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Rural Water Supply and Sanitation in Pakistan

Lessons from Experience

Hafiz A. Pasha and Michael G. McGarry, editors



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Hafiz A. Pasha and Michael G. McGarry, editors

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ABSTRACT

This report is based on a review of Pakistan's rural water supply and sanitation sector instigated by the Canadian International Development Agency (CIDA) and the World Bank in September 1987. The review was carried out by specialists in rural water engineering, hydrology, health education, medicine, community development, economics and financial analysis.

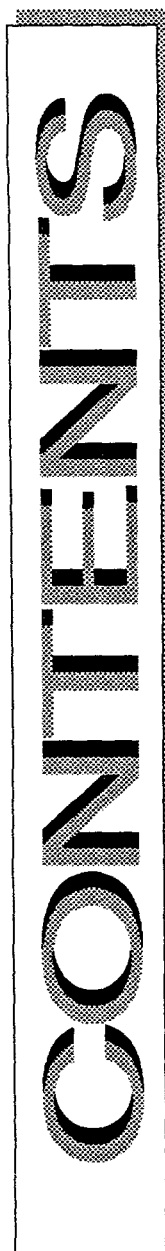
The report summarises their findings and describes six case studies of projects in Pakistan which have successfully adopted appropriate technologies and encouraged community participation. The case studies are:

- **The Aga Khan Rural Support Programme (AKRSP)**
This programme covers three of the poorest districts in Northern Pakistan, with a total population of about 750,000. Its main objective was to double rural incomes within 10 years. With some adaptation, the village organisational model used is considered suitable for community-based water supply and sanitation programmes.
- **Baldia - The Busti Programme**
Baldia Township, north-west of Karachi, has a population of 271,000. The project was designed to reduce the high infant mortality rate and provide social benefits for children. It was seen as a pilot project to encourage the construction and use of soakpits. Women played a major role in the project.
- **Baluchistan Integrated Area Development (BIAD) Programme**
Baluchistan is Pakistan's least developed region and has an infant mortality rate between two and three times the national average. BIAD was set up as an independent agency able to adopt an integrated and multidisciplinary approach to water supply, sanitation and health. The programme focused on providing piped supplies to rural people and encountered difficulties because of the cost and complexity involved. More success was achieved with the promotion of low-cost sanitation technologies, and the Extended Immunisation Programme was very successful.
- **Mansehra District Development Programme (MDDP)**
The MDDP was the first District Development scheme in Pakistan in which the community helped to prepare plans and implement water supply schemes. The programme aimed to improve rural water supplies, to provide better sanitation facilities, especially for women, and to promote self-reliance in the development of infrastructure. The scheme has had a number of notable successes, and is seen as an important step in integration of community resources and participation into governmental programmes.
- **Orangi Pilot Project**
Orangi is one of Pakistan's largest squatter settlements, with a population of about 800,000. The project sought to build a sewerage system for the town, to raise health awareness, to support community based institutions, and to strengthen technical, managerial and organisational skills among the residents.
- **Punjab Sanitation Programme**
Covering six districts, with a combined population of 4.4 million, the programme aimed to cut infant mortality by 35 percent and halve the incidence of intestinal and parasitic diseases in children and mothers. It also aimed to provide sanitation for 20 percent of villages and water supplies for almost one-third.

Following individual reviews of these case studies, the report includes an analysis of the role of the private sector in Pakistan's rural water and sanitation programme, and a discussion of seven key issues related to development of the sector. This is followed by recommendations from the 1988 National Policy Conference on Rural Water Supply and Sanitation, including the Islamabad Declaration on a proposed government strategy.

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PREFACE AND ACKNOWLEDGEMENTS

This report comprises a brief review of Pakistan's rural water and sanitation sector, together with a study of innovative projects which have involved the community. The report concludes with the Islamabad Declaration from the 1988 National Policy Conference on Rural Water Supply and Sanitation, which guides future policy in this sector.

The editors wish to thank the Government of Pakistan, which made it possible to carry out the study, the Canadian International Development Agency (CIDA) which provided financial support for the preparation of the case studies and the workshop, and the World Bank, including contributions of the UNDP/World Bank Water and Sanitation Program.

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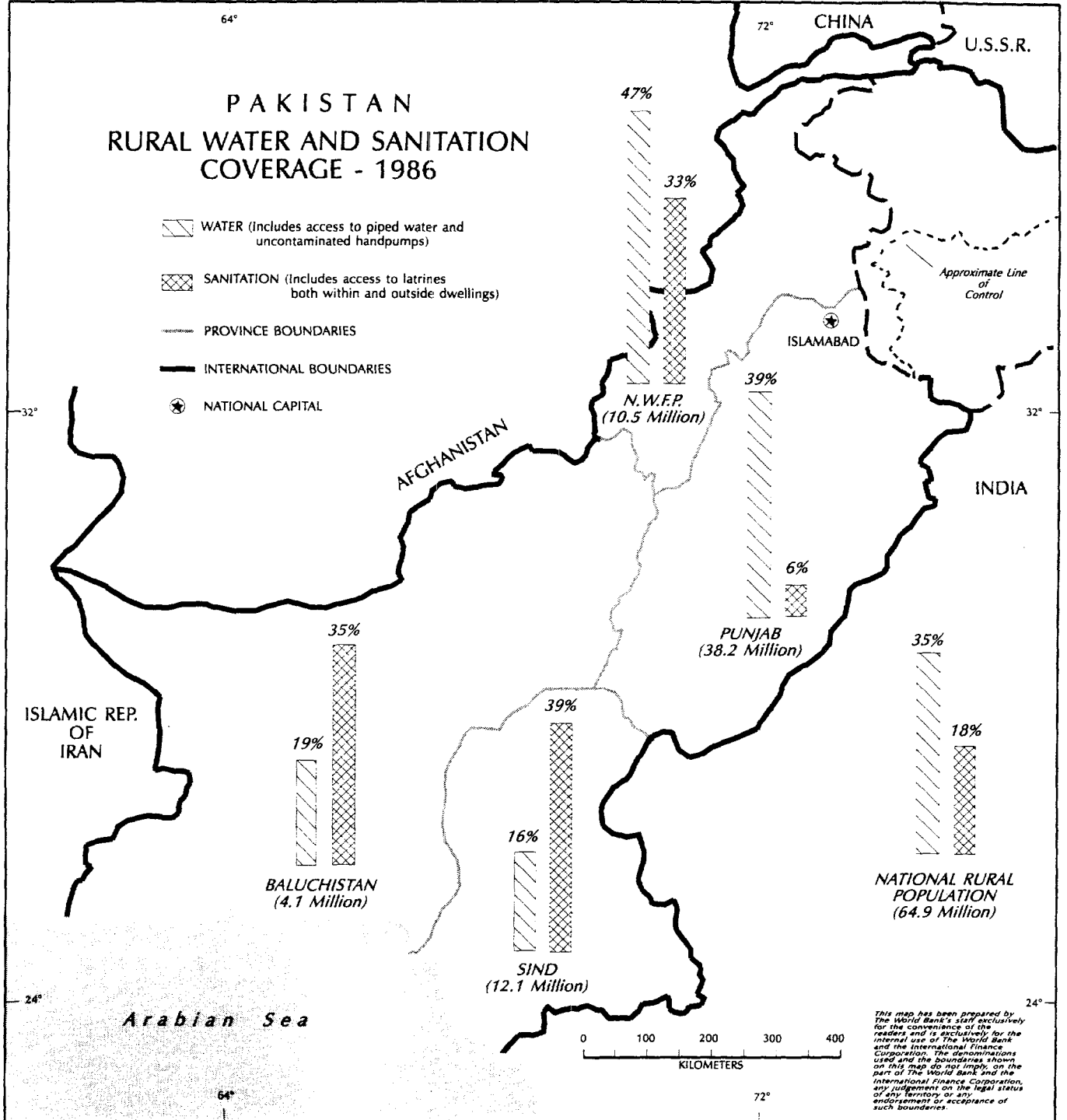
The sponsorship of the workshop and conference by the Federal Ministry of Local Government and Rural Development and the organisational support of Sahibzada Mohibul Haq and Javed Chishti.

The staff of the reviewed projects who willingly gave of their valued time. We hope that our report represents their projects fairly and accurately.

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The Editors



OVERVIEW:

Rural Water Supply and Sanitation in Pakistan

THE improvement of the quality of life in rural Pakistan has been high on the list of political priorities since the return of an elected civilian Government in 1985. As a result, substantially more funding has been allocated to improving the country's rural infrastructure and services. Allocations for water supply and sanitation have increased considerably with Rs. 8.1 billion being allocated to rural water supply between 1986 and 1990.

Despite the Government's efforts to improve services to Pakistan's rural communities, the country's basic health indicators are still poor. Even today, only one third of the rural population has access to adequate water supplies and less than one fifth has any sanitation facilities or hygienic excreta disposal.

This lack of water and sanitation facilities is one of the basic reasons why infant and young child mortality rates are still high at 160 per 1,000. Diarrhoea is estimated to account for 45 percent of all child deaths - the largest single cause of infant mortality in Pakistan. Improvements in water supply and sanitation would not only reduce the number of child deaths but also give a much needed boost to the quality of rural life. Improved access to water would greatly increase convenience, especially for women who carry water over long distances. It would also release labour for greater input into agriculture and cottage industries.

The Pakistan Government wishes to carry out its ambitious plans for water supply and sanitation improvements as soon as possible and has sought financial help from donor countries. In response to this request for support, a review of Pakistan's rural water supply and sanitation sector was instigated by the Canadian International Development Agency (CIDA) and the World Bank in September 1987. A team of seven specialists, drawn from the diverse fields of rural water engineering, hydrology, health education, medicine, community development, economics and financial analysis, spent over one month travelling the country talking with Government officials at federal, provincial and local levels, elected representatives, community leaders and non-government organisations (NGOs). This report summarizes their findings and looks at six recent projects in Pakistan which have successfully adopted appropriate technologies and encouraged community participation.

OVERVIEW

Several questions concerning Pakistan's rural water, health and sanitation were raised by the study team. Here is a brief summary of their findings.

What is the main method of water supply?

Of the 35 percent of Pakistan's rural population deemed to have an adequate supply of drinking water, more than half are served by handpumps. These are concentrated in the sweetwater areas of Punjab and Sind.

Locally produced pumps are normally installed and maintained by the private sector and tend to be of cheap and simple design lacking in durability. In areas where groundwater is brackish or the water table is deep, more complex piped systems are frequently required.

So far, private contractors have installed handpumps and tubewells with little Government support. There is great potential for expanding the role of the private sector, especially in sweetwater zones where over 50 percent of the rural population lives.

The Government could help in improving pump technology, distribution systems and tubewell designs as well as extending credit facilities for consumers, contractors and suppliers. This would enable the private sector to expand its activities and increase service coverage at little cost to the Government.

Who is responsible for water and sanitation?

The Government is responsible for installing most piped systems. Responsibility for rural water supply and sanitation lies in the hands of the provinces, although the money for the programmes is provided by the Federal Government.

Projects are primarily undertaken by the provincial Public Health Engineering Departments (PHEDs), and secondarily by the Local Government and Rural Development Departments (LGRDDs).

PHEDs are primarily engineering organisations with strong technical expertise but limited community development skills. In some cases, the lack of community focus in PHED programmes has led to the wrong choice of technology and poor maintenance.

LGRDDs undertake rural infrastructure works, including some water supply schemes in the smaller settlements, and have a better focus on community development. However, they lack technical strength in water supply systems.

Some rural development projects have successfully involved informal village organizations, including members from the Union Councils - the lowest formal level of Government. This may be the structure which is most likely to ensure community commitment to rural water supply schemes.

Source and quality of drinking water to rural populations by province - 1986.

Source	Quality	Provincial Coverage (%)				Pakistan	
		Punjab	Sind	NWFP ^a	Bal ^b	%	Millions of Rur. Pop.
Piped	Potable	12	3	45	18	16	10
Handpumps	Potable	27	13	2	0	19	12.5
Handpumps	Contaminated	27	13	2	0	19	12.5
Other	Contaminated	34	71	51	82	46	31
TOTAL		100	100	100	100	100	66

a. North West Frontier Province

b. Baluchistan

Who identifies which schemes should be built?

Projects are frequently identified on the initiative of the LGRDD and PHED, based on their perception of needs. Some projects are also identified by members of the National Assembly. Small projects are approved at the Department level, those under Rs. 30 million at Provincial level and larger projects at Federal level. For these projects, feasibility documents (PC-1s) are prepared but the approval process can be slow, leading to cost escalation, under-budgeting and implementation delays.

Projects tend to be evaluated in isolation with an emphasis on capital costs rather than on relative investment priorities, project benefits, recurrent cost implications, or the human resource capacity to implement an entire programme. There is a need to prepare broad sector investment programmes.

Does Pakistan have the resources to implement its water supply and sanitation programmes?

Increasing resources are being invested in rural water supply. Yet staff and resources are limited in both PHEDs and LGRDDs and this may prevent the Government from meeting its targets on time. Because the targets for the 1986-90 period have probably been over-ambitious, a revised investment strategy proposed for 1988-93 would improve the likelihood of goals being achieved. Key elements of the strategy would be increased community participation, a gradual increase in the focus on sanitation, improvements in system rehabilitation and O & M, and promotion of increased participation by the private sector.

New recruits need to be trained. In addition, in-service training programmes need to be instigated together with training in how to work with villages in the planning and management of community schemes.

Would improved coordination between organisations bring any major benefits?

There is scope for the skills of LGRDD and PHED to complement each other, and coordination between the two organisations could be improved significantly. Also, other rural sector organizations could be encouraged to play a more active role in rural water and hygiene. At present, hygiene edu-

cation is not a significant component of primary health care, and is missing from school curricula.

The Water and Power Development Authority (WAPDA) is technically competent and has substantial resources at its disposal, but does not currently provide PHEDs with relevant water resource data and expertise.

Who is responsible for operation and maintenance and what is the cost?

Union Councils are, in principle, responsible for revenue collection and scheme operation, but frequently have insufficient administrative staff, technical capacity, financial systems or community links to carry out this task. Revenue collection is poor, at 50 percent or less in all provinces.

Current O & M requirements are estimated to be Rs. 215 million per year, compared with the current O & M allocations of only Rs. 70 million. If PHED schemes are implemented as planned under the 1986-90 Investment Programme, O & M requirements would be about Rs. 600 million by 1992-93.

The rapid expansion of programs in the water sector has already strained PHED management. Piped water supply systems have generally been installed with little or no community participation in scheme design, and so little commitment to keeping the scheme running. With many schemes operating for only a few hours a day, taps are frequently left on and there is considerable waste. Poor revenue collection means insufficient funds for O & M, so that systems generally deteriorate quickly.

New systems vs rehabilitation?

Until now, the emphasis has been on installing new systems and on achieving targets to extend services. There have been few attempts to rehabilitate existing schemes or to involve communities in the planning and financing of new schemes.

Do people want sanitation?

In general, most rural people do not see the need for improved sanitation in itself. However, surveys have shown that the demand for latrines exists or can be stimulated when the price is right.

Sanitation is frequently regarded as another term for drainage and so only needed because of

the excessive use and wastage of water. It is common to find high-cost, open drains of rectangular cross-section. These are being used by the rural population for direct defecation and garbage disposal and quickly become blocked and unhygienic. Alternative technologies should be adopted according to need and more attention should be given to providing basic on-site sanitation and hygiene education.

Does community involvement help?

Experience with individual projects has shown that user involvement in system design, management and finance leads to schemes which are likely to be appropriate to the community needs and well

operated and maintained. Greater user participation is also seen as a way of enabling PHED staff to concentrate resources where they are most needed.

Who benefits from appropriate systems?

Women are generally responsible for the collection of water and have most to gain from appropriate systems. The use of clean water, combined with sanitation and hygienic practices, can effectively reduce the incidence of disease. Women and children benefit most from clean water and adequate sanitation.

The box below summarizes the basic recommendations made following the Sector Report.

SUMMARY OF RECOMMENDATIONS

1. Better links should be forged between PHEDs, LGRDDs and Health Departments.
2. Provincial sector investment programmes need to be prepared.
3. More money should be provided for sanitation programmes.
4. The Government should consider using its resources to finance a minimum level of water supply coverage for everyone.
5. An assessment should be made of the level of funding necessary to meet basic sanitation and drainage needs.
6. The private sector should be given support to increase its contribution and effectiveness to the sector.
7. Community resources, user management and financing of schemes should be fully tapped.

NEXT: We review six recent water and sanitation schemes in Pakistan which have tried to overcome many of the problems mentioned here by actively involving the community in projects, adopting more appropriate designs and rethinking the organisational strategy.

THE CASE STUDIES:

Introduction and Summary

THESE case studies were carried out to review new approaches in implementing water supply and sanitation programmes and to find out whether they could be replicated in other parts of the country. Each project was carried out by either the Government or a non-governmental organisation (NGO), with or without external donor agency participation.

The following criteria were used for selection of case studies within Pakistan :

- (i) The project should involve community participation;
- (ii) All provinces should be represented;
- (iii) Each project should have a target population of over 200,000;
- (iv) The project should have been operating for sufficient time so that lessons could be learned from its implementation.

Six case studies which met these criteria were selected and the main features of each project are summarized in the table on page 6.

In addition, a case study has been conducted of the private sector's role in the districts of Multan and Gujranwalla in the province of Punjab.

The case studies were presented and discussed at a workshop in Islamabad April 5 to 7, 1988.

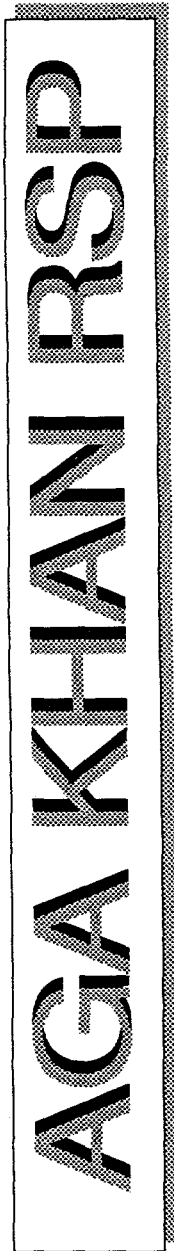
SUMMARY OF THE CASE STUDIES

Case Study	Province	Start Year	Executing Agency	Donor Agency	Component WS S Other	Target Pop.
AKRSP	Northern Areas	1983	NGO	CIDA DUTCH Gvt ODA	CD	802,000
BSPP	Sind	1979	NGO	UNICEF JAYCEES DUTCH Gvt	S CD	200,000
BIAD	Baluchistan	1981	PG	UNICEF EEC DUTCH Gvt CIDA	WS S HI	280,000
MDDP	NWFP	1982	LG	UNICEF	WS S	1,000,000
OPP	Sind	1980	NGO	BCCI	S CD	800,000
PSP	Punjab	1981	PG/LG	UNICEF	WS S CD	940,000

Key:

WS	Water supply
S	Sanitation
HI	Hygiene Education and Extended Immunisation Programme
CD	Community development
PG	Provincial Government
LG	Local Government
NGO	Non-Governmental Organisation
BIAD	Baluchistan Integrated Area Development
AKRSP	Aga Khan Rural Support Programme
MDDP	Mansehra District Development Programme
PSP	Punjab Sanitation Programme
BSPP	Baldia - The Busti Programme
OPP	Orangi Pilot Project

AGA KHAN RURAL SUPPORT PROGRAMME



THE main objective of the AKRSP was to double rural incomes within 10 years. Its emphasis was on improving agricultural productivity through the provision of extension and training services. It was not intended to provide potable water supplies or sanitation.

BACKGROUND: The AKRSP covers three of the poorest districts in Northern Pakistan - Gilgit, Baltistan and Chitral. About 750,000 people live in the project area in 1,030 villages. Village populations vary in size from less than 100 to 1,000 inhabitants. The people speak many different languages and dialects and come from diverse ethnic backgrounds. Village kinship ties are strong and often form the basis of the community.

Despite the remoteness of the region, communities have a liberal and progressive outlook and are not bound by taboos or customs. They depend on an unreliable subsistence economy which is based on agriculture, horticulture and livestock. There is a desperate need for more reliable sources of food and this has made the population receptive to new ideas and opportunities.

The project has a strong link with the Ismaili population whose spiritual leader is the Aga Khan. Most Ismailis live in the Hunza Valley and it is doubtful whether the project would have been as successful without the Ismaili community as its entry point. Nevertheless, other religious groups have benefited substantially from the project.

THE ORIGIN OF THE AKRSP

The AKRSP is a private limited company which was set up to increase the productive capacity of the local people so that the region's income would double in 10 years. It was not intended to replace Government efforts, but rather to complement their work in agricultural and infrastructure development.

The AKRSP staff are committed to a project philosophy which revolves entirely around community participation. No effort is made to involve villages which show no interest in the programme.

The AKRSP has been included in this report because, although improvement of water and sanitation is not one of the project objectives, the village organization model used could be adapted to community-based water and sanitation programmes.

HOW THE ORGANISATION WORKS

A General Manager heads the AKRSP and is supported by specialists in engineering, agriculture, economics, marketing, training, women's role in development, social organising, finance and accounting.

The AKRSP aims to promote the growth of village institutions in the form of Village Organisations (VOs). It is the task of the VO to organise and manage project work with support from project staff. There is an AKRSP staff member for every 3.1

VOs, a professional for every 6.7 VOs and a Social Organiser for every 32 VOs. The project aims to develop 1,280 VOs and so far has managed to create 764. To date, there is one staff member for every 200 households contacted. All the AKRSP senior staff are qualified and experienced professionals from Pakistan.

There are weekly meetings of senior staff to present progress reports and analyse any problems. Every three months, a meeting of VO managers is held and management and field staff are invited. Implementation principles are reinforced, progress is reviewed, experiences are shared and training lessons repeated. Any concerns of the villagers are shared openly.

Day-to-day contact between the Village Organisations and the AKRSP is through the Social Organisers who train each VO in the basic organisational skills and various specialist functions.

No formal leadership exists in the villages but many of the younger, more enterprising and better educated men are emerging as leaders. The lack of an entrenched power structure and the rapidly changing economic climate has encouraged innovation and enterprise in this area.

The VOs are now the largest organised village-level institutions. About 75 percent of their members are from the village households, most are male and generally the heads of households. A household can have more than one representative in the organisation. There is no structure or hierarchy to the membership except for the VO's Secretary and Manager/Treasurer. The members have an equal say in decision making, which is based on consensus.



The villagers are given engineering suggestions by the AKRSP staff, but are not obliged to follow their recommendations.

The VOs meet frequently, often every two weeks to discuss the progress of projects and make a record of joint savings. The contribution of each individual is recorded but the savings are banked collectively. At the meetings, the VO selects members who will go to the district headquarters for training in agriculture, plant protection, veterinary skills, accountancy and management.

Who provides the money?

Funds totalling Rs. 186 million have been generated for this project, with the Aga Khan Foundation providing 35.5 percent of the total. CIDA has contributed Rs. 46.5 million and The Netherlands Government has given Rs. 32.4 million.



IDENTIFYING PROJECTS

The AKRSP General Manager attends the first meeting in every village. The objectives of the programme are explained and the villagers are invited to put forward a scheme that they are prepared to undertake. The scheme is termed the productive physical infrastructure project (PPI). At the second meeting, the feasibility of the PPI is explored and a project blueprint and costing are worked out. At the third meeting, the finalised scheme is discussed and the terms of partnership between the AKRSP and villagers are reviewed. The AKRSP staff outlines the support that it is willing to give and the villagers explain how they will plan and carry out the scheme, how they will develop skills and run a savings scheme and how often they will hold meetings.

At the end of the third meeting, a VO is formed. Its members elect a President and Manager and it receives its first grant instalment from the AKRSP.

The project organisation and management is carried out by the VO with advice provided by AKRSP's engineers. Their advice may or may not be accepted. The AKRSP provides finance in the form of a grant for materials to add to the community contribution in the form of voluntary labour.

The AKRSP will provide the VOs with additional development funds, for land development, income-generating activities, purchase of agricultural machinery and materials, and marketing in the form of short- to medium-term credits.

There has been an extremely low default rate on



Old and new ideas combined. In Gilgit district, some villagers decided to build a 3,300-ft.-long inverted syphon out of flanged steel pipe.

the loans. This is because the money is given to the VO, rather than individuals, and the loan has to be repaid before new credit is made available.

Total credit of Rs. 45 million has been used for marketing (Rs. 5.9 million), fertilizer (Rs. 19.4 million), land development and agricultural machinery (Rs. 17.7 million).



PROJECT IMPLEMENTATION

The village people have relied on traditional technology and local skills for most of their project work. As a result, there has been extensive use of masonry for irrigation canals and water tanks. The AKRSP has not discouraged the traditional approach but has attempted to graft new technologies onto the established skills and methods. If the village wants to incorporate some modern methods, the AKRSP will provide the necessary design back-up and training. A good example of the marrying of old and new technologies can be found in Rahbat village, Gilgit district. An 8-inch diameter flanged steel pipe is being used for a 3,300-ft.-long

inverted syphon which will carry water across a channel to feed an irrigation system in a remote area.

Occasionally, villagers have disregarded the engineers' suggestions and followed their own ideas. This can be seen during the building of channels. The AKRSP staff survey and mark construction levels but the villagers ignore the marks and let the water flow determine the bed slopes - a method they have been using for hundreds of years.

In another example, at Sust, the villagers insisted on digging a tunnel through the mountains for their irrigation channel against the advice of the AKRSP engineers who said it would be too costly. The AKRSP withheld the project funds but the villagers pressed ahead using their own money. However, the engineers returned to help overcome the villagers' tunnel alignment problems. The proj-

ect proved to be successful and project funding was resumed.

These two examples illustrate the flexibility of the AKRSP approach which gives ultimate responsibility to the Village Organisation. The project staff argues that the imposition of modern methods and designs often results in the use of inappropriate technology.

Operation and maintenance

Because tried-and-tested techniques are being used in the schemes, there are few operational problems. Maintenance work can be carried out by villagers who built the schemes. In addition, the growing managerial ability of the VOs has meant that replacement parts and materials can be obtained quickly and cheaply.



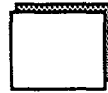
Maintenance of the gravity-fed system is carried out by the villagers who built the scheme.

THE OUTCOME



SUCSESSES

- Since December 1982, 764 VOs have been created. About 48 percent of rural households are members of these organisations. In Gilgit, over 96 percent of the households are members.
- The VOs have a savings deposit of Rs. 34 million (December 1987) - an average contribution of Rs. 45,000 per organisation. Ten percent of this money has been contributed by women.
- By September 1987, 975 projects had been identified and 331 completed.
- By May 1987, 207 people had been trained in livestock development; 152 in plant protection; 152 in poultry development; 23 in accounting and 85 in marketing. These villagers have been given 424 training kits and 19 refresher courses have been arranged. Training has also been given to VO office bearers in bookkeeping, agenda preparation, meetings procedures and reporting.



PROBLEMS

- Links between PHEDs, LRGDDs and village-level organisations need to be improved.
- More training is necessary in construction skills, control of funds and O & M at the village level.

BALDIA - THE BUSTI PROGRAMME

THIS project was designed to reduce the infant mortality rate and provide social benefits for children. It set out to encourage the construction of soakpits.

BALDIA - BUSTI

BACKGROUND: The Baldia Township is located in north-west Karachi and covers 1,060 acres. The current population is about 271,000, with an average population density of 150 persons per acre.

Baldia's population is made up of a wide variety of ethnic groups which have migrated from surrounding areas. Almost 42 percent of the people have come from India, 21 percent from the North West Frontier Province, 17 percent from Baluchistan, 9 percent from Sind and 8 percent from Punjab. Despite the cultural differences, there is a high level of interaction between people from different mohallas and a good community spirit prevails.

Karachi and the Sind Industrial Trading Estate (SITE) are within easy reach of Baldia by road and rail, and this has improved employment opportunities.

In summer, the climate is hot and humid but the winters are mild. There is an average annual rainfall of 7 in. The water table lies between 3 and 12 ft. below the surface, in sandy-clay soils, but has been rising gradually since water supplies were introduced.



THE ORIGIN OF THE PROGRAMME

Ten years ago, Baldia faced a major water supply shortage. In some areas, the public standposts were providing less than five gallons per person per day. This prompted the Karachi Water and Sewerage Board (KWSB) to install one standpost per street which would serve, on average, 20 houses.

Baldia's sanitation system was also inadequate in 1979. About 80 percent of houses had bucket latrines and excreta was dumped in the lanes throughout the township. This caused extreme health hazards and the area became a breeding ground for flies, mosquitos and other vectors. Children and women were particularly at risk. The Karachi Metropolitan Council (KMC) selected Baldia Township as a *katchi abadi* in need of upgrading and UNICEF proposed the Baldia Soakpit Pilot Project (BSPP).

Although the project had KMC's blessing, it was not popular among the local community or politicians who did not want soakpit technology.



THE PROJECT ORGANISATION

UNICEF initiated, organised and sponsored the Baldia Soakpit Pilot Project (BSPP) in 1979. Pakistan's Jaycees (Junior Chamber of Commerce) and the University of Karachi's Social Work Department also collaborated in the project. In its initial planning phase, the project was assisted by the Dutch Advisory Mission (DAM) which had been examining sanitation projects for the area. KMC provided the administration umbrella.

The overall responsibility for project implementation was in the hands of the Project Team which initially consisted of a community organiser from Karachi University and an engineer from the Jaycees. This was later strengthened to include two Social Organisers, also provided by the University.

The BSPP brought together people from different disciplines without specifying a clear-cut line of action. This flexible approach had great benefits. It allowed the experiences of different disciplines to be combined, making the team responsive to new ideas and enabling it to respond to

success and failure. The BSPP team had no formal hierarchy, but strong leadership was provided by Dr. Quratul Ain Bakhteari.

At the community level, organisations such as mosque committees, sports clubs and soakpit committees were in charge of project implementation. Altogether there were about 47 community-based organisations in the Baldia area of which 75 percent were registered.

All the members of these organisations were nominated by the local people. Every committee was keen on development, technically inclined and receptive to new ideas. They also helped the Social Organisers to motivate the community and aided the engineers with installation work.

Mosque committees provided religious education for children and managed the mosque. They also stored and distributed water to the communities and helped to solve day-to-day problems.

Some of the other organisations were initially set up to lobby the local authorities for services. Others carried out charity work and provided social services such as burials. Some committees became powerful. For example, the Turk Colony's organisation managed to secure water supply, electricity and land titles for its inhabitants.

Recently, a new women's organisation - the Home School Teachers Welfare Organisation - has emerged out of the BSPP and has registered with the Directorate of Social Welfare.

Who provided the money?

UNICEF provided most of the money for the pilot and second phase of the BSPP. The availability of funds for the full or partial subsidy of demonstration projects was of key importance to the programme. In the second phase of the programme, the BSPP was changed into a non-governmental organisation (NGO) called the Basic Urban Services for Katchi Abadis (BUSTI). A major feature of BUSTI was the creation of a revolving credit scheme, in place of subsidies, for beneficiaries.

The overall cost of the Baldia project was about \$482,000 for the six years between 1981 and 1987. About \$318,000 was spent on sanitation.

Demonstration projects of the BSPP cost \$87,000. About five percent of the area's 25,000 houses had demonstration latrines installed. A quarter of these

were paid for by UNICEF, while 58 percent were built using free material, some of which was provided by UNICEF.

The community donated approximately \$413,000 to the scheme in the form of superstructure construction, labour and leadership.



PROJECT IDENTIFICATION

Several criteria were used for project selection. First, the poorest should benefit. As a result, demonstration schemes were aimed at the most poverty-stricken areas. Second, there should be no existing sanitation and, third, the community should be receptive to the ideas. Fourth, the communities should be willing to contribute to the installation of a soakpit.



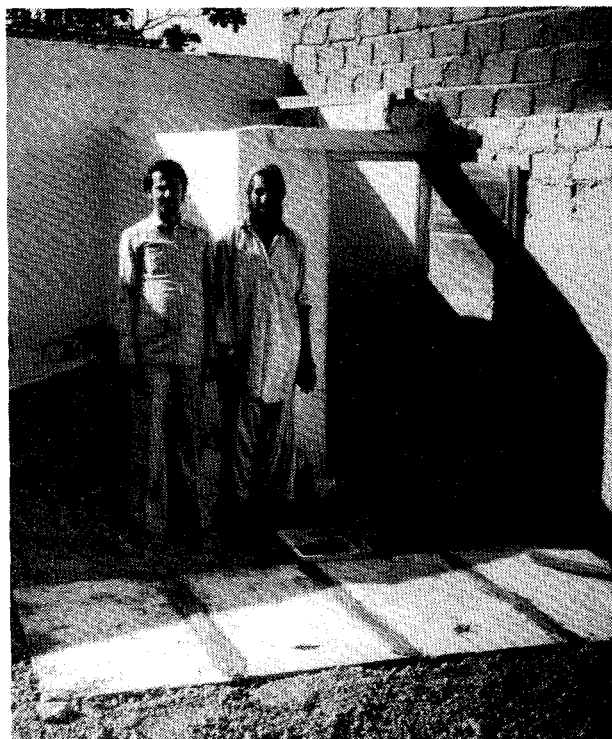
PROJECT IMPLEMENTATION

When the project began, about one-fifth of the houses had soakpits. The rest used bucket latrines but were keen to upgrade their sanitation system. However, most people wanted a sewerage system and did not welcome soakpit technology. The poor opinion of soakpits had been brought about by the existing soakpits in the area, which tended to be substandard, expensive and difficult to maintain.

This meant that an education programme was necessary to overcome the communities' negative feelings about soakpits. This was carried out by the Social/Community Organisers in a two-part plan. First, the existing community leaders were approached and told about the merits of the new technology. Next, the target group and households were visited and the technology was discussed using slide and sound shows, posters and the like.

Community education and training

The BSPP had no formal training component when it began but 60 masons and 100 families were trained in the construction, use and maintenance of soakpits through practical demonstration and



Trained local masons were essential to the rapid spread of pour-flush latrines in Baldia.

discussions. Pits were opened in front of the communities so people could see how they were working—a demonstration that proved to be particularly valuable.

It soon became clear that the soakpits would only be used properly and maintained if children and women were taught how to use them. In 1981, two girls from the community were trained to give primary health education to children in their homes. This was the start of the Home Schools Project. Now there are 120 Home Schools operating in Baldia, covering 4,000 children.

The Home School teachers have been trained as Public Health Care Workers (PHC). The first group of teachers took a month-long training course on growth monitoring, nutrition, breast feeding, ORS therapy and immunisation. An additional 50 girls went on a six-week training course run in collaboration with the Civil Hospital and EIP departments. A female doctor now supervises the PHC workers.

The role of women

Most of the BSPP and subsequent health and education programmes were run by women for women. Half of the project team members were women who were able to enter homes and motivate other local women who in turn convinced the men to build soakpits - and often helped with the installation work.

Contracts

Formal written agreements or contracts were not issued at any stage during the installation of soakpits. However, there was a verbal understanding between the project team and soakpit committees which carried out the installations. The introduction of the revolving credit schemes, as part of the BUSTI plan, meant that written agreements became a necessary part of the development plan. A written application form, an accounts submission form and a loan recovery card were used to record transactions.

Loans given under the revolving fund scheme were Rs. 950 per household. By December 1987, Rs. 120,000 had been disbursed; loan recovery was poor, with only about 30 percent of payments due repaid on time. Financial reporting and financial discipline generally were poor, and in 1988 no new loans were made.

Since the soakpits were installed inside the houses, they became the property of the houseowner who now has the responsibility for desludging. However, KMC currently provides desludging facilities on demand.

Was the technology appropriate?

Soakpit technology was the most appropriate choice in 1979 when there was a low water table, a water shortage and no drains. However, KMC originally insisted that the soakpits had to be installed within houses and this discouraged people from using them. After much effort, the project team persuaded the people to accept the idea of soakpits inside homes.

Since most homes now have direct access to

water supply, and public receptivity to sewerage systems is good, greater responsiveness by the project to the expressed wishes of the community for sewers might have been appropriate.

Between 1979 and 1985, the soakpit design was changed five times. The first change introduced a second pit into the design. Pits were then changed from circular to square and reduced in depth. As a result, the desludging operation is now carried out every 5 years instead of 20 years. However, these design changes have reduced the price of soakpits from Rs. 2,000 in 1979 to Rs. 800 in 1985.

Operation and maintenance

The higher frequency of desludging has increased the maintenance problem for households. Officially, KMC should desludge the pits free of charge, but the service is poor and most people have resorted to employing scavengers or making unofficial payments to KMC staff. People now want the pits connected to open drains.

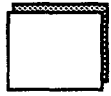
The water table in Baldia is rising and this may require some of the soakpits to be converted to septic tanks in the near future. Technical support will be needed to bring about the change.

Spin-offs

The BSPP stimulated the creation of the PHC programme which successfully trained the community in health and hygiene matters. While the Home Schools Programme was set up because of the need to train people to use latrines, these schools have also been instrumental in awakening the community to the benefits of formal education. A primary school has since been set up by the Baldia community and this is creating interest outside the area. The Home Schools have won places in Government primary schools for some of the Baldia children.

One of the most important contributions has been to provide girls with access to schools. Without this programme, most girls would remain illiterate. By training women as teachers and workers, the Home Schools have managed to raise average household income levels by 25 percent.

THE OUTCOME

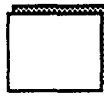


SUCCESSES

- Between 1979 and 1985, 1,065 demonstration latrines were installed.
- By 1985, half of Baldia's houses, or over 14,000 households, had soakpit latrines. This indicated a demonstration-to-household installation ratio of 1:13.
- Unit latrine cost has been progressively reduced. This cost is even lower if the dissemination of the technology outside of Baldia is taken into account.

KEYS TO SUCCESS

- The community wanted some form of sanitation and 20 percent of the houses already had soakpits.
- Women played a major role.
- The past problems with bucket latrines encouraged people to pay for better forms of sanitation.



PROBLEMS

- The soakpit design was inflexible. It could not be changed to cope with local conditions, such as rising water tables.
- A household loan system was introduced but was difficult to maintain.
- Recently, increased water supply in the area has raised the groundwater table which has interfered with pit operation. Many families are connecting their pits to the open drains and operating them as septic tanks.

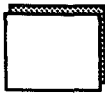
BALUCHISTAN INTEGRATED AREA DEVELOPMENT PROGRAMME

BALUCHISTAN

THIS project was aimed at reducing Baluchistan's infant mortality rate which is between two and three times higher than the national average. The deaths are mainly caused by the lack of potable water, poor health services, unsanitary conditions and inadequate hygiene education.

BACKGROUND: Baluchistan is Pakistan's least developed region and its 4.3 million rural inhabitants live on an estimated annual per capita income of Rs. 1,200 - less than half the national average. The majority derive their livelihood from farming, mining and services.

In the past, agriculture was dependent on the old 'karez' system of gravity-fed irrigation but the introduction of tubewells has brought about changes and in some areas the groundwater levels have fallen considerably. In the mountains and plateaux to the north and west, the water-bearing rocks are quite deep (300 to 600 ft.) except in the valleys where the water table is near to the surface. In the Indus plains to the east, canal-fed irrigation has raised groundwater levels and, as a result, waterlogging is common. In the southern coastal region, the groundwater is brackish.



THE ORIGIN OF THE PROGRAMME

The origin of the Baluchistan Integrated Area Development programme (BIAD) dates back to the 1980 UNICEF/Baluchistan Government joint planning workshop. This meeting proved to be the catalyst in the setting up of the "Rural Water Supply and Sanitation in Baluchistan" sub-project (RWSSB) which was part of the overall Baluchistan Special Development Programme. However, in 1981 the project was renamed the Baluchistan Integrated Area Development Programme after UNICEF provided \$6 million of project funding and persuaded the EEC, Dutch Government and CIDA to give their support to the scheme.

At that time, BIAD/UNICEF estimated that the programme would cost about Rs. 740 million of which the Government was to contribute 11 per cent, beneficiaries 35 percent (mainly in the form of land, labour and O & M costs), with the remainder coming from the donors.

BIAD was set up as an independent agency, so as

The BIAD Project focused on providing piped water supplies to the rural people.



to adopt an integrated and multi-disciplinary approach which covered all aspects of water supply, sanitation and health. Under the existing weak institutional framework, this kind of approach would have been almost impossible to achieve. The Public Health Engineering Department (PHED) was not independent but under the umbrella of the Irrigation Department. In addition, the traditional independence of the various Government departments meant that effective coordination would be difficult. The concept of an integrated approach also needed a financially independent central organisation which could adopt a flexible approach in order to meet the project objectives.

Under the BIAD programme, operation and maintenance of water supply, sanitation and health schemes had to have a high level of community involvement. But how could BIAD get local people interested in helping? BIAD adopted a simple philosophy. First, concentrate on supplying villagers with what they want most - clean water. Once these desperately needed water supplies are installed and maintained with community support, the people will be prepared to listen to new ideas about health and sanitation.



HOW DOES BIAD WORK?

The Directorate General of BIAD, which controls project implementation, is made up of engineering and administrative staff who have been seconded from local Government departments in Baluchistan. It has a large Public Health Engineering Department (PHED) with posts for 70 engineers and a hydrogeologist and geologist. BIAD also has a Community Development Wing (CDW) comprising a director and male and female assistant directors. This wing also has master trainers at divisional level and mobile teams which carry out district level health and sanitation programmes.

The concept of community participation in the setting up, maintenance and operation of schemes is new to BIAD staff as is the idea of an integrated development plan linking water to health, education and sanitation.

Seminars and workshops on the concept of community involvement in projects have been organised by UNICEF to orient BIAD staff. But the effectiveness of this orientation programme has never been tested on the water and sanitation schemes of Phase I, all of which have been designed

by consultants and let to contractors. There is sometimes a lack of coordination between BIAD's public health engineers and community development workers.

At village level, there are few formal self-help or community development organisations but there is a well-established and highly organised system of collective management of common resources such as the 'karezes'. In some cases, enlightened tribal leaders have promoted the introduction of health education, for both boys and girls, and have played a major role in organising the construction and maintenance of agriculture-related projects.

Who manages the money?

UNICEF manages all the donor funds and pays for the capital costs of the water supply schemes, BIAD's physical assets and supplies for the project's basic health services. Expatriate UNICEF staff have helped to set up the BIAD programme but the numbers of expatriates have now been reduced to a resident representative and a water supply consultant.



IDENTIFYING PROJECTS

Four districts, Kalat, Loralai, Naseerabad and Gwadar, together with experimental areas in Quetta and Pishin districts, were chosen for Phase 1 of BIAD. These districts were chosen because they included two ethnically different areas with groundwater (Kalat and Loralai), one with canal water (Naseerabad) and one with only saline water (Gwadar). The hydrogeological survey of each district had also identified several technically suitable locations for water supply schemes.

Each District Council was asked to choose three or four suitable locations for water supply schemes. It was at this point that the more politically powerful councillors managed to get their village 'clusters' approved for development (each cluster comprises 4-5 villages). Once the clusters had been selected for development, the BIAD District Mobile Team visited each area and persuaded the inhabitants to set up cluster committees, made up of two representatives from each village. In almost all cases, the cluster committee consists of tribal elders or influential landlords who control the decision making.



During the project's first phase, technologies tended to be over-designed and expensive. This is now being corrected.



PROJECT IMPLEMENTATION

Water supply - the pitfalls of rigid guidelines

The nearest water sources to the village clusters were selected in order to reduce the cost of abstracting and distributing water. However, settlement density in Baluchistan is low and in some cases villages are up to 5km from the water source. This has raised the supply costs substantially and the Phase I-A per capita costs of about Rs. 2,000 are 3-4 times higher than anticipated.

BIAD's rigid guidelines on the choice of technology led to these high per capita costs. The guidelines specified that deep-well turbines had to be used in groundwater areas and sedimentation tanks and slow sand filters employed in surface water areas. In some areas, the distribution network had

to have an overhead water storage reservoir and be capable of delivering 10 gallons/day of water per capita. Such technologies appear to be inappropriate as the local people do not have the skills, finances or incentive to build them.

In Phase I-B, the vetting of consultant designs and changes to specifications have reduced the per capita cost of schemes to Rs. 1,100.

Phase II schemes have adopted a far more flexible design philosophy (ground level reservoirs, 2-5hp pumping sets at well heads with 1-2hp pump sets at reservoirs with standby diesel power and use of modular designs) and the per capita costs are expected to be a maximum of Rs. 500. Repairs and spares for smaller pumps can be obtained in most towns, particularly those situated on trucking routes or in areas irrigated by tubewells.

The technology used in the Phase I water supply schemes has led to high operation and maintenance costs. Each household is paying Rs.10-15 per month, excluding energy costs, and cluster communities argue that the power authorities are applying the wrong energy charges. They claim that they are being charged at irrigation power supply rates which are higher than the water supply rate tariff.

Sanitation - following by example

Latrines were installed in the houses of those willing to accept them in the hope that this would demonstrate their usefulness to others.

At first, BIAD built two dry pit latrines in the Pir

Alizal cluster. These did not work properly and were rejected by the community. Pour flush latrines were then installed. The first models had flushing and splashing problems and so the demand for latrines declined.

In 1985, the latrine's pan design was changed and local interest has picked up again. It has now been decided that households have to pay Rs. 75 towards the cost of the pan. UNICEF has stopped providing the construction materials for the latrine superstructure and ceased paying labour charges. All these costs now have to met by the household.

Village-level education

Once a project has been accepted by the village leaders, BIAD offers training programmes to encourage local people to become skilled Pump Operators, Community Health Workers, Traditional Birth Attendants, and Village Sanitarians who are able to install latrines.

The District Mobile Teams also hold meetings of men and women from village clusters and these have raised considerably the communities' awareness of water and health matters. This is shown in the 95 percent Extended Immunisation Programme coverage in certain BIAD areas.

The role of rural women in BIAD projects is minimal, largely as a result of the strict enforcement of 'purdah'. However, there are also fundamental cultural and linguistic differences between the health staff and rural women and this has been a barrier to communication.

THE OUTCOME



SUCCESSSES

- The BIAD programme might have been slow in meeting its targets but it managed to raise the people's awareness of water and sanitation for health in the project areas.
- The sanitation programme achieved a measure of success because the technology being promoted was simple and cheap.
- The Extended Immunisation Programme coverage was very successful.



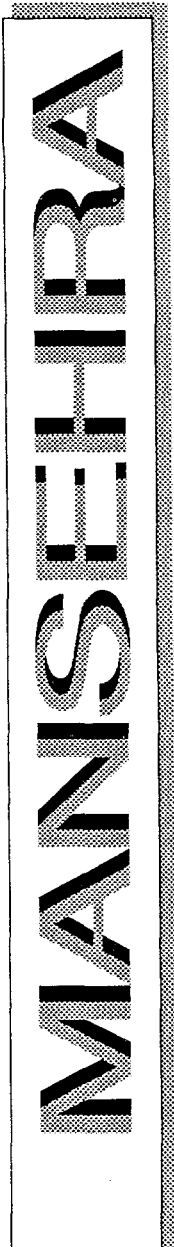
PROBLEMS

- The water supply technology used in the first phase was too complex and beyond the capacity of the local people to manage.
- Operation and maintenance costs were consequently too high.
- Essential spare parts are difficult to find.
- The main problems arose because of the lack of coordination between the hydrogeological, anthropological and technical investigations at the planning stage.
- There has also been a lack of coordination between UNICEF, BIAD and the Government organisations.
- BIAD's original targets were unrealistic, especially in view of the skill shortages in the province, the population scatter and logistical problems.

Summary of the BIAD targets and achievements for Phase I.

Activity	Target	Achievement	Success Rate (%)
Water supply schemes (clusters)	26	16	(61%)
Latrines	5,375	1,353	(25%)
Traditional Birth Attendants (TBAs)	78	31	(39%)
Community Health Workers	208	52	(25%)
Sanitarians	26	26	(100%)
EIP (Children under 5 years)	9,044	8,848	(97%)
Oral Rehydration Therapy (Families)	5,375	4,408	(82%)

MANSEHRA DISTRICT DEVELOPMENT PROGRAMME



THIS project had three main objectives. First, it aimed to improve rural water supplies and, second, to provide better sanitation facilities, particularly for women. Self-reliance for the development of infrastructure was the third objective. The MDDP was the first District Development scheme in Pakistan in which the community helped to prepare plans and implement water supply schemes.

BACKGROUND: Mansehra district is one of the more politically, socially and economically advanced regions of the North West Frontier Province. It lies in the foothills of the Karakoram Mountains at an elevation of 3,500-4,000 ft. above sea level and has wide, fertile valleys and numerous springs and rivers. Apart from the more remote villages, most of the region is well served by roads such as the Karakoram Highway (KKH) which is a major export route to the rest of Pakistan for one of Mansehra's main products - timber. Most of the land in Mansehra is divided into small plots up to 10 acres in size although there are some large landholdings in the forested region of the Kaghan Valley.

Improvements in communications, coupled with its long history of migrant working, have left Mansehra with a society which is much more open than in many other areas of NWFP. Consequently, the people are keen to listen to new ideas and accept change. The rapid urbanization, strong urban-rural links and a growing service industry are further evidence of the dynamism of Mansehra society.

Mansehra's District Council has a high quality of political leadership. It has introduced a successful revenue-earning, timber export tax and also implemented numerous development schemes, especially in water supply. High priority has also been given to education, electrification and roads. The weakening of the feudal society and proximity of the more affluent areas such as Abbottabad and Rawalpindi will continue to stimulate Mansehra's desire for development.

THE ORIGIN OF THE PROGRAMME

The origin of the MDDP goes back to the District Council election of 1979 which was won by Syed Qasim Shah on a manifesto that promised to bring piped water supply to villages. The 1980 Housing Census revealed that only 3 percent of Mansehra's rural population had access to piped water. Over 78 percent still relied on springs or streams for their supplies.

As a first step in fulfilling his electoral promise, Shah obtained permission from the Federal Government to levy a tax on timber exports from Mansehra - a move which quadrupled the District's annual revenues to Rs. 10 million. The District Council also carried out a needs assessment survey in which every household had to state its priorities from a list of basic services. Water emerged as the top priority and sanitation ranked fourth and so a district development plan was formulated to respond to these demands.

The needs assessment survey had a side benefit. It acted as a catalyst for creating a new awareness of people's needs and aspirations. During the survey, District Council staff and the local administrators met the people and began to understand their problems. The rural people, in turn, realised that the Council was concerned about their welfare.

The plan had to overcome some major water supply and sanitation problems. Traditional water sources in the area are frequently a long way from settlements and are invariably contaminated by

livestock. During heavy rains, the watercourses become muddy and, in winter, often freeze over. Some wells have been dug but these can dry up in summer.

The high population density in Mansehra villages has reduced the number of open areas for defecation - a special problem for women who face restrictions in public places. The problem becomes worse during winter and the rainy season and this has led to an upsurge in the use of rooftop dry bucket latrines which are emptied by women at night.

ORGANISATION OF THE MDDP PROGRAMME

Mansehra District Council had overall responsibility for the development plan. The Council's administration and planning departments shaped the policies but feasibility costs and designs were supposed to be prepared by the engineering staff and implemented by village-level project committees or private contractors. UNICEF also became involved in the plan at an early stage.

UNICEF started assisting the MDDP in 1981, with the software components of the programme, such as surveys, training and project management, in which the District Councils had no experience.

The plan was to teach the project committees project management and monitoring skills and train Traditional Birth Attendants (TBAs), Community Health Workers (CHWs), Community Skills Trainers for Women and Sanitary Promoters. The pro-



Traditional water supplies in the MDDP area are invariably contaminated.



A project committee discussing plans.

gramme managed to train 2,121 project committees, 142 primary school teachers, 148 TBAs, 26 CHWs and 44 Sanitary Promoters. These trained people were not successfully integrated into the MDDP but their presence and work will raise health awareness in the communities.

At the District Council's request, UNICEF also agreed to supply galvanised iron pipes and accessories for water schemes. However, UNICEF only supplied just over 10 percent of the 10 million running feet of pipe which have so far been used in the schemes. In total, UNICEF provided Rs. 10 million in the form of supplies.

Who provided the money?

In line with the objective of self-reliance for development and infrastructure, the District Council felt that it would have to rely on its own resources.

The total funds available for the first five years of the MDDP project amounted to Rs. 132 million. This was made up of Rs. 72 collected from revenues, Rs. 50 million of Government grants and Rs. 10 million contributed in the form of supplies by UNICEF.

The District Council provided money for pipes and all other materials and fittings except the cement for storage reservoirs. The community was also asked to meet the equivalent of 18 percent of total project costs and this was usually provided in

the form of unskilled labour. This community effort saved about 15 percent of the contractor's costs. A with-holding tax of 3 percent made up the total contribution. Shah¹ estimated that up to June 1986, community participation accounted for 50-60 percent of total investment costs in about 1,550 rural water supply schemes.

For the sanitation project, Rs. 500 were recovered from beneficiaries - Rs. 200 in advance and the remainder in six equal instalments.



PROJECT IDENTIFICATION

The way in which the village-level Project Committees were formed and operated was complicated. The community first had to make a proposal for a water supply scheme. Any individual in the village could put this proposal forward to the local administration. It was then up to the local District Council to set up and lead a Project Committee to carry out the work. Each Project Committee was made up of two community representatives and a Council member and it was their job to submit the plan formally to the District Council and apply for help.

Representatives from the District Council then carried out site visits with Project Committee

¹Shah, S.M., "Naveed-e-Sehr", Mansehra, 1986.

members and prepared a feasibility report, cost estimates and design guidelines. The Council's Chief Officer gave his views on the plan to the Council Chairman who had the power to sanction money for the scheme. The money was given to the Project Committee in four instalments (as cash or construction materials) which depended on the satisfactory completion of each construction phase.

As the Project Committees had little or no experience of carrying out water supply schemes, most of the tank construction work and distribution network plumbing was farmed out to private contractors.

PROJECT IMPLEMENTATION

Water supply

The emphasis of the MDDP was on cost reduction and community self-help. Villages were left to design and build their own schemes with little help from the Council. It was originally envisaged that the District Council's four-man engineering team would design and supervise every water supply scheme but this proved to be impossible. In fact, no detailed designs were prepared by the District Council engineers or other agencies for the village communities. Where preliminary project designs were made by the Council sub-engineers, these were generally ignored by the Project Committees. This meant that the technical support necessary for the success of the scheme was lacking. Nevertheless, the Project Committees, with their limited skills, built schemes and carried out design modifications after completion to improve their efficiency. This proves that the Committees were responsive to new ideas, could learn from their failures and adapt to changing conditions.

The private sector also played a major role in each scheme. The Project Committees purchased materials from local shops, used private contractors to transport materials to site and hired masons and plumbers to carry out some of the skilled work.

Most of the communities which designed schemes favoured gravity-fed water supplies, although 113 shallow wells were dug. The gravity-fed

schemes usually convey water from natural springs, via a long pipeline, to a village's elevated storage reservoir. Water from this reservoir is piped to village standpipes and house connections for the more affluent or influential households. The pipework is made of galvanized mild steel ranging from 1.5 in. to 0.5 in. in diameter and is laid exposed at ground level where it is open to the elements and easily damaged.

Despite the lack of proper design, most schemes are flexible and can be upgraded and the technologies are appropriate to the needs of the community. The high capital cost of constructing a hill source is offset by the low O & M costs.

Sanitation and health education

Demonstration pit latrines were provided with Rs. 75,000 earmarked for each village demonstration project. Model sanitation schemes in selected villages were not adopted and were eventually abandoned. One of the problems was that the latrine cost Rs. 5,000 to build - far more than most people could afford.

The project did not succeed in developing the necessary motivation, skills and organisation within the District Council to enable it to manage the project's software components. One of the reasons for this was the District Council's preoccupation with obtaining construction materials for water supply schemes, to the detriment of the software component. UNICEF's attempts at starting a community education and training programme had little success as the programme was not properly integrated into the MDDP.

Operation and maintenance

Each community had to operate and maintain its own water supply system and the Project Committee normally appointed someone to undertake maintenance. Formal maintenance policies were non-existent and a system of crisis maintenance now operates. However, expensive maintenance is not anticipated for the gravity-fed water supply schemes.

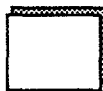
Maintenance of pit latrines was overlooked.

THE OUTCOME



SUCSESSES

- In the 1982-86 period, the MDDP envisaged construction of 1,552 schemes. However, 3,639 schemes have been completed - over 2,000 more than planned.
- UNICEF has trained 2,121 project communities, 142 primary school teachers, 148 TBAs, 26 CHWs and 44 Sanitary Promoters.
- The MDDP is an important step in the integration of community resources and participation into governmental programmes.
- Although not meeting the usual technical standards, the water supply schemes are cost-effective and continue to provide water close to the homes up to this day.
- The MDDP has succeeded in transferring responsibility for O & M over to the community.



PROBLEMS

- The water schemes created large quantities of wastewater which are posing a health hazard.
- None of the 500 planned drainage and street paving schemes has been completed. Only 325 have been started.
- The target of installing 2,000 latrines has not been met.

ORANGI PILOT PROJECT

THE primary objective of this programme was to build a sewerage system for the town. In addition, the project aimed to raise the health awareness of the people, support community-based institutions and strengthen technical, managerial and organisational skills among the residents of Orangi.



ORANGI

BACKGROUND: Orangi is one of Pakistan's largest squatter settlements (katchi abadi) with a population of about 800,000. It is situated north west of Karachi on gently undulating rocky desert with numerous creeks and gullies. Most of the people live in houses, totalling 90,400, which are organised in 6,200 carefully-planned lanes. A piped water supply has been in existence for the past seven years and many homes have electricity.

The people of Orangi come from a variety of backgrounds. Over 200,000 refugees from East Pakistan (now Bangladesh) were settled in the colony in the 1970s. Other residents have left impoverished rural or urban backgrounds and are trying to build a better life in a new environment. The monthly household incomes vary from Rs. 1,000 to Rs. 4,000 per month, with an average income of Rs. 2,500.

Many of the settlement's inhabitants have been forced to live outside Karachi by the soaring price of land. Clerks, typists, journalists, teachers and bank employees as well as unskilled workers live in Orangi.

Land tenure problems are complex in the settlement. There is an informal property market and this has spawned a sophisticated "parallel administration" in Orangi which has given the residents a considerable feeling of security and the incentive to invest in their houses.

THE ORIGIN OF THE PROJECT

Ten years ago, the people of Orangi realised that a sewerage system was the only answer to their sanitation problems. Until then, three main forms of excreta disposal had been used. Most people used bucket latrines which were emptied by scavengers every fourth or fifth day for a fee of Rs. 15 per month. However, the scavengers frequently emptied the buckets into the unpaved streets, causing a health hazard. More affluent households had soakpits but these filled up after a few years and were not seen as a long-term sanitation solution. Some people had laid sewerage pipes from their houses to the nearest creek or *nullah* in a haphazard way and, although not ideal, the system kept excreta out of the lanes.

WHO ORGANISED THE ORANGI PROJECT?

Agha Hasan Abedi, President of the Bank of Credit and Commerce International, wanted to help

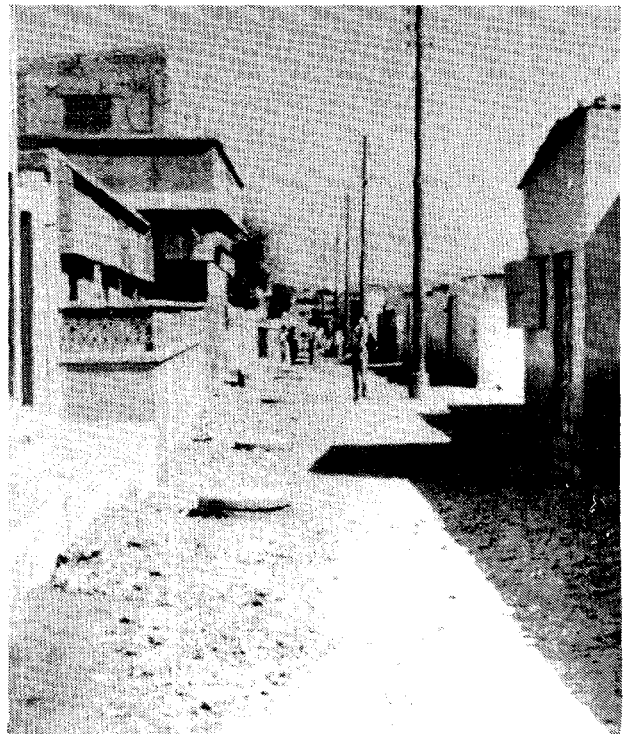
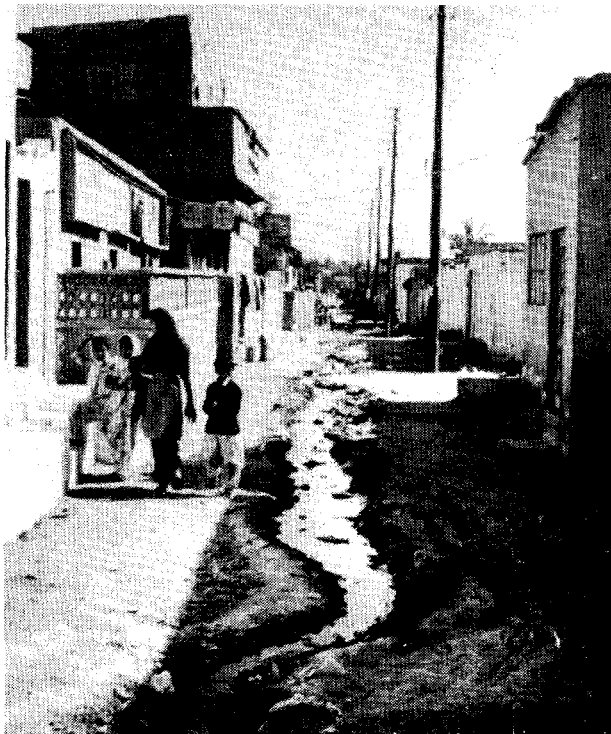
the people of Orangi and demonstrate to others that communities could help themselves with development projects. He encouraged Dr. Akhtar Hamed Khan, an eminent Pakistani social scientist, to help him organise and manage the Orangi Pilot Project (OPP). The scheme was seen as a prototype which might be copied by the 35 percent of Karachi's population who live in squatter settlements.

The initial OPP research identified several problems in providing sewerage for squatter settlements. Before setting up community organisations, the OPP investigated the feasibility of installing sewerage. For example, Orangi's inhabitants thought the local authority should build the system. But the local authority said that it could not afford to do so and had a rule that only open drains could be built in squatter settlements.

International loans might have been raised for one or two small sanitation projects. However, it would be impossible to borrow or repay the money needed to provide sewerage for all the squatter settlements in the area.

The OPP research also indicated that in the sewerage systems built by the local authorities, only one-fifth of the total construction costs arose from

Before and after sewer construction in Orangi; the improvement speaks for itself.



labour and materials costs. The remainder was accounted for by administrative overheads, contractors' profits and the like. Khan and Abedi, therefore, decided to encourage the Orangi community to build its own sewerage system.

The first step was to create community organisations which were associated with lanes in the town. Each lane had 20 to 30 houses whose inhabitants knew and trusted each other. OPP arranged for one of its Social Organisers to meet with the residents of the lane, discuss the sewerage plans and encourage them to form a lane committee and elect a manager.

Once the committee had been established, a member of the OPP technical staff surveyed the lane, set up benchmarks and prepared plans and cost estimates for sewerage work. Lane managers then had the task of collecting money for the scheme from the residents.

Who provided the money?

All the community investment in sanitation was collected, managed and spent by the lane organisations. Accounting methods were rudimentary and no bookkeeping was carried out. In many cases one of the older women acted as the treasurer and provided money for the lane manager. Total investment by the community up to December 1987 was approximately Rs. 10 million. Each household spent about Rs. 500 for the shared facility of primary and secondary drains.

The OPP has spent about Rs. 1.5 million on research and extension (about 15 percent of community investment). In addition, OPP invested about Rs. 200,000 in tools and equipment which were borrowed by the community to implement schemes.

The OPP claims that this community-based approach reduced sewerage costs by 80 percent compared with official costs.

PROJECT IMPLEMENTATION

In the first part of the scheme, no supervision of construction was provided and the workmanship was poor. By 1982, OPP realised that the technological standards had to be improved or else people would lose confidence in the scheme and no new lane committees would be formed. OPP carried out research which enabled it to simplify the engineering design standards and, through a large number of meetings, explained how the pipes should be laid to avoid technical problems. Where lanes were located at long distances from nullahs (natural creeks), the OPP suggested that secondary drains should be installed.

The OPP also trained private sector contractors in the construction of sewers and gave their addresses to lane committees.

Operation and maintenance

The lane organisations were responsible for O & M of the sewerage system and it was their job to clean and repair manholes and sewers. Most sewer blockages occurred when manhole covers were broken and the manhole turned into a rubbish dump. The OPP is now planning to make strong and inexpensive precast concrete manhole covers which will eliminate many of these problems. Money for maintenance work was collected from the residents by an individual involved in the original project construction. Most people were anxious to protect their investment, and there have been no problems so far with community maintenance.

The OPP has found that maintenance costs were directly related to the quality of the original construction. As construction methods have improved, the maintenance cost per lane per month has been reduced substantially and is well below that of schemes administered by formal water/sewerage authorities.

THE OUTCOME



SUCCESES

- Since July 1981, 2,230 primary drains have been installed.
- By the end of December, 147 secondary drains had been installed by the residents. In addition, OPP supervised the construction of 26 secondary drains which were paid for by KMC councillors.
- The OPP has shown that it is possible for small groups of people to build a sewerage system based on lanes.
- The completed sewerage systems are often finished to a higher standard than those built by the KMC.
- The lane organisations and the OPP are now important new groups working for community development.
- Construction of the sanitation system brought people together for a common purpose. Now, they are capable of undertaking other joint tasks.
- Using sanitation as its entry point, the OPP has started a low-cost housing programme and a Women's Welfare

Programme to promote health and hygiene education, immunisation, family planning and the provision of seeds for kitchen gardens. Nine Women's Work Centres have provided jobs for 600 women.

- KMC's policy that only open drains could be built in squatter settlements has been revoked and the Council is now funding sewerage projects.

- The OPP has also managed to stimulate the private sector.



PROBLEMS

- There is no treatment of the wastewater which is discharged into nullahs and this may pose a health hazard. The nullahs have already started to silt up as a result of the sanitation programme.
- The locally-manufactured sewer pipes are inferior to those made by KMC and will have a shorter life.
- The original manhole cover design was inappropriate as it could be removed easily. This enabled people to use the manhole as a refuse pit.

PUNJAB SANITATION PROGRAMME

THIS programme, which ended in 1986, had several major aims. It was designed to cut the infant mortality rate by 35 percent and halve the incidence of intestinal and parasitic diseases in children and mothers. It also aimed to provide sanitation for 20 percent of villages and water supplies for almost one-third.

High priority was given to improving public awareness of the health benefits relating to sanitation, water supply and waste disposal. Another priority was to train community leaders in the organisational work needed for sanitation projects.

PUNJAB

BACKGROUND: The project area encompassed six districts - Rawalpindi, Jhelum, Chakwal, Attock, Mianwali and Dera Ghazi Khan which had a total population of 4.4 million in 1981. The region's economy is based on agriculture and landholdings are small. There is no feudal structure. The major crops are wheat, maize, jowar, bajra, pulses and vegetables and there is a high degree of mechanisation on farms since tractors can be easily rented for Rs. 60 per hour. Despite their relatively modern approach to farming, the farmers still rely on rainwater for crops as well as for domestic water supplies. The terrain is hilly and the rainwater runoff is fast. In times of drought, the people suffer. The lack of irrigation and the seasonal nature of farming has encouraged many men to seek employment in the nearby cities of Rawalpindi and Islamabad.

The influence of nearby urban areas is quite strong. People are receptive to new ideas and have a high level of literacy, estimated to be 40 percent.

ORIGIN OF THE PROGRAMME

The Chairman of the Rawalpindi District Council, who was keen on regional development, was responsible for initiating the programme and brought the plight of the rural poor to the attention of the Provincial Government.

There is no doubt that something had to be done about the appalling water supply, sanitation and health problems in the six districts. The population always suffered during times of drought because livestock and crops were badly hit. The situation was worsening as the water table was falling and well yields were declining. The lack of safe water had led to an increase in the incidence of water-borne diseases, so much so that 80 percent of women and children had some kind of intestinal or parasitic disease. In 1980, the infant mortality rate was 105 per thousand.

Virtually no one had access to any form of hygienic sanitation. People generally used the open fields for defecation. The increase in population density reduced the number of available open spaces and made it difficult for women to maintain privacy without walking long distances.

The poor health statistics motivated the Provincial Government, with help from UNICEF, to set up the Punjab Sanitation Programme. The programme's objectives are detailed on the opposite page.

The first step was taken in 1981-82 when a series of pilot projects were started in a few villages.

However, the programme soon grew to cover numerous villages throughout the six districts.

PROJECT ORGANISATION

UNICEF formulated policy, coordination, funding and training. However, UNICEF withdrew from the programme in 1986; this will be discussed later in this section. At the provincial level, the Local Government and Rural Development Department (LGRDD) coordinated with UNICEF and carried out overall programme administration and financial control. The Assistant Director of LGRDD in each programme district carried out basic monitoring while each *Marakaz* Project Manager was in charge of day-to-day administration, including the release of funds to Union Councils and supervision of sanitation promoters.

The Sanitation Promoters formed the final link in the PSP organisation. Their job was to motivate and educate village committees and households in the installation and use of the new latrines. Each sanitation worker underwent a two-month UNICEF training programme in Lalamoosa. At first, the sanitation workers were grouped in teams comprising one man and two women but this was later changed to one-man, one-woman teams.

At the village level, the community organisation was made up of Village Sanitation Committees (VSCs). The post of VSC Chairman was taken by a Union Council member and the Secretary's job was normally taken by the Union Council Secretary.



Infant mortality in the Punjab Sanitation Project area was 105 per thousand in 1980.

Other village notables made up the VSC membership. The VSC's prime role was to motivate the people, demonstrate ideas, implement the programme, arrange loans from the project and later recover them. An attempt was made to involve women in the work of the VSCs by setting up Women's Committees.

The private sector's role

The private sector supplied the PSP with pans, pipes, building materials and skilled labour for the construction of latrines. Some of the labour was provided by VSC members who had been taught latrine installation by the Sanitation Promoters. Installation services for latrines and handpumps were provided by local component retailers as part of a sales package. Most retailers operated within a 10-mile radius of their village. The contractors generally worked on demand and did not actively market the latrine/handpump installation services.

The withdrawal of UNICEF - and the consequences

UNICEF left the PSP in 1986 and no formal arrangements were made by the Government for taking over UNICEF's role or for setting up permanent financial arrangements. Neither was there a formal plan for absorbing the Sanitary Promoters into the regular workforce. As a result, the programme stopped suddenly, the Sanitary Promoters lost their jobs and the VSCs, which had developed into viable community organisations, were disbanded.

Who provided the money?

The total projected capital cost of the PSP between 1983 and 1985 was Rs. 18.9 million and this should have been jointly provided by UNICEF and LGRDD. However, the LGRDD did not contribute its share and UNICEF had to foot most of the bill, spending Rs. 18 million between 1981 and 1986. Of this, Rs. 9.2 million was spent on demonstration projects, Rs. 1.0 million on staff training and Rs. 2.1 on salaries for Sanitation Promoters. In addition, Rs. 6.4 million was earmarked for revolving funds which would allow loans to be made to villagers. The loan repayments would be ploughed back into community welfare schemes.

PROJECT OBJECTIVES

1. To reduce the infant mortality rate from 105 per thousand in 1980 to 70 per thousand in 1986.
2. To halve the incidence of intestinal and parasitic diseases in mothers and children from 80 to 40 percent.
3. To increase rural water supply coverage from 13 percent to 30 percent.
4. To increase rural sanitation coverage to 30 percent in the villages encompassed by the programme.
5. To train community leaders in the organisation and implementation of sanitation projects.
6. To improve the peoples' awareness about the health hazards brought about by poor sanitation, water supply, animal waste disposal and poor household hygiene.

The PSP aimed to cover 55 marakiz, 171 Union Councils and 470 villages in the six districts. It had an effective target population of 940,000. Under the plan, demonstration latrines were to be constructed in schools and village community health centres and this was to be followed by a major household latrine construction programme. In addition, soakpits, biogas plants and water systems were to be introduced.

Under the programme, each village was to receive Rs. 21,000 in revolving funds. In practice, villages received amounts varying from Rs. 25,000 to Rs. 44,000. The money was usually distributed among households in the form of cash loans of Rs. 300 or in kind - two bags of cement, a latrine pan and a pipe. Some households received loans ranging from Rs. 1,000 to Rs. 2,000. There was no shortage of credit as the size of the revolving fund exceeded demand. It is not clear whether the poorer village members were given preference for large loans.

The recovery rate for these loans was low. Under the PSP plan, the loans should have been paid back to the VSCs in monthly instalments ranging from Rs. 50 to Rs. 100. There are several reasons why the money was not recovered.

Many people seemed to think they were receiving a grant which did not need to be repaid. In any case, the monthly repayments were beyond the reach of most borrowers. Those who did make repayments hardly ever received a receipt.

The VSCs and the Union Council made no earnest effort to recover the money for fear of losing goodwill and popularity among the public. In turn, the public suspected the repayments would not be used for community welfare, as part of the revolving fund.



PROJECT IDENTIFICATION

The District Council selected the villages to be covered and carried out project planning, administration and supervision. Project Managers felt the choice of villages was made primarily on political grounds but the PSP had explicit criteria for village selection. There had to be road access and between 100 and 300 houses in each village. There also had to be an available water supply, and a clear felt need for sanitation.

However, there were no village surveys and, in practice, the selection criteria were not always met. Small and remote villages, for example, were sometimes included in the programme.



Village masons were trained and latrines constructed - including latrines for schools.



PROJECT IMPLEMENTATION

Sanitation

Soakpits and septic tanks existed in the project area but there seems to have been no effort to standardize the design even within individual villages.

The choice of septic tanks was inappropriate and, in any case, most of the tanks were badly designed, having no outlets. Soakpits proved to be appropriate but again the designs were poor. In many villages, the sides of the soakpits were lined with bricks joined by a cement mortar. This greatly

reduced the soakage area and increased the capital cost.

Pour-flush latrines required a bucket of water for flushing each time they were used in order to work properly. But the scarcity of water meant that the latrines were under-used.

Many of the latrines were also over-designed with large pits and elaborate superstructures. This raised the average cost of each household latrine to Rs. 2,300. A total of 10,281 latrines out of the planned 32,900 were installed during the PSP programme and the overall cost per latrine was Rs. 1,500.

Biogas plants and water cisterns - inappropriate technology

It was clear from the start of the programme that the people would find it difficult to understand and accept biogas plants, water cisterns and soakpits. Nevertheless, this technology continued to be demonstrated until the programme ended. There was no positive response from the villagers.

Lack of interest in this technology can be attributed to the villagers' fundamental doubts about whether it would work and the benefits it might bring. A second problem was the high cost of the equipment. A biogas plant costs Rs. 5,000 and a water cistern, Rs. 7,000 - beyond the reach of most families.

Operation and maintenance

The pour-flush latrine was difficult to maintain in areas with water shortages. People were still worried about the pits filling up and about the resultant desludging problems they would face.

People who installed latrines were not trained how to use them and this contributed to their under-use.

Community education

The PSP missed opportunities to emphasize the links between water supply, sanitation and health. There was no formal hygiene component in school curricula even though many schools had demonstration latrines.

THE OUTCOME

SUCCESSSES

■ A high rate of latrine installation was achieved in the first few years of the programme. Over 10,000 latrines were installed.

■ The provision of loans in kind or as cash from the revolving funds, coupled with sanitation promotion, encouraged villagers to accept latrines.

PROBLEMS

■ In areas with a low water table there is a shortage of water for sanitation purposes which limited the use of pour-flush latrines.

■ The PSP did not recruit and train sufficient Sanitation Promoters to cover the number of villages encompassed by the scheme. The Sanitation Promoters were expected to cover large areas without proper transport.

■ The four project components - biogas plants, water cisterns, soakpits and latrines - were not integrated.

■ The cost of the technologies selected for the project components was too high for rural households.

THE PRIVATE SECTOR

ABOUT half of Pakistan's rural water supply systems have been installed by the private sector. This chapter looks at the private sector and examines the role it could play in the future in helping the Government meet its rural water and sanitation targets. A number of recommendations are made, detailing the support the Government might give to enhance the private sector's role.

THE PRIVATE SECTOR

WHY IS THE PRIVATE SECTOR IMPORTANT?

The Public Health Engineering Departments have made major efforts to recruit the extra engineering staff to carry out the water supply and sanitation schemes which the Government plans to undertake. Even so, the PHEDs will still rely heavily on private sector consulting firms for help with design and supervision of piped water supply schemes, for example.

Of the 400 or so nationally registered engineering and planning consultants, only 29 say they have experience in water supply and sanitation and only four of these have worked in rural development and planning. Few of the firms have the necessary multi-disciplinary capacity for integrated water supply and sanitation projects.

Most of the simple rural water supply and sanitation schemes, involving tubewells, handpumps and simple latrines, are carried out by small locally based formal and informal contractors. In general, they have limited technical skills and own little construction equipment.

THE CURRENT ROLE OF THE PRIVATE SECTOR

The private sector plays a significant role in the provision of rural water and sanitation. It is involved with handpump installation and manufacture, project design and supervision, execution of PHED schemes, pipe manufacture, latrine construction and with the manufacture of motor pumps for private tubewells.

At present, privately installed and financed handpumps provide water to about 25 million people - almost 40 percent of the rural population. In the sweetwater zones of the Indus Valley, Punjab and Sind, household handpumps predominate. However, a water quality study of these pumps showed that only half provide potable water (see box).

Handpump manufacture is mainly carried out by thousands of small establishments who market their pumps in local markets. There are few large-scale handpump manufacturers. Pakistan's pump and pipe manufacturing industry has excess capacity and should be able to meet any increase in demand.

A SURVEY OF TWO PUNJAB DISTRICTS

In order to understand more fully how the private sector works, a special review of 22 villages in two Punjab districts (Gujranwala and Multan) was undertaken. Two hundred households and 26 handpump installers were interviewed. Here is a summary of the study findings:

Drilling and handpump installation

Seventy percent of the installers work alone, hire unskilled labour or use client help. Drilling and handpump installation are only some of the services they provide. Each installer carries out an average of 17 handpump installations a year at an average cost of Rs. 1,060 (ranging from Rs. 800 to Rs. 1,700). Each drilling and handpump installation takes one to two days.

Drilling and handpump installation equipment is relatively cheap, costing from Rs. 1,000 to Rs. 2,500.

Ready-made handpumps are available in Gujranwala but the standard components are sub-grade. In Multan, pumps are made to order after the column's length has been specified. Roughly two-thirds of the installers have handpump fabrication facilities.

The installer makes a profit of about Rs. 90 per job. There is no marketing of handpumps. Instead, installers wait for households to approach them. Credit facilities are unavailable for householder or installer.

Handpump repair

On average, pumps break down once a year. Half need filters replaced, one-third require new pipes and only one-fifth need a new valve. Most problems occur below ground. Repair costs average about Rs. 150, with 80 percent of the repairs costing over Rs. 100.

Repair shops are usually nearby. Over 80 percent of the villagers reported repair shops within 2 km. of their village. About 70 percent of the households said that handpump parts were available within 10 km. - usually from a larger town which could offer a wide choice of supply.

Assuming each pump is used by 10 people, the average per capita cost of handpump water supply is Rs. 100.

Latrine installation

Most artisans install about eight septic tanks a year at a cost of Rs. 3,000 each. Privacy, rather than health, is the prime motivation for latrine construction but the high cost of the septic tank is prohibitive to most families.

The study statistics indicate that in Punjab's sweet water zone, there are probably 12,000 artisans who install between 150,000 to 200,000 handpumps a year. It is impossible to estimate latrine installation rates from the study data.



THE PRIVATE SECTOR & THE FUTURE

The private sector could help by rehabilitating existing installed handpumps so that they provide potable water. About 1 million handpumps need to be upgraded, mostly through better installation practices and sealing the area around the pump.

More pumps are still needed and could be provided in the sweetwater zones by the private sector.

Private sector consultants in water and sanitation could be trained and boost PHED and local government capacity to undertake schemes.

Manufacturers could increase and improve pipe and pump supplies. Tubewell installation could also be improved.

RECOMMENDATIONS

The Government could support the private sector by:

1. Training technicians to improve handpump design, installation, operation and maintenance and rehabilitation.
2. Adapting proven handpump designs for local manufacture.
3. Introducing twin pit pour-flush latrines nationwide.
4. Promoting handpumps and latrines by improved marketing in the media, through health workers and by technology demonstrations at the Union Council level.
5. Providing rural credit schemes to small-scale contractors and low-income households. The latter could be introduced as part of the proposed marla housing credit scheme.

This chapter has been compiled from information contained in *Pakistan: Investigative review of private sector involvement in rural water supply and sanitation* by Habib Ahmed and Sajjad Muneer, April 1988.

SEVEN KEY ISSUES

The Rural Water and Sanitation Sector Review of Pakistan, along with the National Workshop on Case Studies in the sector and the Policy Conference, have led to the identification of seven key sets of issues for development of the sector. This chapter raises these issues.

KEY ISSUES

1 **SECTORAL PRIORITY, PLANNING AND FINANCING**

(i) What should be the service-level targets in the medium and long term and what, consequently, should be the sector's share of GDP and public sector plan allocations? For example, is the target of full water supply and 50 percent sanitation coverage by 2000 attainable?

(ii) What should be the share of international funding versus domestic resources in the development of the sector? How important are the different costs/terms of financing and conditions associated with greater resort to external sources? To what extent should soft terms on international loans be passed on to final beneficiaries?

(iii) What share of the total domestic resources required for the sector should be mobilised by different levels of government, viz., federal, provincial, local, and by the beneficiaries?

(iv) What type of planning for the sector should be undertaken at different levels of government - federal, provincial, local?

(v) What should be the institutional process for project preparation and appraisal so as to minimise delays and depoliticise, to whatever extent possible, the selection criteria?

2 **INTEGRATED APPROACH TO DEVELOPMENT**

(i) What are the key intra-sectoral (water, sanitation, drainage and hygiene education) relationships which have to be promoted so as to maximise the benefits from investments in the sector?

(ii) How can the integration of different components be achieved in the best manner institutionally?

(iii) How can households and communities be induced to contribute their own resources towards the provision of sanitation and drainage?

(iv) What mechanisms can be used to create a general health awareness and to promote hygiene education?

(v) How can hygiene education best be delivered within available institutions in the Government, NGOs and communities, given that any such input has to be provided at the community level on a continuing long-term basis?

3 **INSTITUTIONAL FRAMEWORK**

(i) What should be the overall institutional mix and allocation of responsibilities for development of the sector?

(ii) What should be the respective roles of the PHED and the LGRDD?

(iii) How can adequate software expertise in sociology, community development, economics, and finance be introduced into existing institutions which have primarily an engineering orientation?

(iv) How can the community be made an active and respected partner in project development and execution?

(v) What needs to be done to bring about a greater recognition that the primary beneficiaries in the sector are women and children?

(vi) What should be the nature of village-level organisations (individual or clusters of villages, elected/nominated, multi-purpose/single project, permanent/temporary) to ensure effective user participation in the process of identification, execution and management of projects in the sector?

(vii) What type of human resource development activities need to be undertaken for institutional strengthening in the sector?

4 **CHOICE OF TECHNOLOGY**

(i) What constitutes 'basic' service level in the sector?

(ii) How can the technology be made upgradable and adaptable to changing conditions ?

(iii) What types of technology are likely to be readily acceptable to users/beneficiaries ?

(iv) What should be the trade-off between, on the one hand, high capital cost/low O & M cost technology and, on the other hand, low capital cost/high O & M cost technology ?

(v) How can the labour needs of the chosen technology be enhanced to reflect local manpower resources and enable greater community participation ?

5 SUSTAINABILITY OF INVESTMENTS

(i) What implications do different technologies have on the rate of depletion of different natural resources in the environment, e.g., on the depletion or pollution of groundwater ?

(ii) What types of institutional arrangements need to be made at the local level to ensure proper operation and maintenance ?

(iii) How can adequate emphasis be placed on using existing infrastructure properly as opposed to expanding capacity, especially through donor agency funds ?

6 COST RECOVERY

(i) What should be the extent of capital and O & M cost recovery in the sector ?

(ii) What is the best method of financing (tariffs versus taxes, regular collections vs collections in response to need) ?

(iii) To what extent should financing be decentralised, or community-based ?

(iv) How can the process of cost recovery be effectively integrated within the existing institutional/community structure ?

7 ROLE OF THE PRIVATE SECTOR

(i) Given that the private sector is a major but often uncoordinated and informal resource for the sector, how can its efficiency be enhanced ?

(ii) Which sub-sectoral and geographical areas have the greatest potential for an enhanced private sector ?

(iii) What support systems (credit, technology development and standardization, marketing, skill development, etc.) need to be instituted to fulfil the private sector's potential ?

(iv) How far can the Government rely on the private sector to achieve the stated objectives ? What contribution can the private sector make in reducing the financial burden on the public sector for developing the sector ?

NATIONAL POLICY CONFERENCE ON RURAL WATER SUPPLY AND SANITATION: Declaration and Detailed Recommendations

Provincial and federal officials met April 5-7, 1988 at a workshop in Islamabad to consider the review of case studies and the private sector. From April 13-14 they met at a conference to define sector policy which incorporated the key lessons from the case studies.

This section details their conclusions in the form of a policy declaration and more detailed recommendations.

DECLARATION

**NATIONAL POLICY CONFERENCE ON RURAL WATER
SUPPLY AND SANITATION
Islamabad Declaration
April 13-14, 1988
Proposed Government Strategy**

The Conference strongly endorses the objectives of the Five-Point Programme, which seeks substantially to increase coverage of water supply and sanitation to the rural population of the country. The Conference recommends an extension of this sound socio-economic commitment, to achieve full water supply and 50 percent sanitation (hygienic disposal of human waste) coverage to the rural population by the year 2000. The Conference proposes a strategy that will ensure sustainability and assist resource mobilization through enhancing the role of the beneficiaries in planning, financing and managing their services, and that will ensure maximum benefits through the integration of water, sanitation and hygiene education.

The strategy includes the following points which should be incorporated into national sector investment guidelines:

1. Community involvement, with a special focus on enhancing the role of women, is an essential component of the strategy. Beneficiaries, through constituted associations, should participate in planning, construction, management and maintenance of schemes, and should finance, in cash or kind, a part of capital costs and all of the O & M costs.

2. The integration of water supply, sanitation and hygiene education is also an essential component of the strategy, to ensure improved health of the rural population. This will require close collaboration between sector institutions.

3. Institutions must be strengthened and coordinated at all levels to undertake challenges of the future. Multi-disciplinary training programmes should be established. Public Health Engineering Departments (PHED) must be strengthened and their social mobilization skills reinforced. The technical skills of both the PHED and the Local Government and Rural Development Departments (LGRDD) must be strengthened. Both institutions must ensure closely coordinated operations, together with departments of Health, Education and Social Welfare. Expanded participation of non-governmental organizations (NGOs) should be encouraged and supported.

4. The private sector plays a key role in sector development, which must be further strengthened through technology upgrading, training, marketing support and credit assistance.

5. Technology choice will reflect the different environmental conditions, and water resources constraints across the country, but the principle that technologies should be affordable and sustained by the beneficiaries should be adopted.

6. Service levels should reflect the expressed demand of the beneficiaries, who should receive the service level that they desire, can afford, and can sustain in the long term. In order to accelerate equitable coverage, the Government should assist in the provision of a basic level of service.

DETAILED RECOMMENDATIONS OF THE CONFERENCE

A. Institutions and Linkages

1. The Conference recommends inter-sectoral co-ordination through provincial steering committees (PSC) so as to ensure co-ordination in the delivery of integrated programmes in the sector. It also recommends an inter-provincial committee (IPC) for developing common design standards and criteria, standard specifications for plant and equipment, common training programmes and the sharing of experience. The PSCs should consist of secretaries/heads of the Planning and Development, PHED, LGRDD, Social Welfare, Education and Health departments, with co-ordination by the Planning and Development Department. The major objective behind the establishment of PSCs, which may meet quarterly, is to ensure full sectoral co-ordination in the delivery of integrated programmes in the sector.

2. The IPC will comprise nominated members of the PSCs and one member each from the Planning Commission and the Federal Ministry of LGRDD. The IPC should also have representatives from the FATA, Northern Areas and Azad Jammu & Kashmir. Meetings of this committee will be held at least once a year before the formulation of the ADP. Its functions will be to evolve common design standards and criteria, suggest standardisation of equipment, share experience in methodologies and organize joint training programmes and workshops. The IPC will have a secretariat located in the Federal Ministry of LGRDD. The Secretariat should be funded and staffed by the Federal Government, keeping in view provincial representation. It should comprise not more than two or three professionals. Details of staffing should be worked out by the IPC. The secretariat will also act as a data centre, a resource group and perform programme monitoring functions.

3. A conference should be held every two years at different locations by rotation among the provinces to share experiences and should be funded by the Federal Government.

4. There should be a formal memorandum of understanding between the participants in a project, viz., the village organisation and the govern-

ment or the NGO. A bank account should also be established by the former.

5. A training centre for the sector may be established, possibly at the Institute of Public Health Engineering, with a regional network which will include the social sciences and engineering departments at Karachi, Peshawar and Lahore. Training in social mobilization and low-cost technologies should be incorporated into curricula of university and technical training institute courses. Field placements should form a mandatory part of training programmes.

6. The role of NGOs in the sector should be promoted. Special encouragement must be given to NGOs which have already demonstrated the ability to develop activities in the sector in low-income areas.

7. Water, sanitation and hygiene education are necessary components of an integrated programme for achievement of maximum health benefits. In areas where water supply and sanitation schemes already exist, they should be complemented by hygiene education programmes. Where perceived need and demand for sanitation and/or hygiene education is lacking, awareness must be created by social mobilization and education. As a general principle, for new projects social mobilisation should precede all project interventions, and these interventions should follow demand as expressed in a memorandum of understanding.

8. In view of the ambitious targets for extension of coverage in the Five-Point Programme and thereafter to the year 2000, the implementation capacity of the PHED should be augmented in the short run by the involvement of consultants in the planning, design and supervision of schemes.

B. Community Roles and Responsibilities

9. To institutionalize the role of the community in the sector, two levels of organization must be established. Broad-based village water, health and sanitation associations would include representatives from most households. From this body a special committee should be drawn for the de-

tailed implementation and management of projects either directly or in liaison with the sponsoring PHED/LGRDD departments. The village organisations should be established with the support of the Union. They should not necessarily be registered as non-governmental organisations. With the assistance of the PHED, LGRDD and other line departments, these organisations should participate in and be responsible for the planning, execution, O & M and financing mechanisms of schemes.

10. Communities should be adequately prepared for the execution and management of projects prior to their commencement. Technical, organisational and financial skills are required and should be provided by expanded LGRDD Department staff trained in water and sanitation technology and social mobilization. PHED engineers should also be trained in social mobilization skills so that they may involve communities in decisions on the location, service levels, financing and operations & maintenance requirements of schemes. The LGRDD Department should coordinate with other line departments to provide extension services to the communities, and should draw upon line departments' resources to impart training.

11. Government staff from the PHED, LGRDD, Health and Education Departments should be trained as master trainers at the existing LGRDD Department's institutes, which need to be strengthened. This training should include social mobilization, basic water and sanitation technologies, accounting, project management, and health education. Master trainers should then be responsible for providing training and support to village organizations. Suitable arrangements for their mobility will have to be ensured. The number of trainers will depend on the resources available and the settlement pattern of the geographical areas. In addition, the private sector may be supported in its role of training local artisans. Promotional costs should not be included in costs to be recovered from beneficiaries.

12. The participation of women in the sector should be increased through their role as sanitation promoters and community health workers, wherever social and cultural conditions permit. The ultimate target for the proportion of women in these cadres should be one-half. Existing village

workers; traditional birth attendants; and teachers, including religious teachers, should be provided with basic training in hygiene education. This training should be conducted by women master trainers, if possible, such as lady health visitors.

13. Implementation of schemes embodying simple technology should be handed over to communities (through appropriate village organisations), who should be responsible for project execution. Adequate technical support should, however, be provided to them. In the case of schemes involving more complex technology, an effort should be made progressively to hand over the execution function to communities once they have acquired adequate technical and managerial capabilities through training and extension services.

C. Technology Choice

14. A formal mechanism between WAPDA and each provincial PHED, LGRDD and Irrigation department should be established to exchange water resource data and fill in identified data gaps.

Mechanisms will be prepared and instituted through the PSC to ensure sound water resource management.

15. In order to provide a basic level of service, low-cost technology should be used. A basic level of service is defined as a community supply located outside the household at a convenient distance (which may vary with location). Capital and recurring costs of technologies adopted should be the minimum possible costs. Appropriate low-cost technologies might be spring-based gravity schemes, handpumps, and on-site latrines, depending on site conditions.

16. In recommending the adoption of least-cost technologies, it is assumed that the upgrading or augmentation of existing supplies will be considered as a matter of course and appropriate solutions adopted. Also, technology choice should be based on the most reliable energy source.

17. All technologies adopted should be socially acceptable, economically sustainable, technically efficient and environmentally sound. That is, schemes should be designed to provide the highest level of service demanded by the community

providing that it is able and willing to pay for, operate and maintain such schemes subsequently.

18. Designs should be standardised to the extent possible so as to facilitate training and maintenance and avoid high-cost, custom-made designs. It is recommended that each province prepare standard design manuals for water and sanitation which include:

- a. collection of data;
- b. design criteria;
- c. alternative standard designs; and
- d. specifications and tender documents.

19. Research and development should only be addressed to those issues actually requiring further research. A vast amount of data on low-cost appropriate technology exists worldwide and this should be gathered and disseminated through the PSCs.

20. An entrepreneur support programme to enhance the role of the private sector is recommended which would include the following:

- a. credit facilities should be provided through institutions such as the IDBP (Industrial Development Bank of Pakistan), the commercial banks, etc.;
- b. designs and information should be standardized;
- c. there should be training programmes for contractors; and
- d. contractors should be certified for special types of contracts.

D. Operations and Maintenance and Cost Recovery

21. Users should bear part of the cost of the provision of a basic level of service. These partial con-

tributions may be in the form of labour, materials and/or cash. This will ensure the sense of ownership essential to the operation and management of schemes. Above basic service levels, beneficiaries should bear the full cost of the incremental service. Moreover, users should bear the full cost of O & M over their schemes. These costs can be greatly reduced through user participation in scheme management.

22. For simple schemes, communities should be made responsible for operation and maintenance. For complex schemes, in the short term, O & M should be carried out by the PHED and transferred gradually to Union Councils as their technical capacity to shoulder such responsibilities is developed.

23. The community should be responsible for the mechanism of revenue collection and management of funds.

24. In view of the increasing demand on water resources and for the disposal of water, it is recommended that each province study existing legislation to determine future requirements for better control.

25. Monitoring and evaluation of O & M should be vested in provincial departments such as the PHED and LGRDD.

26. Where a cluster of villages exists, a central committee should be formed to operate and maintain the central facilities whether they be central tubewell and pumping stations, or common stream, canal or spring intakes. Membership of the central committee should be made up of members of the downstream village organisations.

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