MEGA-CITIES

INNOVATIONS FOR URBAN LIFE

URBAN ENVIRONMENT-POVERTY
CASE STUDY SERIES

NEW CULTURE OF
URBAN SANITATION

Bombay

A Project of
Committee of Resource Organizations
(CORO), Bombay

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The intersection between environmental issues in low income urban settlements and broader metropolitan environmental policy constitutes a unique environment/poverty dynamic operating in the world's largest cities.

In 1992, CORO took over failed municipal toilet projects in several locations and managed them on a cooperative basis

In Bombay, the CORO Pay Toilet Project provides commuity run sanitary facilites in the city's low income settlements. In 1992, CORO, a literacy NGO, took over failed municipal toilet projects in several locations throughout the city. Local groups manage the toilets on a cooperative basis, providing monthly pay for 500 workers. Community members, happy with clean facilities and water, and familiar with those running the project, are willing to pay for the service.

The case study series was completed in 1994 as a joint project between the Mega-Cities Project, Inc. and the United Nations Development Programme (UNDP). Urban Innovations were documented in nine cities by Mega-Cities Project Coordinators, in cooperation with the NGOs and government agencies initiating the respective projects. The case study series includes projects from New York, Mexico City, Rio de Janeiro, Buenos Aires, Accra, Cairo, Bombay, Delhi, and Jakarta.

The series examines environmental innovations operating primarily within low-income urban communities, but which are supported and extended through partnerships with government and NGO entities not traditionally associated with grassroots community organization. By supporting environmental programs at the community level and circumventing traditional hierarchies of political and economic support, these innovations address crucial environmental issues beyond the reach of more centralized approaches. The case studies illustrate that the urban environment is a fertile policy arena for the formation of decentralized solutions, which are an increasingly significant strategy as the challenges of metropolitan governance and management are redefined in mega-cities.

Each of these Case Studies is the product of a collaborative effort which includes members of the Mega-Cities field site in each city, representatives from local NGO and government agencies in each city, and members of Mega-Cities Core Office in New York City.

Mega-Cities Bombay

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As India becomes increasingly urbanized, traditional living habits forged in rural settings confront urban conditions

India is a nation of ancient and firmly entrenched tradition and culture. For thousands of years religion, geography and the necessities of a rural agrarian society have sculpted a complex caste system based on status, hierarchy, and, above all, a strict division of labor. As India is becoming increasingly urbanized, and her people are leaving their traditional rural communities and entering into an environment marked by fluidity, change and drastically different technological and physical conditions, traditional divisions of labor and living habits forged in rural settings are increasingly incompatible with urban conditions. Yet, Indians continue to cling to traditional cultural mores, often causing great problems, especially for the poor.

Bombay is India's largest and fastest growing city, and exemplifies many of these problems as traditional, rural culture clashes with the reality of conditions in the modern mega-city. Over half of Bombay's residents live in poorly serviced slums marked by overcrowding, pollution, poor sanitation and a host of other problems shared by the urban poor the world over. Of particular concern in Bombay is the problem of human waste. The lack of clean and adequate toilet facilities, the lingering rural custom of relieving oneself outdoors, and deeply entrenched attitudes and taboos preventing most slum dwellers from cleaning up human waste, have all resulted in slums littered with feces and reeking of urine. Despite the construction of public toilets by municipal agencies, the problem has persisted. The mere presence of toilets is not enough; they need to be maintained, kept clean, and widely used. This implies more than just the construction of new facilities, but a widespread change in the attitudes and traditions of all city residents, one that would promote sanitary practices, an appreciation of the importance of hygiene and the urban environment, and the reform of a cultural system that only allows a small minority to clean toilets or deal directly with human waste.

The Community of Resource Organizations (CORO), in response to a request from the Indian Department of Science and Technology (DST), has undertaken the management of several municipal pay-and-use toilet complexes in the slums of Bombay. CORO has reformed the toilets' management and maintenance structures, using local labor and introducing incentives which have resulted in cleaner toilets, less corruption and more community participation. By combining toilet maintenance and administration with their already existing work in literacy and book distribution, CORO has increased their reach into the slums, increased education about the importance sanitation and the urban environment, and laid the groundwork for more effective community organization around other issues. Through a two-pronged approach stressing literacy and hygiene, CORO has begun to create a whole new culture of urban sanitation, waste management and environmental education.

Over the last ninety years, India has seen phenomenal urban growth, concentrating more and more people in larger and larger towns. Between 1901 and 1991, the number of cities and large towns in India doubled, and their total population increased eight fold. In 1991 26% of Indians lived in cities and large towns, and the Registrar General projects that by 2001, 29.4% of the country, or 278 million people, will be urban dwellers. One of the most striking examples of this urban population explosion is Bombay, and as the largest and fastest growing city in India, it continues to struggle with many of the problems such drastic change entails.

Bombay was a group of seven swampy islands inhabited by fishermen when it caught the attention of European explorers and traders. As early as 1529 the Portuguese established a naval provisioning base there, and under the British East India Company it became the most important port and trading center in India, especially with the opening of the Suez Canal and the development of railroads in the Indian interior in the 19th century. Bombay continues to be the commercial and financial capital of India, as well as the center of the largest film industry in the world, and an important transportation center with an airport that handles 60% of the country's international flights and 40% of its domestic ones. Bombay provides 10% of the India's industrial jobs and pays one third of its income tax, one fifth of its excise tax, and 43% of the its corporate tax.

Greater Bombay had a population of 9.9 million in 1991 and is one of the fastest growing cities in the world. An estimated 300 families, or about 1,500 people, move into the city every day, and the city is expected to grow to 15 million by the year 2000. With the expansion of industrial and commercial activities over the last few decades, land in the central island city has been converted to commercial use, and with no more space available in the core city, housing colonies and slums have developed

in the eastern and western suburbs. Most of Bombay's new residents live in slums far from the city center and without many basic civic amenities; the city's recent growth has taken place far away from the traditional service networks and places of employment.

Table 1:
Population of Bombay (in thousands)

Year	City	Suburbs	Extended Suburbs	Percent Total Increase
1951	2,329	510	155	2,924	------
1961	2,772	1,037	343	4,152	42
1971	3,070	2,167	733	5,970	43
1981	3,258	2,799	2,169	8,226	38
1991	3,159	3,986	2,762	9,907	20

Source: Municipal Corporation of Greater Bombay

Obviously, such a quickly growing population places extraordinary stresses on traditional service delivery systems and limited municipal resources. These stresses are exacerbated by economic and political factors. Despite higher revenues from an expanding tax base, Bombay has gotten little in return for its increased contributions to the state and national exchequers. Even more problematic has been the stagnation and recent decline of industrial growth and employment during the 1980s. From 1981 to 1988 only ninety additional factories were built in the Bombay Metropolitan Region, and actual industrial employment fell sharply from 604,000 to 474,000 (see table 2).

Because of the loss of industrial jobs many Bombay residents have had to look for work in an informal sector

marked by low-skill, low paying jobs without any benefits or job security. This informal sector is accounting for a growing share of a stagnant labor market and is unable to fulfill the city's employment needs. Bombay's population growth has not been accompanied by an expanding job market, leaving many of Bombay's residents unable to pay for basic necessities, and the city as a whole unable to provide for its ever-growing number of poor.

Table 2 Changes in Employment in BMR, Maharasthra & India							
Area	Employment in Lakhs				Annual Compound Growth		
	1961	1971	1981	1988	1961-71	1971-81	1981-88
Gr. Bombay	05.05	05.93	06.04	04.74	01.02	00.01	03.04
Rest of BMR	00.38	01.09	01.32	01.16	11.11	01.93	01.83
total BMR	05.43	07.02	07.36	05.90	02.60	00.05	03.01
Maharashtra	07.87	09.98	11.92	11.56	02.40	01.79	00.44
India	39.28	50.83	70.32	78.75	02.61	03.30	01.63

SOURCE:
1. Inspector of Factories
2. Statistical Outline of India, published by Tata Services Ltd. (1989-90)
3. Economic Survey of Maharashtra (1988-89)
4. Reserve Bank of India Bulletin, December, 1989.

Many of the cities basic services are inadequate, and the poor suffer especially. There is a lack of recreational space and educational opportunity. Although Bombay has more doctors and hospital beds per person than the national average, many of the medical services are inaccessible and unaffordable for the poor. There is an extensive public transportation system serving Bombay and its suburbs, but it is unable to alleviate the huge congestion caused by the large number of commuters to the city, and Bombay is plagued by traffic problems and air pollution from cars and buses.

Bombay produces 4000 tons of rubbish a day and 1500 tons of silt and debris. The city is hard-pressed to remove it all, though the department of solid waste management employs a workforce of 22,000 and has an annual budget of Rs. 12.6 million (US$ 400,000). Slums are especially cluttered with trash.

Bombay is unable to meet the high demand for water. The recommended daily use is 254 liters per capita per day (lpcd); yet in Greater Bombay domestic supply of water on an average is not more than 130 lpcd. In the outer sections of the Bombay Metropolitan Region it is even less than 70 lpcd. In addition, most people have access to running water for just a few hours each day, and must collect and store water for the day's use, often carrying it from public standpipes to their homes.

Despite the existence of a relatively modern sewage network installed in 1935, and even with a vast new system financed by the World Bank and scheduled to open in 2005, Bombay is simply unable to treat the vast amount of waste water and human waste the city generates. Most of the city's sewage flows into local creeks and coastal waters inadequately treated.

Air pollution is also a major problem in Bombay, the result of factories, the vast numbers of motorized vehicles, cooking fires, and the nation's largest chemical industry (Bombay is home to about 50% of the nation's chemical production). 1,700 tons of pollutants, mostly sulfur oxides, suspended particles, hydrocarbons, carbon monoxide, and oxides of nitrogen bensyprine, are discharged into the air every day. Not surprisingly, Bombay's residents suffer from unusually high and constantly rising rates of emphysema, asthma, bronchitis, coughs, colds and headaches. 25-30% of the city's children have emphysema or asthma as a result of sulfur and nitrogen oxide in the air.

The most obvious problem caused by exploding growth has been the incredible population density and an acute shortage of suitable and affordable housing. Government agencies and private developers are only able to build a third of the estimated 60,000 new housing units needed every year, and those that are built lie beyond the means of the vast majority of residents. By 1982, 82% of Bombay's households lived in one room units and the city-wide average of 3.99 persons per room made Bombay

the mostly densely populated city in India.

Because of the great shortage of housing and the city's inability to expand infrastructure and services to its exploding population, an estimated 5 million people, or nearly one half of all Bombay, live in slums marked by overcrowding, poor living conditions, pollution and a lack of basic services and amenities.

Services in the slums vary, according to the slum's size, age, population, and residents' ability to establish links with municipal officers and elected officials. Nonetheless, conditions in the slums are generally awful. Lack of paved roads and improper drainage leads to widespread flooding and water logging in slums during the rainy season, and access to huts is often limited because of excessively muddy conditions. During the dry season, access is often blocked by accumulated garbage, as solid waste collection is often inadequate or simply nonexistent.

For most slum residents, obtaining adequate amounts of water is a daily struggle. The vast majority of residents are served by public standpipes or shared taps, and water runs for just a limited time each day. The water supply for the average slum resident is only 50 liters of water per day, about a fifth of recommended minimum amounts.

All of these problems are exacerbated by the incredible overcrowding in the slums. With so many people living in such small areas without many basic services, life in the slums is marked by pollution, disease and squalor.

Obviously, the municipal government cannot begin to solve all of the problems of the slums on its own; however, it is widely seen as responsible for providing services and infrastructure and residents are extremely reluctant to assume the responsibility for conditions in their own neighborhoods. In the absence of concerted community action and initiative, the government is left to itself to perform tasks way beyond its resources.

The proper disposal of human waste is a huge problem in the slums of Bombay because of a great shortage of latrines and suitable sewage systems. Unfortunately, traditional technologies have been unable to solve Bombay's human waste problem and have proved impractical given Bombay's large slum population and scarce resources.

- *Conventional Sewerage System*
  Traditional sewer systems are very effective, but they require a large and continuous supply of water and sizable financial resources. Although they are convenient, their average per capita cost, including house connection, is more than Rs.5,000/- (US$167). Operation and Maintenance costs, as well as necessayr adjustments to house plumbing prior to connection, makes these systems even more expensive. The system often takes up to ten years to plan and install. They also require high levels of energy and a large quantity of water. At least 100 liters of water per capita per day is needed to maintain the minimum flow in the pipe without deposition. Lastly, although the number of micro-organisms is substantially reduced during treatment, the effluent from a conventional treatment plant is still highly charged with pathogens which are capable of polluting a river and spreading disease. This can hardly be considered an optimal solution for households in the slums.

- *Septic Tank*
  A septic tank with a soil absorption system is a method for excreta disposal in unsewered areas, but this is not an appropriate option in Bombay for a number of reasons. Septic tanks require extravagant use of water for flushing feces from the pan into the tank, and Bombay already suffers from inadequate supplies of water. After partial treatment of sewage in the septic tank, the effluent has to be discharged in a

drainage field having permeable soil. For this reason it is impractical for Bombay, where the water table is very high and where there is a shortage of available land for drainage fields. Lastly, the capital cost is high, and it requires periodic desludging necessitating expensive outside help.

In the face of these inadequate solutions, some alternatives have been designed to solve the problems of human waste in Bombay's slums.

- *Mobile Toilets*
  Mobile toilets have been introduced in Bombay to provide service for slum dwellers. Mobile toilets are made of easy-to-clean fiberglass and have a collecting tank at the bottom which can be emptied remotely by a valve at the site of disposal. Unfortunately, their effectiveness has been undermined by poor scheduling, inadequate maintenance and a lack of access to nearby sewer lines. However, if the operational problems were solved, this system could yield good results in urban slums.

- *Sulabh Shauchalaya*
  Sulabh Shauchalaya is a low cost pour flush water-seal sanitary latrine. It is an improved version of the designs already available in the country based on researches conducted by different organizations and institutions on pour flush water-seal latrines. The designers of Sulabh Shauchalaya sought to provide an appropriate, efficient, cost effective and affordable excreta disposal system and to free scavengers from having to collect night soil and carry it on their heads.

  Sulabh Shauchayala is very popular in India because it has the following advantages :

  - It is odorless as it provides a water-seal between the pan and the pit.
  - It can be constructed inside the house. The cover slab of the pit may be used for various household uses like peeling vegetables, washing utensils etc.

- The excreta can be flushed with a small quantity of (1-2 liters) of water per use.
- It is a permanent structure requiring only a small space (1.80m x 1.20m).
- It can be constructed in nearly all sub-soil conditions.
- After a period of 2 years, the digested sludge in the pit becomes odorless and free from pathogens, at which point it may be used as manure.
- It is acceptable both from the aesthetic and health points of view, as the excreta is removed from sight and the smell is trapped under ground.
- It is cost-effective and is affordable for the majority of Indian households.
- Its maintenance is very easy and hardly requires outside help.
- It can be upgraded to the water-borne sewerage system without any alterations.

Even with the advent of such promising new technologies, people in the slums of Bombay suffer from a terrible lack of suitable latrines. Over 90% of slum dwellers depend on public latrines, and the Bombay Municipal Corporation has built 1400 public toilets. However, there is widespread dissatisfaction with the city's public toilets, and they cannot begin to meet the great demand and are woefully overused. They are marked by long lines, and inconvenience.

In addition, existing latrines are very unhygienic and dirty. The municipal workers responsible for maintaining the toilets are often undependable, and there is rarely enough water to clean the latrines sufficiently. Indeed, they are often so filthy that they become a problem in and of themselves, breeding disease and discouraging the use of toilets, especially for small children who are too small to use toilets designed for adults.

As a result of all of these problems, many slum residents must relieve themselves in open spaces near their homes. This results in extremely dirty and unhealthy conditions, with streets and alleys dotted with human excrement.

Excreting in the open creates particular problems for women. In a culture which demands modesty for women, they suffer a humiliating lack of privacy when forced to use open spaces in lieu of a latrine. Most women feel forced to wait for darkness to maintain a minimum of privacy, and their effort to control themselves often has adverse effects on their health. Also, using open spaces in the dark can be unsafe for women, and there have been instances of women being molested while going to defecate at night or in the early morning.

In addition to the present problems with Bombay's latrines, there are many substantial barriers to positive change.

- *Cultural*
  A vast majority of rural Indians still do not use confined space for toilets, and generally relieve themselves in open spaces away from their homes. In Bombay, most slum dwellers belong to this rural culture and are not yet fully urbanized in their habits. They do not understand that a toilet can be clean and hygienic, and do not attach toilets to their living spaces, perpetuating a dependence on public latrines. Furthermore, they often continue to use open spaces even when latrines are available, even though this practice is inappropriate and unhealthy in an urban setting.

- *Spatial*
  In city like Bombay, as slums grow, people do not reserve space for toilets or baths, so that there is often no place to put new public latrines. This lack of space contributes to the small number of toilets typically available to slum dwellers; a slum community of about 300 households may commonly have only about six to twelve common toilets. Also, as long as a community is not officially declared a slum, the Municipal Corporation of Greater Bombay does not provide toilet and water facilities. When it provides them, people are expected to pay for water while the corporation

provides for toilet upkeep and maintenance. Unfortunately, there is often not enough water, either for individual use or for cleaning the toilets. Municipal maintenance is often unsatisfactory. Toilets are overused, filthy, and poorly maintained.

- *Social and Historical*

In a city like Bombay it is also evident that an overwhelming majority of residents do not set high standards of cleanliness and sanitation for their toilets and urinals. Hence public toilets including those in offices, hotels, restaurants, railway stations and streets are filthy and unclean.

In India, over the last two thousand years, the caste system has dominated society, sharply separating intellectual work from physical work, productive work from services, and clean work from that associated with filth. Thus most people would be forbidden to clean up human waste, and there would always be a particular group who would be responsible for cleaning and removing it. Even today, most urban dwellers do not clean their own toilets. They usually engage someone else from the appropriate caste to do it, usually someone who is uneducated, culturally backward and without a sophisticated sense of sanitation. However, with growing urbanization and industrialization, even members of these castes have discontinued doing this particular work. Because of accelerating development, the caste system is beginning to break down, but Indian society has not found new ways to solve the problems of sanitation and related services.

Against this background, urban India needs not only clean toilets but a whole new culture of urban sanitation and waste management. The construction of toilets must take place within the context of an overall effort to educate people about the need for sanitation and hygiene and to break down entrenched social attitudes which prevent urban dwellers from adopting healthier, more sanitary lifestyles.

As an innovative approach to the problems of human waste disposal in the slums of Bombay, Community of Resource Organizations (CORO) combines literacy efforts with a new system of maintaining toilet complexes under a locally run pay-for-use plan. Using its experience with slum residents gained through its literacy program, CORO has set up a new administrative structure which uses local labor to clean and oversee public latrines. These administrative teams are able to provide residents with clean and effective toilets, encourage latrine use, and help create a new culture of cleanliness and responsibility among the poor of Bombay.

With this well-run system, residents have proved willing to pay to use clean latrines with sufficient water, and have begun to move away from their traditional role as passive recipients of free government services which often proved to be inefficient or unusable.

CORO's administrative teams are able to provide residents with clean and effective toilets
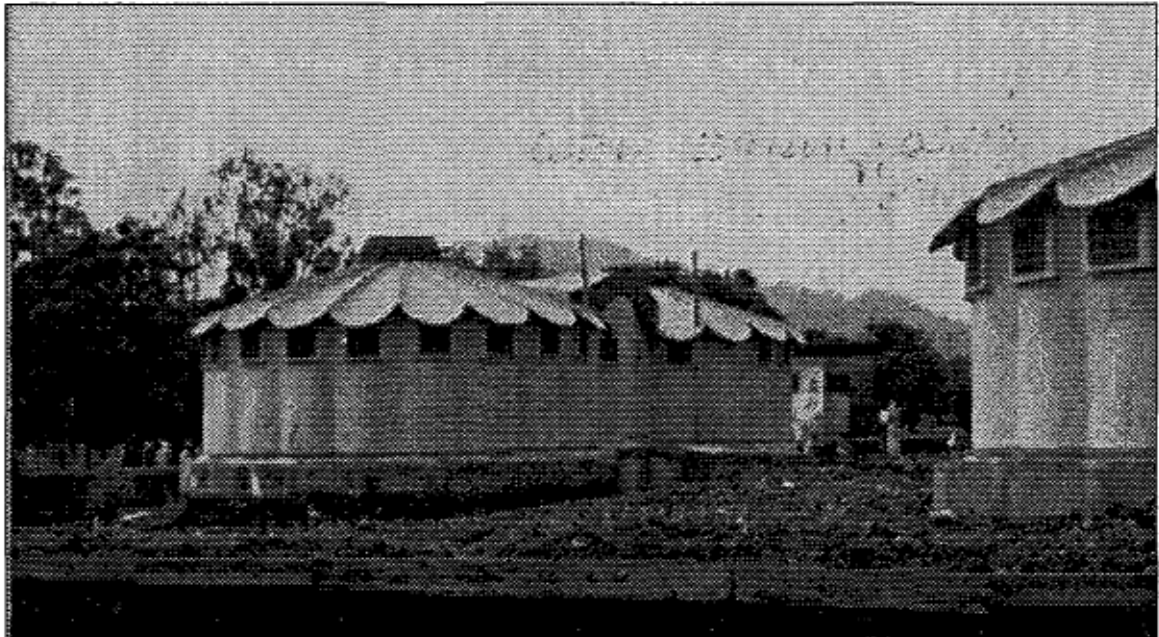
Objectives

In combining its literacy campaign with efforts to run pay-for-use toilets CORO seeks to achieve the following objectives:

- promote literacy among uneducated slum dwellers and provide them with reading materials;

- provide clean, efficient and affordable toilet facilities for slum dwellers and promote their widespread use, especially among women and children;

- reduce defecation and urination in open, public spaces, providing a cleaner environment in the slums and reducing the health risks associated with large amounts of human waste;

- provide jobs for slum dwellers;

- make public toilets economically self-sufficient;

- use literacy and latrine use to educate slum dwellers about environmental issues and the importance of local sanitation;

- provide a structure for community activism; create a new culture of cleanliness and responsibility in which residents expect to pay for reliable service, and in which they begin to take responsibility for conditions in their neighborhoods.

Moreover, through the toilet blocks, CORO hopes to promote reading habits among the users. For instance, it proposes to built libraries at D.N. Nagar, Chembur and Dharavi toilet complexes from where latrine users can borrow literacy kits and other reading material. The idea is to promote environmental education through literacy work and developing reading habits.

History of CORO

CORO began as a loosely formed group of different

activists from several voluntary agencies in Bombay. These original members were concerned about increasing literacy levels among Bombay's slum residents. Despite a relative lack of experience in literacy training, they started a Mass Programme of Functional Literacy in the Dharavi-BARC belt in Greater Bombay in 1989. At first, while visiting schools and trying to gain support for their efforts, the group was viewed with suspicion as outsiders from different backgrounds. It took some time for CORO to break down these barriers of mistrust. By establishing links with local community workers who were experienced political organizers, CORO was gradually able to generate community enthusiasm for literacy and reading. Young community workers were especially helpful in this process of mobilizing residents, and they became enthusiastic about the idea of promoting literacy. Contrary to their previous political experiences, which often involved frustrating encounters with passive residents or unresponsive bureaucracies, literacy training involved personal contact and visible, concrete, positive results.

Through CORO's initiatives, communities supported efforts to abolish illiteracy. With funding from the National Literacy Mission teachers were trained, and materials were purchased and distributed. Famous celebrities were invited to distribute literacy kits in the selected communities, creating interest and stimulating participation in the program.

In spite of their ability to mobilize slum residents, CORO had difficulties. The teachers were not highly qualified and the training programs were poorly designed. CORO's survey indicated that 90 percent of the illiterates were women and willing to learn but were often discouraged from learning to read by their husbands. The illiterate men were not willing to admit to illiteracy and were more difficult to contact since they had to commute long hours to work and often did not return until late in the evenings. Moreover, many men preferred to spend their free time drinking and gambling rather than learning to read. Lastly, CORO workers often found themselves

overextended, unable to take enough time away from their jobs to work on the literacy program. However, 12 CORO members were able to negotiate with their employers and voluntary organizations and began to work full-time for CORO. Gradually, the literacy program began to succeed.

Roving Libraries

The concept of libraries (`Savitri Vachanalaya') grew out of a need for a literacy network and in response to a lack of reading material in the slums. To form a library a CORO activist consults with local contacts and recruits librarians, usually school children, adolescent school dropouts, or unemployed youths, but occasionally newly literate adults. First, the librarians count and number houses in the slum and organize the houses into clusters of four libraries, 100-150 households per library. Every librarian then goes house to house to enroll members. Membership is free; one member per household. There is no charge for torn or lost books since this is a part of learning to use books and happens very infrequently. Each librarian begins with about 25 books worth Rs.200 (US$6,67) and every month books worth Rs.100 (US$3.33) are added. Four libraries in a cluster receive different books and the stacks of books are rotated among the four libraries every week. Hence, members get to see new books all the time. The librarian gives books to about 25 households one day and collects them after one day to give them to the next 25. In this manner 150 houses are served in a week. As the number of books grows, members can either keep a book for a longer period or can borrow more books.

The entire project costs about Rs.1.50 (US$.05) per household per month. The cost has been kept deliberately low so that the members can run the libraries through monthly contributions after their first year. Most members who use the library free of cost are willing to pay membership fees after three months of operation, and about fifteen percent of the members are willing to participate in running the libraries.

Today, 80 libraries have became operational and provide at least one book every week to each one of the 10,000 households covered by them. A recent sample survey indicated that on and average two to three people per household, especially girls and semi-educated women, read the books regularly and want more titles.

In addition to providing slum residents with reading materials, each library provides an organizational infrastructure for local slum people to come together free of so-called political or other petty rivalries.

History of Public Toilets in Bombay

In 1984 the Government of India undertook several projects designed to apply science and technology in a manner more responsive to the needs of communities. One of these projects, overseen by the secretary of the Department of Science and Technology (DST), was the Integrated Waste Management Pilot Project to be implemented in Bombay and then expanded to all major Indian cities. The pilot was to include a city-wide project to provide clean, supervised, pay-and-use toilets for the entire city and to manufacture fuel pellets from 4,000 tons of daily municipal garbage.

The project began in late 1990 with the planning and construction of public toilets in several Bombay slums and the planning of a Refuse Derived Fuel (RDF) plant. By February, 1992 12 toilet blocks had been constructed at Malwani, a large slum made up of displaced residents relocated from communities throughout Greater Bombay.

The toilet design has following features:

- An attractive external appearance unlike a stereotypical Indian toilet facility.

- Use of ferro-cement technology to produce pre-fabricated construction elements.

- Excellent ventilation and lighting due to circular

design with a central space open to sky.

- Water storage tanks to store 20,000 liters of water.

- Twenty four to twenty six toilets in two circles of a block.

While pre-fabricated materials were meant to facilitate on-site construction within one month or less, in reality, several problems related to drainage, sewer, water, and electrical connections, all requiring interfacing with the municipal and other authorities, meant a minimum construction period of 3-4 months. Nonetheless, users have been happy with the design.

Until August, 1992 the toilets were managed and maintained on a pay-for-use basis by a small private contractor. The contractor was paid on a monthly basis to run, guard and maintain the toilet blocks. The toilets were to be open daily from 5 A.M. to 9 P.M. and continually manned by teams of one supervisor and two sweepers working in eight hour shifts. At night a watchman would guard the complex. Total expenditure was expected to be around Rs.5,800 (US$193) per block each month, with Rs.4,800 (US$160) going towards salaries and Rs.1000 (US$33) for cleaning supplies and other maintenance costs. Thus to attain basic self-sufficiency, a block would have to collect Rs.200 (US$6.67) per day in fees.

The block-staff was to collect Rs.0.25 (25 paise) per use from the users above the age of eight and turn over these fees to CMC Ltd., a public sector undertaking entrusted with construction and maintenance of the toilet complexes. Water and electricity was provided free of cost.

By June, 1992 it was obvious that this maintenance system had some serious problems. The staff, especially the supervisors, were of questionable character. Their accounts and those of their employers could not be verified and considerable cheating was suspected. Assurance of monthly salaries regardless of how much

was collected from latrine users eliminated any incentive to keep track of all the collected fees and to turn all of them over to CMC Ltd.

In addition, there was a resistance to the pay-and-use scheme. The Malwani toilets were constructed after demolishing existing public toilets that were filthy but free. Thus local people had no choice but to pay and use the new toilets. Daily payment of 0.25 paise per use was expensive, as the entire family would spend anywhere from Rs.30 to Rs.50 per month. In comparison, monthly room rents in slums are generally Rs.15 and are hardly ever paid. Local elected representatives encouraged people to use the toilets without paying, even though these same officials had participated in the implementation of the scheme. The contractor who constructed the toilet blocks failed to complete planned improvements in areas surrounding the toilets, and construction faults interfered with the toilets' proper functioning. At 5 toilet blocks municipal corporation supply of water was insufficient. Finally, residents resented the profits made by the toilets' administrators. Residents felt forced to pay for a service that was inefficient in order to contribute to the profits of allegedly corrupt contractors.

CORO Takes Over Municipal Toilets

In July of 1992 the private contractor was dismissed and CORO took over the management of the public toilets at Malwani. CORO had developed in an interest in hygiene in the slums through their observation of conditions in the settlements where they were doing literacy work. In addition, the beginning of toilet construction in the Chembur, Govandi area, where CORO is doing literacy further aroused their interest, and they went to Malwani to inspect the toilets being run under private management. Under CORO's direction the management scheme was redesigned in response to the problems mentioned above. A family pass system for local users was instituted. At Rs. 10 a month it represented an affordable alternative to the 25 paise charge for each use and encouraged families to use the latrine regularly. Non-pass holders continue to

to use the latrine regularly. Non-pass holders continue to pay a 25 paise charge per use. CORO pays for a night watchman, cleaning materials and minor repairs as well as small stipend of Rs. 250 for substitute staff in case of illness or absence. The expenses incurred by CORO are reimbursed by the DST through CMC Ltd.

Staff members are in charge of keeping the latrines clean and collecting the fees, and their salary comes from an even division of the money collected. At Malwani CORO hoped that community residents would take an active interest in managing and supervising the latrines. This has happened at two of the toilet blocks, and there is substantial community input and participation. However, the unsatisfactory initial experience with the pay-for-use toilets and Malwani's status as a relocated slum with little strong community feeling has limited community participation in the rest of the blocks to the presence of a community representative who monitors the work of the staff and keeps accounts of the daily records.
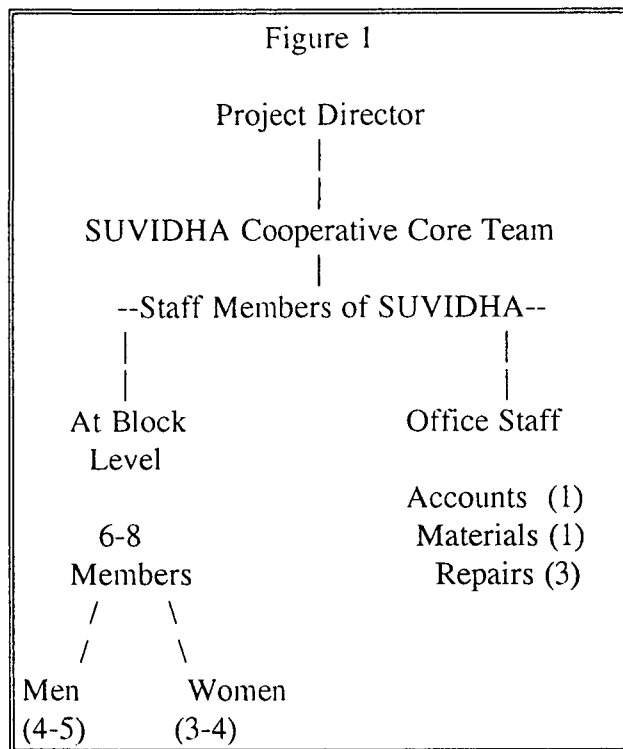
CORO integrates its toilet complexes with other community activities

*CORO
hoped that
community
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supervising
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The improved model of management has resulted in the following :

- The community has realized that this is not a commercial venture since their money goes towards salaries of those who serve.

- The staff have less reason to cheat. If they cheat at all, it is at the expanse of their colleagues.

- The blocks are staffed by only 3-4 persons who can be

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                    Figure 1

                  Project Director
                        |
                        |
           SUVIDHA Cooperative Core Team
                        |
              --Staff Members of SUVIDHA--
               |                       |
               |                       |
           At Block                Office Staff
           Level
                                   Accounts  (1)
             6-8                   Materials (1)
           Members                 Repairs (3)
           /    \
          /      \
       Men        Women
       (4-5)      (3-4)
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sustained by the block earnings.

- The staff strives to keep the toilets clean since collection is also related to the standard of cleanliness.

As toilet blocks were completed in other slums, including Chembur, Govandi where CORO had begun literacy work, CORO took over their management and operation. Having learned from mistakes made at Malwani, the new toilets were constructed in open space, and the old free toilets were left standing, giving residents a choice

between free toilets that were dirty and poorly maintained, or pay toilets that were clean and well maintained.

With more time and experience, CORO was able to make improvements on its management scheme. As a first step CORO created a cooperative comprised of its most active members, mostly literacy volunteers with experience working in the slums, and community organizers from organizations like Stree Mukti Sanghatana, Granthali Readers' Movement, Yuvashakti Pratishthan and All India Women's Conference (see figure 1). As latrine maintenance staff were recruited from the communities themselves, they became cooperative members as well..

The cooperative (called the SUVIDHA cooperative) is committed to self-sufficiency; all salaries, materials and repairs would be paid for with money collected at the toilet block. DST continued to guarantee reimbursement for materials and repairs if necessary but the SUVIDHA units tried to avoid the use of any external funding. Finally, the entire cooperative general body meets once every month to discuss problems and progress.

This reformed management structure has resulted in a more flexible, accountable and responsible staff and greater financial independence and allows for community input and democratic decision making as well as providing community residents with employment.

With introduction of this new concept CORO started to tackle the main problem of sanitation faced by most of the slum dwellers in Greater Bombay. While implementing the scheme CORO also tapped the need to promote reading habits among slum dwellers, which they thought would be useful in developing a new outlook towards sanitation and to create a clean and hygienic environment in Bombay.

Resource Utilization

Ideally, public toilet blocks run by CORO would be clean and accessible for twenty-four hours a day; members of families that owned monthly passes would all use the

families that owned monthly passes would all use the toilets every day; and toilets would be affordable and completely self-sustaining. These goals have come to depend on two main factors, the availability of water and the ratio of users with passes to 25 p. users. Table 3 shows the relationship between these factors.

Table 3
Relationship between Self-sufficiency and Cleanliness with Water Constraint

Number of Users			Self-Sufficiency	Cleanliness
Pass	25 Paise	Total	Money Available	Water Available
0	900	900	Good	V. Good
0	1500	1500	V. Good	Good
0	2000	2000	Excellent	Fair
600	900	1500	Good	Good
1200	900	2100	V. Good	Fair
1200	300	1500	Fair	Good
1500	0	1500	Poor	Fair
2100	0	2100	Fair	Fair
3600	0	3600	V. Good	V. Poor

* Pass for family of 6 @ Rs.15/- per month.
This table is based on a toilet block of about 24-26 toilets having a water holding capacity of about 20,000 Liters and staff of 7 people.
Self-sufficiency definitions :
Fair = enough to pay minimum salaries,
Poor = not enough to pay salaries of required staff,
Good = enough to cover salaries, materials and minor maintenance,
V. Good = Enough to cover expenses including part of overheads.
Excellent = Full self-sufficiency.

The factor which ultimately controls cleanliness and the number of users is water. Without enough water, the toilets cannot be cleaned and users will not be willing to pay to use the latrines. Water has to be stored since it is supplied only for about 3-4 hours in the morning or evening. Toilet blocks that get their water in the

mornings are better off than blocks that get their water in the evenings, since usage is heaviest in the morning. Where water is supplied in the evening, only the 15-20 thousand liters of available stored up water can be utilized. This often causes shortages, and water has to be used sparingly.

Table 3 demonstrates the balance that needs to be struck between users, self-sufficiency and cleanliness. Obviously, larger numbers of users are needed to make the toilets self-sufficient, and the optimum number of users goes higher as the relative percentage of pass-holder users increases. This in turn puts pressure on available water. Also, although 3600 pass-holder users can, in principle, make a block self-sufficient, it means each toilet will be used by more than 100 users, an unrealistic number.

At the moment, the toilets are managed with a large number of daily 25 p. users. Now several systems are self-sufficient but they cannot be said to be fully successful because a 25 p user often does not use the toilets every day. In spite of CORO's desire to give more family passes, to do so would cause a serious financial imbalance, since the toilets depend on 25 p. users to be self-sufficient; monthly passes will not pay for the toilets.

In order to achieve CORO's social goal of as extensive use of latrines as possible, the system must be based on family passes. This will mean that either the water storage capacity needs to be doubled to 40,000 liters or economic self-sufficiency will have to be sacrificed and external financial sources sought. As the use of family passes rises, CORO will probably depend on a combination of these two strategies.

The self-sufficiency achieved in the CORO model is based on a monthly salary of Rs.1500/US$50 for the core Group members and the lower salary of Rs.600/US$20 for the sweeper. If people with much higher salaries are accommodated, self-sufficiency is lost. Furthermore, fees collected do not presently cover the cost of major repairs costing more than Rs. 2,000. It is estimated that every

toilet block will need at least Rs.10,000 by way of external support per annum.

It is clear that ideal self-sufficiency coupled with high standards of cleanliness are unlikely with the present per use charges and water storage capacity. In the long run, with more and more community toilets being built, the percentage of 25p. users will come down and the system will not be self-sufficient unless salary requirements are reduced. In order for that to happen, users will have to be better educated about the environment and the toilets will need to require less maintenance. Even so, CORO may need to depend on partial outside funding to keep public toilets running efficiently.

Results

Through its literacy program, roving libraries and management of pay-and-use toilets CORO has provided essential services to previously underserved communities and begun to lay the foundation for improved awareness of health and sanitation issues and a new culture of cleanliness and responsibility.

By maintaining clean public toilets honestly and efficiently, CORO has provided a viable and affordable alternative to filthy, unhygienic free latrines or open spaces near homes. CORO-run toilets have been well received and are heavily used (see table 4), demonstrating that slum residents are willing to pay for suitable service. Widely used latrines have also resulted in a noticeably cleaner and healthier environment in the slums, with less human waste in streets, fields and other open spaces.

For women, clean public latrines have provided a way to relieve themselves in privacy, avoiding the humiliation of using public, open spaces and the danger to their health and their personal safety resulting from waiting until dark to relieve themselves.

By enlisting local residents to serve as maintenance workers and SUVIDHA cooperative members, CORO

provides employment and income in an area marked by unemployment and poverty. Maintenance workers and cooperative members, gain valuable work and organizational experience. Use of local labor also ensures greater accountability and community participation; as community members, the maintenance workers are trusted, can raise community concerns during cooperative meetings and cater service to community needs.

Community workers also gain valuable experience in CORO's literacy campaign and working as librarians for the roving libraries. They have been able to enlist the support of slum residents and to recruit library members. There are now 80 functioning libraries providing over 10,000 households with reading materials in the slums of Bombay.

TABLE 4				
Area	Blocks	Toilets	Users	Self-sustaining
Malwani	12	380	About 15,000	No
Jogeshwari	1	26	About 1,240	No
Andheri	1	26	About 1,800	Yes
Dharavi	1	26	About 1,400	Yes
Chembur	2	52	About 3,000	Yes
Govandi	4	120	About 6,000	Yes
TOTAL	21	600	About 28,440	No

SOURCE: CORO 1993.

Taken together, CORO's literacy campaign and its management of pay-and-use municipal toilets have helped to lay the groundwork for more substantial changes in the attitude and culture of Bombay's poor. Through literacy

classes, reading, and the efforts of local latrine workers, residents are learning about the importance of sanitation, hygiene, and the environment. Latrine workers have begun to provide an alternative to the increasingly unworkable system of cleaning and maintenance based on the caste system, and have begun to demonstrate that individuals and communities can take care of their own human waste problems. Maintenance workers, literacy advocates, and librarians have ceased to be passive recipients and are taking an active role in improving conditions in their neighborhoods. Residents have shown a willingness to pay for service instead of demanding service for free and placing an even greater strain on an already overextended municipal government. By combining libraries with latrines, CORO can serve communities, create a springboard for community efforts centered on other important issues, and extend their network's reach into more homes.

Obstacles

CORO has had to overcome several obstacles in order to achieve success in literacy training, distributing reading material, and running pay-and-use toilets. Attitudes take a long time to change, and there is still a considerable amount of resistance to the kind of change CORO envisions in Bombay slums, as well as continuing problems of a more mundane and technical nature.

CORO has had difficulty getting children to use the public toilets, despite not charging them and even going out into the neighborhood in order to bring children used to defecating outdoors to the toilets. A major problem lies in the toilet design, which is too large for small children. CORO is working on possible new designs to be used in new toilet complexes.

In spite of the generally cooperative nature of CORO's relationship with the municipal government, there have been problems. Toilet construction is often delayed because of difficulties with municipal agencies in charge of electricity, drainage, water and sewage. Despite

prefabricated elements that should allow construction to be completed in one month, toilets usually take three to four months to be built. In addition, CMC Ltd. was skeptical of CORO's ability to run the toilets at first. A meeting had to be arranged with satisfied users to convince CMC that CORO was indeed able to manage toilets competently and efficiently.

There is continued resistance to pay-and-use toilets among many residents, especially at Malwani where the destruction of a free alternative, the actions of local politicians, and the initial experience with unsatisfactory service and inefficient, sometimes corrupt management created resentment among some residents. CORO's effective management and the cleanliness of the latrines themselves are gradually eroding this resistance, and residents are becoming more willing to pay in order to use clean toilets.

Initially, CORO had difficulties within the management units. Staff members felt that cleaning toilets was degrading work, beneath their station as educated citizens. Their ancestors had been discriminated against within the caste system for doing precisely this kind of work. After discussion and experience managing the toilets, workers began to feel that they were not engaged in demeaning work, but in cooperative self-development. They were beginning to make a difference in their communities and were fulfilling an essential role in a collective undertaking in which they had an important say.

Groups had problems with inefficient workers and dishonesty. They set up internal vigilance groups and even fired some workers who were cheating or not working. This was extremely difficult for the units to do, but it was essential in order to maintain standards. It represented a change in attitudes, one in which labor and honest were rewarded and workers were held accountable for their behavior.

Groups had trouble with expensive repairs to the toilets, especially when they had to depend on outside repairmen. They were able to cut down on this expense by finding

their own repair people from among CORO community literacy activists.

CORO also had troubles at the beginning of their literacy campaign. CORO activists had little experience with literacy training and the program suffered from ineffective teachers and poor training courses. Men were especially difficult to teach, as they were unwilling to admit to illiteracy, and had little free time to learn because of long commutes to work. They also often discouraged their wives and daughters from learning how to read, further undermining CORO's efforts.

In all of CORO's efforts entrenched attitudes and cultural mores continue to cause problems. Most Indians slum dwellers retain rural customs, and are unused to using toilets or reserving space for them when planning homes or communities. Such habits are difficult to change. Also, centuries of a rigid caste system has trained people to leave much essential work to others; they are forbidden by caste rules and custom to engage in a host of necessary activities. This has produced a culture of resignation and robbed many people of initiative; they do not see it as their responsibility to improve their lot, clean their toilet or any number of other things. CORO faces a constant challenge in motivating residents to fulfill roles and do jobs to which they are not accustomed and which they might find objectionable.

Diffusion

Because of the success of their programs CORO has been able to expand their management of public pay-and-use toilets as well as their roving libraries into new slums. DST has asked CORO to run new toilet blocks in five new slums since their successful administration of the Malwani toilet block in 1992. (The five slums are Jogeshwari, Andheri, Dharavi, Chembur and Govandi.) CORO is now forming new libraries, recruiting new librarians and signing up new library members.

In addition, the innovation has been documented and publicized in the press, on videotape and on television. Many voluntary agencies, community groups, and individuals within Bombay and throughout the country have learned about CORO in this way. Also, CORO workers have attended training programs, seminars, and workshops to make presentations and share their experiences.

When faced with the challenge of promoting literacy and managing public toilets in the slums of Bombay CORO devised several strategies which were innovative and essential to the project's success.

- *Integrating Literacy and Sanitation*
  By combining the running of municipal toilets with pre-existing efforts to combat illiteracy, CORO was able to capitalize on community knowledge and contacts they already had.

  As an organization that was already working in the slums, CORO already had some understanding of the problems in the community and credibility with the residents. They were able to build on their pre-existing organizational strength and to call on the resources of their activists to motivate residents to utilize pay-and-use toilets and join roving libraries.

CORO has been able to supply important community infrastructure

  As an organization dedicated to promoting literacy and distributing reading material, CORO was already involved in education efforts. When CORO began to manage community toilets, they found themselves equipped to address the cultural and education issues involved in promoting new norms of cleanliness and sanitation.
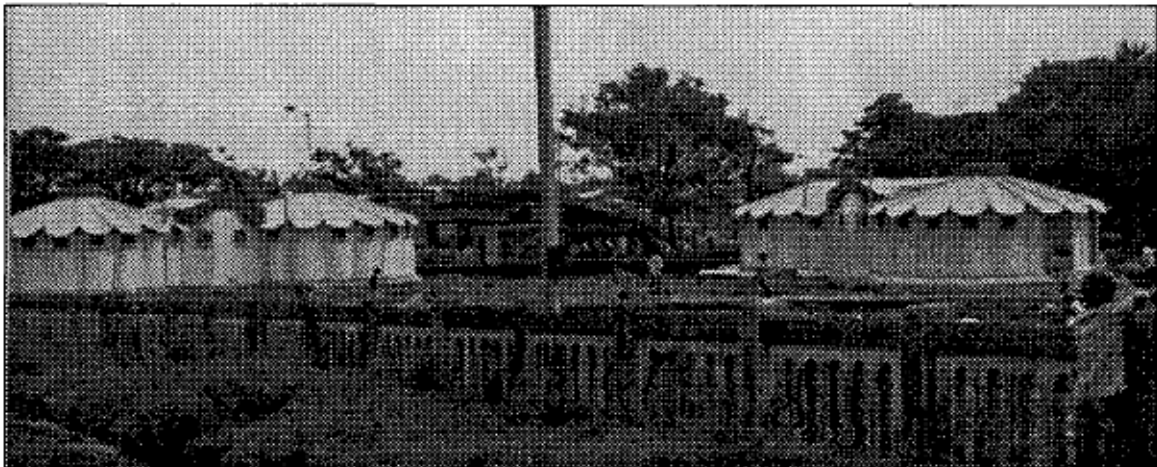
- *Using Local Volunteers and Labor*
  With local staff members running latrines, CORO was
  able to gain residents' trust and be responsive to
  community needs. CORO was able to provide jobs to
  slum residents, generate income for poor workers and
  give them organizational and job experience. As
  community-run enterprises, CORO managed toilets
  demonstrated that communities could work to solve
  their own problems, including problems of human
  waste. This is an important lesson for communities
  bound by habits of passive receivership and centuries
  of caste-determined labor and sanitary practices.

  In their literacy work, the enthusiasm of local activists
  was essential in motivating residents to learn to read
  and to join the roving libraries. Local librarians
  distribute books, sign up families, and recruit other
  librarians. Such participation gives residents a stake
  in the project and a sense of being able to create
  positive change in their neighborhoods.

- *Forming a Cooperative*
  By forming a cooperative and including local
  community members, CORO opened up the decision
  making process and involved the community in
  identifying problems, devising strategies and sharing
  responsibility. CORO became a community
  organization run for and by the community.

- *Instituting Monthly Family Passes*
  By selling monthly family passes at a fixed price,
  CORO was able to encourage daily toilet use, while
  making it more affordable. With a pass, family
  members were more likely to use the toilets often, as
  each use did not cost any more.

- *Tying Salaries to Fees*
  By tying staff members' pay to the amount of fees
  collected, CORO devised a built-in incentive for
  workers to work efficiently and to encourage
  community members to use the toilets. Staff salaries
  are a result of staff efforts; the cleaner the toilets and
  the more effectively they can convince residents of the

need to use latrines, the more people will use the toilets and the more money the staff will make. This system also minimizes corruption. The staff monitor each other and are less likely to cheat since it would be depriving their co-workers, who often are also their neighbors, of money. The residents also appreciate this system, and prefer that their fees go towards staff salaries rather than a corrupt private contractor.

- *Partnerships*
  CORO benefited from the efforts of the following important partners:

- *Indian Government Department of Science and Technology (DST)*
  DST oversees the Integrated Waste Management Pilot Project, including the construction and maintenance of the public toilet blocks. DST was the agency which first approached CORO to take over the administration and maintenance of the toilet blocks and is the source of funds for construction, major maintenance projects and, when needed, materials.

- *CMC Limited*
  This is a public sector corporation which has been charged with the construction and maintenance of the public toilets in Bombay. CMC Ltd. distributes DST funds to CORO, and works with them to construct and maintain toilet facilities.

- *National Literacy Mission*
  This organization provided funding for teacher training and literacy materials.

- *Famous celebrities*
  These celebrities distributed literacy kits in the slums and helped raise interest and enthusiasm for CORO and literacy.

- *Community organizers*
  At the beginning of their literacy efforts and throughout the ensuing literacy project and toilet

maintenance scheme, community organizers lent
enthusiastic and valuable support. They helped
mobilize residents to participate in libraries, take
literacy classes and use public pay-and-use latrines.

- *Slum Residents*
  Residents have shown a willingness to pay for clean
  latrines and to join local roving libraries. Without
  their participation, non of CORO's efforts would have
  been successful.

Despite its inexperience in sanitation and toilet management, CORO was able to maintain latrines, gain acceptance of a previously unpopular pay-for-use scheme, institute participatory management and increase latrine use in the slums of Bombay. The key to CORO's success was its fundamental redefinition of the basic problem; latrine maintenance and use was not a problem of service delivery, but one of organization, education, and legitimacy in the eyes of the community. By creating a structure more open to community accountability and with built-in incentives for maintenance workers, by combining toilet maintenance with education and literacy efforts, CORO was able to integrate latrine maintenance and promotion into an overall framework of community development and change.

The project itself is fairly specific, applicable only where people are forced to depend on public toilets for their sanitary needs and unaccustomed to using toilets in the first place. Given this, the following preconditions must be satisfied in order to implement a program based on CORO's New Culture of Urban Sanitation.

*   *Governmental Role*
    When looking to solve toilet maintenance and usage problems, governments need to redefine the problem as one of organization and awareness. They need to be open to the possibility of solving what seems like a straightforward service delivery problem by calling upon the services of community organizations or NGO's with little experience in service delivery but organizational capacity, credibility and experience in the intended beneficiary community. Governments must also be willing to invest resources in sanitary improvements for the poor. The construction and maintenance of toilets is expensive, and CORO's experience shows that planning for them to be economically self-sustaining is unrealistic; an outside funding source will almost always be necessary.

- *Implementing Agency*
  There must be an organization well-positioned to implement a new organizational structure for the maintenance of public toilets and able to integrate toilet maintenance into a broader program of community development and education. The implementing agency should have experience in the beneficiary community, be responsive to community concerns, and have effective mechanisms to ensure community input and participation in decision-making and action.

Beyond the issue of latrine use and maintenance, CORO's New Culture of Urban Sanitation has wider implications for municipal governments faced with what appear to be traditional service delivery problems. CORO has shown that those problems may be organizational or cultural ones, and the solution may be found by organizations with little experience in the specific problem area. Governments looking for solutions to such problems might find success in partnership with community development organizations and NGO's.

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