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DR. JORGE ANZORENA's
report on Pakistan Projects.

Orangi pilot project

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DR. JORGE ANZORENA's report on Pakistani Projects.

INTRODUCTION

Dr. Jorge Anzorena is professor of Architecture at the Sophia University, Tokyo, Japan. The subject that he teaches at the post graduate level is "Development". Six months of the year, from October to March, he spends in visiting, evaluating and advising development projects in South and South East Asia. He is considered, the world over, as an expert in his field. He has been associated as a consultant with various community participation projects in the Philippines and Indonesia. He is the author of numerous papers and a book in Japanese on development. Recently his new book, "A Time to Build: Peoples Housing in Asia", has been published by the Asian Bureau, Australia.

Dr. Anzorena has visisted Pakistan regularly the past many years. His most recent visit was in last January, when he spent two days with the Orangi Pilot Project and slept for two nights in OPP office. In his newsletter he has written on OPP and two other Pakistani Projects. The Pakistani portion of his newsletter for February is enclosed.

E. J. ANZORENA, S.J.
FEBRUARY, 1984
PAKISTAN.

ORANGI PILOT PROJECT (QPP)
1-D/26 Daulat House
Orangi Township
Karachi 41, Pakistan.

Introduction:

Paul Baross's report to ESCAP of the infrastructure provision for low income settlements was published in the newsletter of October 1983 with some concluding observations:

"The environmental conditions in low income neighbourhoods remain poor and hazardous to health because adequate solution to water supply is on a purely autonomous basis".

To make progress probably a new institutional model of partnership is required with corresponding innovations of technology and organizational skills which requires sharing of responsibility for the production and maintenance of urban services.

In March 1983 I reported about the pioneer work of OPP in Karachi related with the sewer system.

But after my visit in January 1984 I felt the uniqueness of this project with regards to:

- 1) Creating better environment for thousands of families;
- 2) Its affordable cost;
- 3). The increasing sense of community:
 - a. When 20 to 30 families in the same lane set up a sewer for their lane;
 - b. When the families living in several lanes come together to set-up a secondary lane;
 - c. Eventually several hundreds of families connected with several secondary lanes set up the main lane.
- 4) The way this project is creating a more decentralized system in Orangi shows that citizens can now handle by themselves many of their problems and are able to build an infrastructure system and are developing the capacity to maintain it;
- 5) The capacity of the OPP technical team is to analyze and divide the complicated technology of the sewer system in a series of simple steps which can be understood and handled by masons and the local residents;

- 6) The role of OPP is not to control but to guide the local projects through discussions, leaflets, posters in which the small failures of the residents become a learning process for them.

I. GENESIS OF THE PROJECT

Orangi is a Katchi abadi or substandard urban area, a squatter town inhabiting 800,000 people in an area of approximately 5,000 acres. In the Karachi division alone, there are 362 such Katchi abadis with a total population of two million.

For a long time the existence of such large numbers of people living in Katchi abadis was not recognized by the government. The government felt no obligation to their developmental needs and no attention was paid accordingly, until a Directorate of Katchi Abadis was created in order to look into the possibility of providing the Katchi Abadis the basic services such as water supply and sewerage, etc.

The improvement of Katchi abadis in term of providing water supply and sewerage involves large sums of money. The government agencies who are responsible for this task, first the

Karachi Development Authority (KDA), and since July 1981 the Karachi Metropolitan Corporation (KMC), have faced difficulties with regards to funding these improvement projects.

The difficulty has not been so much in finding a lender as much as in finding the ways and means of recovering the loan money for repayment. The government would have to either repay the loan from its own resources or recover it through the beneficiaries (local residents of Katchi abadis). When large sums are involved none of this seems to have been easily possible. Experience from Baldia Improvement Project of Karachi shows that recoveries from lease charges lag behind expenditure. In the first three years, KMC spent Rs:30 million (US\$2,000,000) but it recovered only 33% of this amount from the residents who are reluctant to pay lease charges as long as they do not see improvement works actually carried out.

As for raising the necessary funds from the local residents of Orangi in the form of development charges, the major obstacle has been the prohibitive rates charged by the KMC or KDA planners, engineers and contractors. Residents find it impossible to pay Rs.3,000(US\$200) or Rs:4,000(US\$267) per house for the development of improvement of drains,

sewerage, etc., they are charged Rs:15,000 (US\$1,000) or Rs:20,000 (US\$1,133) for a house built on 80 to 100 square yards (66.90 sq.m to 83.6 sq.m.).

The residents felt that it was the duty of the local councillors or the KMC or KDA to provide these basic facilities for them. The KMC, on the other hand, being unable to recover the development charges from the residents of these low-income areas left things as they were, and the result was further deterioration of the sub-standard and unhygienic conditions in the lanes and in the area as a whole.

Under these difficult conditions, some people have themselves made several attempts to improve the sanitation of their lanes including constructing elementary sewerage facilities in a few areas. They have tried to lay pipes for the disposal of water and sewerage from the lanes into the big nalas (natural drains). A few people who can afford the cost have even made their own septic tanks. However, given the lack of technical support many such efforts have been unsuccessful. The level of the pipes has not been properly maintained, Manholes are often not made. Or the pipes have not been laid at sufficient depth to be able to bear the weight of vehicular traffic.

It seems that despite good intentions and some investment the government authorities have not been able to bring about any substantial change in the infrastructure of Katchi abadis. Whatever may be the reason, it seems to be two set of rules operating in every country, one for the affluent sections of the society who need and get all the facilities of a healthy living, and the other for the poor who are made to live without the basic facilities of running water, sanitation, drainage system, roads electricity, etc.

**II. SEARCH FOR A DEVELOPMENT
STRATEGY THAT IS PEOPLE
ORIENTED:**

When Dr. Akhtar Hameed Khan, the Director of the Orangi Pilot Project began to explore the possibilities of finding a solution to this problem, he first thought that the government could be persuaded to pay more attention to the needs of the councillors, mobilizing the existing local organizations, in particular the All Orangi United Federation, and meeting the high officials of KMC, KDA, Local Government in order to draw their attention to the plight of the people of Orangi.

But soon it was discovered that the problem is not the lack of effective lobbying but of constraints of a very different nature. On the one hand, the KDA and KMC charges more far beyond the reach of the people of Orangi. And on the other hand, because of unknown reasons, the KDA or the KMC were not able to reduce the cost of providing basic facilities to the common people.

The broad outline of the alternative strategy had been envisaged by Dr. Khan: that it had to be development from below in which local residents would be organized and their resources would be mobilized. By this method, the creation of effective local organization and dissemination of technical skills among local people would be the key to the improvement of Orangi. And above all, the success of the methodology would depend on a sound low-cost technology-technical competence and professional approach.

There seems to have been three barriers preventing the improvement of Orangi on a self-help basis. First, there has been the psychological barrier both ^{at} the top and at the bottom. At the top, the psychological barrier has been with the government departments, who perhaps feel that the problem of Katchi abadis cannot be solved with any significant results in view of the fact that they do not have sufficient resources

Psychological barrier at the bottom refers to the attitude of some people in Orangi who still expect the KMC or the KDA to do the work for them. They also feel that in any case the work of sanitation, water supply, drainage, and so on, is beyond their own abilities and resources.

The second barrier, and connected with the first, is the cost barrier. As pointed out earlier the cost of constructing a proper sanitation system through conventional methods involving government departments, vested interests, corruption, etc., has been excessively high for the people to afford.

And the third barrier has been the technical or technological barrier. This means that when residents have been interested and motivated in constructing a sewerage system, they have lacked the technical know-how to do it competently and satisfactorily. The result has invariably led to failures sooner or later.

As a first step, the OPP has attempted to try to remove the three barriers. With regards to the sanitation programme the experiment has been (a) to persuade the residents that if they do not organize themselves to improve their living conditions, nobody will do it for them, and they will face greater

hardships; (b) to try to reduce the cost of a standard sewerage system; and (c) to provide the interested residents with a low-cost technology and the technical guidance and assistance for constructing it, and to train them in its maintenance and upkeep.

In order to eliminate the problem of mistrust, Dr. Khan started with the lane as the unit of organization. On an average there are between 20 to 30 houses in each lane. The heads of these households get together, discuss the problem of sewerage and the need to rectify it. When they all agree that work on sewerage should be done and that they are willing to contribute their share of the cost, then they make a formal application to the OPP office. The OPP office sends its technical team which surveys the lane and gives the design and cost estimate. Then the residents collect and give the money to elected lane managers. The managers then buy the material and organize the work. Full account of expenses is maintained and a copy is submitted to the OPP office.

By making lane as the unit of organization makes it possible to organize people into an effective structure of collective action.

The task of removing the cost barrier became possible by reducing the cost of construction. By eliminating kick-backs and profiteering the cost has been brought down to less than a third of prevalent rates. In some cases, the cost has been reduced to as low as Rs:12.60 (US\$.84) per rft, as compared to the prevalent rate of Rs:45 (US\$3.00) per rft, of drainage line.

This drastic reduction has been possible by improving the design of the manholes and septic tanks. By changing the design of the manholes from block construction to cast in-situ the need for expensive skilled masons has also been eliminated. Steel shutterings are provided to the residents who use it to construct the manholes themselves under OPP supervision if needed.

It is fully realized that the reduction in cost should at no stage compromise the quality of work. By improving the design of the manhole (by eliminating waste in material, simplifying construction, etc.) and also by simplifying the system by putting a 'T' in a Haudi (interceptor chamber) rather than building an expensive waffle chamber, it has been possible to further reduce the cost. It took many months of experimentation with various designs of Haudis and manholes before a satisfactory solution was found.

The task of extension work involved considerable time and effort. After having arrived at a successful design of Haudi with a T-pipe connection, it was found that the residents were often not following the OPP instructions. When the technical staff surveyed the lanes constructed with OPP assistance it was found that a number of houses had given direct connection with the main line. They had either not built the Haudis with T-pipe. This naturally threatened with choking and failure of the system.

Consequently OPP had to instruct all its managers and technical staff to make sure that no future direct connections are made and those made are rectified. To improve the understanding of the people plastic models to scale were made to demonstrate visually how the system works, from the toilet to the Haudi to the main line.

OPP is aware that it cannot immediately build a fully integrated and complete sewerage system. The purpose is to organize the people to learn how to do it themselves. Deviance and error of judgement is part of the process of developing local organizations and local skills and expertise which will eventually eliminate the need to depend on the expensive services of outside institutions and professionals.

The demonstrative effect of this self-help programme has been significant. When the programme first started in September 1981, it took three months for Dr. Khan and his social motivators to convince the residents of one lane only that the proposal was not another political gimmickry, that it would work and work well. Today the demand from lane residents keep pouring in.

III. RESULTS:

A. Introduction:

1. OPP has approximately 30,000 houses in the area.
2. Out of 2,207 lanes, 1,221 have no sewerage lines. The percentage of lanes without sewerage is 55.3%.
3. Nine hundred six lanes have some kind of sewerage lines. This is 44.6% of the total lanes.
4. The figures indicate both the interest in sanitation and the immensity of the task.
5. The sewerage lines have become popular only recently and only in some of the Mohallas (neighbourhoods).
6. In many cases the lane residents have been too impatient to wait for OPP designs and maps. They have proceeded on their own, often copying the work done in the adjoining lanes imperfectly.
7. Therefore, the rectification work to be undertaken with respect to self-made lines is equal to doing the work again.
8. Even the so-called OPP lines need some rectifications in many cases.

When all the families of one lane (20-30) decide to intervene in this project, accepting to bear the costs and the responsibility of the construction and sometimes subsidizing, some families who are too poor to put their share in the project, ask OPP to have a survey of the area.

B. From October 1981 till June 1983:

Requests received from 43 Mohallas (neighbourhoods) = 511 lanes
Survey completed in 42 Mohallas = 418 lanes
Maps, plans and estimates supplied in 39 Mohallas = 346 lanes

Details of Estimates:

Number of houses	7,635
Length of sewage lines rft.	131,506
Number of manholes	3,114
Total estimated cost	Rs:2,428,564 (US\$161,904)

Averages:

Area of house	124.17 sq.yd.(104 sq.m).
Cost per house	Rs:318.08 (US\$21)
Cost per sq.yd.	Rs:2.56 (US\$17)
Cost per rft.	Rs:18.47 (US\$1.21)

C. From July till December 1983:

Survey completed in 20 Mohallas = 56 lanes.
Major plans, estimates supplied in 15 Mohallas = 41 lanes.

Details of Estimates:

Number of houses	1,085
Length of sewage lines rft.	17,333
Number of manholes	586
Total estimated cost	Rs:338.689 (US\$22,579).

Averages:

July-September:

Cost per house	Rs:295.43 (US\$19.70)
Cost per rft.	Rs: 18.68 (US\$ 2.46)

October-December:

Cost per house	Rs:368.61 (US\$24.57)
Cost per rft.	Rs: 22.30 (US\$ 1.49)

Construction work in progress:

July to December 1983, in 13 Mohallas = 53 lanes.

D. Extension:

The success of a popularly financed and managed programme depends greatly on the training and education of the residents and the managers chosen by them. Therefore, OPP are placing the major emphasis on extension work, the preparation and distribution of instruction sheets, pamphlets and posters as well as lane meetings. To the seven leaflets distributed in July-September, the following have been added in the quarter (October-December)*

- * Proper construction of manhole and Haudi covers.
- * Fixing a vent pipe in the haudi.
- * Proper ratio of cement and bajri.
- * Instructions for manhole maintenance.

Frequently the local workers engaged by the lane managers are reluctant to follow the instructions, and try to introduce unnecessary and often harmful deviations. OPP therefore started keeping records of the work of good and reliable workers. There are now a dozen names in OPP register, whom OPP can recommend to the lane managers.

The only way which OPP can influence the neighbourhoods is through information through posters indicating wrong and right constructions, publication of leaflets and the Orangi quarterly in which case studies of constructions are studied or profiles of the activists and councillors together with even critical views of OPP approach are published.

E. Supervision:

In many lanes the sewage lines cannot be constructed until the designs of secondary drains are completed. These require prolonged research and investigation.

A pattern has been evolved for (1) surveying and mapping, (2) for designing, and (3) for estimating the cost of the secondary drains. Previously OPP had evolved a simple pattern for the lanes only.

F. Research-Circle Plan Book:

With the data collected through the comprehensive survey, OPP is compiling a plan book for each of the council circle.

The plan books contains the following:

- * Map of Orangi Township, showing councillors circles.
- * Enlarged map of the councillors circle showing Mohallas and sectors.
- * Enlarged maps of each Mohalla, showing the lanes, roads and the Nallas (creeks).
- * Each map contains information about: (i) number of houses in each lane, (ii) slope of the lane, and (iii) condition of sewerage, etc.

The plan book will be of great assistance to the councillors for the comprehensive development of the sewerage and drainage system in their circles. Instruction manuals and leaflets are enclosed with the plan book.

IV. PROBLEMS AND CRITICISMS

A. Problems:

1. Insistence of some houseowners to make direct connection from the toilet of the house to the manhole, and
2. the low quality of manhole covers. Educative effort to overcome these problems have been intensified.

3. In some lanes a strong Rehri (base) is not put under the manholes. A leaflet emphasizing the importance of Rehri, and also indicating the ratios of mixture, and the method of curing is being written for distribution:
4. The shutterings for manholes, which have caused trouble in some cases by making the thickness of manhole walls uneven, are being improved by fixing an angle iron.
5. In view of the low quality material used by the lane people, OPP is recommending an increase in the thickness of walls, from 3" to 4".
6. Quality of Pipes: The cement concrete pipes used by the lane people are those which are commonly available in the local market. The clients of OPP belong to the lowest income groups. They cannot afford a capital intensive construction. The preference naturally is for labour intensive, capital saving alternatives. Hence, even when superior quality pipes are available, the people generally prefer the cheaper variety. The advice for the best quality would be discarded on the ground that it is beyond their means. They found that fiberglass pipes are too costly. The consultants have told OPP that these lower quality cement pipes are liable to corrosion and may have to be replaced after 12 to 15 years. The people have been informed. Their attitude is that they can bear the cost of future maintenance more easily than a bigger investment immediately.

B. Criticisms:

The most common of the criticisms raised against the OPP is that since the main drains are not being built by the KMC, the sewerage system as being presently constructed in the OPP areas simply shifts the problem of sewage disposal from the lanes to the open Nallas (creeks).

The point that has to be appreciated in order to understand the approach of OPP is that neither the OPP has the resources to provide for a final and completely integrated sewerage system in the immediate future, nor can the KMC provide it to the people of Orangi given its own financial limitations. An integrated work plan is undoubtedly most desirable and there can be no debate on the issue. But now since this is not possible, the only viable option left is to build the system incrementally, together with local and government resources.

The fact is that lane organizations in Orangi have already improved their lanes through collective efforts and the mobilization of local resources and are now bringing pressure on councillors and government departments to develop the main drains so that dirty water from the lanes does not flow in the open. The councillors are receptive to the needs of the people and with sufficient organized pressure government assistance could be successfully mobilized.

OPP's approach is only a first step in the transition to a system in which eventually sewage will not be left in the open Nallas but carried away into the sea or to treatment plants.

The second criticism points to the fact that working through a lane as the unit and without a sanitary engineer will lead to difficulties at a later stage when main and secondary lane will not match with the pipes of lanes. It is correct that to some extent there are problems and some duplication of work and extra expenses which could have been economized with an integrated plan. But the choices for the people of Orangi is either to wait indefinitely for an integrated plan with the filth and unsanitary conditions of the lanes with health hazards for their children or to get the work started on a lane basis now with a design which has shown to be technically sound in more than 300 lanes which have already been improved. Apart from that in Orangi there are natural slopes in the main Nallas which will cause no impediment in the flow of sewage.

Another criticism is the size of the haudi. It has been pointed out that the Haudis are small and therefore will be filled up within 3-4 months. First of all, the haudis which were built eight months ago are still not full. And secondly, the constraint on size has been the unwillingness or inability

on the part of the residents to spend more than a certain amount in the construction of these Haudis. From February 1983 OPP has been advocating the construction of cast in site septic tanks. Shutterings have already been supplied to lane managers with far less cost.

Conclusion:

It is getting more and more difficult to handle construction and maintenance of the infrastructure of all our cities. In Orangi, Karachi, I have witnessed a new experience of a sewer system constructed by the people under the direction of a technical team. The secret consists of;

1. Mobilizing the people to construct the sewerage system, and
2. Analyzing, directing and simplifying to the people a complicated technology like the sewer system, in order that the people will understand and therefore be able to main it.

I firmly believe that this experiment should be studied, supported and improved by national and international groups. Organizing the responsibility of the families living in lanes and neighbourhoods will be the better system for administration which is badly needed in all cities.

Zaidi