Citizen Selective Collection Program: an analysis of its implementation in the Brazilian Army

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Executive Summary

The Citizen Selective Collection Program is a public policy for solid waste management, which establishes that recyclable waste generated by public administration entities should be primarily destined for associations and cooperatives of recyclable material collectors (Brazil, 2022a). In Brazil, this program has been operating since 2006 as the Solidarity Selective Collection Program, having its name changed with the regulation of the Brazilian National Solid Waste Policy (PNRS) in 2022. The Brazilian Army, as well as other federal public bodies, participates in the program, implementing actions to expand the contribution of its Military Organizations (OM) in the process of proper disposal of solid waste (Brasil, 2006; Brasil, 2022a). The disposal of waste for recycling, through commitment agreements with cooperatives and municipalities, generates environmental and social benefits, fostering the circular economy and valuing waste pickers. However, the weak articulation with local entities and the low capillarity of recycling in the North, Northeast and Central-West regions limit its expansion. This work analyzes the program in the Brazilian Army, focusing on structural advances and limitations. The case study

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covers 67 Military Organizations from 10 Military Regions, between March 2024 and April 2025, with a qualitative approach and document analysis (Cervo; Bervian; Silva, 2007; Gil, 2008). The results achieved highlighted the importance of the program for improving the environmental management of military organizations and emphasized the need to expand partnerships, institutionally strengthen cooperatives and associations, and overcome logistical obstacles that hinder the full implementation of the Citizen Selective Collection within the scope of defense activities.

Keywords: recycling; circular economy; selective collection; sustainability.

1 INTRODUCTION

Solid waste management (SWM) is a growing challenge, driven by population growth, disposable consumption, and inadequate disposal, with environmental and health risks (Gouveia, 2012).

In 2020, the world generated 2.1 billion tons of municipal solid waste (MSW), with 805 million tons improperly disposed of and 404 million tons recycled. By 2050, it is projected to reach 3.8 billion tons, with 1.6 billion tons improperly disposed of, which will exacerbate environmental and health impacts (UNEP, 2024).

In 2023, Brazil generated 81 million tons of MSW (382 kg/inhabitant). Of this, 85.6% went to landfills or dumps, and only 8.3% were recycled (ABREMA, 2024). The data reinforce the urgency of public policies to change behaviors and strengthen management.

Given the territorial extension and socioeconomic diversity of Brazil, municipalities adopt various methodologies for MSW management. These strategies range from contracting private companies to entering into contracts with urban cleaning concessionaires, responsible for the collection, transportation, and final disposal of waste (ABREMA, 2024).

The Brazilian Army, subject to the Brazilian National Solid Waste Policy (PNRS), has approximately 600 military units and 215,000 military personnel throughout the country, generating waste according to national standards. This scenario reveals high potential for sustainable actions aimed at proper waste management.

Municipal solid waste management improves environmental health and contributes to mitigating climate change. Recycling avoids the extraction of natural resources and reduces

greenhouse gas (GHG) emissions by replacing virgin raw materials and decreasing the amount of waste sent to landfills (Borges *et al.*, 2024).

Ongoing climate change impacts the planet globally, with direct repercussions on the security of countries. Caused mainly by human actions linked to GHG emissions, these changes have been recognized as risk factors to the internal and external stability of countries. According to Gomes Filho (2024), this new reality has been incorporated into the strategic and operational planning of the Armed Forces, with repercussions in high-level defense documents in several nations.

In this context, this work analyzes the results of the implementation of the Citizen Selective Collection Program in the Brazilian Army, its advances and structural and operational limitations. The research is classified as applied, as it aims to solve a practical problem, is exploratory in nature, and has a qualitative approach, developed through a case study (Gil, 2008), analyzing the implementation of the Citizen Selective Collection adopted by Military Organizations of 10 Military Regions, between the years 2024 and 2025.

As a technical procedure, documentary research was used, which, according to Cervo, Bervian and Silva (2007), includes the collection, selection, analysis and interpretation of institutional documents as primary data sources, allowing an understanding of the actions in the analyzed context.

2 SELECTIVE COLLECTION BY RECYCLING ASSOCIATIONS AND COOPERATIVES

The disposal of MSW in landfills, besides representing a significant risk to the environment, poses risks to waste pickers, who seek recyclable waste to generate income. Given the need to close landfills and the urgency to promote the social inclusion and economic empowerment of these workers, a Federal Decree was published in 2006 establishing the Solidarity Selective Collection Program, marking the beginning of public policies aimed at encouraging the destination of recyclable waste to waste pickers (Brasil, 2006).

This agenda for progress was strengthened in 2010 with the enactment of the PNRS, which established the mandatory elimination of open dumps and the recognition of waste pickers as fundamental agents in the recycling chain (Brasil, 2010a).

In 2022, the Solidarity Selective Collection Program was renamed the Citizen Selective Collection Program, reinforcing the participatory nature of the initiative and the central role of

waste pickers and civil society, in line with the principles of the circular economy. (Brasil, 2022a). In the same year, the National Solid Waste Plan (PLANARES) was published, which reinforces the principles of selective collection, highlighting the need to expand actions and promote the productive inclusion of waste pickers (Brasil, 2022b).

As highlighted by Cruz, Ferreira, and Garcia (2024), recycling plays a fundamental role in job creation and the promotion of social inclusion, especially in low-income communities that depend on collecting recyclables as a means of subsistence. Despite regulatory advances and implemented incentive mechanisms, Brazil still faces structural challenges in MSW management, which directly impact defense activities throughout the country.

The precarious structural conditions of the North, Northeast, and Central-West regions, where open dumps prevail and cooperatives are absent, highlight flaws in policy implementation and compromise the inclusion of waste pickers (Brasil, 2023).

Regarding the recycling chain, the diagnosis revealed that, of the 1,921 cooperatives and associations of waste pickers reported by the participating municipalities, 36% are located in the Southeast region, 31.5% in the South, 19.8% in the Northeast, 7.7% in the Central-West, and only 4.1% in the North region of the country. These data indicate greater structuring of selective collection in the South and Southeast regions and highlight the need for improvements in the other regions (Brazil, 2023).

Table 1 - Distribution of associations and cooperatives of waste pickers by region of Brazil

Macroregion	Number of cooperatives/associations of waste pickers	Number of members	Average number of members by cooperative/association
North	79	1,783	22.6
Central-West	147	3,247	22.1
Northeast	381	10,088	26.5
South	605	10,802	17.9
Southeast	709	13,079	18.4

Source: Adapted from Brasil, 2023.

Regional inequality in waste disposal and recycling infrastructure highlights shortcomings in the implementation of public policies and points to the need for specific strategies and targeted investments. In this context, the difficulty faced by many municipalities in financing MSW management exclusively through the Public Cleaning Tax stands out.

The PNRS established, as one of the minimum contents of PLANARES, the definition of targets for the elimination and recovery of open dumps, determining that the environmentally sound final disposal of waste should have been implemented by December 31, 2020 (Brasil, 2010a).

However, with the update of the basic sanitation legal framework in 2020, the deadlines were redefined for municipalities that, by that date, had prepared the Integrated Solid Waste Management Plan and had collection mechanisms capable of ensuring the economic and financial sustainability of the services (Brasil, 2020). Currently, a bill is being processed in the National Congress that proposes extending the deadline for municipalities with up to 50,000 inhabitants until August 2, 2029 (Brasil, 2024a).

Despite the significant progress of the regulatory and institutional framework aimed at MSW management in Brazil, with emphasis on the valorization of waste pickers and the creation of economic and reverse logistics instruments, structural challenges still persist that compromise the effectiveness of these policies.

3 SOLID WASTE MANAGEMENT IN THE BRAZILIAN ARMY

3.1 ARMY GUIDELINES FOR SOLID WASTE MANAGEMENT

The Directorate of Real Estate and Environment (DPIMA), under the Department of Engineering and Construction, is the body responsible for standardizing, guiding, and coordinating asset and environmental management actions within the Brazilian Army. Among its responsibilities, the development of guidelines focused on the management of solid waste stands out.

With several military organizations classified as large waste generators, some of them have been excluded from municipal public waste collection services in their localities. In light of this scenario, and with the aim of guiding environmentally sound waste management and optimizing the use of public resources, DPIMA published General Instruction 20-10 (IG 20-10), establishing the guidelines for the Environmental Management System of the Brazilian Army (SIGAEB). This system encourages the implementation of selective collection and the recycling of waste (Brasil, 2008).

Complementing this regulation, Regulatory Instruction 50-20 (IR 50-20) was published, establishing procedures for the correct implementation of SIGAEB. IR 50-20 emphasizes the

mandatory nature of selective collection and the preparation of a Solid Waste Management Plan (PGRS), reinforcing the importance of the correct disposal of recyclable waste (Brasil, 2011).

In line with the evolution of national environmental legislation, the Brazilian Army published, in 2010, regulations establishing guidelines for institutional adaptation to the PNRS. This document defines specific responsibilities for military organizations, such as the inclusion of waste management, selective collection, and recycling actions in Basic Environmental Management Plans (PBGA), in addition to the obligation to prepare PGRS in accordance with the current legislation (Brasil, 2010b).

With the aim of disseminating these practices and facilitating their implementation in the units, the Army's Environmental Handbook (CAmbEx 1) was developed, which guides the preparation and execution of Environmental Management Plans (PGA) and Solid Waste Management Plans (PGRS), in addition to encouraging the formalization of partnerships focused on selective collection, reverse logistics, and recycling of solid waste (Brasil, 2019).

Considering that the implementation of PGRS requires financial planning and adequate allocation of resources, the Guidelines for Administrative Agents assigned to DPIMA the responsibility for decentralizing the resources destined for the execution of services for the collection, treatment, and disposal of common and hazardous waste. Waste from healthcare services and waste from the cleaning of effluent treatment systems are excluded from this responsibility (Brasil, 2024b).

However, there was a significant increase in the number of direct contracts for the collection, transportation, and proper disposal of this waste, which raised operational costs. By 2024, these costs had already reached approximately R$ 12 million, considering services provided in 90 Military Organizations.

To ensure proper contract execution and efficiency in the use of public resources, DPIMA published a Technical Note, which guides the analysis of requests for authorization for new contracts and extensions related to waste management. The document seeks to ensure technical and financial compliance, control budgetary decentralization, promote the circular economy, and reinforce the need to implement Citizen Selective Collection (Brazil, 2024c).

According to Gomes Filho (2024), climate emergencies tend to intensify the competition for public resources, reducing the budgetary space for traditional military investments. In this scenario, sustainable actions such as those conducted by DPIMA demonstrate that sustainability can be an ally of administrative efficiency and strengthen the Brazilian Army's engagement with the contemporary climate agenda.

3.2 IMPLEMENTATION OF THE CITIZEN SELECTIVE COLLECTION IN THE BRAZILIAN ARMY

To raise awareness among military personnel regarding the correct segregation of solid waste, DPIMA implemented environmental education initiatives. Through a review of documents in DPIMA's Internal Bulletins, records of training sessions held at events were identified.

Table 2 - Instructional activities

Event	Date	Instruction
Real State and Environment Meeting (REUPIMA)	27 to 29 February 2024	Citizen Selective Collection
Virtual Seminary - Management of Solid Waste Contracts	4 and 5 June 2024	Methodology for Analyzing Waste Management Contract Authorizations
General Environmental Training for Officers	16 and 25 October 2024	Solid Waste Management

Source: Designed by the authors (2025).

Documentary analysis of the monitoring of the implementation of the Citizen Selective Collection program showed that, in parallel with environmental education actions, the preparation of public calls for proposals was monitored, as well as the signing of commitment agreements with associations and cooperatives of waste pickers. As a result of these initiatives, the participation of 67 Military Organizations was recorded, distributed across 10 Military Regions.

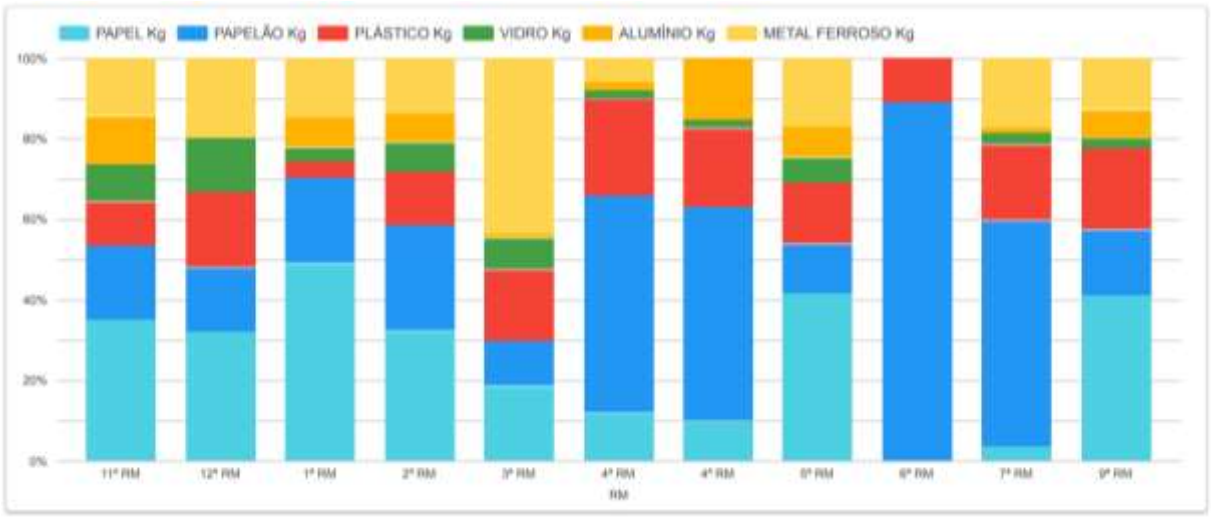
Figure 1 – Citizen Selective Collection: distribution of Military Organizations by Military Region

Source: Designed by the authors (2025).

Analysis of the distribution of the Military Organizations reveals that, in municipalities without structured selective collection or trained cooperatives, the effectiveness of recyclable waste management remains limited. This scenario reflects the national reality, marked by the absence of local solutions and appropriate technologies, as well as logistical and economic difficulties, especially in regions far from sorting or recycling centers.

The data from the monitoring carried out by DPIMA also allowed for the identification of recyclable waste generated by Military Regions, enabling the comparison of waste generation profiles by type in different regions, which is useful for guiding the implementation of the Citizen Selective Collection program.

Figure 2 – Generation of recyclable waste by type



Source: Designed by the authors (2025).

Despite the challenges, the performance of the Military Organizations stands out as an important institutional achievement, as between March 2024 and April 2025, they allocated 485,147.6 kg of recyclable waste to associations and cooperatives of waste pickers. This initiative generated direct savings of over R$ 300,791.51 for public coffers by avoiding additional costs in waste disposal contracts.

It is estimated that implementing the initiative in the approximately 600 active OMs in the country could generate annual savings of approximately R$ 2,693,213.13. This action highlights the potential of Citizen Selective Collection as an effective instrument for environmental management and for promoting the socioeconomic inclusion of members of waste picker cooperatives.

It is noteworthy that these results are consistent with the findings of Trigo *et al.* (2021), who analyzed the implementation of the then Solidarity Selective Collection at the Celso Suckow da Fonseca Federal Center for Technological Education (CEFET/RJ), with regard to cost-effectiveness in public administration.

Nascimento *et al.* (2013), when presenting the methodology used for the implementation of the program at the Research Campus of the Paraense Emílio Goeldi Museum (MPEG), conclude that the implementation of selective collection goes beyond compliance with the guidelines of the Federal Decree, being fundamental to fostering an institutional culture committed to the social inclusion of recyclable material collectors.

Faced with the growing impacts of climate change, the Armed Forces are challenged to adapt their structures and missions. According to Gomes Filho (2024), these impacts manifest

themselves in six main areas: (1) the debate on the role of the Armed Forces as emitters of greenhouse gases; (2) the dispute over public resources, given the demand for investments in mitigation and adaptation; (3) the direct effects on military areas, facilities and equipment; (4) the increased involvement in civil defense missions; (5) involvement in humanitarian operations in areas affected by natural disasters; and (6) the possibility of high-intensity conflicts with environmental motivations.

In this context, DPIMA's actions, through the Citizen Selective Collection program and environmental education, constitute an effective response to these demands. By promoting proper waste management and encouraging reverse logistics practices, it contributes to reducing the environmental footprint of the Military Organizations. Furthermore, the direct savings of over R$ 300,000, with the potential to increase to R$ 2 million, demonstrates the compatibility between sustainability and budgetary efficiency. Finally, by integrating sustainability into military training and doctrine, it reinforces the Brazilian Army's commitment to environmental preservation.

4 RECOMMENDATIONS

- Expand the debate on Citizen Selective Collection among public institutions, fostering networking and direct interaction with waste pickers, encouraging the formation of associations and cooperatives, especially in the North region.

- Implement actions aimed at the environmentally sound disposal of solid waste, reducing the total volume generated, and optimizing the transport of recyclable waste to units closer to waste picker associations and cooperatives, as well as including composting methodology for organic waste, especially in more isolated Military Organizations, such as the Special Border Platoons.

- Improve the ongoing training of military and civilian personnel of the Brazilian Army, focusing on solid waste management practices, reverse logistics, and the implementation of Citizen Selective Collection, in partnership with public institutions present in the most deficient regions.

- Promote the signing of agreements between the Brazilian Army and local environmental agencies for the integration of Military Organizations into local waste management systems, enabling the sharing of infrastructure for sorting, storing, and transporting recyclable waste.

- Incorporate the climate variable into the environmental planning of Military Organizations, promoting the adoption of strategies to mitigate and adapt to the impacts of climate change, with an emphasis on nature-based solutions, energy efficiency, and resource conservation.

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