

Arif Hasan

# Low-cost sanitation for a squatter community

The sanitation programme of the Orangi Pilot Project in Karachi has shown that the condition of the poor can be improved through a development strategy in which the people participate, provide finance and take over some of the functions of government agencies.

The Orangi Pilot Project started in 1980 as a result of an understanding between Akhtar Hameed Khan, now its Director, and Aga Hasan Abadi, President of the Bank of Credit and Commerce International, which provides it with funds. About half of Orangi township, the largest squatter colony in Karachi, lies in the project area, which amounts to some 800 hectares and contains 3181 lanes and 43 424 housing units. Except for the project's low-cost sanitation programme and the recently-installed standposts supplying water, there are no urban services.

## Money and method

There are two major impediments to providing a sanitation system for a squatter colony. The first is that the local authorities do not have the finances for constructing a sewerage system. Where international finance is available the question of repayment arises. Furthermore, international loans can only deal with a small part of an

immense problem: there are over 362 squatter colonies in Karachi alone, comprising over 4 million people. Secondly, the cost of urban services as developed by local authorities is five times the actual cost of labour and materials. Squatters cannot afford to pay the resulting charges.

The project's low-cost sanitation programme aimed at discovering alternative sources of finance and a new method of implementation that would not cost more than the materials and labour. To achieve these objectives it was necessary to study the sociology, technology and economics of the people's solutions to their sanitation problem.

Before the programme began, the majority of the people of Orangi used bucket latrines that were emptied every four or five days, very often on unpaved lanes. The more affluent houses had soakpits which filled after a few years and did not solve the wastewater problem. Some people laid sewerage pipes from their houses to the nearest natural drainage outlet. These pipes were frequently defective and there were often many parallel pipes in one lane. However, despite its shortcomings, this

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system cleared the streets of both excreta and wastewater, and if properly laid, no recurring expenditure was required to maintain it. The people preferred an underground system, and the project organizers felt that, if the right technical support and tools could be provided and the residents trained to use them, a sewerage system financed and constructed by the people could become a reality.

### Community participation

Three concepts were central to the sanitation programme: community participation; modification of standard engineering technology and implementation procedures to make them suitable for such participation; and redefinition of relations between the community and local government.

The first step towards creating a sewerage system was to form community organizations with the lane, which in Orangi consists of 20–30 houses, as the basic unit. This was a small cohesive unit with no problem of mistrust. Moreover, it was judged that the

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traditional leadership, which functioned at neighbourhood level, would not feel threatened if the programme was limited to one lane at a time. Working in this way was considered by planners to be an invitation to disaster but because of innovation and

modifications to engineering practice their fears proved to be unjustified.

The project's social organizers held meetings in each lane and, with the help of slides, models and pamphlets, explained the programme and its economic and health benefits. It was pointed out that the Karachi Development Authority and the Karachi Municipal Corporation did not lay sewerage pipes free of charge, and that their prices were beyond the means of the residents. If they formed an organization in which the whole lane participated, then the project would give them assistance. In the second stage, the organization was born and chose its lane manager, who formally asked for assistance. The project's technical staff then surveyed the lane, established bench marks, prepared plans and estimates and handed them over to the manager, who collected the necessary money from the people and called meetings to sort out any sociological problems connected with the work. The project's staff provided supervision but never handled the people's money. Studies of the way in which the lane organizations have dealt with sociological and technical problems have been prepared, and some have been published in *Orangi*, a magazine published by the project.

### Education and research

As there was no central supervisory and controlling agency and as people often worked on their own, the only way of trying to guarantee quality was through education. However, people who are financing and managing their own work cannot be forced to listen to advice, and some substandard work was done. In mid-1982 there was a lull in the programme because of this, and a re-evaluation of the concept, design and implementation procedure became necessary. Research followed on the causes of

substandard work and on ways of simplifying engineering designs. The results were taken to the people in hundreds of meetings. In this way the people learnt about mixing concrete, curing it and making inverts to manholes. Masons were trained in the required sanitation technology and their addresses given to the lanes that applied for assistance. This extension effort led to a great improvement in the standard of work.

### Pressure on councillors

Initially only those lanes asked for assistance which were near a natural creek or *nullab*, or where drainage into *nullabs* presented no difficulties. To promote the concept of secondary drains the project arranged for a physical survey of Orangi to be carried out by architecture and engineering students, who recorded land use, slope and other details. After 30–40 students had moved through the area, talking to the people and involving them in their work, the function of secondary drains became widely understood. In addition, community participation came to the attention of universities and colleges, whose involvement in the area is consequently growing. The results of the survey were communicated to the local councillors and the people were informed of this. They pressurized the councillors to take an interest in the matter. A large number of neighbourhood lane organizations thereby came together and asked the project for technical assistance in the construction of secondary drains.

Major changes have taken place in the relationship between the Orangi councillors and the Karachi Municipal Corporation. Councillors get grants-in-aid from the Corporation for certain development projects in their areas. The Corporation's regulations state that this aid can only be used for the

construction of roads or open surface drains. However, in November 1984 the people of Orangi Sector 5 forced their councillor to use money from this source to construct an underground sewer. Initially, they also insisted that they should use it themselves without engaging a Corporation contractor. This was not agreed to and a contractor was employed according to the Corporation's regulations. The people, now well versed in sanitation technology, did not permit any substandard work to be done. They also won agreement that the project should design and supervise the construction work.

### Continuing progress

There is no longer a need to motivate the people. Lanes now organize themselves and contact the project for technical assistance, and increasingly the project is involved in this rather than in organization.

The project now identifies locations where secondary drains should be constructed and designs and supervises works being financed by the Corporation, in addition to helping with the construction of primary drains. In effect, the project seems to have become a research and extension agency for the Corporation.

By December 1985, over 1571 lanes had built sewerage systems; over 137 secondary drains had been constructed, 107 of them financed by the lane residents and 30 by the Corporation. The people have invested US\$ 1.7 million in this effort and the project's investment in research and extension has been about \$ 93 750, inclusive of capital expenditure for tools, shuttering and vehicles. The local authorities would have spent about \$ 8.5 million on this work. The project's social organizers, the lane managers, and the people who participated in the development work are emerging as an

alternative leadership to the traditional one, which consists mainly of land-grabbers and subdividers who created Orangi and have exploited the people ever since. One of the project's social organizers has been elected as a councillor.

Two other squatter colonies in Karachi have applied to the project for assistance in acquiring a sewerage system through community participation and finance. Requests for help have also been received from large villages. In addition, the Aga Khan Medical University and the Department of Architecture of the Dawood College of Engineering and Technology, Karachi have associated their courses with the programme.

A major environmental and social change has taken place in Orangi. The lanes which have a sewerage system are now clean and healthier. The people here have undertaken

to improve their houses and the value of their property has gone up considerably. Quarrels about sanitation, which used to be common, no longer occur.

On the basis of the experience gained in the sanitation programme, the project is carrying out a housing programme, a women's welfare programme, and a programme for women's work centres. Furthermore, as a result of lobbying of the Karachi Municipal Corporation by the project, consultants have been asked to prepare a sewerage master plan for Orangi, which will incorporate the work already done. □

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## Constraints on housing improvement

*Most human dwellings fail to protect people against avoidable health hazards. The improvement of the housing situation largely depends on socioeconomic progress, which, in many countries, is constrained by:*

- *poverty, which limits the material and social means for advance, contributes to debilitating malnutrition, and restricts land tenure;*
- *the growth of populations at rates that outrun economic development, and massive urbanization that thwarts efforts to meet minimal health and security needs;*
- *limited powers of governments and communities to confront the fact that most dwellings are self-built, coupled with inadequate knowledge among the public about the health aspects of human habitats;*
- *inadequate attention to social development as it relates to economic conditions.*

— *Shelter and health. Contribution of the World Health Organization to the International Year of Shelter for the Homeless. Geneva, WHO Programme of Environmental Health in Rural and Urban Development and Housing (document WHO/EHE/RUD/87.1).*