

The Orangi Pilot Project-Research and Training Institute's Mapping Process and its Repercussions

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1. Preamble

The Orangi Pilot Project-Research and Training Institute (OPP-RTI) is an NGO working in the informal settlements of Orangi Town in Karachi, Pakistan and in other cities of the country.

This monograph deals with the process of development of expertise in the OPP-RTI and the communities it supports for mapping informal settlements and urban infrastructure. The development of this expertise and the documentation it has produced has had major repercussions on planning and operation and maintenance of infrastructure, community-NGO-local government partnerships and on state policies regarding IFI funded infrastructure projects and on government informal settlement upgrading programmes.

2. The Context

Pakistan is a federation of four provinces. Each province has an elected provincial assembly and at the centre there is a national assembly in which every province is represented in proportion to its population. In addition, there is a senate at the centre where each province is represented equally. Every province is divided into *zilas* (districts) and districts are divided into rural and urban *tehsils* (sub-districts). The *tehsils* are further subdivided into union councils which are the lowest administrative unit. The average population of a union council (UC) varies between 50,000 to 70,000. The larger cities, which include the provincial capitals are run as city districts and subdivided into *tehsils* or towns and the towns into UCs. The *zilas*, *tehsils*, and the UCs are headed by elected *nazims* (mayor) and *naib nazims* (deputy mayors) who are elected directly by councillors elected by voters of above 18 years of age. Thirty-three per cent of councillor seats are reserved for women and five per cent for workers and peasants. There are 103 *zila* governments in Pakistan, 335 *tehsil* councils and 6,022 UCs.

According to the Devolution Plan enacted in 2001, all the three levels of local government have considerable autonomy and can raise funds and plan and implement physical and social developments independently. They are supported by a bureaucracy that is subservient to them. The *zila nazim* is responsible for the district administration as a whole and is assisted by a senior bureaucrat who is the District Coordinating Officer who coordinates the functioning of all government departments in the district. Before this devolution to the district level, all planning and implementation were controlled by the provincial government and its line departments.

Karachi is the largest city in Pakistan and has a population of 13 million. As a result of the enactment (under Devolution Plan 2001) of the Local (City) Government Ordinance (LCGO) 2001, Karachi is now a district headed by a *nazim* and *naib nazim*. The district is divided into 18 towns and the towns are further divided in 178 UCs. Each town and UC has its own *nazims* and *naib nazims*. The composition of the house or representatives of the city government is given below.

- *Nazims* of union councils 178
- 33 per cent women seats 059
- 5 per cent workers and peasants 009
- 5 per cent minorities 009

 Total House 225

Elections to the *nazims* and *naib nazims* are through the elected councillors and as such indirect. After the enactment of the Ordinance, the development and operation and maintenance (O&M) related agencies which were under the provincial government have been dissolved and have become a part of the city government set-up. Thus, all planning, implementation and O&M have been centralised with the city government, or allocated to the towns and UCs.

The Housing Demand Supply Gap in Pakistan

Pakistan requires 350,000 new housing units per year for its urban areas. The formal sector is able to supply only 120,000 housing units per year. The demand-supply gap is accommodated in *katchi abadis* (squatter settlements on government land) or through the informal subdivision of agricultural land (ISAL) on the periphery of cities and towns. It is estimated that nine million people live in *katchi abadis* in the urban areas of Pakistan and another 15 million in ISALs¹. Both type of settlements are unserviced to begin with but over a 15 to 20 year period they manage to acquire water, electricity, gas and some sort of social infrastructure. However, sewage invariably flows into cesspools or into the natural drainage system. The physical and social infrastructure that is acquired is through ad-hoc arrangements made by the residents themselves or through small unconnected projects implemented by local government councillors for their constituencies or as “gifts” and political patronage through funds provided by the government to members of national and provincial assemblies.

Karachi has an annual housing demand of 80,000 units. In the last five years the formal sector has been able to provide 26,700 units annually². The demand-supply gap has been accommodated in *katchi abadis* whose population is now over six million. Between 1992 and 2003, 25,438 housing units have been demolished as a result of mega projects and to satisfy the land hunger needs of a strong politician-bureaucrat-developer nexus³.

Since 1973, the government has been operating a Katchi Abadi Improvement and Regularisation Programme funded with loans from the World Bank and the Asian Development Bank (ADB). Through this programme people pay for land and development and acquire a 99-year lease. The programme has improved and regularised only 1.5 per cent of *katchi abadis* per year. Thus it has not been a success. The reason for the poor performance of the programme is that there has been no proper community participation in it and as such cost recovery through lease charges has been poor; there is a lack of capacity in government institutions to involve communities and develop innovative engineering and community participation procedures; the process of acquiring a lease is complicated; and since people have a de-facto tenure security, they are not pushed about transforming this into a de-jure one. The programme has increased Pakistan’s foreign debt which is difficult to repay.

¹. Author’s own calculations based on government of Pakistan.

². Data acquired from the Karachi Building Control Authority and the Sindh Katchi Abadi Authority, 2001.

³. Information provided by the Urban Resource Centre, Karachi. The Centre monitors evictions in Karachi.

There is no programme for the improvement of ISALs although their conditions (except for security of tenure) are no different from that of the *katchi abadis*.

Mapping Urban Infrastructure Capacity in Government Agencies

The most important agency providing maps in Pakistan is the Survey of Pakistan which is a federal government institution. Over the years it has produced ariel maps of all Pakistani cities. The last ariel maps were produced in 1969 (before that in 1955) and updated for the larger cities by the Surveyor General of Pakistan in 1972-74. More recently, the Survey of Pakistan has been working in collaboration with the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) which is the National Space Agency. SUPARCO has a wide range of remote sensing data products and one of its projects is the National Land-use Mapping Project. However, none of the planning departments in the districts in Pakistan or at the federal level are making use of SUPARCO's products. They are still relying on the 1969 ariel maps and their updating and adding to them in an ad-hoc manner as and when the need arises.

The maps available with the planning agencies after 1969 are of those settlements which they have planned or of those informal settlements that they have regularised. The planning and mapping of planned settlements has been done in-house whereas the survey of *katchi abadis* (informal settlements) has been done by private consultants hired by the Katchi Abadi Directorate (KAD) and authorities of the eight larger cities. The *katchi abadi* surveys are limited to those settlements which are on government lands and do not include settlements that have developed as a result of the informal subdivision of agricultural land which constitute the bulk of the informal settlements in Pakistan which need to be integrated into the city infrastructure plan for which maps are required. Water and sewage agencies, electricity and gas companies use the available maps or make maps (or have them made by consultants) of areas into which they are extending their services. There is no standard scale to these maps and there hence they seldom relate to each other. As such, no urban area in Pakistan has a proper map and all the agencies interviewed feel that a proper city map which can be regularly upgraded is the most important requirement for planning purposes⁴.

The urban planning and implementation departments of the larger urban areas have the capacity for plan table survey. They have theodolites, dumpy levels and other related equipment. However, such planning agencies would be limited to no more than 25 urban areas whereas UCs all over Pakistan have no capacity to prepare maps.

For the UNDP supported Karachi Master Plan 1975-85, proper land-use plans for the city were developed through ariel surveys. Again, for the UNDP supported Karachi Development Plan (KDP) 2000 an operational digital mapping system (using remote sensing) was developed within the now defunct Karachi Development Authority to replace the old analogue mapping system. The scales of these maps were of 1:25,000 or 1:50,000 and they were developed for bulk water supply; population projections; land-use; telecom zones; metropolitan boundaries; electricity billing; gas lines; primary water supply, sewage, roads and drains. Due to the small scale of the maps no maps for the informal settlements could be developed. Professionals working on the KDP 2000 were trained in an approach to urban planning based on computer technology. However, because of civic strife in Karachi and its political repercussions, the Karachi Development Authority (KDA) could not function as planned. By 1990, the mapping unit ceased to function and most of its trained personnel

⁴ Interviews with Deputy Director Planning (Shahid Saleem) of the Water and Sewage Department of the District Government and Deputy District Officer (Javaid Sultan) of the Master Plan Group of Offices of the City Government.

migrated to North America. In subsequent years, its equipment has become obsolete and inoperational.

In addition, there are other problems as well. In the informal settlements communities organise to lay sewage lines to the nearest drainage channels, depressions and water bodies. They also tap existing government water lines and extend them informally to their settlements. The state also provides funds to members of the National and Provincial Assemblies for development of infrastructure in their constituencies. Much of these funds are spent in an ad-hoc manner in informal settlements. Previously, the government provided similar funds to ward councillors and they invested these in water supply, sewage (though open drains) and road paving. Billions of rupees have been invested in this informally planned and built infrastructure. However, none of this work has been documented although some of it of reasonably good quality and much of it can be rehabilitated and integrated into an overall city infrastructure plan. The result is that this investment is completely ignored when plans for upgrading of informal settlements are developed.

Satellite Imagery Mapping

The major consulting firms in Pakistan use satellite imagery for their work. They have a direct link with the image providers and the skills to use and develop that imagery. It is estimated that about twenty firms have this capacity and capability along with staff and equipment. Three of them also provide imagery at commercial rates and have training programmes for professionals wishing to acquire skills in mapping and GIS. Numerous informal commercial training centres provide “tuitions” in Cad, map drawing, and computer literacy. In addition, there are formal institutions, both public and private, which offer the same facilities through certificate, diploma and degree qualifications. In Karachi, there are five such institutions. However, their fee is unaffordable for poor and lower middle classes and they do not meet the demand because of which the tuition centres have developed and thrive. In the informal settlements of Pakistan acquiring computer literacy is a priority for young people and these informal centres are the only source because of their low fee.

NGOs and CBOs such as the Pakistan Wildlife Fund and the Citizen Police Liaison Committee also use satellite imagery and related technologies extensively for their work. They have all the necessary equipment and staff for this purpose. They also provide images and their digitisation at commercial rates to other organisations along with training.

The Orangi Pilot Project

Orangi is one of the towns of Karachi and consists of an agglomeration of *katchi abadis* and has a population of 1.2 million. It is divided into 13 UCs. The OPP was established in Orangi in 1980 with the purpose of overcoming the constraints faced by the government in regularising and improving *katchi abadis*. The objective of the project was to: i) understand the problems of Orangi and their causes; ii) through action research develop solutions that people can manage, finance and build; iii) provide people with technical guidance and managerial support to implement the solutions; iv) in the process overcome constraints that governments face in the upgrading of *katchi abadis* (and other informal and low income settlements).

Participatory research identified four major problems: i) Sanitation; ii) Employment; iii) Health; and iv) Education. Sanitation was considered the most important. Programmes have been developed around these four issues.

In 1998, the OPP was upgraded into three autonomous institutions. These are: i) OPP-RTI dealing with sanitation, housing, education, research and training; ii) the Orangi Charitable

Trust dealing with micro credit; and iii) Karachi Health and Social Development Association dealing with health and gender issues.

OPP-RTI's Low Cost Sanitation Programme

The OPP-RTI's Low Cost Housing Programme is its most important programme. The OPP-RTI divides sanitation into "internal" and "external" development. Internal development consists of

- Sanitary latrines in the house
- Underground sewer in the lane
- Neighbourhood collector sewers

External development consists of

- Trunk sewers
- Treatment plants

The results in Orangi and in 236 other locations in Pakistan have demonstrated that communities can finance, manage and build internal development provided they are organised and are provided with 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 technical assistance of the OPP-RTI has consisted of provided communities with plans and maps, estimates of labour and material, tools, training for carrying out the work and supervision of work. OPP-RTI's research has developed new standards, techniques and tools of construction that are compatible with affordability of poor communities and are compatible with the concept of communities involvement in construction. It is important to note that the OPP-RTI does not touch the people's money. They collect and use it themselves.

In Orangi 95,496 houses have built their neighbourhood sanitation systems by investing Rs 90.286 million (US\$ 1.438 million). Local government for the same work would have invested Rs 630 million (US\$ 10.50 million)⁵. All sewage discharges into the natural drainage system as for over 80 per cent of Karachi. Infant mortality in areas that built their sanitation systems in 1983 has fallen from 128 to 37 in 1993. OPP-RTI investment versus people's investment is 1:18.2.

The OPP-RTI Sanitation Programme has been scaled up by:

- Local government building external sanitation in Orangi
- Government agencies and departments adopting the OPP-RTI concept and methodology with the OPP-RTI as consultant and trainer.
- OPP-RTI supported NGOs-CBOs leading to partnerships with local governments.

41,906 houses outside of Orangi⁶ in 11 Pakistan towns have built their internal sanitation using existing external sanitation systems and/or and local government in almost all cases is supporting them in building the externals. In two replication projects water supply systems have also been laid on an "internal-external" basis. In three towns the replication project has

⁵. OPP-RTI's 99th Quarterly Report: July – September 2004.

⁶. OPP-RTI's 100th Quarterly Report: October – December 2004.

become consultant to the government for water supply, sanitation and road paving projects all being built on the “internal-external” concept. The OPP-RTI partner CBOs and NGOs have learnt how to make maps (some use computers for the purpose and some also use satellite images and GIS) and develop extension literature. Their activists are constantly negotiating with local, provincial and federal government representatives and agencies.

A Community Development Network (CDN) has been established linking up all the partner organisations who meet every quarter as a different replication project and present and discuss developments that have taken place in their programmes. Local government officials of the area are also invited to the CDN meetings and site visits are arranged. Some partners are stronger in community participation and others in technical matters. They contact each other directly for support and often plan joint negotiations with government agencies.

3. The History Of The Mapping Process At The OPP-RTI

From the Lane to the Circle

The methodology of the OPP-RTI’s Low Cost Sanitation Programme system consisted of:

- Holding meetings to mobilise people at the lane level to form an organisation for building their underground lane sewer.
- Once the organisation was formed it elected, selected or nominated a lane manager who applied to the OPP-RTI for technical assistance and managerial guidance.
- On receiving the application the OPP-RTI survey team visited and surveyed the lane and established benchmarks.
- Back at the OPP-RTI office a map of the lane was prepared giving the position of the manholes (along with their details and invert levels), diameter and joint details of the RCC pipes, and the disposal point which was inevitably a natural drainage channel. Since it does not rain in Karachi for more than ten to twelve days a year, the channel is almost always dry of storm water.
- The lane manager and the lane committee collected money from the people and organised work.

Map and estimate making was a very important part of the programme. Initially, a draftsman, a surveyor and an advisor (who was a teacher at the local polytechnic) were employed for the map making process which centred around the lane alone. However, soon requests were received from lanes that were far away from the natural drains and the only way they could connect to the natural drainage system was through collector sewers. For this to happen an overall plan of Orangi was required on the basis of which a drainage master plan could be developed and within which the lane and collector sewers could be accommodated.

It was suggested by the UN advisor to the project in 1983 that a surveying company should be hired for documenting the Orangi settlements and for preparing the plan. However, the OPP director and OPP consultants decided to get students from the Department of Civil Engineering at the University and from the Architecture Department at the Dawood college to document the settlements. There were two reasons for this. First, the concept of community participation in urban planning and infrastructure development would be introduced to academic institutions and as a result their involvement with such programmes would increase and could also lead to changes in their curriculum. Second, it was felt that if 30 to 40 students would move across Orangi, accompanied by activists and OPP’s social

organisers, discussions and debates on the sanitation system and on the need to develop collector sewers would take place and as a result people's involvement in the process of developing a sanitation system for Orangi would increase. The OPP's decision has been proved right on both counts.

The first step that was taken for documenting the settlements was to acquire whatever plans were available for Orangi from the ariel surveys of Karachi and from the KAD of the Karachi Municipal Corporation (KMC). These plans were on different scales and were incomplete since the settlements had expanded well beyond the limits marked on the maps. Also, the plans had no contours, levels or land-usages marked on them. However, the natural drainage system was clearly marked.

Students were trained to conduct "walk-through" surveys. They walked along the lanes in groups or two or three along with an area activist and/or an OPP social organiser. They identified and marked the direction of the slope of the lane or road, landuse along it, existing infrastructure (usually open drains built by the councillors) and marked the extensions to the existing settlements. The extensions were marked not by accurate measurement but by "steps". However, they were accurate enough for preparing a master plan. Once lanes in the extension areas applied for assistance, accurate dimensions were included.

At that time (1983) Orangi was divided into 15 councillors' wards or circles as they were called in Karachi. The councillors had development funds provided by the KMC. It was felt by the OPP that people would not be able to afford the cost of building the collector sewers and that the councillors should be induced to invest in them. For this reason, the OPP documented the circle of each councillor separately in booklet form and called it "the Circle Handbook". The handbook consisted of maps showing the natural drainage system, existing infrastructure and proposed collector sewers to which lanes could connect. In addition, major landmarks and social sector facilities were also identified. Estimates were provided to the councillors on request for the proposed collector sewers. Community organisation and lane residents were informed regarding the circle handbook and about the fact that these had been provided to their ward councillors. As a result, people started pressurising their ward councillors for building collector sewers as per the design and estimates of the OPP. Only three councillors collaborated with the OPP and in the other wards people formed confederation of lanes, collected money and built the collector sewers themselves. In the process, the Orangi settlements were documented to a single scale for the first time. Each lane sewer and collector sewer that had been built or was built subsequently was marked on the Orangi map. Detail of each lane and neighbourhood sewer was developed separately.

The mapping process was carried out by university and college students and the OPP social organisers and community activists under the supervision of OPP sanitation director Perween Rahman and her technical team of three persons. Many of the social organisers got converted into technical persons as well by going through the process⁷. A number of students who participated in this process have after graduation become involved as teachers, consultants and employees in organisations related to informal settlement upgrading and community participation programmes⁸.

⁷. For details, see Working With Government and Working With Communities by Arif Hasan, City Press Karachi, 1997 and 2000 respectively.

⁸. For example, Dr. Sohail Khan and Dr. Mansoor Ali who are both teaching at WEDC Loughborough University UK participated in the survey when they were engineering students at the NED University, Karachi

Attempts at Replications in Karachi

Between 1985 and 1988, a number of Karachi communities outside of Orangi applied for assistance from the OPP for replicating the sanitation programme. Attempts to do this were made in three settlements. However, these attempts were not successful because the OPP replicated the role it had in Orangi in these settlements. It did not have the capacity to do this. It was realised that for replication projects to succeed a strong community organisation (or activists who can create it) is required at the replication site. In addition, for the replication to be sustainable mapping, surveying, documentation and monitoring skills should be available in the community. It was realised that these skills would only develop through training local activists and technicians. This was one of the reasons why in 1988 the OPP-RTI was created when the OPP was decentralised into four autonomous organisations.

Manzoor Colony Development

Manzoor Colony is an informal settlement having a population of 100,000 living in about 20,000 houses. The Manzoor Colony community organisations were introduced to the OPP by the NGO Resource Centre, a Karachi based NGO. They wanted to replicate the OPP-RTI sanitation programme. Through a process of training and supporting local activists and technicians maps for the settlement were developed along with plans and estimates for an underground sanitation system which drained into the Manzoor Colony *Nala* (natural drain). Separate estimates were prepared for each collector drain and each lane. All surveying was done through plan table by equipment supplied by the OPP-RTI.

The survey of the settlement was carried out by two teams which worked together. The first team consisted of OPP-RTI staff which took levels and trained a local person associated with them in the process. The second team consisted of representatives of the Manzoor Colony CBOs who measured the lengths of the streets and counted the houses in each lane. Joint field inspections were carried out and possible sewage disposal points were identified. Regular visits of the CBO activists and technicians were arranged to the OPP-RTI and Orangi settlements where they met with people, similar to themselves, who had built their sanitation systems and were maintaining them. In the process the community got to learn about designing a sanitation system and the reading of maps and preparation of estimates.

On the basis of these maps the community organisations contacted their councillor and asked him to fund the construction of the collector sewers. This was the first community-councillor dialogue in which the community was asking the councillor for funding a specific programme designed and costed by them. The negotiations failed and the communities funded the collector sewers themselves. They informed the Mayor of KMC that the KMC should take over the maintenance of the sewage system that the community had constructed. The KMC refused saying that they did not have funds or manpower for this purpose. As a result, the community organisations contacted the provincial Ombudsman and after a number of hearings the Ombudsman gave his verdicts in favour of Manzoor Colony and instructed that the Karachi Water and Sewerage Board (KWSB) should take charge of the maintenance of sewage lines laid by the people. The Manzoor Colony case was pleaded by a community activist and members of the Manzoor Colony community organisations water and sewerage committee. No professional lawyer was hired. In all these negotiations and hearings, the maps of the settlement were presented as evidence and substantiated the point of view of the Manzoor Colony CBOs. These maps were later utilised for the lease and regularisation negotiations which were successfully negotiated by the Manzoor Colony CBOs with the KMC. They were also utilised for negotiating a deduction in the lease and development charges that individual houses have to pay for acquiring ownership papers. A deduction to the extent of the amount households have spent on sanitation was demanded by the residents.

An important spin-off of the documentation of Manzoor Colony and the disposal of its people's built sewage system into the *nala* was the desilting and conversion of the *nala* into a box trunk. The story of the Manzoor Colony Nala is given in Box – 1 below. The association of the OPP-RTI with the *nala* conversion into a box trunk process also taught the OPP-RTI regarding the various actors and factors that are involved in determining how development takes place and regarding the corruption and its relationship to inappropriate planning and construction through formal process in low income settlements. The story has been disseminated by the OPP-RTI and contains many lessons for development planners and activists.

Box – 1: The Manzoor Colony Nala

The Manzoor Colony nala serves as a disposal for sewage and rain water for a large catchment area serving a population of over a million and comprising three upper middle income colonies and other low income settlements including the five katchi abadis of which Manzoor Colony is one.

In 1990 the NGO-RC introduced the OPP-RTI to three Manzoor Colony CBOs. With OPP-RTI's technical assistance they built their sewerage system and disposed it into the Manzoor Colony nala. After this the CBOs, on advice of the OPP-RTI lobbied with the KMC for channelising and developing the nala as a proper disposal point. As a result, the KMC prepared a plan for the nala. The plan consisted of desilting the nala, compacting earth embankments on either side and building roads along the embankments. The width of the nala was increased to between 85 to 195 feet. In the process 850 houses were being displaced. The total cost of the project, along with a resettlement plan for the displaced houses, worked out to Rs 266.7 million (US\$ 4.45 million). In March 1996 work for the desilting, embankment and road making components was contracted out and demolition of the homes began. The demolition created a law and order situation. Residents organised themselves with the help of the Idara-e-Amn-o-Insaf (Institute of Peace and Justice), a Karachi NGO which works extensively with poor communities, and formed the Ittehad (unity) Welfare Association. The Association sent petitions to the minister of local government and to the elected representatives of the area. A series of demonstrations were arranged at the Press Club between May and July 1996, in which the women of Manzoor Colony also participated. The Ittehad Welfare Association also pointed out that although only 850 houses were being demolished, the KMC had prepared plans for rehabilitating over 3,000 houses. In addition, after the announcement of the plan, outsiders had arrived in the area and built a large number of shacks along the nala and had been issued rehabilitation slips by the KMC. As such, the Ittehad Welfare Association was of the opinion that the entire KMC project was nothing more than a land scam.

As a result of the petitions and demonstrations, the District Commissioner South requested the OPP-RTI to review the KMC design in February 1997 and propose an alternative. The OPP-RTI prepared an alternative plan, which replaced the katcha drain by a covered concrete drain whose width ranged from 8 to 38 feet. Its cost was 25 per cent of the cost of the KMC proposal and no houses needed to be demolished. In addition, 18.72 acres of land from the nala was reclaimed for the KMC. The value of this land was estimated at Rs 271.9 million (US\$ 4.53 million).

The plan was presented to the CBOs and was accepted by them immediately. However, the KMC had some objections to the OPP-RTI plan and as a result, a review committee comprising representatives of KMC and OPP-RTI was constituted. This committee adopted the plan after eight months of discussion with some modifications. The work was contracted out in May 1998 at a cost of Rs 93.3 million (US\$ 1.56 million). The then Minister of Local Government took a personal interest in this entire process. In July 1998, the Minister was removed and in August work was stopped as the new minister, advised by KMC engineers, ordered that the drain design be changed to a reinforced concrete open drain. The cost increased to Rs 115 million (US\$ 1.91 million) (as opposed to the original concrete covered drain design costing Rs 93.3 million (US\$ 1.56 million). In October work began again with the changed design. However, no document ordering such a change could be located and over 400 running feet of the open reinforced concrete drain was built even though it was an environmental hazard (as all open sewerage drains are), technically inappropriate and exorbitantly expensive for what it was. Community activists and the OPP-RTI held several meetings with KMC engineers in efforts to retain the original design. Since these meetings were not successful, the OPP-

RTI, which was supposed to assist KMC in monitoring the construction of the drain, withdrew its support.

Residents then sent petitions to the Governor and held meeting with the Chief Secretary Local Government and KMC Administrator against the changed design. They requested implementation of the earlier approved design of the covered concrete drain. The OPP-RTI guided the activists and at the same time held separate meetings with the KMC Administrator and Secretary Local Government. As a result of these efforts, the Governor ordered the work to be stopped and constituted an inspection team to resolve the issue. In March 1999, the inspection team recommended that the OPP-RTI design should be adopted. As a result, work on site began. Thus, after five years of constant lobbying, monitoring and fighting for an appropriate sewage disposal, and against a powerful lobby of land grabbers and contractors, the Manzoor Colony CBOs had their way and in the process a large area of Karachi benefited.

The Defence Housing Authority, which is down stream of Manzoor Colony, has developed a part of the nala as well. The possibility of setting up a treatment plant where the nala meets the sea is being studied by the OPP-RTI. And this all began with the mapping of Manzoor Colony and its nala in 1990-1992.

End Box

Sanitation Documentation and the ADB-Orangi Project

The OPP-RTI has a map of Orangi that it has developed as described in the sections above. This map is to a scale of 1:1000. On this map all people's built infrastructure is marked in red, local government built trunk sewers are marked in green and the open paved drains built by the KMC are marked in black. The map has continuously been updated since 1984 and every quarter tables are produced which give statistical details of the sanitation programme. The tables are included in the OPP-RTI's quarterly report. A sample of the latest tables is given in Box – 2 below.

Box – 2: Community-Government Partnership Built Sanitation in Orangi

Cumulative Construction By People: 1981 to August 2004

	Cumulative May 2004	June to 2004 August 2004	Cumulative August 2004	Percentage
OPP Area:				
- Sewer Line	3,666	39	3,705	97.06
- Length (Rft.)	879,055	6,010	885,065	
- Secondary Sewer	297	3	300	
- Length (Rft.)	133,998	900	134,898	
- S. Latrine	53,656	400	54,056	98.90
Non-OPP Area:*				
- Sewer Line	2,693	10	2,703	77.85
- Length (Rft.)	707,527	1,326	708,853	
- Secondary Sewer	132	-	132	
- Length (Rft.)	42,225	-	42,225	
- S. Latrine	41,840	95	41,935	82.88
Total Orangi Area:				
- Sewer Line	*6,359	49	6,408	87.91
- Length (Rft.)	1,586,582	7,336	1,593,918	

- Secondary Sewer	+429	3	432	
- Length (Rft.)	176,223	900	177,123	
- S. Latrine	95,496	495	95,991	91.20

* 5,365 by people; 1,043 by government

+ 269 by people; 163 by government

People's Investment in Low Cost Sanitation (Cost in Rupees)

	Cumulative May 2004	June to 2004 August 2004	Cumulative August 2004	Average
OPP Area:				
- Sewer Line	12,365,367	335,420	12,700,787	3,428
- Secondary Sewer	1,382,510	-	1,382,510	4,608
- S. Latrine	29,453,400	720,000	30,173,400	558
Non-OPP Area:				
- Sewer Line	14,244,082	72,930	14,317,012	5,296
- Secondary Sewer	479,793	-	479,793	3,635
- S. Latrine	32,341,650	171,000	32,512,650	775
Total Orangi Area:				
- Sewer Line	226,629,449	636,350	27,265,799	4,255
- Secondary Sewer	1,862,303	-	1,862,303	4,311
- S. Latrine	61,795,050	892,000	62,686,050	653
Total	90,286,802	1,527,350	91,814,152	

KMC-ADB Trunk Sewer: Construction and KMC Investment

Non-OPP Area	June 1994 to December 1997
Trunk Sewer	116
Length (Rft.)	120,983
Cost (Rs.)	36,294,900

Nala Development into Box Trunks – KMC/CDGK Construction and Investment

Nala Numbers	5 (Haryana, Bukhari, Ghaziabad, Gulshan-e- Behar, Hanifabad)
Length (Rft.)	19,453
Cost (Rs)	41.04 million

Source: OPP-RTI's 99th Quarterly Progress Report: July, August, September 2004.

End Box

With this information in hand the OPP-RTI was very concerned in November 1990 when it read a report in the press which said that an agreement for upgrading 2,300 acres in Orangi had been signed between the KMC and NESPAK, a reputed Pakistani firm of engineering consultants. On further investigation it was discovered that this was a part of the ADB financed Karachi Urban Development Programme (KUDP) and that Kenhill, a foreign

engineering firm, was the main consultant. Part of the project was to prepare designs and implement water supply, sanitation and road paving for 10 sub project areas (SPAs) in Orangi. The project was going to finance and build lane sewers and collector drains for the SPAs. However, the trunk sewers were to be built later under a separate loan package that had not yet been negotiated.

The OPP-RTI initiated a dialogue with the KAD and the Mayor of Karachi and explained through the maps prepared at the OPP-RTI that a lot of work had already been done by the people in the SPAs which needed to be integrated. Also, that if the ADB project financed the lane sewers as well, then the community-government partnership on the “internal-external” model would fall a part. As a result of these negotiations and because of the maps available with the OPP-RTI, the OPP-RTI was appointed consultant to the project.

After being appointed consultant the OPP-RTI discovered two important issues. One, that the consultants had not made any surveys of existing infrastructure in the settlements and as such had little or no idea of the extent of work done and the investment that people and the KMC had made in the SPAs. In addition, they did not have the expertise to make these surveys quickly and to document them. This expertise was acquired by the OPP-RTI through necessity over a considerable period of time and is not ‘taught’ at professional training institutions. They also had very little idea of the Orangi terrain and could only relate to it through maps and plans. The second issue related to the Balfours plan for the Orangi trunk sewers (not yet constructed), which were being used as a disposal points in the proposals of the consultants.

The NESPAK had been asked by the KWSB engineers to relate their work in Orangi to the design of trunk sewers that had been prepared by Balfours under an ODA (UK) funded project. When OPP-RTI studied the plans prepared for the trunks, it was horrified. The trunks did not pick up the lines laid by the Orangi communities or the KMC. In addition, the plan required six pumping stations in an area where there are considerable gradients. If the trunks were to be built, they would run dry unless the Orangi residents were to dig up their sanitation lines and lay them all over again.

The sanitation system developed by OPP-RTI, on the other hand, follows the natural slope of the land and, through various *nalas*, reaches the main Orangi *nala* which then empties out into the Lyari river. As such, OPP-RTI felt that the trunks should either be laid in the bed of *nalas* or parallel to them. Incidentally, the Greater Karachi Sewerage Plan also envisages trunks in the bed of the Lyari river.

In addition, OPP-RTI was concerned at the enormous cost of developing the proposed trunks and realigning the existing system to link up with them. This could not be done without acquiring another major loan and the psychological burden on the communities would be disastrous for any further community financed and managed work.

After a number of meetings with the OPP-RTI and KAD, it was decided by the KWSB to shelve the Balfours design and drain the sewers into the open *nalas*. This decision was conveyed to Balfours in a meeting that was held after the OPP-RTI had signed a formal agreement with the KMC. At this meeting, the Balfours representative was very concerned and pointed out that “Her Majesty’s” government had invested one million pounds in the preparation of these designs. However, these considerations were set aside and OPP-RTI was asked to prepare designs for the trunks in keeping with its concept.

The final OPP-RTI designs consisted of trunk sewers on either side of the *nalas*. This was because it was discovered that two trunks of a smaller diameter would not have any of the problems associated with traversing the *nalas*, and would not only be much cheaper but also much easier to construct. The costs of these trunks worked out to Rs 120 million (US\$ 3

million) at contractors' rates, a sum that the government of Pakistan could afford. The Mayor was sure he could get this amount from the Prime Minister's fund.

Finally, an agreement was drawn determining the role of the KMC, NESPAK and that of the OPP-RTI in implementing the project. The OPP-RTI was to document all existing infrastructure (including road and water lines); review sanitation designs prepared by NESPAK and modify them if necessary; coordinate the design and implementation of "external" development for sanitation so as to relate it to the "internal" development that was to follow; and monitor implementation with the help of the community. The OPP-RTI was to submit a monthly monitoring report on sanitation development to the KAD, identifying problems and proposing actions to solve them.

NESPAK was to design, tender and supervise the construction of roads, water supply system and sanitation for the SPAs. However, after OPP-RTI signed the agreement with KMC, NESPAK's role in sanitation became limited to the design and supervision of "external" work only. In addition, it was to avoid duplication of all work that had been done in the SPAs. This duplication was to be identified by OPP-RTI surveys.

The KMC was to finance, design and maintain "external" development while the work was to be tendered out to contractors by KMC's subsidiary, the KWSB, which was also given the responsibility of supervising construction. The community, meanwhile, was to finance and build "internal" development.

The OPP-RTI was to be paid a lump sum of Rs 700,000 rupees (US\$ 17,500) per year as fees and direct costs for the services it rendered for the duration of the project.

The OPP-RTI identified activists in the SPAs and supplied them with a simplified version of NESPAK maps and design details and specifications. It also trained them on how to read these maps and supervise the work that the contractors were doing on external sanitation. As a result, after a few conflicts between the KMC engineers, contractors and areas activists, relatively good quality work was done in the Orangi SPAs. Another spin-off was that in the Ghaziabad settlement, which was one of the SPAs, OPP-RTI was able to identify activists who have later on played an important role in the development of their area. They have been able to apply the "internal-external" model to security, electricity, solid waste management and parks. In the local body elections of 2001 their candidates won the elections defeating representatives of powerful commercial and political interest groups.

As a result of the OPP-RTI's involvement with the KMC's upgrading work in Orangi, the cost of the ADB funded project decreased from Rs 1,300 million (US\$ 21.6 million) to Rs 36.2 million (US\$ 0.60 million) and people with OPP-RTI technical and managerial support built and financed sewers in 1,093 lanes having 21,866 houses and supervised external development work. An ADB report has considered this project as the only successful sanitation project it has funded in Karachi in the KUDP⁹.

As a result of the project excellent relations were built with local government engineers and administrators because of which the OPP-RTI has been able to successfully lobby for converting the Orangi natural drains into box trunks. The process is on going.

The Documentation Of Katchi Abadis

In 1991, the OPP office shifted from Orangi to the neighbouring settlements of Qasba. It was felt by the OPP management that since it was located in Qasba it should extend its

⁹. ADB: PAA-PAK 19076 – Project Performance Audit Report on the Karachi Urban Development Project in Pakistan; December 1999.

programme to this settlement. As a first step it was decided to document the Qasba settlements. Local high school students and school educated young people were recruited to work on the documentation which was undertaken in 1992-93. The young men were given training by associating them with the OPP technical team with whom they worked both in the office and in the field. A small daily stipend was given to them. Maps of Qasba were acquired from the local government and updated. Support of Rs 140,000 (US\$ 2,330) for documenting 10 *katchi abadis* was provided by SELAVIP. However, 50 *katchi abadis* were documented as a result of this support and in the process a number of young men from these settlements became associated with the OPP-RTI programmes. Two of them independently promoted the sanitation programme in their settlement and later established a school which has evolved to become a major Qasba institution. Its work is described in Box – 3 below.

Box – 3: People’s Initiatives in Islamia Colony

Abdul Waheed Khan was a student when he was identified in 1993 as someone who could help in the documentation of the Qasba settlements. For this he worked with the OPP-RTI on documenting his own settlement of Islamia Colony. In the process he got to understand the social and technical methodology of the OPP-RTI’s low cost sanitation programme. He motivated his neighbourhood to adopt the OPP-RTI model and as a result, nearly 95 per cent of Waheed’s area has been paved, sewage lines laid and there has been great improvement in the appearance of the area. The main sewer was laid by SKAA through finances generated from the area as lease charges. Waheed and other activists of the area supervised the laying of the sewer and also facilitated the lease process in coordination with SKAA. The Society which Waheed Khan and other residents of the area formed for development purposes, believes that its greatest achievement is the setting up of a school in their area. This school was set up by Waheed and his friends Syed Lateef and Faqir Muhammad in Waheed’s own house, with a loan of Rs 1,300 (US\$ 22) from the OPP-RTI.

In the beginning there were no students, so the founders asked the children of their extended family to come to school, and they did. This resulted in other children also starting to attend the school, and the number soon rose to 45. Soon the space for the school became insufficient and new premises had to be located. This was a costly matter and Waheed had to raise the fees charged by the school to ensure that they could have appropriate accommodation for the new premises. To his surprise, the increase in the school fee, rather than reducing enrolment, increased it considerably.

The school is run by the Bright School Education Society, which was established in October 1996. OPP-RTI helped this Society in its early years with advice, and when the Society required land to build a school, the OPP-RTI played a pivotal role and requested SKAA to provide land where the school could be housed. The acquisition of a plot by the Society created numerous problems. The land grabbers of the area asked Waheed to turn the plot into small lots in partnership with them and sell them. When Waheed refused they told the community that Waheed had no intention of building a school but was going to sell the land. This divided the community and turned a number of persons against Waheed. However, when this did not deter Waheed and his partners from their objective, the land grabbers, who are influential persons in the area, had Waheed arrested and took over the plot. The matter was settled in Waheed’s favour with the intervention of the Deputy Commissioner, but after construction started, Waheed was arrested again as the police wanted a share of the construction cost. Again, the local administration, through OPP-RTI lobbying had to intervene to get Waheed released. Construction was finally carried out under police protection.

The school now consists of a large building containing nine classrooms, a library, a computer room and offices. It has been built with the help of donations from the community and philanthropists and from loans. It has 450 students and 24 teachers. The Bright School Education Society has evolved and 80 Orangi schools are associated with it to whom it provides services such as teacher’s training and dealing with government and NGO resource organisations. With the help of the Aga Khan University it has initiated a training of master trainers for training teachers in Orangi. So far over 400 Orangi teachers have been trained.

Source: OPP-RTI reports and interviews of Bright Education Society office bearers.

End Box

The documentation of the Qasba *katchi abadis* consisted of identifying existing infrastructure, schools, clinics, sewage disposal points, building component manufacturing yards, slope of the land, a number of houses, and the approximate investment made by people and government in infrastructure development. This documentation showed the OPP-RTI management that people even outside of Orangi and without OPP-RTI's support had made major investments in attempts to improve the physical and social environment of their settlements.

Youth Training Programme (YTP)

After the documentation of 50 *katchi abadis*, the OPP-RTI felt that there was a need for the documentation of *katchi abadis* all over the city. It felt that this could also establish its contacts with activists and CBOs outside of Orangi and give a larger base to its community and advocacy work. It would also train people in informal settlements to help in the replication of the OPP-RTI's programmes.

At about this time, the OPP-RTI had also become a consultant to the Sindh Katchi Abadi Authority (SKAA), a government institution in-charge of regularising and improving *katchi abadis* in the province of Sindh, where Karachi is located. SKAA has accepted the OPP-RTI's "internal-external" concept and the OPP-RTI under its agreement with SKAA, was to train SKAA's staff in the OPP-RTI methodology. Surveys of *katchi abadis* to document existing infrastructure were also required to facilitate the work of SKAA.

As a result in 1994, a Youth Training Programme was initiated. The students at the programme are matriculation and/or intermediate (10 and 12 grade) in qualification and most of them are also studying in schools and colleges. In addition, training is also provided to community activists. For the students training is provided for sanitation and the main focus is on surveying, drafting, documentation, levelling, designing and estimation. For the activists the focus is on estimation, construction, on-site supervision and community mobilisation. Training has also been provided in housing so as to produce para-architects. This training has consisted of survey, designing, estimation, construction technology and on-site supervision.

The students are taught through both theory and by mapping and documenting *katchi abadis*. Initially, they went to the field with an OPP-RTI technical staff member. However, over time the older students started to guide the new ones. Teams now consist of one senior and one junior member. They go out and document physical and social infrastructure in the *katchi abadis* and identify the slope of the land. They have also documented the *nalas* of Karachi into which sewage discharges. In the *nalas* they have documented slopes, widths, encroachments on them and major sewage and storm water inlets into them.

The YTP has evolved over time. Initially, whoever applied for training was given a three-month probation period during which he was given a daily stipend and not a regular salary. Due to this method of identification, there was a large drop out rate. Now the Technical Training Resource Centre (TTRC) runs a 26-day training programme for applicants and those who are successful in the training programme become students at the YTP. The training for housing has also been taken over by the TTRC (for details of the TTRC and its courses, see Box – 4).

Box – 4: TTRC and its Courses

YTP was commenced by the OPP-RTI in 1994. Towards the end of 1995, a 21 year old young man, Mohammad Sirajuddin, joined it. He completed the 90-day housing course on theory, practical and on the job training on surveying, designing, estimating and site supervision. After completion of the course he stayed on with the OPP-RTI to polish his skills. In mid-1997 Sirajuddin motivated a diploma engineer, Shahid Malik, to join the OPP-RTI as a trainee. On the completion of Shahid's training, the OPP-RTI advised the two to set up a consultancy in Orangi for architectural design and surveying so as to serve low income communities and in the process earn a living as well. In late 1997, they set up SS Consultants. The firm operated from the OPP-RTI offices.

In the beginning clients were not willing to pay for the services of SS Consultants. They expected free service as was being provided by the OPP-RTI housing programme. However, slowly they started receiving requests for designing of houses, mosques, shops and schools and started receiving fees as well. At the same time Sirajuddin started to train young Orangi resident to assist in his work. In May 2000, he set up his office in a rented room in Ghaziabad, the Orangi settlement in which he lives.

SS Consultants are providing services to a variety of clients including NGOs such as the URC, Faran Education Society, Bright Education Society, Reformers and the OPP-RTI for settlement surveys; design of schools, shops, mosques and homes; and estimates and supervision of construction.

In 1999, Sirajuddin enrolled in a diploma course in a polytechnic. Over there he realised that students studying with him would be unable to do practical work once they graduated. He felt that they needed a practical training course. To set up such a course, he linked up with Ashraf Sagar who had also been trained at the OPP-RTI and had set up his consultancy unit called "A-I Surveyors" in 1998. A-I Surveyors have completed the survey of six settlements independently for community organisations to help them in the regularisation process.

The two young men set about organising a training course. It was decided that the course would be of three-month duration and would include drafting, quantity surveying, level and plan-table survey, construction and supervision. The fee for the course was set at Rs 1,500 (US\$ 25) and Abdul Hakeem, one of Sirajuddin's teachers agreed to take the course on construction, supervision and estimation. OPP-RTI provided guidance when required. So far 12 courses have been held and 56 students have been trained.

TTRC has been requested by the OPP-RTI to conduct a 26-day training course on mapping and documentation surveys for students wishing to work with the YTP. Students who are successful in the course then receive training at the OPP-RTI through the YTP. So far TTRC has conducted 19 such training courses in which 59 students have participated.

The TTRC has received an endowment of Rs 500,000 (US\$ 8,340) from Homeless International, a UK based charity. An additional Rs 220,000 (US\$ 3,660) has been provided by Homeless International for replicating the TTRC by setting up the Housing Resource Centre. The TTRC has also been acting as a technical advisor to UC-6 in Orangi Town.

Source: OPP-RTI literature and interview of Muhammad Sirajuddin.

End Box

Fifty per cent of the trainees are full time and they receive a salary of between Rs 2,200 to Rs 2,500 (US\$ 37 to US\$ 42) per month. The other 50 per cent are part time because they are either studying or working. They work after 2:00 pm and are paid Rs 1,750 (US\$ 29) per month. Almost all of those who are studying say that they have been able to continue to study because of the income that is provided to them by working with the OPP-RTI.

So far the OPP-RTI through the YTP has completed the documentation of sanitation, water supply, clinics, schools and *thallas* (building component manufacturing yards) in 334 *katchi abadis* which constitute just over 60 per cent of the total *katchi abadi* population. The

documentation of these *katchi abadis* has been digitised and results along with detail maps of 100 *katchi abadis* have been published. The documentation of an additional 100 *katchi abadis* is in the press and will be out soon. The digitisation has been done by OPP-RTI technical staff members who had some knowledge of computer graphic programmes. They were encouraged to use this knowledge for digitisation and in the process they have become efficient in computer graphics and digitisation. As a result, a computerised mapping unit is now functioning and two trained persons from the YTP are part of the unit. The format of the documentation is given in Box – 5 below.

Box – 5: Katchi Abadi Documentation Format

1. Overall Statistics of Surveyed Katchi Abadis

- *Abstract*
- *Analysis*
- *Detail Statistics*
 - *Sewage lines*
 - *Water supply lines*
 - *Clinics, schools and thallas*

2. Photographs

3. Location

- *Map of Karachi showing location of katchi abadis*
- *List of katchi abadis surveyed*

4. Individual Katchi Abadi Information and Maps

- *Map showing location of Karachi*
- *Map showing the immediate neighbourhood of the katchi abadi*
- *Statistics of “internal” and “external” development*
 - *People’s efforts (sewage and water)*
 - *Government’s efforts (sewage and water)*
 - *Number of government and private schools, clinics and thallas*
 - *Maps (separate for each item) showing:*
 - *People and government laid sewage lines and their direction and disposal points*
 - *People and government laid water lines and their direction and source*
 - *Private and government built clinics and schools and thallas and mosques*

End Box

The documentation of the *nalas* has been presented in two different ways. An A to Z guide of Karachi was acquired and all the pages pasted together to form a map of Karachi to a scale of 1:10,000. This map covers an entire wall in an OPP-RTI classroom. Karachi’s natural drainage system and sewage trunks are marked on this map. So far documentation of 83 *nalas* measuring 718,208 running feet has been completed. Detailed catchment area survey of 43 *nalas* has also been completed. The map shows a clear picture of Karachi’s sewage disposal system and as more information comes in, it is added to the maps. In addition, digitised maps to a smaller showing the same details have also been prepared.

The survey of the 334 *katchi abadis* has shown the extent of people’s work. There are 224,299 houses in 19,463 lanes in the surveyed settlements. Sixty-two per cent of these lanes have sewage disposal facilities and 50 per cent have water lines, both laid on a self-help basis. Approximately Rs 334.48 million (US\$ 5.6 million) have been invested by the

people in this work. Government investment has also been made for sanitation and water supply but most of their work is on main sewers, drains and water mains. The survey results show that the “internal-external” concept of the OPP-RTI has been unwittingly followed in an unplanned manner by the government and the communities. Furthermore, 1,041 clinics and 773 schools have been set up by entrepreneurs and/or charities in these settlements as compared to 12 government clinics and 143 government schools¹⁰.

4. Repercussions Of The OPP-RTI Mapping Process

The setting up of the YTP and the mapping process had a number of important repercussions on policy issues related to infrastructure and *katchi abadi* upgrading, planning concepts in local government and community managed development work. These are given below.

- Documenting of *katchi abadis* showed people’s involvement and investment in development in clear terms. As a result, planning agencies and local government have realised the need to support this work rather than duplicate it or simply go out and build schools (often without teachers), clinics (often without para-medics) and water and sanitation systems which are not properly designed, maintained and operated.
- Persons in community were trained in skills and knowledge that communities require to establish a more equitable relationship with government agencies, improve their settlements and build local institutions.
- The documentation laid the basis for questioning government and IFI planning policies and development projects and for promoting viable alternatives that were based on a sound knowledge of ground realities that government agencies and their foreign consultants do not have and nor do they possess the skills to develop this understanding.
- As a result of the documentation, OPP-RTI’s concepts were reinforced by statistics and maps at an all Karachi level and not just limited to Orangi. This has increased OPP-RTI’s standing and credibility to the extent that its advice is now sought at the national, provincial and city level in all matters related to sewage and *katchi abadi* upgrading.

Some of the more important developments that have taken place due to this documentation are given in the paragraphs below.

SKAA Becomes Solvent

In 1994, SKAA decided to follow the OPP-RTI proposed methodology for upgrading *katchi abadis*. This policy consisted of documenting and integrating community and KMC councillor funded infrastructure into an overall plan of each *katchi abadi*. It was also decided that SKAA would only build “external development” and leave the building of the “internal development” to communities.

¹⁰. Perween Rahman, *Katchi Abadis of Karachi: A Survey of 334 Katchi Abadis*; OPP-RTI, 2004.

OPP-RTI's work as consultant to SKAA has consisted of:

- Documenting existing sanitation and water supply in the settlements and identification of external sanitation and water supply projects. Community activists assist the OPP-RTI and SKAA teams in both these activities.
- Preparation of detail design and estimates by SKAA engineers and review of these by OPP-RTI.
- Approval of the project by community members before finalisation.
- Financing and contracting of external development is arranged by SKAA either by conventional contracting or through departmental work ¹¹.
- Supervision of work by SKAA engineers and its monitoring by OPP-RTI and community activists (guided by OPP-RTI).
- On completion, checking of the infrastructure through tests and if approved by the community, issuing of a no objection certificate by the community and OPP-RTI before final payment to the contractors.

The most important aspect of this entire work is the documentation of the *katchi abadis* leading to the identification for external development and an overall plan that integrates existing infrastructure. This entire work has been done by the YTP under OPP-RTI supervision. As a result of this work, SKAA which was completely dependent on ADB funding has become solvent and now has considerable surplus funds derived through lease charges from the communities it has partnered with ¹².

OPP-RTI Alternatives for the Greater Karachi Sewerage Plan

The results of the documentation of the *katchi abadis* by the YTP showed clearly that the OPP-RTI concept of “internal” sanitation being built by communities and “external” sanitation being built by the government, was valid and workable. In addition, SKAA's work supported by the OPP-RTI, on these principles, has also been very successful. However, the KWSB's Greater Karachi Sewerage Plan (GKSP), which tries to provide both “internal” and “external” development and take the sewage to its treatment plants has been unsuccessful and its investments, provided through international loans, have not even begun to be recovered, putting considerable strain on the economy of the city and the province. KWSB owes Rs 42 billion (US\$ 700 million) to the ADB.

OPP-RTI mapping established the reasons for the failure of the GKSP. The GKSP ignores the existing reality that sewerage systems are already in place and are discharging into the natural *nalas* of the city. This is because documentation of much of this work is not available and even if it is accepted that it exists, it is considered as “substandard” by IFI consultants. The GKSP tries to take sewage to the three treatment plants it has built by constructing trunks along the main roads. In the process it does not pick up the existing sewerage systems that discharge into the *nalas* and so the trunks remain dry and the treatment plants function to no more than 25 percent of their capacity¹³. To link up Karachi's existing infrastructure with the treatment plants and the KWSB trunks, the sewerage infrastructure of

¹¹. In departmental work a people's committee of the neighbourhood where the project is to be implemented is formed to manage and construct the project; the OPP-RTI becomes its advisor; and local government funds and designs the project with OPP-RTI-community involvement.

¹². SKAA quarterly reports: for details see, 41st Quarter Report, March 2004.

¹³. OPP-RTI: *Proposal for a Sewage Disposal System for Karachi*; City Press, Karachi, November 1998

entire neighbourhoods would have to be dug up and re-laid. This is simply not possible. To support its view, the OPP-RTI made a case study of the ADB financed Baldia Project in which the KWSB methodology was followed and only 1,744 houses out of 25,000 could connect to the system. The old system of discharging into the natural *nala* of Baldia continues to function. As such, more than Rs 400 million (US\$ 6.7 million) spent on the project have been wasted¹⁴. These facts have been brought to light by the OPP-RTI documentation of *katchi abadis* through the YTP.

After studying its documentation the OPP-RTI proposed that the existing sewerage systems, laid formally or informally, should be documented and accepted and that the natural *nalas* of Karachi should be converted into box trunks and treatment plants should be placed at locations where they meet the sea or other natural water bodies. A comprehensive report, "Proposal for a Sewage Disposal System for Karachi" was prepared and published. Research also showed that in 1998-99, KMC subsidy to the KWSB was Rs 329 million (US\$ 5.5 million). With these finances 35 kilometres of *nalas* could have been converted into box trunks and in six years all of Karachi's 200 kilometres of *nalas* could be developed except for the Lyari and Malir rivers and the Korangi Creek. Funds for treatment plants would be in addition to these costs.

The KWSB planners and engineers objected to this proposal because they felt that sewage and rain water flowing together was against good engineering practice. However, through its contacts with academics in Japan the OPP-RTI was able to get information that in Japan this practice has been followed.

On the basis of its proposals for Karachi, the OPP-RTI also proposed alternatives for the proposed Korangi Waste Water Management Project (KWWMP), which was being financed by a US\$ 70 million loan from the ADB and counterpart funds of US\$ 30 million from the Sindh government. Korangi is an extensive industrial cum low income residential area of Karachi. The OPP-RTI proposal for the KWWMP was simply to accept the present community and KMC built sewerage system and convert the *nalas* which act as its disposal in to box trunks and place a treatment plant at the end of it just before the point where the sewage enters the Korangi Creek. This brought down the cost of the project to within what the Sindh government was to invest in it and made the ADB loan unnecessary. The documentation of the existing Korangi infrastructure was done by the OPP-RTI through the YTP and with the help of community activists.

After 1997, the OPP-RTI made a series of presentations of its proposals before the KWSB, government of Sindh departments, the Planning Commission in Islamabad, the President of Pakistan, the Governor of Sindh and the ADB. These presentations led to discussions and debates and as a result of them in April 1999 the Governor of Sindh decided to cancel the ADB loan of US\$ 70 million for the KWWMP. It was also decided that the project would be built through local resources and local expertise. A committee was formed by the Governor to develop a conceptual plan for the project. The committee requested the OPP-RTI to prepare such a plan which it did in March 2000. The cost of the project, according to the OPP-RTI plan worked out to US\$ 15.18 million.

The KWWMP generated a lot of discussion and debate in the press and among NGOs and CBOs. A meeting of these, which included several Korangi CBOs, was held at the Urban Resource Centre (URC), a Karachi NGO. The meeting decided to make efforts to get the low cost alternative plan implemented. In December 1999, they also sent a petition to the ADB Inspection Committee, which was signed by hundreds of Korangi residents, upholding the rejection of the loan and requesting an independent review of the project. In the last quarter of 2000, 59 NGOs and CBOs (including OPP-RTI) came together on a common agenda for

¹⁴. Ibid.

the city's water and sanitation plans and proposals and produced a position paper. This paper is reproduced as Box – 6: Citizen's Position Paper on Water and Sanitation Policy for Karachi. The paper was been sent to the President of Pakistan, concerned provincial and federal ministers and departments, Governor of Sindh, external support agencies and their embassies, international agencies and local and international universities. The group has now been formalised as Water and Sanitation Network and is based at the URC. Its details are given in Box – 7.

The debate generated by the OPP-RTI's alternatives to the GKSP led to the Governor's Task Force on Municipal Services requesting the OPP-RTI to undertake a study on institutional issues related to the sewerage sector. A report "Sewage, Drainage and Treatment Plants: Responsibilities, Finances, Issues and Policy Changes Needed" was prepared and its conclusions are given in Box – 8. This study is of considerable importance and has formed the basis of an on-going debate within government circles and is responsible for the conversion of *nalas* into box trunks which has become an on-going activity of the Karachi towns.

Box – 6: Citizen's Position Paper on Water and Sanitation Policy for Karachi

On June 28, 2000, a meeting was arranged between Government of Sindh and various Karachi NGOs, CBOs and citizens on the issue of water supply and sanitation for the city. The workshop was organised by the Government of Sindh: Local Government; PHED; Rural Development & Katchi Abadis Department in collaboration with World Bank and was facilitated by World Bank consultants. The NGOs, CBOs and citizens handed over a paper and walked out of the meeting for the following reasons:

- The government of Sindh and KWSB were not represented at this meeting by decision makers. Additional Chief Secretary, Department of Planning and Development, Government of Sindh, was supposed to chair the meeting. The citizens felt that their dialogue had to be with their government representatives and not with the Bank officials.*
- The NGOs and Citizens had informed the organisers that they had reservations regarding the manner in which the workshop was being conducted in which individuals were making comments on behalf of various interest groups. The NGOs and Citizens had requested a panel discussion on the subject. However, the organisers did not change the format of the workshop.*
- When community members objected to the fact that the decision makers were not there, the facilitators asked them to stay quiet and behave in a civilised manner.*

However, there is a background to this conflict. In the water and sanitation sector, the KWSB has borrowed over Rs 42 billion (US\$ 700 million) for development purposes since 1983. It has not even begun to service the loan. As a result, this servicing is done by deducting Sindh government revenues at source, thus, increasingly depriving the province of funds for development. In addition, none of the projects carried out through these loans has been successful, except the sewage disposal project in Orangi, based on the OPP-RTI model. This fact has been confirmed by the Asian Development Bank (PAA; PAK). 19076-Project Performance Audit Report on the Karachi Urban Development Project (Loan 793-PAK[SF]) in Pakistan, December 1999.

OPP-RTI has developed low cost realistic solutions to the problems of sewage disposal in Karachi. However, these have been rejected by the KWSB, without seriously considering them or even visiting the OPP-RTI sites to see how they work. It is important to note that these very solutions have been applied to similar situation in Japan, Switzerland and other first world countries. These solutions do not require large foreign loans for implementation.

The citizens and NGOs are extremely concerned about his state of affairs and are adamant it should not continue. They insist that a review of KWSB's and the international loan giving agencies role in this disaster should take place. However, this is something the international agencies are not even willing to consider.

There are a number of changes that the NGOs, CBOs and citizens feel are required to make the loan giving process more transparent and to make it cost effective. These are:

- Projects identified for a loan should be part of a larger program and not isolated ad hoc interventions as they are today.*
- Foreign consultants receive over 20 per cent of the loan amount as fees and overheads (in some cases more). They should not be employed since highly qualified local expertise is available and can work at a fraction of the cost.*
- International tendering, which is part of the loan conditional ties raises the cost of implementation by anything between 200 to 300 per cent of the local costs. This should be done away with and local contractors be employed for implementation.*
- Recovery of loans should be guaranteed from the benefits produced by the project itself rather than from other sources.*
- A steering committee of interest groups should review the project at the conceptual stage through public hearings, as to the social, physical and economic viability and need before a request for a loan is made.*
- And, above everything else, the loan should be taken if it is impossible to mobilise local resources for the project.*

The Government of Sindh and Pakistan must protect the interests of the people of the province and country, and should dictate loan taking procedures and conditional ties in the larger interest of the people of Pakistan. It has to be realised that the debt trap is the biggest cause of poverty in this country and the only way out of it is to live within our means and rely upon the ingenuity and frugality of our people who have managed to survive in an extremely hostile economic environment which has been forced upon us by self seeking governments and the ruthless international market.

Source: Urban Resource Centre, Karachi.

End Box

Box – 7: Water and Sanitation Network

Over the past five years, there has been a growing interest among citizen's groups in Karachi on the issue of water and sanitation. This is because of the poor state of these services and also because of forums organised by the URC on the subject. The process of opposing the ADB's KWWMP and promoting the OPP-RTI alternative has been another reason for this interest. As a result, 23 groups including OPP-RTI got together to form a network on water and sanitation and named it "People's Voice". Many other groups support the network as and when needed.

The Network has strongly advocated the use of local resources as opposed to foreign loans and for building on what exists rather than investments in insensitive mega projects. The Network has also presented citizen's concerns and detailed comments on the World Bank Pakistan Country Assistance Strategy Paper. Presentations of the Network's concerns have been made periodically to the media and city and town nazims along with the OPP-RTI alternatives for sewage disposal for the city.

More recently, the Network has taken up the issue of the proposed ADB funded Common Effluent Treatment Plant (CETP) for Karachi. The experts associated with the Network have discovered a number of financial, technical and operational problems with the ADB proposal and have raised these issues with the ADB. Members of the All Pakistan Textile Manufacturer's Association (who only got to know of the proposed plant through the Network) have also expressed concerns. The Network's effort now is to present viable alternatives and initiate public hearings on the CETP and other ADB funded projects in the pipeline.

The People's Voice is also involved in issues related to solid waste disposal and transport in addition to sewage and water. Because of forums, television programmes, meetings with government agencies and local government representatives, government plans for sewage disposal, water supply and transport have been influenced.

Source: OPP-RTI and Urban Resource Centre Quarterly Reports.

End Box

Box – 8: Sewage, Drainage and Treatment Plants – Responsibilities, Finances, Issues and Policy Changes Needed

Study conclusions are:

- At present KWSB is servicing only about 20 per cent area in Karachi. Servicing means maintenance and renovation of existing system. In these areas most sewage is diverted to storm drains and natural nalas.
- KWSB's role in sewage disposal system development has been negligible. The only known development project undertaken by KWSB has been upgrading of Treatment Plant (TP)-I, TP-II, construction of Baldia sewerage project, Lyari trunks and T.P III, which are all components of the KWSB's Greater Karachi Sewerage Plan. The functioning of these projects, costing about Rs 42 billion (US\$ 700 million) in foreign loans, is questionable as already shown in the case of TP-I, II and Baldia project. In the remaining 80 per cent Karachi area, not serviced by KWSB, development has been undertaken by KDA, other development authorities, Cantonment Board, KMC, co-operative housing societies, builders and the people themselves.
- Natural nalas and storm drains serve as disposal channels for 90 per cent sewage generated in Karachi. In the areas under KWSB jurisdiction (20 per cent Karachi area), nalas and drains are also being used for sewage disposal. In the 80 per cent remaining Karachi area (including katchi abadis) not under KWSB jurisdiction, the sewage disposal points are the storm drains and natural nalas.
- Neither KWSB nor KMC (now the city and town governments) accept responsibility for maintenance / development of these natural nalas and storm drains. The result is the consequent overflows and breakdown of the sewerage system all over the city. The KWSB Managing Director and Foreign Projects Office rejects this reality and persists on imposing a master plan (the Greater Karachi Sewerage Plan) which has no relation to the existing system in place. KMC's opinion is that these storm drains and natural nalas are sewage disposal channels. Therefore, it is KWSB's responsibility to maintain them.
- The KMC and KWSB's sewerage wing (responsible for O&M) are responsive to accepting the ground reality. KMC has already allocated budgets for nala/drain trunk development as per Governor Sindh's directive of 3rd March 1999. The KWSB sewerage wing accepts the ground reality but is helpless due to the KWSB policy.
- For financing the sewerage wing, KWSB is dependent on KMC subsidy. For sewerage maintenance and repair KWSB's revenue receipt 1998-99 is Rs 120 million (US\$ 2 million) (50 per cent share in conservancy charge) while its expenditure budget is Rs 483.4 million (US\$ 8 million). The deficit is covered by subsidy from KMC of Rs 275 million (US\$ 4.6 million). This subsidy covers establishment, maintenance and repair cost.
- KWSB sewerage wing budget on maintenance and repair is mostly wasted, which means that KMC subsidy is wasted. KWSB persists on revitalising a collapsed system, while at the same time it negates the functional drain/nala disposal system. It spends huge sums on renovating and maintaining lane sewers, secondary sewers, and trunk while the actual disposal is neglected.

- *KWSB's dependence on foreign loans for development projects is disastrous for the institution. Presently KWSB has a loan liability of Rs 42 billion (US\$ 700 million), which it has not been able to service.*
- *Inability of KWSB to service the loans has a negative implication on the budget of Sindh Government and its allied organisations. The KMC's (now the City Government) budget allocations due from Sindh Government have been deducted at source on account of KWSB loans and their servicing.*
- *Responsibility needs to be redefined. KMC is a viable organisation to take responsibility for sewage disposal in Karachi. KMC (now the city and town governments) is responsive to accepting the ground reality as specified in Governor Sindh's directive of 3rd March 1999. KMC is financially viable. It has the technical and administrative capacity to take the responsibility for developing and maintaining sewage disposal systems. The maintenance and repair wing at KWSB can function under KMC (now the city and town governments). KWSB is better suited to function as a Water Board.*

For the above suggestions to be implemented, no changes are needed in the SLGO (Sindh Local Government Ordinance). However, a government directive is needed as per SLGO clause, which states that "KMC to take up any other role assigned by government."

For KWSB to be converted into a water board the KWSB Act needs to be amended.

Source: OPP-RTI's 84th Progress Report

End Box

Development of Orangi Nalas in Box Trunks

As a result of OPP-RTI's presentations of its documentation of *katchi abadis* and the alternative proposals to the KWSB's GKSP, the Governor of Sindh gave a directive in March 1999: "*KMC should develop and upgrade main nalas/drains as sewage and rain water drainage channels, for which budget would be allocated annually.*" As a result of this directive, the KMC started work for converting tertiary *nalas* into box trunks on the basis of OPP-RTI surveys and designs. After Devolution in 2001, the City Government has continued with this process. The OPP-RTI has developed designs and estimates of 17 tertiary and one main *nala* in Orangi based on its surveys. The total length of these *nalas* is 33.7 kilometres. So far work has been completed and/or is on-going in the case of four *nalas* which serve 1,625 lanes. Tenders for two additional *nalas* have been floated.

Preparation Of The UC Handbooks And Their Spin-Offs

After the Devolution of 2001, 13 UCs were created in Orangi Town. Each UC has a population of between 50,000 to 100,000. The UCs have no technical capacity or capability and nor do they have proper maps for planning, implementation and operation and maintenance of development work. Therefore, the OPP-RTI decided to prepare UC Plan Books for the *nazims* of each UC. The Plan Book contains:

- Maps of the entire UC and of individual settlements within each UC.
- Documentation of existing social and physical infrastructure related to sewage disposal, water supply, health, education, parks and playgrounds and solid waste disposal.

- Identification of development needs on the basis of the documentation and the role of the community and governments in planning and delivering this development.

A number of UCs have used this documentation effectively. Development in those that have not has been ineffective, inappropriate and substandard leading to a considerable misuse and waste of public money. UC-6 is a model UC and it has used the Plan Book for:

- Developing external sewage and water supply which has included repairing water mains and de-silting blocked sewers. The location of the leakages and blockages was identified by OPP-RTI surveys.
- The *nazim* with the help of area activists has organised pick up of solid waste from the main bins. The UC Plan Book with a map showing the disposal points has helped in organising this work. People are responsible for disposal of solid waste from the house and lane to the main neighbourhood bin from where a government van picks it up. 4,000 houses and 450 shops are organised to do this work and they pay the sanitary workers employed for this purpose Rs 20 to Rs 30 per month per shop or per house.
- Where people have laid lane sewers on self-help basis, the *nazim* finances the paving of the lane.
- Tree plantation and electrification have been developed on the “internal-external model”.
- The mapping has been done by the YTP and the UC has been assisted by the TTRC in its development planning and implementation work.

Requests from UCs and towns from all over Karachi have been received for the preparation of similar documentation and advisory support. This is being provided to UCs in 11 out of 18 towns of Karachi. These towns are now in the process of converting their *nalas* into box trunks. However, the process of building treatment plants at the end of the *nalas* has not yet begun although the OPP-RTI is in the process of researching low cost options.

5. Mapping Process In Replication Projects Outside Of Karachi

OPP-RTI partner CBOs and NGOs outside of Karachi have also developed expertise in mapping. This expertise is the result of the OPP-RTI strategy for supporting NGOs and CBOs wishing to replicate its programmes. This strategy has developed overtime after many modifications and is given below.

- CBO/NGO or community activists contact the OPP-RTI for support.
- OPP-RTI invites them for orientation to the OPP-RTI office in Karachi or directs them to one of its partners.
- After orientation CBO/activists convince their community to adopt the programme.
- They create a team of a social organiser and a technical person who are trained at the OPP-RTI and/or on-site in their settlements through visits by the OPP-RTI staff.
- The training is in surveying, mapping, estimating, construction supervision, documentation, accounts.

- Training does not have a specific period. It continues throughout the life of the project.
- OPP-RTI arranges financial support the team and related expenses through WaterAid. Initially, it is about Rs 200,000 (US\$ 3,500) per year.

Invariably the CBO-NGO comes into contact with local government departments as its work expands. When that happens local government representatives are invited to the OPP-RTI for orientation. If they are convinced they send their staff for training. Neighbourhood settlements and sometimes even villages and local government of neighbourhood towns contact the CBO-NGO for replicating their programme. Some of the results of this strategy are given below.

- Anjuman Samaji Behbood (ASB) is a Faisalabad CBO that has been replicating the OPP-RTI programmes. It has collected all available maps of Faisalabad city, documentation of main disposals and main and secondary sewers. In addition, it has related its own mapping of neighbourhoods where it has worked to these maps. It has also acquired knowledge of GIS mapping and has supported Jaranwala Town in acquiring satellite imagery, digitising it and establishing a GIS base. Similar support is being given by ASB to Chiniot Town. ASB is visited by CBOs, NGO and staff of local government agencies for training and orientation.
- The Lodhran Pilot Project (LPP) is a NGO working in partnership with the local government of Lodhran Town. With support of consultants they have developed a complete plan table survey of the town on the basis of which they have developed a sewage and water supply master plan. They have extended their services to five nearby towns and completed sewage schemes in 12 neighbouring villages. They have, with the support of local communities, prepared maps for all these projects. They are flooded with requests and are attracting training groups from various government and NGO agencies.
- The Conservation and Rehabilitation Centre (CRC), Lahore, has a project of conservation of historic monuments in Uch Sharif, a small but ancient town in southern Punjab. CRC was interested in providing the town with better infrastructure and contacted the OPP-RTI for this purpose. A replication project was established. The CRC team trained six young members from the community in plan table survey and computer mapping. They have prepared sewage and drainage master plans and maps of the city on the basis of which government is building external development and the people are building internal development. The CRC Sanitation Unit has now become consultant to the Uch local government and is guiding their external sanitation projects, road construction and lane paving and conservation projects developed by the CRC in consultation with the communities and government.
- Plan table expertise has also been established in seven other CBOs outside of Karachi and in the case of Rawalpindi city it has led to a collaboration between the ADB-under-preparation environmental project and the local OPP-RTI partner, the Akhtar Hameed Khan Memorial Trust.
- The OPP-RTI mapping methodology has also been transferred to the Punjab Katchi Abadi and Urban Improvement Directorate (a government of Punjab agency in-charge of regularising and improving *katchi abadis* in the Punjab province) and the NGOs and CBOs working in collaboration with it.

6. Future Directions

The OPP-RTI now has an enormous amount of maps of *katchi abadis* and of the catchment areas of the main Karachi *nalas*. Since a year ago it has started acquiring all maps of various sectors and schemes that have been developed by federal, provincial and local governments for Karachi. It also has maps of the cities it and its partners have worked in. For the future the OPP-RTI plans to digitise all these maps (the process has begun) in two different arrangements. One, maps that are related to the OPP-RTI's work and two, maps which are unrelated to its work but can be of enormous use to CBOs, NGOs and government agencies. A very large volume of unrelated maps are available for the second arrangement and they will keep on increasing. As such, the OPP-RTI wishes to set up an autonomous "mapping Unit" to carry on this work under the second arrangement.

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File: (138) IIED-OPP Paper (Feb 2005)