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Arif Hasan

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# Financing the sanitation programme of the Orangi Pilot Project–Research and Training Institute in Pakistan

ARIF HASAN

Arif Hasan is an architect and planner in private practice in Karachi, who has long worked closely with the Orangi Pilot Project and with the Urban Resource Centre in Karachi (of which he is Chair). He is also Visiting Professor at the Faculty of Architecture and Planning at NED University in Karachi. He has published widely on urban issues, including a series of books with City Press in Pakistan: *Working with Government: The Story of the Orangi Pilot Project's Collaboration with State Agencies for Replicating its Low-cost Sanitation Programme* (1997); *Akhtar Hameed Khan and the OPP* (1999); *Understanding Karachi: Planning and Reform for the Future* (1999); *Working with Communities* (2001); and *The Unplanned Revolution: Observations on the Process of Socioeconomic Change in Pakistan* (2002).

Address: arifhasan@cyber.net.pk

1. See Hasan, Arif (2006), "Orangi Pilot Project; the expansion of work beyond Orangi and the mapping of informal settlements and infrastructure", *Environment & Urbanization* Vol 18, No 2, October, pages 451–480.

**ABSTRACT** This paper describes the financing mechanisms for the sanitation programme supported by the Orangi Pilot Project's Research and Training Institute (OPP–RTI) in informal settlements in Karachi and other urban centres in Pakistan. These centre on OPP–RTI support for the inhabitants of a lane to plan, implement and finance the "internal components" – sanitary latrines in the houses, underground sewers in the lanes and neighbourhood collector sewers – and support for local governments to finance the larger "external" trunk sewers into which the neighbourhood sewers feed and also treatment plants. The inhabitants have to raise all the funding to cover the costs of the internal components and in around 300 locations in Pakistan, communities have financed, managed and built their own internal sanitation systems. Local governments can also afford to install the external systems as they no longer have to fund the internal components, and as OPP–RTI has helped them develop much lower-cost methods for planning and building trunk sewers.

**KEYWORDS** CBO / finance/ NGO / sanitation

## I. BACKGROUND

This paper focuses on the financing mechanisms used for the sanitation programme supported by the Pakistan NGO, Orangi Pilot Project–Research and Training Institute (OPP–RTI). It also explains their connection to other work programmes, including the programme to map and survey informal settlements in Karachi and the Youth Training Programme – although these are not described in detail as they were the focus of a paper published in 2006 in *Environment & Urbanization*.<sup>(1)</sup>

Developing infrastructure in low-income settlements in Pakistan and in other low- and middle-income nations in a conventional manner is far too expensive, and the Pakistan government has been taking loans from international financial institutions for this purpose. However, the scale of the problem is so enormous that not even a fraction of the requirement can be tackled through such international loans. In addition, loans come with conditionalities, foreign consultants and, often, with international bidding for implementation. All this increases costs by more than 200 per cent. The other problem is the difficulties local governments face in the subsequent operation and management of the systems built with international funding. Local governments do not have the financial and/or technical means to do this effectively.

The OPP was established in 1980 with the aim of overcoming the constraints faced by the government in regularizing and improving the informal settlements (*katchi abadis*) where a high proportion of Karachi's population lived. Participatory research identified four major problems: sanitation, employment, health and education, and programmes have been developed around these four issues. Sanitation was considered the most important.

The OPP-RTI was clear from the very beginning that foreign loans could not solve the infrastructure problem in *katchi abadis*. It was necessary to raise local resources and develop local expertise. Part of this could come from the community, provided the costs of construction could be reduced by eliminating contractors, modifying engineering standards and mobilizing communities to finance and manage the construction of an underground sanitation system.

In order to do this, four barriers had to be removed:

- **the psychological barrier:** communities had to be convinced that not only the house but also the street and the neighbourhood belonged to them;
- **the social barrier:** communities had to come together and organize to build their sanitation systems;
- **the economic barrier:** costs had to be reduced to make the proposed systems affordable to households and communities; and
- **the technical barrier:** communities had to be provided with tools, maps, estimates and technical supervision.

It was assumed that organized communities supported by professionals and the OPP-RTI would be able to develop partnerships with government and, as such, be able to direct available government resources to supporting the sanitation programme.

## II. FUNDING MECHANISMS

The OPP-RTI was funded initially by a Pakistani foundation. It was agreed between them that there would be no targets but that the programme would be an exploration into finding alternatives to the existing development paradigm for the *katchi abadis*. This funding has been used for administrative purposes, research, documentation, training and extension, but not for funding development. Table 1 provides financing details for the OPP.

The OPP-RTI divides sanitation into "internal" and "external" development. Internal development consists of sanitary latrines in the houses, underground sewers in the lanes and neighbourhood collector sewers. External development consists of trunk sewers and treatment plants.

The funding for internal development has been generated by the community and organized at the lane level. The reason for making the lane the unit of organization was because it consisted of 20 to 40 houses and, as such, was small enough to be cohesive.

The OPP-RTI has never collected or managed the people's money; this is the responsibility of lane committees or chairs. The process starts with meetings held in the lanes and people are told that if they form a lane organization and elect, select or nominate a lane manager, they can then apply to the OPP-RTI for technical assistance in developing a sanitation

**TABLE 1**  
**OPP receipts, expenditure and assets: audited figures in Rupees ('000), 1989-2005**

Year	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05
Income	1,179	1,582	2,024	9,152	4,996	5,437	5,138	7,059	7,517	4,677	8,356	7,137	8,567	9,694	11,392	7,276
Expenditure	1,179	1,500	1,419	3,005	3,546	3,868	3,876	5,209	4,985	5,383	6,003	6,091	7,099	7,641	7,255	7,684
Assets	0	83	688	6,834	8,284	9,853	11,115	12,965	15,497	14,791	17,144	18,190	19,658	21,711	25,848	25,439

system for their lane. Once a lane has applied for assistance, OPP-RTI staff survey the lane and develop a map and estimates for funding, labour and materials for the lane manager or the lane team. The lane manager or team then collect the money from the residents and organize the work with OPP-RTI supervision and managerial guidance.

Initially, only those lanes that were near a natural drainage channel into which they could discharge their sewage and wastewater could participate. Later, lanes that were far from the drainage system began to apply. For them to dispose into the natural drains, collector sewers were required. This led to the creation of a confederation of lanes that financed and built the collector sewers. In certain wards where the confederation of lanes was strong, the elected ward councillors funded this effort. Maps of the ward, identifying where the collector sewers were required and their costs in terms of labour and materials were prepared by the OPP-RTI and handed over to the lane organizations and the elected councillors.

For "external" infrastructure, detailed plans and estimates are developed by the OPP-RTI and/or its NGO/CBO partners. With these, the NGOs and CBOs can negotiate with local government to fund external development. It was clear to the OPP-RTI from the very beginning that the natural drains into which the sewage was being disposed could eventually be converted into box trunks (replacing the natural open drain with a covered, concrete drain) and treatment plants built, where they flow into the natural water bodies. In cases where disposal points are not available, a revolving fund has been provided to partner NGOs and they have developed link trunks between their settlements and the existing government sewer systems. Each lane pays a proportional cost back to the revolving fund when it connects to the link trunks. In one case where this has been done successfully, funds of Rs 500,000 (US\$ 8,333) were provided by WaterAid. This small fund helped 8,722 houses in Faisalabad to link their self-built neighbourhood sanitation systems to the existing government trunk sewers. Loan recovery has been 87.5 per cent and the fund continues to revolve.

By providing plans, designs and estimates for external development, the OPP-RTI and its partners have been able to mobilize government resources that would previously have been spent on internal development. In Orangi and in 284 other locations in Pakistan, this has shown that communities can finance, manage and build internal development, provided they are organized and are given technical support and managerial guidance. Local governments can support the process by building external development, provided they accept the "internal-external" concept and train their staff in OPP-RTI methodology and in working with communities.

The cost per household for the sewage line in the lane, the house connection and the sanitary latrine pan works out at between Rs 1,500 and Rs 2,000 (US\$ 25-33.33). For the collector sewer, which links the lane sewers, the per household cost varies considerably depending on the length of the sewer. This cost is between Rs 500 and Rs 1,000, or an average of Rs 750 (US\$ 12.50). In Orangi, 96,994 houses have built their neighbourhood sanitation systems, and their total investment is around one-sixth of what it would have cost if local government had undertaken the same work. Initially, the OPP-RTI investment versus people's investment was 1:18. These figures have not been re-worked since then as it is very difficult to do so. This is because the OPP-RTI beneficiaries have

multiplied due to the conversion of *nalas* (natural drains) into trunk sewers and due to the OPP–RTI’s advocacy work. At a rough guess, looking at beneficiaries and the OPP–RTI budgets, the ratio has now decreased to about half of what it was before, that is 1:9.

### III. SCALING UP

The OPP–RTI sanitation programme has been scaled up through a range of processes:

- Local government building external sanitation in Orangi, as natural drains are converted into box trunks designed by the OPP–RTI and supervised by community activists trained at the OPP–RTI. The cost of conversion of *nalas* into box trunks varies between Rs 1,200 (US\$ 20) and Rs 3,120 (US\$ 52) per household depending on the scale of civil works involved and the number of houses benefiting from this conversion.
- Government agencies and departments adopting the OPP–RTI concept and methodology, with the OPP–RTI acting as consultant and trainer – as in the work programme of the Sindh Katchi Abadi Authority (SKAA) that supports a large upgrading programme for the whole province of Sindh, which includes Karachi.<sup>(2)</sup>
- Scaling up through NGOs and CBOs that developed partnerships with many local governments throughout Pakistan.<sup>(3)</sup>

Outside of Orangi, 46,821 houses in 11 towns at 284 locations in Pakistan have built their internal sanitation at a cost of Rs 88.15 million (US\$ 1.47 million). The replication projects have mobilized Rs 146 million (US\$ 2.43 million) from local government funds to build “external” sewage disposal systems, not only for their settlements but also for large areas of the towns and/or cities in question. In two replication projects, water supply systems have also been installed on an “internal–external” basis. In three small towns, the replication project has become a consultant to the government for water supply, sanitation and road-paving projects that are all being built on the “internal–external” concept.

When the OPP–RTI became consultants to the Sindh Katchi Abadi Authority, they realized that proper mapping of the existing infrastructure of the *katchi abadis* was necessary because it would be much cheaper to build onto existing systems than to build a new system. The mapping was undertaken, supported by the Youth Training Programme, and 337 *katchi abadis* have been surveyed and mapped along with their physical and social infrastructure. Eighty-five of the 92 natural drains carrying 80 per cent of Karachi’s sewage have been documented along with their catchment areas. This documentation has shown that:

- Eighty per cent of Karachi’s sewage, coming not only from *katchi abadis* but also from middle-class and elite settlements, is planned to empty into the natural drainage system.
- Disposing of this sewage into the trunk sewer system proposed by an Asian Development Bank-funded and external consultant-designed project is not possible without huge investments and without digging up almost all of Karachi’s roads. At present, the Asian Development Bank-funded trunk sewers are mostly dry and the treatment plants function at no more than 20 per cent of their capacity.

2. See reference 1 for more details.

3. See reference 1.

- In the *katchi abadis*, people have invested Rs 180 million (US\$ 3 million) and government has invested Rs 531 million (US\$ 8.85 million) in sewerage through ad hoc projects. Similarly, people have invested Rs 154.5 million (US\$ 2.58 million) in water lines and government has invested Rs 195.7 million (US\$ 3.26 million). Although this work has great importance in improving provision for water and sanitation, this has not been documented and is ignored completely when plans are developed by local governments and foreign consultants.
- Documentation also shows that in the surveyed *katchi abadis* there are 1,041 private clinics as opposed to only 12 government hospitals and clinics. Similarly, there are 773 private or community-financed and managed schools as opposed to 143 government schools.

There have been a number of spin-offs from the Youth Training Programme and the documentation that has been (and is being) developed. These include:

- An alternative sewage plan for Karachi: the OPP-RTI developed a sewage plan for the whole of Karachi that required no foreign loans except for treatment plants that are to be placed at the end of the natural drains that are to be turned into box trunk sewers.
- A change in the Asian Development Bank-funded sanitation programme for Orangi: by accepting the OPP-RTI methodology, a project costing Rs 1,300 million (US\$ 21.67 million) was reduced to only Rs 38 million (US\$ 0.63 million). The project was supervised by OPP-RTI-trained lane activists. The huge difference in these costs is due to the fact that reworked designs made it possible for sewers in 2,152 lanes to become the financial and construction responsibility of the lane and neighbourhood organizations. In addition, existing infrastructure, whereby waste was disposed into the *nalas* (natural open drains), was accepted and, instead of trunk sewers along the roads (which necessitated costly pumping stations), the *nalas* were converted into box trunk sewers for which funds were available within local government.
- An Asian Development Bank-funded project, the Korangi Waste Management Project costing US\$ 100 million, was shelved and the loan cancelled when the OPP-RTI demonstrated that with OPP-RTI methodology, and by accepting people- and councillor-built infrastructure, it could be done for US\$ 25 million. The OPP-RTI-trained community technicians documented the existing infrastructure, the communities lobbied against the project and the OPP-RTI engineers prepared the alternative plan.
- The OPP-RTI has prepared plan books for *nazims* (mayors) of the 13 union councils in Orangi, which document the existing social and physical infrastructure and associated problems in each union council and identify the missing infrastructure.<sup>(4)</sup>
- Two graduates of the Youth Training Programme have been supported by the OPP-RTI in setting up the Technical Training Resource Centre (TTRC) in Orangi. This centre now trains young people in surveying, documentation, estimation, on-site supervision and community mobilization. They have also become technical consultants to the Orangi union councils. The UK charity Homeless International has given them an endowment of Rs 1 million (US\$ 16,670), which takes care of their salaries and expenses. The centre is also getting a lot

4. See reference 1.

of surveying work from SKAA and from communities wishing to negotiate regularization of their settlements with local authorities. Two more training centres are in the making. In one of the union councils in Orangi, water supply was a major problem because of leakages and missing valves. Documentation of the leakages and missing valves and of the general condition of the system by the Technical Training Resource Centre has led to successful rectification. Other union councils are now asking for the same services.

- In June 2004, engineers from the Works and Services Department of the Karachi city government requested OPP–RTI support for the conversion of *nalas* into box trunks and also for the upgrading of existing drains in Karachi. The OPP–RTI, together with the city engineers, is a member of the focal groups formed to undertake this work. Through mutual consultations, the *nalas* that are to be upgraded are identified and the OPP–RTI support consists of providing survey maps, designs and estimations. So far, documentation of about 25 *nalas* has been provided to the city engineers.
- The city government's Tameer-e-Karachi programme has allocated Rs 2.02 billion (US\$ 33.66 million) for the development of *nalas*. Rs 669 million (US\$ 11.15 million) has been allocated for 14 projects identified and designed by the OPP–RTI. This development has been made possible by the fact that the OPP–RTI has documented 102 natural *nalas* with a total running length of 931,708 feet.

#### IV. WHAT LESSONS HAVE BEEN LEARNT?

A number of lessons related to governance and finance issues have been learnt from the OPP–RTI programmes and experience.

- Government has sufficient funds to develop the external development through contractors but not to develop both external and internal development through the contracting system.
- The absence of documentation on existing community and/or NGO-built infrastructure makes it impossible for this infrastructure to be integrated into government plans for sanitation. As a result, there is a lot of duplication and waste of investment in NGOs/community and government schemes that are never fully utilized.
- Poor households living in *katchi abadis* in Pakistan can invest up to Rs 2,000 (US\$33.33) in financing an underground sewage system. Very poor families are able to collect this sum in about four to six months.
- This is done in no fixed manner. In Faisalabad, we have been told that the better-off residents of the lane pay at the beginning and recover the money in instalments from the poorer families over time. There are instances where people pay in instalments to the lane managers while the work is taking place. Sometimes, work stops for lack of funds and begins again when people pay. However, evidence from Faisalabad and Lodhran suggests that in the majority of cases, work begins without all payments having come in and is completed without any problem as payments are made while the work is being undertaken.
- The cost of community-financed and managed internal infrastructure is about 25 per cent of the cost of government-developed sewage systems.



- OPP–RTI-designed and community-supervised external development is less costly and of better quality than conventional government-planned and implemented development.
- Poor communities invest incrementally in improving their living conditions, provided they have de facto or de jure security of tenure; they also invest to establish de facto tenure security. Much of this investment is poorly implemented due to the absence of sound technical advice. This investment is also not recognized by the state and since it is not documented, it is not integrated into official plans. If it is documented, and it is large in scale, it becomes difficult to ignore.
- Development does not take place with funds alone. It takes place through the development of skills, self-reliance and dignity, and the three are closely interlinked and follow each other in that order. They make relationships within community, and between communities and government agencies, more equitable. This change in relationships brings about changes in government planning procedures and, ultimately, policies.
- “Capacity and capability” in government institutions can never be successful without pressure from organized and knowledgeable groups at the grassroots. Such groups can only be created by activists who have to be identified, trained and supported financially. Formally trained professionals and technicians are not an alternative to such activists. The formation of such groups forces transparency in the functioning of government agencies.
- One of the major reasons for disasters in government planning is that ideal plans are made and then finance is sought, which often does not materialize. Things would be very different if planning was done on the basis of a realistic assessment of available funds, if an optimal relationship could be arrived at between resources (financial, technical and others), standards and demands, and if planning could recognize and accommodate the fact that all three are dynamic and can change over time.
- Community organizations exist all over Pakistan. However, their main function is to lobby government agencies and politicians for development. This development is handed out as patronage and without proper planning and implementation. It is sub-standard and inadequate. More often than not, it does not materialize. People have lost faith in the lobbying process and are looking for alternatives.
- A map of the settlement, or the small town in which replication is to take place, is an essential prerequisite to planning. The process of preparing a map identifying existing infrastructure and the inherent problems is, in itself, a motivational exercise. The map changes perceptions about what is required for the settlement or city and relates them to ground realities. It has been observed that government agencies do not have such plans or the expertise to prepare them and, as such, their planning perceptions and assumptions are inaccurate.
- In all the cities of Pakistan, wastewater and sewage is either disposed of in depressions outside the city or into the natural drainage system. It has been planned as such. This reality is ignored when sewage-related planning is undertaken.
- Even in smaller towns, municipal authorities have access to sufficient funds for “external” development if the OPP–RTI model is accepted.

Local government agencies also have basic engineering expertise and this can be further enhanced by training at the OPP-RTI. A partnership between people and government agencies, as has been demonstrated on a large scale, is possible in these towns. In larger cities where sophisticated engineer-dominated specialized agencies exist, such a partnership is not possible to begin with. However, as sanitation work in a settlement expands, contact between the NGO/CBO carrying out the work and the government agency in charge of water and sewerage becomes inevitable. If the replication project is large enough and successful enough, this contact develops into a dialogue and subsequently into mutual understanding, if not collaboration.

- The creation of surveying, levelling, mapping and documentation, and planning skills within a community leads to the creation of a more equitable relationship between government agencies and CBOs. People who acquire these skills move on to create institutions around them and this, in turn, leads to development within the settlement. These institutions become a gathering place for people, activists and dialogue.
- In Karachi, where a large number of replication initiatives have been consolidated, CBOs have gone on to do other things and have taken control of their neighbourhoods and settlements. If they are put in contact with each other, they learn from each other and expand their work. If a network of these CBOs is created and supported by city-level NGOs, academics and concerned citizens, it can become a major force in determining policy direction, especially if it can put across its views on the basis of scientific research and planning alternatives. This process is taking place in Karachi in a big way, but for it to become irreversible policy, it has to be nurtured.<sup>(5)</sup>
- Once the work of CBOs consolidates, they realize that many of their problems are related to larger city planning issues. However, understanding these city planning issues, and participation in promoting pro-poor solutions to them, is only possible if there is an active NGO in the city that carries out research on these issues, promotes alternatives and involves CBO activists in it. Karachi is lucky that the Urban Resource Centre performs this role for the city and is in constant dialogue with the technical departments of the city government. A similar centre has been set up in Lahore and more are in the offing.
- Government officials and agencies respond positively if research findings and development alternatives are supported by large-scale on-site work and large-scale public involvement, even though they may have serious reservations regarding the alternatives. Where powerful contractors, consultants and the interests of international loan-pushing agencies exist, reservations regarding the alternatives become active opposition, as in the case of the ADB-funded Korangi Waste Management Project in Karachi.
- The informal sector is an important player in the delivery of services and financial and technical support to poor communities. This sector operates on a very large scale and government and donor programmes cannot replace it except at a project level. However, they can support this sector through research and extension of technical advice, credit and managerial training. If this is accompanied by an increase in the awareness of communities with regard to what their relationship with

5. See Hasan, Arif (2007), "The Urban Resource Centre, Karachi", *Environment & Urbanization* Vol 19, No 1, April, pages 275–292.

the informal sector should be, then a more equitable relationship can be achieved. This is what the OPP-RTI programmes have succeeded in doing in Orangi and in the replication projects.

- Through its work with other NGOs, the OPP-RTI has learnt that large funds for small NGOs results in the destruction of those NGOs because they do not have the capacity to utilize the funds properly and also because such large funds are seldom reliable. Once they are stopped, the NGO cannot function anymore and its activists and staff have to look for alternative livelihoods. In addition, there are always donor agencies and big NGOs searching for smaller, grassroots NGOs and CBOs that can promote their programmes. In OPP-RTI's experience, these smaller NGOs soon become the implementers of donor programmes rather than developing and sustaining their own programmes.
- It can also easily be seen that government functionaries who are associated initially with the development of innovative projects have considerable loyalty to them. However, their replacements tend to be indifferent to such initiatives.
- The manner in which government agencies function is deeply rooted in well-established routines and procedures. Similarly, engineers and bureaucrats who head development organizations are educated conventionally and are not interested in innovative work. Thus, the normal functioning of government development work is not disrupted by the transfer of high-level officials, whereas that of unconventional work certainly is. Therefore, the OPP-RTI now cultivates engineers and middle-level officials who are generally seldom transferred.

The OPP-RTI has also worked closely with international agencies and donors and has reached a number of conclusions regarding this association. These conclusions are given below:

- Donors have their own agenda, which consists of quantifiable targets and large-scale spending. This approach makes it difficult for them to support for any length of time a process of exploration and gestation. And without such a process, innovation and its institutionalization are difficult, if not impossible. In addition, most donor concepts are based on wrong assumptions. It is assumed that government departments can fulfil the roles that donor projects assign them if training is imparted or if they are ordered to perform by their superiors. The fact that capability and capacity, given the organizational culture of state institutions, cannot be enhanced without the establishment of a process of accountability and transparency is often overlooked. Donors also manage to impose their own culture on government agencies. This culture consists of impressive seminars and publicity and, in some cases, a show of affluence. This not only alienates *katchi abadi* residents but also makes the project appear "non-serious" to project staff, since seminars, workshops and media reports are seen as an end in themselves.
- There is also the issue of monitoring donor-funded projects. This monitoring is usually carried out by people who have very little to do with the implementation of the project and its day-to-day affairs. The result is that monitoring is no more than policing, and causes conflict between the project and the monitors who are more

interested in finding out what is “wrong” rather than sympathetically understanding issues and guiding the project actors.

- Donors have an important role to play. They can positively influence policy and they can provide much-needed funds for experimentation. However, to play this role effectively, they must have a good idea of the processes in low-income settlements rather than merely the conditions, and the assumptions regarding government agencies and inter-agency relations should not be based on incorrect information or assessments.

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