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Emerging Issues in Solid Waste Management in Argentina

Amarilis Netwall
Serge-Henri Troch
Peter Cohen
Alfredo Rihm

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1. Introduction

1.1. Background

The Environmental Safeguard Unit (ESG) of the Inter-American Development Bank (IDB) works to promote the environmental and social sustainability of Bank operations. The ESG is therefore looking to promote and make progress in the strengthening of country systems with regard to environmental and social safeguards for specific countries, sectors and operations. As part of these efforts, the ESG in 2014 planned to execute specific analytical and capacity-building activities to strengthen country systems. Specific capacity-building needs among Executing Agencies (EAs), provinces and municipalities in the environmental, social and health and safety (ESHS) aspects of solid waste management rose in the last few years with the IDB's preparation and execution of projects in countries including Argentina, Belize, Bolivia, Brazil, Ecuador, Guyana and Panama.

In this context, to meet the most pressing needs,[1] ESG and the Water and Sanitation division (WSA) teamed to organize a May 2014 workshop in Argentina for EAs, provinces and municipalities, as well as consulting firms assisting the EAs, to enhance ESHS knowledge during preparation, construction, operation and closure of solid waste management facilities (i.e., cells, transfer stations and sorting facilities). The workshop was also aimed at increasing collaboration among the different players (the IDB, EAs, provinces and municipalities).

1.2. Objectives

This paper has several objectives:

1. Review and discuss the Bank's programmatic approach to operations in solid waste management (and in other similar operations) and the impacts that approach has on ESHS aspects.
2. Highlight and discuss the need to strengthen capacity in ESHS aspects of solid waste management among local agencies in light of the Bank's programmatic approach.
3. Summarize the current situation in the solid waste sector, as well as the ESHS aspects of solid waste management, and provide insights in the context of Argentina.

[1] The IDB is involved in several solid waste operations in Argentina (e.g. AR-L1025, AR-L1121 and AR-L1151), some of which are in preparation and others in execution. During the preparation and supervision of these operations, potential weaknesses have been noted in the way the solid waste facilities (e.g., cells, transfer station, sorting facilities) are managed from an ESHS perspective during construction and operation.

4. Provide recommendations to improve ESHS aspects in solid waste management.

The following sections of the paper will go over these four objectives.

2. Solid waste management at the IDB

2.1. Programmatic approach

2.1.1. Background

The Bank provides funding to countries through different instruments,[2] such as loans for specific projects, loans for Multiple Works Programs, Conditional Credit Lines (CCLIPs), Multiphase Loans (MLs) and grants (specifically for Haiti) financed through the Fund for Special Operations.

For some operations in sectors such as water and sanitation, solid waste management, energy and roads, the Bank provides loans that have a programmatic approach. These operations have several sub-projects; some of these are well defined (i.e., they have final designs approved), while others are not defined at the approval stage.[3] For these types of operations, ESHS aspects have to be managed accordingly and the capacity of EAs, consulting firms supporting EAs, provinces and/or municipalities plays a crucial role.

2.1.2. Environmental, social and health and safety aspects

For operations that have a programmatic approach and include sub-projects, the ESG has approached the ESHS aspects at two levels:

- **For sub-projects that have final designs during the preparation phase**, the ESG will review relevant documentation (such as environmental and social assessments) and, based on that, evaluate compliance with safeguard policies.
- **For sub-projects that do not have final designs prior to approval, and for the overall program**, EAs, with Bank and ESG support, will prepare an environmental and social management framework (ESMF) that will describe how all sub-projects should be

[2] See http://www.iadb.org/en/about-us/idb-financing/investment-loans,6056.html and http://www.iadb.org/en/about-us/idb-financing/grants-,6039.html.

[3] See, for example, the following projects: AR-L1025, AR-L1151, AR-L1084, AR-L1162 and BO-L1073.

managed to ensure adequate ESHS management and compliance with local and national regulations and the Bank's safeguard policies.[4]

The ESMF is a tool that has been used in several Bank operations to manage programs' ESHS impacts and risks. Clients agree that this tool is useful, especially when they understand it and can adequately implement it. Because the ESMF is part of the operating manual (*Reglamento Operativo*) and therefore a contractual requirement for clients, continuous training and capacity building are key to ensuring its implementation.

2.2. Strengthening capacity in ESHS aspects of solid waste management

Institutional strengthening is a key component of integrated solid waste management operations financed by the IDB. Separately or as part of the ESMF, operations and sub-projects must ensure that opportunities are created for key stakeholders to acquire the necessary knowledge and capacity to adequately manage the ESHS aspects of each project. However, in the ESG's experience, planned initiatives are often deployed ineffectively or too late in the project cycle. Initiatives for institutional strengthening often focus on working directly with the EAs to ensure that project execution teams are complemented with essential and competent specialists. Although this model is necessary to ensure that Bank requirements are implemented satisfactorily, it fails to be a comprehensive approach at all project management levels. As a result, it is common to experience disconnects in the administration of ESHS aspects of Bank-financed operations and sub-projects. Projects could benefit by instead incorporating integrated models that promote collaboration among all relevant project stakeholders.

As will be shown through Argentina's example,[5] suggested strengthening models could include short, two- to three-day workshops at the different stages of the project cycle, with content tailored to project stakeholders. Specific recommendations regarding best practices and management practices in solid waste management will be covered in Section 3. Based on the ESG's past experience in those operations, it is very important that the client internalizes the ESMF through training and capacity building among key players (EAs, provinces, municipalities and/or consulting firms). This can be achieved at different stages of the operation: (i) at the

[4] See http://www.iadb.org/en/topics/sustainability/sustainability-and-safeguards-policies,1515.html for the IDB safeguard policies.

[5] See Section 3 for details.

initial workshop (*taller de arranque*); (ii) after the initial workshop but prior to first disbursement; or (iii) throughout the execution of the loan.

2.3. Solid waste management in Argentina

2.3.1 Current Situation

In Argentina, the population is mainly (92%) concentrated in urbanized areas. The coverage of solid waste management services is quite elevated, covering approximately 89% of the population, and the nation boasts a trash collection rate of 99.8% (with more than 70% of collection occurring daily). The urban solid waste and household solid waste generation rates are 1.15 kg/hab/day and 0.77 kg/hab/day, respectively.[6] Nevertheless, it is estimated that 64.7% of solid waste is disposed of in sanitary landfills, while the remaining 35.3% is disposed of inadequately, mainly in controlled and open dumpsites typical of smaller localities. In urban centers, disposal is mainly done at landfills.[7]

Often, these urban landfills are in need of significant investments in infrastructure, equipment, emission management systems and other interventions to ensure their adequate operation and minimize their potential impact on the environment and the surrounding population's health. Similarly, environmental degradation and health effects are likely from the long-term operation of open dumpsites, a situation that can be costly to remediate.

Risks related to the inadequate management of waste in landfills and dumpsites have been well documented. They include: the spreading of communicable diseases due to unsanitary conditions; the transmission of disease vectors due to the presence of animals; and environmental contamination stemming uncontrolled emissions of leachate, landfill gasses from waste decomposition and toxins from waste burning. The greatest impacts can be expected on sectors of the population dependent on the landfill and dumpsites for survival, a group that includes informal recyclers, many of whom are women and children, who work long daily shifts sorting and collecting recyclables in these sites under unsafe and unsanitary conditions.[8]

Although the exact number of informal recyclers in Argentina is unknown, it is estimated that the population of recyclers in Buenos Aires alone reaches 40,000 people, who together

[6] IDB. 2010. "Regional Evaluation on Urban Solid Waste Management in Latin America and the Caribbean – 2010 Report (IDB-MG-115)". Washington, DC, United States.

[7] Ibid.

[8] Ibid.

represent a $178 million-a-year industry.[9] Indeed, their activities can have a significant impact on the Argentinean economy. Major metropolitan areas have established discrete systems for processing different types of waste (e.g. plastic, glass, paper, and cardboard) generally collected by informal recyclers who work directly in disposal sites or in separation plants. Typically, informal recyclers collect and segregate the recyclable materials and then sell them to an intermediary, who in turn sells the materials to a given industry for processing. In smaller municipalities, where resources and capacity are scarce, recyclers are thought to significantly contribute to the waste management process. It is estimated that recyclable material recovered by informal recyclers, which otherwise would end up in waste disposal sites, results in space savings of up to 30% at landfills, while also reducing collection and transportation costs, ultimately having a net positive effect on municipal budgets.[10]

The Argentinian legal framework is characterized by the overlapping of requirements at the national, provincial and municipal levels, which often renders the implementation of regulations ineffective, most notably with regard to institutional responsibilities.[11] The situation is further complicated by a lack of unified environmental and social requirements and procedures under the relevant national law (*Ley General del Ambiente (LGA) Nº 25.675 del año 2002*), as well as the presence of a separate solid waste management-centric law (*Ley Nº 25.916 del año 2004*) that has been sanctioned but not uniformly applied throughout the country. The provinces hold responsibility for regulating key aspects such as environmental and social studies; permits and licenses for works; and projects and their categorization, monitoring and control. Municipal governments are then responsible for managing waste generation within their jurisdictions, as well as, ultimately, reducing the environmental impact of waste generation. It is estimated that 65% of small municipalities in Argentina have their own solid waste management plans.[12] Nonetheless, in most cases, municipalities depend heavily on financial and human resources

[9] Medina, M. 2008. "The informal recycling sector in developing countries." *Gridlines*. 44. World Bank: Online. <https://openknowledge.worldbank.org/bitstream/handle/10986/10586/472210BRI0Box31ing1sectors01PUBLIC1.pdf>.

[10] WIEGO. 2013. "Recicladores – El derecho a ser reconocidos como trabajadores". Online. <http://wiego.org/sites/wiego.org/files/resources/files/WIEGO-Waste-Pickers-Position-Paper-Espanol.pdf>.

[11] UNEP. *Global Partnership on Waste Management*. Online. <http://www.unep.org/gpwm/InformationPlatform/CountryNeedsAssessmentAnalysis/Argentina/tabid/106557/Default.aspx>.

[12] IDB-MG-115

assigned by provincial governments and on provincial investment in solid waste infrastructure projects. This interdependency among all government levels in the Argentinean federated system highlights the importance of establishing effective institutional frameworks.

2.3.2. Impacts, risks and lessons learned from solid waste projects in Argentina

The IDB has developed wide-ranging experience in Argentina's solid waste sector, most recently financing several operations that either focus solely on solid waste management or include a significant sub-component in the sector (e.g. AR-L1025,[13] AR-L1121[14] and AR-L1151[15]). In most operations, the IDB promotes an integrated solid waste management model that usually includes: (i) strengthening institutional capacity; (ii) closing or converting existing open dumpsites; (iii) constructing new sanitary landfills; (iv) building separation and/or transfer stations; (v) acquiring equipment for processing recyclable materials; and (vi) supporting the process for formalizing informal recyclers.[16] Throughout the preparation, implementation and supervision of these operations, the ESG identifies deficiencies mainly attributable to breakdowns in the current legal frameworks (i.e., there is a lack of clearly defined responsibilities at the national, provincial and municipality levels). The ESG also identifies potential opportunities for improvement, from an ESHS perspective, in institutional arrangements and in the construction and management of waste facilities.

To better understand specific difficulties in the Argentinean context, the ESG visited active projects financed under the ongoing Solid Waste Management Program in Touristic Municipalities (AR-L1025). As a secondary objective, conclusions and lessons drawn helped identify environmental and social risks encountered while analyzing the Integrated Waste Management Program (also known as GIRSU) that was in preparation at the time. Findings and

[13] The AR-L1025 (Solid Waste Management Program for Touristic Municipalities) operation is in supervision, having beenapproved in 2007). See MrBlue for more details at http://esgmrblue/projectdetail.aspx?pid=28151493-39c6-4a5f-944a-38490dbd60af.

[14] The AR-L1121 ("Reconquista" Basin Sanitation Environmental Program) operation includes components related to solid waste management and is currently in preparation (expected to be approved in the middle of 2014). See MrBlue for more details (link).

[15] The AR-L1151 (Integrated Solid Waste Management Program) operation was approved in July 2014. See MrBlue for more details (http://esgmrblue/projectdetail.aspx?pid=97be1175-fe0e-4869-b996-176674075416).

[16] AR-L1151 POD

further details on sites visited were documented in the Supervision Report.[17] Below is a summary of the most notable findings:

Dumpsites (official closure financed by IDB)

- Lack of monitoring and control over access to dumpsites after formal closure, which promotes environmentally and socially unsafe activities, (e.g. waste dumping, scavenging, tree cutting, waste burning, etc.)
- Absence of formal procedures for monitoring environmental and social activities (e.g. no monitoring programs for groundwater and surface water)
- Too-basic closure plans and schemes; "one size fits all" approach may not be adequate in all situations due to specific environmental and social factors

New waste disposal facilities

- Inadequate grievance mechanisms for surrounding communities during construction and operation of facilities
- No evidence of a formal communication mechanism between the municipality and the authority for monitoring results (this gap was usually observed at the provincial level)
- No or poor inspection mechanisms during construction and operation of facilities
- No evident environmental or social monitoring procedures
- Inadequate communication plans for local communities
- Inconsistent implementation of social inclusion plans during operation

Evaluation of the AR-L1025 program, together with further analysis during the preparation of the GIRSU program (AR-L1151) led to the development of a matrix that identifies expected risks and impacts in integrated solid waste management projects (see Table 1).

[17] AR-L0125 Supervision Report, November 2013.

Table 1. Activities, impacts and benefits of integrated solid waste activities in Argentina

Phase	Activities	Risks and negative impacts	Benefits
Construction	• Earth movement during construction of slopes and excavation of waste cells • Construction of access pathways • Construction of fencing and auxiliary/ complementary buildings • Activities related to cell preparation such as impermeabilization, construction of drains for leachate and landfill gas extraction/ collection • Presence of informal recyclers in dumpsites/ streets	• Affected air quality due to increased emissions of particulate material, dust and noise • Risk of oil/gas spills from machinery and equipment • Modification of surface runoff due to reshaping of the landscape • Natural soil erosion and removal of native flora • Increased transit and vehicle movement • Vulnerability of informal recyclers livelihood to proposed project activities • Inadequate communication with stakeholders	• Development of sound municipal solid waste (MSW) management • Improved environmental conditions for the closure of existing open dumps • Improved access roads • Increased demand for construction workforce • Potential increased property value in sites to be improved • Development of sound social inclusion plans for recyclers

Table 1, continued

Operation and maintenance	• Movement of soil and ground operations for MSW disposal • Bumping and compacting of waste within the cell • Operation of the separation and recovery plant • Implementation of environmental and social management plans (ESMPs)	• Increased particulate matter and dust • Increased risk of gaseous emissions and odor problems in the surrounding area • Increased risk of leachate leakage • Risk of failure to implement ESMPs • Risk of failure to implement social inclusion plans • Inadequate communication with stakeholders • Risk of inadequate coordination among responsible parties/ agencies	• Infrastructure modules kept up to date with the latest construction technologies • Improved public health and quality of life of the population • Presence of environmental controls
Closure and post-closure	• Maintenance of infrastructure • Operation of environmental control facilities • Activities held in recreation area • Maintenance of drainage systems • Maintenance of slopes and embankments • Maintenance of access roads and re-vegetated closed areas	• Risk of gaseous emissions and odor problems • Risk of reopening closed facilities • Risk of readopting unsafe social activities or developing new such unsafe activities	• Improved public health • Increased afforestation • Recovery of a recreational area for the community • Increased property value

Based on the identified risks and impacts, an ESMF[18] for the new program was developed, taking into account lessons learned from the program during execution, as well as from analysis conducted for it. The ESMF was aimed at establishing and standardizing basic ESHS requirements for the sample projects analyzed and for all sub-projects that will eventually be financed through the program. Fundamental requirements include, among others: (i) criteria for environmental compliance (eligibility) of projects; (ii) guidelines for categorizing projects based on their ESHS impacts; (iii) basic guidelines for developing ESHS management plans, including social inclusion plans; and (iv) stakeholder responsibility for the implementation and supervision of all requirements. As expected, the ESMF was annexed to the *Reglamento Operativo* of the program, to be regarded as a contractual requirement.

The ESMF was intended as a guiding tool to adequately develop and implement IDB-financed projects. Nonetheless, during the supervision and analysis phases of both programs, significant disconnects were observed in the interaction among the EAs, provincial governments and municipal operators. To bridge this gap and promote the implementation of the ESMF, the ESG recommended providing general safeguards-based training to the responsible parties involved in implementing the new program.

Therefore, the ESG and the Water and Sanitation Division (WSA) together designed and delivered a two-day workshop in Buenos Aires, Argentina to address emerging ESHS issues in solid waste projects and concerns noted during the supervision of projects. The workshop was developed to: (i) enhance the ESHS knowledge of Executing Agencies (EAs) and consulting firms assisting them during the preparation and construction of solid waste management facilities (e.g., cells, transfer stations and sorting facilities), closure of open dumps and efforts made to improve relationships with municipalities; and (ii) enhance municipalities' ESHS knowledge during operation of the solid waste management facilities and improve relationships with the EAs. Table 2 presents a summary of the main topics addressed in the workshop.

[18] AR-L1151 ESMF

Table 2. Summary of topics covered in the workshop

Topic	Content
IDB safeguards	Overview of environmental and social safeguards in the project cycle; institutional actors in solid waste projects; and Independent Consultation and Investigation Mechanism (MICI).
Integrated solid waste management system	Objectives, components and importance of an integrated solid waste system. Best available techniques (BAT) vs. best available techniques not entailing excessive costs (BATNEEC) in solid waste projects.
Stakeholder engagement	Objectives, key social aspects, opportunities and principles for stakeholder engagement; consultation process, including planning and tools for consultation. Types of stakeholders, grievance mechanisms and dissemination of information.
Inclusion of informal recyclers	Identification of informal recyclers, safeguards requirements. Objectives, content, development of a social inclusion plan. Key actors in social inclusion and opportunities in the market. Principles and phases of social inclusion.
Construction and operation of sanitary landfills	Basic concepts for landfill construction; key design concepts and designs for operation plans; operation design; landfill gas and leachate.
Closure and post-closure of sanitary landfills	Planning, designing and managing post-closure phase of the landfill; remediation of dumpsites.
Environmental, social and health and safety aspects	Environmental aspects in the design, construction, operation and post-closure stage of landfill. Monitoring activities during each stage and monitoring parameters. Structure of environmental monitoring and control plans, including a health, safety and environment plan and a disaster and contingencies management plan. Environmental and social management systems.
EIA/EA **EIA/EA – Case studies**	Selection process: Pre-assessment to determine appropriate level of EA. Minimum content requirements and characterization of EA. Phases in the EA process, responsibilities and purpose for implementing EA, including ESHS aspects. Expected products and main results. Mitigation and compensation measures. Case studies: shares lessons learned.
Institutional frameworks	Roles and responsibilities in the implementation of a project and the relationship between them in different stages: design, construction, operation and post-closure maintenance of waste management facilities.
Proper inspections	Implementation of adequate inspections at different stages of a waste management project covering the technical and ESHS aspects.

Aside from providing a capacity building opportunity, the workshop allowed EAs (who design the projects) and representatives of municipal and provincial governments (in charge of their implementation and operation) to come together in a common space to exchange ideas and experiences. The exchange resulted in diverse recommendations that not only express the need for stronger communication models among participating stakeholders, but also the need for additional support from the Bank during project preparation.

3. Conclusions, recommendations and next steps

The workshop was an overall success, since it achieved the intended objectives. In addition, participating stakeholders had the chance to present important recommendations. Among them were a request for more workshops and opportunities to meet in person during project preparation and the notion of creating a community of practice among applicants and contributors of the GIRSU. These recommendations were consistent with the desire on both sides (those of the client and the Bank) to continue the exchange of knowledge, experiences and ideas, as well as the strengthening of institutional frameworks. Other thoughts expressed suggested that representatives hope to work more closely among one another and with the IDB during project preparation to improve the content and use of ESMFs. This particular suggestion could prove beneficial to the ESG by allowing the ESMF to be better customized and more practical, resulting in more effective implementation throughout the design, construction and operation phases of projects. Documented suggestions are included in Table 3.

Table 3. Recommendations emerging from the workshop

Representative	Topic	Description
SAyDS (*Secretaría de Ambiente y Desarrollo Sustentable*)	Community of practice for the GIRSU	To promote more interaction among important actors and provide training, workshops and other capacity-building activities.
Catamarca	Customized training	To provide further training contextualized to the realities of specific provinces.
San Miguel	Development of amicro-regions	To develop a "pilot micro-region" for the area of Lagos in the San Miguel and the province of Rio Negro that would leverage prior investments made in the area.
Mendoza	Strengthening capacity and resources	To create an institute or school for GIRSU to strengthen the provinces in the region at different technical and financial levels. Also, to promote discipline and a systemic approach to addressing emerging issues in the GIRSU program and the sector in general.
Villa Carlos Paz, Córdoba **Consultant to Villa Carlos Paz**	Taking the training to the field / Necessity of more meetings with all actors involved during project preparation	To hold meetings with all actors involved (EAs, provincial and municipal governments, consultants and the IDB) as a requirement of project preparation to better understand requirements and limitations to requests.
Provincial environmental secretary for Jujuy	Strengthening landfill building and operation	To potentially integrate materials into the existing curriculum for wastewater treatment at the University of Bolivia in Jujuy.
Consultant to MINTUR (*Ministerio de Turismo*)	Strengthening and building capacity	To periodically replicate topic-specific workshops intended to strengthen knowledge on diverse, relevant topics.
MINTUR (*Ministerio de Turismo*)	Face-to-face consultations and follow-up with EAs	To hold occasional meetings with municipalities involved in GIRSU to ensure adequate/effective progress.
Villa Pehuenia, Neuquen	Strengthening and building capacity	To develop exchanges and training/capacity building with current landfill operators (such as CEMASE) who are tasked with adequately implementing projects.
MINTUR (*Ministerio de Turismo*)	Strengthening, building capacity and knowledge sharing	To have a place (virtual and/or physical) to share experiences, ideas and knowledge regarding solid waste management.
Unknown	Strengthening and building capacity	To have a catalyzer/owner to manage the workshops/trainings to ensure they have continuity.

These examples prove that workshops like the one offered for the GIRSU Program in Argentina are catalysts for ideas likely to improve the preparation and implementation of projects. However, it is important to note that initiatives such as communities of practice could

be logistically complex and require commitment and ownership to ensure sustainability, sustained knowledge transfer and continuous collaboration between actors. As has worked for other Bank projects, a solution could be found in the use of virtual tools (like BIDComunidades) and social media to exchange experiences, ideas and knowledge; ask questions regarding the requirements of the IDB and other multilateral agencies; and help organize workshops and/or meetings on relevant ESHS topics.

In the ESG's experience, strengthening institutional frameworks, including project management models, is necessary to properly manage the environmental and social aspects of IDB-financed operations. Sustainability of these models is key, particularly in nationwide programs, where the risk for management breakdowns may be higher, resulting in significant impacts on the overall management of a given operation.