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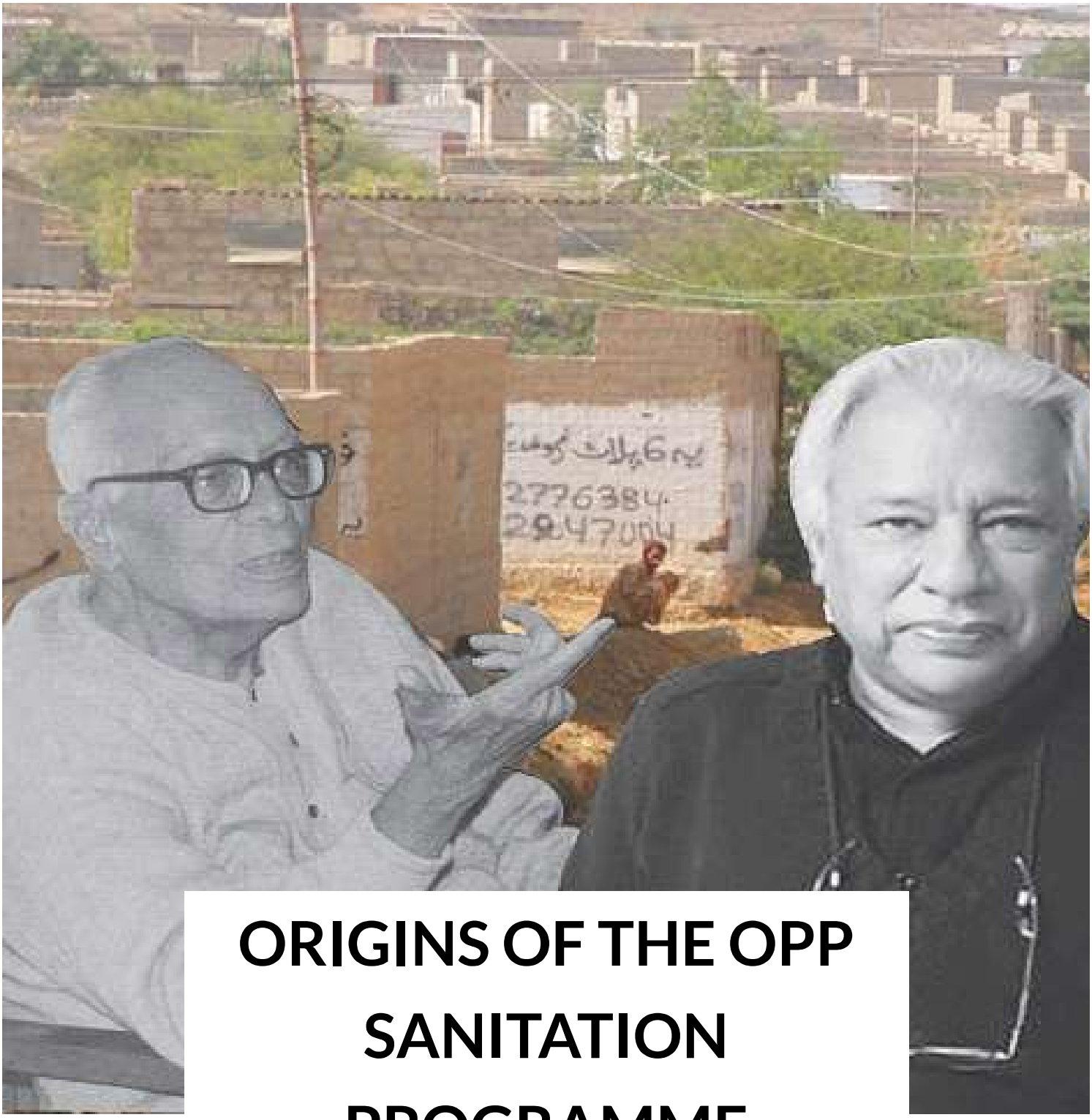

ORIGINS OF THE OPP SANITATION PROGRAMME

The low-cost sanitation programme has now become famous worldwide for how it involves poor communities in upgrading their own settlements.

Arif Hasan | Published March 31, 2024

Sometime in 1973, I received a phone call from a person who called himself the 'chor [robber] man' of the federal government's Appropriate Technology Development Cell (ATDC). He wanted to see me immediately. I told him I was busy and could only see him the next day. He said he was disappointed and hung up.

However, after 20 minutes, a rather tall man with a marked limb walked into my office and introduced himself as Ghulam Kibriya, chairperson of the ATDC. He asked me if I was Arif Hasan and, when I said yes, he said, "You are such a young man, and here I am, talking to you so politely [Main aap aap kar raha hoon]," and sat down.

He discussed housing with me for about 15 minutes, after which he told me that he wanted me to be a technical consultant to his organisation. After some discussion, I agreed. He was completely oblivious to the fact that I had other work to attend to.

He had brought a typist and a typewriter with him, and he told the typist to type a contract which ran something like this: "I, Ghulam Kibriya, chairperson of the ATDC, with the power vested in me by the President of Pakistan, hereby appoint architect Arif Hasan as a technical consultant to the ATDC, on terms and conditions that will be decided subsequently. His term in office begins today." A year later, I had something that looked like a normal contract.

Later on, I was to learn that he had no powers vested in him by the President of Pakistan, and the decision to appoint me was a personal one. A carbon copy of the letter was handed over to me. After this, I was informed that they would be sending me a ticket by the evening to visit Islamabad the next day. When I arrived in Islamabad the next day, I was received at the airport by Mr Kibriya himself, who was a grade 21 officer at that time. I was surprised.

The low-cost sanitation programme of the Orangi Pilot Project, initiated by Dr Akhtar Hameed Khan, has now become famous around the world for how it involves poor communities in upgrading their own settlements. It has also been replicated in places all over Pakistan. Arif Hasan, who was one of its prime architects, recounts how it came about and the people who were instrumental in making it happen…

Working with Ghulam Kibriya, I learned one thing: if the people can afford your product, you have a national programme; if a government subsidy is needed to make it affordable, you have a number of projects that may not be sustainable.

PAKISTAN'S BIGGEST PROBLEM

Sanitation is Pakistan's biggest problem. Cities and settlements are overflowing with sewage, creating immense environmental and health problems and polluting the sea and most freshwater bodies, which are the only disposable points for sewage.

So Ghulam Kibriya decided in 1974 that the ATDO should work on this problem. I was asked to try and understand why sanitation projects are so expensive that neither the people nor the state can afford them.

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For this, I looked at tender documents of a number of government projects and identified the expensive items, which were deep excavations and manholes related to them, jointing details and the costs of pipes, and engineering standards related to gradients so as to make the drains self-cleansing.

We could not complete this work, which was aimed at developing alternatives to the existing formal sanitation standards. There was a military coup in 1977, Gen Ziaul Haq came to power and Ghulam Kibriya and I, being good

democracy-loving individuals, resigned from the ATDC, and this work was put on the backburner.

In 1981, Ghulam Kibriya came to my office and informed me that the Orangi Pilot Project, which the renowned social scientist Akhtar Hameed Khan had initiated, was having problems with its sanitation programme, and that maybe I could be of assistance to him.

WORKING WITH OPP

I visited Akhtar Hameed Khan. It was a short meeting, in which he complained bitterly about the greed and lack of innovation in Pakistani professionals and academic institutions, which were unable to help him make sanitation technology and extension processes simpler and cheaper so that communities could finance, build, manage and maintain their own sanitation systems. He also expressed his doubt as to whether I could help him.

On Ghulam Kibriya's insistence, I revisited Orangi and studied the problems of sanitation. I wrote a small note (handwritten) and gave it to Ghulam Kibriya. (The gist of the note is given in the box.)

Akhtar Hameed Khan liked the note and came to see me. He again spoke against the engineers and architects, called them thieves and anti-poor, and said that their solutions were so expensive that the people could not possibly afford them and that the solution to the problem lay in the affordability of sanitation by the people of Orangi.

In books, papers and news reports on the OPP, there is seldom any mention of Engineer Ghulam Kibriya, although he played an important role in developing some of the extension concepts of both its sanitation and housing programmes.

The extension work was also managed by the three social organisers that Akhtar Hameed Khan had selected from the working class communities of Orangi. Ramzan Qureshi was a contractor for home-based tailoring; Hafiz Araain was a political worker and a rickshaw driver; and Nooruddin Saifee was a local plumber. Their role, under the guidance of Akhtar Hameed Khan, is also not recognised although, without them, the sanitation programme could not have taken off.

The most important problem that surfaced as a result of my further studying the Orangi situation was that most sewer lines became clogged up because of a lack of water. To solve this issue, I suggested a small septic tank with each toilet, so that only liquid would go into the system. The minimum cost of such a tank worked out to 2,400 rupees. Akhtar Hameed Khan said that this was unaffordable. I asked him what would be affordable, and he responded, “240 rupees.”

No argument could make Akhtar Hameed Khan alter this figure. So we decided that we would work backwards and design a septic tank that would cost 240 rupees. It worked out to a tank whose dimensions were one metre by one metre. With a special arrangement of a T-pipe, we hoped that it would work, and we started using it, placing it between the toilet and the sewer.

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Arif Hasan, Akhtar Hameed Khan and Parveen Rehman at Arif Hasan's office in 1984 | All photos courtesy of Arif Hasan

CONFLICTS WITH ENGINEERS

Given the publicity the project was receiving, all developments of the OPP were closely monitored by the engineering profession in the Karachi Water and Sewerage Board (KWSB), the Karachi Metropolitan Corporation (KMC), and by elected local councillors.

My proposals came under attack, for technical and social reasons. In 1982, this criticism received considerable support from the United Nations Centre for Human Settlements (UNCHS), who were appointed technical advisers to the OPP project. There were disagreements around **six main issues:**

1. The UNCHS wanted an air-conditioned office for the project in a posh locality in the city. Akhtar Hameed Khan wanted it in Orangi, where its residents could come and go freely.

2. The UNCHS wanted a pilot area for the project. Akhtar Hameed Khan felt that, as a result, only households from the pilot area would be able to participate.

3. The engineers objected to the OPP discharging sewage into the natural drainage system, as most of the sewage flowed from high-income areas into the natural drainage system. OPP argued that Orangi-generated sewage was not even one per cent of the total sewage that made its way to the sea, and would be taken care of when a larger sewage plan would be made for the city.

4. Engineers also felt that the standards that were developed by me as a rule of thumb were not suitable to run a long-lasting sewage system. Special criticism was made for the one-chamber septic tank, which in Orangi acquired the name “haudi”.

5. Akhtar Hameed Khan wanted OPP social organisers to be from Orangi, while the UNCHS called them “muscle men” and wanted university graduates in their place.

6. To work in all of Orangi, we needed a map of the township, and it did not exist. The UNCHS suggested hiring a survey company to do the job. I suggested that students of architecture and engineering, under the supervision of Parveen Rehman (who had just joined the OPP), should be made to do this since it would take the message of

the project back to the universities. Akhtar Hameed Khan agreed to this suggestion. The plan was made, and the links with the universities were consolidated as a result.

In 1984, the guru of sanitation, John Pickford from the University of Loughborough, visited Orangi and spent some time looking at the sanitation system. After John Pickferd left, Akhtar Hameed Khan called me.

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With a rather smug expression on his face, he told me that John Pickford had said that I was a quack and that the system I had planned would stop functioning within a couple of years, and that it would be a colossal waste of people's money.

I told Akhtar Hameed Khan that yes, I was a quack, for I had no qualifications in sanitation and engineering. I also told him that I could get him the best possible sanitation engineer with the highest possible qualifications. He laughed and said, yes, but his fee will probably be higher than the cost of the sanitation project, and the cost of development will be such that not even a government project could afford it twice.

A before (left) and after (right) comparison of a lane that was fixed due to the initiative taken by the OPP. Sanitation is Pakistan's biggest problem — cities and settlements are overflowing with sewage, creating immense environmental and health problems

"No, Arif Sahib, you continue with what you are doing. We will sink or swim together."

Two years later, John Pickford came back and was surprised to see that the system still worked without any problems. He wanted to see my calculations, on the basis of which I had designed the system. I told him that there were no calculations. He asked me how I had managed without them.

He was surprised when I told him that it was through the modification of conventional rules of thumb based on observation, experimentation and intuition. The following year, he sent his students to work on the calculations that had emerged from the experiment.

Since then, till 2016 (when I resigned from the OPP), Orangi residents had built sanitation in 7,280 lanes on the same principles and invested Rs168 million in the process. Meanwhile, the OPP sanitation project had become a part of the Orangi Pilot Project Research and Training Institute , and people from all over Pakistan, including elected councillors, district engineers and social activists, came to receive training at the training institute.

As a result, in 651 urban locations outside of Orangi sanitation systems in 6,459 lanes were developed, serving 77,859 households. In these, people had invested Rs 206 million in their lane sewers and the government had invested Rs 700 million.

In addition, sanitary facilities were built in 14,011 households, spread throughout 1821 lanes in various villages. The total cost of this construction was Rs 378 million, more than half of which was paid for by the residents who financed, built and managed the construction themselves. The rest, consisting of disposal points and trunk sewers, was built by local government agencies based on the OPP's advice.

The manner in which the OPP operated had a lot to do with the personal culture of Akhtar Hameed Khan, which was a reflection of the culture of the freedom movement of undivided India. Akhtar Hameed Khan was always dressed in white or beige khaddar (hand-woven cotton cloth). It was rumoured that he had only three khaddar suits, and he used to wash and iron them himself.

He once told me that, while washing his clothes, he thought about what he had to do for the coming days. He roamed around in a ramshackle jeep driven by himself, and I and Parveen were scared travelling with him, since he never changed gears at the right time. He disliked air conditioning, but tolerated it for computers and their accessories.

A before (left) and after (right) comparison of a lane that was fixed due to the initiative taken by the OPP. Sanitation is Pakistan's biggest problem — cities and settlements are overflowing with sewage, creating immense environmental and health problems

A number of students, activists, NGO workers and community organisations came to visit him. They just walked in. Often, when he was carrying on a conversation with one group, he would invite visitors or groups waiting for him to join the discussion. "Like this, I can give them knowledge and also understand their problems." The OPP reports, accounts and research papers were

available to whoever visited; there was nothing secret about the OPP organisations.

He had three very different manners of communication. One, with people from the community; two, with students and their teachers; and three, with state officials and international agencies. With community organisations, the conversations were interwoven with folk stories, local wisdom and aphorisms, such as "*sher aaya, sher aaya*" [the lion is coming, the lion is coming] or '*Totay maina ki kahani*' [the story of the mynah and the parrot] — in which the parrot built his house of salt that was washed away during the rains, while the mynah bird built hers of wax, which survived. Many stories were taken from Buddhist texts and from Persian poet Saadi's Gulistan.

His conservatism was expressed in very many ways. For example, once an OPP delegation had gone to visit the Pakistan FisherFolk Forum. It was late in the evening, and there was much dancing and singing. When the news reached him, he was horrified that the OPP senior staff had participated in it. Yet, he was aware that the world was changing and the new generation of Orangi women were the ones who would change Orangi society.

He regularly read the London-based magazine *The Economist* and *The Independent* and valued their opinions. He had problems with the World Bank and other loan-providing agencies, such as the Asian Development Bank (ADB), but insisted that without an understanding of their method of operation, one could

not understand the problems of development in Pakistan.

Ghulam Kibriya was much loved by the social organisers in Orangi but was considered an eccentric. We built a school with the ATDO technology in Gujranwala. After it was complete, Kibriya sahib donated the block-making machine and the steel-shuttering for the beams and the slabs to the contractor. When the ATDO asked him why he was doing this, he said, “The contractor will use this technology for new buildings, and that is the best form of extension that you can imagine.” He was right.

Similarly, when a block-making machine that had been given to a contractor was knocked out, he refused to replace it and told the contractor that he should repair it himself. When I pointed out that this was unfair, he said, “He will learn how the machines function, and it is possible that he will be able not only to repair but also to make machines in the future.”

Throughout Pakistan, he travelled with a small collapsible table and two collapsible chairs, along with a secretary and typewriter, and issued orders on behalf of the president of Pakistan.

I am happy to have been associated with these two remarkable men, who have influenced the thinking of three generations and continue to do so.

The writer is an architect and urban planner and was OPP’s Chief Technical Adviser from 1981 to 2016

The First Arif Hasan- Akhtar Hameed Khan Communication

I have spent two days in Orangi and looked at the Sanitation Project. My comments are as under:

1. The process adopted by Dr Khan is the antithesis of conventional planning, but it makes sense if viewed from the "self-help" aspect. To accommodate his "social model", technical and procedural changes are required; otherwise, the social model will be rejected by the communities.

2. What needs to be done technically and why is given below:

• The sewage systems built by the communities visited have problems because of a lack of water. This situation is likely to last. The alternative is soak-pits which people do not wish to invest in. To solve this problem, a one-chamber inexpensive "septic tank" is required between the toilet and sewer line. This will stop solids from entering the system and, as such, clogging.

• The design of manholes and pipe-jointing need to be revised and made cheaper. Steel shuttering can be developed for manholes and their sizes rationalised for different depths. If they are made round, their concrete section can be reduced. Steel shuttering will also reduce plaster costs, and they can be made by unskilled labour, thus reducing costs further.

• Simple rules of thumb need to be developed for determining gradients, pipe-sizing, manhole sizes and

curing procedures for concrete. All these rules should take into consideration that Orangi Town already has gradients and that the lanes have no cars/trucks in them.

• All construction work requires tools. The OPP does not provide what is required, such as a steel platform for mixing concrete, dhurmats for compacting backfill, or chalk and rope for establishing straight excavation lines. Concrete aggregates are also poor and have earth mixed in them. Without tools, communities cannot build.

• The OPP technical unit should have a qualified person in it who is capable of understanding larger social issues, so that technology can be made compatible with them. This should be a younger person who can be trained by Dr Khan and/or by OPP's technical adviser, who I feel is required. If necessary, he should be hired from the market. Without expertise that can be innovative, the project will fail.

• An overall survey of Orangi should be carried out so that locations of intermediate infrastructure can be identified. Without this, distant locations cannot be linked together or to the nullas and an integrated sewage cannot be built. If students (from NED or Dawood College) carry out this survey, they will interact with the Orangi residents and spread awareness regarding the sanitation system. Also, they will take back the knowledge they gain in the process to their departments. Hiring companies to do the survey will be a rather cold impersonal process for a community project.

Arif Hasan

17 November, 1981

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