Solid Waste Management in Bandung, Indonesia

Program Name:
The Integrated Resource Recovery System

Importance of the Issue:
Municipalities in both the developed and developing worlds have become inundated by the volume of solid waste which they must process in order to assure the health and safety of their populace. Particularly in the developing world, there is a problem of meeting capital and operations costs necessary to support the collection-transportation-landfill model of waste management which is currently prevalent in the developed world. In addition, many districts in developing country cities do not have adequate road infrastructure for the passage of waste collection vehicles, making formal collection services physically impossible to provide. This has resulted in cities in the developing world falling further and further behind in the collection and processing of solid waste, putting the population of their cities in more and more danger from epidemics and other health risks.

Recent outbreaks of cholera and other easily communicable diseases in the shanty towns of large cities in South America have clearly demonstrated the connection between the proper management of solid waste and the health of the public, particularly the poor living in squatter communities. Besides immediate health effects, the more long term problems of groundwater contamination and pest infestation are also prevalent in areas without proper waste disposal. And as the population of developing cities grow, these problems can only get worse.

Programmatic Goals:
The goal of the Bandung Integrated Resource Recovery System program is to manage the large amount of previously unmanageable waste through the development of an indigenous waste management approach, which is low cost, provides employment for urban poor, and defers the cost of waste disposal through the sale of materials which were previously unavailable for recycling.

Sustainability Principles Applied:
Adaptability - developing solutions to chronic problem conditions by supporting and developing indigenous, community-based responses to those problems.

Abstract:
In response to a growing population, and therefore a growing amount of solid waste which it did not have the financial or land resources to manage, Bandung, Indonesia has developed, along with a non-governmental organization working in the city, the concept of a "module" of people who work to separate recyclables from the city's waste stream, thereby providing a low-cost alternative to the landfill model of waste management services.

The recyclers working in the module are persons who previously survived as "scavengers," that is, poor residents of the squatter's settlements who make their living by collecting recoverable and recyclable materials from the waste stream. Historically, in Bandung and in cities with large poor populations throughout both the developing and the developed world, scavengers are considered to be a hindrance to the operation of efficient solid waste management rather than as an inexpensive and often entrepreneurial labor resource that can be supported and developed to collect and process recoverable
materials. These people have been traditionally harassed and even jailed for their activities.

Through the Integrated Resource Recovery (IRR) program, these people have been given financial and technical support to improve their recoverable waste collection services, to compost organic wastes, and to create indigenous businesses and employment using waste products as raw material and "capital." Finally, the IRR program builds financial institutions which provide a financial base internal to the community, providing capital for other, non-recycling enterprises. IRR also has a significant impact on setting fair prices for the secondary materials from which the scavengers make their living, thereby supporting a fair living wage for these people who were heretofore considered an economic liability.

In the IRR concept, each module consists of a group of families. These families are given social system support in the form of evening schooling for children, health care, and assistance in the development of a savings and loan and a cooperative corporation. With this organizational infrastructure, these people then form businesses in resource recovery, composting, and seed farming which not only provide them with income, but reduce the amount of money which the city must spend on solid waste management in the form of landfill sites and the collection and transportation of waste.

**Staff:**

For each module, 22-24 persons are employed.

**Budget:**

Each module has a monthly operating budget of approximately 960,000 Rp per month ($525,000 USD). Income is approximately 740,000 Rp ($404,000) from compost. This is supplemented by income from other recyclables such as plastics. This level of investment yields a module which can extract recyclables from the waste of 25,000 - 30,000 people.

**Financing:**

The initial financing requirements were for the land needed (approximately 1000 sq. m. per IRR module) and for equipment. The equipment required costs approximately 2,500,000 to 3,000,000 Rp ($1,400,000 to 1,600,000) in the Indonesian context. This amount is provided from as investment from the budget of the waste handling authority in Bandung.

**Other Financing Options:**

Given correct market and social conditions, it is possible that cooperatives could not only be self-sustaining but also self-replicating - expanding to meet the conditions of the market.

Other levels of government may also find that, when the total costs of environmental protection and social welfare needs are considered, it is most cost effective for them to provide capital and/or operating revenues to establish IRR- like businesses.

**Contextual Elements:**

One of the interesting elements of the IRR model is its transportability to other cultures and contexts. Scavenger support programs have also been established with similar success in other large metropolis such as Cairo and even among inner-city poor populations in the developed world like those of New York City.

**Source:** "Case Studies" - ICLEI


Access time: 09/12/2002