



Solid Waste Management in Bolivia

By Isabel de la Parra Leibson

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Editor' Note: This paper has been targeted for a broad audience. The level of scientific detail provided is therefore not as high as would be normally be required in technical paper subject to peer review by environment industry professionals.

Bolivia is situated in the center of the South American continent. Politically and administratively, it is made up of 9 departments, 112 provinces and 327 municipalities. The territory spreads over 1.098.581 km² with an average population density of 9,31 inhabitants per km². According to the national census executed by the National Statistics Institute (INE), in the year of 2001 the total population was 8.274.325 inhabitants. Approximately 67% of these occupy urban areas and the other 33% rural areas (INE, 2012)

Solid Waste Management in Bolivia, as there is currently not one city where this management is realized, is directed principally to the work by waste collection services. More specifically, it is directed primarily to the recollection and transportation of wastes, and in the best cases also the final deposition of these wastes in "controlled" waste dumps which contain many technical and environmental defects.

It is calculated that the national per-capita production of domestic wastes in the urban areas of Bolivia is approximately 0,50 kg per person per day, and 0,20 kg per person per day in the rural areas. The variation in waste generation is directly related with the consumption capacity of each municipality as well as the type of waste generated. It is estimated that in the year 2010, 1.745.280 tons of waste was generated in the urban areas only (DGIRS, 2011).

Regarding the composition of the wastes, it can be affirmed that more than half the wastes (55,2%) are biodegradable, 22,1% is recyclable material and 22,7% is considered as unusable waste. While information regarding waste composition is available, it is important to remember that there is as of yet not one city in Bolivia where waste is separated at the origin and/or formal selective recollection services for different types of wastes. Although there have been various attempts in the past at a pilot project level which have attempted this, the lack of preparation and lack of beneficiary population interest have unfortunately always been limitative factors for these types of initiatives (DIGIRS, 2010).

The quantity of dangerous wastes has not been formally quantified except for the wastes originating from health establishments. These wastes are recollected in various ways and deposited in a unique cell apart from the common wastes. In this cell, the wastes receive a unique treatment with Ca O₂. In the case of industrial wastes, there are no special recollection services. Because of this, the wastes end up being deposited in waste dumps together with the domiciliary wastes. The same happens with the special wastes, such as tires and construction wastes, which often end up in public areas, rivers and ravines. It is estimated that the annual generation of construction wastes is 43.591 m³ in the city of Cochabamba alone (SGAB-CF, 2009).

Solid waste management, primarily in the capital cities and some larger municipalities, is realized through municipal waste recollection services. Only 17% of the municipalities have succeeded in implementing the financing of these services through waste recollection tariffs. Nevertheless, the amounts collected through these tariffs only covered between 40% and 60% of the costs. This obligates all the municipalities to subsidize the waste recollection services, usually up to 100% of the total costs (DGIRS, 2011).

The collection of wastes for recycling is realized in an informal manner. The majority of the wastes with recoverable value are collected in containers and sites at the final waste deposition site. The work is realized by waste pickers, who are mainly women and form the echelon of society with the lowest economic incomes. At a national level, it is calculated that approximately 175 tons/day are collected by the waste pickers. Unfortunately the work executed by these people and their contribution to the country's economy and economic savings is not recognized by the legislation. Laws even penalize these services, prohibiting these types of activities and establishing wastes as property of the municipalities (SGAB-CF, 2008).

The majority of environmental problems occur at the final deposition. Only 38% of wastes are deposited in controlled waste dumps, which are most often located in the capital cities. In 90% of the cases, waste dump sites are uncovered, 7% are controlled waste dumps in operation, and 3% are controlled waste dumps with a remaining life of 1 to 3 years without defined replacement sites. The lack of relocation sites is mostly due to rejection of candidate sites by the population. Part of the principal problems caused by the final deposition is due to the generation of gases and leachates, which don't receive treatment and leak into the atmosphere and surface and ground-water bodies. These processes, among other factors, cause constant social conflict where populations settle near the waste dumps (DGIRS, 2011).

With respect to the legal and institutional framework regarding solid waste management, few advances have been made. This makes this sector one of the necessities receiving the least attention by authorities and the society in general. The institutional weaknesses or absence, as well as insufficient legal and financial mechanisms have caused a significant retardation in the development of adequate policies. The normative framework is insufficient and outdated in relation to the dynamics of the sector, the necessities of the various stakeholders and of structural changes occurring in the country. In sum, there is a lack of coercive force.

Waste management in Bolivia has become a great challenge, even more so with the new State Political Constitution (approved in 2009) and the "Andrés Babiñez" Framework Law of Autonomy and Decentralization (approved in 2010). These have caused a new organization of the Plurinational State of Bolivia which gives municipalities more freedom in creating their own policies. Finally being able to create their own waste management policies, the municipalities can now create their own solid waste management laws which are adequate for their specific situation (DGIRS, 2011).

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Isabel de la Parra Leibson



Isabel De La Parra is a BSc – Environmental Engineering and a specialist in Integrated Solid Waste Management and ISO-14001 Management Systems. During the past seven years, she has been researching about solid waste management for a private institution named the Bolivian Environmental Management Society (SGAB). She has developed and implemented Solid Waste Management Plans in five municipalities in the tropical region of Cochabamba and has trained part of the team which has elaborated Hospital Waste Management Diagnostics in seven departments of Bolivia. During the past five years, she has investigated the development of tools, techniques and programs regarding environmental education as part of the Focal Cities Cochabamba project, which is financed by the Canadian International Development Research Center (IDRC) and executed by SGAB.

As a result of the investigations in the environmental disciplines, she has generated a Municipal Environmental Education Strategy for the city of Cochabamba. This strategy has now been implemented as a municipal law. Moreover, in coordination with the Departmental Education Secretary of Cochabamba, she has directed the implementation of an Integrated Waste Management training program for school teachers in the municipality.