Recycling in Bogotá: developing a culture for urban sustainability

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I. INTRODUCTION

THE UNITED NATIONS Conference on Environment and Development held in Rio De Janeiro in June 1992 (the Earth Summit) made us think seriously about environmental priorities in Colombia. In the case of Bogotá, Colombia's capital city, the issues addressed by this meeting - and events leading up to it - confronted policy makers with the need to contribute to the sustainability of the city.

Improvements are possible if changes are made both in the style of development and in the terms of trade between industrialized countries and the so-called "South". The expectations generated by the Earth Summit, however, were not in general fulfilled. The most conspicuous issue to be examined in the meeting appears to be global environmental problems such as global warming and the depletion of the stratospheric ozone layer. But such "global priorities" are not necessarily issues of primary concern for the inhabitants of a specific city or country.

One current environmental priority in Colombia is the generation and disposal of wastes in urban areas, in which most of the people live. The disposal of solid refuse has become an important and relevant research topic and recycling is a key component in analyzing the viability of sustainable urban development.

II. SOLID WASTE IN BOGOTA

THE COLLECTION AND disposal of refuse usually absorbs between 30 and 50 per cent of municipal budgets worldwide. Given other local social and economic priorities, it is important to reduce this cost and one way to do this is to raise the efficiency of the management and treatment of solid waste. In Bogotá, the cost of solid waste services is of relatively less importance in the metropolitan budget. From an environmental perspective, the lack of systematic methods for handling refuse increases the likelihood of floods and may lead to worsening air, water and land pollution.[2] Present trends in urban growth and the destruction of surrounding areas has led to the deterioration of natural resources, resulting in the progressive loss of

1. United Nations (1991), "Gestión ecológicamente idónea de los desechos sólidos y cuestiones relacionadas con las aguas servidas. Antecedentes", A/conf 151/PC/76, Geneva, July (mimeo).

2. It is estimated that around one-tenth of the productive time of an individual is wasted due to poor health related to refuse. The economic burden of the cost of medical help and productivity losses has important consequences for social and economic development.

bio-diversity in urban areas.

The "culture of urban recycling" is a citizen's attitude, an understanding of collective behaviour which means a respect for environmental resources and the rational use and transformation of the waste generated by the city. The renewal of public spaces is also an important component of urban recycling. The inadequate disposal of waste leads to a range of environmental problems and reinforces unsustainable trends. Appropriate policies and practices for the management of refuse are required to increase sustainability. Recycling could provide a way forward.

Besides the renewal and more efficient use of public spaces, other policy-making objectives may help to provide the basis for urban sustainability. One example is ensuring that those making a living from the collection and re-cycling of waste are viewed more positively and given better equipment. Incentives for the reduction and separation of refuse at the point of production, a decrease in the volumes of waste destined for sanitary landfills and rubbish dumps, and encouragement for the reclamation and recycling of waste, all constitute elements for an improved environmental management of solid waste services.

III. A PROSPECTIVE VISION

THE INTRODUCTION OF an environmental component into urban planning has emphasized the need to add an initial phase when designing a strategy for the delivery of public services. This present review of recycling activity in Bogotá forms part of a wider study of the sanitary situation in the city to produce a complete, policy oriented overview of the more relevant social, economic and institutional aspects of the present and future growth of the city. This initial study suggests the need for a more decentralized form of waste management whereby the treatment, elimination and transformation of waste occurs in the area where the refuse is produced. This points towards a style of public service management based on culturally sensitive practices which take into account the fragility of the local environment. Such a style avoids the conventional sectoral approach to service delivery whilst accepting the interdependence of all urban activities. In order for this and other options to be viable, it is necessary to evaluate their acceptability, profitability and replicability and, most importantly, to obtain the political will to initiate and maintain them.

The recycling of metals, paper, glass, plastic, textiles, organic waste and the re-use of water has been shown to reduce the demand for energy,[3] for raw materials, for fertilizers, for foreign exchange and for fresh water resources. A culture needs to be introduced to facilitate the sorting and recycling of waste, a culture in which citizens accept responsibility for achieving sustainability and put pressure on the state to achieve these goals. For example, composting can be an effective form of transforming organic waste, but it is not always culturally acceptable and applicable in specific social and economic situations. The scarcity of land for sanitary landfills, the rising cost of disposal operations, and the increased inclusion of environmental costs in decision-making are reasons for considering composting as a viable option. The use of organic matter to maintain parks, green areas and grass verges might help them resist the effects of motor vehicle generated pollution.

3. A World Bank study entitled "Reciclaje y recuperación integrada de recursos" (GLO/80/004, Washington, DC) estimated that in 1980, recycling practices in Bogotá and Medellin, the country's second largest city, led to energy savings of some 2.4×10^9 kilowatts per hour. This was equivalent to 19 per cent of the country's oil imports at the time. [Such savings no doubt serve a very useful purpose, particularly given the serious energy crisis which the country is currently undergoing as a result of the combined effects of drought and mismanagement. The low water levels in the hydrolectric dams that supply most of the electricity have led to daily power cuts of up to eight hours in most parts of the country since April 1992 - **Editor's note**].

It has been estimated that the waste disposal industry could provide employment for 1 to 2 per cent of the labour force.[4] International trade in recyclable materials could take advantage of the existing differences in technical capacities and the need for raw materials. Cooperation between cities and countries could include the exchange of these materials. For several years, Colombia has bought scrap iron from the Netherlands; however, this exchange is not reciprocated.

For these goals to become reality, waste management needs to be introduced as an integral part of urban planning. Similarly, institutional activities which are conventionally seen as separate sectors, such as solid waste management, need to be integrated in land use plans and infrastructure planning. This is central to developing an environmentally aware form of urban planning and in formulating urban development policies.

In Colombia, these issues are beginning to be evident in national and municipal planning. Bogotá's Environmental Management Plan, currently being developed by DAMA, the city's environmental agency,[5] is one example. This plan is part of a wider strategy to clean up the Bogotá River and includes a master plan for the management of solid refuse for the capital and for the smaller municipalities located along the river. The plan also includes a proposal for organizing recycling activities in Bogotá. The activities developed by DAMA during its two-year life illustrate an encouraging approach to environmental management in Colombia.

A large part of city waste collection involves dealers of used materials, who in Bogotá are known as *basuriegos*, *recicladores* and *cartoneros*.[6] To increase the productivity of these groups, the incorporation of refuse dealers in municipal sanitary operations has been proposed.[7] More specific proposals include improved training, access to subsidized loans, and the provision of institutional support for the establishment of small-scale waste disposal firms operating within a flexible legal framework which allows them to be effective and competitive while contributing to improvements in their working conditions. These proposals aim to improve the working life of those who provide the city with much needed services but without due social and economic recognition.

It is important to study ways of supporting small informal recycling industries in large cities such as Bogotá. Other aspects which require further investigation include market analyses for recycled materials. As CEPAL has argued,[8] it is necessary to revise traditional public health approaches to solving pollution problems. It is no longer possible to find solutions solely "at the end of the pipe". Solutions need to be sought at the point of waste generation and the volumes of waste need to be reduced. Greater emphasis must be placed on addressing the problem of non-biodegradable toxic substances since, in the medium and long run, these cause many of the health problems which are difficult to treat. Similarly, the debate about the deterioration of ecosystems has to be expanded to include the impact of large cities upon their hinterland. Until a basic balance between the rural areas and the city is re-established, it is not possible to analyze an urban environment in isolation from its regional whole.

IV. RECYCLING IN BOGOTA

A TECHNICAL REPORT presented to Colombia's Second National

4. See reference 1.

5. This plan was due to be formally presented to the mayor in April 1992.

6. The United Nations report (see reference 1) estimates that, given the available technology, between 30 and 40 per cent of the volume of waste in Third World countries could be reprocessed by small-scale industries. This gives credence to the policy aim of supporting the creation and consolidation of enterprises for waste reclaiming and recycling.

7. Ospina, A., H. Collazos, J.J. Rudas and M. Pacheco (1991), "El futuro del distrito capital - un estudio de prospectiva: aseo y reciclaje" (mimeo).

8. CEPAL is the Spanish acronym of the United Nations Economic Commission for Latin America, with headquarters in Santiago, Chile. This argument is taken from a presentation at the Regional Seminar on Policies for the Management of Urban and Industrial Waste, held in Santiago in July 1991.

Recycling Congress, held in the city of Manizales in 1991,[9] noted a lack of both national and city-level statistics. The figures available for Colombia suggest that approximately 5.2 million tonnes of solid waste are generated every year, of which 36 per cent is recyclable and 64 per cent is biodegradable organic waste. Of the recyclable materials, only 841,100 tonnes (or 16 per cent) are recycled every year. The city of Bogotá, with a population of 4.9 million, generates 5,200 tonnes of solid waste per day, an average of 1.05 kg per inhabitant. (Daily municipal waste generation per capita in Canada is (1989) 1.7kg; Netherlands (1988), 1.3 kg; and USA (1986), 2.4 kg.)[10] One municipal firm and two private enterprises collect and transport the rubbish to sanitary landfills located in different areas of Bogotá. However, some 1,000 tonnes of rubbish are left uncollected every day. The collected waste is composed of residential, commercial and industrial refuse and debris from construction.

While residential areas contribute the greatest proportion of organic waste, the industrial sector and the service sector generate most of the toxic and dangerous waste. These are dumped with kitchen leftovers, toxic residues, pathogens, rotting material, inert materials and other waste. This makes the management and collection of refuse difficult for those who reclaim and recycle it.

The large cardboard, paper and scrap iron producers have used recycled materials for over 40 years and recycling in the glass industry dates back ten years. The "formal" market for recycling in Bogotá is based in collection centres around the capital city, with a higher concentration in the industrial area of Puente Aranda, in the west of the city. The average price within the industry (including the costs of reclaiming, collection, selection and transport) for all recycled material is estimated to be US $ 130 per tonne (for comparison, the minimum monthly legal wage is US $ 110). Such prices are low for an industry which supplies many of the raw materials used by some large industries and which involves considerable physical effort while often being dangerous for human health.

The reclamation and recycling of waste is the principal income-earning activity for an estimated 30,000-50,000 people in Bogotá, including cart drivers (*zorreros*), small-scale dealers, street reclaimers and employees of the municipal waste disposal and street-cleaning department. There is no more precise figure for the number of people engaged in this sector, nor have the economic benefits which this sector brings to the local public health services been properly assessed. Small-scale recyclers are often perceived as a nuisance, especially by the larger waste management firms.

An important commercial aspect is the mutual dependency between recyclers and some large industries. Several firms in the paper/cardboard, glass and metal industries have established large collection centres around the city. Most of the material collected in these centres comes from poor individual recyclers and their families. However, although some industrial establishments are sensitive to environmental issues and actively promote recycling, these are the exception rather than the rule. The culture of recycling needs to permeate all social strata and should not just be confined, as at present, to the refuse dealers and the recycling industry.

A recent study identified 17 groups of individuals and families operating in the Bogotá region working in the refuse collection and processing industry. Among these, the cooperative group El Triunfo, located in the *Barrio* Las Cruces in the centre of the city, illustrates the range of activities and the productivity levels that can be achieved

9. Fundación Social y Asociación Nacional de Recicladores (1990), "Memorias del primer encuentro nacional del reciclador", Bogotá (mimeo).

10. World Resources Institute (1992), *World Resources 1992-3*, Oxford University Press, New York and Oxford.

in sorting and selling waste material. El Triunfo is made up of 30 people who reclaim waste from the streets and sell nearly 12 tonnes of refuse to recycling firms every week. The largest constituent is paper and cardboard, of which an average 4.5 tonnes are reclaimed and sold every week. The group also collects and sells 3.2 tonnes of glass, 1.8 tonnes of plastic, one tonne of metals, 800 kilogrammes of different types of containers (including batteries) and 500 kilogrammes of rag and fluff.

Groups such as El Triunfo are supported in various ways by non-governmental organizations.[11] The Dispatch of the First Lady, attached to the President's office, has also contributed to an increased awareness of the socio-economic problems of reclaimers. It is hoped that such institutional help will support a sustained improvement in the quality of life of these workers.

Formal industries can also benefit greatly from recycling. It is estimated that every year some 81,000 tonnes of glass are reclaimed in the country with 36,000 tonnes in Bogotá. This represents an overall energy savings for the industry of around 10 to 15 per cent per tonne.[12] Around 270,000 tonnes of cardboard and paper are recycled every year in the country and 108,000 tonnes in the city, with savings of up to 50 per cent in energy costs. Similarly, 73,000 tonnes of plastic are recycled every year in Colombia with energy savings of between 62 and 85 per cent per tonne, depending on the type of plastic.

The potential for the further commercialization of recycling needs to be considered. According to the views of several recyclers at the Second National Recycling Congress, not enough advantage is being taken of recyclable material in Bogotá, especially in those areas where private firms operate.[13] Recycling is not included in the terms of reference for municipally administered licences. To date, there is no plan to control or monitor the specialization or distribution of collecting centres and a rivalry persists between the different intermediaries. This situation affects the incomes of the poorer recyclers through the pricing system which does not adequately reflect the quality of the recycled material.

Greater commercialization of recycled products could improve working conditions, and hence the living standards of the workers. An experiment carried out in the historic residential area of La Candelaria near Bogotá's centre, involved recyclers in the rubbish collection service in the area in collaboration with the larger street-cleaning and waste disposal firms operating there.[14] This pilot project demonstrates how support to small firms, increased access to environmental education and improvements in the technical tools available to such firms can help achieve urban sustainability.

V. STRATEGIC OPTIONS FOR THE FUTURE OF RECYCLING

CHANGES IN INDUSTRIAL production processes and the introduction of "environmentally friendly" technologies may help reduce the volume of waste and facilitate more recycling. Dialogue and consultation with industrial producers and waste recyclers, and the introduction of adequate tax incentives and other types of legislation could stimulate alternative "styles" of production and consumption which are more conducive to improving the urban environment. Incentives

11. These include national groups such as Fundación Social and Ferba, but also groups with international links such as ENDA, an NGO originally launched in Senegal in the 1970s.

12. Uribe, María Manuela (editor) (1991), *La historia del reciclaje del vidrio en Colombia*, Peldar, Medellín.

13. Private enterprises have been given licences to operate in the city since 1989. Of the 88,000 tonnes collected by waste disposal firms in December 1991, 55 per cent was collected by the municipally owned EDIS, with the remaining 45 per cent collected by two private firms.

14. Opazo, M., I. Molina and M. Pacheco (1991), "Plan de manejo de basuras para La Candelaria", Corporación La Candelaria, Bogotá (mimeo).

could also be used to promote the use of recycled products, the separation of household wastes to facilitate classification and sale, and to simplify the reclamation of certain materials and products. Actions such as these could help stimulate environmentally aware domestic habits and promote a culture of recycling. These and other practices require changes in the traditional structure of the management of solid waste; civic organizations and teaching institutions could be given a key role here.

If urban sustainability becomes a policy objective, management support must, in the first instance, use local expertise. Foreign consultants are rarely aware of the local context and may lead to programmes and measures which conflict with local customs. Second, the design and use of many products needs to be changed to ones which are less harmful to the environment, for example, a reduction in packaging material.

Increasing the status of waste collectors and recyclers requires the promotion of certain strategic activities such as understanding trends in the artisanal and small-scale reclamation and recycling industries. This includes raising the productivity of existing systems; removing technical, financial and institutional obstacles; and promoting a better understanding of the interrelationships between local activities and the wider context in which urban development takes place.

The education system needs to increase its efforts in both formal teaching and training and in domestic education so that the culture of recycling "starts at home". The demonstrably positive effects of projects such as the one implemented in La Candelaria, suggest that selective collection on different days for organic and inorganic waste is one desirable course of action. This provides job opportunities for local people who collect and dispose of the waste and sweep the streets. Small, local firms could help in measuring the efficiency, the volume and the nature of the material recycled throughout the city, and evaluate the impact of changes in consumption habits and the waste generated.

The adoption of effective proposals involves mobilizing the necessary political will to provide guidelines for environmental management. It also entails steering public investment and services so that they help generate concrete actions to develop a culture of urban sustainability.