

Sanitation and Water Supply: Practical Lessons from The Decade

by Sandy Cairncross

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SANITATION AND WATER SUPPLY:

**PRACTICAL LESSONS
FROM THE DECADE**

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and Tropical Medicine**

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Executive Summary

This paper provides the author's personal perspective and analysis of experience gained during the International Drinking Water Supply and Sanitation Decade's ten-year effort to provide low-cost waste disposal facilities to poor communities in developing countries. It highlights important issues and discusses approaches that have been taken to address them. **The principal lesson is that progress and continuing success depend most on responding to consumer demand.** A program's designers and managers must understand that they are selling a product, not providing a service. Where sufficient demand exists, the facilities and services offered must be tailored to that demand; where demand is not strong, it must be stimulated.

Government departments and agencies typically have little experience with the techniques of marketing, and donor agencies may have little patience with the time and effort required to achieve success. Community contact and consumer education are essential. It is useful to begin promotion and education efforts with an established cadre of community workers and to build the program on the sanitation solutions the target community has used in the past, aiming for sustained growth rather than rapid coverage. It is better to improve an existing system in ways that are affordable, sustainable, and upgradable than to aim for a new solution that may be ideal but often proves to be unsustainable.

Important linkages with housing, water supply, drainage, solid waste disposal, and land tenure must be considered in planning and executing a program. Equally important, interactions and complementarity with water supply and health education can significantly increase the total benefit to a community.

Equipment choice, installation, financing, maintenance strategies, and cost recovery are important considerations that must be dealt with afresh in each locality. It is important to test several options and approaches in the communities where they will be used. It is also vital to offer consumers a range of choices and allow them to choose the one they prefer and are willing to pay for. Two low-cost sanitation options that have been shown to have wide applicability are the VIP latrine and the pour-flush toilet. Both are adaptable and have had successes in a variety of environments and cultures.

1. Introduction

The International Drinking Water Supply and Sanitation Decade (1981-1990)¹ was marked by sustained efforts of communities, governments, and international agencies to make adequate water supplies and hygienic toilets available to more people, particularly to the poor in developing countries. Much of this work was spearheaded by the World Bank. The Bank's efforts and those of many other agencies participating in the Decade were enthusiastic, often innovative, and sometimes outstandingly successful. However, some of the more optimistic Decade targets have not been achieved. It is now clear that much remains to be done before safe water and sanitation are available to all.

Some of the Decade's most important achievements have been in the realm of ideas. We know far more now than ten years ago about handpumps and low-cost latrines, for example. Invaluable knowledge has been gained from ten years of experience implementing water and sanitation programs, and this knowledge has changed our perceptions of the roles of technology and of engineers, heretofore the chief profession active in the sector.

The principal challenges of the next decade will not be technological questions — the "hardware" of water supplies and sanitation — but the "software" issues: How are water and sanitation programs to be organized and financed? How can people be trained, organized, and motivated to install, use, and maintain the facilities? How can institutions develop the sector further and make improvements more sustainable? These are the questions for the 1990s.

We do not have complete answers to such questions, but we have learned important lessons from the successes and the shortcomings of programs that have been executed during the last ten years. However, the lessons of each program have often been learned only by the small group most actively involved in it. There is a need to make their experience widely available so that others will not have to gain it the hard way.

Moreover, the comparison of different programs, even if executed in dissimilar settings and with widely differing goals, highlights recurring themes that have much to teach us. It is important to share the experiences of the Decade, and also to formulate them in a useful, systematic way.

Those were the purposes in view when the World Bank commissioned case studies of water and sanitation programs in Asia, Africa, and Latin America. The Bank supported these programs, or at least followed them closely, over several years, and each had particularly interesting features. Some of the case studies have been published (Narayan-Parker 1988, Evans et al. 1990). This paper seeks to consolidate the insights

1. So declared by the General Assembly of the United Nations; hereinafter, "the Decade."

gained from these and other cases and provide an overview of the main issues and promising approaches that have come to light.

Focus of the paper

Sanitation programs -- programs to promote and install low-cost waste disposal facilities -- are the primary interest here. There are good reasons to dwell on sanitation more than water supply.

Urban water supply does not present major challenges to creative implementation. Its organizational and institutional problems differ little from those of any other economic enterprise. The technological questions are broadly the same as those raised by urban water supply in industrialized countries, and the answers are similar and well known. Water supply for urban low-income communities raises important economic questions relating to tariffs and cost recovery, but this paper is an overview of a wider range of issues.

One promising approach for low-income urban communities is to consider options in water supply that are autonomous and do not depend on a city water distribution system. Construction of local wells or support to local water vendors are options of this kind. They raise interesting implementation issues, mostly problems of building community institutions, but these are much the same as those raised by rural water supply.

Regarding the implementation of rural water supply programs, a considerable amount of work has already been published, including several books that offer diagnosis, description, and guidance (Feachem et al. 1978, Cairncross et al. 1980, Glennie 1983, Therkildsen 1988, Black 1990). There is little to be added to what others have already written.

On the planning and management of low-cost sanitation programs, however, very little practical guidance is available except with regard to selection of the technology, an area on which the World Bank has published extensively (Kalbermatten et al. 1981). This paper is a step toward providing guidance based on the hard-won experience of many dedicated workers.

One thing is clear from the record of the last ten years: sanitation programs cannot be simply transplanted from one setting to another. A good idea, however successful for those who first applied it, needs sensitive and creative adaptation if it is to succeed in a different setting. Rather than supplying answers, therefore, the aim of this paper is to enumerate the questions, list the decisions that must be made, discuss the issues to be taken into account, and provide examples of how others have addressed them. The reader will not find recipes or formulas.

Although the focus is on sanitation, it has too many links with water supply for these to be ignored. The two have been seen as necessary adjuncts of one another for over a century and a half, particularly by those who promote them to improve health. Any plan

to provide water for domestic use, if it does not ensure that households also have adequate means to dispose of wastewater, can endanger health rather than improve it. The links between water supply and sanitation relate both to the benefits and to the technology itself. Sanitation schemes have foundered when water was not available to operate flushing systems. Equally important, the period of construction of a water system is an outstanding opportunity to stimulate demand for improved sanitation (Glennie 1983).

Water supplies and sanitation are not always mutually beneficial. On-site sanitation can pollute local groundwater and contaminate on-site water supplies. Such a conflict arises only under specific conditions (Lewis et al. 1982), and the solution is to provide piped water. Providing the water from off-site is usually far less costly than off-site sanitation, which requires transporting the wastes in sewers or vehicles.

Many of the lessons to be learned from water supply programs are relevant to sanitation schemes, and vice versa. Rural water supply has taught us that systems planned without user participation are likely to be inappropriate to users' needs, but this important lesson is yet to be learned by many in the sanitation field. The problem of replacing old latrines at the end of their design life has already been confronted in some programs, but we are still awakening to the problem of replacing major components of the rural water supplies built in the last few decades.

Water supply and sanitation are often the responsibility of a single agency, and they may be implemented in a single program; in other cases, an interagency committee seeks to coordinate them. Implementing them together may bring benefits, but it can also cause conflicts arising from the different nature of the two interventions, and special efforts are needed to overcome these. No discussion of implementation issues in low-cost sanitation would be complete without taking into account the links and conflicts with water supply, as well as the lessons to be learned from it.

During the Decade, it came to be recognized widely that water and sanitation need to be accompanied by hygiene education to achieve the greatest possible benefits from each. It is probably still too early to draw detailed lessons about hygiene education in connection with sanitation programs since there are relatively few well-documented experiences to draw on, but much that can be said about the promotion of sanitation also applies to the hygiene education which should accompany it. Promotional methods are discussed in Chapter 5, which also refers to several excellent books on hygiene education.

Integrated programs

There are some who argue that sanitation should be promoted as part of an integrated program of rural development, urban upgrading, or primary health care, or at least together with water supply and hygiene education. Interventions combined in a single program sometimes have a greater impact than they might individually, and implementing them together can be cheaper. The most powerful argument for combining sanitation with other interventions such as water supply is that sanitation would

otherwise be neglected. The relatively high political profile of the water sector makes it a suitable vehicle to pull sanitation into prominence and attract the resources it needs. The question may not be whether to promote sanitation as part of an integrated package or on its own; in practice, it is often a question of promoting sanitation as part of a broader program or not at all.

Sanitation does not always benefit from integration with other measures. The implementing agency may not have the appropriate staff or structure. In the MMINUTE urban upgrading program in the Philippines, for example, the program's sanitation component and the degree of community participation in it were constrained by the large number of engineers in the project staff. In rural areas of the Philippines, attempts to integrate water supply with sanitation failed because the procedures used for one were unsuitable for the other. Contractors might build water supplies, but people preferred to build their own latrines.

Moreover, the decision to implement several interventions in a single program does not guarantee that they will advance at the same pace. The pace of sanitation implementation is set not by administrative fiat but by consumer demand, so that it rarely matches the progress of other measures. In combined water and sanitation programs, for instance, sanitation usually either lags behind (as occurred in the Philippines) or shoots ahead (as in Zimbabwe).

There is no general answer to the question whether sanitation should be promoted on its own, in free-standing sanitation programs, or as part of integrated packages. For every development program which has successfully included a sanitation component, there is an equally successful free-standing sanitation program. The question should not be decided from theory or general principle, but on the merits of the case in each specific context. There may not even be a single answer for a whole country or region. In Malawi, the existence of a national, free-standing sanitation program did not prevent several regional rural development programs from including a sanitation component based on the national program, which accelerated the extension of coverage to the rural population.

In the following pages, then, reference to a "sanitation program" should not be taken to imply that sanitation should always be promoted on its own. The phrase applies equally to a program focusing solely on sanitation, and to the sanitation component of a wider, intersectoral program.

Why promote sanitation?

Improved health is the principal economic and social benefit that governments and other agencies seek to gain by investing in sanitation schemes or by promoting such investment by individual householders. The health effects of sanitation improvements have been discussed in great detail (Feachem, et al. 1983). Little need be added here except to consider the implications of the fact that use of a sanitary latrine bestows potential health benefits not only to the household that uses it, but also to the neighbors

whose environment is thus protected from a degree of fecal pollution. This has important consequences for the implementation of sanitation programs.

The first consequence is that sanitation has what economists call "externalities," benefits external to those occurring directly to the consumer who purchases a latrine. Sanitation can thus be considered a "public good" to some extent; the individual cannot be expected to pay for the external benefits, and to that extent the good becomes worthy of subsidy by the government.

Second, it is likely that the potential health benefits will not be fully realized by a sanitation program unless it achieves a high degree of coverage and a high degree of use by those households it covers. If 90 percent of a given community owns latrines, the transmission of excreta-related disease may be maintained by the promiscuous defecation of the 10 percent who do not, or even by those members of latrine-owning families who do not always use the latrines they own.

Health benefits, however, are not the only motives for promoting sanitation in low-income communities. Sanitation workers often mention that a more effective selling point for potential users is the privacy and convenience a latrine can offer. For example, a survey of rural households in the Philippines elicited the following reasons for satisfaction with a new latrine (note the order):

1. lack of smell and flies
2. cleaner surroundings
3. privacy
4. less embarrassment when friends visit
5. less gastrointestinal disease

It would be a mistake to regard the first four of these as mere selling points. Clearly, if poor families are willing to pay for privacy and convenience, as they often are, these are benefits to which a money value can be applied.

Some governments would go further and include externalities to benefits such as these, often considered as merely aesthetic. A country planning to promote the tourist trade, for example, might promote low-cost sanitation to eliminate the sight of people defecating in public. More fundamentally, privacy and convenience, in the context of human defecation, are really other words for human dignity; if the quality of life is degraded for all when some of a community's members have no toilet, then the quality of life for all is that much the better when they have one.

The dignity of the users is not the only issue. Some antiquated sanitation systems require degrading work by others who remove wastes for disposal. This was the case with the bucket (in practice, more often a basket) latrines of India, traditionally emptied by sweepers drawn mainly from the scheduled castes. For centuries, the unsavory nature of the work helped maintain their low position in society. The desire to emancipate these persons from "untouchable" status is the primary factor in the Indian Government's commitment to eliminate bucket latrines by promoting more hygienic sanitation systems.

In addition to economic and social benefits, there are sound political reasons for promoting sanitation. It is particularly popular in urban areas, and the promise of it can win political support. If appropriate low-cost technology is employed, and if it is implemented with a substantial contribution from the population, it can be a relatively cheap and certainly visible vote-catching measure. Sanitation often features on the agenda of community organizations and of local politicians in urban slums and shantytowns, notably in Brazil.

The political potential of sanitation is not measured only by expressed demand for it. Demand stimulated by a sanitation program is real, as can be seen by the example of Zimbabwe. Before independence, demand for pit latrines in rural areas was small, but the success of the rural sanitation program has made a VIP latrine the aspiration of most rural Zimbabweans. The widespread introduction of these latrines is one of the most visible and popular achievements of the postindependence government.

There is a final, fundamental reason for promoting domestic waste disposal. Its strength is hard to evaluate precisely, but it is worth consideration. As low-income communities grow and consolidate, their population density tends to increase and their housing becomes more substantial. If waste disposal facilities are not provided early in the process, their installation becomes increasingly difficult and expensive both to the individual and to the community as well, especially if housing has to be demolished to make way for pipes and public toilets.

The poor cannot afford to plan for the future, but governments and city authorities cannot afford not to do so. Today's periurban areas may become tomorrow's central cities. Sanitation is a basic part of the infrastructure of any civilized community, and installation is cheaper the earlier it is carried out. The long-term savings made possible by timely installation of durable, upgradable systems can logically be considered an external benefit justifying government subsidy.

To these general reasons for implementing sanitation programs, international agencies and aid donors add other, specific motives for supporting the sector. The details matter little because the decision to support sanitation is generally undertaken with a cooler head than the decision how to support it. What matters most is the commitment, voiced by most of them and implicit in the Decade's title, to end the neglect from which the sector has suffered by comparison with water supply.

Progress so far: Why is it slow?

The following table shows a steady increase in the percentage of persons in developing countries provided with water supply and sanitation facilities. Progress may seem slow, but very large investments are required by governments that often have severe constraints on their resources. What is more, rapid population growth in most developing countries means that ever-larger populations must be provided water supplies and sanitation simply to maintain *current* rates of coverage. This is especially the case in urban areas, where natural growth is aggravated by rural-urban migration.

**Water Supply and Sanitation Coverage in Developing Countries,
1970-1985**

Portion of population with access to adequate facilities (percent)			
	1970	1980	1985
Urban water supply	65	74	77
Rural water supply	13	33	41
Urban sanitation	54	50	62
Rural sanitation	9	13	18

Source: WHO (1987a)

Growth in sanitation coverage has been much slower than that for water supply. Even low-cost, on-site sanitation is more expensive than its water supply equivalent, the handpump or public standpost. WHO (1987a) reported a median capital cost per capita of \$120 for on-site urban sanitation in the least-developed countries, but only \$60 for standpost water supply.

It is also true that individuals, communities, governments, and agencies have spent less on sanitation than on water supply in recent years. For individuals, payment for sanitation is often harder than for water supply, since it is usually a lump-sum investment, whereas the capital cost of water supply is recovered from consumers in tariffs over many years, if at all. For governments too, investment in water supplies is usually more attractive. Despite all the persuasive arguments for sanitation outlined above, popular demand for water supply is usually stronger, and most politicians would prefer, other things being equal, to have their names linked with water taps than with latrines.

Lack of resources is not the only reason for slow progress in sanitation coverage. Low-cost sanitation programs are far more difficult to implement than water-supply schemes, for several reasons. The first has to do with the technology. Water-supply systems are built in only a limited number of ways and with a limited range of materials, and in general the solutions in appropriate textbooks and manuals will suffice. Low-cost sanitation systems, on the other hand, usually require adaptation to local cultural preferences, locally available building materials, and local ground conditions. The systems most likely to succeed are usually those which build on local customs and techniques rather than replacing them with imported solutions. An engineer must exercise a far greater degree of creativity and flexibility. Professionals with the will and the competence to meet such a challenge are not always easy to find.

To some extent the difficulty has been mitigated by the work of the World Bank, with support from UNDP. The Bank's Technology Advisory Group (TAG) devoted several years to the study of successful indigenous technologies, and then produced manuals on sanitation technology and its selection. More recently, they established the International Training Network for Water and Waste Management, which has helped to make the training of engineers and technicians in a number of countries more appropriate to local needs.

Even the best manuals cannot teach an engineer to be sensitive to the needs of an impoverished community. Many of the difficulties of implementing sanitation programs arise from the fact that sanitation improvements are an intervention in the domestic domain. A latrine is part of its owner's house, largely built at the owner's expense and frequently with the owner's labor. Its use requires a change in people's most private habits. In most poor communities, by contrast, the water supply is very public, often a well in the center of the village or a tap on the corner of the street.

This difference generally means that greater commitment by the user is needed for a latrine to be installed than for a water supply. Most of the initial investment in sanitation must usually come from the users, whereas investments in water supply can more easily be recouped subsequently through the water tariff. The latrine user will often be expected to acquire most of the materials required for its construction, although this is not required in even the most participatory "self-help" water supply schemes.

Commitment by the householder is required not only to build a latrine, but also to ensure its use by all members of the family. Very probably, the mother is the only collector of water in the household, so she need not influence the behavior of anyone else to change their source of drinking water. To change the defecation habits of everyone in the family is far harder to achieve, however willing she may be to try.

Moreover, user commitment to sanitation is less likely to be present than commitment to a water supply. The convenience and aesthetic advantages of a ready source of clean water are usually apparent to all, and desire for them needs little stimulation; any developing-country politician knows how popular water supplies can be. Not everyone is convinced, however, of the advantages of latrines. For those accustomed to a contemplative squat in the open air in the cool of the early morning, who among them would choose a dark, damp, smelly, and possibly precarious cubicle?

Considerable persuasion is therefore required in most successful sanitation programs, whether it is called health education or salesmanship. People need to be convinced of the advantages of owning a toilet. The amount of contact required for this communication to be effective is greater than can be achieved via mass media. Individual households and communities will need guidance on how to build and use their latrines, and they may encounter problems that cannot be foreseen.

This is why the promotion of sanitation generally requires a cadre of well-trained people in the field. They should have the same cultural roots as those they serve, and they must understand the technical aspects of low-cost sanitation. Above all, they must be sensitive

to the perceptions of the communities and able to win their confidence, deal with their doubts, and stir their enthusiasm.

To recruit, train, establish, and manage such a cadre of field workers is a far greater challenge than simply to manufacture and sell latrine components. It has most often been achieved on a small scale, where some dedicated and often charismatic individual has been able to have a direct influence on the fieldwork team, personally carrying out their selection and training, maintaining their *esprit de corps*, and providing a role model. Such individuals seem to be found more often in voluntary organizations than in government service, and more sanitation initiatives are probably undertaken by nongovernmental organizations than by governments.

Where the government or the local authority does take the initiative, it often proves much harder than might be expected to "scale up" a small local program to a larger area. Chains of command lengthen and reduce the possibilities for personal motivation and supervision of field staff. Procedures become slower, more formal, and less responsive to local needs and initiatives. Of course, such problems affect any large organization, and that is precisely the point: large-scale sanitation programs need good organization that takes time and considerable skills to achieve.

Even with the best organization and the most motivated field workers, there is a time factor in the adoption by the public of new habits and a new technology. Few people will want to install an expensive, unfamiliar addition to their house without evidence that it performs efficiently and safely. Most will wait until a few pioneers have tried it and their experience has shown that the new latrines are as advertised. Others may prefer to wait until their old latrine is due for replacement, however unsanitary it may seem to an outsider. There is a "sales curve" in many of the most successful sanitation programs, and it may take several years to reach maximum coverage. An example is the curve for the first few years of Mozambique's urban latrine program, shown in Box 1 (page 12).

Links with other sectors

Urban sanitation programs face additional constraints due to their strong links to other aspects of urban improvement. Along with water supply, another example is drainage. Low-income urban communities are often found in areas with severe drainage problems. They are there precisely because the risks of flooding, landslide, or erosion make the land undesirable to those who can afford to choose where they live. A latrine that is liable to overflow in a flood, or a septic tank that discharges effluent into a channel where children play can be as serious a health hazard as no latrine or septic tank.

Another link is with solid-waste collection and disposal. Urban latrine pits must be periodically emptied and septic tanks desludged, and the only agency with the necessary equipment and organization is often the municipal refuse or cleansing department. In fact that department can benefit from the disposal of pit contents and sludge, because these wastes can improve the feasibility of composting domestic refuse (Shuval et al. 1981).

The lack of recognition of these links has been a constraint to sanitation in the past. The lesson is that the various environmental services -- drainage, solid waste collection, water supply, and sanitation -- should be planned together to determine the priority of their implementation. Water and sanitation may not necessarily be the first priority, and institutions will have to reflect the fact that urban services need to be based on balanced development rather than demands of a single sector.

The relationship to housing is more than a linkage. Sanitation workers often fail to notice the fact, but low-cost excreta disposal is integral to the housing sector in a way that water supply is not. Problems of urban housing have a fundamental impact on sanitation schemes. For example, if roofing materials are in short supply, but are made available for latrine construction, it should hardly surprise anyone that residents will use them, as a first priority, to extend their houses.

Urban sanitation is also related to land tenure. Squatters can hardly be expected to invest money and effort in a new latrine if they are likely to be evicted; even legal tenants may be reluctant to improve a property for which their landlord may increase the rent as a result of their efforts. Regularization of property rights may therefore be a prerequisite to many urban sanitation programs.

Land tenure is related to urban planning. One of the abiding lessons of the Decade must be the need for integrated spatial planning of the urban environment. Such planning requires consideration of the sanitary infrastructure including sanitation, water supply, drainage, and solid waste collection. To see the importance of good physical planning, one need only observe the difference between a shanty town where plots have been laid out in an organized way, and one where they have not. In the latter, there is often insufficient space for access by refuse collection vehicles, for building drains, or for laying sewers; frequently, there is not even enough room to build a latrine for each house. Where site-and-service schemes are not affordable for everyone, "site-only" schemes, in which plots are set out but no services provided, may help make environmental improvements, including sanitation, easier to implement in the next decade.

In many cases, urban sanitation problems may be almost unsolvable unless approached in the wider context of urban planning and housing, including drainage and land tenure. The problems these raise are often far more intractable, more political, and more expensive to resolve than the difficulty of merely erecting a few latrines and they have clearly limited the impact of many sanitation programs.

Reasons why sanitation coverage advances more slowly than water supply are not excuses for inaction. On the contrary, they justify greater effort on sanitation if the two sectors are to advance together. To devote effort to a problem is not simply to throw money at it, or to distort its solution by striving for unachievable goals. Rather, it requires creativity, commitment, and common sense. Common sense is the fruit of experience, and in attempting to distil some of the experience of the last decade, this paper seeks to contribute to the sector's progress in the next.

BOX 1

URBAN SANITATION IN MAPUTO, MOZAMBIQUE

By 1980, most families in Maputo had a latrine of some kind, but residents of low-income areas had difficulty obtaining materials for the floor of their pit latrine. As a result, most pit latrines were unhygienic and/or structurally unsafe. The city's sanitation program was therefore based on a prefabricated concrete slab to place over existing pits. Interviews indicated that most people would buy these at cost.

To reduce transport costs and breakage, the slabs were mass produced at small neighborhood workshops. One such shop was set up to refine the technique and test-market the slabs. Care was taken not to put more effort into marketing than was likely if the project were replicated citywide. The prices -- Mt. 500 (\$12.50) for a 1.5-meter diameter slab, and Mt. 350 for a smaller version -- covered production costs.

Sales built slowly, as shown below. Surveys in the neighborhood showed that many people wanted to wait until their old latrine pit was full before purchasing a slab for the new one. Others did not know the purpose of the slabs, or had difficulty transporting them. However, all of the families interviewed were interested in buying a slab. Publicity leaflets were produced, and the workshop acquired a handcart for customers to use to transport the slabs.

It was decided to replicate the pilot workshop by organizing a slab production cooperative in each neighborhood of periurban Maputo. The members, many of them women, were trained at the pilot workshop. They also received training in accounting, and in how to make glove puppets and put on shows as a form of advertising. By 1984, there were 11 such cooperatives in the city, each with about a dozen members, as well as the pilot workshop which now functions as a national training center. The project has now been replicated in other towns, with a total annual production of over 10,000 latrines per year.

Source: Brandberg (1985), *The Latrine Project, Mozambique*. IDRC-MR58e(Rev.) Ottawa: International Development Research Centre.



2. Organizing the Program

Demand-led programs

The most fundamental lesson to be drawn from low-cost sanitation programs of the last decade is that success or failure and rates of progress are determined principally by consumer demand. Where demand for sanitation is strong, programs focusing on the delivery of sanitation facilities have a chance of succeeding as long as the facilities they provide have been tailored, in terms of quality, level of service, and cost, to that demand. Where the demand is not strong, the first priority of a sanitation program must be to develop it. In either case, the perspective of the program's management must be that of marketing a product rather than providing a service.

At the most basic level, effective marketing requires:

- A **product** that is attractive enough and cheap enough for people to want to pay for it;
- A **market** whose characteristics are determined by market research and test marketing;
- A **delivery system** to make the product accessible to potential purchasers;
- **Promotion** to inform customers about the product and develop demand; and
- **Service** to build customer confidence that the product will be useful for a reasonable time.

The government departments and international aid agencies working in sanitation programs may have little experience in marketing. If they have a task to be done, they tend to pay someone to do it; targets are set, and someone is made responsible for meeting them. Markets, however, are less accountable. Sales cannot be caused to grow by administrative decree; a sales program has to evolve and expand as the management learns how the market operates.

To plan a program that is flexible enough to allow for this process of learning and growth while satisfying planning and budgetary requirements of funding agencies is a major challenge. In general, the most successful programs in water and in sanitation have been those whose management has risen to that challenge. When donor agencies are involved, the necessary responsiveness can be sustained only when there is flexibility, patience, and understanding on their part.

In this paper, sanitation programs may sometimes seem to be described as if they were planned in a vacuum. In practice however, the strategy is often to develop an activity that is already under way and has promise and political support rather than to plan a new initiative from scratch. As was pointed out in the previous chapter, sanitation projects are often developed as one component of a wider program -- urban upgrading, for example, or primary health care.

This paper is also largely written from the perspective of a national government or governmental agency. Without intervention by governments, the millions who lack sanitation will still lack it well into the next century. However, governments do not have to implement sanitation projects by themselves (Box 2). Rather, they must plan for them and create conditions for them to succeed. A national agency must take responsibility for this.

Choice of national agency

For a government contemplating a major initiative, the first decision is which ministry or other agency will be responsible for it. Responsibility for sanitation is often diffuse and fragmented. It is preferable, at least in theory, for a single body to have overall responsibility.

The ministry of health, for example, might have an obvious interest. Excellent sanitation programs have been run by ministries of health, but this does not necessarily mean that the national and local health authorities are best suited to implement them. Sanitation involves the building of latrines and therefore needs infrastructure such as cement stores and casting yards, equipment such as four-wheel-drive trucks and concrete mixers, and people with relevant skills such as masons and engineers. It is also desirable to facilitate the purchase of materials and equipment and allow for making loans to and collecting payments from individual householders. Health authorities frequently lack these prerequisites; more than one health ministry has found that shovels, cement, and blockmaking machines do not fit easily into their pharmaceutical warehouse.

Another agency often associated with sanitation is that responsible for domestic water supply, on the grounds that water supplies and sanitation should be installed in an integrated program. It is usually responsible for any water-borne sewerage systems, whether national or municipal, public or private, and in most cases it is best equipped for that responsibility. However, it is sometimes an unsuitable agency to implement a low-cost sanitation program, for several reasons:

- It may be biased toward expensive technology and unwilling to consider systems such as pit latrines, which it considers "second best."
- It may be a commercial venture, and may therefore be considered inappropriate for providing a subsidized service to the poor.

BOX 2

A NEW ROLE FOR GOVERNMENT

In September 1990, a background paper was circulated to participants at the Global Consultation in Delhi. It summarized a new consensus about the role of government in the sector:

There is a need for governments to concentrate less on direct intervention in providing services and more on enabling public and private institutions to deliver services.

In cities, utilities need managerial and financial autonomy and a clear mandate if urban water supply and sewerage services are to be effectively provided. There is a clear correlation between the performance of utilities and the degree of independence from direct government intervention. There is, however, an essential and important role for government in creating the "enabling environment," in setting standards, and in monitoring performance targets, especially to promote service provision in periurban areas and rural communities.

Governments, then, may not necessarily need to finance, build, or maintain water supplies and sanitation facilities; but for the reasons given in Chapter 1 they do have responsibility for promoting them. In practice that means ensuring the availability or existence of:

- agencies with adequate capacity for implementation;
- locally appropriate, field-tested technology;
- training;
- personal and institutional incentives to achieve sector goals;
- appropriate regulatory legislation and capacity to enforce it;
- the necessary financial mechanisms to fund the sector; and
- monitoring of sector performance and capacity to intervene when it is inadequate.

Some of these, if they do not exist, need to be created. A government ministry or some agency answerable to the government must retain at least a planning function and overall responsibility for the sector, be it water supply or sanitation. Many actors may be involved in implementing water and sanitation schemes, such as parastatal agencies or state-owned companies, private firms, nongovernmental nonprofit organizations, freelance artisans, cooperatives, municipalities, community organizations, and not least, the local residents themselves.

- It may have no capacity or vocation for the communication and educational support low-cost sanitation requires; the engineering approach, which tends to dominate water-supply agencies, may not be the best for an agency seeking to change people's most personal habits.

Candidates for a leading role in sanitation include (a) the agency responsible for housing, since a latrine is part of a house; (b) the local government ministry, in view of the key role of municipal administrations in implementation; (c) the physical planning or environmental protection agency, because of its powers to plan necessary infrastructure, ensure a physically planned environment in which the infrastructure can be installed, and enforce the construction of adequate sanitary facilities; (d) the drainage authority, because of the need to link sanitation with surface water drainage; and (e) the urban (or rural) development ministry, as a part of its overall coordinating role.

A recurring theme in the history of many successful sanitation programs has been the importance of having a cadre of community workers to support them, and the need to provide this cadre with adequate training and back-up. Some of the most impressive programs have worked well because they made use of a pre-existing cadre. In the Philippines, for example, there were sanitary inspectors 40 years before they were given the role of promoting rural sanitation. Establishing such a team from scratch, may take years. A significant qualification for an agency to be responsible for sanitation is the possession of a cadre in the field, or at least the capacity to recruit, train, and support one.

In practice, it is extremely difficult to arrange for a single agency to be responsible for all sanitation activities. Where sanitation is promoted as part of a broader, area-based rural or urban development program, the agency implementing that program has a strong case for taking overall responsibility for the sector in its area. Ministries of health and education are unlikely to relinquish their interest in sanitary facilities at health-care establishments and schools, in spite of the fact that many persons first encounter latrines at such places, and they therefore play a potentially essential part in promoting sanitation.

Coordination

Whichever agency assumes the central role, links need to be established with other sectors. There is likely to be a need for liaison and active cooperation between the sanitation agency and the bodies responsible for water supply, health, education, drainage, housing, land tenure, and other possibly relevant fields.

Such cooperation should not be left to chance. The number of people involved in sanitation may be small in the early stages, and it may seem unduly formal to constitute interdepartmental committees when all that is needed initially is for one or two people to talk occasionally on the telephone. But by the time the program has grown to the point where formal procedures are essential, time and money have already been wasted and the pioneers no longer have the time to set them up. Moreover, a formal arena in which plans are discussed and defended has the virtue of ensuring that the key questions addressed in the planning stage.

In a number of countries, effective interdepartmental liaison on sanitation at the national level has been achieved by committees established to coordinate activities for the Water and Sanitation Decade. These have worked best (i) when the members have held

sufficiently senior positions to be able to make decisions but have not been too busy to participate in regular meetings, (ii) when one agency has taken a leading role in the sector and effectively provided a secretariat, and (iii) when cooperation has led to improved coordination mechanisms at the local and national levels. The planning or finance ministry sometimes chairs or convenes the committee, but the agency playing the leading role should be in close contact with day-to-day developments in the sector.

Intersectoral coordination at the national level may seem relatively easy to achieve, if all that is required is for a dozen officials to meet periodically and confer. Far more work is required to achieve good coordination at the local level, but it is even more important for smooth implementation. In some countries, the national action committees have been replicated in each region and district, with local representatives of the same national ministries conferring in a similar way. In other cases, coordination is needed between the departments of relatively autonomous local government bodies.

Local government

The problems of implementing sanitation programs are frequently tied to the problems of local government. After all, the prime function of local government is to develop and maintain community infrastructure, and sanitation is a part of that infrastructure. Successful urban sanitation programs have usually been executed with the active participation of the municipal administration, and if local government is less often a part of rural sanitation programs, this is usually because local government at the level of the individual rural community simply does not exist in many developing countries.

Central authorities are often mistrustful of local governments. An obvious reason for this arises when the local government is elected and controlled by a different political party from the one in power at the central level. Even when such overt political differences do not arise, the central ministry may doubt the competence of local-level staff or the capacity of local bodies to implement a program on the scale required, may fear that resources allocated centrally may be diverted to other sectors, and for these or other reasons may wish to retain direct control over the program and its resources.

Sanitation must be marketed so that households will be convinced that it is worth the cost and effort of installing it. For sanitation programs to succeed, they must meet an existing demand, or they must create it. In either case, they must be flexible and responsive to local needs and perceptions. It is much harder for a centralized program to achieve this than for one managed through local institutions. At the very least, effective feedback is needed from local residents to guide the continuing program, and this is most effectively ensured when there is active participation by the local community in its management. In practice, participation by local communities means participation through local institutions. Where it exists and is effective, the most appropriate institution is likely to be local government. It is certainly the most suitable local counterpart for the national government sanitation agency.

A vertical, sectoral program, even if it really does respond to a local need, is also less likely to be sustainable than a locally managed one. Guidance from the national capital

is usually treated with less enthusiasm by local people than a decision made in a local forum or a recommendation given by a locally respected figure, and less local commitment is required to implement a national program than a community initiative. A centrally managed program may also depend on changeable political forces at the national level, or on international funding of limited duration.

A further point is that it is easier to integrate sanitation with other sectors at the local level than to ensure that the staff of a large national program moves in harmony with initiatives in other sectors by sending orders from a distant headquarters.

However, local government institutions in many developing countries suffer especially from the national scarcity of resources, and they often lack both the funds to undertake new initiatives and the capacity to manage them efficiently. If they are to take part in improving sanitation, they need support from the national level. The problem is not solved by putting money or equipment into the hands of local bodies; training for staff and guidance on procedure are also needed.

Commitment to sanitation by local bodies cannot be expected simply because the central government desires it, or has funds on offer. Obtaining their participation by decree or by the offer of a transient financial inducement is hardly a recipe for sustainable sanitation improvements. There have been plenty of examples of sanitation programs which have failed, after being wished upon reluctant or uninterested local authorities by a national or international agency.

Many successful programs require evidence of local commitment before the central sanitation agency agrees to provide assistance. In the Burmese rural sanitation program, for example, District Councils must make a formal request for assistance and draw up an agreed action plan before the Ministry of Health will consider distribution of latrine components to them. In other countries, formal contracts are signed between local authorities and the central government agency before they can benefit from the program.

Key questions requiring answers early in the planning stage relate both to the responsibilities of national bodies and procedures to ensure their collaboration, and also to the responsibilities of local authorities and the mechanisms by which they interact with the central agency. Analogous questions arise at each administrative level, from national to provincial or regional, to district, to village or neighborhood council. Particularly important questions relate to the interaction between the local administration and individual communities. In most developing countries there are no paid local government staff at the village or neighborhood level, and the question is one of promotion (Chapter 5) rather than administration.

In water programs too, the local government's participation is essential. This is not always understood at first because it is relatively easy for a central agency to install a large number of water supplies that in most cases will be popular and well used. However, a central body is not usually able to maintain the supplies, and without local involvement they are not sustainable. Where existing sources of water are relatively accessible, close consultation with local representatives is needed to ensure that the level of service is appropriate to local conditions, so that the new water supplies will be used.

In periurban areas, rural institutional arrangements can be complemented by and coordinated with an existing municipal utility. For example, in Tegucigalpa, Honduras, the city water utility is the promoter, provider of technical assistance, and "wholesaler" of water, which local communities sell "retail" to consumers.

In many low-income urban communities, strong institutions already exist; they may exist to protect de facto ownership of land, to lobby the government, to control crime, or as the local organs of a political party. They are potentially powerful vehicles for implementing water and sanitation programs. The Committees for the Defense of the Revolution, in Ghana played an important role in the maintenance of public urban latrines.

In rural areas, the institutions of local government are often lacking at the level of the community served by a single rural water supply -- the village. They must then be established, at least in embryonic form, as water committees, if water supplies are to be effectively maintained. It requires care and sensitivity to protect the committees from domination by a single group -- men or landowners, for example -- and to ensure they have powers of sanction accepted by the community as authoritative. Otherwise they will not be able to collect revenue reliably. They also need monitoring and support to ensure that their resources are not misused. The same applies to sanitation programs when the facilities are managed collectively, as in the case of public latrines.

The builders

An equally fundamental question is, who will build the latrines and under what institutional arrangements. Various approaches have been tried successfully, so there is no single answer to the question. Laborers employed directly by the municipality or other implementing agency have been used in some countries, as in the rural program in Botswana where the District Councils used direct labor. In the Botswana urban programs however, private contractors were used to provide the basic latrine structure for site and service schemes. Contractors have also been used to build latrines for existing urban households in Tanzania.

It might seem that the potential role for contractors would be limited to urban schemes, but the rural sanitation program in Lesotho obtained good results by training local artisans to do the work. The client in this case, though, was not the implementing agency but the individual householder. An advantage of this approach, particularly if (as in Lesotho) no direct subsidy is involved, is that the implementation capacity of the program need not constrain the rate of latrine construction. For every latrine built in the Lesotho program, four were built independently as a result of its promotional activities.

However, there are drawbacks. The program management has less control over prices, which are particularly likely to escalate when the latrine builders have a degree of monopoly. Providing a choice of builders in each community, or a choice of construction arrangements, may help to limit this tendency. In Zimbabwe, for instance, roughly half the households choose to hire a local builder trained by the program to erect the latrine, and half build their own. In a rural pilot project in the Philippines, most households did

not want to pay the contractor (hired centrally) as they felt they could build their own latrines more cheaply.

A different approach was tried in Maputo, Mozambique, where initial experiments with the manufacture of latrine slabs in a commercial concrete casting yard showed that it was preferable to use a number of local production sites throughout the city to cut transport costs and reduce slab breakage during transport. Local manufacturers of soil-cement blocks for house construction might have been trained in slab production, but it was felt that they were not sufficiently motivated to develop the market for latrine slabs and were likely to divert scarce cement into blocks, which were easy to produce and had a guaranteed market at profitable prices.

It was decided to set up small neighborhood cooperatives, each with about a dozen members chosen by the neighborhood council from among unemployed local residents. Roughly half the members were women. They were trained in slab production and marketing, and lent an initial sum of working capital. Though most of their slabs are simply sold to the public, some households pay a cooperative to build a latrine and install the slab.

One option that always merits consideration is for households to build the latrines themselves. They may need training, or at least printed brochures such as those used in Zimbabwe, and they may also need access to specific components such as slabs, vent pipes, or pour-flush pans. Even if the program relies on paid labor, it may be necessary to keep the option of self-construction for those who cannot afford the builder's wages.

Construction by the residents need not necessarily mean that each family builds its own latrine. That could result in a failure to provide sanitation facilities to the elderly or to households headed by women. Self-help construction can be organized on a community basis, the work parties helping every household in turn. Some villages in Malawi organized themselves in this way when they learned that slabs would not be produced for them unless a certain percentage of households built latrines in which to install them.

As the examples illustrate, the latrine builders will need training and supervision. The examples also show that much depends on inducements for the builders to carry out the work and do it conscientiously. If builders are to be paid, who will arrange to withhold payment in the event of shoddy workmanship? Who will ensure that householders do not pocket their subsidy? Who will be liable if a pit latrine collapses, causing a fatality? There are no perfect answers to such questions, but the important thing is to ensure they are dealt with early, when there is time to answer them coolly.

This discussion is also more relevant to water supply than might be apparent. Most of the organizational forms used to build latrines are rarely used to build water supplies, but this does not mean they are inapplicable to the sector. For instance, water supply agencies do not often train and employ local artisans, although artisan well-builders are commonly hired by individual rural households in many countries, often at a lower price than the unit cost of the government's well-building program. The rural water supply program set up in southern Zimbabwe with the help of the Lutheran World Federation showed that the use of artisans could have great advantages. Well diggers were trained

to qualify for blasting certificates, and were then available for hire by the program itself, and also by institutions such as schools and health centers, private individuals, or even whole communities. In this way, the benefits of the main program went beyond the number of wells it paid for, and a basis was laid for further sustainable development.

The promoters

If anyone has a role in a sanitation program more fundamental than those who build the latrines, it is the field workers responsible for promotion. The importance of this cadre has already been emphasized. Sometimes the staff will be available, underemployed and waiting for something to do; an example might be Zimbabwe's Health Assistants, many of whom had been medical orderlies with the guerrilla forces during the war, demobilized at Independence.

The South Coast Handpump Project in rural Kenya provided an interesting example of a promotion system provided by a nongovernmental organization for a government-run program. The Kenyan Ministry of Water Development collaborated with the Kenya Water for Health Organization (KWAHO), which promotes water supply improvements by focusing on women. First, the two-person community liaison team hired and trained five local village women as promotion workers, who then trained others in community organization and development and the use and maintenance of simple water supplies. These in turn motivated village women and men to form water committees, raise money, and undergo training in pump maintenance.

The focus on women is now becoming common where water supplies are concerned, and it is also relevant to sanitation. Female promotion workers are more likely to convince other women of the advantages of sanitation; and women, as the guardians of health, cleanliness, and children's welfare in most households, are most likely to be interested in sanitation and committed to its use. In the Philippines, for instance, where most men in a sanitation program admitted that they had been convinced to join by their wives or mothers, the role of female health workers in promoting sanitation has been fundamental to its success. The use of female promotion workers is not a panacea, of course. Young unmarried women or educated middle-class women may lack credibility in the eyes of the most influential members of the community, male or female. In some societies, male promotion workers may have to accompany them to gain the ears of the men.

Where an existing promotion cadre is not available, one simple solution is to train the builders in promotion. If they are paid according to the number of households requesting latrines, the builders have a direct interest in encouraging more requests. In Lesotho, the builders spontaneously undertook a promotional role. In the Maputo project, members of the slab production cooperatives were trained to make and use puppets as a promotional tool. In both Lesotho and Maputo, some of the most productive latrine builders have been women.

If an existing cadre is to be used, it is important to examine the relationship between their new tasks and their old ones. In a rural program in Tanzania that planned to use village health workers, the funding agency was unwilling to support them in their

curative tasks, although these were what the Ministry of Health and their fellow villagers expected of them and the main thing they were trained to do. As a result, the village health workers performed neither the curative role nor that of sanitation promotion.

In other cases, village health workers may be too burdened with their existing tasks to undertake new responsibilities in sanitation. Governments often expect more from such voluntary cadres than they are willing or capable of doing without pay. On the other hand, if the voluntary cadre can earn some income from sanitation promotion, they may support it eagerly, to the detriment of their other, voluntary tasks.

Promotion workers need training, supervision, and support at least as much as the builders. In a job requiring as much motivation as theirs, regular visits from one's superiors are as important as the prompt payment of one's salary and field allowances. Ideally, a career structure that offers prospects for promotion is needed. For example, the Health Assistants of Zimbabwe are part of a hierarchy of positions leading up to the Chief Health Inspector.

Promotion consists of far more than simple exhortation. The promotion worker comes up against all sorts of problems, concerns, and misgivings that the program managers may never have considered. "How can I avoid using the same latrine as my mother-in-law?" "What do I do when there are so many trees here that the VIP system does not work?" "What do I tell the health inspector who says the latrines put nitrates in the wells?" "How do I keep mosquitoes from breeding in the pits?" All of these need a response, which the field worker may well be unable to provide unaided.

The promotion system must therefore ensure the flow of information upwards through the organization and in from the field, as well as the far easier flow of guidance downwards and outward from the program managers. Only by listening to the problems arising in the field, and to the concerns voiced by the users, will the managers be able to respond and alter the promotion messages, and even the program design, if necessary. In other words, the promotion system should serve not only for marketing the improved sanitation facilities, but also for monitoring the progress of the program and diagnosing problems. This monitoring may require a special procedure, such as a monthly evaluation meeting; it certainly requires a great deal of trust and mutual respect between the promotion field workers and their superiors.

Program development

In the world of sanitation promotion, important decisions must be informed by experience, and a program that is built gradually is far more likely to succeed than one launched on a grand scale from the start. The process of program development therefore needs discussion. In most successful programs, it can be divided roughly into three phases:

1. Technology development
2. Pilot program
3. Expansion

These three phases apply not only to a free-standing sanitation program, but also to the sanitation component of a program in which improvements in excreta disposal are included in a broader range of interventions. Because of its dependence on demand, sanitation tends to proceed at its own pace and rarely keeps up with the other components of an integrated program.

The first phase might be called the "ludic" phase characterized by a period of playful experimentation, particularly regarding the technology to be employed and generally conducted by only a few individuals. The focus must be on listening to the local population and their perceived needs, and studying the solutions to their problems that they have developed. A technology that builds on an existing solution is more likely to take root and be replicated easily than one transplanted from another country.

Water supply programs have discovered the need for locally appropriate technology. In rural Guatemala, for example, the communities were unable to operate and maintain complicated systems with unfamiliar hardware. In many countries, it has taken several years of experimentation to develop a handpump suitable for local conditions and village-level maintenance.

After the experimental phase, and from the experience of other parts of the world, one or more technology options will begin to emerge; construction of a prototype or two, for the use of willing households or for an institution, will refine some ideas and eliminate others. This process can take a year or more, and it is unwise to hurry it or subject it to too many bureaucratic constraints.

The pilot phase is no less important. As well as providing an opportunity for test marketing, it is the stage for development and planning of institutional arrangements, particularly with regard to development of demand and delivery of the product. The pilot program is large enough for experimentation with organizational approaches, promotional methods, payment arrangements, and so on, but small enough for project planners and managers to maintain personal supervision and monitoring, and to make adjustments in response to problems that may arise.

Because of the personal involvement of the program's progenitors, there is a temptation in the pilot phase to promote the new sanitation technology too vigorously, using publicity or subsidies to a degree that would be impossible in a full-scale program. It is important in this phase to restrain enthusiasm and develop a replicable approach to promotion. Only in this way can a true estimate be made of the acceptability of the new facilities and the public's willingness to pay for them. This can be done by careful monitoring of the progress of the pilot phase, and by a simple market survey when enough latrines have been built for most residents of the pilot area to be familiar with them.

Latrines built in the pilot phase serve as demonstration models for local residents and especially for community leaders from other areas to which the program might be extended. The pilot phase can also serve as an excellent demonstration to agencies that might consider funding the full-scale program.

The pilot phase serves other purposes. It offers an opportunity to refine the designs under trial, to test and improve their acceptability and reliability, to take advantage of locally available materials, and to reduce costs. It makes it possible to check the accuracy of cost estimates under production conditions. It is the most convenient setting to train the staff who will form the backbone of the subsequent full-scale program; in fact, the pilot production facility can continue to serve as a training center long after the conclusion of the pilot phase, when the program has "gone to scale."

When the pilot phase has developed and successfully tested the technology, and demonstrated the viability of the chosen implementation strategy, it is still unwise to make an immediate leap to an expanded scale, although the pressure from funding bodies to do so is often strong. A phased expansion is usually more prudent and allows time to make further refinements to the program strategy and to build capacity in an ordered way. However, it should by now be clear that the build-up in capacity is by no means the only factor that determines the rate at which a program can expand. A more fundamental constraint is the rate of growth in demand.

An example from the water sector is the South Coast Handpumps Project in Kenya, which evolved and grew over several years into the district-wide Kwale Project. The Kwale Project document envisaged this growth as a learning process and made allowance for project staff to stop and re-evaluate its progress, and to slow down if community commitment was questionable, even if that meant borehole drilling machines stood idle.

It should be clear that the many options and dilemmas that are addressed in this paper do not all require decisions at the same time. Rather, they need to be kept in mind throughout the process, and options chosen initially may need to be changed in the light of experience. One of the earliest questions to be faced is the technology to be used; that is the subject of Chapter 3.

3. Choosing the Hardware

Much has been written on appropriate, low-cost technology for water supply and waste disposal in developing countries. The World Bank has published a number of books and manuals on the subject, and this paper does not seek to replace them. Rather, this chapter outlines some of the factors that must be considered when choosing among various options, particularly those related to implementation.

Nevertheless, it is appropriate to mention the two sanitation options that have emerged during the Decade as having the widest application; the ventilated improved pit (VIP) latrine and the pour-flush toilet (Box 3).

Both systems are extremely adaptable; they have been built with a wide range of materials and successfully introduced into a variety of environments and cultures. However, there is a danger in promoting them as the sole solutions to the problems of sanitation for low-income communities in developing countries. For example, pour-flush latrines were installed in urban areas in India that suffer from acute water shortage. It takes little imagination to foresee that they will rapidly become blocked under such conditions. A "dry" system, not requiring water for its operation, would have been preferable.

Another example would be the adoption of the VIP latrine for communities that cannot afford a roof on their toilet. A latrine with a roof also requires stronger, more expensive walls than one with only a privacy fence. Many of the urban poor, offered subsidized roofing materials, would prefer to use them to extend their houses rather than to build a latrine. Promoting the VIP system in such communities could require a subsidy too high for a large-scale program to be affordable, or loans too large to be recovered in a reasonable time, or too forbidding for most people to accept.

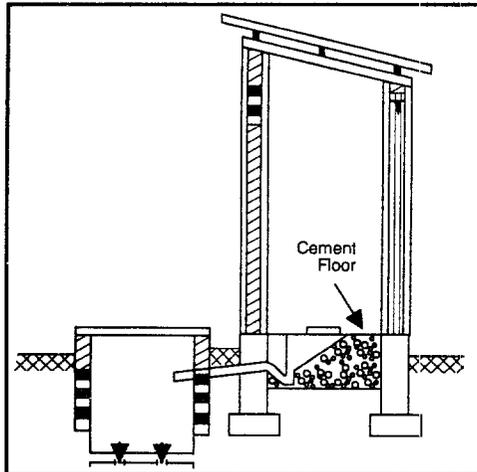
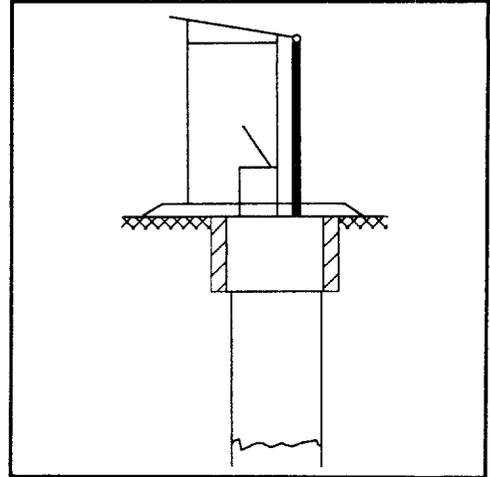
This is what occurred in Dar es Salaam, Tanzania, where a tradition of roofless pit latrines had existed for many years. The VIP latrines promoted under the Dar es Salaam low-cost sanitation program had to be kept very small in order to minimize the cost of the superstructure, making them somewhat cramped by comparison with the existing latrines, and certainly unsuitable for bathing, a purpose for which the old latrines had sometimes been used. Whether the design or the cost was responsible, or a combination of both, the fact is that very few individuals accepted the loans offered for their construction. A roofless latrine could have been made much larger at less cost. Odors are hardly a problem in an open-air latrine, and a measure of fly control, albeit imperfect, could be achieved with a tight-fitting lid.

Rather than introducing ready-made solutions, then, it is preferable to start with a study of the solutions already existing in the community, focusing on their constraints and defects to remove them. Often the result will be some variation of the VIP or pour-flush systems, but others should not be discounted. Two examples, from opposite extremes, may illustrate this.

BOX 3

THE VIP LATRINE AND THE POUR-FLUSH TOILET

In the VIP latrine, the vent pipe serves to remove odors from the pit so that the toilet is more pleasant to use. The odors emerging from the vent pipe also help divert flies that might otherwise enter the pit to lay their eggs but are prevented from flying down the pipe by the mosquito screen at the top. Should any flies succeed in entering by the squat hole, their young are attracted to the light coming down the pipe but are trapped by the mosquito screen until they are caught by predators or fall back into the pit and die. For this to work, the latrine superstructure must have a roof and be enclosed so that more light comes down the vent pipe than the squat hole. This system has been used mainly in Africa.



The pour-flush latrine uses a water seal similar to that on a conventional cistern-flush toilet to prevent the emergence of flies and odors. The water seal is designed to be flushed with a smaller volume of water, typically two to three liters, which is poured into it by hand. This system requires readily available water. Pour-flush toilets have been introduced chiefly in Asia, but also used in other regions such as the Caribbean.

In Maputo, Mozambique, when a low-cost sanitation program was first considered, it was immediately apparent that the cost of a roofed superstructure was beyond the reach of most low-income households, many of whom had great difficulty in obtaining materials to roof their homes. The majority already owned a pit latrine of sorts, and the major felt need was to make the floor less liable to collapse. The precarious structures covering many pits were known to have caused deaths and deterred many persons, particularly children, from using the latrines. The program which was developed therefore concentrated on the floor slab; fitting it with a tight cover also helped control flies.

On the other hand, VIP latrines were successfully introduced into a low-income urban area in Northeast Brazil, but subsequently local residents, strongly aspiring to own a water-sealed toilet, replaced them with cistern-flush toilets discharging to rudimentary septic tanks. This had three important adverse consequences for public health. First, the large amount of water needed for their operation worsened an already serious shortage of water in the area, where the piped supply operated intermittently and at very low pressure. Second, the septic tanks became the principal breeding site for the *Culex quinquefasciatus* mosquitoes that transmit filariasis in the area, causing elephantiasis. Third, the effluent from the septic tanks was discharged to small open channels used for surface water drainage, and in which children often played. In retrospect, a system such as small-bore sewerage would have been preferable to the VIP latrines.

Public or private latrines?

Some sanitation programs for low-income urban areas have been based on the provision of public or communal latrines. Several arguments have been put forward in their favor. The installation of public latrines can be relatively simple to administer, with construction carried out on public land by contractors; and it avoids the need for negotiation with individual householders or landlords, or for the mobilization of voluntary labor. It can be less costly overall because of economies of scale. Public facilities can also be provided in areas where the population density is so high that there is not sufficient space to build a separate cubicle for each household. They may also help to make unsatisfactory household systems such as bucket latrines and chamber pots less unhygienic; many of those who visit a public latrine come carrying a container of night soil to empty into it. Special provision should be made for this kind of use.

In the long run, however, public latrines could easily prove more expensive than facilities for individual families. They have a heavy maintenance requirement, and a full-time attendant is needed. To pay for this, a charge usually has to be levied for their use. Even with a conscientious attendant, a public latrine is likely to suffer misuse and occasional vandalism, necessitating frequent cleaning and ongoing repairs.

More fundamentally, the user charges and the distance of a public latrine from the home, together with the need in most cases to lock up the facility at night, will inevitably deter some potential users. Special arrangements can be made for children to use them free of charge -- as in many public latrines of Kumasi, Ghana -- but this does not cater for the special difficulties of the elderly, the ill, and women fearful of walking to and from them after dark.

Although numerous descriptions of public latrine programs have been published, it is noteworthy that none documents an evaluation of them from the user's point of view. It is likely that any such evaluation would rapidly bring these and other problems to light. For example, monitoring of usage rates of public latrines in the Philippines has shown that some are used only by a minority of the population in their service area, and that nearly half the regular users visit them less than twice a day. Public latrines, even well-maintained ones, can never meet all the needs of a community for sanitation facilities. In practice, the experience of most cities is that public facilities are not well maintained

in the long term. The best that can be said for them is that they are better than nothing at all.

Where space limitations make it impossible to provide an individual family latrine for each house, an alternative is to provide a communal block in which each family has its own cubicle and its own key to the door. The family is then responsible for cleaning and maintaining its part of the facility. Where individual family cubicles are not a feasible option, a second-best alternative is for each compartment to be shared by two or three families; in that case, it is important for each family to choose those with whom it will share to minimize the probability of disagreements about the sharing of duties between them. However, a careful survey of user preferences is necessary for any such sharing scheme, and the results can be surprising. In Indonesia, for example, it was found that many households preferred an (unsubsidized) private latrine to a (subsidized) shared one, even when the cost got them into debt beyond their means. As this example illustrates, the best decision for the program management will usually be to offer households or communities a choice, and let them decide which is most appropriate to their needs.

Setting the design cost

Engineers in the commercial world frequently design a product to specifications that include a cost ceiling. Designers of low-cost sanitation facilities should start from some idea of what the market for which they are designing will bear, and then design something affordable in that market. In practice, however, it is more common to start with technical design criteria and predetermined choice of technology. The typical result is a design that neither individuals nor governments are willing to pay for in sufficient numbers to cover the target population.

To set the design cost, it is necessary to estimate the amount most households are able and willing to pay for improved sanitation, and also the likely level of subsidy available. This is discussed in Chapter 4.

Not all the money invested in sanitation is spent directly on the construction of new facilities. The cost of promoting the program is likely to be considerable, but it cannot normally be recovered from the users in charges and therefore has to be deducted from the subsidy. In rural sanitation programs in Zimbabwe and the Philippines, the cost of a typical latrine worked out roughly as shown in the table.

Promotion of the program accounted for 45 percent of the government subsidy in Zimbabwe. In the Philippines, where the only subsidized component was a fiberglass toilet bowl, promotion and administration accounted for most of the government input. Promotion for sanitation costs considerably more than for water supply, relative to total costs.

Cost Components in Rural Sanitation Programs

(1988 dollars)

	Zimbabwe	Philippines
Government subsidy		
Materials	20.40	6.0
Promotion and administration	16.80	20.00
Household contribution		
Materials	14.60	27.00
Labor	48.20	3.00
Total	100.00	56.00

The ideal latrine, one that meets all technical and sanitary requirements, is probably too expensive. Some compromise is then required to produce an affordable design. But compromises require decisions that are often difficult for the public health engineer: How shall we lower standards? Shall we sacrifice fly control? Shall we discharge wastewater into open channels? Given limited resources, however, it is more useful to consider how much a program will improve the existing situation, how likely it is to be replicable on a wide scale, and how it can be upgraded when resources allow.

The final arbiters in these decisions are the consumers. A latrine that is too costly will elicit limited demand. On the other hand, skimping on important details may detract from the acceptability of the product, also reducing demand. For example, the pan of a pour-flush latrine is the component with which users come into closest contact, and aesthetic criteria may be more important than the cost. In India, most consumers prefer the more expensive porcelain pan to the lower-cost fiberglass one.

To take account of user preferences requires careful market research during the technology development phase of a program and conscientious monitoring in the pilot-scale trials (test marketing). It is usually advisable to offer a range of options, each with an appropriate price, from which the consumer can choose. This has been called the "supermarket" approach to sanitation promotion.

Water supply: Levels of service

To choose between public and private latrines, and to set their design cost, is effectively to decide the level of service to be provided. Analogous decisions relate to water supply; should full house connections be provided, or one tap in each yard, or public standpipes? If public standpipes, how many? Should these include laundry and public bathing

facilities? These decisions are frequently made without consulting the consumers, but the need to do so is becoming more apparent as funding agencies increasingly insist on an element of cost recovery, even in rural water schemes. If the level of service provided does not respond to the preference of the consumers, they may not want to pay for it.

When consumer willingness to pay for different levels of service is studied, the findings are sometimes surprising. Many consumers, even in rural communities, are willing to pay for individual connections, but are far less interested in paying for a public source such as a standpipe or communal handpump if alternative water sources are available and accessible (Briscoe and de Ferranti 1988). This is supported by a theoretical analysis suggesting that the value of time saved from water collection is alone sufficient to justify the additional investment required for this higher level of service (Churchill et al. 1987). Yet many low-income groups already pay large sums to water vendors, not all of whom deliver water to the house. These consumers would gladly pay for a similar level of provision of better-quality water (Zaroff and Okun 1984).

Pilot-scale trials

The importance of testing a chosen technology at pilot scale has been mentioned in Chapter 2. The planner should be aware that these tests take time. In the Lesotho rural and the Mozambican urban sanitation programs, the pilot phases each lasted roughly eighteen months and culminated in the construction of several hundred latrines. That may seem slow, particularly to those acutely aware of the scope of the problem and the size of the unserved population, but it is essential if the program is then to produce tens of thousands of latrines in a similar period.

The pilot phase should not be limited to the implementation of a single design. On the contrary, it is preferable to offer two or more options, for two reasons. First, it may be necessary in the subsequent full-scale program to offer a range of choice, to allow for differences in ground conditions, and for varying householder aspirations and purses. Second, it will help decide which designs are most acceptable.

When assessing relative acceptability of different designs, it is easy to send misleading signals to the users that cause a bias in their choice. For example, if the demonstration models of two different options have been built to apparently differing standards of quality, this will affect people's preference. In several pilot scale trials it has been found that large numbers of people opted for composting latrines on the grounds that they were told that they were more permanent, or because the demonstration models were built to a more permanent standard, than the limited-life pit latrines offered as the alternative. This occurred in the early phases of the Maputo sanitation program and appears to have affected the ultimate choice of latrine design in the Wanging'ombe rural project in Tanzania. It might not appear a bad thing, were it not for the fact that a substantial portion of those opting for compost latrines had no idea how they functioned, and most of the others did not use them correctly.

Pilot-scale trials are less common in the water sector, probably because most water-supply programs concentrate on provision of a service rather than stimulation of

demand. Most countries already have many years of experience in water supply for low-income communities, but a pilot program can be very useful and is advisable whenever a new technology or a new approach to implementation is envisaged. The trials of different handpump designs conducted by the UNDP-World Bank Program are an excellent example of how the best designs can be selected and improved by this means. Two of these, the South Coast Handpumps Project in Kenya (Narayan-Parker 1988) and the Mirzapur Project in Bangladesh (Kjellerup et al. 1989), also illustrate how implementation methods can be developed, and staff trained, before expanding to a larger scale.

Maintenance

In the choice of water-supply technology, particularly for rural communities where technical and institutional resources are limited, maintenance is a fundamental consideration. The importance of providing for maintenance at the local level has been recognized over the last ten years and lies behind the effort to develop VLOM (village-level operation and maintenance) handpumps.

In the sanitation sector, however, planners seem less conscious of the problem, and many embark on programs without a clear policy, or at least without a proven strategy, of what to do when pits need to be emptied or latrines replaced. Nevertheless, the choice of composting latrines in the above examples shows that the users themselves are very much aware of the possibility that a latrine may not last forever.

Two aspects of the Zimbabwe rural sanitation program show that maintenance considerations were not neglected. First, the lowest-cost design, a VIP latrine built almost entirely of locally available materials, was dropped when it became clear that they would not last very long if they did not receive appropriate attention and upkeep. The costlier brick alternative was less likely to fall into disrepair quickly and give the program a bad name. Second, an explicit policy decision was made to offer a subsidy only for a household's first latrine. It was anticipated that, by the time a replacement was needed, ownership and use of latrines would have become the norm and incentives would not be needed. The latrines promoted by the program were deliberately designed to last long enough for this to occur.

In rural areas, a latrine with a full pit can simply be demolished and replaced. Where space is limited, builders need to be told the danger of excavating new pits immediately beside existing full ones, a common cause of fatalities. In urban areas, lack of space makes it very difficult to dig new pits safely, so they must be emptied. The contents of the pits are a valuable resource that can be used in agriculture or aquaculture (Mara and Cairncross 1989). Emptying arrangements must be planned carefully.

Pits can be emptied by mechanical means, using vacuum tanker trucks. It is sometimes assumed that the pits of new latrines will be emptied, when the time comes, by trucks from the fleet already operated by the municipal authorities to desludge septic tanks, but this can give rise to three serious problems. First, maintenance of a fleet of trucks is not an easy task for a municipality, and there is rarely spare capacity to attend to latrines.

The greater political influence and purchasing power of owners of septic tanks generally ensures that poorer latrine-owners are the ones to suffer from the shortfall.

Lack of adequate municipal capacity is not a serious problem when the private sector also offers a hygienic desludging service, but that does not overcome two other problems. One is that the seepage of liquids into the soil from the pit of a dry latrine or a pour-flush toilet can lead to a greater degree of consolidation of the pit contents, and hence a higher viscosity, than is ever attained by the sludge in a watertight septic tank. Nonfecal solids such as soil and bulky anal cleansing materials that sometimes accumulate in the pits of dry latrines can make it impossible to remove the contents with normal desludging equipment.

The other problem is the difficulty of access by large tanker trucks, down narrow lanes and up steep slopes to the crowded neighborhoods in which latrines are often found. It may be possible to run a suction hose from the truck to the latrine, but the maximum usable distance is reduced when pit contents are heavily consolidated.

Research on the technical problems of latrine emptying has led to development of high-power suction pumps and systems using small, maneuverable vehicles (Bosch and Schertenleib 1985, Carroll 1989). Still, there are many settings in which the less sophisticated, labor-intensive option of emptying by hand may be preferred.

Emptying latrine pits by hand is never a hygienic operation, and always exposes those who do it to infection with fecal pathogens. The alternate use of twin pits is intended to avoid this risk. One pit is used until full, and then the users switch to the second pit. After a year, the contents of the first pit are no longer infectious or offensive and can safely be removed by hand and used, if desired, as fertilizer and soil conditioner. The country with the largest number of twin-pit latrines is India, where several hundred thousand twin-pit, pour-flush toilets have been installed in urban areas. Some municipal authorities there offer a free pit-emptying service to those who do not wish to empty their own. The cost of the service is recovered by selling the pit contents to farmers.

However, the operation of twin-pit systems in practice has rarely been evaluated. One or two studies have found indications of recent fecal contamination in a large portion of pits that have supposedly been closed for many months, suggesting either that the pit not in use is incompletely sealed from the other, or that many users do not operate the system correctly. It cannot therefore be assumed that the twin-pit system is completely safe, and pit-emptying workers should be provided protective clothing, typhoid immunization, regular stool examinations, and treatment for intestinal parasites.

When planning for the emptying of pits or desludging of septic tanks, attention must be paid not only to the technical aspects but also to how the work will be paid for. As the Indian example shows, the cost can sometimes be recovered from sale of the pit contents; however, the existence of a market for pit contents cannot be assumed. Where income from this source is unlikely to cover the cost of the service, users will have to pay a charge.

The simplest arrangement is to charge each time a pit or tank is emptied, but this will lead many people to request the service only at the last possible moment. Where septic tanks are concerned, they will by then have ceased to operate effectively, and the solids emerging in the effluent are likely to have caused expensive blockage of soakaways or sewers downstream. It may therefore be preferable to pay the cost of the emptying service by a monthly charge on all customers, so that septic tanks can be emptied regularly, not when householders notice, too late, that something has gone wrong.

It is appropriate to mention payment first, in the context of maintenance rather than construction. Funding for maintenance, whether of water supply or sanitation, is more difficult to obtain than for the construction of new systems, but the need for it is frequently neglected in the planning stage. Funding of construction in low-cost sanitation programs is the subject of Chapter 4.

Efficient operation and maintenance depends on far more than a choice of appropriate technology. It depends most on people's motivation and organization, whether the task is emptying a latrine pit or changing the washer in a tap. The lesson has been painfully learned in the rural water sector. Perhaps promoters of low-cost sanitation will benefit from that experience.

4. Meeting the Costs

In the past, there was a sharp contrast between the conventional assumptions about who should pay most of the capital cost of water supplies, and who should pay for low-cost sanitation. It was believed that an adequate water supply was a basic human need, and it was assumed that investment in water supplies was a governmental responsibility even though in many cases, particularly in rural areas, it would not be possible to recover that investment from the users. On the other hand, it was seldom maintained that governments should bear the full cost of latrine construction. In practice, although certain latrine components might be made available at a subsidized price, most of the construction cost was borne by the users.

The two conflicting approaches were in fact supported and implemented within the sanitation sector itself. Expensive sewerage schemes were often implemented with little prospect of recovery of government and/or donor funds invested in them, while self-help remained the prevailing ideology in most low-cost sanitation programs for the poor.

Thinking in the two sectors has tended to converge in recent years. The issue of cost recovery in water-supply programs has received increasing attention in the quest for new sources of funds to fuel progress toward the targets of the Water Decade. Meanwhile, experience with large, low-cost sanitation programs has highlighted the complexity of the funding problem and increased awareness of the different perspectives on it from the point of view of the various interested parties: the users, their landlords, the government, and external donors. The contributions of these four parties are discussed below.

The users

It is remarkable how little detailed study has been made of user willingness to pay for sanitation facilities, given that their contribution is often the major part of the cost of a sanitation program, and that without their willing cooperation any program is doomed to fail. If any estimate at all is made in the planning stage of a sanitation program, it is often little more than the application of an untested "rule of thumb" based on a percentage of average household income.

For external donor agencies eager to promote a technology that they consider adequate from the sanitary point of view, the temptation is to overestimate the willingness of consumers to pay for it. Agency staff, brought up in a culture where sanitation is taken for granted and ignorant of the perspective of people who have managed to live their lives without sanitation, are also liable to assume that the *ability* to pay a certain amount implies a *willingness* to do so. The large number of externally supported sanitation projects that have not succeeded in building more than a few hundred latrines is testimony to this tendency to overestimate.

National governments, on the other hand, are more likely to underestimate the willingness to pay of low-income groups. One possible motive for this, in negotiations with donor agencies, is that it may help secure a higher level of external funding for the sector. It may also be more honestly inspired by the tendency of middle-class officials to underrate the aspirations and hygiene standards of the poor. Moreover, those who are more conversant with the values of the users may still be skeptical of the degree to which a well-conceived promotion system can generate new demand.

How, then, can user willingness to pay for sanitation be assessed? As a first approximation, the rule of thumb based on household income, for all its faults, is better than no estimate at all. Various studies of household budgets in developing countries have led to the conclusion that housing typically represents 15-20 percent of household expenditure. Detailed studies in Tanzania, Egypt, and elsewhere indicate that expenditure on infrastructure ranges between 50 percent and 60 percent of this total, and that sanitation accounts for a quarter to a third of the infrastructure expense. From this it may be estimated that low- and middle-income groups will typically spend only 2-3 percent of their income on sanitation. This figure, of course, is a maximum; there are two important reasons why the limit for low-income groups is likely to be lower.

First, of course, the sanitation system on offer should meet their needs and be sufficiently attractive for people to want it. In practice, the ideal is rarely affordable, and any misgivings people harbor about the system will be reflected in their willingness to pay for it. Conversely, they must also be dissatisfied with their current sanitation arrangements. Second, this rule of thumb is based on the income of the *average* household; households that are poorer than this are usually obliged to spend a greater than average proportion of their income on food and consequently have a smaller portion available for sanitation.

A more specific estimate of willingness to pay may be derived from the amounts that the target population already pays for services such as electricity and water supply. However, there are three important factors to bear in mind when making such extrapolations: (a) the users may ascribe higher priority to the other services than to sanitation; (b) coverage with these services may be less than is hoped for from the sanitation program, and it may be limited to the better-off households; and (c) a large portion may have managed to evade payment.

What is surprising is that the poor may already pay more than most officials imagine to informal suppliers. For example, the amount paid to water vendors in some towns is more than the total revenue of the water supply agency. The water-supply sector could benefit from a survey of how much people already pay.

An approach that may prove to be more accurate than many analysts had supposed until recently is to ask potential users directly how much they would be willing to pay. Social researchers have often counseled against such an approach, as it involves the use of a hypothetical question which illiterate people might find hard to understand, and it may produce a biased answer if the respondents seek to manipulate the survey to their advantage. Yet the poor are perhaps more experienced than the well-off at making careful assessment of the value of things; it is a fundamental component of the careful budgeting

essential to survival. And if they have an interest in giving an answer which is misleadingly low to ensure they are not charged too much for sanitation, they also have a good reason *not* to give too low a figure, lest it be determined that they do not want sanitation enough to deserve it.

A refinement of this "contingent valuation" approach is to arrive at an estimate of how much the consumer is willing to pay by means of a "bidding game." For example, consumers are asked in sequence whether they would be willing to pay \$10, \$20, \$50, \$100 and so on until a price is reached which they are not willing to meet. By comparing the results of bidding games in which the bidding goes upwards or comes downwards, or starts at different points, it is possible to check the consistency of consumer responses. The method has been used and tested in the water-supply sector, where the results of several studies indicate that most consumers do in fact give consistent, rational responses in such exercises (Whittington et al. 1987, 1989a, 1989b). It is equally suitable for the study of willingness to pay for sanitation (Box 4).

Those expressing a willingness to pay a given price for sanitation facilities may nevertheless have difficulty raising the cash; putting credit at their disposal may speed the uptake of the sanitation on offer by the community. Indeed, loan schemes are a tempting way to bridge the gap between willingness to pay and the construction cost of the latrines that are being promoted, especially where funds for the sanitation program are provided by a lending agency.

Provision of credit to householders to install sanitation facilities is subject to the same considerations as credit schemes for other housing improvements, and a considerable amount of literature is available on that subject. There are serious difficulties in ensuring that credit is really available to low-income groups, while ensuring a satisfactory rate of repayment. In India, where commercial banks are required by law to devote a certain amount of their income to such credit, the default rate is so high and debt recovery so expensive that the banks usually write off these amounts as being, in effect, given away.

There are low-cost housing schemes where only a small minority of households have fallen into arrears in their loan repayments, but low default rates have often been achieved by careful preselection of participants (Laquian 1983). Where such selection criteria are applied or where firm security is required from those seeking loans, those most in need -- female-headed households, for example -- may be deterred from applying. Households that have difficulty managing their food budget from one week to the next are unlikely to want to go into debt for housing improvements, and still less for a latrine.

A low rate of take-up of credit is especially likely if the sum is relatively large and the repayment period long, a year or more. Many low-income families in Manila chose to pay cash for materials to build their toilets rather than borrow for three to five years at 12 percent interest under the Housing Materials Loan Scheme. Credit does not solve the problem that, in view of the difficulty of targeting subsidies to low-income families, almost any scheme for cost recovery is likely to exclude or deter some of the poorest households.

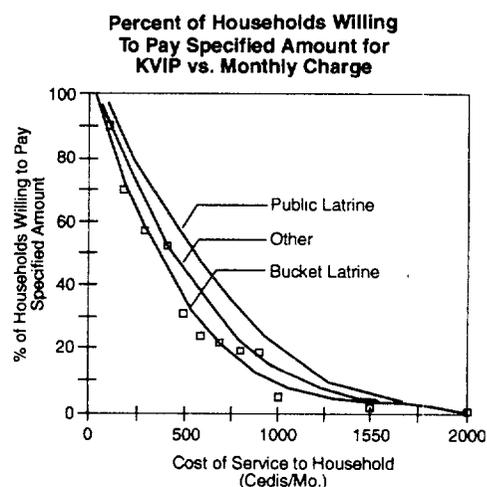
BOX 4

WILLINGNESS TO PAY FOR SANITATION IN KUMASI, GHANA

A survey of a sample of households in Kumasi, Ghana, showed that 25 percent of them had a bucket latrine, and 25 percent had a water closet. Most of the remainder (38 percent) relied on public latrines, and 12 percent resorted to other systems or defaecation sites such as pits or open land.

The survey also asked householders how much they would be willing to pay, in the form of a monthly charge, for an improved type of sanitation, a form of VIP latrine developed locally and known as the KVIP. The question was posed in the form of a bidding game in which respondents answered if they would pay specific amounts, which ranged from 0 to 1,000 cedis per month. The results are shown in Fig. 4. Note how those currently using public latrines are willing to pay more than those with buckets, reflecting the inconvenience of that system.

These results can be analyzed in several ways. At the simplest level, one can read off directly from the graph what level of coverage can be expected at a given monthly charge rate. That charge multiplied by the number of households willing to pay it gives an estimate of the revenue that can be expected. For comparison, the cost of installing the latrines can be expressed as an annual rate including amortization of the capital invested and the cost of debt-service charges. Subtracting the expected annual revenue from the annualized cost gives an estimate of the amount of subsidy required to achieve a given level of coverage. In this case, it was estimated that service coverage could be raised to 50-70 percent of households with no subsidy at all.



Source: Whittington and Lauria (1990), *Household Demand for Improved Sanitation Services: A Case Study of Kumasi, Ghana*. UNDP-World Bank Water and Sanitation Program, Program Report 3. Washington, DC: The World Bank.

There may be a role for relatively short-term credit, but short-term arrangements such as rotating credit associations and credit unions already exist in many low-income areas. Before a new credit scheme is included with a sanitation program, it should first be considered whether or not existing arrangements will suffice. Existing credit systems were mobilized in support of sanitation in Lesotho, for example, where a partnership between the rural sanitation program and the existing credit unions provided a new impetus to both.

Loans to householders are not the only way to recover the cost of sanitation schemes while cushioning residents from the high initial capital investment such schemes may require. The capital cost of conventional sewerage projects is not normally paid out in

cash by householders but financed through the sewerage agency and recovered over several years in a tariff or from a municipal rate or tax. Mechanisms of this kind have been used to recover the cost of on-site sanitation, especially in site and service schemes such as those in urban Botswana and Kenya. Households are allocated a plot which is already provided with basic services such as water supply and a pit latrine, and can then build their own house on it. The cost of the services is then recovered in a monthly land rent or plot charge. Since the plot charge can be levied with the sanction of eviction, and since plot owners can sublet part of their plot to augment their income if necessary, default rates tend to be low.

If the experience of cost recovery in site and service schemes has been positive on the whole, the popularity of such schemes in many countries has waned for other reasons. They are expensive in relation to the number of people housed, and the ultimate beneficiaries are not always the poorest, as others often end up owning and subletting the housing which is built. The upgrading of existing slums and shantytowns has been found in many cases to be a more cost-effective intervention. The use of tariffs, taxes, or even land rents is a promising means of recovering the cost of sanitation and other improvements in upgrading schemes, but is not yet well documented.

The landlords

Owner occupiers have a direct interest in improving their sanitary facilities, but those who rent their housing may face a complex decision. If they install a toilet, even at their own expense, the landlord may use it as a pretext for a rent increase, or even for eviction so that the property can be let out to new tenants at a higher rent.

Squatters face other dilemmas. To the owner of the land, the installation of sanitation infrastructure may turn a collection of shacks, which can always be bulldozed if necessary, into a substantial, irreversible occupation of the land, and thus may be the "last straw" that prompts the landlord to evict the occupants. It should be possible to persuade landlords that sanitation improvements add to the value of their property and benefit them in the long run.

Can landlords be induced by this means to contribute to the funding of sanitation programs? Probably not. Landlords may be willing to invest in their property to accommodate more tenants or to rent it at a higher rate, but it is hard to find examples where they have voluntarily invested in improvements to the facilities offered to the existing occupants. On the contrary, they are likely to resist any sanitary improvements that are likely to cost them money; they will lobby against new regulations and evade them however possible. The resistance of London landlords to the provision of constant water supply in the late nineteenth century is just one episode in a long and lamentable history of such behavior.

The use of building regulations to oblige landlords to install adequate sanitation has rarely been effective in developing countries, partly because such regulations are already impractical and frequently ignored in low-income communities (UNCHS 1985). Landlords can be made to pay for sanitation improvements in the form of plot charges or property

taxes, but they are likely to pass such charges on to the tenants. This may have administrative advantages over a direct charge on the tenants, but it does not represent a shifting of the burden of payment.

There are, of course, happy exceptions to the neglect by landlords of poorer tenants. For example, one in four rural Zimbabweans lives in a commercial farming area, and for most of these their landlord, the farmer, is also their employer. Some of the more enlightened farmers were early enthusiasts for the VIP latrine, providing them for the work force at their own expense.

The government

There are several reasons why governments should contribute to the cost of sanitation programs. Not the least are the externalities of sanitation discussed in Chapter 1. If sanitation improvements are in the interest of the community, and if government funds are necessary to ensure that they take place, it is hard to deny the logic of a subsidy. The contrast with the water sector, where the government's role is often taken for granted, has already been mentioned.

A further argument for subsidy to low-cost sanitation programs derives from equity considerations. Sewerage projects, which rarely serve low-income communities, usually fail to recover their capital costs from the beneficiaries. Whether by design or by default, it is hardly equitable to oblige poorer residents who cannot afford a sewer connection (or, more usually, who live in an unsewered area) to pay a greater share of the cost of their cheaper sanitation facilities.

One elegant solution that answers the equity argument is a cross-subsidy arrangement whereby an additional charge is levied on households that pay for sewerage (through water tariffs or municipal rates, for example), and the proceeds are used to subsidize low-cost sanitation for those who are as yet unserved. A degree of political commitment to such a scheme is required, not only for it to be instituted in the first place, but also to ensure that the additional revenue is permanently earmarked for low-cost sanitation and not eaten up by inflation or diverted by the sewerage agency in a period of financial crisis. When sewerage and low-cost sanitation are the responsibility of different agencies, a common arrangement, cross-subsidies are far harder to establish. The funds are likely to have to pass through the ministry of finance, and it becomes hard to maintain the distinction between such a cross-subsidy and a more conventional government subsidy.

There may be a more than adequate economic and moral justification for a subsidy to low-cost sanitation, but it can be dangerous to plan a sanitation program on the assumption that such a contribution will be forthcoming. Funds promised are not always allocated, and funds allocated are not always released on time. The managers of many sanitation programs dependent on government subsidies have found that budgetary limitations are the principal factor limiting the rate at which their programs can be implemented.

Dependence on subsidies can constrain both the pace of implementation and the ultimate scale of a program. The greater the government contribution required per person served, the more the achievable degree of coverage will be constrained by budgetary factors; the smaller the subsidy needed to install each unit, the wider the scale on which the program can be replicated and the larger the number of people who will ultimately benefit.

Thus, while theory may justify a subsidy, pragmatism suggests that it is wise to keep it to the minimum necessary for the program to succeed, concentrating on the constraints to implementation that government funding can help to release. Often these will be indirect costs such as research and development, administrative and other overheads, and promotion. In the short term, the rate of implementation does not depend directly on the funds available for these purposes, so that if the subsidy is limited to these items, the level of funding need not constrain the program's growth. Sometimes, however, it will be judged necessary to subsidize some specific direct costs, particularly the manufacture of latrine components such as floor slabs and pour-flush pans.

The donors

The considerations that apply to government subsidies are equally relevant to donor agencies, whether they support sanitation programs through national governments or implement them directly. By their very nature as funding agencies, they suffer far more than governments from the temptation to resort to subsidies to speed up implementation or to make a more expensive technology affordable, and they need to work harder to resist it. Sanitation problems are not solved by money alone, but it is hard to convey that message to a donor agency's head office. The result has often been projects that appear successful to the visitor, but which are doomed never to be replicated -- and sometimes not even maintained -- due to insufficient local counterpart funds.

However, some donor agencies willing to be patient enough have been rewarded with successful sanitation programs replicated on a national scale. Examples in recent years include the urban programs in India funded by the World Bank, and the rural program in Burma supported by UNICEF. The hallmark of these successful donor-supported programs seems to be the willingness of the donor agency to seek out enthusiastic local workers in the sector and support their (often unorthodox and innovative) endeavors. While they can benefit from better information about the experience of other countries, they do not need imported solutions so much as help in overcoming the constraints they confront in developing their local solutions to local problems.

Water supply

The dilemma of choosing between cost recovery from the consumer and subsidy from government or donors has been less apparent in the water sector. In urban areas, low-income groups use only a portion of available water. They are often willing to pay substantial amounts for it, and in any case the cost of providing it at public taps can easily be met by a cross-subsidy, charging a little more to the larger users who hardly

notice the difference. Regarding rural communities it was widely agreed, particularly among donors, that charging for water would often be impractical, and some governments made it a matter of principle to provide a basic level of service free of charge. A recent study in rural Brazil (Briscoe et al. 1990) found that the provision of free water at public standpipes had little impact on people's willingness to pay for house connections, and consequently on the total amount of revenue.

Recently, the pendulum has swung the other way, and cost recovery has also been advocated as an ideological principle. There is strength in the argument that water can be provided for more people if consumers pay for it, and many of those still unserved in both urban and rural areas would be willing to pay a substantial part of the cost. However, as this chapter's discussion of sanitation illustrates, a cost-recovery scheme must be preceded by a study of the market, and some of the poorest families may be unable or unwilling to pay the charge. It has also been argued that concentrating on cost recovery in rural programs may divert weak organizational resources from other activities essential to sustainable programs, and hence prove self-defeating (Yacoob 1990).

In practice, a balance must be struck. There are enough externalities in water supply for government or donor investment to have a role, but there are also opportunities and good reasons for user charges. The relative importance of each is ultimately a political decision, whether for water supply or for sanitation. The greater interest of politicians in water supply often helps to ensure a subsidy. It certainly means that the setting of water charges is seldom left to the specialists.

5. Promotional Methods

"Promotion" has long been used in rural water supply, particularly in Latin America. In that context, it related to a range of activities seeking to motivate, educate, and organize a community to contribute towards the construction, operation, and maintenance of a new water supply. Much of the promotional effort in the water sector has been devoted to setting up community institutions to mobilize and manage collective resources. There was little need to persuade people of the benefits of water supply, but there has been increasing support for hygiene education as an adjunct to water-supply programs to ensure that they are fully used and their potential benefits fully realized.

The promotion of sanitation, on the other hand, has rarely sought to develop institutions at the level of the village or urban neighborhood. (Programs focusing on public toilets have been exceptions because a public toilet, like a water supply, is an item of community infrastructure.) Rather, sanitation promotion aims at the household level and seeks to develop demand for sanitation and encourage appropriate use of facilities. Thus the sort of activity most practitioners would recognize as "promotion" of a sanitation program contains elements of marketing, but in some ways it is more akin to health education.

Social marketing

A latrine is a product which one seeks to persuade people to acquire, usually at a price, and there is no fundamental reason why methods that encourage people to buy soap should not be used to persuade them of the benefits of latrines. Advertising is probably essential: the latrine design and the financial incentives accompanying it will not be familiar at the outset. However, the use without adaptation of methods from the commercial world, or "social marketing," as it has come to be called (Manoff 1985), could have shortcomings in a sanitation program.

Promotion is more difficult than simply marketing a product. First, a commercial marketing executive is not concerned, once a sale has been made, with the identity of the purchaser. But low-cost sanitation programs are targeted at those who cannot afford more expensive systems. In subsidized programs especially, funding bodies are concerned to ensure that the benefits accrue to those who would otherwise lack sanitation, rather than to those who would have installed satisfactory toilets anyway, at their own expense. However, more prosperous households are not very likely to obtain undue benefit from such a program, since they usually prefer costlier systems such as conventional sewerage, not included in the program.

A second difference between marketing and promotion is that the marketer is mainly interested in selling the product, while the promoter is also concerned with ensuring that it is correctly used. One might persuade a whole community to build latrines, but if they are all used to store firewood, one can hardly call the program a success. Even if the

latrines are correctly used but not properly maintained, the success of the program is jeopardized. Sanitation is a process, not just a product, when its use and maintenance are included, and that makes its promotion more difficult.

A third potential weakness is that commercial marketing techniques are usually aimed at individuals rather than the whole community. The highest rates of coverage have generally been achieved by sanitation programs in which the decision to install latrines is made collectively and community institutions are mobilized to ensure its implementation.

Finally, mass communication techniques are so attractive to the busy administrator that they easily tempt those who use them to forget to test and monitor the effectiveness and appropriateness of the messages they convey. Marketing messages go in only one direction, and must be balanced by feedback from consumers. No intelligent businessperson spends money on advertising without careful market research.

Commercial communication techniques can certainly be harnessed for sanitation, but they need to be adapted and evaluated carefully, bearing in mind the special needs of the sector. Helpful guides are available (Perett 1983, 1984; WHO 1987b; IRC 1991)

Health education

To the extent that water and sanitation programs seek to achieve health benefits, all promotion of them is a form of health education. This is not the place to offer a manual on health education techniques: excellent books on the subject are widely available. However, one theme recurs in the accounts of the more successful efforts at water and sanitation promotion. They tend to include some degree of participation by the community at which they are aimed. Details of participatory techniques are given by Srinivasan (1990). In this way people are spurred to think about the content of any health education and to assess how it might apply to their community.

Whereas the significance to health of a clean and plentiful supply of water is widely recognized, the health benefits of improved sanitation are not always understood by low-income communities. They need help in understanding sanitation if health considerations are to carry appropriate weight in their decision to build and maintain a latrine.

One measure that can add greatly to the credibility of promoters in this respect is for them to organize, early in the process, a program of treatment for intestinal worms, either for the population as a whole or for children of school age and below. A broad-spectrum anthelmintic drug should be used to deal with several species of parasite, but the most dramatic effect stems from the expulsion of adult *Ascaris* worms, typically 8-12 inches long and clearly visible to the naked eye. When a community suddenly discovers that a substantial number of its children are infected with large numbers of these worms, the perceived health benefits of sanitation acquire much greater significance.

This approach was used in a sanitation project in the "sweepers' area" of the town of Bhaktapur, Nepal (Lohani and Guhr 1985). Most of the residents believed they were very healthy, but after a deworming campaign that included a competition to produce the greatest number of *Ascaris* worms, their attitude changed. The project community workers explained that these worms were caused by promiscuous defecation, but stressed that any further action would have to come from the residents themselves. Within five days, a delegation came to the project office to seek assistance, sites for demonstration latrines were selected, materials were collected, the pits were dug, and construction of the latrines had begun.

There is a particular advantage in demonstrating the health benefit to children, since they tend to carry the largest burden of worms and suffer most frequently from diarrheal disease. Children thus stand to gain most from the health benefits of sanitation. It also follows that, contrary to popular belief, children's feces are more infectious than those of adults; they are more likely to contain diarrheal pathogens and greater numbers of worm eggs. If excreta disposal is to bestow benefits to health, therefore, it must include measures for the hygienic disposal of children's wastes.

However effective the health education methods used, few householders beyond a small minority of pioneers are likely to install a new latrine purely on the advice of strangers. Most people need peers pressure and support. For this reason there are advantages in a promotion system which mobilizes prominent community residents, such as Community Health Workers, officers of the local residents' association, women's organization, political party, or other volunteers, to spread the word among their friends and neighbors.

More powerful than persuasion or exhortation is the strength of example. Any cadre of promotion workers, whether trained professionals or local volunteers, must be seen to own and use sanitation facilities, preferably of the type they are promoting, if their words are to be taken seriously. This has the added advantage of allowing local residents the chance to inspect one of the latrines at first hand, and also to discuss its cost, use, and maintenance with the owners.

Inducements

Demonstration and exhortation have limitations. Their effects can take time to have an impact as the idea of improved sanitation starts to catch on in the community, and it can be many years before ownership of a latrine becomes the social norm. Inducements are often used to speed up the process. The simplest and most common of these is to subsidize the cost of construction. Subsidies were discussed in Chapter 4, and it was pointed out that in some cases they can be a constraint to program implementation and growth, and their use to speed implementation could be self-defeating.

There are other forms of inducement. Lottery tickets, for example, are popular and inexpensive. One approach that has been used in rural programs from Guatemala to Bangladesh is to link sanitation with water supply and make it a condition that a community install latrines for a set percentage of households before it can qualify for

subsidized water supply. There is a danger, however, in using incentives that are not directly related to sanitation. There have been cases of such sanitation-water linkage where there was no perceived need for sanitation in the population, who built latrines on sufferance with a view to obtaining a water supply but did not use them or maintain them adequately.

Inducements more directly related to sanitation might include a chamber pot for children, or items to clean or decorate a latrine; these could be offered as prizes to those with the best-kept latrine in each community, those persuading most of their neighbors to build or apply for one, or even to all those completing the superstructure in a scheme where the substructure has been built by the sanitation agency.

In some rural areas in the Philippines, rice from the World Food Program was given to households that completed their latrines, ostensibly to compensate them for up to five days' production lost during latrine-building. However, a survey showed that most residents would join the program with or without the rice incentive. On the other hand, if a household did not complete its latrine within two months of receiving a free toilet bowl, the toilet bowl was confiscated and given to another household.

Inducements need not be offered to individual households; as the water-supply example shows, inducements can also be offered to a community. Some rural pit-latrines programs in Malawi have provided an interesting example of this. They were based on a prefabricated floor slab that can be installed in an existing pit latrine to improve its appearance, reduce the risk of children falling down the hole, prevent hookworm transmission, and provide a measure of fly control. Production facilities for these slabs can be moved from village to village in response to requests from the villagers. However, a certain percentage of households in the village must first have their latrine pits dug and ready to receive the slabs before the production team will visit. In this way, the offer of the slabs, originally designed to upgrade existing pit latrines, has caused the construction of many thousands of new latrines and increased coverage in many villages from a minority of households to over 90 percent. An important component of the process has been the mobilization of the less enthusiastic residents by their more active neighbors.

Compulsion

In a community where only a minority of households have adequate sanitation facilities, compulsion is unlikely to change the situation very much. Some colonial regimes in Africa and elsewhere tried to make it compulsory to build a latrine, but succeeded in building little but resentment and contempt for such regulations. In many cases, such regulations are still on the books of independent former colonies, often as part of the building regulations. Their effect on sanitary conditions is no greater than before.

Part of the problem is that building regulations of many developing countries are irrelevant to the needs of low-income groups. There is no doubt some virtue in making them less so by adapting them to embrace on-site sanitation systems and local low-cost building materials. Most useful of all, though, is to make them more useable by writing

them in the form of guidelines and manuals rather than legal prohibitions, and applying them by offering technical guidance and support rather than by policing their enforcement.

Nevertheless there are two sets of circumstances in which some form of compulsion may help to ensure a high degree of coverage of a community with sanitation facilities. It can be argued that a high coverage level is necessary if sanitation is to be of benefit to the community's health because the fecal pollution caused by a minority of nonusers is sufficient to jeopardize the health of all their neighbors.

The first case is where anyone wishing to erect a house in an area of new construction is first obliged to install a latrine. For example, in some of the new communal villages formed in Mozambique in the first years of independence, the villagers' committees passed by-laws under which construction of a house for a new resident is not permitted until a pit latrine has first been completed. In the urban site and service schemes in Botswana, each plotholder has to complete the latrine superstructure within three months from occupation of the site and before starting to build the house.

The other case is the consolidation phase of a sanitation program, in which the majority of households already own a latrine and sanitation has become the social norm. Compulsion, reinforced by the power of peer-group pressure, may then help ensure that the remaining minority conforms to that norm. Here too, the compulsion must be an expression of the values of the community, rather than coercion from outside or the residents will not accept the authority of those who impose it and will probably seek to evade it. If the compulsion is visibly an expression of the will of the community, members of the community will themselves apply pressure to those who do not comply. In general, successful promotion is most effectively achieved through members of the community, who can exert a far stronger influence on their friends, relatives, and neighbors than any outsiders or mass media.

To summarize, this chapter has touched on a variety of promotional methods, from marketing and health education to inducements and even compulsion, all of which can be applied using a range of media and institutional arrangements. There is no reason why, in a given context, only one of these should be appropriate. In practice the best strategy will involve a mix of different approaches used together or in different phases or settings. However, the communication and promotion strategy of a sanitation program needs to be planned. Planning a promotional strategy offers ample range for creativity informed by intuition and sensitivity to the cultural context of the program. Program managers should give careful thought to it from the first phase of the program, so that the strategy can be tested and refined in the pilot phase.

6. Targeting the Promotion

If low-cost sanitation programs are to succeed, they must be acceptable to consumers, politicians, planners, and the agencies that fund them. Sometimes, indeed, it is here that they encounter the greatest resistance. Promotion targeted at such decision makers is usually referred to as advocacy, and this paper does not seek to offer detailed guidance on that important subject. Chapter 1 gives several arguments for support to low-cost sanitation by governments and donors, but a more graphic illustration of the sector's potential is often necessary to convince senior officials. With UNDP support, the World Bank has produced video and slide materials that can be shown to decision makers for this purpose, and local World Bank staff can help arrange a viewing. The best argument of all, though, is a visit to a successful pilot-scale program. Decision makers can see the benefits of sanitation in the local setting, and they can meet satisfied users personally. The rest of this chapter, however, deals not with advocacy but with targeting the promotion of low-cost sanitation to consumers.

A company with a product to sell, certainly a company aiming for a high volume of sales, normally directs its initial promotion efforts at a carefully selected segment of the market. The target consumer may be a particular kind of person or institution, and sales may initially be limited. Those planning the promotion of improved sanitation facilities are well advised to follow a similar strategy.

It was mentioned in Chapter 2 that the pilot phase will help refine and test the promotional approach and provide a demonstration area when the program goes to full scale, but these functions need not end with the conclusion of the formal pilot phase. The methods used for promotion need continual refinement and adaptation as the program expands into new areas and builds up to a larger scale. Every latrine built and every community served are demonstrations that can help promote the program. Careful targeting of the initial promotion can ensure that this demonstration potential is exploited to maximum effect.

Demonstration models

One group that should receive latrines as early as possible is the promotion workers themselves. Apart from providing them with a handy demonstration model, no one can doubt their sincerity when they promote the advantages of improved sanitation.

Provision of latrines at public institutions will also facilitate demonstration. Health facilities should receive early priority; it is hard to persuade people that hygienic sanitation is good for their health if health facilities themselves do not provide it.

Sanitation for schools, especially primary schools, is also important. The significance for health of latrine use by children has already been mentioned. In addition, children can play a key part in introducing new habits to the family, and if the habit of using a latrine

can be taught at school age, it is likely to continue into later life. However, simply providing the latrines is not enough. In the Kwale Project in Kenya, where demonstration latrines were built at schools as part of a rural water supply program, most were used only by the staff and had little impact on the community at large. Normally, separate latrines are needed for pupils and teachers.

Other community institutions and public facilities suitable for demonstration latrines will suggest themselves in the particular settings. For example, in the low-cost sanitation program in Dar es Salaam, a large portion of the latrines built in the early stages were at local offices of Chama Cha Mapinduzi, the national political party. Most people had to visit these offices from time to time and thus had an opportunity to see and, if they wished, to use one of the improved latrines that the program was promoting.

Latrines promoted for individual household use may not be suitable for the more intensive use and less careful maintenance that institutional sanitation facilities are likely to receive. A latrine whose pit fills too fast, whose door falls off, or whose floor becomes impregnated with urine can hardly be an attractive model. But care must be taken to ensure enough similarity for anyone to identify the demonstration models as using the same technology and providing the same benefits as the household latrines the program seeks to promote.

Another approach, which need not conflict with the suggestions above, is to concentrate in the early stages on achieving high levels of coverage in specific communities. The use of target communities is discussed below.

Targeting households

One of the important targeting decisions in commercial marketing is to select the groups at which the promotion is to be directed. A similar decision faces the promoters of low-cost sanitation. The intuitive answer might seem correct: one promotes low-cost technology by aiming at the poorest groups in the population.

In practice, however, one is often faced with a dilemma. In most societies, the first to take advantage of new technology, credit, government subsidies, and opportunities to improve their standard of living are the relatively well-off members of the population. They are economically more secure and better able to take initiatives others might perceive as risky; they are better educated and more aware of the benefits offered. Innovations they adopt are likely to acquire an aura of status that makes them attractive to emulate. Should one therefore target the promotion at this group, as well as the poor?

The dilemma is most acute when a subsidy is involved. Is it equitable if a subsidy intended to put sanitation within the reach of the poorest is taken up by those who could afford to build their own? Is one to put a ceiling on the income of the households which are allowed to benefit from the program? In many cases, the problem is solved when the wealthiest households aspire to more expensive sanitation systems such as conventional sewerage or septic tanks, but it cannot always be assumed that this will occur. On the other hand, it is not necessarily bad if relatively well-off households adopt the sanitation

technology which is being promoted. As long as their participation does not absorb an excessive amount of program resources, it can help to turn a latrine into a status symbol others will wish to acquire.

The argument can be taken further. The program may be specifically targeted, initially at least, at those a little above the poorest socioeconomic status. This is not as heartless or as unprecedented as it may seem. Most sanitation programs are limited in their coverage to those with more or less permanent housing, and if they include some degree of cost recovery or self-help construction, they are likely to exclude the very poorest households. The promotion of pour-flush latrines in urban India is not aimed at pavement dwellers.

A more striking example is found in the rural sanitation program in Zimbabwe. One of the latrine designs originally developed for rural application was of minimum cost as it used very few materials that were not available locally. However, this type was later dropped from the program because it required a fair amount of maintenance if it was not to deteriorate in a few years. Construction of the more substantial designs required greater expenditure on the part of the owners, but this was not considered a disadvantage. The program was deliberately targeted at households of average or above-average income, as it was believed that this would impart status to latrine ownership so that lower-income households would be encouraged to save for latrines of their own. That in fact occurred, and coverage levels of over 60 percent have been achieved in many villages.

As this example shows, the choice of target population interacts with the design cost of the latrine (Chapter 3) or, to be precise, with the amount the users will be expected to contribute (Chapter 4).

In commercial marketing it is necessary to select not only the types of households, but also the members of those households on which the promotional effort is to be focused. As soap manufacturers learned long ago, the role of women in the management of domestic hygiene is crucial. This has come to be recognized in the hygiene education activities that accompany many water-supply programs, and it is no less relevant to the promotion of sanitation.

Women are usually very eager to have sanitation, whether for privacy or to protect their families' health. They are usually responsible for disposing of the wastes of infants and toddlers, teach defecation habits to the older children, and clean and maintain the household latrine. Though they may pay for and even build latrines themselves, they often need the agreement of the male household head. Women are therefore rightly the prime focus of sanitation promotion, but they need support in persuading the men of its advantages.

Promotion activities aimed at children through schools can also play a supporting role. Primary schoolchildren are the largest, most impressionable, and most attentive audience in the world.

Targeting communities

Another important planning decision relates to the choice of communities that will be targeted in the initial phases of the program and will receive priority in its development. Several options have been tried, and there are valid arguments in favor of each.

One option is to start with a number of communities scattered over a wide area, to provide the greatest possible demonstration effect. These might be chosen for their spatial distribution, or for small size (so that high coverage rates can be achieved quickly); or they might be the most enthusiastic, best organized, or easiest of access so that implementation will be as easy as possible while the staff are still developing their skills. More people are likely to hear of the program and see its results if many demonstration communities are chosen, but this strategy tends to disperse the program's efforts over a wide area in the early stages, when staff need most supervision and when logistical capacity is still being developed.

Another possibility that is not difficult to justify is to start with the communities whose present sanitation conditions are the worst, and where the program can offer the greatest benefits to the environment and to community health. For example, when selection criteria were drawn up in Manila for the allocation of public sanitary facilities, priority was given to congested, low-income areas where the residents lacked private toilet facilities, although other factors such as the availability of water supply and the ease of land acquisition were also taken into account.

Alternatively, if it is considered that political will at the local level is the best guarantee of success, the program's intervention may be restricted to those communities where the local authorities have actively requested it. This policy was followed in the rural sanitation program in Burma, where District Councils had to make a formal request for the assistance of the Ministry of Health's sanitation team and draw up a detailed implementation plan before the ministry would help them.

In Zimbabwe the rural sanitation program developed after each province planned a demonstration project in a single district. The program now uses the resources of the whole province to increase coverage in a single district before moving on to another and repeating the process.

The time frame

The literature on the diffusion of innovations (Rogers 1983) describes four successive phases in the adoption of a new practice by a community, such as ownership of a latrine. In the first, the innovation is adopted by "innovators" who tend to be younger people with a more cosmopolitan outlook and better education. They are soon followed by the "early adopters" who command more respect in the community. They are often the wealthier households with resources to spare for such novelties and to cushion them if the innovation turns out not to be a success. The two groups constitute some 15 percent of the population, and indeed it has often been noted that an innovation only "takes off" after it has been adopted by 10-25 percent of the community.

In the third phase, the example of the early adopters having shown that the new practice is feasible and beneficial, others will decide to follow them. It is in this phase of the process that the innovation comes to be accepted by the majority of the population, and it gradually becomes the norm in the community. This prepares the scene for the fourth and final phase, in which peer-group pressure is exerted on the remaining minority of "laggards" for them to conform.

The relevance of this analysis to sanitation programs is not hard to see, and the gradual process of adoption of latrine ownership as the social norm has been documented in several cases. For example, in one village in Palestine (Smith 1988) where no outside agency sought to promote sanitation, the "latrine acquisition curve" showing the progressive increase in the percentage of households owning latrines stretched over more than two decades. The Maputo sanitation program described in Box 1 had a "sales curve" rising progressively over several years. It has still not reached the turning point of the S-shaped curve of cumulative adoption by the whole community.

However, there are advantages in concentrating the effort of promotion in an intensive campaign of relatively short duration, at least in each community. The advertising industry has long known this, as its campaigns have often shown. In the context of water and sanitation, many self-help programs have illustrated that it is possible over a limited period to generate far more enthusiasm and effort on the part of the residents than could ever be sustained in the long term. In the context of the heightened interest developed in a campaign, health education messages are likely to reach a wider audience than when they are delivered in routine circumstances. It is also possible to use "publicity stunts" such as deworming campaigns (Chapter 4) to greatest effect.

Experience suggests that intensive sanitation campaigns can achieve higher coverage rates than campaigns in which the sales curve is allowed to take its course, but the cost of promotion will be greater as a result of the increased promotion required if a campaign is to be successful. An intensive campaign does not guarantee success, though. However enthusiastically it is launched, and however great the resources available to promote it, it should first be tested at pilot scale (Chapter 1), and suitably organized (Chapter 2) to promote an appropriately chosen technology (Chapter 3) based on a realistic assessment of what is affordable (Chapter 4).

7. The Role of Donors

Troublesome ambiguities beset the role donors can play in supporting water and sanitation programs:

First is the inevitable conflict between the need of donor agencies to safeguard their investments and their desire to empower national agencies and local communities. Donors are enthusiastic to develop counterpart capacity in the countries where they are active, and to promote the participation of local communities, both as passive contributors of labor and as active, responsible collaborators in planning and implementation. But they are also concerned to ensure that the programs they support are cost-effective and meet objectives the donors consider worthwhile and within a period they consider acceptable. The objectives of a donor agency are not necessarily espoused by the national government or by local communities, and they may think in terms of very different time-frames.

Second, while donors are anxious to assist programs that will become self-sustaining, their assistance can create its own dependence. This is particularly true when their assistance takes the form of funds, but technical assistance can also create dependence if it shifts the primary responsibility of decision making to foreigners. The professional development of junior local staff is impeded, and senior officials acquire the habit of leaving things for the donors to decide, or even trying to second-guess the donors' wishes.

Third, while donor support to a water and sanitation program does not normally seek explicitly to influence national or local politics, it can have considerable political impact because of the potential popularity of these programs and the important role of local government in their implementation. They therefore arouse the interest of politicians, so that politics, particularly local politics, can have a major influence on them. Water supply and sanitation programs are unlikely to be successful unless they fit into a workable political strategy.

How then can one reconcile the objectives of donor agencies with those of national governments and local communities and politicians? How can one achieve both efficiency and empowerment? For donor agencies wishing to increase the rates of coverage with water supply and sanitation in developing countries, while helping to create sustainable programs in the long term, there are no simple answers to these dilemmas. However, some approaches seem more promising than others.

Local institutions

The first, which has already been mentioned in previous chapters, is to start from local problems and local attempts to solve them, rather than from solutions that have been successful elsewhere. This applies as much to institutional questions as to the choice of technology.

"Local" in this context may refer to the developing country concerned, or to a region, district, or community. As developing countries seek to democratize and decentralize their administrations, donor support can play an important part in strengthening the institutions of local government. This is not to suggest that donors should support the localities or agencies of their choice without reference to the national government. It is the task of the national government to coordinate the donors' activities and ensure that they fit into the framework of its regional and sectoral policies. Nevertheless, within this framework there is room for dialog between donor and government. A donor is most likely to find itself supporting a successful program if, when it chooses a counterpart agency to support, it is sensitive to the wishes of the government and also to the strengths and commitments of existing local institutions.

It may be that a donor already supports projects in a sector related to sanitation. It is likely to choose the agency which implements them; its existing contacts there could facilitate further collaboration and inspire confidence that the new program would be implemented competently. An appropriate choice of local implementing agency can also improve coordination with related sectors, such as housing. For example, the implementation of the urban sanitation schemes in Botswana through the ministry responsible for planning and housing was essential for their success, and particularly for the system of cost recovery through plot charges. Choosing an implementation agency from another, richer sector can also help capture some of the resources of that sector and increase the amounts available for water and sanitation. In Manila, for example, much of the urban low-cost sanitation upgrading was entrusted to the Department of Public Works and Highways, where it cost no more than one third of the total amount spent, including drainage and street improvements.

On the other hand, such an agency may lack the vocation for sanitation work. In particular, it may lack the cadre of field workers skilled in community relations and promotion which sanitation requires. This was a problem in the Manila program, which at one time was managed entirely by engineers who did not pay attention to relations with local governments and communities.

For the donor, then, it may be preferable to seek a local agency that has an interest in developing a sanitation program and a vocation for the task, so as to help support it and release the constraints to its growth, rather than impose a program on an agency which, though formally responsible for the sector or active in a related field, is not interested in it. In some cases the "interest" of an agency in promoting sanitation may consist of little more than one enthusiastic, competent, well-informed individual, but the possibility of donor support may be just what they need to persuade their colleagues of the feasibility of their ideas. Donor agencies often produce their best results when they find such individuals and work through them. The central role of the local divisional secretary in the success of the Wang'ombe water and sanitation project in Tanzania is an example of this process.

The growth points, be they agencies or individuals, are not only to be found in the public sector. They may also be nongovernmental organizations such as Agua del Pueblo, which provided a model for subsequent programs in rural Guatemala, or the Kenya Water for

Health Organization (KWAHO), which worked with the Kenyan Government and SIDA to provide the promotion support in the South Coast Handpump Project.

Finding the growth points takes time and patience on the part of the donor. The need for patience at this stage is most difficult to understand in the donor's head office, where there is often pressure to commit funds as soon as possible. Later, as the project gets under way and encounters its first bureaucratic obstacles, the impatience shifts to the field staff, who may suffer a strong temptation to administer it themselves, or to establish an autonomous agency to implement it independently of the existing, inefficient bureaucracy. This may result in the project achieving more concrete goals in the short term, but the program is then almost certain to founder as soon as donor support comes to an end. It will also undermine the possibility of indigenous agencies taking responsibility for the development of the sector in the future.

Technical assistance

In the same way as imported technology and imposed institutional arrangements are less likely to take root than their home-grown equivalents, imported technical assistance also has problems. That is why the international donor community, with the World Bank and UNDP playing a leading role, has devoted considerable effort to developing and supporting a network of institutions active in training professionals from developing countries in the field of low-cost water supply and sanitation. However, there is, and there will continue to be, a role for expatriates in the water and sanitation programs of many countries for some years yet. At its best, the provision of expatriate technical assistance can be the most valuable single contribution to the sector a donor agency can make; but care is required to ensure that it does not undermine the value of all the others.

One principle, followed by some donors more than others, is to refrain from posting expatriates to a project unless specifically requested by the local implementing agency. An agency that does not recognize that it needs help is unlikely to accept it gracefully, and if the donor does not trust it to use funds wisely without expatriate supervision, it can hardly be trusted to sustain the program when donor funding has ended.

The roles which expatriates are called upon to fill also need careful choice. A noteworthy feature of the Kwale project in Kenya, and of various other successful donor-supported water and sanitation schemes, has been that external agency staff were restricted to supportive rather than managerial roles. A donor agency needs considerable resolve to restrict its expatriates to training and institution-building activities and keep them away from operational functions, particularly when the sector's weaknesses are a constraint to project implementation. The temptation for the external funding agency is to set up its own implementation capacity to by-pass the bureaucracy of the local institutions. The result is that the local institutions do not gain in efficiency; on the contrary, they lose their best staff to the donor's organization, which is entirely dependent on external funds. Some donor agencies have taken an intermediate course, paying incentives or salary supplements to the local staff to improve their motivation and productivity. There is a

risk that this may lead to them giving up any other tasks for which they do not earn such supplements, as well as demoralizing other staff not covered by such a scheme.

Many donors employ expatriates on relatively short contracts or post them for a limited period in each country, typically two years, and this can cause problems in sanitation programs. It does not give them much time to study existing conditions in their country of posting; they must hurry to make a start on implementation if they are to achieve concrete results before they move on. The rapid turnover in expatriates can also give the donor too short a memory of what has been learned in the field. There is therefore a lot to be gained from postings of longer than two years, and some donors now recognize this. Some of the best examples of external technical assistance to water and sanitation have built on four or more years of experience in the country by the expatriates concerned.

The project cycle

Another aspect of the role of donors deserves consideration. It has been suggested that the project cycle, central to the procedures of most donor agencies, exerts a distorting influence on project implementation. The time-frame of two to three years imposed by such project funding is too short for the perspective of 10 years or more to be seen in many successful programs. More significant, it can be argued that a master plan drawn up for water or sanitation in a large city or a rural region can take too much time and money to prepare, with such a heavy staff requirement that it is inevitably entrusted to a foreign consultant, and is then too rigid an instrument for the planning of effective programs. A detailed case study of the negative effect of master plans in the rural water supply sector in Tanzania has been published by Therkildsen (1988).

Many successful programs have been developed without the benefit of a master plan or feasibility study. In Zimbabwe, early development work on low-cost water and sanitation was carried out entirely with routine national government funds. On the other hand, master plans are unlikely to identify new areas for intervention unless these have been foreseen in their terms of reference. One need only look at the many sanitation master plans produced for tropical cities before 1980, most completely neglecting nonsewered sanitation, and thus sanitation for the lowest income groups, to see this.

Whatever the value or otherwise of strategic plans or feasibility studies, one lesson is clear from the more successful water and sanitation programs. The process by which they are planned and administered must allow the greatest possible degree of flexibility. There are two main reasons for this.

First, the promotion of water and sanitation for low-income communities is a creative, responsive process, and the "blueprint" approach is inappropriate. Each project is a learning process, in which every staff member accumulates experience that can contribute to improvements in project design. The project must be able to evolve and grow, at least in its early stages, as the best approach to implementation is identified, developed, and refined.

Second, delays in project implementation are so common that it is prudent to expect that they will occur. Delays often result from difficulties in tendering and procurement, and they can also be caused by unexpected problems of implementation. Such delays can try the patience of any funding agency, but patience is precisely what is needed if the learning process is to be fruitful and empowering to the project's staff and beneficiaries.

Fortunately, the donor community is increasingly conscious that it does not have all the answers, and that many of the problems of the water and sanitation sector can be solved only on the basis of local experience. If there is one abiding lesson that the Water Decade can teach us, it should be that all of us -- donors, planners, engineers and promoters -- still have much to learn.

BOX 5

STRATEGIC SANITATION PLANNING

One of the lessons of the Decade has been the futility of relying exclusively on the master planning approach or on high-cost conventional sewerage alone for meeting the sanitation needs of all segments of urban communities, particularly the poor. To address this concern, the UNDP-World Bank Water and Sanitation Program has developed the Strategic Sanitation Planning (SSP) approach to the provision of services.

The SSP is both a plan and a process. It is the *plan* (produced at the prefeasibility stage of the project cycle) that defines the approach to be followed in the delivery of sustainable sanitation services to all segments of a given community. It is also a flexible, bottom-up *process* that allows different factors and parameters to be taken into account in meeting service goals. The process requires that consideration be given to a wider range of sanitation technologies, willingness to pay, and to local resource endowment in preparing the overall strategy and determining appropriate service levels for different segments of the community. It also has an inherent capacity for learning by doing and for institutional strengthening.

Basic elements of SSP are:

1. Establishment of sanitation service goals following a situational analysis.
2. Preparation of a strategic plan for meeting the sanitation service goals for the whole community.
3. Preparation of a first-stage project for a part of the total strategic plan area.
4. Implementation of the first stage project, including operation and maintenance.
5. Monitoring and evaluation of the project.
6. Feedback of implementation experience.
7. Progressive expansion to cover entire planning area, using feedback to refine subsequent projects.

Source: Macoun (1990), Extending sustainable services in a resource-scarce world. UNDP-World Bank Water and Sanitation Program.

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