The goal of reducing runoff by 50% by implementing a comprehensive green water infrastructure plan to for the city of Philadelphia is valient but immense. While the City should expect to spend considerable time, energy, and financial resources towards this end, it should by no means see itself as the only party responsible or capable of taking on the project. Rather, the City could view this challenge as an opportunity to create a team of many strong players that can diffuse the work load and enrich the outcomes.

Rather than being the sole proprietor of a new green infrastructure plan, the city should consider working in tandem with:

universities
non-profits
private entities
community groups
citizens.

# Be a team.

The Orangi Pilot Project (OPP) began in 1980 in the suburban, low-income settlement of Orangi outside of Karachi, Pakistan. Since then, it has become one of the best known community-wide sanitation improvement projects. In addition to the Low-Cost Sanitation Program, the OPP also created the Low-Cost House Building Program and Health and Family Planning Planning Program, thus creating a more holistic set of offerings to tackle the immense challenges present. The NGO was led by Akhtar Hameed Khan, a native of Agra, India.

The OPP created a space for interaction between government agencies, interest groups (formal and informal) and communities. Needs were identified, and solutions were created, nurtured and institutionalized over a period of time.

The program now covers all of Orangi and has been replicated in 419 settlements in Karachi and 23 cities in Pakistan.
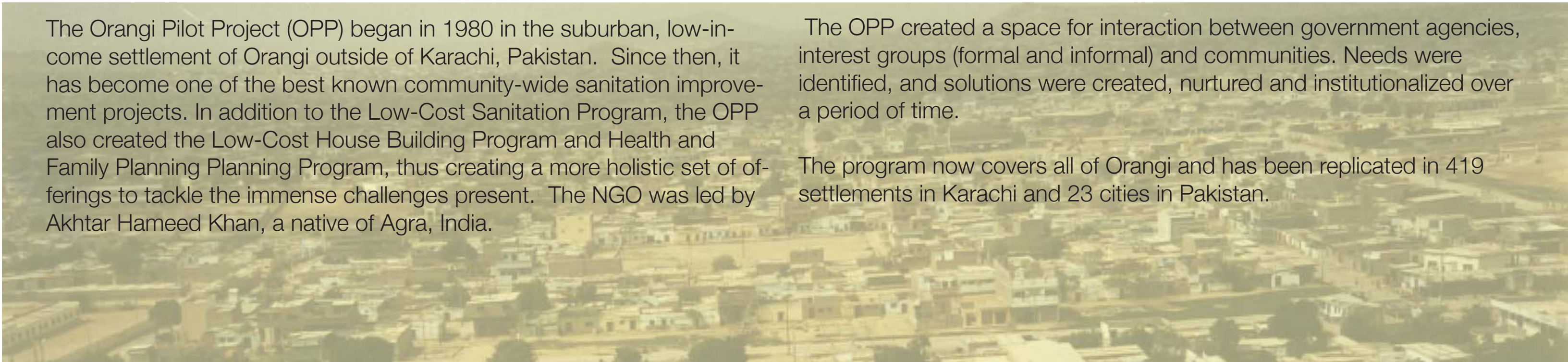
Rather than considering this in the framework of a traditional city plan (wherein a plan is finalized by the City and implemented by the City), consider this as long-term participatory action research that engages all team members in both research and extension. Research is done 'in an evolutionary and exploratory manner and steers the project accordingly.' (#) Thus, while the goal of reducing runoff by 50% can remain in place, the means of getting there are purposely left unknown at the outset.

In this model of action research, there is very little hierarchy to the organizational structure. The strengths and reaches of each team member are leveraged at various points of the project.

While the coordinating body (either a group or an individual) could be housed within the City government (seemingly the Water Department), this body will not be charged with making decisions alone. In action research, decisions are made together by those all along the chain, from grassroots activist or private landholder to the City's coordinating body.

# Be a research project.

*action research* - A reflective process of progressive problem solving led by individuals working with others in teams or as part of a "community of practice" to improve the way they address issues and solve problems.

*research and extenstion* - A method of outreach and capacity building, typical in rural areas and farming communties, in which existing assets and current areas of improvement are identified, technical assistance and guidance are provided, and farmers provide the labor for improvement.

Khan previously worked for nearly 30 years in a large rural settlement in Comilla, Pakistan. He was familiar with the practice of research and extention, but was unfamiliar with Karachi. In his words, 'I acknowledged my total ignorance. I had never lived in Karachi. I was a newcomer. So first I educated myself...gradually, I learned what sort of people were living in Orangi, what their problems were, what they thought of these problems, what was being done for them, and what they were doing for themselves.' (42) Action research provided a viable model for this newcomer, as well as those already familiar with Orangi, to critically assess conditions.

In this context, research here consists of:
(a) research the community, communities within, and residents of Philadelphia.

    What are citizens concerned about?

    What are their capabilities and priorities?

        Who builds what? How do people organize? What communities exist already? Who are the community leaders?

(b) In response to these findings, concurrent research projects should be driven by the question,

    How can the City assist and advise citizens to attain viable solutions?

Research should address the following four barriers:

# psychological
# economical
# technical
# sociological

# research

In the OPP, wastewater problems were ruining the homes people had built themselves.  Owners were painfully aware of this and desired to save and improve their property.  Knowing that it could be done more immediately if they themselves did it was a driving force behing their action. Additionally, residents knew that waste in the lanes was detrimental to their health.  They were especially concerned for the health of their children.  After the solution was made more economical, families realized that less than one month's wages could immediately resolve their. concerns

The OPP analyzed existing systems: thallas (blockmaking yards) were producing substandard, cracked bricks; masons built homes (as opposed to architects, engineers, contractors) but did not know proper construction or ventilation techniques
r

Create training programs to enable citizens, private companies, or non-profits to become technical advisors that can provide technical assistance. In particular, a 'green infrastructure entrepreneurs advising program' would enable new entry into new markets.

Encourage the participation of existing companies in the new green infrastructure commodity economy (i.e. provide current supply stores or construction center access to new infrastructure components)

Provide graphically legible visual aids and posters, audio aids in both printed and online formats.

# extension

OPP found willing thallewalas to participate in the development of better building materials. OPP then provided the thallas with better block-making machinery, which was deemed the best route towards improvement.

OPP trained masons, lent them tools, and provided them with plans and buildings standards.  They provided ongoing technical guidance and construction supervision.  They wrote manuals, created visual and audio aids, and build demonstration models
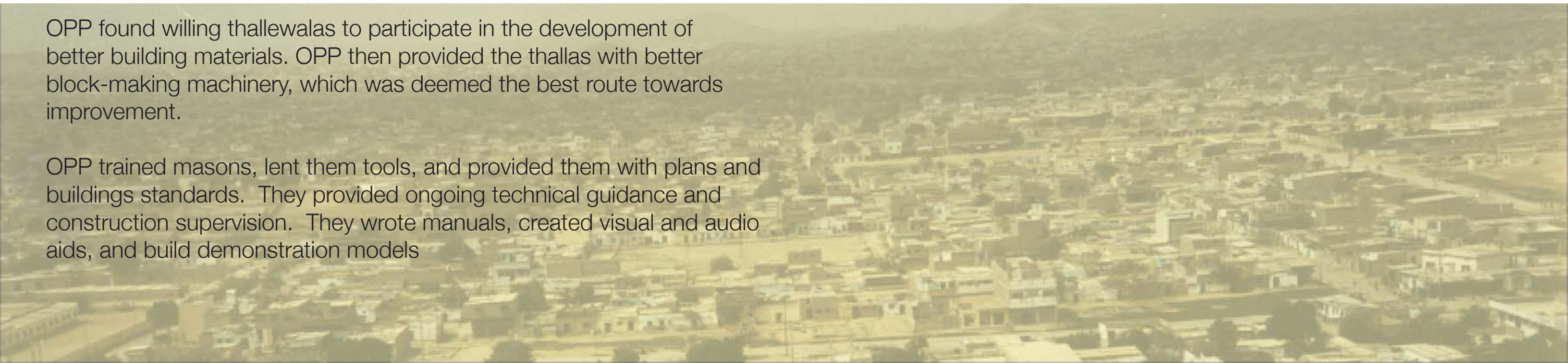
Accessibility to information and scalar familiarity are both essential for success.  Uniformed citizens will be in no better a position ot act for themselves.  Additionally, mobilization can be encouraged if information and organization comes from someone familiar or is specific to a particular street or neighborhood.

Viable water management solutions may vary by neighborhood or even by street. Thus, the size and scale of study, information-sharing, and implementation must be considered.  This will determine the approach and scale of response.

Locate existing local activists and leaders to pixilate the program into manageable, comfortable pieces and deliver information. Take advantage of the power of familiar faces.

# organizational structure - pixelation

In the OPP's Health and Family Planning Program, workers found that 'the process of changing attitudes and opinions...is access...To be within real reach of segregated women a 'welfare center' or family planning clinic should cover no more than twenty or thirty lanes...' (81)  Instead of creating many fixed centers, they created:
(a) mobile training teams,
(b) a selected female contact / activist for every 10 - 20 lanes, (selected every 6 months)
(c) regular meetings at the home of the activist (1/week), and
(d) a neighborhood group managed by each activist.

The Low-Cost Sanitation program was broken down by lane, a unit size determined by the nature of the infrastructure (every private resident paid for and installed water infrastructure in the lanes as well). Organizers were found on each lane.

As this model is neither entirely top-down nor grassroots, multiple levels of coordinated leadership are necessary.  There is no need to reinvent the wheel; leaders already exist, and alliances and accountability are already in place.  Local leaders can be conduits to individuals and groups, and thus will play a vital role in achieving community buy-in and participation.

Leadership must be sought at the following levels:

- overall coordinator of the initiative
- leaders of research and extension
- leaders within existing community organizations, groups, affiliates
- neighborhood or street leaders

# levels of leadership

The OPP relied heavily on existing leaders in the community.  Residents were often times more amenable to working with someone they already knew and admired as opposed to a new face.

While there are multiple viable leadership styles, not just any leader is equipped with the right philosophy and skill set to coordinate and support such an initiative.

The role of coordinator of such an initiative placed within a city department should consider his or her role one of gentle steering rather than heavy-handed directing. A coordinator of action research could potentially be invisible, as ideally the ideas and work are being created and implemented by citizens.

The ultimate objective by placing someone with a disposition amenable to this type of role is that it moves power and capacity into the hands of many. Thus, a water infrastructure project can become an education project, a social gathering, a new market with new jobs, a design competition.

# type of leadership

Akhtar Hameed Khan was bold in his vision but viewed his own role modestly. He saw the true drivers of the project the residents of Orangi, who became the technical assistants, researchers, organizers, problem-solvers, maintainers, and constructors of the OPP.
Besides Khan's previous knowledge and experience, his leadership style heavily influenced the direction and success of the OPP. He was a philosopher, sociologist, educator, system designer, and, in his later years, a social critic.
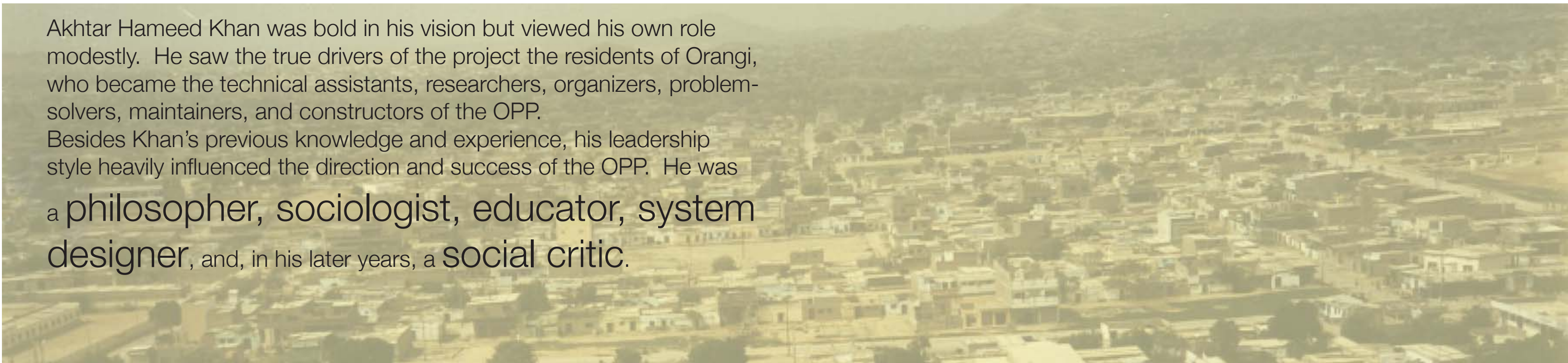
Study the existing approaches to working, organizing, educating, and managing water of the Philadelphia community.

There may not be identifiable quantitative goals from the outset.

No one makes decisions alone.

# principles

Communities, organizers, and activists already exist - utilize them.

Improve assets, fill in the gaps, and introduce new ideas.

Only ideas that stick move forward.

The goal might be a moving target.

Pixelate the project until it becomes familiar to citizens.

Citizens are capable of making change.

Citzens are willing to mobilize if they see the value in doing so.

The coordinating leader should have a bold vision and invisibly steer the project.