system**.

Social business can provide the missing institutional mechanism

The second finding is that technical waste recovery alone is insufficient. A sustainable system requires an institutional model capable of coordinating social purpose, finance, markets, workers, and reinvestment.

Yunus Social Business provides such a potential mechanism. The model links commercial activity to explicit social objectives and reinvestment, thereby addressing a central weakness in conventional waste systems: the separation of economic incentives from social and environmental outcomes.



Evidence from Kenya is particularly relevant. The CirculaRise programme supported social businesses working on circular solutions and sought to bridge economic viability, environmental responsibility, and social impact (Yunus Environment Hub, 2023). This provides practical evidence that social-business approaches can be connected to circular-economy transitions.

The finding therefore supports the proposition that **social business can function as an institutional bridge between circular economy and sustainable development.**

Inclusive livelihoods are central rather than peripheral

The third finding is that youth, women, and informal waste workers should be treated as economic actors rather than passive beneficiaries.

Recent African research demonstrates that waste pickers perform essential environmental functions but remain marginalized within formal policy structures (Koromaa et al., 2025). Research in Rwanda further demonstrates that the experiences of women and men involved in waste work differ and must be incorporated into socially just circular systems (Surchat et al., 2024).

This evidence modifies the conventional interpretation of the waste-to-wealth concept. The central question should not simply be how much waste is recovered, but **who controls, processes, and benefits from the recovered value.**

The social-business framework therefore proposes worker participation in ownership structures, cooperatives, governance mechanisms, training, and value-added processing.

This creates a direct pathway toward Zero Poverty by transforming precarious informal work into more stable livelihood opportunities.

Waste valorization can strengthen food-system resilience



The fourth finding concerns the waste–agriculture relationship. Organic-resource recovery can contribute to food security when compost and related products are incorporated into climate-smart farming systems.

Evidence from Ethiopia is particularly strong. Teklu et al. (2024) found positive associations between adoption of compost and other climate-smart agricultural practices and household food and nutrition security. This supports the proposed pathway from organic waste recovery to soil improvement and agricultural resilience.

The significance of this finding is that waste policy can become agricultural policy when organic materials are recovered and safely returned to productive soils.

The resulting circular relationship is:

Organic waste → compost/resource recovery → soil improvement → agricultural productivity → food security.

This pathway provides a practical mechanism through which Zero Hunger can be connected to waste management.

Circular systems can contribute to carbon reduction

The fifth finding is that shifting from disposal toward resource recovery can contribute to low-carbon development.

Organic waste disposed under anaerobic conditions can generate methane, while recycling and resource recovery can reduce the demand for virgin materials and associated environmental impacts. Consequently, circular waste systems can contribute to climate mitigation while simultaneously creating economic value.



However, the study emphasizes that the carbon benefits of circularity should not simply be assumed. They should be measured through appropriate lifecycle and emissions assessments. The framework therefore proposes carbon accounting as a key component of future implementation.

The Three Zeros framework thus becomes more operational when Zero Carbon Emissions is connected to measurable indicators such as waste diversion, methane avoidance, material recovery, renewable-energy generation, and lifecycle emissions.

Community governance is a critical enabling condition

The sixth finding is that technological interventions alone cannot produce sustainable transformation.

Recent research shows that African circular transitions face institutional, financial, regulatory, and capacity constraints (Debrah et al., 2022; Mulindwa et al., 2024). These findings indicate that successful implementation requires governance arrangements that connect communities, municipalities, enterprises, workers, financial institutions, and researchers.

Participatory governance is therefore positioned as an enabling mechanism rather than an optional component.

The proposed framework requires communities to participate in system design, monitoring, accountability, and value creation. This increases local ownership while ensuring that social objectives remain central to enterprise activity.

7. Integrated African Waste–Food–Climate Framework

From waste collection to regenerative development

The findings support an integrated framework consisting of five interconnected stages.



Resource mobilization

Organic waste, recyclable materials, human labour, community knowledge, finance, and institutional support constitute the system's primary resources.

Social-business organization

These resources are organized through enterprises, cooperatives, community businesses, or partnerships structured around social objectives and financial sustainability.

Value creation

Waste is segregated, processed, composted, recycled, transformed, and reintroduced into productive systems.

Social and environmental reinvestment

Financial returns are reinvested in worker development, infrastructure, technology, environmental restoration, agricultural services, and enterprise expansion.

Three Zeros outcomes

The system produces interconnected outcomes:

Zero Poverty through employment, enterprise development, income generation, and skills.

Zero Hunger through compost, regenerative agriculture, improved soil health, and food-system resilience.



Zero Carbon Emissions through waste diversion, methane reduction, recycling, resource efficiency, and low-carbon production.

The critical insight is that these outcomes are not separate projects. They are **interdependent outputs of the same system**.

8. Discussion

From fragmented interventions to systemic transformation

The findings demonstrate that the major development challenge is not a shortage of individual solutions. Africa already possesses waste entrepreneurs, informal recovery systems, agricultural knowledge, community organizations, and emerging circular enterprises.

The problem is the weak integration of these components.

This finding is consistent with recent East African research showing that circular social enterprises face institutional and financial barriers despite their potential contribution to sustainable development (Cau & Ciambotti, 2024). The proposed framework responds by positioning social business as the institutional architecture through which fragmented activities can become mutually reinforcing.

The Three Zeros as an operational framework

The Three Zeros framework has substantial normative power, but its value for development practice depends on operationalization.

The study proposes that each Zero should be associated with measurable pathways.

Zero Poverty can be monitored through employment, household income, enterprise survival, skills development, and worker participation.



Zero Hunger can be assessed through agricultural productivity, soil health, household food security, dietary diversity, and adoption of regenerative practices.

Zero Carbon Emissions can be assessed through waste diversion, methane avoidance, material recovery, renewable-energy production, and lifecycle emissions.

This converts the Three Zeros from a broad vision into a framework capable of guiding monitoring and evaluation.

9. Policy and Development Implications

Local government

Municipal governments should move beyond collection and disposal functions toward resource-recovery systems. Waste policies should integrate circular-economy planning with climate adaptation, agricultural development, employment, and local economic development.

Communities and informal workers

Informal workers should be formally recognized as participants in circular economies. Cooperative structures, occupational safety, training, market access, and participation in governance can increase both social protection and system efficiency.

Social enterprises

Social businesses can develop decentralized composting, recycling, biogas, material-recovery, and agricultural-input enterprises. Their distinguishing feature should be the reinvestment of returns into measurable social and environmental impact.



Financial institutions

Conventional financing mechanisms often fail to accommodate enterprises operating simultaneously for financial, social, and environmental objectives. Blended finance, patient capital, impact investment, and outcome-based financing could improve the scalability of such enterprises.

Research institutions

Universities and research organizations should develop measurement systems capable of simultaneously evaluating livelihood, food-security, circularity, and carbon outcomes.

10. Scholarly Contribution and Novelty

The principal contribution of this paper is theoretical, methodological, and practical.

Theoretically, it brings **Yunus Social Business Theory, Systems Theory, and Sustainable Development Theory** into a single analytical architecture.

Conceptually, it links three domains that are frequently studied separately: **circular waste management, climate-smart food systems, and inclusive livelihoods**.

Practically, it provides strategic action pathways through which waste resources can be transformed into employment, agricultural inputs, and climate-mitigation opportunities.

Most importantly, the paper advances a novel proposition: **Yunus Social Business principles can serve as an institutional mechanism for operationalizing the Three Zeros through an African waste–food–climate nexus**.



Rather than claiming that no previous study has examined any individual component, the novelty lies specifically in the **integration and operationalization of these components within a single African-oriented framework.**

This distinction is important for international scholarship because circular-economy research increasingly recognizes the importance of social inclusion, while African social-enterprise research recognizes the importance of environmental sustainability. What remains comparatively underdeveloped is a framework explaining how these dimensions can be deliberately coordinated toward the Three Zeros.

11. Limitations and Future Research

The principal limitation is the conceptual nature of the study. Although recent empirical evidence and African case illustrations strengthen the framework, the study does not provide primary field data testing the complete causal chain.

Future research should therefore undertake comparative case studies across African cities and rural communities. Such research could measure changes in household income, employment, waste diversion, compost production, crop productivity, food security, and greenhouse-gas emissions.

Longitudinal research would be particularly valuable because social-business systems require time to establish markets, institutional relationships, worker organizations, and reinvestment mechanisms.

Future studies should also investigate gender-specific outcomes because recent evidence demonstrates that women and men experience waste-sector opportunities and constraints differently (Surchat et al., 2024; Koromaa et al., 2025).

A further priority is the development of standardized indicators for assessing the contribution of social businesses to the Three Zeros.



12. Conclusion

This study demonstrates that the African waste challenge can be reconceptualized as an opportunity for systemic sustainable development. The central finding is that waste management becomes significantly more transformative when it is connected to livelihoods, agriculture, climate action, and social enterprise.

The evidence indicates that circular waste systems can create economic value, while social business principles provide a mechanism for ensuring that such value contributes to community development rather than being captured solely as private profit. Informal workers, youth, and women can become active participants in value creation, while organic-resource recovery can strengthen climate-smart agriculture and food security.

The study therefore advances an integrated pathway:

waste resource → social business → value creation → livelihoods → regenerative agriculture → food security → carbon reduction → Three Zeros.

The broader implication is that sustainable development should not be approached as a collection of isolated programmes. It requires institutions capable of connecting economic activity with social and ecological objectives.

Yunus Social Business offers one such institutional possibility. When combined with systems thinking and sustainable-development principles, it provides a framework for transforming waste from a disposal problem into an entry point for inclusive, regenerative, and climate-resilient development.

The contribution of this paper is consequently not simply to advocate recycling or social enterprise. It is to propose a **systemic development architecture in which waste, livelihoods, food systems, and climate action reinforce one another.**



For Africa, this represents an opportunity to move from externally defined development interventions toward locally embedded systems in which communities create value from resources already available within their environments. Globally, it offers a potentially transferable model for translating the Three Zeros from an aspirational vision into measurable development practice.

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