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WATER AND SOLID WASTE MANAGEMENT**

***REGIONAL REVIEW OF ECONOMIC INSTRUMENTS FOR SOLID WASTE
MANAGEMENT IN LATIN AMERICA AND THE CARIBBEAN***

Case study of solid waste management in Montebello, Antioquia

EXECUTIVE SUMMARY

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(Original Document in Spanish).

INTRODUCTION

The Inter-American Development Bank (IDB) has established a regional Network for Dialogue in seven areas, one of which is the Environment. A key issue to be addressed at the next February 2003 meeting will be the management of solid wastes, focusing on the use of economic instruments as management tools to minimize wastes at their sources, produce the largest possible amount of recycling, achieve the largest collection coverage that is financially viable, carry out a safe and optimum final waste disposal (from the economic, social and environmental viewpoints) and strengthen citizen's participation in solid waste management.

This document for discussion presents the urban experience of Montebello, a small municipality in Colombia's mountainous northwest region, with 10,400 inhabitants, of whom 1,850 are urban dwellers and in which a variety of economic instruments have been used to underpin the project's sustainability.

CONTEXT

Montebello is located in the department of Antioquia, Colombia, 51 km from Medellín. It covers 83 km² of rugged topography. The town is situated at an altitude of 2,350 meters, has an average temperature of 16°C and receives 2,600 mm of rain a year.

The urban area is well-endowed with infrastructure. The water supply, sewerage and garbage removal systems are administered by the Municipal Office of Public Services. The water system supplies 100% of the urban population with water, with a very low sanitary risk, in adequate amounts and with sufficient continuity and pressure through a system of household connections. The sewerage service serves 95% of the community and discharges the wastewater directly into La Miel River without any treatment whatsoever.

The electric power and telephone services are supplied by departmental enterprises. They are good quality services with 100% coverage of electric power and 18 telephone receivers per 100 inhabitants. Cellular telephony is widely used.

A monthly service charge is paid for each of these services (excluding telephone service), averaging around \$25,000/month (US\$ 9.10/month) per household.

The local economy is agriculture-driven: coffee (3,200 hectares and 1,600 tons/year), bananas (510 hectares and 2,040 tons/year) and avocados (60 hectares and 180 tons/year). The second activity is small-scale feldspar mining. A rural cement factory contributes almost 90% of the industrial and trade taxes collected by the municipality. The municipal administration is the major employer in the service sector.

Montebello's budgeted income for 2002 was \$2,732 million (US\$1 million), 24% consisting of its own revenues and 76% from the municipality's share of current national income or transfers. Some 28% of this budget is earmarked to cover operating costs and 72% for investment. A noteworthy fact about the municipal finances is that Montebello has no public debt.

BACKGROUND INFORMATION ON THE PROJECT

Before 1989, a municipal dump truck collected the garbage once a week and dumped it along the border of the urban area; the service was free of charge, but the poor state of the roads kept the coverage from reaching 100%. Street cleaning, generally on week-ends, was limited to the central park and the main streets.

In 1989-1990 a manual sanitary landfill was designed on land belonging to El Olival, a district of Montebello, and entered into operation in 1992. By 1995, municipal government decisions had turned it into an open dump. It was at that point that the community living in El Olival protested and blocked the site.

Some of the inhabitants of El Olival began to recycle the paper and cardboard in an effort to reduce the environmental impacts and earn a little extra income. They ran up against many problems because “the trash reaching the dump was very dirty.” The community proposed the possibility of recycling and putting the organic wastes to use. This is how the present project was born.

PROJECT DESIGN

The project design did not follow the traditional linear process. It was first formulated in mid-1996. The participants included different departments of the municipal administration and El Olival community, which received both financial support and technical assistance from the Committee of Coffee Growers and from the Montebello municipality.

The project was launched in 1998 with the production of worm-generated compost and recycling resting on local experiences. The incineration of the remaining waste was added due to the opposition of the inhabitants of El Olival to the existence of the landfill. CORANTIOQUIA is financing the infrastructure. The Montebello Women’s Association (ASOMUBELLO) became involved in the recycling component and the local police and the educational sector were brought, through the secondary urban schools, into the community promotional campaigns for separating the solid wastes. Composting was a later addition. The National Traineeship Service (SENA) joined the project in June 2002 as adviser to optimize the management of organic wastes.

The guiding criteria and use of economic tools were defined during this dynamic design process: the decision to turn a problem (that of the final disposal of solid wastes) into an opportunity; the involvement of the community, community leaders, community civic organizations, local and regional government agencies and private agricultural organizations in the project; the boost given to recycling and the turning over of the job to an organized group of female family heads, ASOMUBELLO; the utilization of organic wastes at the site where the badly operated sanitary landfill had operated, and the choice of El Olival community to do this work; the decision to buy, through the Municipal Technical Agricultural Assistance Unit (UMATA), all of the production of the compost and the worm-breeding operations for its farmer support programs.

The main problems revolved around being able to convince some external institutions of the merits of the project and to correct local shortcomings in project preparation and timely decision-making, caused by a lack of experience in the comprehensive management of wastes.

PROJECT DEVELOPMENT

The comprehensive management of solid wastes project is made up of the components shown in the diagram and following tables. Its development rests on management, administrative and promotional activities coordinated by the Municipal Planning Office, which bring together different municipal departments (Office of Public Services, UMATA, Cultural Center, Local hospital, Secretariat of Education, Local Police), the community (whether organized or not) and

regional institutions (SENA, CORANTIOQUIA, and the Coffee Growers' Federation).

These institutions meet in committees organized by work topics and in a Coordinating Committee that continuously plans and evaluates the project, and makes the key decisions regarding it.

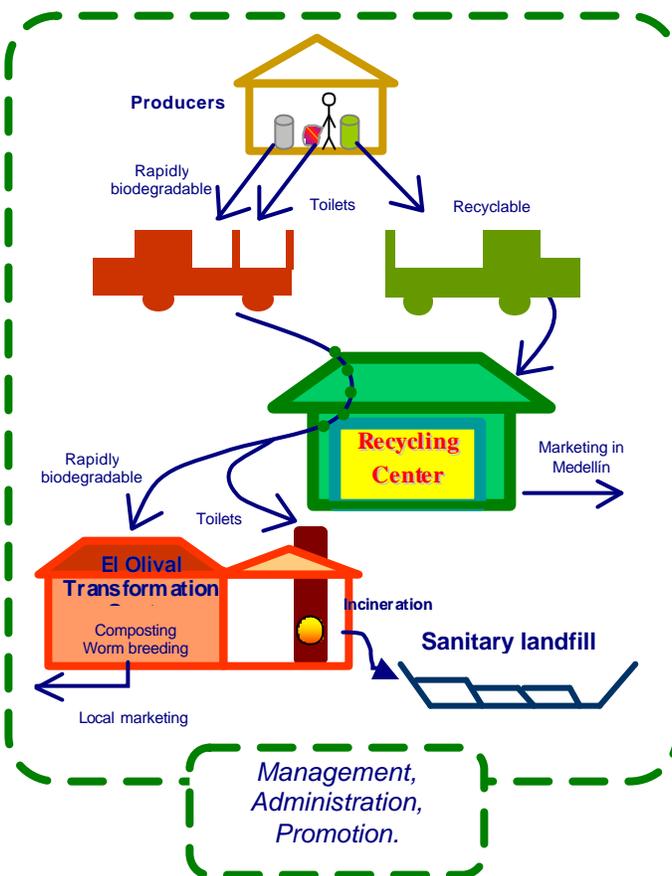


Diagram. Relationship among the different activities of the project in Montebello

COMPONENTS OF THE MONTEBELLO, COLOMBIA PROJECT

Production:	24,000 kg/month 0.40 kg/person – day.
Household separation of solid wastes:	Carried out by the community, 90% of the users. 1 container for rapidly biodegradable garbage and trash. 1 plastic bag for the toilet. 1 container for recyclable material. Unit cost (US\$ 1.89/ton) The costs include both the operation and maintenance and recovery of the investment. Costs are assumed per user.
Collection:	A truck collects biodegradable and toilet wastes at the same time, while a second truck collects what can be recovered. 100% coverage. 2 times a week. Total unit collection cost US\$ 31/ton.
Recycling	Paper, cardboard, glass, metal and plastic are recovered. Recovered 3,600 kg/month. Unit cost US\$ 39.75/ton. Marketing revenues US\$ 24.75/ton. The Association of female family heads, ASOMUBELLO, a local community organization, takes care of the recycling.
Utilization:	Compost and humus (worm breeding) and protein (worms) are produced from the rapidly biodegradable organic matter. Utilized 12,000 kg/month. Final product 4,600 kg/month. Unit cost US\$ 32.58/processed ton. Marketing revenues US\$ 81.69/product ton. The inhabitants of El Olival district, organized as a community, are responsible for the utilization. Institutions provide advisory assistance.
Incineration:	Toilet matter and the matter rejected in the recycling and utilization processes are burned in a device using ACPM. Incinerated 8,400 kg/month. Unit cost US\$ 35.14/ton. El Olival community is in charge of the operation.
Final disposal:	Sanitary landfill. Approximately 240 kg/month of ashes and inert matter are finally handled. The costs are included under utilization. Operated by the organized community of El Olival.

EVALUATION OF THE PROJECT'S SUSTAINABILITY

The project's sustainability, understood as its capacity to continuously provide the benefits expected of it, with a minimum use of resources and the conservation of the environment, should be built on the simultaneous junction of three major dimensions immersed, in turn, in the political, legal and institutional contexts: the community, consisting of its inhabitants, culture and institutions and which, in the final instance, is the actor that establishes the conditions for its demands for environmental goods and services; the environment, in which the community lives, produces and manages its development and which offers its resources for rational use; and the knowledge base, represented by science and technology geared towards the solution of problems related to vulnerability and exposure to risk (defined by the relationship between community and environment), as well as towards the supply of, and demand for resources by means of services.

These three dimensions and their inter-relationships evolve within a political, legal and institutional context that defines their boundaries. Within these dimensions one identifies the economic, financial, legal, and institutional regulatory framework, the quality control rules for environmental services, and the technical cooperation required.

The project as a whole was started five years ago and its evaluation gives reason to believe it will last much longer. Some of the grounds –or lessons learned– upon which project sustainability are based include:

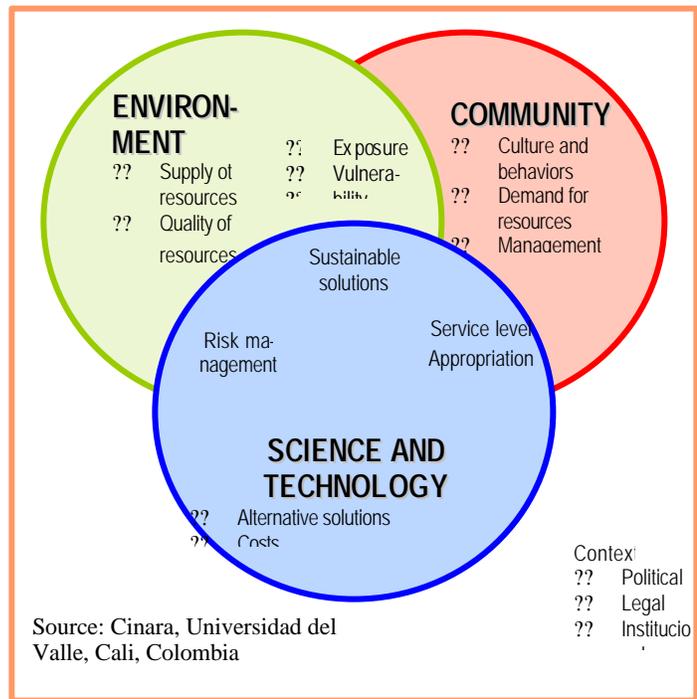
?? The community is familiar with the project and performs specific activities, like separating the solid wastes at the source (90% of the users) and participating in the educational campaigns, particularly the children and young people.

?? The community pays promptly for the service (90% of the users)

?? Local institutions join forces with regional and national institutions.

?? Thus far, the local government and its institutions are responsible for the momentum of the project, insofar as its administrative handling and overall management are concerned.

?? A 68% reduction in contamination has been attained as a result of the solid wastes that are re-utilized.



- ?? According to the analyses made by the environmental authority, the project does not produce any atmospheric contamination.
- ?? Environmental awareness among the citizens has increased, as expressed in their support for the new project.
- ?? All of the technical equipment can be operated, maintained and administered by the community, except for the incineration.
- ?? The existing legal system is conducive to organized community participation in the provision of the services, an endeavor that has proved useful in small communities.
- ?? The regional and national institutions are geared toward providing financial support for the investment and technical cooperation for the project.

THE FINANCIAL SUSTAINABILITY OF THE PROJECT

The financial sustainability of the project has rested in large part on the use of economic instruments that have contributed to the attainment of large coverages, good service quality, promotion of recycling, and effective environmental management and conservation. It is important to bear in mind the intensive community participation in the Montebello project, accompanied by efforts coordinated with local government institutions, with continuous and mass educational campaigns and the cooperation and work of regional and national institutions. The financial results and economic instruments used include:

- ?? ***Costs and financing sources.*** The total investment cost was \$160,200,000 (US\$58,250) and its recovery is included in the project's cost calculations. The financing sources are: private institutions (the National Federation of Coffee Growers, 28%); regional institutions (CORANTIOQUIA Regional Environmental Corporation, 22%); and the Montebello Municipality (50%). The annual operating cost of US\$19,367 is covered as follows: US\$2,494 a year (13% of the total cost) from a direct municipal subsidy; US\$4,873 (25%) from marketing revenues; and US\$12,000 (62%) from community service charges and other payments. The direct municipal subsidy is needed to cover the cost of the services for the lowest-income groups (1 and 2), inasmuch as the crossed subsidies from service payments by residential users (group 3) and commercial users are not sufficient. The social benefits produced by the project fully justify this direct subsidy. These benefits include the strengthening of the community's self-management capacity; the reinforcement of the social fabric and social capital formation; and the creation of local jobs and a positive setting where fellow citizens live in harmony with their environment.
- ?? ***Service charges.*** The municipality has established a differentiated rating scale for the 570 residential, commercial and institutional users. Users in the first two categories have been broken down into three income groups according to their economic capacity, as estimated by the physical conditions of their dwellings or commercial establishments. The monthly residential rate ranges from US\$0.20 for the lowest income group, US\$0.76

for the intermediate group, and US\$1.49 for the highest income group. Commercial and institutional users (110 users) pay rates of US\$ 1.53 to US\$2.73 a month. Crossed subsidies are obtained for the lowest income residential groups.

- ?? ***Joint collection of service charges.*** Charges for municipal garbage, water and sewerage services are collected jointly. Any delinquency in payment is handled through friendly arrangements. If the latter fail, the water service is cut off until the user pays the amount owed. The good quality of the services and the active involvement of the community in the project have contributed to a timely payment rate of 90%, with maximum delinquency standing at 3 months.
- ?? ***Revenues from marketing of processed materials.*** The project generates sales revenues from the marketing of recycled materials and of processed products (compost, humus and protein). Incineration services to third parties, together with consultations, visits and sales of educational materials produce other minor earnings. These revenues amount to US\$4,873 a year, or 25% of the total income.
- ?? ***Transparent accounting practices.*** The municipality keeps separate project accounts that are open to all participants, including the community. When the resources are shared with other projects, costs are assigned on a time use basis. Values are calculated on the basis of the costs incurred, without including returns on the invested capital, but considering its recovery.
- ?? ***Technical support for the operation.*** Different institutions, state-related or not, provide technical assistance to help the municipality and the community solve their problems more efficiently. CORANTIOQUIA offers support for environmental evaluation and the incineration operation. The Federation of Coffee Growers and the National Apprenticeship Service use and market the materials that are produced. The cost of the technical assistance is charged to those institutions.
- ?? ***Incentives for community participation .*** An organized group of women household heads from Montebello is in charge of waste recycling. As an incentive, the association (ASOMUBELLO) is given all of the earnings from the marketing of the recycled products, which are distributed among the members who participated in the work. The organized community from El Olival district receives a cash payment for 74 days of work for activities such as composting, humus production, incineration, and management of the sanitary landfill, where ashes and inert materials are disposed of.

RECOMMENDATIONS FOR THE PROJECT'S REPLICATION

This final section presents some key recommendations for effective solid waste management in Latin America and the Caribbean, taking into consideration that each country and city will demand a different set of actions and methodological approaches:

- ?? Encourage community participation throughout the project cycle (problem identification, planning, design, execution, operation, maintenance and evaluation). Community participation should be incorporated in the provision of services, project administration and management of the different activities throughout the project cycle.
- ?? Approach solid waste management issues comprehensively and from an early stage; establish the necessary linkages between waste management and other community development issues, as well as broad national and regional concerns.
- ?? Study alternative solutions, taking into account the local, political and institutional sustainability of projects. The leading concerns are: the community, with its cultural, social and economic development aspects; the environment, with its natural potential, requirements and limitations to provide long-term sustainability; and technology, which is linked to the former two dimensions and which management solutions depend upon.
- ?? Solid waste management can open new development opportunities if accompanied by economic solutions. Economic approaches and instruments can be brought to bear before wastes are produced, and at the time of waste collection, transportation, treatment and disposal.
- ?? Promote participatory education as an essential component of solid waste management (by combining knowledge, one can produce effective solutions)

Projects like this should be promoted by national governments, especially in smaller cities where private sector is not sufficiently attracted to become involved in solid waste management projects. This can be done: by incorporating such projects in national legislation and regulations, thus supporting their introduction and development in local communities; by opening-up participatory schemes among organized sectors of the community, including business organizations; by offering systematic and timely technical assistance, including the dissemination of information; by encouraging community participation in technical cooperation programs that use evaluation schemes; by facilitating the involvement of other actors, especially from academics and international programs; and by serving as communication link between communities and their institutions.

Support Latin American and Caribbean network initiatives in which communities share their experiences and access technical assistance programs. Government, academic and research institutions, and economic development sectors should all be involved. The network should be entrusted to the headquarters of a regionally recognized institution that has well-defined objectives, clear work plans, precise performance and evaluation indicators, and budgetary resources to cover its operation.