

Inception Report (Output 1)

Behavioural Insights for Better Waste Management in Brazil

Prepared for Global Environment Centre Foundation (GEC)

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June 16, 2026

1. Introduction

Municipal Solid Waste (MSW) management has become one of the main environmental, social, political, and institutional challenges facing cities worldwide, particularly in developing countries experiencing rapid urbanization, increasing waste generation, and financial and institutional constraints (UNEP, 2024). Beyond technical, economic, and infrastructure limitations, recent international studies have increasingly highlighted the importance of behavioural, social, and institutional dimensions in shaping the performance of municipal solid waste management systems (OECD, 2017; World Bank, 2023; Paes et al., 2024).

The *Global Waste Management Outlook 2024* emphasizes that the transition towards more sustainable waste management systems requires not only technological improvements but also social and behavioural changes capable of strengthening community engagement, social collaboration, and environmentally responsible practices (UNEP, 2024). Likewise, the report *Behaviour Change in Solid Waste Management: A Compendium of Cases* demonstrates that waste management outcomes are strongly influenced by financial, social, motivational, and system design mechanisms (World Bank, 2023).

In this context, the present study seeks to analyse the relationship between behavioural dynamics, governance arrangements, and MSW management performance in selected Brazilian municipalities. The project is being developed in collaboration with the United Nations Environment Programme – International Environmental Technology Centre (UNEP-IETC) and the Global Environment Centre Foundation (GEC), with the objective of generating insights, analytical frameworks, and practical recommendations for more collaborative, efficient, and sustainable MSW management systems.

Previous studies conducted by the research team have already identified the relevance of environmental education, social participation, local governance, and institutional coordination for improving material recovery indicators and supporting transitions towards circular economy practices and climate change mitigation in Brazilian municipalities (Paes et al., 2021; 2024; 2025).

The study will focus on three Brazilian municipalities – Harmonia (State of Rio Grande do Sul), Ibertioga (State of Minas Gerais), and Birigui (State of São Paulo) – selected

because of their different institutional trajectories, management arrangements, and levels of community participation, providing valuable insights into behavioural aspects related to MSW management.

Harmonia achieved significant results in waste reduction and material recovery through behavioural change driven by environmental education and strong local cross-sector collaboration. Ibertioga also achieved expressive recycling, sorting, and composting performance through multilevel governance arrangements involving the State Government of Minas Gerais, combined with strong local technical and political capacity. Birigui, which will also be analysed in this project, had not yet achieved similarly significant material recovery outcomes at the time of previous assessments.

2. Study Objectives

2.1 General Objective

To analyse the relationship between behavioural dynamics, governance arrangements, and MSW management performance in selected Brazilian municipalities.

2.2 Specific Objectives

- To identify behavioural factors influencing waste separation, recycling, composting, and community engagement;
- To analyse public policies and institutional and governance arrangements related to MSW management systems;
- To investigate how infrastructure and service design influence community collaboration and waste-related practices;
- To compare different municipal experiences and identify good practices, barriers, challenges, and potential pathways forward;
- To develop practical recommendations to strengthen collaborative and sustainable MSW management systems.

3. Scope of the Study

The study focuses on a comparative analysis of three Brazilian municipalities located in three different states:

- Harmonia, Rio Grande do Sul, Brazil;
- Ibertioga, Minas Gerais, Brazil;
- Birigui, São Paulo, Brazil.

The analytical scope of the project is structured around the relationship between:

- behavioural dynamics;
- institutional and governance arrangements;

- economic and financial instruments;
- infrastructure and service design; and
- MSW management performance.

The project seeks to understand how these dimensions interact in shaping community engagement, waste separation practices, and the outcomes of MSW management systems.

Particular attention will be given to:

- behavioural barriers associated with waste management practices;
- institutional trust and legitimacy;
- community engagement;
- social participation;
- economic and financial incentives;
- local governance capacity;
- service accessibility and convenience; and
- environmental education.

The study also considers recent international discussions on behavioural insights, collaborative governance, and socio-behavioural approaches to sustainable transitions (OECD, 2017; UNEP, 2024).

4. Analytical Framework

Recent literature has increasingly recognized that waste management challenges are not only technical or infrastructure-related, but also involve behavioural and institutional dimensions (World Bank, 2023; UNEP, 2024).

Traditional approaches to waste management have often prioritized infrastructure expansion, operational efficiency, and regulatory instruments. However, several studies indicate that infrastructure alone is insufficient to ensure proper waste separation, recycling, composting, or waste prevention practices (Bortoleto et al., 2012; World Bank, 2023).

Behavioural studies suggest that environmental practices are influenced by multiple interconnected factors, including:

- personal norms;
- perceived behavioural control;
- social norms;
- environmental awareness;
- institutional trust;

- service accessibility; and
- community engagement (Bortoleto et al., 2012; OECD, 2017).

According to the World Bank (2023), behavioural interventions in waste management can be organized into three major categories:

- financial mechanisms;
- social and motivational mechanisms; and
- system design and infrastructure mechanisms.

At the same time, the OECD (2017) highlights that behavioural insights should complement – rather than replace – traditional public policy instruments such as regulation, infrastructure, and economic incentives.

Therefore, the analytical framework adopted in this study incorporates an innovation perspective, examining how waste management practices integrate institutional and behavioural arrangements that contribute to improved effectiveness and efficiency in MSW management systems.

The framework integrates:

- behavioural dimensions;
- governance arrangements;
- economic and financial instruments;
- infrastructure and service accessibility; and
- MSW management outcomes.

This integrated perspective is also aligned with recent discussions on socio-behavioural governance systems and collaborative environmental governance (i.e. UNEP, 2024). Previous studies conducted in Brazilian municipalities have demonstrated that consistent environmental education programmes, community participation, and local and multilevel governance arrangements (including support from higher levels of government) can significantly contribute to higher material recovery rates and more collaborative and sustainable MSW management systems (Paes et al., 2024; Paes et al., 2025).

5. Methodological Approach

5.1 Desk Review

The study will initially undertake a desk review covering:

- academic literature;
- international reports;
- official state and federal data and information;
- municipal documents;

- waste management policies and plans; and
- references related to behavioural insights and waste management.

Particular attention will be given to:

- the UNEP Global Waste Management Outlook (GWMO);
- the World Risk Poll;
- OECD reports on behavioural insights;
- World Bank publications on behaviour and waste management; and
- previous studies developed by the research team.

5.2 Comparative Analysis of Municipalities

A comparative analysis will be conducted across the three municipalities, considering:

- governance arrangements;
- behavioural dynamics;
- environmental education initiatives;
- community participation;
- waste management infrastructure and services; and
- material recovery performance.

The comparative approach seeks to identify:

- behavioural barriers and drivers;
- governance, economic and infrastructure factors associated with waste-related behaviours;
- good practices observed across municipalities; and
- practical recommendations for promoting positive behaviour change.

5.3 Use of Information and Experiences from Previously Studied Municipalities

The project will draw upon information and analyses previously developed by the research team for the municipalities of Harmonia and Ibertioga, particularly regarding:

- governance arrangements;
- MSW infrastructure and services;
- environmental education initiatives;
- community participation; and
- material recovery practices.

These municipalities have previously been studied by the research team through projects and publications related to innovation and municipal solid waste management (Paes et

al., 2021; 2024; 2025), allowing the present study to build upon an already consolidated body of empirical knowledge.

In addition, representatives and former managers involved in these municipal experiences will participate in the project's participatory webinar, contributing reflections on the development, governance, and performance of MSW management systems over time.

This approach will allow the incorporation of relevant practical and institutional perspectives without requiring the implementation of new comprehensive assessments of municipal waste management systems.

5.4 Semi-Structured Interviews

Semi-structured interviews will be conducted primarily in Birigui (SP), involving:

- representatives of the local government;
- representatives of civil society; and
- other relevant stakeholders, as deemed necessary.

The interviews will seek to understand:

- behavioural barriers;
- perceptions regarding waste management services;
- local governance dynamics and challenges;
- perceptions regarding economic and financial instruments related to waste management services;
- challenges related to MSW infrastructure and service provision; and
- mechanisms of community engagement.

5.5 Participatory Webinar

The project will also organize a participatory webinar involving representatives from the three municipalities, as well as specialists in behavioural insights and waste management.

The objectives of the webinar are to:

- discuss preliminary findings;
- promote the exchange of experiences;
- validate interpretations; and
- identify insights, analytical frameworks, recommendations, and practical lessons.

This participatory approach seeks to strengthen stakeholder engagement and foster collaborative learning processes among experts, practitioners, public managers, and the broader community.

6. Preliminary Annotated Structure of the Insight Paper

Section	Main Content
Introduction	Context, objectives, and relevance of behavioural approaches in waste management
Theoretical and Conceptual Framework	Behavioural insights, governance, economic instruments, and waste management
Methodology	Comparative approach, interviews, and analytical framework
Municipal Analysis	Comparative analysis of Harmonia, Ibertioga, and Birigui
Discussion	Behavioural change, governance, economic instruments, and infrastructure dimensions
Recommendations	Practical recommendations and policy implications
Final Considerations	Main conclusions and future perspectives
References	Bibliographic and documentary references used in the study
Box for the Project Report	Executive summary of the main findings and practical lessons
Annexes	Supplementary data, interview materials, information from the participatory webinar, and supporting materials

7. Updated Work Plan

Stage	Main Activities	Timeline
Inception Phase	Literature review, methodological refinement, and preparation of the Inception Report	Month 1 (May 18 – June 18)
Data Collection and Comparative Analysis	Desk review, interviews, analysis of official municipal, state, and federal data and information, and comparative analysis	Months 1–3 (May 18 – August 18)
Participatory Webinar	Discussion and validation with stakeholders	Month 3 (July 18 – August 18)
Osaka Workshop	Discussion and validation of findings with all project participants	Month 4 (first half of September)*
Draft Development	Preparation of the Insight Paper and the Box for the Project Report	Months 3–4 (July 18 – September 18)
Final Review and Submission	Final revisions and submission of deliverables	End of consultancy

*Subject to confirmation by GEC.

8. Expected Challenges and Limitations

The main potential challenges include:

- differences in the availability and quality of local data;
- variations in the institutional capacity of municipalities;
- availability of stakeholders for interviews and engagement activities; and
- limitations associated with comparing municipalities with different socioeconomic, institutional, and territorial contexts.

Nevertheless, the qualitative and comparative approach adopted in this study is expected to generate robust analytical insights and relevant practical recommendations.

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