

**DRAFT
JANUARY 2004**

**COMMUNITY-MANAGED SANITATION SERVICES FOR THE URBAN POOR IN
ASIA, AFRICA AND LATIN AMERICA: CONSTRAINTS TO SCALING-UP OF
'ISLANDS OF SUCCESS'¹**

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1. Introduction and Overview

About 2.4 billion people, or 40% of the world's population³, in developing countries still lack adequate excreta disposal systems, despite the professed commitment of governments and the international community to tackling the problem. The result is a continuing horrifying toll in death and disease that is widely recognized as one of the greatest failures of the last decades. Despite all the ideas and 'pilot' projects, approaches have not proved to be replicable, sanitation policies are absent or not put into practice, investment remains mainly external and limited, and local subsidies have not been sustainable. In the words of Kofi Annan, the Secretary General of the United Nations: "There is a tragic disparity between its human importance and its political priority."

The Millennium Development Goals (MDGs) set by the international community for 2015 is to halve the number of people without adequate sanitation facilities. This means that, taking into account population growth, an additional 350,000 people will have to gain access to improved sanitation facilities every day (or a total of 2.2 billion people) between now and 2015. This is a huge task, and many organizations and governments are therefore looking for new, innovative approaches to reverse the negative trend of non-achieving targets and make progress on the scale needed to meet this goal.

The scale and depth of the inadequacies in provision for water and sanitation for much of the urban population in Africa, Asia and Latin America and the Caribbean needs particular emphasis. There are two different sets of estimates⁴ as to the number of urban dwellers lacking provision for water and sanitation in 2000. The first comes from the most widely used and quoted international source, the 2000 WHO/UNICEF assessment, and is based on who has "improved" provision; as this assessment explains, the data available do not allow it to estimate the proportion of people with good quality provision or "adequate" provision. Table

¹ This paper has been commissioned by the Norwegian Ministry of the Environment. However, the views expressed in this paper are the responsibility of the author and do not necessarily reflect the views of the Ministry.

² President, Resources and Environment Group, New Delhi

³ See Environmental Sanitation by IRC, Delft, Netherlands

⁴ This discussion is based on the **Editors' Introduction**, *Water & Sanitation*, Environment&Urbanization Vol 15 No 2 October 2003

It is drawn from the UN-Habitat study⁵ shows two different sets of estimates as to the number of urban dwellers lacking provision for sanitation in 2000. For sanitation, "improved" provision is access to a private or shared toilet with connection to a public sewer or a septic tank, or access to a private or shared pour-flush latrine, simple pit latrine or ventilated improved pit latrine. As staff from the World Health Organization stress, "improved" provision does not greatly reduce the risk of faecal-oral diseases.⁽⁷⁾ On the basis of these definitions, most of the urban population in Africa, Asia and Latin America have "improved" provision for sanitation, and it is possible to claim that there were significant improvements in the number of people gaining access to improved water and sanitation during the 1990s.⁽⁸⁾

The second set of estimates, drawn from the UN-Habitat study, uses definitions for "adequate" provision for sanitation which demand better quality and more convenient provision – levels of provision that *do* greatly reduce the risk of infection from faecal-oral diseases. This includes hygienic, well-maintained, easily accessed toilets that are used by all family members; and safe and convenient disposal of wastewater. Adequate provision includes⁶ levels of provision that meet the needs of children, which are often not met with "improved" provision. If the criteria by which provision is judged are changed from "improved" to "adequate", a much larger urban population is found to lack provision. For instance, 50–60 per cent of the urban population in Africa lack adequate provision for sanitation, more than three times the number lacking "improved" provision (Table 1). In addition, trends over time look much less impressive, as the growth in the number of urban dwellers reached with "adequate" provision during the 1990s is much less than the number reached with "improved" provision.

Table 1: Different estimates of the number of urban dwellers lacking provision for sanitation in 2000

Region	'Improved' Sanitation	'Adequate' Sanitation
Africa	46 million (16 percent)	150–180 million (c. 50-60 percent)
Asia	297 million (22 percent)	600-800 million (c. 45–60 percent)
Latin America and the Caribbean	51 million (13 percent)	100-150 million (c. 25–40 percent)
Total	394 million	850-1130 million

NB. The UN-Habitat Report (1996) emphasizes that its figures are "indicative estimates", because most governments do not report on provision for water and sanitation using definitions for "adequate" provision.

⁵ See UN-Habitat study *Water and Sanitation in the World's Cities*. Also see Hardoy, Jorge E, Diana Mitlin and David Satterthwaite (2001), *Environmental Problems in an Urbanizing World: Finding Solutions for Cities in Africa, Asia and Latin America*, Earthscan Publications, London, 448 pages.

3. UNCHS (Habitat) (1996), *An Urbanizing World: Global Report on Human Settlements, 1996*, Oxford University Press, Oxford and New York

⁶ See Sheridan Bartlett (2003).

Estimates of the "scale of need" and of the funding required to address this depend heavily on which of these definitions is used. The task of halving the number of people lacking provision for water and sanitation between 1990 and 2015 (as called for by the Millennium Development Goals) is far larger and more complex if this is based on the number lacking "adequate" provision rather than the number lacking "improved" provision. For example, in 2000, the total number lacking adequate sanitation were between 850 to 1130 million, much larger than the 400 million lacking improved provision. In Asia alone, the number of people lacking adequate sanitation was between 600 to 800 million in 2000.

One of the targets of MDGs is to have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers. Approximately one-third of the urban population globally live in these conditions. Typical slums in developing countries are unplanned informal settlements where access to services is minimal to non-existent and where overcrowding is the norm. Slum conditions result in placing residents at a higher risk of disease, mortality and misfortune. 94% of the world's slum dwellers live in developing regions, which are the regions experiencing the most rapid growth in urban populations and with the least capacity to accommodate this growth. Where available, trend data indicate that this problem is worsening. UN-HABITAT estimates that there are currently 924 million slum dwellers in the world and that without significant intervention to improve access to water, sanitation, secure tenure and adequate housing this number could grow to 1.5 billion by 2020.

A number of countries in Africa and Asia have developed programs under which they have encouraged people's efforts to the construction of private toilets. Such efforts have included country level or city-level programs of hygiene education and the need for washing of hands. A number of programs provided low cost sanitation alternatives including pour-flush latrines and VIP latrines. In a number of cases, loans and credits have been provided through micro-finance institutions for construction of latrines. Reviews of these programs are available in a number of publications of the Water and Sanitation Program (WSP) and other international organizations.

During the last two decades, there are reports of a number of successful experiences of community involvement and management in providing public sanitation services to the poor slum-dwellers as well as for meeting the needs of floating populations in cities. Such experiences have provided sanitation and health benefits to millions of urban poor in Asia, Africa and Latin America. However, these experiences have covered only a small proportion of the total populations who need such services and there is an urgent need to support programs where such efforts can be 'scaled-up' to cover much large number of people in different regions over time.

Such an effort would depend on an analysis of the institutional and financial constraints to scaling-up of these 'islands of success'. There is a need to understand what succeeds and why and what does not succeed. In particular, a detailed analysis of financing aspects and financial viability is required to assess the financial sustainability of such efforts over time and the possibilities of their 'scaling-up' in other regions.

This section presents a review of some of these experiences based on available literature, both published and unpublished⁷. For each of these experiences, where ever available, some data are presented on the extent of coverage of sanitation services provided; sources of finance; financial viability of the institutions providing services; constraints to 'scaling-up' and key lessons learnt.

The seven experiences from Asia and Africa analysed here are:

1. Sulabh International's Program of Community Toilet Complexes in India;
2. SPARC- assisted programs of community toilet blocks in India;
3. Orangi Pilot Project in Karachi in Pakistan;
4. Bangladesh urban sanitation program in Dhaka and Chittagong.
5. Ouagadougou Strategic Sanitation Plan in Burkina Faso;
6. Strategic sanitation program in Kumasi, Ghana;
7. Sanitation programs in Luanda, Angola and;
8. Condominial system in urban sanitation, Brazil

2. Sulabh community toilet complexes (CTC) in India⁸

Sulabh community toilet complexes (CTC) in India have succeeded in providing clean toilets and bathing facilities to urban poor at nominal charges. There are around 6000 community toilets⁹ providing toilet-cum-bath services to around 3 million people¹⁰ in 625 towns on a pay-and- use basis. A key aspect of Sulabh's program is its inclusion of facilities for bathing and doing laundry. Their public toilets are staffed by an attendant 24 hours a day and supply powdered soap for hand washing, bathing, and laundry. Some special toilet complex facilities have also provided telephone services and primary healthcare. Free services are offered to women, children and the disabled. This is very important for the homeless and the very poor who live under cramped conditions¹¹.

⁷ A lot of this material has been obtained from various websites and journals and reports. Very few case studies provide data that can be used for detailed analysis of financing and financial viability of such investments and experiences. Hence, there is an urgent need to carry out specific analysis of some of these programs including those that did not succeed.

⁸ For details, see Bhatia, Meera and Ramesh Bhatia (2003): Sanitation, Energy and Water Supply Nexus: Constraints To 'Scaling-Up' Of Sulabh Community Toilet Complexes Program In India, December 2003; Resources and Environment Group, New Delhi

⁹ In addition to these community toilet complexes, Sulabh International Social Service Organization (SISSO) has constructed about a million private household toilets using the low cost sanitation method. According to one estimate, 10 million people use these household and public toilets. See The Sulabh Movement: Human Development Approach to Sanitation, SISSO, New Delhi, 2003.

¹⁰ On average, a CTC has 20 seats and around 500 persons can use the facilities every day. Some complexes are very large with 100 seats each where the number of users per day is a few thousands.

¹¹ One other programme of community-designed, built and managed toilet blocks undertaken in many cities by urban poor federations and women's cooperatives with support from the Indian NGO SPARC has been described by Burra, Patel and Kerr (2003). This programme has reached hundreds of thousands of poor urban dwellers with improved sanitation and has demonstrated to city authorities the capacity and competence of organizations helping the urban poor.

2.1 Need for Scaling-Up

Potential for Meeting Sanitation Needs of the Poorest

According to one estimate¹², there were 2500 CTCs in India in 1990. If this is true, only 3500 new Complexes have been added over a 13-year period, giving an average of 270 new units per year in the entire country. Although the Sulabh public toilet complexes have provided much-needed services to millions of poor people, the growth in the number of units per year is much less than the requirements in urban areas. For example, Sulabh currently maintains 294 toilet complexes in Delhi¹³ of which Sulabh has also constructed more than 100, the others were originally built by other agencies such as Municipal Corporation of Delhi, Cantonment Board etc but are currently maintained by Sulabh. Compared to this, as many as 7000 such units are needed in Delhi alone to meet the needs for 3.5 million slum population who do not have access to private or public toilets. The number of such units required is 150,000 complexes (compared with 6000 today) to meet the sanitation needs of currently unserved urban population in India. Thus, the scaling-up effort is quite substantive and it would be important to analyse the factors that support such investments as well as identify factors that constraint rapid multiplication of such complexes. There is an urgent need to analyse the management and financing constraints that have inhibited the growth of such complexes. Further, there is a need to assess what legal, regulatory, institutional and policy changes may be required to accelerate the setting-up of CTCs in Indian mega cities and towns.

2.2 Multiple Benefits of Sanitation, Energy and Water Supply

Of the 6000 community toilet complexes working in the country, only about 100 units (less than 2 percent) have installed additional plants that generate biogas (from human waste) that is used for lighting, cooking, space heating and for pumping water for the complex. The use of human excreta for biogas and its subsequent use as a versatile and clean energy source provide excellent synergy benefits of environmental improvement, resource use and availability of energy for productive purposes. This seems like a perfect win-win-win situation if proper policies encourage investment in biogas plants and user equipment. Hence, it becomes important to analyse the policy, institutional and financial constraints that inhibit the installation of biogas plants along with a community toilet complex. Since biogas can be used for pumping of water for the complex, this can solve a basic problem of CTCs in dry areas where water supply acts as a constraint in setting up of clean toilet and bath complexes.

2.3 Sulabh Model of Management and Financing of CTCs

There are three distinct management approaches Sulabh has adopted in respect of CTCs. In the first case, Sulabh constructs and maintains the CTC for public use on a pay-for-use basis. The land and funds for construction of public toilets –cum-bath complexes are provided by the local bodies or any other sponsoring authority¹⁴. Sulabh prepares the drawings, design and

¹² National Institute of Urban Affairs, New Delhi: A Revolution in Low Cost Sanitation: Sulabh International, New Delhi, Draft, November 1990

¹³ In Delhi, in 1990, there were 68 public complexes in working condition and 61 were under construction.

¹⁴ Several business houses, multinational corporations and public undertakings such as Tatas, Proctor and Gamble, Crompton Greaves, Port Trust Authority, State Road Transport Corporation, Cantonment Boards, Railways etc are setting up Sulabh toilet facilities specially in metropolitan cities. This makes a departure from traditional practice that government alone runs civic services. Recently, some Non-Resident Indians (NRIs) have

estimates of the project and executes the project. It raises its resources by charging the sponsoring authority 20 percent of the project cost as implementation charges. The money thus collected is used for running Sulabh organization. Sulabh does not take any grant, assistance or subsidy from any agency national or international, in any form.

Second, in some municipalities, Sulabh has taken over these complexes from city officials for contracted period of 30 years, relieving the municipal authorities from the task of operating and maintaining them. This has vastly improved the quality of facilities available to users. Often these comfort stations are the cleanest ones in town, even in major cities like New Delhi, Bombay, Calcutta and Madras¹⁵.

In the third case, Sulabh also helps local communities (e.g. temples, churches, schools, hostels) set up, operate and maintain the community toilet complexes, run on a pay-and-use basis.

Affordability of "pay-and- use" facilities for users

Sulabh runs the public toilets-cum-bath complexes on "pay and use" basis without putting any burden on public exchequer for their maintenance. Sulabh undertakes maintenance of these complexes for a period of thirty years, free of cost to the local body/sponsoring authority. Children in slums and other weaker sections of the society who do not have the capacity to pay are allowed free use of these facilities. All other users currently pay Re 1 for toilet and Re 1 for using bath facility.

It has been stated that such public toilets are beyond¹⁶ the reach of slum dwellers since the use of these will cost Rs 150 per family per month. This assessment is not correct since the Sulabh CTCs charge Re 1 per use from the male users only and women and children are allowed free use of the facilities. If this is taken into account a family may have to pay Rs 30 to 40 per month for using facilities that are not available anywhere else in the neighbourhood.

2.4 Constraints to Scaling-Up of the Sulabh CTC Program

Institutional Issues in Scaling-Up

Sulabh International Social Service Organization (SISSO) is registered as an NGO (Non-government Organization) under the Registration of Societies Act of 1985. Although Sulabh can accept grants and donations, its current organizational structure is such that it cannot raise loans from banks or financial intermediaries such as Indian Renewable Energy Agency (IREDA). From the perspective of Sulabh, they are not interested in raising loans and constructing CTCs and take the financial and management risk. Sulabh is not interested in

also sponsored setting up of Sulabh complexes. The coming up of business houses in social service sector has also helped improve the quality of toilets and their services.

¹⁵See: Water Supply and Sanitation Collaborative Council, Geneva.

¹⁶ According to one view (Burra, Patel and Kerr 2003) these public toilets work well in large concourses such as railway stations and bus stops, but are not a workable solution in slums because of the high prices charged, usually 1 rupee per person each time the toilet is used. A family of five would have to spend 150 rupees a month to allow each member to use these toilet blocks just once a day - a sum beyond the means of most of the urban poor. However, this figure is not correct and a family never pays more than Rs 30 per month for using facilities in a Sulabh CTC since women and children get free services.

setting-up a private company that raises loans, constructs CTCs and then manages these over time. Given the difficulties of obtaining land and financial risks (see below) of investing in CTCs (even when land is free of cost), Sulabh is not interested in expanding its activities. Instead, Sulabh's activities depend on the request for setting up the facility that generally comes from the civic authorities themselves who also provide the land and the finances for construction. Under this arrangement, Sulabh has no incentive to scale-up the number of CTCs constructed during a year.

Management Capacity of Sulabh

Since Sulabh views this activity as a part of its social service activities of providing education and employment to children of scavengers, they are not unduly concerned about the number of CTCs they construct in a year. Further, Sulabh has been approached by a number of religious and charitable organizations, colleges and hostels to build CTCs for them. Under the situation, the management capabilities of Sulabh act as a constraint to the setting-up of more CTCs or installing biogas plants in existing CTCs.

Financing Needs of Scaling-Up of CTC Program

Apart from the institutional issues discussed above, the scaling-up of CTCs also depends on the financial viability of these public complexes. Financial issues of replicability of the Sulabh program are discussed below with the help of a case study for meeting the needs of public toilets for slum population of Delhi.

The estimated 1999 population of Delhi was 12.7 million of which an estimated 40 percent or about 5.1 million people live in slums. It is estimated that currently about 30 percent of the Delhi slum population, that is about 1.5 million people, have access to some sort of public toilet facility¹⁷. The remaining 70 percent of the slum population, or 3.56 million people, currently do not have access to toilet facility and they need to be provided this facility.

According to available estimates, average capital cost of establishing a seat with bath facilities in a community toilet complex is Rs 50,000. (see Annex 1). Assuming that each seat will provide toilet facilities to about 50 persons per day, this gives an estimated capital cost of Rs 1000 per person in a large complex. Providing such facilities through a scaled-up program of Sulabh CTCs to the entire population of 3.56 million will require an estimated investment of Rs 3560 million (or US \$ 84 million at 2000 prices). Such financial resources may have to be raised from the central government, state government, municipal corporation and from financing institutions such as Housing and Urban Development Corporation (HUDCO).

Financial Viability of a Community Toilet Complex

Assuming that one seat is required for 50 persons in a toilet complex, and a toilet complex¹⁸ will have 40 seats, the population coverage will be 2000 persons per CTC.

¹⁷ Sulabh currently maintains 294 toilet complexes in Delhi of which more than 100 have also been constructed by Sulabh.

¹⁸ These estimates are for relatively large complexes where economies of scale in construction and O&M can be achieved. Since actual number of users will vary from one complex to the other and may be lower on average, this analysis of financial viability is on the optimistic side.

Annual revenue per CTC is estimated as Rs 30,000 per month if one-half of all the users of toilets make payments @ Rs 1/user. Another Rs 15,000 may be collected from users of bath facilities @ Rs 1/user. This will give an estimated revenue of Rs 45,000 per CTC per month. (see Annex 1)

Operation and Maintenance (O&M) costs for each CTC is estimated at Rs 43,000 per month for each complex¹⁹. If only one-half of the total population pays for these facilities, the revenues earned will be just enough to cover O&M costs. Hence, it will not be possible to provide any money towards payment of interest and depreciation to cover for capital charges (Rs 33,300 per month @ 20 percent of Rs 2 million of each large CTC).

In the most optimistic case where all users (2000 per day) pay for toilets and 1000 users pay for bathing facilities, the monthly revenue will be Rs 90,000. In this situation, the revenues will be higher than O&M costs and will cover capital charges as well.

The above analysis shows that the financial viability of the CTCs will depend critically on their ability to raise revenues from users or from other sources. Such sources include :

- (i) net revenues from setting up of nightsoil-based biogas plants (NSBs) in the complexes and selling of gas and/or electricity generated from this biogas;
- (ii) net earnings from shops (e.g. grocery shops or community kitchens or cook shops) that provide benefits to the slum-dwellers and provide revenues to the complexes.

The use of these alternatives to improve financial viability of investments in CTCs has their own legal, regulatory and institutional constraints that are discussed below.

Improving Financial Viability of a CTC by Adding a Biogas Plant

In a large toilet complex, human waste or nightsoil can be used to generate biogas that can be used as a clean source of energy. Adding a biogas plant to a CTC helps in resource recovery, disposal of waste and generation of energy. Out of a total of 6000 complexes in the country, Sulabh has installed around 100 biogas plants in large CTCs.

Out of these 100 biogas plants, 4 are of 60 Cu.m./day capacity while the remaining are of 30-35 Cu.m. capacity. According to technical experts at Sulabh, a biogas plant can be connected with any CTC complex. However about 300 users of the toilet complex are needed to produce about 10 Cu.m. of gas in a day.

Biogas produced from such a plant can be transported in pipes to a distance of about 50 feet or can be used within the compound as a substitute for LPG or kerosene in cooking or lighting or as a substitute for diesel for running a dual-fuel engine to pump water from shallow aquifers. Hence, it is possible to have a win-win situation where a CTC with a biogas plant can be used to provide sanitation, bathing services and energy/electricity and water supply. It is important to study the financial, institutional, legal and regulatory constraints in scaling-up of such investments in CTCs with biogas plants.

¹⁹ We could not get any estimate of the annual maintenance costs from Sulabh. The estimates presented here may be taken as "informed estimates" and have been given here to provide an estimate of revenue-cost comparison. The annual cost have been estimated on the assumption that each complex employs 6 persons (@ Rs 3600/person/month), gives soap to users for washing of hands (Rs 1500/month), pays electricity bills etc (Rs 3000 per month), maintenance cost (Rs 2000/month), supervision and other miscellaneous cost (Rs 15000/month).

Financial Viability of Adding a Biogas Plant to a CTC

Financial viability of adding a biogas plant depends on the estimates of revenues generated from the sale of biogas or from the savings generated in the use of biogas when it replaces LPG or kerosene in cooking or diesel in electricity generation. (Annex 2) The total capital costs of a 35 Cu.m /day capacity biogas plant based on night-soil is Rs 550, 000 out of which Rs 200,000 is for the digester, Rs 140,000 for water supply and Rs 100,000 for gas distribution. The Government of India²⁰ provides a subsidy of Rs 400,000 on a nightsoil-based biogas (NSB) plant of 35 Cu.m./day capacity. The cost of land development, construction of boundary wall for the complex etc. are not included since these are already a part of the CTC.

Assuming that the current level of subsidies for NSB biogas plants will continue, a biogas plant will add Rs 150,000 to the capital cost of a CTC. The revenues generated from biogas will depend on the use of gas for cooking and lighting or for electricity generation. If there are legal difficulties of selling gas or electricity by the organization owning and operating the CTC, gas will have to be consumed within the compound of the CTC (as is the current practice). Changes in legal and regulatory environments will be required for gas to be sold to outside users.

In the first situation in estimating financial viability of a biogas plant, it is assumed that the gas will be used by staff within the compound and will replace equivalent quantity of LPG (on fuel-efficiency basis) . Based on daily use of CTC, it is assumed that a 35 cu.m./day biogas plant will have a gas output of 10,500 cft per month or 126,000 cft/year. On energy basis, with same stove efficiencies for biogas and LPG stoves (60 percent), 75 cft of biogas equals 1 kg of LPG (liquefied petroleum gas). At the current prices of LPG at Rs 250 per cylinder of 14 Kg, this gives a total savings in LPG costs of Rs 30,240 per year (for a total biogas output of 126,000 cft per year). Based on these estimates, additional capital cost (Rs 150,000) of a biogas plant will be recovered in less than five years.

In the second situation, it is assumed that gas will be piped and sold to outside users. From available data, it is estimated that a 35 cu.m./day biogas plant will have adequate gas to supply gas to 7 families at 20 cft (cubic feet)/hour for 2.5 hours per day. This gives a gas use of 1500 cft per month per family or a total of 10,500 cft per month or 126,000 cft/year. On energy basis, with same stove efficiencies for biogas and LPG stoves (60 percent), 1500cf/month biogas equals about 20 kg LPG or about 1.5 cylinder/month. At the current prices of LPG at Rs 250 per cylinder of 14 Kg, this gives a monthly savings in LPG costs of Rs 360 per month per family or a total savings of Rs 30,240 (360x12x7) per year.

If gas is to be sold to seven households, this will involve additional capital costs in gas distribution infrastructure (pipelines etc.). Biogas distribution costs are estimated at Rs 25,000 for the 7 HHs (not including the stoves). Assuming financing of the Rs 25,000 is at 12.5% over 15 years then annualised capital payment is about Rs 3750 (0.15 * 25,000). O&M costs for the distribution system is taken as Rs 2500/year, giving an estimate of total annual costs of gas distribution at Rs 6250/year.

²⁰ The subsidy is provided through the Ministry of Nonconventional Energy Sources (MNES) and state governments to promote the use of renewable, clean energy source of biogas.

This gives a net annual revenue of Rs 24,000/year after deducting these distribution costs from the gross annual revenues of Rs 30,240 per year (assuming households will pay Rs 360 per month at the equivalent costs of 1.5 cylinder or 20 Kg of LPG saved). This means that the payback period for additional investments in a biogas plant (after taking into account subsidies) will be 6.25 years.

Legal and Regulatory Issues

Sulabh does not face any legal problems in its work because the request for setting up the facility generally comes from the civic authorities themselves who also provide the land and the finances for construction. The major problem they see in extending the facility to all slums comes from the classification of slums as legal or illegal. Sometimes the municipal authorities do not permit them to extend this facility to illegal slums.

Since land and the CTC are owned by the funding agency, it may be difficult for Sulabh to raise financial resources by renting premises to shop owners. Although such revenues can improve the financial viability of a CTC, this may require a change in the contracts between Sulabh and funding agencies.

Further, the possibilities of raising revenues from setting-up of a biogas plant within the CTC may be restricted due to current regulations or ban on the sale of biogas and the sale of electricity generated from a biogas plant. The location of a biogas plant within the CTC complex may mean that there will be some social resistance to using biogas for cooking that is seen to come from a toilet complex.

2.5 Conclusions

To recapitulate:

1. Sulabh is running a successful program of providing community toilet and bathing facilities to the urban poor at prices they can afford. As many as 3 million people are benefiting every day from these services including women and children (who get these services free of charge).
2. In about 100 community toilet complexes (CTCs), Sulabh has installed biogas plants that provide additional benefits of clean environment and renewable energy that can be used by the poor people.
3. However, the current program needs to be "scaled-up" significantly if it has to meet the unserved population among the 300 million current residents in urban areas and another 200 million who will be added to urban population over the next 15 years. To provide sanitation services to even one-half of this population i.e. to 250 million people is a challenge that will require concerted efforts of governments, NGOs, communities, bilateral aid agencies and multilateral finance organizations.
4. There are significant institutional, management and financial constraints to "scaling-up" of the Sulabh program both over time and across regions.
5. The financial sustainability of the program is based on 100 percent subsidies in capital costs and revenues raised from the users cover only a part of the O&M expenses in most complexes. Even where biogas units can be added, the financial viability depends on the availability of capital subsidies to the extent of 75% of capital costs.
6. It is absolutely necessary for the complexes to raise revenues by renting space for advertisements or for grocery shops or other activities. Since land and the CTC are

owned by the funding agency, this may require a change in the contracts between Sulabh and funding agencies.

7. Given Sulabh's institutional status as an NGO registered under the Societies Registration Act, Sulabh can receive grants and donations and gets an assured income from its remuneration (commission or implementation charges) from the construction of CTCs. If Sulabh gets funds for the construction of 200 CTCs in a year, Sulabh has an assured income of Rs 40 million on a total expenditure of Rs 200 million incurred by others. This is a very substantial return on low investments made by Sulabh.
8. Since Sulabh is an NGO, it is not qualified to raise its own finances and/or accept loans from the financing agencies such as HUDCO or IREDA or from financial intermediaries such as banks or IDFC (Infrastructure Development Finance Corporation).
9. Sulabh is not interested in starting a private sector company which is willing to raise the loans, take the government subsidies and run the CTCs (and/or attached biogas plants) as commercial enterprises taking the financial risks.
10. Hence, the number of CTCs added every year is constrained by the total funds available to the municipalities or other local bodies for sanitation. Recently, Sulabh has entered into a contract with HUDCO where a number of CTCs will be constructed and managed by Sulabh where funds will come from special provisions such as slum development funds. In sum, it is the public funds for sanitation that constrain the total number of CTCs that are built. The existing institutional structure and lack of financial viability and sustainability are serious constraints to the "Scaling – Up " of the Sulabh model of community sanitation.

3. SPARC-assisted Community Toilet Blocks in Pune and Mumbai, India

This section²¹ presents a review²² of the experience of the Indian alliance of SPARC (Society for the Promotion of Area Resource Centres), Mahila Milan and the National Slum Dwellers Federation²³ in assisting communities to construct and manage Community Toilet Blocks (CTBs) in slum areas of Pune and Mumbai cities in India.

In Pune, a partnership between the municipal government, NGOs and community-based organizations has built more than 400 community toilet blocks with over 10,000 seats at a cost of about Rs.400 million. Assuming that 50 persons use a toilet seat a day, more than 500,000 (or one-half million) people in the slums of Pune (out of a slum population of 1.1

²¹ For details see, Ramesh Bhatia: Sanitation for the Urban Poor: Community Toilet Blocks in Pune and Mumbai, Draft, January 2004

²² This review is primarily based on several papers by Sundar Burra, Sheela Patel and Thomas Kerr. Including Sundar Burra And Sheela Patel: Community Toilets In Pune And Other Indian Cities, Oct, 2003 and Sundar Burra, Sheela Patel And Thomas Kerr: Community Toilet Blocks. Community-designed, built and managed toilet blocks in Indian cities, Environment & Urbanization Vol 15 No 2 October 2003 .

²³ SPARC is an Indian NGO established in Mumbai in 1984 that began working with women pavement dwellers. The National Slum Dwellers Federation (NSDF) links together and represents organizations and federations of slum dwellers throughout India and, by March 2002, was operating in 52 cities and 9 states with over 750,000 members. Mahila Milan ("women together") is the name given to collectives of women slum and pavement dwellers that work closely with the National Slum Dwellers Federation. The community toilet blocks are part of a larger programme of work in which the SPARC-NSDF-Mahila Milan Alliance is involved.

million) have benefited from the programme²⁴. They have also demonstrated the potential of municipal community partnerships to improve conditions for low-income groups.

In Mumbai, in 2000, SPARC won the contract to build 320 toilet blocks with 6,400 seats in 20 wards. SPARC set up a project management unit supervised by Nirman, a new non-profit company formed by the Alliance to undertake projects because of the growing scale of the Alliance's involvement. On behalf of Nirman, UTI Bank provided the municipal corporation with the performance guarantee needed to sign the contract, and the project began soon after. The target was to complete the 320 toilet blocks by March 2003. When it became apparent that this deadline could not be met, the World Bank argued against any extension. The Alliance argued that for a project that had taken eight years to design, it was overly ambitious to expect completion in two years! Moreover, this project showed a new way of providing sanitation to very low-income city dwellers. Eventually, the deadline was extended to December 2003. As of July 2003, 180 toilet blocks had been completed and another 110 were underway. This will provide sanitation facilities to about 0.3 million persons (out of a total of over 3 million) in the slums of Mumbai.

3.1 Community Toilets in Urban Areas

Only 15- 20 percent of slum dwellers today have minimum access to sanitation in any of India's cities. This reflects the problems confronting city governments as they begin to tackle these huge deficits. In most cases the poor cannot pay upfront for the costs for toilet construction, and they should not have to pay for this level of services. In such a deficit situation, the choice becomes one of providing basic access for all, versus good sanitation for some.

Community toilets rather than individual toilets are a preferred option because they can provide everyone, even the poorest, with sanitation. And the costs of provision for everyone can be afforded. Those who are better off can, and will, gradually build individual facilities for themselves. In this way, the pressure on community toilets will probably diminish over time, but everyone will continue to have access. CTBs are community-managed and controlled because the toilet blocks produce a possibility of change that helps develop new leaders, new relationships within communities and new relationships with external agencies.

3.2 Community Toilets Blocks in Pune and Mumbai

In 1999, the municipal commissioner in Pune sought to greatly increase the scale of public toilet construction and to ensure that more appropriate toilets got built. SPARC was one of the NGOs that received contracts, working with the National Slum Dwellers Federation (NSDF) and Mahila Milan (MM). The Alliance (SPARC, NSDF and MM) became one of the principal contractors and constructed 114 toilet blocks (with a total of more than 2,000 toilet seats and 500 children's toilet seats). The Alliance designed and costed the project, the city provided the capital costs, and the communities developed the capacity for management and maintenance. Between 1999 and 2001, more toilets were constructed and more money spent than in the previous 30 years. More than 400 toilet blocks were built with over 10,000 seats, at a cost of around 400 million rupees.

²⁴ The expenditure incurred on the first phase was Rs.22.5 crores or about a hundred times what was spent in any preceding year.

The design of the toilet blocks introduced several innovations. Unlike the previous models, they were bright and well ventilated, with better quality construction (which also made cleaning and maintenance easier). They had large storage tanks to ensure there was enough water for users to wash after defecation and to keep the toilets clean. Each toilet block had separate entrances and facilities for men and women. A block of children's toilets was included, in part because children always lose out to adults when there are queues for a toilet, in part because many young children are frightened to use conventional latrines. The children's toilets were specially designed for children's use – including smaller squat plates, handles (to prevent overbalancing when squatting) and no large pit openings

The Slum Dweller Federations/Mahila Milan around India have developed skills of persuasion in showing local governments that an unconventional toilet-building partnership with a well-organized community organization is a realistic, even attractive, proposition for solving big problems that stymie municipalities up and down the sub-continent. These features are²⁵:

- sharing costs with a community reduces the city's sanitation cost burden;
- when communities build toilets, the city's construction burden is eliminated;
- when communities maintain the toilets, the city's maintenance costs are eliminated;
- community-built toilets often cost less than those the city builds, so a city's infrastructure budgets can be spread further, increasing service delivery.

These programs also demonstrate that implementation on a large scale requires cooperation with government agencies and/or the organizations responsible for building and managing trunk infrastructure – even if this is only to permit these community initiatives. SPARC chose to manage programs on a much larger scale – a far more complex task that called for a change in the attitude of local authorities to this kind of provision and a change in the relationship between these authorities and the organizations formed by “slum” residents and pavement dwellers.

3.3 Affordability of Toilets for Users

There has been considerable debate about how best to fund the maintenance of these toilets. The Alliance of SPARC, the National Slum Dwellers Federation and Mahila Milan promoted a system whereby each family pays for a pass costing 20 rupees a month. Although it is difficult to envisage how toilet blocks can be maintained without such payment, some elected municipal council members have been demanding that there be no payments and this has depressed collection rates in some toilet blocks²⁶.

²⁵ See Burra, Patel and Kerr (2003)

²⁶ According to Burra (2003), many municipal councilors actively opposed the community toilets in part because these provided councilors with no 'cut', in part as they represented a contractors' lobby objecting to the loss of contracts. Community management went against the long and dishonorable tradition of contractors, engineers and councilors getting a cut from each project, often through inflating the cost estimates. However, some councilors were supporters from the outset while many others became supporters, when they saw the results and the popularity of the community toilets.

3.4 Financing and Financial Viability

Financing of Capital Costs

Financial sources for the CTBs have varied between one project and the other. In Pune²⁷, Municipal Corporation pays for the entire construction, of which one third is its own contribution, the government of Maharashtra pays one third and the central government through HUDCO pays the other one third. However this economics works because the costs of construction by communities itself is almost half that of the contractor would have taken. So it is affordable to the Municipal Corporation. SPARC's bridge revolving fund financed this project, and training for managing infrastructure came from HI (Homeless International UK) and Selavip (Japan).

In Bombay, the slum sanitation project of 440 million rupees comes from the Municipal Corporation of Mumbai which in turn has taken a loan from the World Bank. SPARC has taken a guarantee from UTI Bank of 15% to execute the project, and HI (Homeless International UK) gives a counter guarantee to UTI.

The Indian government has now introduced a new programme - the Nirmal Bharat Abhiyan – where a 50 per cent subsidy for the construction of community toilets is available to local bodies and public authorities. The community toilets built in Pune and Mumbai influenced this.

3.5 Financial Viability of CTBs

According to available estimates²⁸, in Pune more than 400 toilet blocks were built with over 10,000 seats, at a cost of around 400 million rupees (around US \$ 8.9 million) Assuming that each toilet seat was used by 50 persons each day, over 500,000 people benefited at a capital cost of Rs 800 (US \$ 18) per person served. If the entire slum population of Pune (1.12 million) was to be served by these CTBs, the estimated cost is Rs 900 million or US\$ 20 million.

In addition to the capital costs, there are O&M costs that may range between Rs 20,000 to Rs 30,000 per month that may include payments for employees, cleaning supplies and repair and maintenance. If a family is charged Rs 20 per month and a complex caters to 200 families (or 1000 persons), estimated monthly collections will be Rs 4000, at the most. This will mean that either the complex will have to be subsidized from outside funds or labour will have to be provided free of cost by the caretaker.

It has not been possible to obtain any data on revenues, costs or financial viability of these CTBs except to say that collection rates have been depressed in some toilet blocks²⁹. In the absence of any data, it is difficult to say that the CTBs are financially viable and hence sustainable over time. In the case of doubts about its financial viability and long term sustainability, it is difficult to say how such a program can be "scaled up" to provide sanitation services to millions of urban poor in India.

²⁷ Burra, Patel and Kerr (2003)

²⁸ Burra, Patel and Kerr (2003)

²⁹ Burra, Patel and Kerr (2003)

3.6 Conclusions

To recapitulate:

1. The Indian alliance of SPARC (Society for the Promotion of Area Resource Centre), Mahila Milan and the National Slum Dwellers Federation is running a successful program in involving the local communities in construction and management of Community Toilet Blocks (CTBs) in slum areas of Pune and Mumbai cities in India. The CTBs are currently providing services to around 0.8 million persons in the two cities.
2. However, the current program needs to be "scaled-up" significantly if it has to meet the unserved population among the millions of current and future residents in these and other cities who will be added over the next 15 years. This is a challenge that will require concerted efforts of governments, NGOs, communities, bilateral aid agencies and multilateral finance organizations.
 1. There are significant institutional, management and financial constraints to "scaling-up" of the SPARC-assisted program both over time and across regions.
 2. The available information on financing of projects and financial viability of CTBs is rather scant. SPARC has set up a project management unit supervised by Nirman, a new non-profit company formed by the Alliance to undertake projects. It is not clear under what financial performance conditions, UTI Bank has provided the municipal corporation with the performance guarantee on behalf of Nirman. Although this arrangement seems workable, it is not clear what are the financial risks and who bears the risks.
 3. The financial sustainability of the program is based on 100 percent subsidies in capital costs and revenues raised from the users may cover only a part of the O&M expenses in most complexes. Even a payment of Rs 20 per family that may raise a mere Rs 4000 per month for each block is in doubt. Hence, the number of CTBs added every year is constrained by the total funds available to the municipalities or other local bodies for sanitation. In sum, it is the public funds for sanitation that constrain the total number of CTBs that are built.
 4. Given the uncertainties about revenues for meeting the O&M charges on a regular basis, the lack of financial viability and sustainability are serious constraints to the "Scaling – Up" of the SPARC-assisted model of community sanitation.

4. Orangi Sanitation Project, Karachi, Pakistan

4.1 Background

Orangi sanitation project is a well-known example of community involvement in providing affordable sanitation services to the urban poor in Karachi, Pakistan³⁰. Orangi Township, Karachi's largest squatter settlement (*katchi abadi*) has a population of about 900,000 out of a total population of 10 million in Karachi. Before the Orangi Pilot Project (OPP) was established in the township, there was no proper sanitation system. The Orangi project is a low-cost sanitation programme, which enables low-income households to construct and maintain modern sanitation (pour-flush latrines in their own homes and underground sewerage pipelines in the lanes) with their own funds and under their own management. It

³⁰ This review is based on a number of references listed at the end of this section.

offers an alternative approach to the problem of developing water and sanitation provision in urban areas from which important lessons can be drawn.

Through developing low cost technologies and cutting costs by eliminating middlemen or contractors, the OPP enabled the affordability of sanitation facilities for the low-income inhabitants of Orangi. Through imparting health education, advising and motivating collective action, the OPP staff got rid of various psychological and sociological barriers that had prevented the households from taking the responsibility of sanitation in their hands. By providing technical innovations and help they were able to provide know-how and affordable sanitation options.

Between July 1981 and November 1993, Orangi residents invested more than US\$2.2 million on improved sanitation and drainage systems. This has provided 88,000 houses – about 90% of the Orangi residents- with good toilets.

The Orangi project has already been successfully transferred to 42 settlements in Karachi. It offers an alternative approach to the problem of developing water and sanitation provision in urban areas from which important lessons can be drawn.

However much more still needs to be done. The Research and Training Institute (RTI) of OPP is currently assisting both government and non-government initiatives in a number of other cities in Pakistan that are seeking to replicate the Orangi sanitation programme.

4.2 Management and Financing Issues

The OPP is essentially a research institution with the aim of identifying problems and developing solutions which can be implemented by the population in an organized manner. The OPP does not construct infrastructure, but it promotes community organization and self-management on a sustainable basis.

The OPP started with a study of the problems in Orangi and identified four levels in a modern sanitation system: the sanitary toilets inside the house; the underground sewer lines with house connections and manholes in the house access lanes; the secondary collector drains; and the main drains and the treatment plant. The house owners were convinced and made willing and competent to assume the responsibility for the construction and maintenance of the first three levels which constitutes about 90 per cent of the system. The main drains and the treatment plant were agreed to be the responsibility of the government. It has been reported that some problems arose with the main drains and treatment plants responsibility not being discharged properly³¹.

OPP simplified sanitation designs to make them affordable and technically viable so that they could be implemented locally. Through simplifying the design and developing steel moulds for sanitary latrines and manholes, the cost was reduced to one-quarter of the contractor rates. The elimination of the contractors' profits reduced labor costs by a further quarter. The final cost for the proposed system was about Rs.1,000 (approximately US\$31) of which one-half was for the investment inside the house and the remainder was for the lane sanitation, for

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example, laying or renovating sewage pipes. Average earning per household in Orangi is about Rs.1,650 per month against an average Karachi household income of Rs. 2,100.

The Orangi Pilot Project (OPP) has never used credit schemes to finance sanitation and sewerage. The Orangi Project is an underground sanitation system financed, managed and laid by the people. Residents have been increasingly willing to take on the costs and organizational challenge of secondary drains, though several barriers as discussed later had to overcome first. The lane residents are also carrying out frequent maintenance and repair work on their investments.

Through developing low cost technologies and cutting costs by eliminating middlemen or contractors, the OPP enabled the affordability of sanitation facilities for the low-income inhabitants of Orangi. The funds came mainly from the households themselves who were poor though not destitute. Since the household invested their own funds they had incentive to maintain the system and provided finances and management for operations of the system too, making the project financially viable using local funds. The main drains and treatment plants that are the government's responsibility need to be maintained properly to ensure the success of the efforts of the community members. The project facilitated a self-help approach by promoting community organization and political mobilization through the following three principles:

1. ***Sanitation infrastructure costs were lowered by using modified technology:*** OPP research focused on the technology in order to lower the cost of the sanitation system to such a level that the residents of Orangi could easily participate in its construction. Cost reductions were achieved by simplifying the design and the methods of construction and by eliminating contractors and middlemen. OPP research showed that a family owning a house on a 100 sq.yrd plot could have a sanitary toilet on the plot connected to an underground sewer line in the lane at a cost of Rs.1000.
2. ***Technical and sociological support was provided to help householders make suitable choices:*** OPP technicians surveyed the lanes, consisting of 20-40 houses as the basic unit of organization, ascertained levels and prepared maps, plans and estimates, while OPP social organizers explained the benefits of the sewerage system to the house owners and identified an activist in each lane who could serve as lane manager, and hold meetings, create consensus and settle disputes. The OPP chose the lane, since it is small enough to ensure participation and large enough to ensure economies of scale. The task of the lane manager is to collect the required funds, hire labor and manage the construction process; he also keeps detailed accounts of the costs. In addition, the OPP launched a training programme for small-scale building contractors to develop their skills in implementing the construction without constant technical supervision by the OPP staff.
3. ***The internal (household and community) responsibilities and external (municipal) responsibilities in terms of the sanitation system were clearly defined and distinguished.*** The involvement of the residents does not stop with the construction; regular maintenance is very important. Because the lane residents have made a contribution towards the construction of the system, they have the incentives to ensure its sustained operation through regular maintenance. The government was responsible for the main drains and treatment plants.

4.3 Constraints

Reasons why people are hesitant in organizing for taking the responsibilities for sanitation activities often include many barriers that were also prevalent in Orangi before OPP. Psychological barriers the residents faced as they had always believed that it was the duty of official agencies to build sewerage lines to local residents free of charge. The construction of the underground lines required a high level of community organization for collective action and this did not exist which posed a sociological barrier. OPP brought people together and motivated them to work together and enabled the required collective action. The economic barrier- households could not afford the cost of conventional sanitary latrines and underground sewerage. The technical barrier -although the people could build their own houses, neither they nor the local builders possessed the technical skills required for the construction of underground sewerage lines.

The OPP programs have not been without problems. While the Orangi residents constructed their toilets and sewer lines in the area, the government failed to construct the sewer mains and treatment plant to evacuate the sewage from the area. One of the lessons drawn by OPP is the need to work with both the communities and the government to solve environmental problems in squatter settlements. Waste from the Orangi sewers runs into open waterways that flow to the sea. These waterways are overburdened by waste from Orangi and from Karachi in general and still tend to overflow during heavy rains. The main sewers required to prevent this flooding are the responsibility of the Karachi authorities. OPP has developed designs for main sewers and is lobbying the Karachi Municipal Corporation to build them.

4.4 Conclusions

With regard to the possibility of replicating the experience for other places in Karachi and elsewhere, the lessons learnt from this project are important.

- Through developing low cost technologies and cutting costs by eliminating middlemen or contractors, the OPP enabled the affordability of sanitation facilities for the low-income inhabitants of Orangi.
- Through imparting health education, advising and motivating collective action, the OPP staff got rid of various psychological and sociological barriers that had prevented the households from taking the responsibility of sanitation in their hands. By providing technical innovations and help they were able to remove the technical and economic barriers due to which the earlier sanitation options were neither affordable for the households and nor did they have technical know how of.
- Households financed and managed the sanitation system without putting any burden on the government or external aid agencies.

4.5 References:

<http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/mcfs.htm#Anchor-20696>

<http://www.unhabitat.org/mediacentre/documents/wwf15.pdf>

http://akhtar-hameed-khan.8m.com/human_settlement.html

<http://www.tve.org/ho/doc.cfm?aid=575>

http://www.wri.org/wri/wr-96-97/pi_b2.html

5. Bangladesh Urban Sanitation Program³²

The Water Aid-Bangladesh Urban Programme begun by the lead partner, DSK (Dustha Shashthya Kendra), has been implemented since 1998 by a group of seven partner NGOs³³ in approximately 168 slums in the Dhaka metropolitan area and in Chittagong City Corporation, the two largest urban areas in Bangladesh. There are approximately 92,000 households in the working area as a whole, of which 27 percent are estimated to have received one or more of the programs services. Programme services include: water points providing supply water through legal connections to metropolitan water authority lines; installation of tubewells; construction of sanitation blocks combining water points and hygienic latrines; community/cluster latrines with septic tanks; household water-seal, pit latrines; construction of footpaths; drainage improvements; solid waste management; and hygiene education.

Local users wholly or partially pay for all physical improvements. Each partner NGO has a revolving fund through which repaid loans can be used for additional programme activities. Planning and implementation of programme activities are expected to be done in ways that ensure maximum involvement of local people in decisions and facility management. Hygiene education methods also utilize participatory communication strategies adapted from several national and international sources.

5.1 Financing Issues:

As a part of the evaluation of the program, a survey has been carried out. Of the 1130 beneficiary or non-beneficiary households interviewed in the Water Aid study, 32% and 45%, respectively, rent their houses. Average monthly rents range from Tk³⁴.300 to Tk.500. Median monthly household incomes are: Tk.2500 for the very poor, Tk. 3000-3100 for the medium poor, and Tk.5000-5500 for the more solvent.

Beneficiaries of all economic levels were found in a household survey conducted by Water aid³⁵ to make more use of hygienic latrines than non-beneficiaries: 65 percent, as compared to 50 percent. Poor households tend to use community latrines, and solvent households, to use private latrines. The per-person, per-use charge for using sanitation blocks inhibits their use by local area residents, so a large percentage of cost recovery seems to be based on commercial sales to passers-by in locations where people are charged per use. There is some evidence that women have less access to hygienic latrine facilities, especially in sanitation blocks, than men. In one case this is because women use an older facility rather than the one constructed by the programme. In another, a household decision was made to allow the man to pay for a sanitation block bath, but not his wife.

³² This review is based on Suzanne Hanchett, Mohidul Hoque Khan, Shireen Akhter : WATER-AID Bangladesh Urban Evaluation 2001

³³ The seven partner NGOs working with Water Aid are: ARBAN (Association for Realization of Basic Needs); ASD (Assistance for Slum Dwellers); BAWPA (Bangladesh Agricultural Working Peoples Association); DSK (Dustha Shashthya Kendra, an organization specializing in health services for the very poor); PHULKI (an organization working in the Kallyanpur slum; specializing in daycare services); PRODIPAN (a Khulna-based development organization specializing in solid waste management); PSTC (Population Services and Training Center)

³⁴ \$1.00 = approximately 80 taka

³⁵ See.....

For water points, most partner NGOs have worked out methods of covering costs and getting loans paid. For sanitation blocks there are still no firm decisions on how to accomplish these goals and also get enough water to community residents. Supply and demand determines the prospects for success. Even if alternatives are not easily available, poor peoples' financial circumstances can still limit their access to safe water. I am almost 100 percent certain that if they must pay 50 paise per pot, the poor will use safe water only for drinking, if at all.

When programme facility users are required to pay on their loan and cover operating costs, they need to raise a minimum amount of money each month. Some make up the gap by selling to outsiders, usually charging them the same rates as community residents pay.

The unclean condition of most observed programme latrines suggests a need for a more intensive effort to educate users about latrine maintenance and health risks associated with inadequate disposal of faecal matter. There also may be a need for improved staff training on latrine cleaning and maintenance. The fact that many programme area residents, especially the poorest, still use hang or open latrines shows that there remains an enormous need for investment in sanitation facilities -- preceded, of course, by motivational campaigns.

5.2 Hygiene Promotion

Hygiene education is provided in most cases to slum dwellers regardless of whether they use programme water and sanitation facilities. The greatest impact on hygiene awareness, judging from the household survey, has been on hand washing knowledge, understanding how worms infection spreads, using safe water, and covering food to avoid diarrhoeal disease. Hygiene promotion techniques are not discussed to any great extent among Water Aid partners, who use monthly technical coordination meetings for discussion of engineering issues. So the hygiene promotion skills of stronger groups are not being shared with other Water Aid partners.

5.3 Organizational Issues

Most Water Aid partner NGOs have initiated contact with new working areas through existing credit or other self-help groups, which may or may not form the basis of facility-management committees. In at least two NGOs' working areas Slum Development Committees working on behalf of all residents are supporting urban programme activities.

In cases where large numbers of houses are rented, ownership of programme facilities may not ultimately come to area residents who pay for them. In handing-over programme facilities once paid for, an NGO's role may or may not end. Whereas tubewells and latrines can be fully managed by owner-users, the water authority's requirement that the NGO pay the water bill makes full hand-over impossible under present circumstances. Eviction is an ever-present danger, even in the most stable slums, if not legally occupied. After Water Aid and local populations have spent large amounts of money, a slum clearance inevitably results in lost programme resources and less money returning to revolving funds.

5.4 Actual and Potential Impacts of the Urban Programme

The most significant programme achievement to date is in creating a good working relationship with the Dhaka Water and Sewerage Authority (DWASA). The outcome of these efforts has been a high degree of interest among senior management at DWASA in the

programme, and a willingness to approve piped supply connections in slums. The importance of this cannot be over-stated. It opens the door for slum dwellers throughout Dhaka (and Chittagong too) to have the same access to piped supply water which other urban area residents have.

5.6 Reconfigured Strategy Needed to Reach the Poorest

If Water Aid and its urban partner NGOs decide to expand services to include poorer slum area residents, modified guidelines and cost-sharing arrangements will be required. Providing water and sanitation services to the very poor living outside of slums would require entirely new programme strategies.

6. Conclusions

1. Hygiene education should receive more attention through a monthly coordination meeting and more training by partner NGOs of their new staff. Hygiene educators could play an extended role in monitoring of facilities and services.
2. Owner-users, especially committees of very poor people, need help with learning how to manage accounts. Training someone locally should be a priority, so that owner-users will be able to handle their affairs after a loan is repaid.
3. The community-empowerment/ownership concept is still in a trial stage in certain slums, where landlords and other powerful individuals exercise great influence over all community matters. It needs to be further investigated and reconsidered in such situations.
4. People who are considered by the programme to be owners of water and sanitation facilities do not always understand their rights and responsibilities. These should be better explained to them. There should be some way of compensating owner-users if a site is evicted and a programme facility for which they have paid is rendered useless.
5. There should be a goal to ensure that all programme structures will last at least five years. People should be compensated from the programme if engineering or other technical failures interrupt their service.
6. The programme is advised to consider modifying the total concept away from committee-based ownership and use, and to move toward an area-based approach. Some smaller slums (or specific catchment areas of larger slums) should be considered for 100% safe water and sanitation coverage. Payment scales should be adjusted to household economic status. Such measures would ensure full access to programme facilities for all area residents, whatever their economic capacity.

6. Ouagadougou Strategic Sanitation Plan, Burkina Faso

The Ouagadougou Strategic Sanitation Plan (PSAO) is an integrated sanitation and hygiene promotion programme³⁶ implemented by the parastatal National Water and Sanitation Office (ONEA). PSAO has assisted thousands of households in Ouagadougou in upgrading their latrines and installing soakaways. The approach included making the households aware of the technical options available to them. Some subsidies are available if needed. The funds for

³⁶ This section is based on The Ouagadougou Strategic Sanitation Plan: An Holistic Approach to a City's Problem. Blue gold Series. Water and Sanitation Program.

ONEA's promotional work and subsidies for on-site sanitation come from a surcharge levied on water bills. Latrine blocks have been built for Ouagadougou's schools. ONEA has sub-contracted a local NGO (ADRA) and a regional training centre (CREPA) in order to implement all these activities. A sewerage system and wastewater treatment works are also under construction to treat sewage from the city center and the industrial area. Recent legislation requires industries to treat their effluents before discharging them into the sewerage system. They will be entitled to low-interest loans to install the necessary pre-treatment processes. To finance this, ONEA will levy another surcharge on water customers connected to the sewerage system. As an integral component of PSAO, CREPA conducted a pilot school sanitation programme. It trained private enterprises in the construction of school latrines and produced a guide on hygiene promotion.

While the programme does have problems, for example in targeting subsidies at the poorest people and in the relationship between PSAO and the local government, it offers a practical example of a city-wide integrated sanitation programme that could be useful in other countries.

6.1 Background:

In 1999, the 900,000 inhabitants of Ouagadougou, Burkina Faso, were mostly using traditional latrines (70%), while some had access to improved pit latrines (18%) or septic tanks (5%). About 7% of the population were without any sanitation and practiced open defecation. Most schools lacked suitable sanitation facilities. Sewage and wastewater from the central market, the main hotels, the hospital, the brewery, the tanneries and the abattoir were discharged untreated into the surroundings. The quantities discharged had risen to more than 20,000 m³/year of night soil and 600,000 m³/year of industrial effluent. Ouagadougou had major problems of water supply, sanitation and wastewater treatment.

The National Water and Sanitation Office (ONEA) was set up in 1985 and became a parastatal in 1996: it is still part of the public sector but financially autonomous from the government. ONEA manages drinking water and sanitation services in Ouagadougou and 50 other centres, with 45,000 customers and over 1,300 public tap stands.

The programme has three main components:

1. On-site sanitation: PSAO selected this as the preferred technology for about 80% of the urban area. Community workers paid by the programme encourage households to upgrade their sanitation facilities by installing one of several options for the disposal of excreta and/or soakaways for sullage disposal.
2. School sanitation facilities: ONEA aims to construct latrines for the schools in the city and to provide teachers with educational material about hygiene and sanitation.
3. Off-site sanitation: A conventional sewerage system is under construction to serve the city center and the commercial, administrative and industrial zones. Because waste stabilization ponds will treat the effluent using aquatic plants, rather than more costly and conventional chemical processes, industries are required to pre-treat the water that they discharge into the sewerage system. The activities are defined in a long-term contract between ONEA and the government, which specifies the completion of 78,000 sanitation systems by 2010.

Till April 2002 the results were impressive: over 19,000 households have constructed over 28,000 on-site sanitation systems. This programme has reached 26% of the 73,000 residential plots that could be equipped with on-site sanitation.

6.2 Financing:

ONEA generates some of its own financial resources. It has made provision for two sanitation surcharges levied on the cost of drinking water, only one of which is currently in operation:

- One surcharge fully finances the on-site sanitation activities. It is equivalent to 4% of the average water tariff, and effectively constitutes a sanitation tax of US\$0.02 per cubic meter of water sold. In 1999, this surcharge generated a revenue of US\$0.5³⁷ million. Of this sum, 65% was collected in Ouagadougou and 25% in Bobo-Dioulasso (the country's second city, with major industrial activity).
- A second surcharge will help industries to finance the pre-treatment facilities that they must now install to meet national discharge standards. It will be channelled into the Fund for Disposal of Industrial Pollution (FODEPI). It will apply to water users connected to the main sewerage system. It should amount to approximately US\$0.01 per cubic meter.

ONEA also receives significant aid from external support agencies for PSAO. The support of the French Development Agency (AFD) has risen to US\$7 million. A sum of US\$0.2 million helped to subsidize the components of the latrines and sanitary facilities. For example 96% of the VIP latrines constructed benefited from subsidies of between 0% and 40% of the cost and 76% of the soakaways constructed benefited from subsidies of between 21% and 60% of the cost.

The average cost of a system is about US\$57. The construction of soakaways and the rehabilitation of traditional latrines constitute the greatest part of the work, probably because of the low investment cost compared to the other options offered.

Some of the factors that influence the householder's choice are:

- A standard VIP latrine costs about US\$100, which is five to ten times more than a soakaway and two to three times more than the rehabilitation of a traditional latrine.
- The rehabilitation of a traditional latrine requires one working day. The construction of a VIP latrine takes between one and fifteen days. The World Bank has approved a loan of more than US\$4.5 million. Meanwhile ONEA is providing, from its own funds, US\$3.6 million for the on-site sanitation component and US\$0.4 million for school sanitation.

For the same type of work, the price varies significantly because it is negotiated by the client (head of the household) and the artisan. The factors determining the price can include, for example, the contribution of the household (digging the pit, providing sand, etc.) and the possible additions (such as tiled floors). In 1997, the cost of a latrine fell significantly, apparently because of increased competition among artisans. Soakaways were particularly popular; the programme had to meet a demand of over 150 per month. The other types of components were completed at a rate of about 50 per month.

³⁷ 1 million FCFA=US\$1.5k

ONEA entrusted ADRA (Adventist Development and Relief Agency, a Burkina Faso NGO) with the responsibility for community mobilization and hygiene promotion. On average, each field worker contributed to the construction of 100 sanitation installations. The cost of these mobilization and promotion activities per household was about US\$25.

With finance from ONEA, 100,000 primary school pupils were provided with 170 school latrine blocks. This attained the objectives of the pilot phase, at a cost of US\$343,000.

FODEPI is a fund, hosted and managed by ONEA, intended to enable major industries to finance pre-treatment and hence to limit the amount of pollution they discharge. Consultation between the major polluting industries, ONEA and the Ministry of Environment and Water established target discharge levels which are specified in a Special Convention on the Dumping of Industrial Wastewater.

FODEPI will:

- Grant a subsidy of 20%-30% of the pre-tax costs of capital investment
- Guarantee the loans given to industries by banks
- Give a rebate on the interest rates to be paid by the borrowers

The funds for FODEPI will be made up of contributions from external support agencies (France and the Netherlands), as well as interest on long-term deposits. It will also be financed by a surcharge levied on consumption of water by domestic and industrial users connected to the main sewerage system.

6.3 Scaling up:

PSAO's approach was tested in a pilot phase between 1992 and 1994. This was also an opportunity to test the capacity of the local artisans and small enterprises. In 1995, the programme was expanded to 30 areas of the city. For the construction of the sanitation components, ONEA used masons, of whom 260 have been trained to date.

To achieve that expansion, ONEA embarked on a genuine partnership with the city's artisans. It invited a regional training center, CREPA (Regional Centre for Low-Cost Water and Sanitation), to train artisans in the construction of sanitation components, and appointed private companies to carry out quality control. The artisans' output has risen from 1,000 to 6,000 installations rehabilitated or constructed per year. Following the success of PSAO, ONEA is implementing a similar programme in the second city of Bobo-Dioulasso, and may extend this work to four large towns.

The two lessons learnt are important while scaling up of the programme:

1. In Ouagadougou, most of the households that have had a latrine rehabilitated or a soakaway constructed seem to belong to the middle class, as indicated by their employment or vehicle ownership. To reach the poorest households a large amount of subsidies will be required and targeting these subsidies effectively will be imperative.
2. The maintenance and care taking arrangements for these school latrines were inadequate. The installations were the victims of their own success, in that they suffered from unauthorized use, during the night, by other people living in the neighbourhood. Some latrines were vandalized, and others neglected through lack of

maintenance. In future the maintenance of these systems is important for achieving the objectives behind them.

6.4 Conclusions:

The Ouagadougou Strategic Sanitation Approach aims to devise sanitation solutions which are demand responsive, flexible and involve the active participation of all stakeholders. Some features of the approach are:

- The sanitation construction programme is not centrally determined but responds to household demand.
- Households are offered a variety of options which they can 'mix and match' according to their practices and resources.
- Social development work plays a crucial role, both in understanding the needs of the community and in promoting demand for technically, financially, and socially appropriate solutions.
- Both education and incentives are used to increase uptake of sanitation options.

Putting this approach into practice requires sustainable institutional arrangements, such as the establishment of an agency that can generate its revenue and recover costs from the beneficiaries of sanitation, and thus avoid dependence on central government funds.

This agency defines the overall direction and manages the system of incentives; the social development and construction may be carried out by NGOs and/or the private sector. The development of such sustainable arrangements, rather than the construction of a certain number of works over a specified time, is the key to success in implementing the strategic sanitation approach.

7 Strategic Sanitation Programme, Kumasi, Ghana

7.1 Background

The Kumasi program³⁸ is well known for its pioneering work to implement a strategy for urban sanitation programs to be replicated in other urban centers in Ghana, the guiding principle of which would be the sharing of costs between the project and end users.

Kumasi is the second largest city in Ghana and is located 300 km Northwest of Accra, the national capital. At the beginning of 1990, 40% of the Kumasi's residents used public latrines, 25% used the unhygienic bucket latrines, 5% used pit latrines and 5% 'free ranged'. The remaining 25% whom have water closets had septic tanks overflowing into drains. In the recent past a number of pilot activities in the sanitation sector have been initiated. Though some improvements have taken place, it is imperative that these improvements are sustained and expanded.

Pilot activities have been undertaken in the sanitation sector which includes schemes at the household level as well as city level. Kumasi Sanitation Project³⁹, funded by

³⁸ This review is based on the following reference: <http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/mcfs.htm#Anchor-20696>

UNDP/KMA(Kumasi Metropolitan Assembly)⁴⁰ covered Home Latrine, Public Toilets and Simplified Sewerage Scheme on pilot basis. A public toilet facility has been commissioned with funding from the Metropolitan Assembly, Almere and a support from the beneficiary community. Piloting activities under the MERC scheme commenced in Zone 1 of Atonsu pilot area on July 1st 1998. This phase covers a total of about 540 houses and serves a total population of about 5,481.

7.2 Management and Financing Issues

Stakeholders

The stakeholders of the scheme include the KMA, the beneficiary community - Atonsu Zone 4 (Monaco) and the Franchisee. Kumasi-Almere Steering Committee (KASCO) has the overall responsibility for the management of the project. These include policy direction and approval for the disbursement of project funds, conflict resolution through consensus building and monitoring and evaluation. The current membership of KASCO is 12 and is made up of the following: The KMA which is represented by the Presiding Member, the Co-coordinating Director, the Waste Management Department, the Metropolitan Engineer's Department and the Health Education Unit.⁽²⁾ The elected Assembly members for the project area The Catholic Graduates for Action (CAGA) - an NGO.

The KMA, Almere and the Community provide funding for the implementation of this phase. The programme responds directly to the KMA's Five-year Development Plan (1996-2000) and the Ghana Government's poverty alleviation programme in the medium term. The city of Almere has indicated their preparedness to support an extension of the programme to cover two other zones within Atonsu, which will result in an overall coverage of about 70% in the future. To provide the completeness required to maintaining an appreciable public health status in the community, it is imperative that the remaining 30% of Atonsu are covered by a similar exercise. A project proposal has been submitted to ICLEI for Incentive Grant Project (IGP) assistance to cover the unserved 30% of the community. This will provide the completeness required maximizing the impact of the project.

Kumasi had achieved construction of 200 units of household facilities within 6-months as against the 2001 target of 1,700. The dynamics of strategic sanitation planning has been applied under the household latrine programme. Under the Kumasi Sanitation Project (1989-94) beneficiaries were assisted with loans if upfront-payment of 20% was fulfilled. Although loan recovery was satisfactory (75% and more), the management cost of this recovery effort implied that the real recovery is in the range of 50%. Under the Urban IV project, this realization brought about an adjustment in procedures.

Beneficiaries (households) make 50% contributions towards household facilities while the project supports households with a grant of 50%. Households' indicate their commitment by initiating construction up to 25% (or more) cost of the facility before the release of project grant. In this manner the demand-driven requirement of SSP-Kumasi is achieved.

³⁹ (1990-1994)

⁴⁰ KMA is responsible for the overall development of the Kumasi metropolis and is in charge of the preparation of development and budgetary plans for the city; initiate programs for the development of basic infrastructure and has the responsibility for the provision of municipal infrastructure services; responsible for the development, improvement and management of human settlements and the environment, ensuring a secured and sound conditions for development in the metropolis.

The drainage, Community infrastructure upgrading, landfill and seepage treatment facilities development and privatization of solid waste are at various stages. The drafting and finalization of a Franchise Agreement for solid waste management as against the more familiar traditional contract agreements was very challenging. More so, where the agreement should be accommodated within the stipulates of the Local Government Act, Act 462.

7.3 Constraints to Scaling-Up

Challenges Faced

The Community based Kumasi-Almere MERC Scheme faces challenges. Solid waste service has always been offered for free in Kumasi over the years. The introduction of 'Service Fee' under the scheme particularly in Atonsu has been a challenge since the inhabitants of the area are middle to low income people.

Loans were made directly to tenant landlords for the installation of shared sets of latrine units. Repayment was to be made by the landlord over a 2-3 year period. The landlord would either add an amount to the rent or collect it separately. Collection of loan payments in this way has proved problematic. It has led to over billing of tenants and lapses to the regular payment schedule. Landlords sometimes retain funds until all tenants have paid up or use the money as working capital. As of May 1993, over 40 per cent of the 224 loans disbursed in the 3 pilot areas were in arrears. Collection is further complicated by the fact that the responsibility for debt collection does not lie with a single financial institution but rather a combination of project staff and the community steering committee which adds to overall loan administration costs. Finally the financial situation in the country combining inflation and distorted credit markets has exacerbated the situation.

It is also a pilot scheme involving 'Private Sector Participation' (PSP) in the waste management service delivery in the city and hence its success or failure will have an important impact on future policy. Since this is the beginning of PSP in solid waste service, the challenge to providing effective operational monitoring which is an important factor for success has been highly significant. This was initially underestimated which affected the service level adversely.

The use of non-standardized household bins under the service has affected the level of service and hence the success of the scheme considerably. At present, households' use must furnish their own containers, which in practice means a variety of boxes, baskets, bowls, buckets, etc. These have been found to be vulnerable to rain, to being knocked over by stray animals and to physical disintegration thus affecting the service level. 60-litre bins with lids are now being procured for distribution to participating households.

One major problem is the 10% contribution to be provided by KMA and other assemblies. That level of financing is beyond KMA's traditional revenue sources. The participating assemblies like KMA are being bailed out by allocation from the District Assemblies Common Fund (DACF) which is a central government's revenue source. In future projects requiring substantial inputs by the KMA (and other assemblies), levels of contribution should be linked to achievable targets of traditional revenue allocations by the cities.

Another concern, which needs addressing, is the contract award threshold set by the Ministry of Finance and Economic Planning, for Tender Boards like that of the KMA. The levels are

comparatively lower than a number of Urban IV project component's cost, such that while management oversight of the Community Infrastructure Upgrading component, as an example, is KMA's responsibility, the award of contract and payments is at the sector ministry. The review of thresholds set by the Ministry of Finance should solve this problem since with the infusion of more capital from government sources (the DACF) most Tender boards are operating beyond set limits.

7.4. Conclusions

The follow-up to this project may cover community infrastructure upgrading in more low-income and deprived areas of Kumasi, as without doubt sustainable development and its' impact are more appreciable if community involvement and maintenance management roles are enhanced. The direct involvement of cities in project identification, planning and execution as in Urban IV supports the government's decentralization policy. Capacity building has also helped Kumasi in the preparation of a Five-Year Development Plan (KMA-FYDP: 1996-200) and thus will shorten future project preparation schedules. Kumasi project was based on the guiding principle of which would be the sharing of costs between the project and end users.

8. Sanitation Program, Luanda, Angola⁴¹

In the decade after independence, the urban sanitation infrastructure in Luanda, the capital city of Angola, was extremely inadequate due to lack of investment and maintenance. The Department of Urbanism (within the Ministry of Construction) and Development Workshop Angola started a pilot project named Project Sambizanga⁴² in one area of the *musseques* of Luanda to improve water and sanitation infrastructure in the slum areas. This area was the *comuna* of Ngola Kiluanje in the *município* of Sambizanga with a population of 10,000 at that time. Project Sambizanga began the efforts in water and sanitation expansion which were carried on even after the project ended. In the period subsequent to Project Sambizanga⁴³, Development Workshop Angola aimed to apply the lessons learned through two separate programs, one to replicate and extend the supply of public water and the other to extend the provision of family latrines.

Development Workshop programs aim to develop and rigorously test the technology and models of service delivery mechanisms, to serve for further replication. The latrine programme assisted in building of 5,000 on-site family sanitation units between 1995 and 2000⁴⁴. The programme was aimed to achieve near total sanitation by covering 90% of families of specific residential areas in order to maximize health benefits. This approach was adopted as opposed to offering latrines on demand dispersed over a large area. The objective of the programme was to increase the access of underserved peri-urban households of Luanda to basic services namely water supply, on-site family sanitation and solid waste removal. Mobilizers mobilized community members by providing them with hygiene and sanitary

⁴¹ This section is based on Alan Cain, M. Daly and P. Robson: Basic Service Provision for Urban Poor, the Experience of Development Workshop in Angola. Working Paper 8. Working Paper Series on Poverty Reduction in Urban Areas. International Institute for Environment and Development, London

⁴² 1986 to 1995

⁴³ 1995 to 1999

⁴⁴ See Cain et al.

practice education as well as technical advice in choosing their onsite sanitation systems. Families built their own latrines using the latrine slab provided by Development Workshop.

8.1 Financing:

Project Sambizanga received support during its several phases from One World Action (UK), Inter-Pares (Canada), British Overseas Development Agency (ODA), UNICEF, the Netherlands Cooperation and the Swedish International Development Agency (SIDA). The peri-urban Emergency Sanitation Project 1995-1991 was funded by CIDA, SDC and Emergency Sanitation for IDPs, in partnership with One World Action- funded by European Union and Netherlands Cooperation.

Families built their own latrines using the latrine slabs provided by Development Workshop. Slabs were produced in a central workshop run by Development Workshop. The user household is responsible for the latrine construction which involves digging the hole, lining the pit and building the cabin. A professional mason paid by the household itself often does the lining of the pit. The average time taken to build a latrine is four days. Apart from building, the maintenance of the latrine is also the responsibility of the user household.

8.2 Scaling up:

It was hoped that after elections in 1992, the macro- economic situation would improve, thereby improving the affordability of the latrines without the need of any subsidy. However after the elections, Angola experienced its worst phase of conflicts. Government capacity to fund sanitation worsened as did the economic conditions for the poor. The number of people increased in Luanda and most did not have access to sanitation facilities. The need and demand for on-site sanitation remains high and needs to be fulfilled. Community mobilization and health education, in cases where the households can afford the costs of latrines, has encouraged households to invest in latrines. However they did so when they were assured of the technical feasibility, affordability and benefits of the systems being installed. Research into exploring and developing sustainable and cost-effective technical options has been a part of the Development Workshop and the others involved in the programme.

Throughout the 1990s Development Workshop was the only agency that provided sanitation programme in peri-urban area in Luanda. A number of local NGOs have been subcontracted to implement geographically defined latrine projects where they undertake family mobilization, construction supervision and promotion of health education. These NGOs are trained by Development Workshop. By 2001, 15 local NGO family latrine projects had been completed in peri-urban areas of Luanda⁴⁵. Development Workshop has also transferred the improved latrine technology to local partners in provinces of Huila, Huambo, Zaire, Moxico, Kuanza Sul and Kuanza Norte by providing assistance in building local slab production workshops and in training production technicians and social mobilizers. Development workshop has assisted the National Directorate of Water in developing a national strategy for improved latrine programs involving local NGOs and local government agencies.

Schools in Luanda do not have functioning sanitation systems, though the need for them is clear. Latrines have been built in ten schools and their performance is being monitored and adapted.

⁴⁵ See Cain et al.

8.3 Conclusions:

In order to enable scaling up of the program of sustainable basic service provisioning, the following lessons emerge to the forefront:

1. Research into sustainable and cost-effective technical options for sanitary systems need to continue to come up with affordable sanitary systems that the poor can afford. The new technologies need to be diffused and shared among local networks of Development Workshop to promote increased adoption.
2. Continued mobilization and community organization effort to improve the hygiene related behaviour of the households and communities will be required.
3. Subsidies need to be targeted specifically towards the poorest sections who will not be able to afford the systems even the low cost options.
4. School latrine programs need to be given their due attention.
5. Political stability and political will both are important. Political stability enables the conditions in which the households' affordability improves thus enabling them to invest into sanitation systems. Political will promotes technical innovation into low cost alternative technologies to emerge and be promoted.

9. Condominial system in urban sanitation, Brazil⁴⁶

Brazil's urban slums, *favelas*, have serious water and sanitation problems due to poverty, overcrowding and physical reasons like being situated along forbiddingly steep hills or mired together in muddy swamplands. With World Bank financing, Brazil completed PROSANEAR I, a pilot program that developed a new approach of community participation and low-cost technology of delivering water and sanitation services to the urban poor in 60 low-income settlements in 17 cities in Brazil. Over five years (1992-97), PROSANEAR I provided 900,000 poor people with water supply and one million people were connected to sewerage systems at less than \$98 per person for water connections and less than \$140 for sewerage.

Scaling up:

PROSANEAR worked so well by combining two approaches- cost effective, appropriate technologies and community participation. In order to provide safe water and sanitation facilities to millions of urban poor in Brazil similar programs need to be continued. About 21 million Brazilians do not have access to safe water, and more than twice as many (44 million) lack access to sewerage networks or septic tanks. Most of them live in *favelas* and earn less than US \$ 300 per month. There are lessons learned on how to scale-up the program described below.

Background:

In 1982, Brazil launched a small pilot program called PROSANEAR. The Ministry of Interior managed the pilot program, which was financed by federal funds. The program experiments with different types of low- cost technology to extend water and sanitation services to urban

⁴⁶ ⁴⁶ This review is based on PROSANEAR. A Program of Community Participation and Low-Cost Technology Bringing Water and Sanitation to Brazil's Urban Poor. Yoko Katakura and Alexander Bakalian. Water and Sanitation Program. September 1998.

poor, but with only limited success. The program faced various technical and financial difficulties and was about to be abolished by the late 1980s. However the World Bank and Caixa Economica Federal(CEF) reviewed the experience and found some valuable lessons and decided that the program could be successful if earlier work was combined with some new innovative approaches. Thus, in 1992 Brazil launched PROSANEAR I with help from a US \$100 million loan and some technical guidance from the World Bank.

The five principles of PROSANEAR I were community participation; appropriate technology at low cost; environmental protection; cost recovery and house connections. Priority was given to favelas in cities of more than 50,000 people; families who earned less than \$300 per month of which 40% earned less than \$ 100 per month and residents agreed to pay for the water and sewerage in accordance with tariff schedules maintained by water utilities.

Condominial System:

In most cases the Condominial system was chosen as the cost effective option for sewerage collection. It is a beneficiary-centered urban sanitation alternative developed in the early 1980s in northeastern Brazil. It is called condominial because it treats a block of houses like a "horizontal" apartment building, with sewer lines passing through or near each lot. Households connect to the block line through small collection boxes. The users connect to a common block feeder line that is located within residents' private lots, making the feeder network collective and the responsibility of maintaining it, till it reaches the public sewer, that of the users.

Financing:

As discussed above PROSANEAR I projects were jointly funded by the World Bank(50%), the local water companies, state or municipal government(25%) and the Caixa Economica Federal or CEF(25%). PROSANEAR I financed investments in water supply, sewage collection, sewage treatment as well as complementary investments such as bathrooms and in-house connections. The program also financed community mobilization and participation efforts and technical assistance. Operation and maintenance responsibilities were left to the community members in some cases and in some bases were hired out to private contractors. The construction costs for sewerage systems on average are \$104 per capita. In most cases the users paid for the services they received and also for the subsequent operation and maintenance expenses.

Cost recovery and subsidy rules

One of the lessons of the project is that cost recovery and subsidy rules must be set in a clear and transparent manner. Although PROSANEAR I promoted cost recovery through tariffs and connection fees, it did not indicate how much of the cost the communities should pay, and how much should be shouldered by water companies or local governments. Furthermore, although water companies charged monthly tariffs for the water and sewerage services, these weren't high enough to cover the real cost of building, operating, and maintaining the new systems. PROSANEAR I tariffs were often set lower than the subsidized tariff already charged to poor users of conventional water and sewerage systems. Since the previous tariff had been set too low, the subsequent PROSANEAR tariff was also too low for full cost recovery and sustainability of the new services.

In these cases, three solutions were tried: cross subsidizing the PROSANEAR tariff from the water agencies' other consumers, subsidizing directly from local governments, or thoroughly reviewing the existing tariff structure. The first two solutions were the most common, but these solutions in general lacked transparency. The third option was beyond the scope of the project, and rarely happened.

Lessons Learned:

PROSANEAR I programs enabled the provision of water and sewerage services for around million people in urban slums of Brazil that are geographically and socially difficult. PROSANEAR I achieved its success by combining two approaches- cost effective, appropriate technologies and community participation. The lessons summarized in the report are : (i) Community participation must start at the very beginning of project implementation (ii) Cost recovery and subsidy rules must be set in a clear and transparent manner (iii) Formal long terms arrangements for operating and maintaining the systems must be an integral part of the design and (iv) all feasible technical options and their costs must be discussed with the communities.