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INCLUSIVE ADOPTION OF CIRCULAR ECONOMY IN EGYPT: COMMUNICATION AND STAKEHOLDER ENGAGEMENT AMONG LOW- AND MIDDLE-INCOME COMMUNITIES**Leonardo Piccinetti ¹, Maghraby Khalil Elseify ², Donatella Santoro ³, Anna Piccinetti ⁴, Anas Khasawneh ⁵, Mohamed Ramadan A. Rezk ⁶**^{1,2,3,5} *Sustainable Innovation Technology Services Ltd, Ducart Suite, Castletroy, Ireland*² *REDINN, Italy*⁴ *Europe for Business EFB, United Kingdom*⁶ *Academy of Scientific Research and Technology (ASRT), 11516, Cairo, Egypt*E-mails: ¹leonardo@sinnovations.org; ²maghraby.sites@gmail.com; ³annapiccinetti.efb@gmail.com;
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Abstract. This paper explores the adoption of circular economy (CE) practices in Egypt, with a particular focus on communication and stakeholder engagement strategies for middle- and low-income communities. While Egypt has shown growing policy interest in CE through national waste management reforms and international partnerships, the spread of adoption so far has been more visible in urban centers and within the formal sector. The study employs a mixed-methods design, combining the SALSA methodology (Search, Appraisal, Synthesis, and Analysis) to systematically review academic literature, policy documents, corporate initiatives, and NGO programs from 2018–2025, with an expert consultation survey of 20 specialists in CE and community communication. Quantitative survey items were processed through descriptive statistics, while qualitative responses were thematically coded using ATLAS.ti, ensuring transparency, rigor, and contextual depth. Although recycling and green entrepreneurship are expanding, most awareness campaigns still emphasize ecological benefits. For many communities in Egypt, however, the appeal of CE is more tangible when framed in terms of livelihood opportunities, income stability, and social fairness. The analysis highlights the informal sector, particularly informal waste collectors, as playing a pivotal role with exceptionally high recovery rates, indicating the potential benefits of stronger integration within formal systems. Evidence further demonstrates that localized, participatory communication channels and grassroots initiatives outperform centralized awareness campaigns in driving behavioral change. Building on these insights, the paper proposes a framework for inclusive CE dissemination structured around three pillars: grassroots empowerment through education, multi-stakeholder economic integration, and adaptive, data-driven communication. Policy recommendations include reframing CE as an economic opportunity, institutionalizing bottom-up engagement, and embedding informal sector contributions within national strategies. By emphasizing equity and inclusivity, the study argues that CE can evolve from isolated initiatives into a nationwide driver of sustainable development, poverty reduction, and social justice in Egypt.

Keywords: circular economy; stakeholders; low- and middle-income countries

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JEL Classifications: O1, O2, O3**1. Introduction**

The Circular Economy (CE) is an innovative approach aims to convert the traditional linear economic models into more regenerative and sustainable systems by keeping materials and resources in use for as long as feasible is the main objective of CE to minimize waste and the impact on the environment (Geissdoerfer et al., 2016; Abdirahman et al., 2025; Rezk et al., 2023). By 2050, the world's population is projected to rise to between 9.4

and 10.2 billion, a demographic shift that will intensify global environmental pressures (Siankwilimba et al., 2025). Rapid industrial growth alongside this population increase has already contributed significantly to environmental degradation and pollution (Malkawi & Kapiel, 2024). Rising demand for natural resources threatens ecological stability, driving deforestation, biodiversity loss, and accelerating climate change, while increasing greenhouse gas emissions, particularly carbon dioxide (Malkawi & Kapiel, 2024). The strain on natural systems is further reflected in waste production trends, with global municipal solid waste generation projected to surge from 2.01 billion metric tons in 2016 to an estimated 3.4 billion metric tons by 2050, a trajectory linked to unsustainable consumption and inefficient resource extraction practices (Çelik et al., 2024). Addressing these challenges requires a paradigm shift away from the prevailing linear economy characterized by extractive, single-use, and disposal-oriented models toward a Circular Economy (CE) framework that prioritizes resource efficiency, regenerative design, and waste prevention (Kirchherr et al., 2017). The circular economy (CE) offers a systematic framework for rethinking production and consumption cycles by emphasizing recovery, reuse, and innovation to reduce environmental burdens (Silva & Morais, 2021; Aslan et al., 2025). Beyond ecological benefits, CE provides mechanisms to operationalize sustainability by redesigning systems to minimize waste, recover resources, and create regenerative cycles (Wen & Zhang, 2024). By embedding these principles into economic models, CE supports social justice through improved access to resources and opportunities, particularly for vulnerable groups (Estoque & Wu, 2023; Kuwornu et al., 2022). Realizing these outcomes, however, requires structured, sector-wide strategies and cross-sector collaboration, making CE a practical and measurable pathway toward long-term environmental, economic, and social resilience (Eelager et al., 2025).

Many nations continue to place disproportionate emphasis on the environmental dimension of sustainability, often overlooking its economic potential. This imbalance has resulted in policies and initiatives that focus primarily on resource conservation and pollution mitigation but fail to integrate comprehensive strategies that generate economic value, create green jobs, and enhance resource efficiency. The Circular Economy (CE) addresses this gap by serving as a cornerstone of global sustainability efforts, offering innovative solutions that combine environmental protection with economic growth. CE principles are increasingly recognized for their ability to tackle resource scarcity, waste management challenges, and environmental degradation while simultaneously creating opportunities for economic development. The global CE market is expanding rapidly, growing by nearly 12% in just one year to reach an estimated \$518 billion in 2025 (The Business Research Company, 2025). This acceleration is fueled by urban mining initiatives, corporate social responsibility programs, the expansion of e-commerce, greater adoption of circular business models, and the rise of smart cities, reflecting the growing global shift toward sustainable and resilient economic systems. The CE market is projected to continue its strong trajectory, reaching \$798.3 billion by 2029 with a forecast compound annual growth rate (CAGR) of 11.4%. Growth is expected to be driven by mounting pressure on landfill capacity (Figure 1), rising global population, expansion of digital resale platforms, demand for resilient supply chains, increased R&D investments, and heightened environmental awareness. Notable trends shaping the future of the CE market include technological breakthroughs in recycling, eco-design innovations, blockchain-based traceability solutions, and the wider integration of digital technologies. These factors underscore the CE market's pivotal role in advancing a resource-efficient, low-carbon economy that aligns with global sustainability goals.

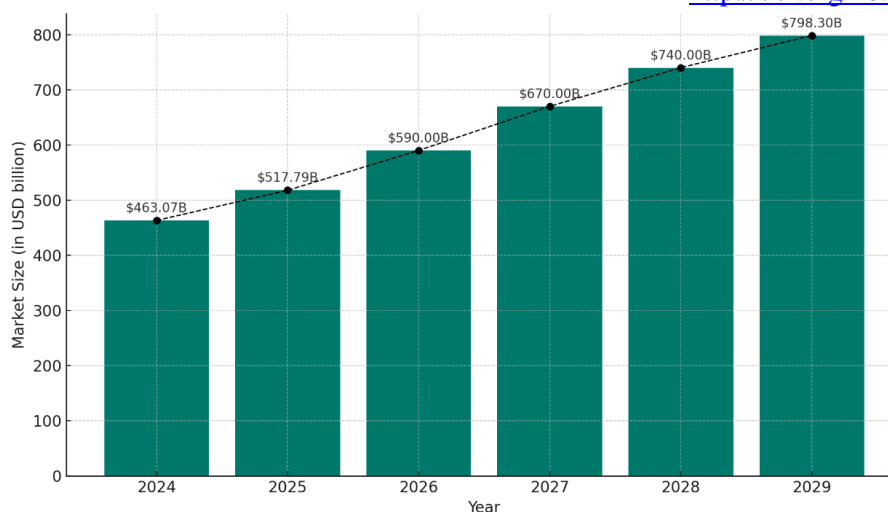


Figure 1. Circular Economy Global Market Size Forecast (2024–2029)

Source: The Business Research Company, 2025

Achieving a fully circular economy requires unprecedented collaboration among stakeholders at every level of society, with citizens and businesses playing a pivotal role in driving systemic change (European Commission, 2020; Carbonell-Alcocer et al., 2025). Stakeholder engagement serves as the foundation for this transition, as it fosters collaboration between government agencies, private enterprises, NGOs, and informal sector actors, while ensuring that policies are responsive to diverse community needs. Yet, research highlights that stakeholders' understanding of circular principles varies widely by sector, region, and organizational size, creating barriers to policy implementation and societal uptake (Van Langen et al., 2021). This variation underscores the importance of strategic communication as a tool to align stakeholder priorities and motivate participation. Existing literature tends to examine individual actors in isolation, such as consumer attitudes toward green purchasing, circular packaging, and remanufactured products (Muranko et al., 2019; Testa et al., 2020), or their preferences for products with different end-of-life scenarios (Atlason et al., 2017). However, the transition to a circular economy requires integrated, multi-actor approaches that emphasize collaboration across the entire value chain. Studies show that well-designed communication strategies can positively shape consumer perceptions and encourage resource-efficient and sustainable behaviors, including the purchase of green and remanufactured products (Warren et al., 2016; Kong & Zhang, 2012). Therefore, combining inclusive stakeholder engagement with targeted, culturally relevant communication frameworks is essential for scaling CE adoption and ensuring long-term behavioral change.

Egypt faces critical environmental challenges, including severe water scarcity, worsening air quality, and an escalating solid waste burden, with annual waste generation estimated at over 90 million tons, of which only about 60% is collected and a minimal share formally recycled (Yoshijima et al., 2024). In response, the country's policy framework has begun aligning with Circular Economy (CE) objectives. Notable initiatives include the Waste Management Law of 2020 (UNEP, 2020), the National Solid Waste Management Programme supported by GIZ and KfW, and partnerships with the European Union (EU) and UNIDO to develop eco-industrial parks and promote sustainable production practices. These efforts complement Egypt Vision 2030, which prioritizes resource efficiency, renewable energy, and green industrialization as drivers of long-term development. Despite such advances, CE adoption remains at an early stage, constrained by institutional capacity gaps, limited stakeholder engagement, and insufficient infrastructure, while adoption is still most visible in urban centers and the formal sector (Rezk et al., 2023). Egypt has recently introduced a range of circular economy (CE) initiatives, yet their adoption remains limited and uneven, particularly among middle- and low-income communities that represent the majority of the population. Media narratives in both the public and private sectors largely frame

CE through an environmental perspective, emphasizing climate action and ecological preservation while underplaying its economic potential to increase household income, stimulate economic growth, and address urgent socio-economic issues such as poverty, unemployment, and resource scarcity in a resource-constrained context. Between 2020 and 2024, an estimated 320 events dedicated to sustainability and CE were organized in Egypt, supported by at least three dedicated media channels and 28 specialized programs and series, including podcasts, radio broadcasts, and awareness campaigns (WUF12, 2025; IEREK, 2025; CWW, 2025; DCarbon Egypt, 2025; GeoCycle Egypt, 2025). However, the absence of publicly available performance metrics makes it difficult to evaluate their reach or effectiveness, particularly in engaging target groups. As a result, CE discourse remains concentrated within a limited network of policymakers, entrepreneurs, and startups, a scope that does not reflect the country's scale, capacities, or pressing development needs. This narrow framing of CE restricts public participation and undermines its potential to deliver comprehensive environmental, social, and economic benefits. Achieving a successful circular economy (CE) transition in Egypt demands localized communication strategies, an economic-first narrative, and robust cross-sectoral collaboration. Global evidence demonstrates that framing CE initiatives in terms of economic opportunities significantly boosts public engagement (Abasli & Mukhtarov, 2024), while decentralized implementation enhances participation among low- and middle-income communities (Chineme et al., 2022). Policymakers should establish clear regulatory standards, provide incentives such as tax relief, subsidies, and green procurement policies, and formally integrate the informal sector, drawing on examples from Colombia and Brazil where waste picker cooperatives have improved recycling efficiency and livelihoods (Fuss et al., 2018). Businesses can strengthen SME participation by developing local production hubs and repair networks based on EU CE models, while civil society organizations should lead training and financing initiatives, similar to India's community-led repair programs (Kumar et al., 2024). Coordinated action among government agencies, academia, NGOs, and financial institutions is crucial to ensure inclusive and scalable CE adoption.

This study aims to develop targeted communication and dissemination strategies that reflect Egypt's diverse socio-economic realities, with a particular focus on low-income communities. It seeks to examine the roles, motivations, and influence of key stakeholders including government agencies, non-governmental organizations, informal sector actors, and private enterprises in advancing the adoption of circular economy (CE) practices. Additionally, the research will identify and analyze barriers to community engagement, such as cultural attitudes, trust deficits, and technological constraints. Building on these insights, the study will propose an inclusive framework for communication and stakeholder engagement designed to enhance CE awareness, encourage meaningful participation, and drive long-term behavioral change.

2. Methodology

This research relies on a methodology that integrates both systematic secondary data analysis through the SALSA framework (Search, Appraisal, Synthesis, and Analysis) and a targeted expert opinion survey. The choice of methodology reflects the multidimensional nature of the circular economy (CE) in Egypt across policy, industry, grassroots initiatives, and communication domains (2018–2025). The literature review is structured around the SALSA methodology (Search, Appraisal, Synthesis, Analysis), ensuring transparency, rigor, and replicability in systematically identifying relevant academic studies and associated sources (Booth et al., 2022). At the same time, and to complement the limitations of relying exclusively on documentary sources, the study integrates an expert opinion survey conducted with 20 specialists whose professional roles focus on community communication, awareness-raising, and circular economy practices. This dual approach strengthens the robustness of findings: while SALSA provides a comprehensive and evidence-based mapping of available knowledge, the expert survey grounds these insights in practical, context-specific experience, thereby producing a nuanced understanding of how CE communication and engagement strategies can be adapted to Egypt's socio-economic realities.

2.1 Secondary Data (SALSA Framework)

The collection of secondary data in this study followed the SALSA framework (Search, Appraisal, Synthesis, and Analysis), which ensured a structured and transparent process for reviewing evidence on circular economy (CE) practices in Egypt. Data were drawn primarily from documents and secondary sources selected for their relevance to the research objectives. Academic studies provided both theoretical perspectives and empirical evidence, while government publications, such as the Waste Management Law (2020) and Egypt Vision 2030, outlined Egypt’s key sustainability policy directions. Reports from international organizations, including UNDP, UNIDO, the European Union, and the World Bank, supplied comparative insights and programmatic experiences. At the corporate level, sustainability initiatives in Egypt were assessed through company reports from Coca-Cola HBC, CIB, Orascom, Juhayna, and emerging startups such as Plastale, highlighting the role of business actors in advancing CE adoption. At the community level, documentation of the Zabbaleen and NGO reports captured grassroots contributions to waste management and recycling. In parallel, Egyptian digital media sources including online news articles, social media campaigns, and podcasts provided insights into the state of public communication around CE.

In line with the search stage of SALSA, databases including Scopus, Web of Science, Google Scholar, and the Egyptian Knowledge Bank were systematically queried, alongside repositories of major international organizations (UNIDO, OECD, EU, World Bank). For the appraisal stage, only credible and Egypt-specific sources published between 2018 and 2025 were included, provided they addressed CE, sustainability, or communication; purely technical studies without social or communicative dimensions were excluded. During the synthesis stage, the evidence was clustered into thematic domains aligned with the study’s objectives, including communication strategies, stakeholder roles, barriers to engagement, and framework models. Finally, the analysis stage applied thematic and comparative methods to identify recurring patterns, extract lessons, and highlight structural gaps in CE communication and engagement.

Table 1. Summary of Sampled Evidence and Analytical Focus

Category	Approx. Sample Size	Representative Examples	Analytical Focus
Academic Publications	~120	Cairo University, Ain Shams University	Theoretical foundations and empirical evidence
Events & Seminars	~320	National CE workshops, international conferences	Evidence of awareness-raising, knowledge exchange, and networking
Corporate Initiatives	23+	Coca-Cola HBC, CIB, Orascom, Juhayna	Private sector sustainability programs and CSR strategies
Circular Startups	~45	Plastale, Green Co., SwitchMed	Innovation, entrepreneurship, and women-led initiatives
Policy & Government Reports	15+	Waste Management Law (2020), Egypt Vision 2030	Regulatory frameworks and institutional strategies
International Organization Reports	20+	UNDP, UNIDO, EU, World Bank	Comparative perspectives and global programmatic approaches
NGOs & Community Sources	10+	Zabbaleen records, local NGOs	Grassroots contributions and informal sector practices
Media Outputs	30+	News articles, TV broadcasts, podcasts	Public awareness, campaigns, and communication outreach

Source: Authors

The breadth and focus of the evidence base are summarized in Table 1, which illustrates the diversity of sources and their analytical application within the study.

2.2. Expert Consultation Survey

To complement the secondary data analysis, an expert survey was carried out with a purposive sample of 20 professionals engaged in community-level communication, awareness programs, and Circular Economy (CE) initiatives in Egypt. Data collection relied on a structured questionnaire, delivered both online and in person, combining Likert-scale items—used to assess the effectiveness of communication channels, stakeholder

influence, and community barriers—with open-ended questions that captured cultural perceptions, trust dynamics, and local practices. Quantitative responses were analyzed through descriptive statistics to reveal key trends, while qualitative inputs were thematically coded in ATLAS.ti to identify recurring patterns and actionable recommendations. This approach served to validate and enrich the literature-based findings, thereby enhancing the robustness of the study's conclusions.

2.3 Limitations, Justification and Ethical Considerations

The study minimized ethical concerns by relying primarily on secondary data from peer-reviewed publications, official reports, and credible institutional sources. Academic integrity was maintained through systematic appraisal, transparent citation, and acknowledgment of evidence gaps. For the expert consultation survey, participants received clear information about the study's purpose, and their informed consent was obtained. All responses were anonymized and treated confidentially, ensuring that expert insights were reported collectively without linking them to specific individuals or organizations. The use of ATLAS.ti for coding enhanced the rigor and transparency of the qualitative analysis.

Nonetheless, some limitations must be acknowledged. Secondary evidence in Egypt remains fragmented, donor-driven, and disproportionately concentrated in urban centers, reducing the generalizability of findings to rural settings. The expert consultation survey, while providing valuable depth, was limited to 20 participants, which narrows the range of perspectives despite purposive sampling for diversity. Household-level surveys were deliberately excluded, as limited awareness of CE among middle- and low-income groups would have undermined reliability. This absence, however, is itself an empirical finding that highlights structural communication and engagement gaps. Overall, the combined use of SALSA and expert consultation was justified as the most appropriate strategy, balancing feasibility, contextual relevance, and methodological rigor for developing an inclusive CE framework in Egypt.

3. Results and Discussion

3.1. Current Practices and Initiatives in Egypt's Circular Economy

Egypt's circular economy (CE) landscape has experienced significant development in recent years, shaped by governmental policies, academic research, private sector initiatives, and grassroots entrepreneurship. Mapping these dynamics is essential for assessing their contribution to sustainable development and for identifying persisting gaps in inclusivity, particularly in relation to middle- and low-income communities. Building on this objective, the present analysis is grounded in a systematic review conducted using the SALSA methodology (Search, Appraisal, Synthesis, and Analysis). In the Search phase, sources were identified through targeted keyword searches across multiple domains, with the search timeframe spanning 2018 to 2025:

- Egyptian governmental portals: Ministry of Environment (MoE), Ministry of Higher Education (MoHE), Waste Management Regulatory Authority (WMRA), and the Academy of Scientific Research and Technology (ASRT).
- University repositories: Cairo University, Ain Shams University, and the National Research Centre.
- International organizations: United Nation Industrial Development Organization (UNIDO- Egypt), SwitchMed, the European Union, UN-Habitat, the World Bank, the OECD, and ESCWA.
- Corporate social responsibility (CSR) reports: Elsewedy Electric, Commercial International Bank (CIB), PepsiCo, Coca-Cola, Orascom, Juhayna, Orange, and AlexBank.
- Startup directories: ENSUN, F6S, and Tracxn.
- Event platforms: IEREK, Cairo Water Week (CWW, 2025), and DCarbon Egypt.

During the Appraisal phase, inclusion criteria prioritized peer-reviewed publications, Egypt-specific grey literature, official reports from ministries and international organizations, corporate documents containing verifiable CE commitments, and program evaluations such as those from SwitchMed and UNIDO. Sources considered anecdotal or unverified, including blogs, informal counts, and social media claims, were excluded. To ensure the robustness of the evidence base, triangulation was applied wherever datasets overlapped, particularly in the case of startup repositories.

In the Synthesis phase, the review of evidence highlights that Egypt's circular economy ecosystem is both vibrant and fragmented, reflecting a multiplicity of actors and initiatives but with uneven documentation and coordination. Academic research has shown steady growth, with approximately 120 publications affiliated with Egyptian institutions between 2018 and 2025, underscoring an expanding interest across universities and the Academy of Scientific Research and Technology. Stakeholder engagement has also been considerable, as more than 320 CE- and sustainability-related events were documented between 2020 and 2024, organized by ministries, NGOs, and international partners; however, their reach beyond professional networks remains uncertain. Media and communication activities have proliferated, including at least three Egypt-based channels such as Green Light Podcast, GeoCycle Sustainability Show, and UN Voices of Impact, alongside 28 programs and campaigns active between 2020 and 2024, yet their societal impact is difficult to evaluate due to the absence of reliable audience metrics. Corporate initiatives have been diverse, with at least 23 distinct CE and CSR programs implemented since 2018 by leading companies and banks. Examples include Elsewedy Electric with 15 community projects, PepsiCo's Recycle for Tomorrow, Coca-Cola's CanBank, CIB's youth empowerment initiatives, Orascom's scholarship schemes, Juhayna's farmer capacity-building projects, and Orange's digital skills training. While these initiatives demonstrate breadth, they remain fragmented and largely undocumented at the national scale. (see Table 2 for a consolidated overview of the current CE initiatives in Egypt, 2018–2025).

In the Analysis phase, these findings collectively suggest that Egypt's CE landscape during 2018–2025 is characterized by considerable activity yet persistent fragmentation. Research output is increasing but remains dispersed across institutions. Stakeholder engagement through events is frequent, though its societal impact beyond professional circles is unclear. Media channels and campaigns exist but lack measurable outreach indicators. Corporate initiatives are numerous and diverse, yet many remain CSR-driven pilots without national scale-up. Entrepreneurship demonstrates promise, especially among youth and women, supported by international programs that provide training and incubation opportunities. Meanwhile, the informal sector continues to be central to waste recovery, yet it remains insufficiently integrated into formal CE policy frameworks.

While the breadth of initiatives illustrates Egypt's commitment to sustainability, their fragmented documentation and weak monitoring mechanisms constrain collective visibility and impact. Strengthening evaluation frameworks, ensuring transparent data collection, and systematically integrating informal actors and grassroots startups into national CE strategies could accelerate societal adoption.

More importantly, future policies should move beyond fragmented pilot projects to establish scalable, inclusive CE models that directly serve low- and middle-income communities. By embedding local voices and grassroots innovations within national policy design, Egypt could position itself not only as a regional leader in CE but also as a model of socially inclusive sustainability.

Table 2. Current Landscape of Circular Economy Initiatives in Egypt (2018–2025)

Domain	Key Evidence	Strengths / Achievements	Weaknesses / Gaps	Implications for Middle- & Low-Income Groups
Academia and Research	~120 CE/sustainability publications (2018–2025) across Cairo Univ., Ain Shams, NRC, ASRT	Growing academic base; integration into higher education	Fragmented, limited governorate-level coverage	Research often disconnected from local community needs
Events and Conferences	~320 CE-related events (ministries, NGOs, UN, EU)	High visibility, international collaboration	Weak follow-up; limited penetration beyond experts	Events concentrated in Cairo/Alexandria; rural voices missing
Media and Communication	3 dedicated channels (e.g., Green Light Podcast) + ~28 programs (radio, podcasts, NGO campaigns)	Awareness platforms emerging	No performance/audience metrics	Hard to assess reach to low-literacy & rural audiences
Corporate and CSR Initiatives	23+ programs (Elsewedy, CIB, PepsiCo, Coca-Cola, Orascom, Juhayna, Orange)	Strong private-sector role; funding capacity	Mostly CSR-driven, not systemic; no unified reporting	Projects localized, often not scaled to governorates
Entrepreneurship and Startups	45+ startups (Plastale, Egyptian Green Co., Bekia, Tilestic); 20 service-model SMEs	Grassroots innovation; 47–48% women in SwitchMed training; youth engagement	Small-scale, survival-stage enterprises	Potentially inclusive, but fragile without finance & policy support
Informal Sector (Zabbaleen)	Up to 80% recovery rates in localized case studies	World-leading recycling capacity	Marginalized from national CE frameworks	Central for inclusion; livelihoods at risk if excluded
International and NGO Programs	UNIDO, SwitchMed, EU, FAO, ESCWA pilots; ~2,200 trained entrepreneurs regionally	Capacity building, women/youth engagement	Often donor-driven, time-limited	Supportive but not institutionalized nationally
Domain	Key Evidence	Strengths / Achievements	Weaknesses / Gaps	Implications for Middle- & Low-Income Groups
Academia and Research	~120 CE/sustainability publications (2018–2025) across Cairo Univ., Ain Shams, NRC, ASRT	Growing academic base; integration into higher education	Fragmented, limited governorate-level coverage	Research often disconnected from local community needs

Source: Authors

3.2. Results from SALSA Analysis

3.2.1 Decentralized Stakeholder Engagement for Circular Economy Adoption in Egypt

Stakeholder engagement is vital for the effective adoption of circular economy (CE) principles, embedding trust, cooperation, accountability, and sustainability into stakeholder relationships (Zorpas, 2024). It facilitates collaboration, co-creation, and knowledge sharing, helping startups and businesses develop Circular Economy Business Models (CEBMs), drive innovation, and advance areas like waste management (Provensi et al. 2024). Actively involving stakeholders also aligns business goals with broader interests, improving competitiveness and financial outcomes (Kahupi et al., 2024). Collaborative strategies are particularly vital for designing and testing circular products, implementing innovative solutions, and facilitating the adoption of new technologies (Henry et al., 2022). Furthermore, multinational corporations and government agencies play a critical role by implementing educational initiatives that develop new competencies, strengthen stakeholder empowerment, and promote engagement in circular practices (Oyinlola et al., 2021).

The review conducted using the SALSA methodology highlights the effectiveness of decentralized, community-driven approaches in promoting circular economy (CE) practices in Egypt. The search process, guided by targeted keywords such as “Egypt decentralized environmental communication,” “local governance sustainability Egypt,” and “community-based circular economy awareness MENA,” examined a broad range of sources, including UNDP Egypt’s local governance evaluations, GIZ/EEAA waste management pilots, World Bank rural development reports, FAO Egypt’s community engagement initiatives, ESCWA case studies, and peer-reviewed environmental communication studies from the MENA region. The appraisal phase prioritized documented initiatives that reported measurable outcomes such as changes in awareness, participation rates, waste diversion, and job creation. Particular emphasis was placed on interventions targeting middle- and low-income communities and on the role of informal sector actors

The synthesis of evidence reveals that bottom-up, decentralized engagement consistently outperforms top-down, centrally managed approaches in driving CE-related behavioral change. The UNDP/Government of Egypt Local Development Program (2019–2023) raised household waste-sorting participation in Qena and Sohag from less than 5% to 22% in just 18 months. This success was driven by face-to-face consultations and the involvement of trusted local leaders. Likewise, the GIZ/EEAA Solid Waste Management Programme (2016–2023) in Kafr El-Sheikh reached 45,000 residents and achieved twice the compliance rates for household waste separation compared to centrally managed areas (Frisch & Pautrat, 2021). The FAO Farmer Field Schools model (2018–2022) further highlighted the power of peer-to-peer learning, increasing adoption of composting and sustainable farming practices by 30% over ministry-driven campaigns. ESCWA’s comparative study (2021) in Tunisia and Morocco also emphasized the value of culturally adapted messaging delivered by respected community leaders, while the World Bank Egypt Rural Sanitation Project (2018–2021) documented a 37% reduction in open dumping in targeted villages over two years. Collectively, these findings highlight the importance of culturally resonant, trust-based communication frameworks in achieving sustainable participation and scaling CE adoption in Egypt.

These findings confirm that trust-building, cultural familiarity, and local ownership are decisive factors in fostering participation in circular economy (CE) initiatives. Projects that incorporated local facilitators, employed context-specific messaging, and actively integrated informal sector actors consistently demonstrated wider reach and stronger behavioral impact compared to centralized communication strategies. Four interrelated mechanisms emerged as critical drivers of success: trust and cultural resonance achieved through face-to-face engagement, capacity development within local institutions and community-based organizations, accessibility supported by language and literacy adaptation for diverse socio-economic groups, and formal recognition of informal sector actors as legitimate contributors to CE systems (Table 3).

Table 3. Evidence of Decentralized Communication and Participation Outcomes

Program / Initiative	Location	Communication Approach	Population Reached	Participation Outcome
Local Development Program (2019–2023)	Qena & Sohag	Face-to-face workshops, engagement of trusted local leaders	~ Households in targeted districts	Household waste-sorting increased from <5% to 22% within 18 months
Solid Waste Management Programme (2021)	Kafr El-Sheikh	Community-level outreach, local facilitators	>45,000 residents	Household compliance in waste separation doubled in pilot districts compared to centrally managed areas
Farmer Field Schools Model (2018–2022)	Various villages	Peer-to-peer facilitation, village-level ownership	Farming communities	Composting and sustainable farming adoption increased by 30% compared to ministry-led announcements

Source: Authors

Together, these insights underscore the importance of institutionalizing governorate- and village-level communication models within Egypt’s national CE policy framework. Embedding decentralized engagement platforms, alongside participatory monitoring and evaluation systems, is essential to ensuring equitable benefit distribution, enhancing inclusivity, and fostering long-term community commitment to CE adoption.

3.2.2 Key Communication Channels for adoption of circular economy

The successful implementation of circular economy principles is closely tied to well-structured communication strategies that facilitate the exchange of knowledge, promote stakeholder collaboration, and ensure coherence in policy development across diverse sectors (Onukwulu et al., 2025). Research highlights the importance of organized communication mechanisms such as multi-stakeholder dialogues, intergovernmental meetings, and sector-focused forums in spreading regulations, sharing technical knowledge, and fostering collective innovation (Savga et al., 2023).

Results from the SALSA review emphasize that communication strategies framed around tangible livelihood benefits including job creation, cost savings, and agricultural productivity gains are significantly more effective in engaging middle and low-income communities than approaches centered solely on environmental protection or technical sustainability narratives. In Egypt, particularly among marginalized urban and rural populations, messaging that links CE adoption to household-level economic security and practical outcomes resonates strongly. These groups often prioritize immediate survival and income stability over abstract environmental goals, underscoring the need for messaging that connects CE to direct social and financial value. According to the ESCWA report, accelerating circular economy (CE) adoption in the Arab region depends on communication strategies that are inclusive, cross-sectoral, and sensitive to cultural contexts (UN-ESCWA, 2023). The report also highlights the importance of awareness campaigns, educational initiatives, and capacity-building efforts in fostering a common understanding of CE principles. Multi-stakeholder platforms connect governments, businesses, academia, and civil society, while regional initiatives like SwitchMed and the African Circular Economy Network facilitate knowledge-sharing and technical support. Digital platforms and localized messaging delivered through trusted community figures and local languages are essential for engaging vulnerable groups and informal sectors. Coordinated media campaigns and cross-border collaboration further amplify CE visibility and attract investment. To operationalize these findings, a Coordinated Communication and Dissemination Plan has been developed and is summarized in Figure 2. This figure visually maps out the multi-level ecosystem of CE engagement, demonstrating how communication strategies intersect with education systems, civil society, industry actors, SMEs, government policy, and media. By placing these elements in a single framework, the figure emphasizes interconnectivity and feedback loops: for example, school-based awareness programs feed innovation hubs at universities, while grassroots initiatives inform policymaking and provide local proof-of-concept for CE solutions. Media and dissemination channels act as multipliers, amplifying stories of economic empowerment to encourage nationwide participation. The visual also highlights how each domain reinforces the others from policy incentives driving industry innovation to grassroots entrepreneurship feeding back into local economic resilience.



Figure 2. Multi-Level Strategic Channels for CE Communication and Engagement

Source: Authors

3.2.3 Evidence-Based Insights for Inclusive Circular Economy (CE) Adoption

Findings from the SALSA review, supported by evidence from regional surveys, peer-reviewed studies, and national reports, provide a strong foundation for strategies aimed at advancing inclusive circular economy (CE) adoption in Egypt. The review underscores that localized communication approaches such as in-person workshops, school-based initiatives, and university programs are consistently more effective in encouraging recycling and waste reduction behaviors than broad media campaigns alone. Digital platforms also prove impactful but are most effective when complemented by community-driven engagement, emphasizing the importance of hybrid outreach models. Message framing is another decisive factor, as clear, actionable guidance on recycling practices, accessible collection points, and explicit financial incentives consistently outperform abstract sustainability messaging. Additionally, campaigns that emphasize collective action and reinforce social norms have been shown to foster pro-environmental behavior, underscoring the need to align CE initiatives with cultural values and daily practices (see Table 4).

Table 4. Evidence-Based Insights for Inclusive CE Adoption

Dimension	Evidence-Based Finding	Strategic Implication
Communication Channels	Local workshops, schools, and universities outperform broadcast media	Prioritize community-based and hybrid outreach approaches
Message Formats	Practical guidance and financial incentives outperform abstract sustainability appeals	Focus on actionable, livelihood-oriented messaging
Trust and Cultural Context	Informal networks thrive where institutional trust is low	Formalize partnerships with informal actors to enhance system integration
Socio-Economic Constraints	Income disparities and poor service access limit engagement	Provide affordable, convenient, and accessible solutions
Stakeholder Collaboration	Multi-actor initiatives yield measurable results	Scale inclusive pilot models nationally
Incentives and Program Design	Deposit-refund and buy-back programs drive participation	Institutionalize economic incentives in CE policies
Evidence Gaps	Lack of national surveys; reliance on sectoral/local data	Commission nationwide CE perception and participation studies

Source: Authors

Trust and cultural context also significantly shape adoption. In contexts where institutional trust is low, informal networks, such as the Zabbaleen waste collectors, play a critical role in sustaining high rates of material recovery. Formalizing their role through training programs, contractual arrangements, and equitable partnerships could substantially increase system-wide impact. However, socio-economic constraints, particularly low household income and inadequate access to municipal services remain major barriers. Families frequently cite cost, convenience, and limited awareness as key obstacles, pointing to the need for CE messaging and initiatives that directly improve household livelihoods. Stakeholder collaboration stands out as a success factor. Multi-actor pilot projects involving universities, municipalities, and NGOs have demonstrated measurable success when technical solutions are paired with targeted awareness campaigns, offering scalable models for national adoption. Additionally, economic incentives and program design including deposit-refund schemes, buy-back initiatives, and widely accessible collection points are proven drivers of participation, reducing waste leakage and reinforcing circular practices.

A notable evidence gap remains, as Egypt does not yet have nationally representative household surveys on circular economy (CE) practices and perceptions, with most existing insights derived from localized or sector-specific studies. While opinion polls reflect considerable public awareness and concern for environmental issues, they also suggest that economic priorities often take precedence. This indicates an opportunity to strengthen communication strategies by placing greater emphasis on tangible financial benefits alongside sustainability objectives.

3.2.4 Addressing Barriers to Circular Economy Adoption

The SALSA review, drawing on peer-reviewed studies, national reports, and sectoral analyses, identifies a series of financial, structural, and social barriers that must be addressed to achieve large-scale circular economy (CE) adoption in Egypt (Table 5 and Figure 3). One key challenge is ensuring sustainable funding, which requires a diversified mix of government allocations, private sector contributions, and international partnerships. Government investments from education and green transformation budgets provide a foundation for national commitment, while private sector engagement through corporate social responsibility (CSR) mechanisms and modest levies reinforces the principle of extended producer responsibility. Strategic sectors such as technology facing e-waste and supply chain pressures and real estate, which can integrate circular design in mega-projects, are well-positioned to drive systemic change.

The review also highlights the role of domestic financial institutions and the Egyptian Sovereign Wealth Fund in supporting CE initiatives through direct investment, sustainability-linked loans, and preferential funding, strengthening local ownership. International cooperation remains vital, with entities such as the European Investment Bank and INTERREG NEXT MED providing both financial capital and technical expertise, ensuring alignment with global standards.

Table 5. Barriers and Strategies for Inclusive CE Adoption in Egypt

Barrier	Key Challenge	Strategic Response
Funding and Resources	Limited and unsustainable financing	Government allocation, CSR levies, sovereign fund support, and international partnerships
Public Awareness	CE perceived mainly as an environmental issue	Reframe as an economic opportunity; use trusted, accessible communication channels
Financial Accessibility	SMEs and low-income households lack access to finance	Expand green microfinance, preferential loans, and targeted incentives
Infrastructure Gaps	Limited collection, repair services, and product access	Establish community collection points, support repair economies, and local business models
Cultural and Social Norms	Resistance to behavioral change	Sustained education, role models, and engagement of local leaders

Source: Authors

Societal and behavioral barriers are equally significant. Evidence shows that CE is often seen as abstract environmental rhetoric rather than a tool for economic empowerment, emphasizing the need for accessible messaging delivered through trusted channels. SMEs and low-income households face financial constraints due to limited access to green financing, requiring microfinance expansion and clear communication of cost-saving benefits. Inadequate waste and recycling infrastructure, limited repair services, and lack of affordable circular products also hinder adoption, highlighting the need for community-based collection hubs, support for repair economies, and expanded circular marketplaces. Finally, cultural and social resistance requires sustained education, role models, and community leader engagement to establish new norms.

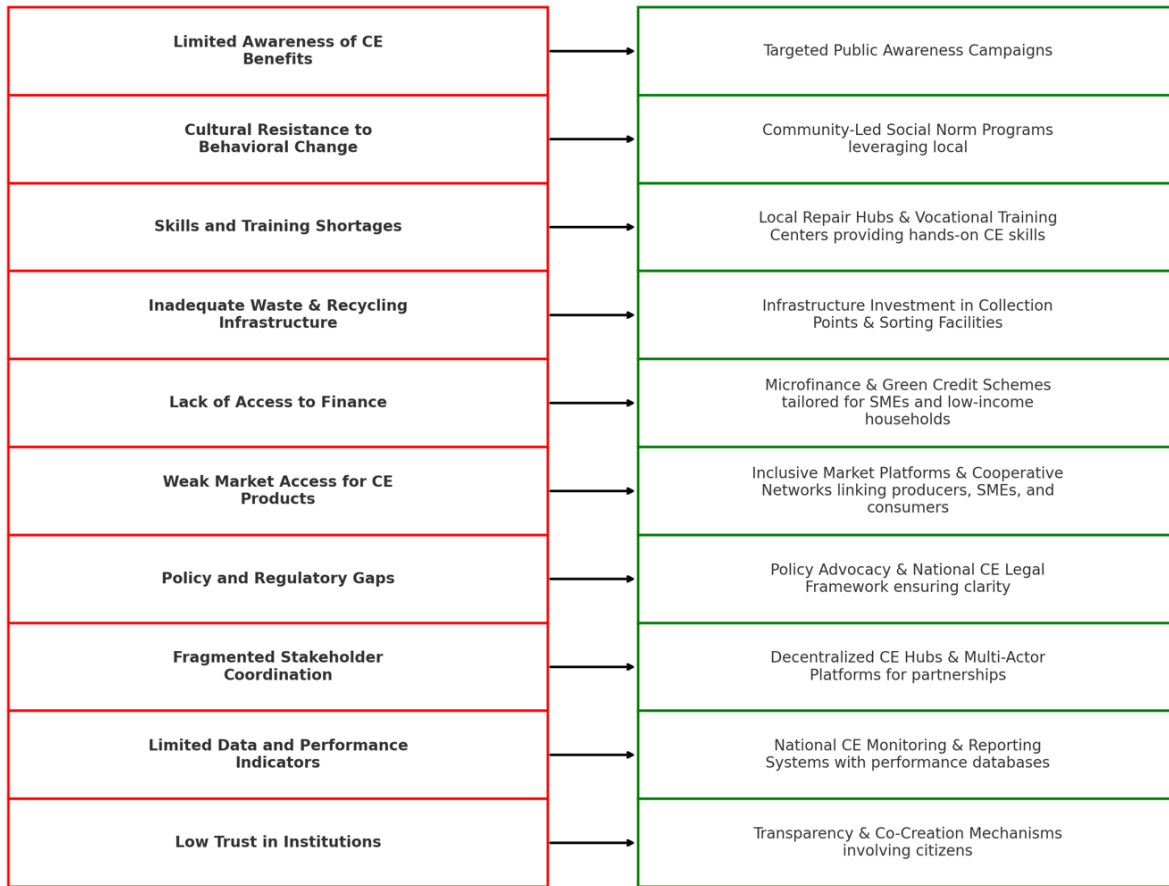


Figure 3. Visual Mapping of CE Adoption Barriers and Recommended Interventions in Egypt

Source: Authors

3.3 Results from Expert Consultation Survey

3.3.1 Communication Channels and Trust

Findings from the expert consultation survey highlight that the effectiveness of CE communication in Egypt is closely tied to the level of trust communities place in the channels used. Experts unanimously agreed that community-based channels such as local workshops, schools, NGOs, and religious institutions are more effective in building credibility and generating behavioral change than centralized or top-down media campaigns. National television and press campaigns were seen as useful for visibility and agenda-setting but were regarded as insufficient for sustained engagement, particularly in middle- and low-income communities. Digital platforms such as Facebook and WhatsApp were identified as promising tools for outreach, yet their influence remains constrained by inequalities in access to the internet, device ownership, and digital literacy. Importantly, experts emphasized that the identity of the messenger is often as significant as the content of the message: communication delivered by trusted local leaders, educators, or community figures was far more likely to resonate with households than generic messages from central authorities. These findings underscore that trust, cultural familiarity, and local ownership are decisive elements in shaping the success of CE communication strategies.

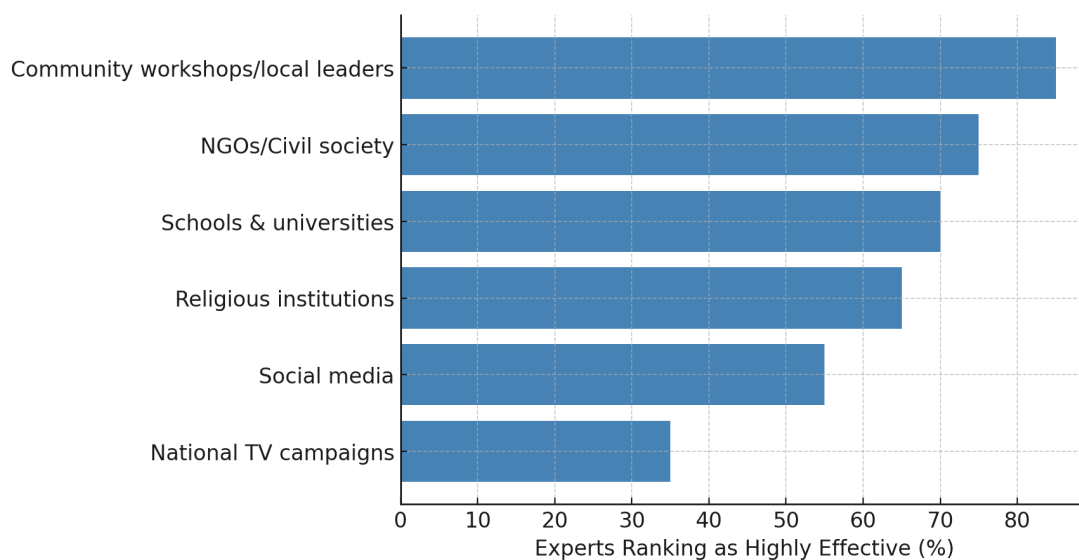


Figure 4. Expert Assessment of Communication Channels

Source: Authors

3.3.2 Socio-Economic Framing and Inclusive Engagement in CE

The expert consultation survey emphasized that accelerating circular economy (CE) adoption in Egypt requires reframing CE as a direct socio-economic opportunity rather than an abstract environmental obligation. Experts highlighted that households are more likely to engage when CE initiatives are presented in terms of income generation, job creation, cost savings, and livelihood security. For example, recycling programs that emphasize potential earnings from sorted waste or composting projects that demonstrate improved agricultural productivity were perceived as more compelling than messages focused solely on climate change or long-term ecological benefits. This framing reflects the immediate livelihood realities of vulnerable groups, where economic survival often outweighs environmental priorities. Linking CE to social equity objectives, such as women's empowerment, youth employment, and community health improvements, further enhances its relevance and resonance.

The integration of the informal sector and the active engagement of youth constitute strategic pillars of inclusive CE adoption, with experts stressing that informal actor, particularly the Zabbaleen and small-scale waste collectors, are already responsible for most recycling and material recovery in Egypt, often achieving efficiencies far exceeding those of formal systems. Despite their contributions, these actors remain marginalized and unrecognized in official policies. Formal integration through contracts, training, and equitable partnerships would strengthen recovery rates while improving working conditions, social protection, and sector legitimacy. Meanwhile, youth engagement emerged as a critical factor, with young people uniquely positioned to bridge institutional policies and community level practices due to their digital literacy, social networks, and capacity for innovation. Experts recommended mobilizing youth as local champions and peer educators through schools, universities, NGOs, and grassroots initiatives to foster long-term ownership and cultural acceptance of CE principles. The findings highlight that reframing CE in socio-economic terms, recognizing informal sector contributions, and empowering youth are mutually reinforcing strategies essential for building an inclusive, community-driven CE transition in Egypt.

3.3.3 Barriers and Proposed Solutions

The expert consultation survey revealed several critical barriers that continue to undermine inclusive circular economy (CE) adoption in Egypt. First, trust deficits were repeatedly highlighted, with experts noting that many communities remain skeptical of government-led initiatives due to a history of fragmented projects and unfulfilled promises. Second, cultural perceptions surrounding waste-related activities act as a major constraint; recycling

and waste collection are often stigmatized as low-status work, deterring wider community participation. Third, financial limitations particularly for SMEs and low-income households restrict the ability to invest in recycling infrastructure, sustainable practices, or green entrepreneurship, leaving CE innovations concentrated among better-resourced actors. Fourth, experts pointed to coordination failures among ministries, local authorities, NGOs, and private companies, which often operate in silos without a unified national strategy. This lack of institutional alignment results in overlapping projects, resource inefficiencies, and limited scalability.

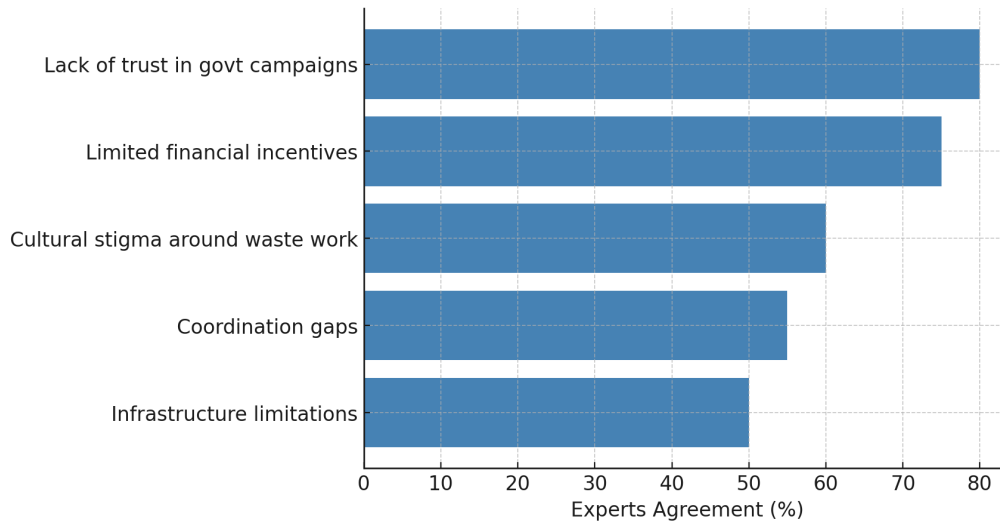


Figure 5. Barriers Identified by Experts

Source: Authors

Experts highlighted the challenge of limited incentives for households and businesses to engage in continuing education practices. Without mechanisms such as deposit refund programs, financial support, and market access for recycled products, engagement remains sporadic and short-lived. Finally, experts noted the absence of long-term monitoring and evaluation systems, making it difficult to assess impact or build accountability. Together, these barriers reflect many of the gaps identified in the SALSA review, but the experts' analysis adds depth by emphasizing the centrality of trust, cultural context, and incentive structures in shaping grassroots continuing education adoption.

3.3.4 Thematic Patterns from ATLAS.ti Coding

The qualitative analysis of expert responses conducted using ATLAS.ti, revealed four recurrent thematic clusters that provide deeper insights into the dynamics of CE adoption in Egypt. The first theme, Trust and Transparency, underscored that communities are more likely to participate when communication is credible, transparent, and delivered by trusted intermediaries such as local leaders, NGOs, or educators. The second theme, Economic Empowerment, highlighted the strong link between CE participation and perceived livelihood benefits; experts consistently stressed that households are motivated when CE practices are framed as opportunities for income generation, cost reduction, or job creation.

The third theme, Community Ownership, reflected the view that long-term engagement requires empowering local groups to take leadership in designing and implementing CE initiatives. Experts emphasized that bottom-up models foster legitimacy, accountability, and sustainability more effectively than top-down directives. The fourth theme, Education and Awareness, pointed to the importance of embedding CE concepts in formal education systems and non-formal community training. Schools, universities, and local workshops were cited as crucial platforms for building generational awareness and sustaining behavioral change, these themes highlight that trust, economic relevance, grassroots ownership, and education are the foundational pillars of effective CE engagement. They also align closely with the evidence derived from the SALSA review, reinforcing the conclusion that

inclusive CE adoption in Egypt requires a shift toward localized, economically relevant, and participatory communication models.

Table 6. Thematic Patterns from Qualitative Analysis

Theme	Description	Implication for CE Adoption
Trust and Transparency	Credibility of messengers central to success	Communication must rely on trusted local actors
Economic Empowerment	Engagement rises when CE linked to livelihoods	Reframe CE as jobs, income, and savings
Community Ownership	Grassroots leadership fosters legitimacy	Build participatory, bottom-up platforms
Education and Awareness	Schools & NGOs essential for long-term change	Institutionalize CE education across levels

Source: Authors

3.3.5 Integrated Insights from the SALSA Review and Expert Consultation Survey

The combined analysis of findings from the SALSA review and the expert consultation survey highlights both areas of strong alignment and key differences that shape the future of circular economy (CE) adoption in Egypt. Both evidence streams converge on the importance of decentralized, community-driven communication, which consistently proves more effective than top-down campaigns in influencing behavior. They also agree that positioning CE as an economic and social opportunity focusing on employment generation, household savings, and livelihood security is far more persuasive for middle- and low-income communities than abstract environmental messaging. Another point of consensus is the critical yet underrecognized role of the informal sector, which remains the most effective actor in waste recovery despite its institutional marginalization and persistent social stigma. However, differences arise in how barriers are interpreted, policy documents and international reports tend to emphasize structural and technical challenges, such as the absence of centralized data, limited impact evaluation, and fragmented governance systems. In contrast, experts place greater emphasis on social and cultural obstacles, including trust deficits, the stigma surrounding waste-related work, and the absence of practical incentives for households and SMEs to adopt CE practices. This contrast underscores a gap between top-down policy frameworks and bottom-up community realities.

The integrated analysis suggests that achieving inclusive CE adoption in Egypt requires bridging these perspectives. Structural reforms such as establishing a national CE roadmap, enhancing data transparency, and developing robust monitoring systems must be complemented by localized, trust-based engagement strategies that empower communities, integrate informal actors, and address economic needs directly. Without this dual approach, CE adoption risks remaining fragmented and accessible only to elite groups, undermining its potential for widespread, sustainable transformation.

3.4 Proposed Framework for Inclusive CE Dissemination in Egypt

Building on the integrated findings of the SALSA review and the expert consultation survey, this study proposes a comprehensive, three-pillar framework to guide the inclusive dissemination of circular economy (CE) practices in Egypt. The framework is designed to address structural gaps while responding to community-level realities, ensuring that CE adoption is not only environmentally sustainable but also socially equitable and economically viable. The first dimension of the framework emphasizes grassroots empowerment through education, positioning local knowledge and skills as the foundation of long-term CE adoption. Integrating CE concepts into formal school curricula through practical workshops and innovation-driven activities will foster early awareness, while universities can serve as hubs for interdisciplinary research and applied solutions. Beyond formal education, civil society initiatives including community workshops, summer programs, and hands-on training in repair skills, composting, and recycling can further strengthen local ownership, providing both economic opportunities and pathways for sustainable living.

The second dimension focuses on multi-stakeholder economic integration, stressing the importance of aligning government agencies, corporations, SMEs, startups, NGOs, and the informal sector within a unified national strategy. Achieving this requires creating inclusive governance platforms where responsibilities are clearly

defined, resources are equitably distributed, and local ownership is prioritized. Industry must embed CE principles in operations through extended producer responsibility and circular design, while SMEs and startups should be supported with training, financing options, and access to scale-up platforms. Recognizing and formalizing the informal sector through contracts, capacity-building programs, and institutional acknowledgment will enhance recovery rates and ensure both equity and legitimacy. The third-dimension underscores adaptive, data-driven communication, advocating for a reframing of CE discourse to highlight its economic and social relevance rather than presenting it solely as an environmental obligation. Dissemination efforts should center around trusted local channels—such as community leaders, religious institutions, NGOs, and schools—to deliver messages tailored to the needs of diverse audiences. These messages must clearly demonstrate tangible benefits, including job creation, cost savings, and resource security. In parallel, a robust monitoring and evaluation system should be established to measure communication effectiveness, track participation levels, and monitor behavioral change. This evidence base will enable greater accountability and the ongoing refinement of CE strategies to maximize impact. By combining education, stakeholder alignment, and evidence-based communication, the framework provides clear guidance for expanding CE adoption across diverse communities. By embedding circular practices into daily community life, empowering economic actors across both formal and informal sectors, and connecting CE initiatives directly to livelihoods, Egypt can shift from fragmented, small-scale projects toward a cohesive, nationwide, equity-centered circular economy model.

4. Conclusion and Recommendations

4.1. Recommendations for Policymakers

A key priority is to establish and institutionalize a comprehensive national plan for communication, outreach, and stakeholder engagement on circular economy (CE) adoption, emphasizing decentralization beyond Cairo and Alexandria to include governorates, districts, and villages as central hubs for capacity building and community mobilization. Communication efforts should shift from abstract environmental messaging to a practical, economic, and livelihood-oriented narrative that highlights tangible benefits such as job creation, income generation, and household savings, fostering inclusivity and leveraging the potential of local communities and informal actors. This strategy must be supported by clear regulatory standards tailored to CE practices to ensure legal certainty, policy coherence, and investor confidence, along with targeted incentives such as tax exemptions, subsidies, and green procurement policies to encourage private sector participation and innovation. Additionally, the formal integration of informal waste workers and small-scale enterprises is essential, with programs guaranteeing fair wages, occupational safety, and social protection, recognizing their proven efficiency in material recovery.

Table 7. Policy Recommendations for Inclusive CE Adoption

Strategic Focus	Recommendation	Intended Impact	Key Actors
Decentralized Communication & Engagement	Develop a national CE communication and engagement plan with bottom-up, localized approaches for low- and middle-income groups	Broad inclusion, economic empowerment, localized capacity building	Ministries of Environment, Education, Higher education, Information; Local Authorities
Regulatory Frameworks	Introduce CE-specific standards and embed CE in development strategies	Policy coherence, legal clarity, investor confidence	Ministries of Industry, Environment, Planning
Incentives & Finance	Apply tax exemptions, targeted subsidies, and green procurement policies	Stimulate private sector innovation and adoption	Ministry of Finance, Investment Authority
Informal Sector Integration	Recognize and formalize waste pickers and small recyclers, providing fair wages and social protection	Social equity, improved recovery rates, livelihoods	WMRA, Local Councils, NGOs
Sectoral Mainstreaming	Integrate CE into agriculture, plastics, textiles, construction, and tourism sectors	Sustainable growth, resource efficiency	Cross-ministerial coordination

Source: Authors

4.2. Recommendations for Businesses and Innovators

Businesses can decentralize their operations by creating local production hubs and repair networks to serve underserved regions. Circular solutions must highlight cost savings and durability to gain adoption among middle- and low-income households. Collaboration with cooperatives, informal recyclers, and local supply chains is needed to create inclusive business ecosystems. Regional innovation centers and incubators will foster solutions tailored to local needs and strengthen Egypt’s competitive advantage. Regional innovation centers and incubators will foster solutions tailored to local needs and strengthen Egypt’s competitive advantage.

Table 8. Business and Innovation Pathways for CE Adoption

Strategic Focus	Decentralized Approach	Economic-First Messaging	Expected Impact
Circular Products & Services	Build local hubs and repair services in rural and secondary cities	Emphasize affordability and household savings	Greater access for underserved groups; reduced waste
Inclusive Business Models	Partner with cooperatives and informal actors	Frame buy-back/take-back as income opportunities	Community participation; improved livelihoods
Innovation & R&D	Set up regional incubators, R&D centers, and university collaborations	Showcase innovation as a driver of competitiveness	Locally relevant solutions; stronger innovation ecosystem
Market Expansion	Extend CE efforts to industrial zones and smaller cities	Present CE as a source of revenue and new markets	SME engagement; diversified growth

Source: Authors

4.3. Recommendations for Civil Society and NGOs

NGOs and civil society organizations should go beyond awareness campaigns to skill-building programs in composting, repair, and recycling. They must advocate for marginalized communities in policy spaces, ensuring inclusive strategy design. They should also bridge financing gaps by connecting communities with microfinance and cooperative funding. Establishing monitoring mechanisms led by civil society will provide policymakers with real-time data for better decision-making.

Table 9. Civil Society’s Role in CE Dissemination

Function	Decentralized Approach	Economic-First Messaging	Expected Outcomes
Awareness & Training	Deliver localized workshops and hubs for women and youth	Position CE as a path to job creation and savings	Adoption of CE as a livelihood strategy
Advocacy & Representation	Elevate voices of rural and informal actors in CE policymaking	Advocate CE for poverty reduction and equity	Inclusive, community-driven policy design
Financing Facilitation	Connect communities to microfinance, cooperatives, SME funds	Promote CE entrepreneurship and affordable solutions	Growth of community enterprises
Monitoring & Evaluation	Civil society-led review systems for events and programs	Demonstrate participation, benefits, and cost-effectiveness	Evidence-based decisions; stronger accountability

Source: Authors

4.4. Cross-Sectoral Collaboration

Circular economy adoption requires multi-level collaboration between ministries, academia, financial institutions, civil society, and private actors. Education and vocational programs should integrate CE concepts to build a skilled workforce. Local banks and cooperatives can provide accessible green financing. Media outlets, especially regional ones, should focus on economic messaging to promote trust and participation.

Table 10. Cross-Sector Collaboration Framework

Sector / Actor	Decentralized Role	Communication Approach	Expected Outcomes
Government & Ministries	Align CE strategies with local policies and training initiatives	Use regional platforms to highlight CE’s value	Stronger policy alignment; local ownership
Education & Universities	Introduce CE-focused curricula and applied research	Emphasize skills and entrepreneurship opportunities	Skilled workforce; innovation beyond Cairo
Financial Institutions	Provide accessible green finance via local channels	Show CE as a profitable household/SME opportunity	Increased grassroots funding
Civil Society & NGOs	Facilitate workshops and engagement networks	Build trust and maintain community feedback	Continuous stakeholder engagement
Private Sector	Expand CE efforts to underserved regions	Stress cost reduction, competitiveness, and jobs	Wider market inclusivity
Media Channels	Use local and social platforms for awareness campaigns	Frame CE as economic empowerment and security	Broad participation and adoption

Source: Authors

Conclusion

This study offers a comprehensive examination of the opportunities and challenges associated with **inclusive circular economy (CE) adoption in Egypt**, emphasizing the role of communication and stakeholder engagement in reaching low- and middle-income communities. Through a mixed method design integrating a SALSA literature review and an expert consultation survey, the research captures structural trends alongside lived realities in Egypt's CE ecosystem. The findings reveal that Egypt has made important strides through policy reforms such as the Waste Management Law of 2020, international partnerships, and the growth of sustainability-focused entrepreneurship. However, CE initiatives remain largely fragmented, donor-driven, and concentrated in urban hubs, which limits their capacity to achieve national-scale transformation... The **evidence mapping** conducted through SALSA highlights significant gaps in awareness campaigns, policy integration, and grassroots participation. Academic research and corporate initiatives have expanded knowledge of CE concepts, but often lack alignment with local needs, while media campaigns and national awareness programs are seldom backed by measurable performance indicators. These findings underscore the need to **reframe CE messaging** to emphasize economic benefits such as job creation, cost savings, and resource security—rather than presenting CE solely as an environmental obligation.

Insights from the **expert consultation survey** strengthen this conclusion by demonstrating that **trust, cultural resonance, and local leadership** are decisive in building community participation. Experts stressed the importance of communication channels rooted in community institutions such as NGOs, schools, and religious organizations, as well as the pivotal role of informal waste collectors, who contribute substantially to material recovery, yet remain excluded from formal policy frameworks. Youth engagement also emerged as a powerful driver of change, with young people positioned to link institutional strategies with community-level action through innovation and digital platforms. The analysis of **barriers to CE adoption** reveals interconnected challenges, including underdeveloped infrastructure, limited access to financing for SMEs and low-income households, social stigma around waste management, and fragmented governance systems. These barriers highlight that **technical solutions alone are insufficient**; achieving large-scale CE transformation requires structural reforms that integrate grassroots voices, support informal sector contributions, and ensure accessible financing mechanisms.

To address these systemic gaps, the study proposes a **three-pillar framework**: grassroots empowerment through education, multi-stakeholder economic integration, and adaptive, evidence-based communication. This framework emphasizes that successful CE transformation hinges on embedding circular principles in education systems, recognizing informal sector contributions, and using culturally sensitive messaging, supported by data-driven monitoring and evaluation. Egypt stands at a **critical turning point** in its sustainability transition. The findings of this study underscore the urgent need to shift from fragmented, pilot-driven projects to **a nationally coordinated, equity-centered CE strategy** that connects top-down policies with bottom-up engagement. By empowering communities, leveraging trusted networks, and positioning CE as a pathway to social and economic empowerment, Egypt can establish a replicable model of circular innovation for the Global South. This research contributes a **holistic roadmap** for bridging policy ambitions with local realities, offering actionable insights for policymakers, educators, businesses, and civil society actors seeking to create a resilient and inclusive circular economy.

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