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## Selective solid waste collection and recycling in Recife, Brazil

by

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### Background

Recife is the capital of the state of Pernambuco, in Northeast Brazil. It has a population of approximately 1,300,000 with an annual per capita income of US\$3,089.-. Population in the Metropolitan, 3,000,000 in 1991, has a rate of increase of 1.81 (Table 1), which is low when compared to other Brazilian cities. Unemployment is the highest among the 6 main metropolitan areas of Brazil. The delivery of services, where women play an important role (table 2) and commerce are the most important economic activity (Table 3). Although Recife has an unequal distribution of wealth and a large proportion of poor families (Table 4), creativity for survival is high. The informal sector employs 53.2% of the working population (Table 5) and people undertake alternatives to formal development.

Drainage is an environmental problem related to a lack of infrastructure and tidal influence. The problem is aggravated by the limited collection and treatment of domestic sewage (79% of the poor have no sewerage system) and the high production and inadequate management of solid waste. Awareness of environmental problems is low. Contamination of water by waste and incidence of water related diseases are high, entailing high costs to the public sector.

Similar to most Brazilian cities Recife has serious financial problems. The municipal institutions therefore turn to social structures and community approaches as alternatives to public services. An integrated basic sanitation programme encompassing drainage, removal of sewage, urban cleaning and health promotion is implemented by a decentralized administration. The city is divided in 6 administrative sectors and sub-divided in three micro-regions each. Communities are represented on regional delegations; Sector Planning Councils and the Urban Development Council function at the sector and Municipal levels.

### The programme intervention

Urban cleaning is a major problem and the Programme of Selective Collection and Recycling of Solid Waste, initiated in June 1993, is a basic instrument for city cleaning. The programme was started in June 1993 and will run till December 1998. The programme aims at behavioural change for reducing the production of solid waste, encourages and promotes the commercialization of recyclable material and stimulates the generation of income. The results in turn help reduce health risks and the municipal costs of urban cleaning (Table 6).

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Through environmental and hygiene education people learn how to separate recyclables at the source and donate them to groups which collect, sort and sell them for a living. The need was defined in consultation with the people through institutional and community channels, such as CBOs and NGOs and the Municipal Councils. The latter promote the programme in a city where almost 2,000 families survive on waste picking, formerly exploited by middlemen and exposed to daily contacts with contaminated garbage in streets and dump sites.

The Municipality of Recife promotes training in recycling. The Urban Cleaning Municipal Company (EMLURB) has a workshop which recycles the waste paper from the Municipality's Departments. This workshop produces on average 2,400 sheets of paper per month for use as covers and folders. The paper produced is rustic and artistic. The workshop offers training courses to community groups interested in production for the paper and package industry.

The programme also involves the small scale production of compost, functioning as a laboratory for studies on waste recycling. It demonstrates the composting process to pupils of elementary schools. The compost is used in public parks and gardens (66 ton./per month on average). To increase the sustainability of recycling and reuse, the programme emphasizes its commercialization and industrial recycling.

The Selective Waste Collection and Recycling Programme is incorporated in three broader development programmes of the Municipality of Recife. The Municipality in the Neighbourhoods Programme aims at the systematic decentralization of the municipal administration in all sectors. It focuses on planning, programming and evaluation of sector and neighbourhood activities and is one of the means of social control through participatory budgeting. It involves over 700 CBOs and is undertaken by 192 community management delegates. The Community Health Promoters Programme - PACS of the Municipal Health Secretariat promotes health through 950 promoters. It diminishes the distance between the Secretariat and the residents and has altered considerably the indicators of health in the Municipality (Table 7). The Programme of Income Generation of the Secretariat of Planning and Special Assistance in the Mayor's Office raises governmental funding through the Bank of Northeast of Brazil - BNB (PROGER/PROFAT) to support economic initiatives.

The waste programme is subdivided in several projects: Selective Collection in Public Departments, with the motto 'Our role/paper is to recycle' (in Portuguese 'paper' and 'role' are the same word), 'Selective Collection in Schools', 'New glass again', and 'Selective Collection in Condominia'. These projects operate independently, while other projects operate in an integrated fashion and work interdependently: 'Voluntary Delivery Spots', 'Communal Selective Collection' and 'Support to Selective Collection by the Informal Sector'.

The 'Voluntary Delivery Spots' project was initiated in 1993. Twenty six special containers for the segregated collection of recyclables have been placed mainly in high income neighbourhoods. The target is 40 more spots. Besides providing a means for the appropriate disposal of recyclable waste, they have an educational purpose. Initiated by the local government, the project is gradually handed to the private sector through community based organizations. Only equipment maintenance and social monitoring remain public sector tasks.

The 'Communal Selective Collection' project is implemented in middle-low and low income neighbourhoods. To stimulate the separation of materials by the households, they are given the possibility to exchange the separated materials for food, mealtickets or construction

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material for a group's building. This exchange is made by each household individually or by a household collective. Priority is given to neighbourhoods with difficult access for conventional garbage collection. Local participation of especially women lowers the amount of garbage and the operational costs which in low accessible areas are relatively high.

For the first three months EMLURB receives and sells the recyclables to the private sector. It also organizes hygiene and environmental education. Then, if receptiveness among residents is high, EMLURB helps the groups to build their management capacity and register as association, micro-enterprise or cooperative and transfers operation to them. Each group generates income for approximately 8 persons. The programme has developed a partnership with local industries to buy and transport recyclable materials. Community pickers and cart pullers collect the recyclables which the housewives separate. The leaders of the process are also mostly women (Table 8). The programme currently has 34 groups, of which 57% led by women, involving 13,200 families. So far five groups are managing the full process. In all areas environmental pollution by garbage is reduced due to the high participation of the residents. Hygiene education is needed to avoid that the food received after handling recyclable materials gets contaminated.

The project 'Support to Selective Collection by the Informal Sector' is meant for two groups active in informal waste recycling: (1) street pickers and cart-pullers and (2) rag-pickers at the main city dump. Both groups are non or semi-qualified labourers, mostly illiterate and without permits. Lack of access to job alternatives, low knowledge of occupational health hazards and a limited perspective and resources keep them from changing their job or working conditions. The project aims at improving the groups' situation based on their background and specific context. The project investigated their background with qualitative and quantitative data on their exploitation by middlemen (waste buyers and owners of stores). It analyzed alternatives through organizing pickers/pullers and developing collective initiatives. Impacts on quality of the urban environment and health conditions were assessed. CBOs then helped to establish 4 pickers/pullers cooperatives (initiated in 1994), with on average 16 members each. The cooperatives got special carts with support from the Municipality, donors and the private sector. The project promotes more hygienic collection and sorting methods in the working places per sector. Thereafter, and depending on interest, the focus is on strengthening the associations and their contacts with the industries and liberating them from the middlemen. Positive effects are an increased number of participants, reduced direct contacts with contaminated garbage, a reducing in number of dump sites and positive effects on the urban environment and expenditures related to waste collection. A survey gave baseline data on number of middlemen and waste collection carts in the city. Identification of carts with plates has been started for better monitoring and follow-up.

At the main city dump site in the Municipality of Jaboatão dos Guararapes, the project aims at upgrading the surrounding area of 60 hectares. The garbage deposited on the site has already been treated by the Municipality of Recife and amounts to approximately 5,000,000 ton or 14,285,714m<sup>3</sup>. Biological processing has been initiated in March 1994 to increase the lifetime of the dump by approximately 5 to 20 years (Table 9). The site was divided in 8 treatment cells, with liquidity and gas drainage and a biological reactor for accelerating the process. The first process has been concluded and the cell closed; the second is still in use. Ragpickers are not allowed due to safety risks from heavy machines, deep trenching and the presence of toxic and hospital wastes. Initially they numbered 700; a new survey of April 95 shows a decrease to 555, 20% of them women and 10.1% children and youngsters, consisting

of 2 sub-groups: ragpickers and vendors. As their work is their living and a benefit to the garbage treatment as it reduces the presence of recyclable solids in the cells, the solution is not to remove them but give social support and better working conditions to those who want to stay and not work sporadically in the site. Support consists of vaccination, hygiene guidance, access to legal documents, etc. The two groups are organizing themselves in cooperatives to improve their legal status and working conditions and have started a Screening/Sorting Centre in September 1994. All 52 children and youths who worked in the site for foodexchange have been given work in communal vegetable gardens with sharing of profits as from April 1994. Recreative-educational activities started in April 1995, including learning to read and handicrafts and involving already 30% of the children. For the short term sunflower planting and commercialization of seeds have been planned. For middle and long terms, planting of fruittrees and reforestation is proposed. The project is linked with the street pickers project: those working in the dump willing to go back to urban cleaning are assisted to join a cart-pullers cooperative and help expand the informal urban garbage collection system.

### Gender aspects

The high visibility of women in Recife's economic life is well known at local and national levels and gave the city the name of 'Mecca of the new matriarchy' because the proportion of women headed households is 9% higher than in any other Brazilian city (Table 10) and their share in the economically active population (EAP) has increased considerably (Table 11). When formulating the solid waste programme, these factors stimulated and justified the identification of practical and strategic needs of women concerning their participation in decision-making process, establishment of new policies and development of income generating activities. Women's interests and participation are most visible in activities spontaneously differentiated by sex. But the programme also used gender specific motivating mechanisms, to deal with different questions and interests of men and women. It identified responsibilities and practices relating to waste management, collection and recycling by sex and developed methods to overcome the cultural constraints to women's participation. In the illustrated charts with the programme's activities a coconut is the main personage and programme symbol. The programme uses this neutral character to facilitate identification of and discussions on the type of people involved in the work and the division of responsibilities between men and women. The most expressive and consistent changes in division of work and benefits have been produced through the rupture of the conventional gender patterns by both men and women, but especially by women.

The Urban Cleaning and Maintenance Programme (EMLURB) is implemented by the Secretariat of Coordination and focuses on mobilisation, education and training. The programme negotiates directly with the leading communities and with their Delegates, through the Programme "Municipality in the Neighbourhoods" in order to select priority areas for the various projects. Community leaders are involved in awareness raising (environmental education), mobilization and behavioural guidance (hygiene education). Training and capacity building on urban problems with a special focus on maintenance and health aspects is offered to delegates of the Programme "Municipality in the Neighbourhoods" and the Community Health Promoters at sectoral and/or micro-regional levels, with as specific objective to train promoters for work in ecological and citizenship awareness raising. Training is also given to technical field staff working in urban supervision, drainage, urban cleaning and will start for staff working in epidemiological surveillance.

## Education and training

Education and training started in October 1994, involving professionals from the departments mentioned and the concerned and motivated departments of the Municipal Secretariat of Education. The programme focuses on the specific characteristics in each administrative region or micro-region and uses the decentralized government administration and health facilities for its sessions.

The establishment of priorities for the maintenance policy (management definitions negotiated with the community representatives) and the results of the other initiatives are monitored by EMLURB, which is in charge of the maintenance of the urban infrastructure and the delivery of public services.

## Programme results

The programme has had the following concrete results:

- 73% increase in recycled materials in two years
- 62% annual increase in volume of material for recycling
- 482 ton/month reduction in of solid waste
- 56,5% reduction of special operations for waste collection and 285 dumpsites reduced to 124 (43.5%)
- 5,796 tons./month less garbage collected (Table 13)
- 5 to 20 years expansion of the life of the dump site. Upgrading of the dumping area and waste treatment
- food supply for approximately 2,040 recycling families

## Sustainability

The continuity of the initiatives undertaken by the Municipality together with the residents for the Selective Collection of Urban Garbage is ensured by a strong emphasis on environmental education and the high participation of CBOs and the private sector.

The difficulties which occurred in this implementation period were caused mainly by the lack of management capacity building at the organizations' level and by the strong price fluctuations in the market of recyclable materials.

Capacity building for small businesses management is now organized by the Urban Social Centres under the Permanent Programme of Vocational Training of the Secretariat of Social Policies. The training teaches the participants how to deal with the fluctuations of the market. In order to tackle also the more basic difficulties -such as the cart-pullers need for learning how to read and write- a specific programme has been started.

The continued partnership between the public and private sectors is an important element of the programme. In Recife, as in any other city, commercial interests should provide the continuity of this partnership. Assumptions are that the recyclable materials will always be part of the urban waste, the industries will always be interested in having these materials and the involvement of the population will have a tendency to increase. The socio-economic characteristics of the population also contribute to their interest in exploring various

initiatives, as there is a lack of other opportunities for getting employment and earning and income in the short term. Another factor contributing to this interest is the type of structure and the degree of informality of the local labour market (Table 5)

Regarding the conditions and structures established for social control of public services (representations, institutionalized councils etc), it has become politically difficult to interrupt the support to these initiatives. Another fact which contributes to the durability of the project is the reduction in the operational costs for waste collection, especially in collection and transportation of solid waste to the recycling sites.

Generally speaking, the programme practically covers its operational costs with the reductions in the costs of public services and the resources obtained with the selling of segregated and recyclable materials directly to the industries (see cost benefit analysis Table 12), once it does not undertake door-to-door collection itself and increases partnerships.

With the exception of the literacy programme and the training of the health promoters, all the projects should become activities operated regularly and without any investment from the Public Sector.

#### Replication

The Municipality of Recife has not yet started to disseminate the programme's information and extend the approach to other areas, even though the response has been satisfactory for a city where the reported practices have only been in existence for two and a half years (Table 6).

**Key words:** Brazil, solid waste collection and recycling, partnership, hygiene and environmental education, private sector, income generation, environmental upgrading