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Architecture of Rapid Change and Scarce Resources
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NEGOTIATING SHARED SPACES IN INFORMAL PERI-URBAN SETTLEMENTS IN NORTH INDIA

COLLABORATIVE ARCHITECTURAL MAKING AS A CATALYST FOR CIVIC EMPOWERMENT AND SOCIAL CHANGE

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Thesis submitted in partial fulfilment of the
requirements for the degree of Doctor of Philosophy
of London Metropolitan University in February 2014

I ABSTRACT

This research investigates the nature and creation of common places in informal peri-urban settlements in North India through negotiation and sharing. It aims to develop a profound understanding of the effect of the post-hoc introduction of amenity buildings and city infrastructure in the creation of common places. The approach takes collaborative architectural making as a catalyst for civic empowerment and social change, discussed primarily through first-hand experience of practical small-scale live interventions in two urban conditions of scarce resources. These interventions serve as case studies.

The research hypothesises that the social structure and order of shared spaces is continually transforming, adjusting and being re-made to accommodate the changing urban conditions within low-income settlements. The informal negotiation of these common spaces creates a shared collective identity. This study suggests that collaborative place-making engenders a renewed understanding or interpretation (by the urban migrant/citizen) of the nature of common places, in which the origins or memory of the traditional rural village are transformed into a new situation of the urban village within the host city.

Central to the research was the development of spatial practices through small-scale interventions in two peri-urban settlements, which acted as vehicles for understanding the civic and institutional order of town for all constituents (including myself as PhD by Practice).

The contribution to knowledge proposed by this research is two-fold:

(a) the first part (chapter 2) addresses spatial practices and develops a methodology for collaborative making by which this is both understood and created.

(b) the second part (chapter 3) uses these methods as a basis (research tool) to understand the nature of civic order in informal peri-urban settlements in North India, and the way the institutional/civic order of these settlements is made. In this way, the thesis provides insights which broaden and deepen our understanding of shared spatiality beyond the concept of 'public space'.

The two case studies of on-going live projects provide the empirical basis for this study:

(1) The Kachhpura Settlement Upgrading Project (KSUP) started in 2006 focuses on sanitation in Agra, beginning with the introduction of household toilets leading to a natural Decentralised Waste Water Treatment System (DEWATS) turning foul drain effluent into a community resource for clean water.

(2) The Quarry Classrooms Project initiated in 2008 deals with amenity buildings in quarry worker settlements in Navi Mumbai. Both projects were carried out in collaboration with Indian Non-Governmental Organisations (NGOs), local communities, and architectural researchers and students from London Metropolitan University, involving a strong hands-on participatory approach from the bottom up.

Connections are established between improved access for basic services, amenities and facilities, and the opportunities for creating common places, leading to suggestions for improving, appropriating and cultivating shared territories in today's informal peri-urban settlements, both culturally and physically. Insights are gained into the role of architectural professionals and students as designers, makers and curators in partnering with the local NGO and settlement families. The study concludes with suggestions on how the notion of cooperative placemaking might be applied in other situations of rapid change and scarce resources where architect, NGO and local population might collaborate to provide shared infrastructure and community facilities, creating opportunities for improving livelihoods and the quality of life within informal peri-urban settlements in North India.

Through the approach of collaborative architectural making as a catalyst for civic empowerment and social change, this study makes explicit a process that was implicit before, a process which enables the creation of social and political institutions for marginalised people to participate as citizens within the host city.

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IV ACRONYMS

ANN / AMC	Agra *Nagar Nigam* / Agra Municipal Corporation
ARCSR	Architecture of Rapid Change and Scarce Resources
ARPHEN	Association of Rural People for Health and Educational Needs
ASD / FASD	Architecture and Spatial Design / Faculty of Architecture and Spatial Design (now known as the Sir John Cass Faculty of Art, Architecture and Design)
ASI	Archaeological Survey of India
BOD	Biochemical Oxygen Demand
CAP	Cross Cutting Agra Program
CCF	Community Credit Fund
CIDCO	City and Industrial Development Corporation of Maharashtra
CTC	Community Toilet Complex
CURE	Centre for Urban and Regional Excellence
DEWATS	De-centralised Wastewater Treatment System
DUDA	District Urban Development Authority
GIS	Geographic Information System
GOI	Government of India
JnNURM	Jawajarlal Nehru National Urban Renewal Mission

KSUP	Kachhpura Settlement Upgrading Project
LMU	London Metropolitan University
MHW	Mughal Heritage Walk
MIDC	Maharashtra Industrial Development Corporation
MOU	Memorandum of Understanding
NGO	Non-Governmental Organisation
NMMC	Navi Mumbai Municipal Corporation
NUWA	National Urban Water Award
O & M	Operation and Maintenance/Management
ORW	Outreach Worker
PAP	Project Affected Person
PEAS	Provide, Enable, Adapt, Sustain [Hamdi 2010]
PAR	Participatory Action Research
PPP	Public-Private Partnership
PRA	Participatory Rural Appraisal
RAY	*Rajiv Awas Yojana*
RRA	Rapid Rural Appraisal
SHG	Self-Help Group
SSK	*Soochna Sansadhan Kendra* (Information Resource Centre)
TSG	Toilet Saving Group
UP	Uttar Pradesh
USAID	United States Agency for International Development
WatSan	Water and Sanitation
WT	The Water Trust

V PREFACE

From October 2010 to September 2013, I undertook this research study at the Projects Office (now Cass Projects) at the Faculty of Architecture and Spatial Design (now the Sir John Cass Faculty of Art, Architecture and Design), London Metropolitan University. Within the office, I conducted my research in the field of the Architecture of Rapid Change and Scarce Resources (ARCSR) - an emergent research area within the teaching and practice of architecture. It examines and extends knowledge of the physical and cultural influences on the process of transforming the built environment. It focuses on situations where resources are scarce and where both culture and technology are in a state of rapid change. Within this environment, I set up and took part in a number of collaborative projects mostly located in India, that led to the development of the theoretical perspectives and concepts presented in this thesis.

From 2006-2008, whilst completing a Professional Diploma in Architecture (RIBA Part II) course, studied within the field of the Architecture of Rapid Change and Scarce Resources, I participated in a live sanitation upgrading project (KSUP) in Kachhpura, Agra, India which derived from studio workshop collaborations with NGO, CURE (Centre for Urban and Regional Excellence). From 2008-2010, I was employed as a full-time architectural researcher for ARCSR (supported by the Water Trust) at the Department of Architecture and Spatial Design at London Metropolitan University. Whilst based in the ASD Projects Office, I have been involved in researching, developing and carrying out small live projects in informal peri-urban settle-

ments within India. Building on the initial household toilet project started as part of KSUP in Agra, a larger settlement wide sanitation project in Agra has developed including the construction of a DEWATS that was completed in April 2011. In 2008, we set up and carried out a project in collaboration with NGO, ARPHEN (Association for Rural People's Health and Educational Needs) to construct community classrooms in stone quarry worker settlements in Navi Mumbai, focusing primarily on community participation whilst also providing hands-on experience for architecture students.

My intention is to use the experience and knowledge gained from these live projects as a basis for conducting further research into collaborative architectural making as a catalyst for community self-empowerment and social change in informal peri-urban settlements in India.

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Lastly I am grateful to London Metropolitan University, the Sir John Cass Faculty of Art, Architecture and Design (formerly the Faculty of Architecture and Spatial Design) - our Dean, Professor Robert Mull, and the support of the Cass Projects (formerly ASD Projects) headed by Anne Markey.

Declaration of Authorship

The two case studies presented in this thesis were collaborative projects, and I explain my involvement with them in my discussion of the methods of practice (chapter 2). The analysis and interpretation of these case studies for the purposes of this thesis is the result of my own work only.

I have not submitted any part of the work referred to in this thesis in support of an application for another degree or qualification of this or any other university or other institute of learning. References to work associated with the two case studies carried out whilst I was a student in the Professional Diploma in Architecture (RIBA Part II) course have been referenced. Material and discussions of case studies and concepts included in this thesis have previously been included in the following publications and public events:

Journal articles

Tang, B. (May 2012) 'Quarry Schools: Building Community Classrooms in Stone Quarry Worker Settlements', originally published in *Children, Youth and Environments Journal*, 22(1): 280-293.

Papers in conference proceedings

Tang, B. (Due 2014) 'Negotiating Shared Spaces in Informal Peri-Urban Settlements in India: The Role of Amenity Buildings and the Effect of the Post-Hoc Introduction of Infrastructure in the Creation of Common Places' in *Planum Journal*, following 'WITHIN THE LIMITS OF SCARCITY: Rethinking Space, City and Practices' conference, University of Westminster, February 2013.

Conference Presentations

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Exhibitions

Learning From Delhi, The Gallery, London Metropolitan University, October 2011.

Provoking Architecture: Live Projects as Research, The Warehouse, London Metropolitan University, February 2012.

Statement of length

This thesis, including footnotes but excluding captions, project portfolio and bibliography, contains approximately 40,000 words and is therefore within the word limit for a PhD by Practice, set by the Research Committee of London Metropolitan University.

Declaration of Ethics

I confirm that research ethics approval from London Metropolitan University was obtained for this research study in the first year of study (2010-11). Signed research ethics consent forms were obtained from key subjects mentioned in the thesis, during field trips from 2010-2013. All persons giving consent requested to be named in full (first name and surname) and did not wish to remain anonymous. In cases where consent forms were not obtained from persons mentioned, only first names have been used or not at all.

Additional visual material: Project Portfolio

This thesis is presented along with a Project Portfolio comprising of the following:

(1) Project Diaries - An extended documentation and review of the two case study projects is recorded and presented through two case study Project Diaries bound separately as two individual documents.

(2) Portfolio Drawings - A collection of 14 large format (A1) project drawings.

CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

The majority of cities in India have grown and developed organically from indigenous origins. Many of these cities have been under colonial rule, and today continue to exhibit characteristics of western influence. Secular 'public-ness' and 'civic-ness' (Hosagrahar 2005) instilled by the British colonials through the rebuilding of cities such as (New) Delhi challenged the traditional predominantly religious Mughal spaces that had existed before in North India. Today, the definition of 'public spaces' in Indian cities is being further challenged by informal urban settlements. Unplanned urban development has led to the creation of new spaces typified by their informal occupation and changing use through the day, month and season. Conditions of these topographies are constantly being redefined with the changing urban landscape and demands of society. The nature of shared spaces in informal settlements can be revealed and understood by first referring to them using more appropriate words that more accurately describe their position within the urban order. Places that are shared or common, invoke a sense of place and belonging more than that of 'public'.

Informal peri-urban settlements exist at the periphery of major cities and towns throughout India. As rapid urbanisation continues globally and cities expand, some rural settlements are swallowed up and become islands – 'urban villages' - within cities. These emerging hybrid landscapes (Davis 2006) often struggle to develop under conditions of scarcity caused by lack of physical and social integration with, and connection to the city. Prob-

lems experienced by communities living in these urban fringe settlements include issues relating to clean water and sanitation infrastructure, housing and provision of amenities and services. Whilst government institutions fail to deal with the scale of the problems that need to be addressed, foreign (outside) aid and intervention by NGOs and charitable institutions attempt to alleviate these conditions of scarcity through amenity building and upgrading of settlements. Whilst rural to urban migration is increasing as villagers make their claim to the city, there is little sense of civic space (in the Western sense) beyond the centre of the city.

In his book *Arrival cities* (2010), Saunders discusses the choices people make to migrate from villages to cities, creating opportunities for themselves to better their lives. Saunders believes that the durable clusters created by semi-permanent village migrants are not a reproduction of agrarian living, but a new understanding of home. He supports the positive impacts of mass migration on cities and people, emphasising that they are not victims, but citizens aspiring towards a middle class[1] world. Davis (2006) on the other hand takes a rather pessimistic view of peri-urbanisation and slum growth, and their detrimental effects on the city. Neuwirth (2005) is amongst those who advocate upgrading of informal settlements, as do global partnership organisations such as UNHabitat and Cities Alliance. Cobbett (2013) of Cities Alliance claims: *slums disappear not through being removed, but by being transformed. Over time, the shack becomes a house, the slum becomes a suburb. This is how citizenship and cities are built.*

This study seeks to understand how shared territories are created in informal peri-urban settlements through negotiated interventions involving multiple participants. Two case study projects involving small-scale built (live) projects in settlements in Navi Mumbai and Agra are described and their effect on collective placemaking is explored. Themes emerging from the methodological process of learning through making are discussed, and concluding questions raised at the end of the thesis, which suggest a new understanding of town, in relation to 'public' brought about by a shift in commitment, awareness and institutions.

The two case studies illustrated in this thesis discuss on-going small-scale interventions in marginal settlements in two cities in India – Kachhpura, a rural-to-urban village in Agra, and temporary migrant quarry worker settlements in Navi Mumbai. Both are located at the periphery of rapidly developing cities - Agra, a historical Mughal city that thrives economically on the great demand for tourism; and Navi Mumbai, built as a new planned town in the 70s (Correa 1989) to ease congestion in Mumbai.

1 'Middle-class' is an ambiguous term in the Indian context used in recent literature to describe the burgeoning class driving the bourgeoisification of Indian cities (Ghertner in Rademacher, & Sivaramakrishnan 2013 p.272).

1.2 RESEARCH PROBLEM AND QUESTIONS

1.2.1 'Public Space'

A public space refers to an area or place that is open and accessible to all peoples, regardless of gender, race, ethnicity, age or socio-economic level. These are public gathering spaces such as plazas, squares and parks. Connecting spaces, such as sidewalks and streets, are also public spaces.
UNHabitat 2011

The problem of understanding the nature of 'public spaces' addresses a number of social, economic and political issues that affect the highly contested areas of the shared urban environment. In India, one of the most significant of these issues is the dichotomy that exists between the concept of Western secular public space and that of traditional Indian sacred vernacular space.

In order to highlight this dichotomy it is useful to begin by questioning how the concept of 'public space' within the context of the formal Indian city differs from that within informal urban settlements. How does the nature of the order of shared spaces differ at the city and settlement scales and in these different contexts? What are the differences in the way formal and informal public and common spaces are used? This research investigates the effect of upgrading schemes on the shared environment in the public realm by governmental and non-governmental organisations (NGO) in two peri-urban settlements. Within the ambitious plans for the upgrading and rehabilitation of low-income urban settlements throughout the country, government policies and NGO interventions tend to place low priority on the shared environment. But spaces outside of the home, at the street and neighbourhood scales of the settlement, are vital to the well being of the community. The street (commonly known as a *gali* - chapter 3.2.1) embodies the collective life of the community, where individual imaginations and aspirations are shared on common ground. This emphasises the need for a better understanding of the public realm at different scales beyond that of the city, to those required for an informal settlement at the edge of a city.

Public spaces in cities such as Delhi are places for trade, manufacture, socialising and even to live. In informal settlements, these places retain similar functions and can be anything from formal courtyard squares (*chowks* - see chapter 2.6) to water points – hand pumps, taps or wells. The street provides a multipurpose space for daily ritual from dawn to dusk and at night, whilst spontaneous shared spaces are created by temporary transformation of open areas and, on occasion, of the urban fabric as a whole.

Recent discussions on what constitutes a public space have attempted to redefine the meaning of the public realm in the context of modern cities and contemporary life. In a recent article, Echanove and Srivastava (2011) wrote:

Public spaces are sacrosanct in urban planning rhetoric and embody a range of virtues—from the community to the commons, from equality to inclusive citizenship... Shopping malls, plazas, sidewalks, parks, museums, pedestrian pathways, flea markets, bazaars, and even transport systems like the metro in Delhi—are all contenders for the label of "public space." As cities aspire to "world-class" status—an idea which carries its own set of notions of what public space should be all about—grand urban designs begin to dominate the imagination of planners and developers and reconfigure our cities.

Urban Planner Mathur (2011) highlights the ambiguity of the term 'public':

Land in a city is divided up into private and public land. But not all public land extends itself into useful public space. We understand that public spaces are meant for public use. However, as planners and architects, we often forget to define who this "public" is... Yet public space that is designed for "anyone" or "everyone" easily converts itself into public space for "no one"...

Planning departments and policies are vague and unclear regarding the issue of 'public spaces' in the city and even more so in low-income (peri-urban) settlements. The idea of common spaces defined and developed by the needs of communities themselves is an agenda that has been adopted by Mumbai based NGO, Society for the Promotion of Area Resource Centres (SPARC India 2011):

An Area Resource Centre is a space defined by the community. It may or may not begin with a physical space but it begins to be created out of the psychological space that the community creates for itself. In doing so it redefines its internal arrangements and they learn a new way of talking to the outside world. It begins by the community deciding that they need to commit themselves to working together on the issues that are important to them. These usually include issues concerning shelter and infrastructure.

However, these policies tend to encourage the designation of areas for specific activities associated with public use. This often leads to failure – an example of this is walled parks and playgrounds provided by the local authority, at both city and settlement scale. These spaces often become open defecation grounds for the residents, who lack basic services such as toilets. Issues of land ownership arise where availability of government or community owned open spaces is scarce. In Katra Wazir Khan, a low-income settlement in Agra, local youths supported by a local NGO[2] cleared

2 The NGO CURE (Centre for Urban and Regional Excellence) is discussed in Project Diary 1.4.1 Kachhpura Settlement Upgrading Project.

an overgrown and rubbish strewn patch of land within their community so they would have a place to play cricket. However, as soon as the land was cleaned up, it was fenced off and reclaimed by the private owner, preventing the youths from accessing the site (Rhodes & Tang eds. 2007 p.35).

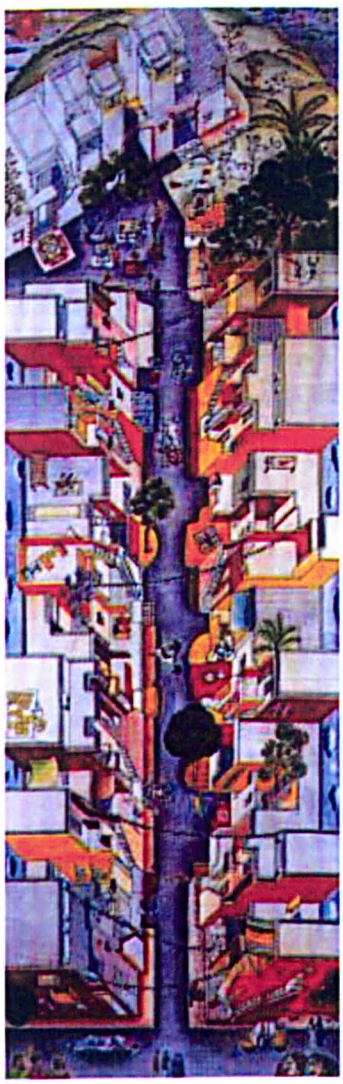


Fig. 1.1. Drawing of Doshi's (VSF) Aranya Community Housing Project, Indore, 1990.

Some low-income housing schemes in the 80s sought to address the lack of open and common spaces that are essential for facilitating community and social life, particularly in new settlement towns usually located at the urban fringe. Two popular housing schemes - the Aranya Community Housing Project in Indore (1983 – 1989) by the Vastu-Shilpa Foundation or VSF (headed by Balkrishna Doshi) and Charles Correa's Belapur Housing (Artists' Colony) in Navi Mumbai (1983-1986) - have been successful in integrating domestic shared spaces into the design and planning of the projects. With the Aranya Community Housing Project, VSF designed the master plan for the settlement, creating a hierarchy of shared open spaces, whilst residents were left to build their own houses incrementally. This allowed residents greater flexibility in creating their own neighbourhoods and civic life within the masterplan provided:

House extensions not only help to expand a small house, but in the process, they also enhance the quality of public spaces. Such an important, but often neglected, aspect of habitat planning was given due recognition in the Aranya project... Changes in the conventional building and zoning regulations envisaged the creation of a transition zone of 0.5 m width between the street and the house, where people would be allowed to build house extensions. The permissible house extensions were stoops, platforms, porches, balconies and open stairs, which would create interesting street character.
The Vastu Shilpa Foundation 1990 p.66

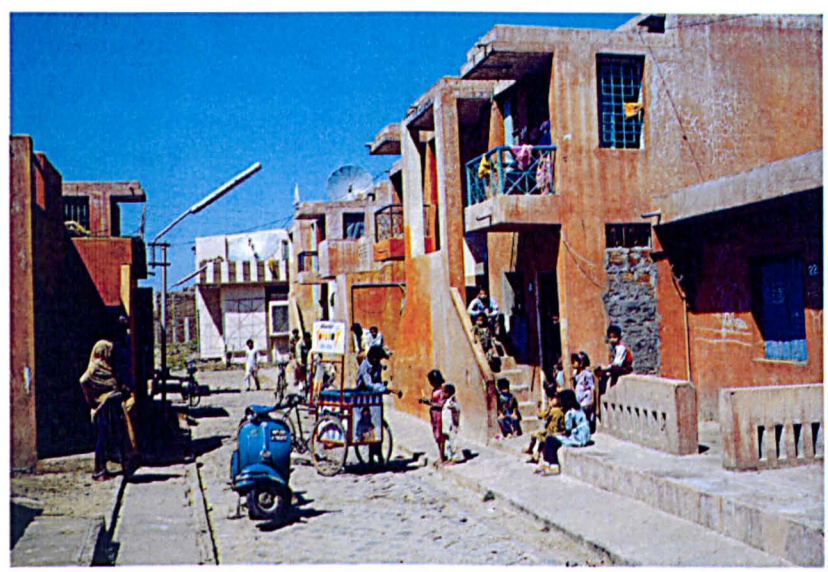


Fig. 1.2. Doshi's (VSF) Aranya Community Housing Project showing street life, Indore, 1995.

Emphasis was placed on bringing people of different religious backgrounds together through the facilitation of social life at street (neighbourhood) level: '*...creating common spaces where Muslims, Hindus, Jains and others in these neighbourhoods can mix, the project promotes co-operation, neighbourliness, tolerance and cohesive social relationships'* (VSF 1990).

Fig. 1.3. Correa's Belapur Artists' Colony in Navi Mumbai, 1989.

In Navi Mumbai, Correa's Belapur Housing draws from the concept of 'open to the sky' (Correa 1989) using a hierarchical arrangement of clustering around open spaces:

This low-rise high-density scheme utilises a cluster arrangement around small community spaces. At the smaller scale, seven units are grouped around an intimate courtyard... Three of the clusters combine to form a larger module of 21 houses surrounding an open space... Three such modules interlock to define the next scale of community space... The spatial hierarchy continues until the neighbourhood spaces are formed where schools and other public-use facilities are located.
Khan 1987 p.70

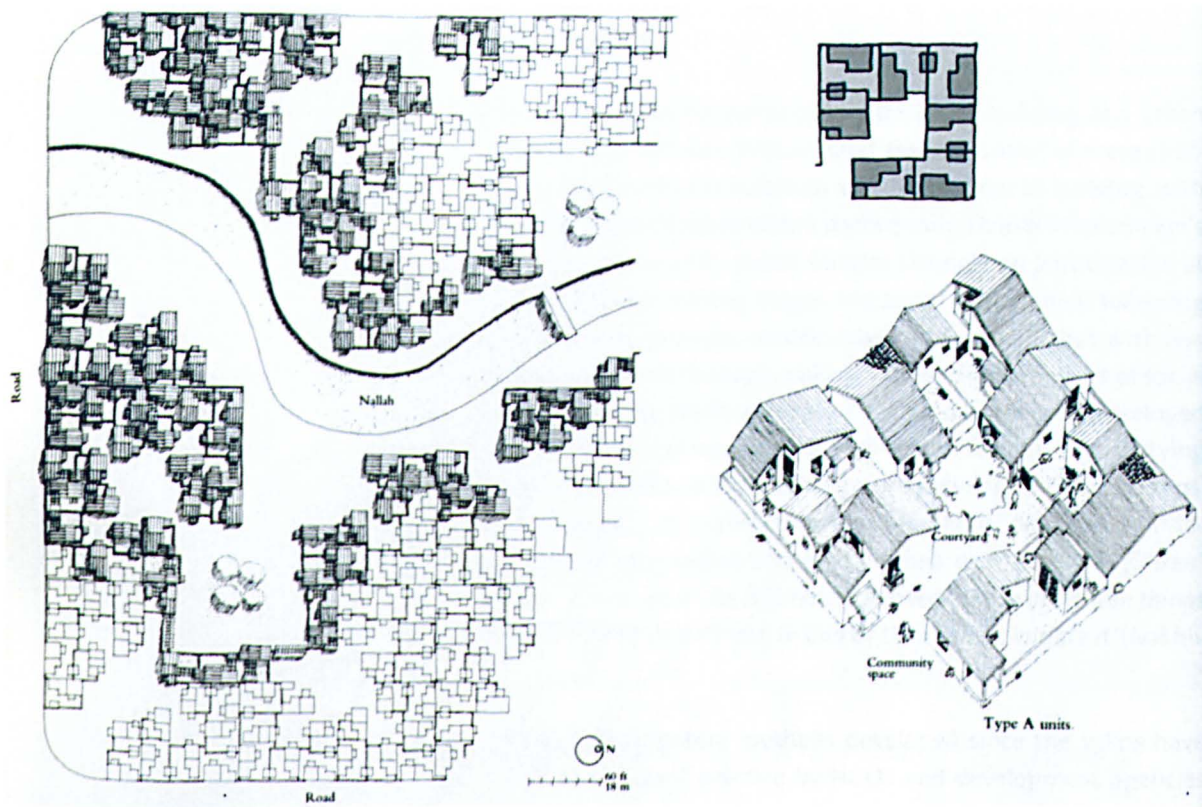


Fig. 1.4. Drawing of seven houses around a courtyard and site plan, Correa's Belapur Artists' Colony in Navi, 1987.

In traditional North Indian towns, the organic nature of the order of public spaces is expressed in the behavioural aspects of people as well as historic and cultural references and associations. The creation of temporal public landscapes is determined by hours of the day and time of the year - a space

changes into a public place by being occupied and when that occupation changes so does the 'nature' of the public place (Hall 2009 p.81). There are several precedents for guidelines to improve public spaces at a city level. These policies and planning tools are not necessarily appropriate for low-income settlements where the topographical morphology develops organically.

In her study of changes in the social and physical environment of Delhi taking place during the colonial era, Hosagrahar (2005 p.2) uses the phrase 'indigenous modernities', a condition she defines as: '*...the fragmented, complex, and paradoxical urbanism of a city's engagement, under the politics of colonialism, with the cultural turmoil of a rapidly globalizing world.*' Throughout the thesis, Hosagrahar's notion of 'indigenous modernities' is tested in the social, physical and cultural environment of the two case studies.

The notion of 'public' which is examined in Chapter 3 emerges as a spectrum, not a single generalisation or concept.

1.2.2 Participation

There are several toolkits for participatory design in building and urban decision making (UN-HSP 2001, Wilcox 1994). However, most of these strategies focus on community consultation and design prior to building, with involvement ceasing once construction starts on site. Hamdi's Placemaker's Guide to Building Community (2010) focuses strongly on participation at the design and decision-making stages and social engagement following a strategy called PEAS (provide, enable, adapt and sustain), but with less emphasis on engagement through making. Within the framework of social sciences, conventionally practiced research methods are well developed and clearly defined processes, offering well-tested formulas for carrying out fieldwork in the fields of anthropology and sociology amongst others. However, when applied to architecture, these methods focus on quantitative and qualitative approaches and used on their own, tend to: *'"flatten" our ontologies so as to erase the differences between living and those things that mediate the living, but do not, in and of themselves, initiate it'* (Ivakhiv 2011).

Well-established participatory methods developed since the 1980s have been adopted as standard practice by NGOs and development agencies and practitioners. Chambers' (1993) Participatory Rural Appraisal (PRA) focuses on the incorporation of knowledge from local people, developed from Rapid Rural Appraisal (RRA) – techniques that could bring about a 'reversal of learning' (Chambers 1983). However, the limits of participatory approaches have been raised with a critical view towards PRA and other similar participatory development methods adopted by NGOs and devel-

opment agencies (Cooke & Kothari 2003). These views highlight a failure to engage with issues of politics and power, instead creating a 'technical approach to development' (Hickey & Mohan 2004). They suggest instead a transformatory approach that addresses citizenship and political capacities within a civil society.

The Joseph Rowntree Foundation (Wilcox 1994) proposes a 'five-rung ladder of participation' consisting of information, consultation, deciding together, acting together and supporting independent community interests. The process is described as four-phase: Initiation, preparation, participation and continuation, with emphasis on initiation.

Five different levels of participation have been identified by Hamdi & Goethert (1997): None, indirect, consultative, shared control and full control. Levels of participation are dynamic and need to be considered throughout the different stages of slum upgrading (as defined by the Community Action Planning model (Batra 2012)): Initiation, planning, (shared control) design, implementation and maintenance (involving city and community).

Today participation is widely regarded as the consensus for grassroots initiatives promoting inclusive community engagement in their various projects. However, in an article titled 'Participation and the *Han Ji* ['Yes Sir'] Syndrome' (*Terra Urban* February 2013), Dumas argues that participation does not necessarily empower people. He states:

Creating structures for participation is a first necessary step to enhance the capacity of destitute populations to defend their rights; but it must be complemented by further measures if we want to see citizens genuinely empowered in the public sphere. Creating sustainable channels of information, enhancing the self-respect of inhabitants, and making them integrate the possible benefits they can derive from participation are objectives that NGOs could easily implement.

Organisations such as Architecture Sans-Frontieres (ASF) promote a community-led participatory design approach to building communities. Their recent action research workshop Change by Design (ASF 2011) explored the opportunities and limitations of this approach through concurrent investigations at the 'macro' institutional scale, the 'meso' neighbourhood scale, and the 'micro' dwelling scale.

Participatory Action Research (PAR) practitioners have developed these participatory methods to make a concerted effort to integrate three basic aspects of their work: (1) participation - life in society and democracy; (2) action - engagement with experience and history; and (3) research - soundness in thought and the growth of knowledge (Chevalier and Buckles 2013 p.10).

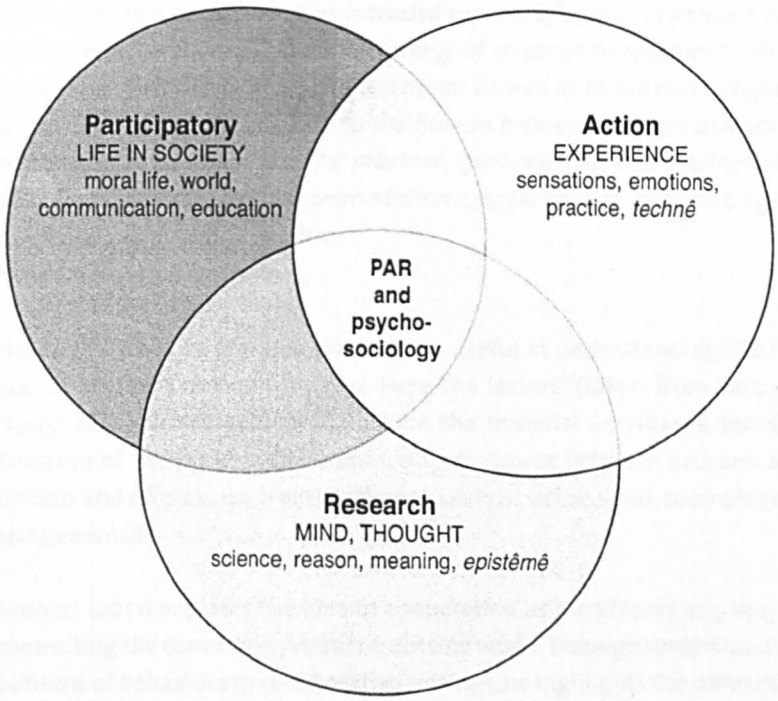


Fig. 1.5. Participation, action, research diagram.

PAR focuses on reflexive enquiry and offers researchers a way to investigate the experience of the individual, raising awareness of inequality and social policy issues. However, PAR projects highlight limitations that a small scale investigation can have on bringing about social change beyond the specific project or case study situation and often have little impact on changing policy at higher levels.

What is important here is the forming of relationships, developing of confidence and building of trust between those involved that takes time, leading to a sharing of commitment. Every person involved can learn from another in a formal setting (training) and through informal situations - this is the true nature of participation. The manner of engagement becomes a negotiation of the very nature of participation. Participation should build relationships and the sharing of resources between informed citizens *'with space to have a voice'* (Appadurai 2007), eventually leading to partaking in self-governance.

1.2.3 Research Through Making

Building/making can be used as a method for generating self conscious engagement with spatial practice, where judgements made through practice can result in a process. Andrew Pickering in his book *The Mangle of Practice* (1995) discusses a view of the context for practice:

The dance of agency, seen asymmetrically from the human end, thus takes the form of a dialectic of resistance and accommodation, where resistance

denotes the failure to achieve an intended capture of agency in practice, and accommodation an active human strategy of response to resistance, which can include revisions to goals and intentions as well as to the material form of the machine in question and to the human frame of gestures and social relations that surround it... The practical, goal-oriented and goal-revising dialectic of resistance and accommodation is, as far as I can make out, a general feature of scientific practice.
Pickering 1995 pp.22-23

Pickering's ideas of research practice are useful in understanding the notion of research through making. Here the 'actors' (taken from Latour's (2005) Actor-Network Theory[3]), include the material conditions, the significance of the place in the community discourse between artisans and citizens and officials, each with different kinds of virtue, skills, commitment and generosity.

Sennett (2012) explores the idea of cooperation as a craft and as a way of connecting the community with the outside world. Through understanding patterns of behaviour in collaborative settings, he highlights the difficulties of working together in situations where people are living in conditions of scarce resources, and claims that society is *'losing the skills of cooperation needed to make a complex society work'.* In his book *Together*, Sennett coins the term 'dialogic skills' emphasising the need for listening for intention rather than meaning. In Sennett's view, the distinction between cooperation and collaboration is the idea of cooperation as something with an end result. Collaboration as a process is different to cooperation, which should not be treated as a means to an end (such as agreement). In his words: *'poor skills of cooperation disable collaboration'* (Sennett 2013).

1.2.4 Improvisation

In informal or low-income settlements at the urban periphery, people often use improvisation as a way to negotiate a path through the failures of government to provide adequate basic needs in terms of dwellings, amenities and connection to infrastructural services, following Lévi-Strauss' (1966) concept of 'bricolage' - making do with what is at hand. Amin and Thrift (2002 pp.128-9) state:

Though urban inhabitants will usually tend to improvise in routine ways, sometimes they will also produce something quite new. So urban spaces have the ability to produce new forms of interaction, to mutate and so exceed themselves... nearly all systems of governance in fact depend on improvisation to keep functioning day on day; they are only partly rule based.'

3 Actor-network theory (ANT) is distinguished from other network theories in that an actor-network contains not merely people, but objects and organizations (social and technical). These are collectively referred to as actors (Ingold 2011 p.64).

Tim Ingold (2013 p.20) takes a view on improvisation in relation to creativity - he writes: *With regards to creativity, it distinguishes the improvisatory creativity of labour that works things out as it goes along from the attribution of creativity to the novelty of determinate ends conceived in advance.*

His treatment of creative improvisation sees: '*collaborative and political dimensions of creativity and thus challenge the idea that creativity arises only from individual talent and expression*' (Hallam and Ingold 2007). Taking this idea further, Hallam and Ingold (2007 p.2) discuss the difference between improvisation and innovation:

[It] *is not that one works within established convention while the other breaks with it, but that the former characterizes creativity by way of its processes, the latter by way of its products. To read creativity as innovation is, if you will, to read it backwards, in terms of its results, instead of forwards, in terms of the movements that gave rise to them. This backwards reading, symptomatic of modernity, finds in creativity a power not so much of adjustment and response to the conditions of a world-in-formation as of liberation from the constraints of a world that is already made. It is a reading that celebrates the freedom of the human imagination - in fields of scientific and artistic endeavour - to transcend the determinations of both nature and society.*'

Following this notion of improvisation and creativity as being intrinsic to the very processes of social and cultural life, places can be transformed through collaborative improvisation – what Sennett (2012) calls 'users' art'. A regulated improvisation of practice can potentially build on individual and collective placemaking at the dwelling and neighbourhood scales and even connection to the city through infrastructure.

The Government of India (GOI) 'Right to Services' legislation (2011) was aimed at providing common public services within guaranteed time bound delivery. These include issuing birth and domicile certificates, electricity connections, voter's and ration cards, as well as copies of land records. In practice, however, the provision of these services usually requires residents to demand these rights from the government to achieve an effective supply. This research investigates how this process worked within the two case studies reviewed.

1.2.5 Freedom, Democracy and the City

Recent discussions in development economics, such as Sen's (2009) theories of social justice (based on Rawl's (1971) rights-based theory of justice), suggest the opening up of choice, and opportunities, leading to individual freedom and increasing the capabilities of the poor. Sen writes:

The freedom to lead different types of life is reflected in the person's capability set. The capability of a person depends on a variety of factors, including personal characteristics and social arrangements. A full accounting of individual freedom must, of course, go beyond the capabilities of personal living and pay attention to the person's other objectives (e.g. social goals not directly related to one's own life), but human capabilities constitute an important part of individual freedom.
Nussbaum and Sen 1993 p.33

Recent studies and literature on development have shown a move towards a focus on how people actually live out their lives (lived experience) and the kinds of opportunities and choices that are afforded to them. In Poor Economics, Banerjee & Duflo (2012) tell the story of how poor people live their lives, of the constraints that keep them poor, and of the policies that can alleviate this poverty. Lack of information and incorrect expectations can trap the poor, and Banerjee & Duflo suggest accepting the possibility of error and engagement as part of city life. To address Sen's (1999) insight for the need for 'substantial freedom' to enhance 'the lives we lead and the freedoms we enjoy' the two live projects developed new methodologies for upgrading these informal peri-urban settlements through a series of small scale interventions directly associated with the way people live their lives.

Notions of urban democracy are discussed by Amin and Thrift (2002 pp.137-141) who propose a shift from traditional deliberative democracy (of which participation is central) to radical democracy where: *'democracy requires the democratization of institutions and the empowerment of subaltern voices in a politics of vigorous but fair contest between diverse interests'.*

Arjun Appadurai (1996) uses the term 'community of sentiment' to describe communities moving from shared imagination to collective action. In his paper *Deep Democracy: urban governmentality and the horizon of politics* (2001), he discusses reworking urban governance by embodying local practices and values and enabling people to negotiate their own collective localities through the creation of a coalition of interest.

David Harvey (2008, 2012, first proposed by Lefebvre in 1967 (Lefebvre et al. 1996)) describes how failures of urban planning and issues of collective 'right to the city' are faced particularly by (migrant) dwellers in informal peri-urban settlements in India. Veena Das (2011) speculates that when capitalism and democracy work against each other, the credentials for rights are built incrementally - around ration cards, water, electricity and so on. The two live projects tested the capacity of people to self organise around the creation of shared spaces and the extent to which this engagement enhanced their sense of empowerment and accomplishment and eased their connection into the wider opportunities offered by the city.

1.3 RESEARCH OBJECTIVES

Chapter 1 has reviewed the notions of 'public space' and 'participation' along with research through making and improvisation, bringing these together with ideas about freedom, democracy and the city. The research questions whether there has been a new understanding of the nature of shared spaces in informal peri-urban settlements in North India using case studies of two live projects which explore the role of collaborative architectural making as a catalyst for civic empowerment and social change.

Chapter 2 addresses spatial practices and develops an evolving methodology by which these practices are both understood and created. Recent literature has shown that theories of making have not been substantially included in 'participation'. The methodology here is focused on the idea of empowerment through collaborative making, and learning from active engagement and involvement in this process. This involves gathering ethnographical data, accessed through an NGO and engagement with student work. Themes emerging from the methodological process are discussed, and concluding questions raised at the end of the thesis, which suggest a new understanding of town (what it is and what it consists of), in relation to 'public' brought about by a shift in commitment, awareness and institutions.

Chapter 3 uses these methods as a basis to understand the nature of 'civic' in the two informal peri-urban settlements, and the way the institutional and civic order is being made. It tests to what extent the interventions have affected the creation of shared ground and connection to the city. Insights gained through this research practice are presented in chapter 4 as a contribution to the broadening and deepening of our understanding of shared spatiality beyond the concept of 'public space'.

1.4 CASE STUDIES

Two Project Diaries compiled as separate documents which are part of the **Projects Portfolio** provide a brief review and chronological diary of the history and circumstances of the two case studies, on which rests the main argument of the thesis. One case study is situated in Kachhpura, a settlement within the larger topography of Agra, and the other is located in the stone quarry worker settlements of Navi Mumbai.

1.4.1 Kachhpura Settlement Upgrading Project (KSUP), Agra

The KSUP began in November 2006 with a studio field trip to investigate the topography of this urban village, which was one of four settlements surveyed to generate hypothetical student proposals from a study of the physical and cultural context. Collaborating with Indian NGO CURE, we responded to the overwhelming need of the female inhabitants of Kachhpura for sanitation. In summer 2007, as students we installed the first internal household toilet and washing space. We carried out hygiene awareness workshops in the schools and established quality standards, a sound construction methodology and a sustainable maintenance programme. Subsequently, by revolving the funding, more than 200 internal toilets have since been produced.

The KSUP project has progressed from small individual water and sanitation interventions on a single street to larger settlement wide schemes which include street paving, repair of open drains and a rooftop tea terrace. From 2008, further investigation and representation of ideas; collaboration and negotiation with residents led to the construction, at the neighbourhood scale, of a Decentralised Waste Water Treatment system (DEWATS) built to clean waste water for irrigation and toilet flushing along a 100 metre long stretch of an existing polluted watercourse. Shared common places at dwelling, street and neighbourhood scales have emerged from the interstitial spaces formed by this intervention linking the area around DEWATS to other community facilities.

1.4.2 Quarry Classrooms Project, Navi Mumbai

Since 2008, collaborating with Indian NGO ARPHEN, we have, through physical and cultural surveys, engagement with residents, and reflection on iterative practice in the incremental construction of classrooms in two quarry worker settlements and through publications and exhibitions of this work, been able to extract and abstract learning in order to strategically re-inform the making process. The aim of the Quarry Classrooms project was to create shared environments in a transitional community using methods of participatory design and making to link architectural endeavour with the process of establishing common ground within the migrant workers' community.

As a result of the classroom construction ARPHEN secured funding for teachers' salaries, children have a route into state education, adult literacy and women's sewing classes have begun and the Municipal Corporation have provided water taps, electricity and street lighting, new pathways and formalised drainage, consolidating the settlement. The project was shortlisted for the Architect's Journal Small Projects Award (February 2010).

CHAPTER 2
METHODOLOGY: COLLABORATIVE ARCHITECTURAL MAKING IN INFORMAL PERI-URBAN SETTLEMENTS

2.1 INTRODUCTION

This chapter discusses the methodology followed for this study: the research methods and processes that have developed throughout the course of the live project (for case studies, see Project Diaries) timelines (and are still ongoing). An evolving methodology that began in late 2006 and will continue beyond the scope of this PhD (2013), is focused on the idea of engagement through making, and learning from involvement.

Questions of methodology are customarily concerned to secure the relation between hypotheses, data properly controlled and conclusions or speculations. However, this study is rooted in two particular case studies. It is precisely a methodology arguing for particular involvement – as against formulating generalisations which might be the basis of techniques supposedly applicable to all cases (theory). There are approximate generalisations of this kind but these are so general, that they serve little more than guides to practice. Conversely, it is precisely the openness to found conditions and to improvisation in the context of making judgements and decisions that is the key to understanding the nature of such settlements as a species of town. In anthropological terms, the process is similar to participatory ethnography where the loss of a supposed objectivity is a gain in intensity of understanding. What guides the dialectics of action and reflection is the topic which claims all participants (for long after the actual intervention).

This study is being carried out as research by practice - through the direct, hands-on engagement with, and the implementation (through making) of the two ongoing live projects over six and four years respectively in marginalised informal settlements in two cities, Agra and Navi Mumbai. As a result, a new understanding and interpretation of shared spaces in the settlements of Kachhpura and Baban Seth, is emerging. These common places are the result of everyday engagements, collaborations, conflicts and negotiations between local institutions: families, neighbours and community groups, as well as longer-term interventions from outside involvement (NGOs, government, academic institutions and individuals). Additionally, the interventions and places themselves exert a significant claim and may themselves be considered 'actors' (Latour 2005). Small scale built interventions provide a platform for uncovering the conditions that make up the two case study settlement areas, leading to an understanding of the nature and order of the idea of a town or city. This differs from the procedures of RIBA work stages, for example, where projects are sealed within legal and technical protocols and all the primary questions regarding the projects in relation to civic order are assumed to be answered. By contrast, all these questions and the origins of architectural and civic order are central to my methodology.

Representing this research as practice is as much part of the methodology as the making and meaning of buildings and infrastructure itself. Writing is paired with the use of large format portfolio drawings, as well as selected illustrations, photographs and diagrams embedded within the text. Both the thesis and portfolio drawings are intended to be read/viewed together - the table of contents outlines the structure of the study with numbered chapters and sub-chapters correlated to the relevant portfolio drawings. Two Project Diaries provide a review and illustrated chronological record of each case study and are intended to supplement the thesis and portfolio drawings, to provide a full account of the individual case study projects.

2.2 PROJECT TIMELINES

The methodology developed in this research begins with the exploration of the physical and cultural topography of a place. The case studies emphasize the need for a process of learning on-site, in continual concrete dialogue with the constituents, requiring a building of trust and understanding between those involved. This may lead to a different project than first imagined, therefore a 'loose-fit' strategy (Mitchell 2010) has been adopted that allows for flexibility and adaptability to circumstances of construction and unplanned or unexpected events that do not necessarily result in a directly linear process and is not completely hostage to chance but adheres to the common topic, which allows for collective engagement, together with individual accomplishment.

Investigating physical and cultural topography is the basis for understanding a place, which seeks to uncover the layers of richness in structures of dependency, getting deeper and allowing a more appropriate fit between intervention and context. Hypothetical testing through student projects is followed by testing through making real-life initiatives. Drawing from anthropology, ethnography and philology, this study attends to the narratives of particular individuals and of concrete human lives, through the lens of the architect – as detective, author and craftsperson (Mitchell 2010 pp.38-56). These roles are understood in this research as follows:

Architect as anthropologist[1] – developing a working understanding of a settlement and its inhabitants through observation, survey and interaction – looking for clues and 'moments' and using 'cultural exercises'. The architect as anthropologist treats physical phenomena as well as cultural ones, in order to uncover the layers of a community and settlement, revealing the complex spatial arrangements and networks of social relationships that make up the metabolism and institutional order of place and identity. As an anthropologist, the continual movement between scale and shifting of positions is required to fully understand the civic nature and negotiations at play.

Architect as author – use of a narrative approach to *'frame, capture and harness... moments from the everyday to use as building blocks for... imagined proposals'.* The architect as author or narrator takes everyday human experiences, stories, memories and understandings and translates these into practical scenarios. This enables a narrative to be generated within the community and with NGO (as well as with the research community) that is continually reformed so that a brief for action is available at any particular time for each incremental intervention. This would include the notion that place can be a dynamic archive of both memory and expressed aspiration

1 Mitchell (2010) uses the term 'detective' which I have reinterpreted as 'anthropologist' as a more appropriate term for describing the full spectrum of on-the-ground methods used to conduct this research in the two settlements.

for both the individual and the 'community' and as such as resource for resolutely moving forward to initiate the next action.

Architect as craftsperson – a *'process of innovation by experimental modelling which turns the imagined making/designing process from a technical task... into a craft.'* The architect as craftsperson curates the process of crafting place.

The background to this research is a rolling studio[2] programme, out of which live projects emerge which use local physical and cultural resources to change urban contexts as the vehicle of collaborative self-empowerment. Upgrading incrementally and iteratively using several small projects (dispersed initiatives/interventions), gradually raises the discourse surrounding urban poverty issues within the settlement. Insights have been gained and lessons learned through direct involvement in the two case study projects over a number of years, developing academically and professionally through my shifting roles as architectural student, researcher and PhD candidate.

The on-going documentation of (both subtle and obvious) change in the settlements relating to the built interventions over time offers glimpses into the developing nature of these places as emerging towns. Time is the key here - at stake is the notion of changing the direction of orientation of an ongoing process of several levels of change (i.e. from dwelling to town). The shifting nature of informal settlements happens quickly (rapid short-term changes) and slowly (long-term evolution) - the nature of which can only be recorded through regular visits to the settlements. A total of 11 field trips (each between 2 and 7 weeks) were made to the two regions between November 2006 and April 2013 (averaging 2 visits per year) with one almost always taken in November (to coincide with academic studio teaching timetables at LMU). With the seasonal climatic conditions (particularly the monsoon season) throughout the year in both Agra and Navi Mumbai affecting people's daily lives and livelihoods, as well as the topography of the settlements, it was important to observe and understand changes over the yearly cycle, as well as the longer-term development of the settlements. Examples of these changes include the shift in character of Meera's yard (chapter 3.2.3) since her toilet was installed in 2007 (long-term), as well as the yearly (renewal) cycle of the DEWATS with annual re-planting of the root-zone taking place after the monsoon period (short-term). Glimpses of long-term changes brought about by the post-hoc introduction of the DEWATS (completed in 2011) have been observed through both temporary events such as its growing association as a marriage place (chapter 3.3.4) and permanent investments such as Bhajan Lal's new house (chapter 3.2.4) that hint at the potential evolution of the area in the years to come.

2 The studio mentioned here is Diploma unit 6 run by Maurice Mitchell and Francesca Pont, at the Faculty of Architecture and Spatial Design (now called the Cass) at London Metropolitan University.

The history of the project is key to understanding the negotiations that have led to the evolution of the methods involved in this study. Analysis of the process using a series of de(re)constructive timelines clearly identifies key stages that inform one another throughout the life of the projects. A general key (fig. 2.1) provides an explanation for the icons, symbols and colours used, and a number of consistent elements remain as thresholds throughout the timeline diagrams: the first conversations between LMU and the NGO initiating the collaboration between institutions at the start, and the shared ambition of the projects at the end. In addition, field trips undertaken are highlighted throughout (labelled FT1, FT2 etc.), alongside the identification of the stages of my involvement over the past six years. In the Agra-only diagrams, the usually heavy Monsoon that caused flooding in Kachhpura in 2010 is marked, whilst in the Navi Mumbai-only diagrams, the deaths of quarry worker residents due to road/workplace accident (that happened during the field trips) are noted. Project timeline diagrams (figs. 2.2, 2.3 and fig. 3.93 - chapter 3.5 p.136) show both case study projects in parallel, whilst others (figs. 2.4 a&b and figs. 2.5 a&b) are shown as individual diagrams for each project.

The use of icons to indicate the phase/built intervention of the project and symbols to denote actions (and celebrations/threats), aim to make explicit the complexity of the negotiations and involvements in the projects, without losing depth or richness. Annotation is used where specific details are deemed necessary, or provide vital information at a particular (key) stage in the diagram.

Throughout the diagrams, the timeline remains on the vertical axis, whilst the headings on the horizontal axis are labelled according to the kind of analysis being represented. Fig. 2.2 Project timelines (along with fig. 2.1 Key to timelines) can be used as a key drawing, and viewed alongside other diagrams. Key events associated with particular negotiations (chapter 2.4) and spatial practices (chapter 2.5) are identified in project-specific diagrams (figs. 2.4 a&b and figs. 2.5 a&b) that can be read in parallel with each particular sub-section in this chapter.

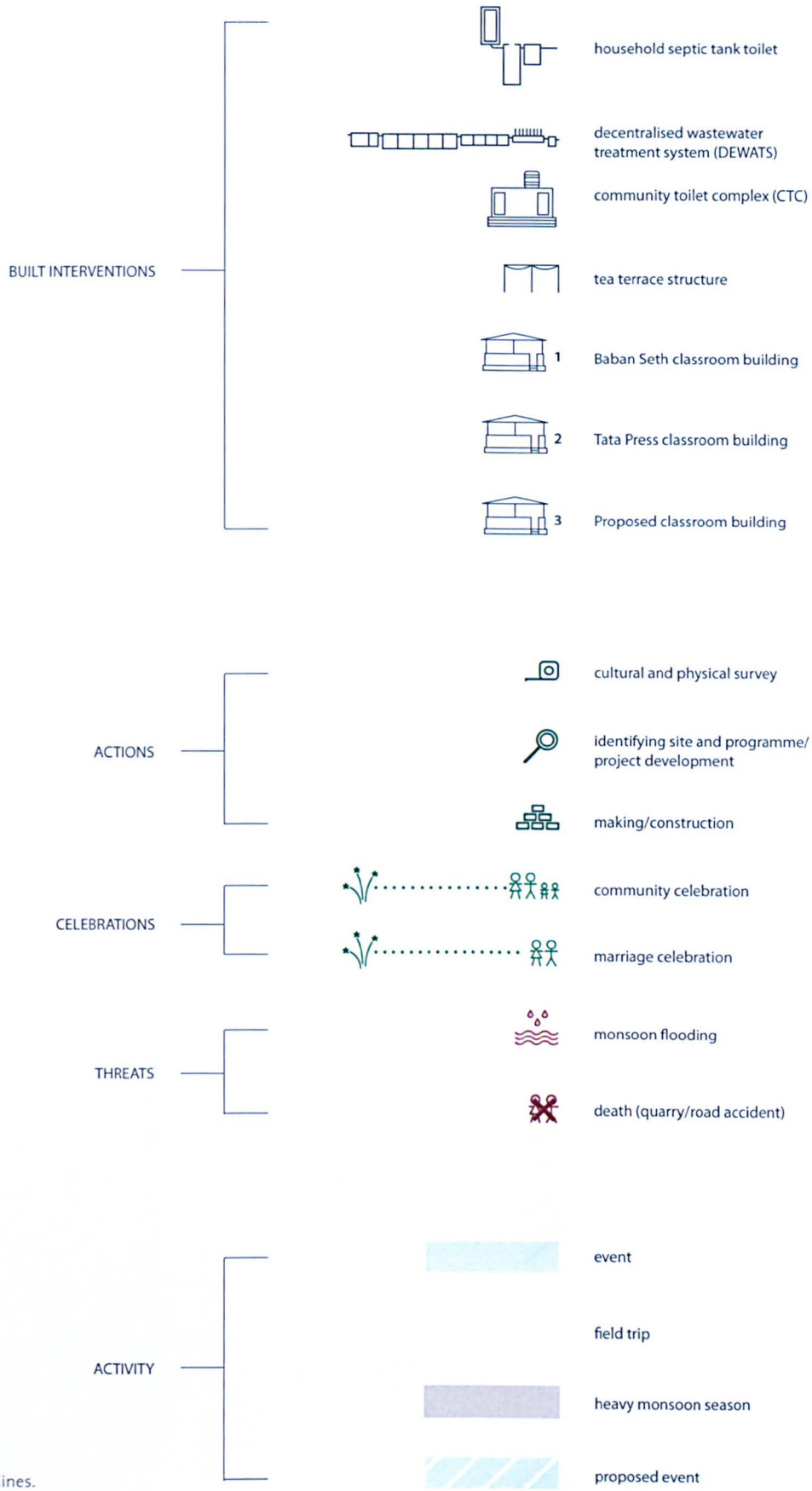


Fig. 2.1. Key to project timelines.

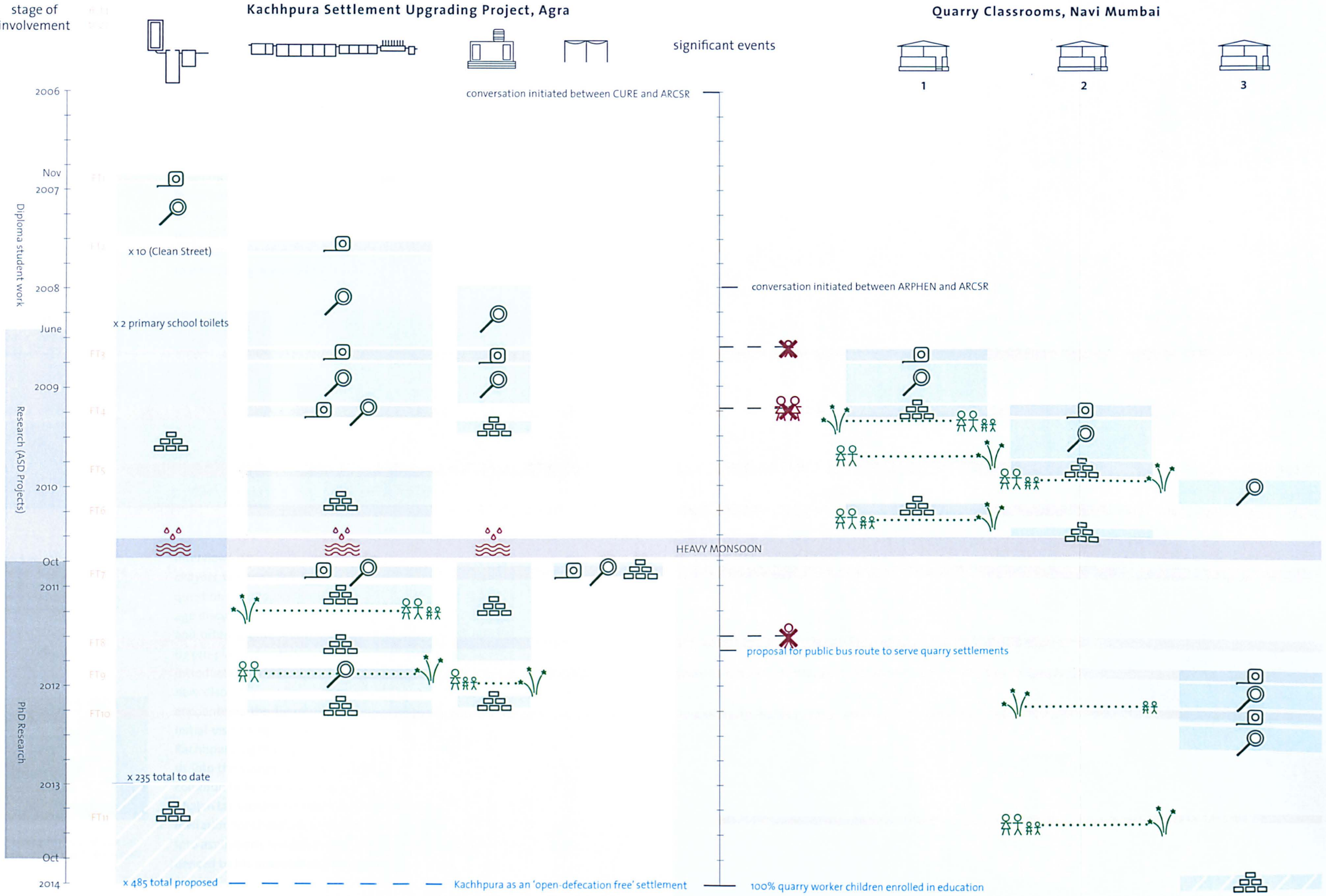


Fig. 2.2. Project timelines

2.3 PROCESS AND METHODS, TOWARDS UNDERSTANDING

A combination and collection of established qualitative methods and techniques were used including interviews, workshops, observation, and documentation through photography, sketches and measured surveys/ mappings, collectively offering an understanding of the concreteness, scale and locale of the physical and cultural topography of a place. This forms the basis for the identification of a programme leading to a small-scale intervention that could be implemented through a collaborative approach. Ongoing monitoring and evaluation of the projects and interventions was important for better understanding effects, impacts and learning lessons for improvement throughout the process. This was carried out throughout and long after the interventions were completed following the same methods and techniques used to document the existing conditions prior to introducing any built interventions.

(a)

(b)

Figs. 2.3 a & b - (a) Interview with Meera at her house in Kachhpura, Agra; (b) Discussion with self-help group held at Baban Seth quarry classroom, Navi Mumbai, both April 2012.

Interviews were conducted with individuals and established groups *(panchayats,* women's Self-Help Groups) in formal settings with predetermined questions and topics (facilitated by a local translator), designed to encourage discussions on particular subjects. Informal conversations, unplanned and often spontaneous/circumstantial, provided key insights overlooked by pre-planned questions. Chats with curious passers by, often led to new introductions to networks of people we were not yet acquainted with, and new discoveries in the settlements that we were not aware of. We first encountered the 'Camel Boy', Brijesh Singh, near the *Mehtab Bagh* on our initial visit to Agra in 2006 and he soon became our unofficial guide in Kachhpura, signifying the beginnings of a friendship that would welcome us into the village, no longer as outsiders but as adopted members of the community. In one instance, a chance meeting with Kachhpura resident, Bhajan Lal, outside his newly built house adjacent to the DEWATS led to an invitation for *chai* (tea) and a tour of his new home, which offered insights into aspirations towards a middle-class lifestyle within the village (as evidenced by his new and very *'pucca'* house).

Fig. 2.4. Having *chai* with Bhajan Lal at his new house in Kachhpura, April 2012.

(a)

Although interviews were useful for gathering information on personal histories, aspirations and opinions from residents in the communities, these only provided a single layered understanding of life in the settlements from adult members. In order to engage with children and young people in the villages, we conducted several workshops based on existing activities, such as sewing and *Sanjhi* art (paper-cutting craft) and card making workshops in Kachhpura, and drawing classes with the *balwadi* (nursery groups) at Baban Seth quarry settlement. These workshops revealed the ambitions and family structures of the younger generation through direct focused drawing activities (family trees and ambitions - see Project Diary 1.4.2 p.136), as well as the latent creativity and enthusiasm shown particularly by girls in craft workshops. These direct participatory activities with the youth in the villages acted as introductory events for further collaboration and engagement with young people during the process of making through interventions.

(b)

Figs. 2.5 a & b - (a) *Sanjhi* art workshop with youth under a Neem tree in Kachhpura, November 2010; (b) Drawing workshop with children at Baban Seth quarry classroom, April 2012

Photographs, and sketches/measured drawings were used as a consistent technique for recording small changes, and the longer development of the settlements over a number of years. An archive of photographs from 10 field trips has developed (as well as those communicated by NGOs and contacts visiting or living in the area). Analysis of this archive as part of this study has revealed gradual and subtle changes that we were not necessarily aware of, or which were not obvious at the time and could not

be revealed without more detailed comparison over a longer period of time. Sequential photographs used to record stages of development of the interventions (prior to, during and long after their implementation have captured moments of placemaking through appropriation of the interventions that affect the gradual evolving nature of the site (i.e. this cannot be understood by simply recording before/after or existing/proposed conditions). Only by recording and documenting consistently over a long period of time can this evolution be seen and understood, leading to a rich structure of interpretation of the evolution of civic order of town in the settlements areas.

Knowledge production, dissemination, exchange and transfer of the project literature and research throughout enabled us to raise awareness both within the settlements and in the public realm at local, regional and international scales. In Kachhpura, informative leaflets and posters were produced at key stages of the projects, such as during and after the first toilets were installed and after the DEWATS was completed, to keep residents informed of the work taking place around them.

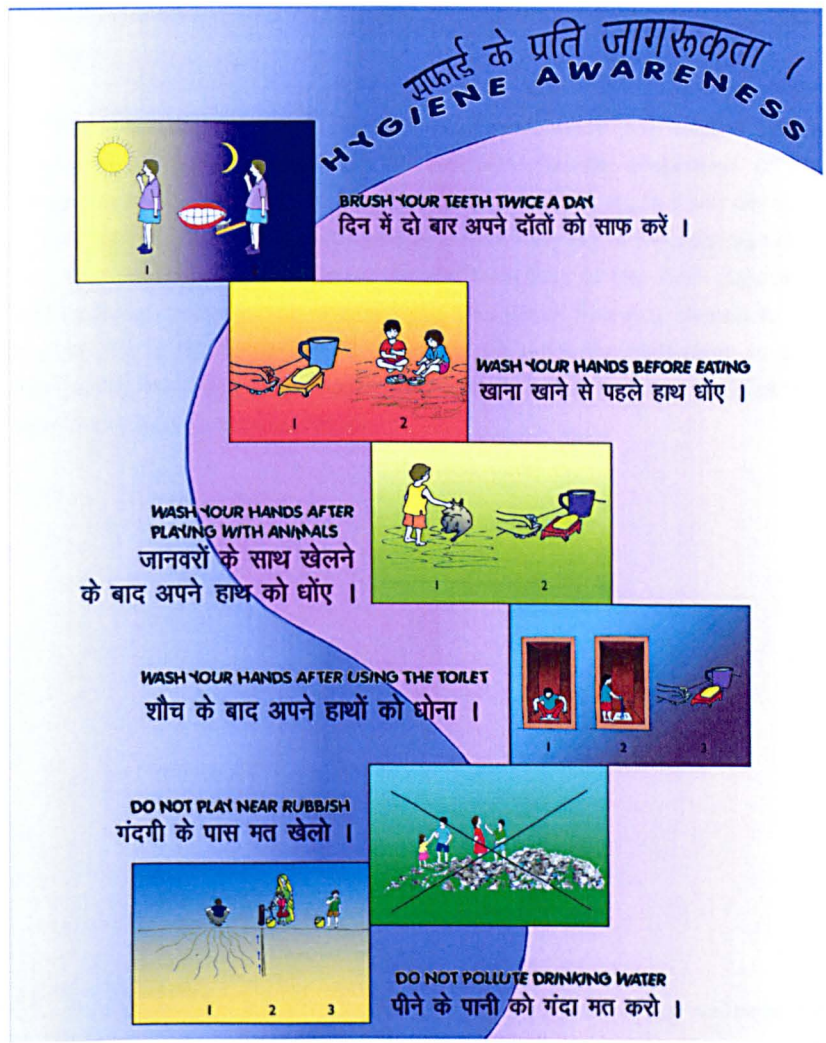


Fig. 2.6. Hygiene Awareness poster produced by students for children/ local primary school in Kachhpura, July 2007

Workshops with specific groups (children, women) and community meetings assisted with engaging residents in the current activities happening as well as the wider issues surrounding the upgrading of settlements. The local press in Agra (some of whom already had established a relationship with CURE and their work) took interest in the developing project in Kachhpura and regularly reported on the project. In London, the projects and research were consistently documented within ASD Projects by research assistants, and shared with other interested parties through talks and exhibitions (*Kachhpura Settlement Upgrading Project* 2007; *ASD Projects* 2009; *Learning from Delhi* 2011; *Provoking Architecture* 2012 - see Project Diary 1.4.1 pp.72-73 and Project Diary 1.4.2 pp.48-49) as well as an exhibition at the School of Planning and Architecture (SPA) in New Delhi in 2009. These public events helped to raise the discourse around the collaborative live project work in Agra and Navi Mumbai, amongst academics, professionals and government bodies. Recognition for the innovative approach shown by the projects included Baban Seth quarry classroom being shortlisted for the Architect's Journal Small Projects Awards 2010, and DEWATS in Kachhpura being shortlisted for the National Urban Water Awards (NUWA) 2011. The Municipal Corporation (Agra Nagar Nigam, ANN) have also recently adopted the idea of further DEWATS within their citywide sanitation plan for Agra.

In Navi Mumbai, 2009, a volunteer filmmaker from the United States produced a short documentary for ARPHEN[3] raising awareness of the issues/problems in migrant quarry worker settlements in Navi Mumbai whilst helping the NGO to promote the work they do in the communities. The documentary also followed the construction of the first classroom in collaboration with LMU researchers. This short film was shown to the community at Baban Seth on a projector set up in the classroom in 2011, continuing the engagement with knowledge production and participation within the community and NGO.

3 The short documentary *Aiding the Forgotten, Mumbai, India* produced by Blake Hodges can be accessed at: http://vimeo.com/11846342.

stage of involvement

Kachhpura Settlement Upgrading Project, Agra

Physical/Cultural Survey
Architect as Anthropologist

Built Intervention
Architect as Craftsperson

Knowledge Production
Architect as Author

2006
conversation initiated between CURE and ARCSR

Nov 2007
studio field trip (mappings/measured drawings interviews/cultural exercises)
studio field trip booklet
student theoretical schemes

Hygiene Awareness workshop
panchayat meetings
10 x Clean Street
LMU/CURE email workshop
Hygiene Awareness poster/ household leaflets
KSUP exhibition LMU, London

2008
2 x school

June
DEWATS site 1 survey
ASD Projects exhibition LMU, London
DEWATS design development

2009
DEWATS site 2 survey
old CTC

2010
Learning From Delhi exhibition SPA, New Delhi

Oct 2011
DEWATS water sump
DEWATS inauguration
Agra Beyond Taj booklet
Learning From Delhi book published
DEWATS shortlisted - Water Awards
student theoretical DEWATS proposal for Gokulpura, Agra
DEWATS overflow drain
Learning From Delhi book launch LMU, London

2012
Brijesh Singh marriage
CTC opening ceremony
interviews - Meera Devi, Brijesh Singh, Bhajan Lal
Live Projects as Research exhibition LMU, London
DEWATS drain crossings

2013
235 x total to date
SCIBE conference, London

Oct 2014
485 x total proposed
PhD Thesis
Kachhpura as an 'open-defecation free' settlement

Diploma student work
Research (ASD Projects)
PhD Research

Quarry Classrooms, Navi Mumbai

significant events

Physical/Cultural Survey
Architect as Anthropologist

Built Intervention
Architect as Craftsperson

Knowledge Production
Architect as Author

conversation initiated between ARPHEN and ARCSR

student summer field trip (mappings/measured drawings interviews/cultural exercises)
summer field trip booklet
ASD Projects exhibition LMU, London

opening ceremony 1
1
ARPHEN documentary

marriage ceremony
opening ceremony 2
2
Learning From Delhi exhibition SPA, New Delhi
Baban Seth classroom - shortlisted for AJ Small Projects Award

re-opening ceremony 1
upgrading 1
upgrading 2
student theoretical projects proposal for Turbhe, Navi Mumbai

HEAVY MONSOON

Learning From Delhi book published

ARPHEN film shown in classroom
proposal for public bus route to serve quarry settlements
pathways/drains 1
Learning From Delhi book launch LMU, London

site 3 survey
children's birthday party
interviews - women
children's drawing workshops
site 3 survey / meeting with quarry owner
Live Projects as Research exhibition LMU, London
Quarry Schools paper published

SCIBE conference, London

PhD Thesis

100% quarry worker children enrolled in education
3

2.4 NEGOTIATIONS AS MAKING AND MEANING

The built interventions carried out in this research followed a cyclical process of experimentation developed by Mitchell (1998) as a method for testing through making: [1] Cultural and physical surveying, leading to identification of a project or topic; [2] Provoking through a small intervention; [3] Recording resistances; [4] Making accommodations; [5] Sustaining this process. This cyclic process of experimentation, focused group criticism and modified proposition allows for continual reflection during the act of making that progresses in a dynamic manner, allowing flexibility for adapting the proposed intervention as necessary.

This process of learning through making is focused on the idea of collaboration and collective involvement, understood here as 'negotiations'. Some participatory theories and methods put into practice can result in a static process, lacking flexibility and adaptability to changing situations. In order to set up the horizons for praxis, there is the understanding of levels of engagement as a method for creating a hierarchy for involvement at various stages, where hierarchy refers to an intensity of holistic participation. This research uses the term negotiation to suggest the multiple reciprocal negotiations that operate within the horizons of involvement for praxis.

If we compare the two case study diagrams (figs. 2.8 & 2.9 pp.31-32), we can see that the involvement taking place during the construction periods of the two classrooms (and upgrades) are more or less consistent, and negotiations are happening across the spectrum of participants. From 2011 onwards, events start to happen on their own with little or no negotiation between participants - Tayama upgrades her dwelling, the local government Corporator provides drains and concreted pathways in the settlement, and the quarry owner constructs new *pucca* dwellings for arriving workers. These can be seen as direct consequences of the classroom intervention that arose from the self-empowerment devolving from the process of collaboration and the classroom itself. In Kachhpura, the negotiations are more complex, between both participants and the sites for the interventions.

Throughout this process, methodology that pertains to knowledge making has emerged. Closer analysis and evaluation of the process reveals more particular stages that inform each other as the projects develop. By generating a series of timeline diagrams as a vehicle for deconstructing the history of the projects, we can see whether a composite world has emerged over time, akin to Hosagrahar's 'indigenous modernity' that lies somewhere between traditional order and urban modernity, and is created from elements of both. We can question to what extent does negotiating through making lead to a shift in understanding of 'public space' and town through social change?

Fig. 2.8. Negotiations - Kachhpura Settlement Upgrading Project, Agra

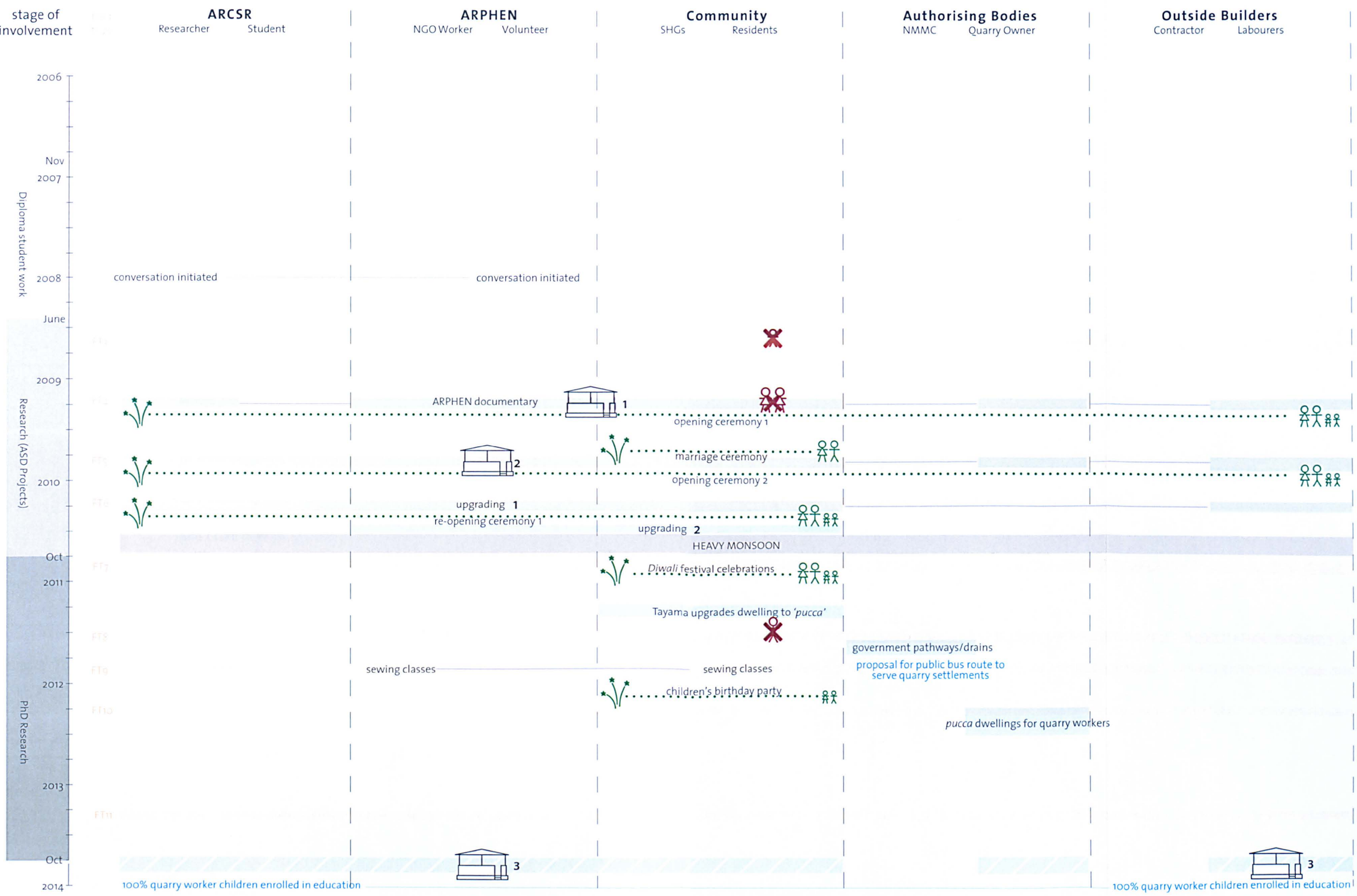


Fig. 2.9. Negotiations - Quarry Classrooms Project, Navi Mumbai

2.5 SPATIAL PRACTICE IN INFORMAL PERI-URBAN SETTLEMENTS

Emergent themes arising from the process of making and collaboration, and analysed through timeline diagrams, can be identified and categorised as the following: [1] Partnering, communication and contracts; [2] Identifying a site and programme; [3] Coalition of the willing: explicitness and knowledge; [4] Building on the familiar and with the local; [5] Placemaking: recording change through small details and events. The timeline diagrams (figs. 2.25 & 2.26 pp.47-48) highlight key events under each of the identified themes. These themes will be discussed in further detail, and illustrated with examples from the case studies.

[Theme 1] Partnering, Communication and Contracts

When London Metropolitan University began their collaboration with each of the NGOs - CURE in Agra and ARPHEN in Navi Mumbai, a Memorandum of Understanding (MOU) (see Project Diary 1.4.1 pp.26-27) was used in place of a standard form of contract. This is an agreed understanding where both parties have their own agenda (social, academic or project driven) but common interests and a shared vision or goal. These agendas overlap at particular points, and collaboration is achieved through sharing of knowledge and assisting each other where possible. An MOU used in place of a contract, and the idea of partnership allows for more freedom and flexibility from rigid obligations and targets, and a 'loose fit' way of working together. In Kachhpura, this on-going partnering between LMU and CURE over six years with a common interest of upgrading informal settlements from grassroots levels, has led to a shared ambition between CURE, LMU, residents and the ANN to make the village of Kachhpura the first 'open defecation-free settlement in Agra'.

Fig. 2.10. Detail from CURE's Agra Newsletter, 2011.

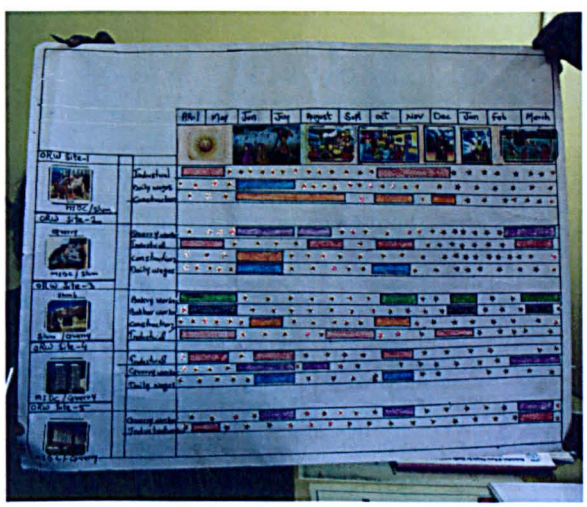
Kachhpura: Towards the First "Open Defecation Free Slum" in Agra

From one toilet in Kachhpura to Swatch Galis (Clean Streets), Kachhpura now has 127 families with toilets at home. Agra Divisional Commissioner has instructed DUDA to help all households to have toilets, making Kachhpura the first open defecation free slum in the city. While DUDA will provide the money to families for building the toilets, CURE shall continue with its technical assistance to customize the toilets.

Fig. 2.11. CURE facilitators conducting total station surveys in Barara using GIS surveying equipment, July 2011.

When the partnering between NGO CURE and London Metropolitan University began in 2006, ways of collaborating were explored through an initial two-week field trip survey in Agra carried out by students from LMU and facilitators from CURE. Four Trans-Yamuna settlements were chosen as study sites following an initial walk hosted by CURE's local office in Agra. CURE staff and facilitators offered insight into the participatory methods and approaches followed by their organisation as well as access to the communities through introductions to key residents, translation and a general cultural background to the settlements. CURE's approaches included PRA methods for sampling, such as transect walks and social mappings, compiled into annual reports. Methods later developed into and included total station surveys (with new access to GIS surveying equipment - fig. 2.11) and up-scaling from settlement to ward/cluster level analysis. Students brought with them techniques they were developing in their architectural education for cultural and physical surveying - photography, sketching, measured drawings, mappings and cultural exercises were produced in small groups and compiled into a studio field trip booklet on return to London. This information, gathered on site over two weeks, then provided the basis for hypothetical schemes to be proposed for real sites identified during the field trip, which were then developed over the academic year in the studio in the UK.

(a)



(b)

Figs. 2.12 a&b. Social mappings of quarry worker settlements produced by NGO ARPHEN outreach workers, April 2012.

A collaborative way of working has emerged between CURE and LMU - new areas of study are proposed and discussed prior to the annual two-week trip, and agreed during the first few days in India. CURE offer feedback on the studio booklets[4] and information gathered, as well as hypothetical schemes proposed by students. Each academic year revolves around a

4 Studio booklets are produced collaboratively by students following their two week annual field trip, and form a collection of original cultural and physical survey work carried out in their sites, as well as initial ideas for imagined design proposals (see Project Diaries).

common theme such as 'Walking City' (2010/11) and 'Edgelands' (2011/12). The access to student work by CURE, together with on-going conversations via email have enabled an exchange of knowledge adding richness and depth to student schemes whilst offering CURE further insights into the communities and new ways of representing their findings through student sketches, drawings and mappings.

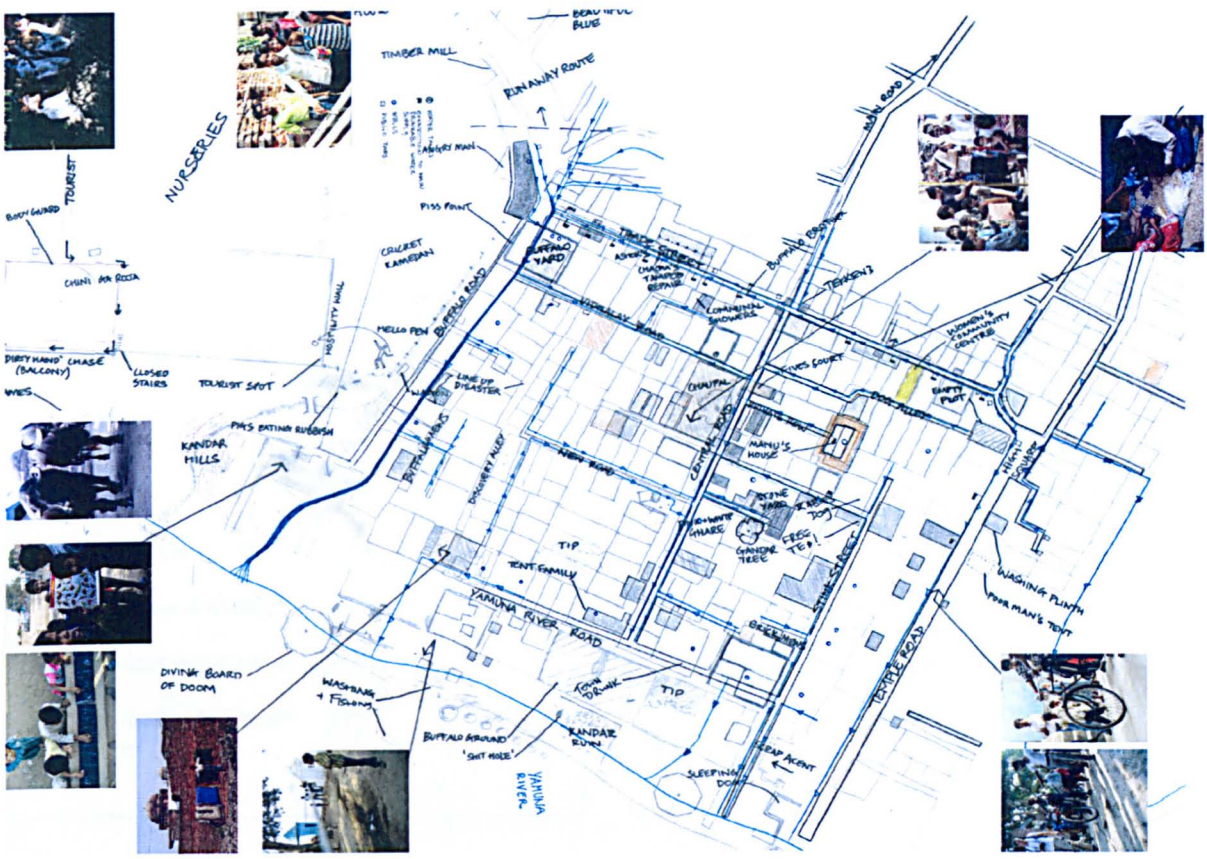
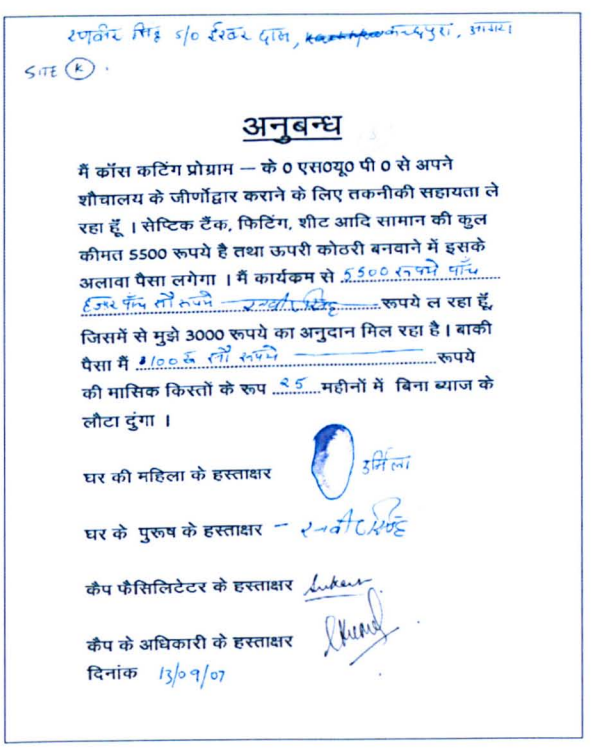


Fig. 2.14. Householder signing a toilet contract, facilitated by a CURE worker, July 2007.

A contract (fig. 2.14) was used between householders and CURE for the household toilet project in Kachhpura - this determined the terms of the subsidised loans taken out by residents for new toilet systems and structures. The project funding worked on a subsidised basis with the Water Trust[5] providing initial funds to pay for the construction of 10 septic tank toilet systems. A revolving Community Credit Fund and several Toilet Savings Groups were set up for householders to take out loans to pay for the construction of the toilet and washing structures. Borrowers would pay back a small amount every month according to their household income, allowing other individuals to take out loans. This local level loan system is based on established microcredit programmes originating from the Grameen Bank model in 1983. This loan process is continuing into its sixth year, with currently (April 2013) a total of 235 toilets installed in Kachhpura.

5 The Water Trust was set up in 2007 to support the work of the ARCSR research area at London Metropolitan University.

The householder toilet contract produced by CURE and LMU students[6] was drawn up in English (fig. 2.15b), and then translated into Hindi (fig. 2.15a) for those who were literate in the community. Illiterate women and men were read the terms of the contract by a CURE facilitator prior to signing both versions. Thumbprints were obtained from residents who did not have signatures, although this process enabled some women to learn how to sign their name, a gesture that could help their development in other aspects of their lives in the future.



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SITE (K).

अनुबन्ध

मैं कॉस कटिंग प्रोग्राम — के ० एस०यू० पी ० से अपने शौचालय के जीर्णोद्धार कराने के लिए तकनीकी सहायता ले रहा हूँ । सेप्टिक टैंक, फिटिंग, शीट आदि सामान की कुल कीमत 5500 रूपये है तथा ऊपरी कोठरी बनवाने में इसके अलावा पैसा लगेगा । मैं कार्यक्रम से 5500 रु पाँच हजार पाँच सौ रुपये [illegible] रूपये ले रहा हूँ, जिसमें से मुझे 3000 रूपये का अनुदान मिल रहा है । बाकी पैसा मैं 2100 रु दो सौ रुपये [illegible] रूपये की मासिक किस्तों के रूप 25 महीनों में बिना ब्याज के लौटा दुंगा ।

घर की महिला के हस्ताक्षर उर्मिला

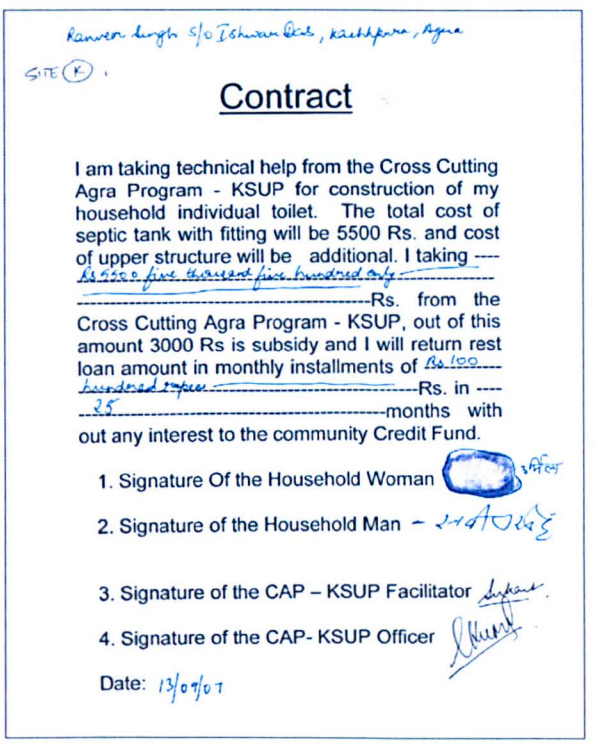
घर के पुरूष के हस्ताक्षर – [illegible]

कैप फैसिलिटेटर के हस्ताक्षर [illegible]

कैप के अधिकारी के हस्ताक्षर [illegible]

दिनांक 13/09/07

(a)



Ranveer Singh s/o Ishwar Dayal, Kachhpura, Agra
SITE (K).

Contract

I am taking technical help from the Cross Cutting Agra Program - KSUP for construction of my household individual toilet. The total cost of septic tank with fitting will be 5500 Rs. and cost of upper structure will be additional. I taking ---- Rs.5500 five thousand five hundred only ---------- Rs. from the Cross Cutting Agra Program - KSUP, out of this amount 3000 Rs is subsidy and I will return rest loan amount in monthly installments of Rs.100 ---- hundred rupee ---------- Rs. in ---- 25 ---------- months with out any interest to the community Credit Fund.

1. Signature Of the Household Woman [illegible] उर्मिला
2. Signature of the Household Man – [illegible]
3. Signature of the CAP – KSUP Facilitator [illegible]
4. Signature of the CAP- KSUP Officer [illegible]

Date: 13/09/07

(b)

Figs. 2.15 a&b. The toilet contract (in (a) Hindi and (b) English), July 2007.

An important aspect of the collaborative nature of this spatial practice is the idea of communication through making. The obvious challenge of the Hindi-English language barriers compounded with cultural barriers and illiteracy in the settlements. These ostensible barriers were addressed through collaborative making and engagement such as demonstration, drawing, and testing/problem solving on site together. Without a full-time translator following us around, we relied on other forms of communication developed through interaction with residents – these were focused around easily arranged group activities such as games, sports, drawing and making workshops that transcended language issues and drew wide-ranging interest from inhabitants of the settlements.

6 The students involved in the pilot toilet project in the summer of 2007 were myself, Shamoon Patwari, Katarzyna Banak and Spencer Owen.

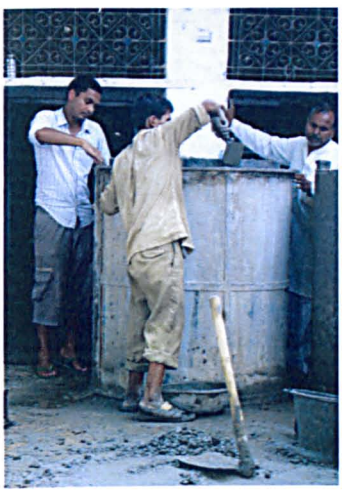


Fig. 2.16. Student and contractors making a pre-cast concrete septic tank, Agra, July 2007.

In Agra, students worked closely with the local septic tank fabricator and contractor, Vinod Kumar, to improve the concrete mix and reinforcement used in the construction of the pre-cast concrete septic tanks at his yard (fig. 2.16). Vinod was offered an exclusive contract with CURE to construct all the proposed toilets in Kachhpura and nearby settlements under the Kachhpura Settlement Upgrading Project (KSUP), under the moral assurance that he would maintain the high quality of the tanks produced (most tanks produced in the area were of poor quality due to fabricators attempting to maximise their profit at the expense of quality by saving on cement). Vinod was provided with a certificate of quality following cube tests on the improved septic tank concrete mix, which has seen his business grow rapidly in the years thereafter. The idea of a regulated monopoly with close engagement rather than competitive capitalism provided a collaborative approach focusing on the development of care and responsibility that then followed.

[Theme 2] Identifying a Site and a Programme

Fig. 2.17. Meera's toilet dispute and development of the dwelling, Kachhpura.

Students, researchers and professionals come into the picture as outsiders, bringing with them fresh outlooks on situations of rapid change and scarce resources. However, unfamiliar territories require an understanding that can be acquired through looking at the physical and cultural topography. This understanding, together with real insights from those engaged in the everyday workings of the place, are a vital initial stage that can lead to the identification of sites and programmes for possible interventions.

Delhi based NGO CURE works under several general development themes such as sanitation, sustainable urban livelihood, and community based tourism (CURE 2012). In identifying a site and programme, the idea of a common topic could be developed. In Kachhpura, the topic of clean places was developed under the general heading of sanitation, that dealt with hygiene behaviour and practices, access to toilets and treatment and re-use of wastewater, common interests shared by both NGO and academic institution.

In March 2007, an email workshop was set up between CURE in India and London Metropolitan University students in London. The workshop was focused around toilets and sanitation – a theme that had emerged from CURE's work with the communities, and the student's field work in Agra that year. Around the same time, a local woman in Kachhpura, Meera Devi, was in the midst of a land ownership dispute with her brother. This dispute resulted in the division of the property where they both resided, and for Meera, importantly the loss of access to a private toilet (fig. 2.17). Meera collaborated with students and CURE to become the first householder in Kachhpura to have an improved septic tank toilet system installed in her dwelling, and soon became an instrumental player in kick starting the pilot

toilet scheme. The local press (Bhardwaj 2009) called her a 'Toilet Missionary'. These chance conditions led to the identification of the first site and programme for an individual household septic tank toilet in Kachhpura village.

Identification of programmes and sites can emerge from initial work (physical/cultural survey), issues present and topics identified. However, they can also be provoked through events or circumstances, as in the case of the Community Toilet Complex (CTC) in Kachhpura. An existing government toilet structure outside the village, close to the *Mehtab Bagh* was proposed to be renovated as part of the DEWATS scheme even though it was agreed by all parties that location of the facility in a sump area prone to flooding was not an ideal choice. Lack of available alternative sites led to the proposed design for reconstruction being put forward to the Archaeological Survey of India (ASI), from whom permission was required to undertake any construction work within the 100m restriction zone around the Mehtab Bagh. A long process of negotiation ensued between CURE and the ASI, resulting in CURE deciding to eventually abandon the CTC proposal, opting to pass the responsibility onto the local authority (chapter 3.3.2). In the end, the provocation of the implementation of the DEWATS led to the eventual construction of a new CTC on a site adjacent to the DEWATS and closer to the community. Although the success of the new facility remains to be assessed when it is fully operating, the choice of site is a substantial improvement on the original sump site. The transference of the CTC project from CURE to the local authority shows a shift in responsibility for the programme following circumstantial events that eventually enabled the transfer to take place.

Identifying a site and programme involves looking for opportunities that present themselves within situations where there are limited resources. The ASI rejected two site proposals for the DEWATS to be located adjacent to the monumental gardens, resulting in the relocation of the DEWATS to a site within the community itself. The unusually heavy Monsoon rains in 2010 that led to flooding of low-lying areas particularly around the DEWATS site provoked improvements/upgrades to the DEWATS and revealed issues with the system that needed to be addressed. A substantial overflow drain was constructed alongside the system, to prevent flooding in future conditions of heavy rains. The incremental upgrading of the DEWATS following its initial completion allowed a process of resistance and accommodation to be followed, with progression taking place one step at a time in a reflective manner.

Similarly, in Navi Mumbai, myself and another research assistant, Shamoon Patwari, returned to Baban Seth one year after the construction of the classroom building allowing us to monitor and evaluate the use of the building by the community, and the impact of the building on the settlement. Key issues were identified in group meetings with Self Help

Groups[7] (SHGs) as well as comments from residents passing by. As a result, improvements were made by ourselves and the residents which addressed the issues most important to the users such as light, shade and ventilation (climatic conditions), daily cleaning (new floor) and security. The increased use of the building later provoked investments in local infrastructure (drains and concreted paths) by the local authority (Corporator).

[Theme 3] Coalition of the Willing: Explicitness and Knowledge

The idea of a 'coalition of the willing' can be used as a way of getting people involved in a collaborative process, engaging with a decision at a particular time and stage of the development of the project. In order to engage constituents at various levels of interaction and enable them to take control, it is important to provide knowledge and be explicit throughout the process. Gradual involvement (say with children to begin with) can lead to gradual accumulation of partners/participants that eventually leads to full cooperation (fig. 2.18). A collaborative spirit can be formed through commitment between several parties to achieve something, and only happens when people care and/or are interested in that something, and where goals are realistic.

Fig. 2.18. Working together to finish upgrading the classroom, Baban Seth settlement, March 2010.

7 A Self Help Group (SHG) is a village-based financial intermediary (support group) usually composed of 10–20 local women.

A participatory approach to community development requires initiation from those organising, leading or managing a project or intervention. Practitioners need to continually reflect on their role as leaders and collaborators and instigators at different stages of the project. Working in situations involving children (whether intended or unplanned) revealed a less formal category of roles, focused less on the idea of a professional designer or architect, but on more familiar role models. In both Kachhpura and the quarry settlements in Navi Mumbai, I was perceived and addressed (whilst as a student and then researcher) by children and young people as 'teacher', 'aunty', 'sister', and only occasionally as 'student'. Whilst fulfilling duties as professional academics, it was also necessary for us to play the roles of the provoker, innovator and enabler.

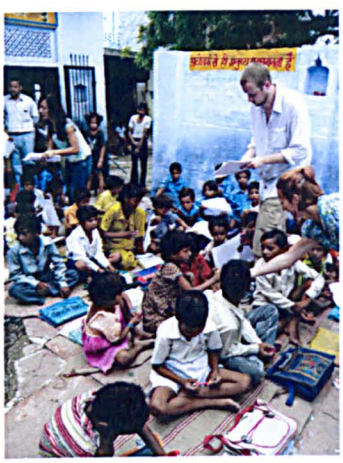


Fig. 2.19. A Hygiene Awareness Workshop with children at the local primary school, Kachhpura, August 2007.

An essential part of the process of integrating sanitation infrastructure into the community was the involvement of the residents themselves. *Panchayat* (heads of the village) meetings were held regularly to ensure everyone was aware of what was happening and were given the opportunity to voice their opinions and any concerns regarding the proposals. In Kachhpura, a hygiene awareness campaign was instigated to inform and educate the community. This involved a basic hygiene workshop with the children of the main primary school (fig. 2.19), and distribution of visual leaflets to every householder in the village that we developed, explaining how septic tank toilets work. The potential for educating children for advocacy in their households became apparent.

In dealing with community-based projects in the built environment, what level of involvement is appropriate? A key starting point was ensuring opportunities were available to everyone. As many members of the settlement as possible were invited to community meetings by NGO workers. Messages were spread by word of mouth a few days prior to the arranged meeting. In addition, informal discussions took place at every opportunity to raise awareness of the project. People passing by, curious to know what was happening, were briefed on the current stage of the project. Engagement, however, can be passive to active, and does not necessarily lead to empowerment. Engagement of community members implies not only the right to criticise but also the obligation to take part. Therefore, if they are willing to criticise, they should also be willing to act. Engaging with smaller groups, spreading knowledge using several means, and encouraging people to challenge the proposals generates genuine care and enthusiasm, that forms the beginning of community ownership and responsibility for what happens in their lives.

The relationships between individuals and institutions constantly shifted throughout the development of the project. At the making stages, different groups within the community became involved at different times. In Baban Seth settlement, children helped with clearing the site, joining in with students busy filling wheelbarrows with rubbish, eventually turning the

mundane task into a light-hearted competitive game. Women helped with carrying materials to site and were instrumental in finding water when this vital resource was scarce. Quarry workers, on their days off, assisted with manual (unskilled) labour digging foundation trenches, and carrying stone donated from the neighbouring quarry. In Kachhpura, the youth took on the role of caretakers, making sure materials stored on site were not stolen, and communicating progress on the project to other residents.

Children play an instrumental role in engaging communities in collaborative projects. Local kids get involved right from the start, enthusiastically helping students to survey by holding tape measures and acting as unofficial tour guides, offering hidden insights into life in the community along the way. The friendships initiated can then lead to planning of events such as hygiene and drawing workshops at the local school through the children's introductions to their teachers. At Baban Seth, the kids were involved in an exercise to envisage the scale of the proposed classroom building by standing along the marked out perimeter holding hands, therefore spatialising the imagined structure (fig. 2.20).

Fig. 2.20. Envisioning the site through children and games, Baban Seth quarry settlement, March 2009.

[Theme 4] Building on the Familiar and with the Local

As mentioned in theme [2], unfamiliar territories require an understanding of the physical and cultural topography before one can honestly intervene to improve the most basic of conditions of scarcity. Building on knowledge of the existing situation - familiar building methods (skills), materials and structures in the vernacular, as well as familiar ways of living and social institutions - allows for appropriate actions to be taken.

In Kachhpura, the social issues of lack of access to toilets and having no choice but to defecate in the open were borne predominantly by women. Initial reluctance by householders to install toilets within their dwellings derived from mostly failed attempts previously by a small percentage of residents to house toilets within their dwellings. The experience of leaky, broken septic tanks and cesspits of poor quality, as well as poorly maintained connections and superstructures led to dirty, foul-smelling toilet areas within dwellings leaving a poor impression of household toilets. The worst cases of household toilets were those that had no systems attached and outflowed directly into street drains, or were emptied using the head-load method. However, experience and impressions of CTCs were equally low in the community.

Fig. 2.21. Toilets outflowing directly into informal drainage channels in Kachhpura, July 2007.

The pilot individual household septic tank toilet project was initiated in 2007 as part of KSUP by CURE and LMU. It was observed that as more improved toilets were installed in the village, the stigma of toilets as dirty places decreased and households (particularly those with no courtyard or outside space eg. rooftops) opened up to the idea of putting toilets inside their homes. The familiarity of and trust in the improved septic tank toilets throughout the village removed the associated stigma of toilets as unclean places.

In Baban Seth where the first classroom building was constructed, this idea of familiarity was the launching pad for involving community residents in the process of design and construction – and therefore allowing for freedom of choice. Community platforms exist throughout the quarry settlements, providing a political and social forum for collective gathering within a community (fig. 2.2a). As a traditional concept, with its origins in rural villages, these platforms have emerged as a stable institution within a transitional place. The design of the Baban Seth quarry classroom building began as a simple raised platform, to address the major issue of the sump site and monsoon flooding highlighted during initial discussions with the residents.

(a)

(b)

Figs. 2.22 a & b - (a) A familiar community platform structure typically found in rural settlements, 2008; (b) The completed classroom building at Baban Seth quarry worker settlement, March 2009.

Once the stone platform had been constructed, residents expressed a need for a roof structure that would provide shelter from the sun and rain (as well as stray rocks from the nearby quarry blasting). A simple lightweight roof was proposed. This process of negotiation with the site, people and evolving building continued through each stage of construction - with the addition of a low wall, the quarry classroom place began to change from a platform to a building, consolidated with the introduction of the final major element, security. Women expressed concern that drunken men would misuse the building in its open state, leading to the addition of steel grilles and a lockable gate, thus securing the building, whilst allowing for ample light and ventilation. The result of this process was a classroom building

that had developed from an initial imagined gathering place as a raised platform to a classroom connected to the temple.

In Kachhpura, the proposal for a DEWATS to treat the main *nala* was a completely new concept to local contractors and tradesmen. The system had been modelled on the technology of an existing DEWATS in Delhi, designed by LMU researchers (including myself) in collaboration with an Indian architect and engineering consultant. The unfamiliarity of the design to local small-scale builders in Agra reluctant to take on the risk of something new required an innovative strategy to be developed. Having failed to obtain any realistic quotes through a tender process, CURE approached the contractor, Vinod, of the prefabricated reinforced concrete septic tank toilets being installed in Kachhpura. There were originally plans for two independent DEWATS (systems 1 and 2) which would treat the main and secondary *nalas* in Kachhpura. The system for the secondary *nala* was redesigned after discussion with Vinod and involved the use of standard size prefabricated concrete septic tanks (identical to the ones used for the household toilets) in place of in-situ rendered brick tanks.

The use of an existing product easily fabricated at Vinod's yard enabled the feasibility of a low-cost proposal for the system. Treating the proposal as a simple scaling up of the technology allowed Vinod to realistically extend his ambitions beyond toilet systems. The size of the other system servicing the main *nala* was unfortunately too large for this idea to be used. However, by discussing these issues and addressing all concerns in detail, Vinod gained a confidence enabling him to also construct system 1 in the manner proposed (rendered brick tanks). System 1 was eventually completed by Vinod and his team of workers in close collaboration with CURE staff, professional consultants and LMU researchers (though system 2 has been put on hold for the time being pending evaluation of system 1 and funding).

The use of familiarity to invite engagement in the making process leads to the assembling of a conceptual image and understanding in people's minds. If this process of familiarisation does not occur, the initiative risks lack of social engagement by the intended users.

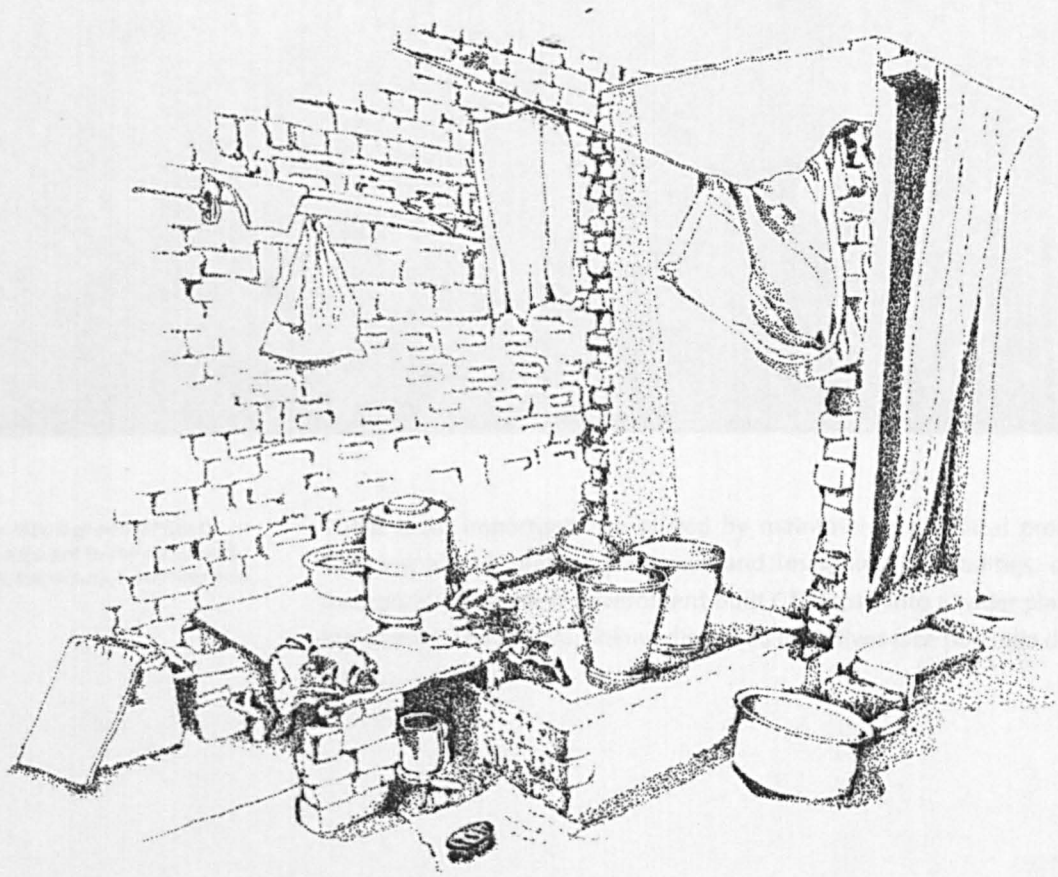
[Theme 5] Placemaking: Recording Change Through Small Details and Events

Placemaking is defined as *'the way in which all human beings transform the places they find themselves into the places where they live'* (Schneekloth & Shibley 1995). The principal idea of community placemaking to be discussed here is that of taking something and making it your own. Empowering people at different levels and enabling them to have some level of control over their environment is the key to successful (design and planning) interventions in the built environment.

The recording of change through small details and events that happen around the built interventions enables interpretation of the institutional order through the notion of placemaking. Appropriation through temporary events and small gestures at and around the sites were collected and documented over time (see chapters 3.3.3 and 3.3.4). Analysis of these collections of moments has generated ideas and topics about permanence (*pucca/kuchha*), middle-classness and collective identity - topics that address aspirations and suggest a changing metabolism of the settlement (and interpretation of town).

The introduction of toilets in Kachhpura has led to the changing of daily habits within the household. Meera's yard with her new toilet and wash area (fig. 2.23 and chapter 3.2.3) now resembles the order and organisation of a Victorian scullery, where the washing up of dishes and laundering of clothes takes place in a wet zone; an extension of the kitchen area. Tidy yards create better-utilised common places within the dwelling (fig. 2.23), and the permanent infrastructure acts as a catalyst for improvements to communal streets and drains. The introduction of informative signage and posters, and the spontaneous naming of places such as *'Swaach Gali'* ('Clean Street') have given significance to a new kind of public space, represented by cleanliness.

Fig. 2.23. Meera's new toilet structure and washing platform, Kachhpura.



The architecture of the DEWATS has created a new identity for the former waste-filled edgeland of Kachhpura village. Brijesh's *baraat* (ceremonial wedding procession) proudly passed along the area that used to be the *nala*, taking foul water away from the village. The notion of the DEWATS as a clean setting has encouraged appropriation of the area by nearby residents for important functions such as marriage celebrations with the erection of a temporary colourful *pandal* (tent) structure (fig. 2.24 and chapter 3.3.3).

Fig. 2.24. Marriage *pandal* (tent) erected adjacent to the completed DEWATS, Kachhpura, November 2011.

There is an important role played by maintaining a cyclical process of thinking ahead, making proposals and imagining possibilities, such as incorporating the new government built CTC (2011) into a wider placemaking plan for the DEWAT, linking dispersed initiatives (see portfolio drawing 3.3.3).

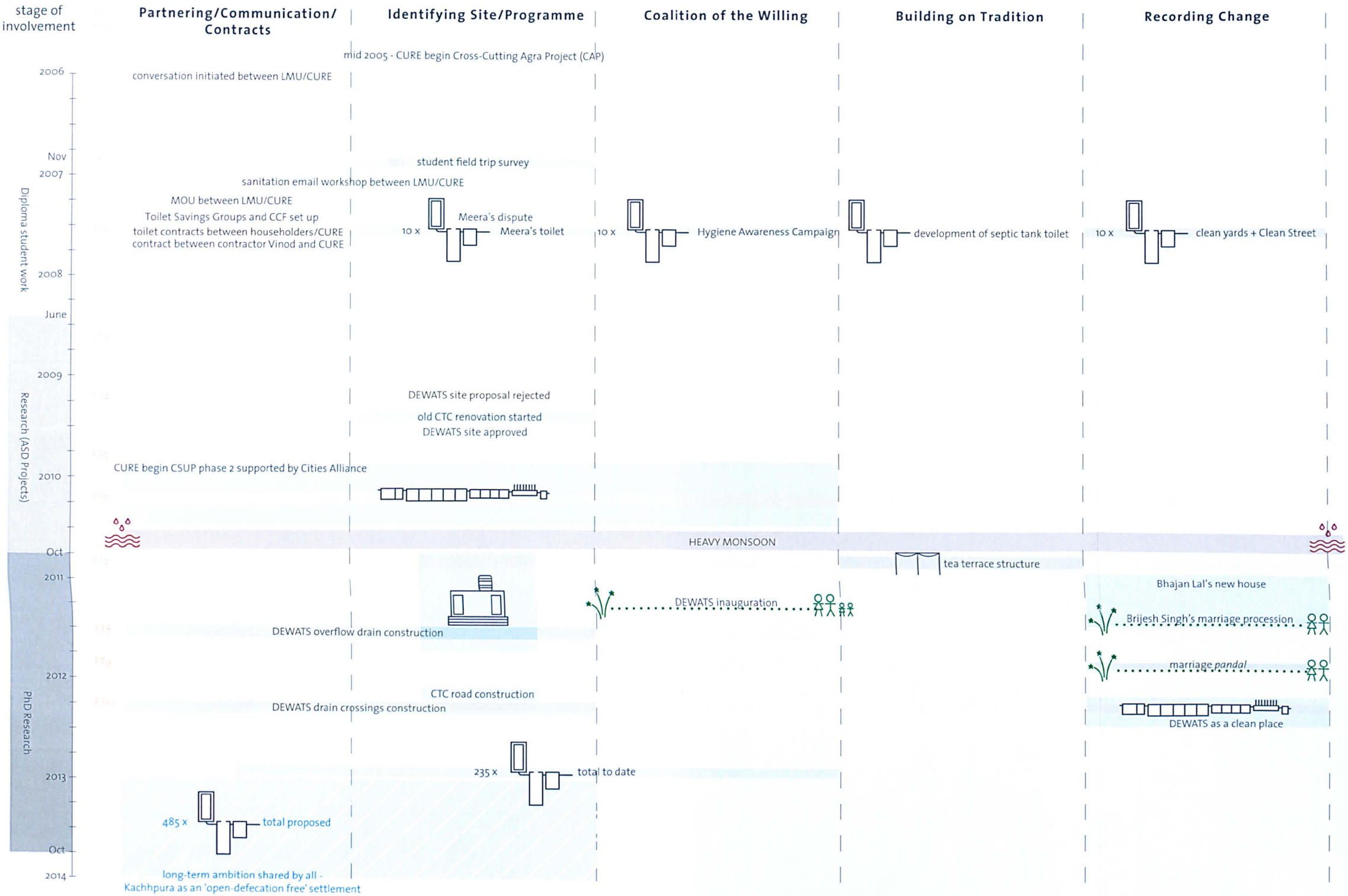


Fig. 2.25. Spatial Practices - Kachhpura Settlement Upgrading Project, Agra

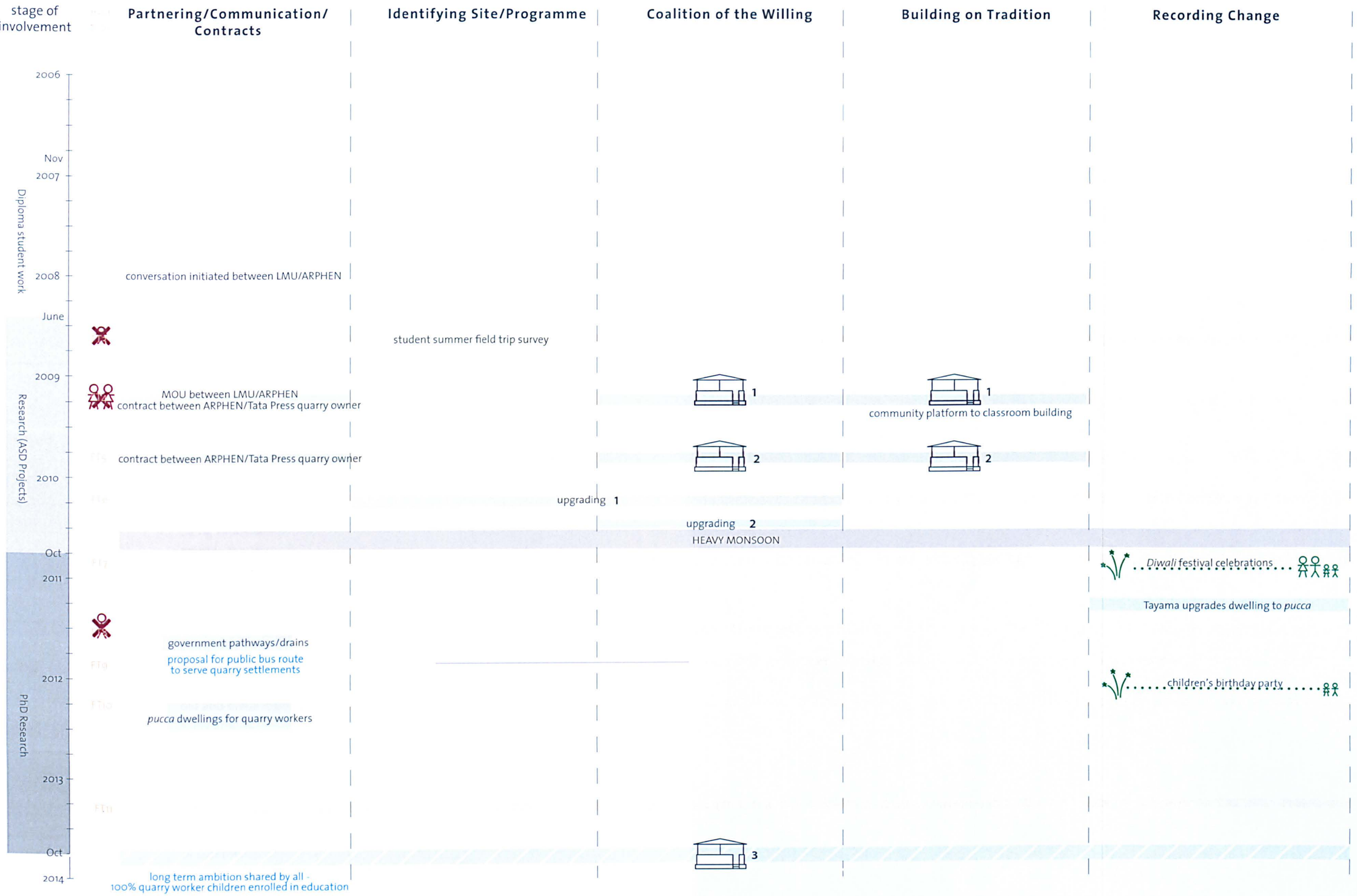


Fig. 2.26. Spatial Practices - Quarry Classrooms Project, Navi Mumbai

2.6 WORKING RE-DEFINITIONS

A discourse around, and an analysis of the evolving process and methods adopted for this study lead us to new understandings of commonly used terms in the field of community development in the built environment. The re-defining of certain terms within a local cultural context can offer a more profound and useful meaning, arising out of direct negotiations in a particular setting.

2.6.1 Informal Peri-Urban Settlements and Urban Villages

The term 'slum' here has intentionally not been used to describe the case study settlements being discussed. Kachhpura is officially now an urban village. The quarry worker settlements in Navi Mumbai are identified as different to established 'slum' areas in the same region. 'Peri-urban' locates these settlements at the periphery of the city, more part of the urban than the rural, but with connections to the villages. 'Informal' describes their low-income, incremental growth as settlement colonies.

Peri-urban areas are characterised by uncertain land tenure, inferior infrastructure, low incomes, and lack of formal recognition by governments. Peri-urban and informal sector settlements are also commonly referred to as 'squatter settlements', 'marginal settlements', 'shanty towns', 'urban slums', or 'illegal settlements', by the city (USAID 1993).

With the rapid urbanisation of the world's cities, rural villages are gradually being swallowed creating a new category band/belt of peri-urban settlements - the phenomenon of the urban village. An example of this is Kachhpura settlement in Agra. In addition, the growing migration of workers to the cities creates new settlements in these edgelands. The stone quarry worker settlements in Navi Mumbai are marginal communities situated at the foot of a 15km long stretch of hillside actively being mined for road stone. The nature of these clusters of small settlements evoke a temporal sense of rural living in a harsh urban context, in a way much like a village in a city (or urban village). The reason why many urban villages[8] contain such old and historic buildings is because they were originally settlements that grew around those buildings in the first place.

2.6.2 Shared Spaces

This study addresses shared spaces in the local sense, as opposed to 'public space'. Public spaces, as defined in the West (with roots in the agora, forum or commons), do not exist in informal peri-urban settlements in the sense

8 *Chirag Dilli* in South Delhi is an example of an established urban village in south Delhi. See glossary.

of formal civic places such as park or squares in cities, or even such settings as the agora or forum. Instead, the informal places that emerge out of daily routine and formal institutions are created by tradition and culture. In contrast to Western cities, shared places in Indian cities are generally seen to be dirty, noisy, smelly, crowded and poorly managed.

The earliest form of human settlement was the village, where a cluster of huts was grouped around a central open space. Every community had a place of assembly where people gathered to discuss their common affairs, resolve disputes and celebrate festivals. A sacred tree or stone, a sacrificial altar or shrine, marked the space. This idea of community space passed into the cities that grew out of these settlements, assuming varied forms and more complex functions.
Dejesus 2011

The city was filled with a collection of both religious and secular spaces, each offering a different kind of place for social interaction amongst the residents. Like the church in medieval Europe, religious institutions such as temples and mosques formed the focus of the communal life in Indian cities. The courtyard of the main mosque was one of the largest open congregational spaces in the urban fabric, whilst the *bazaar* (market) street formed the main commercial spine. Shared spaces were traditionally associated with trade and sacred/secular-ness, but were not political arenas (like the Greek agora).

Migration from rural areas to the city for livelihood opportunities requires adapting to urban living, which often results in a sacrifice of the life left behind. In *The New Landscape - Urbanisation in the Third World,* Correa (1989 pp.32-33) argues that compared with the rural village, poverty in the city is dehumanising:

In rural India the poverty has a far different expression. The people are just as poor, perhaps even poorer, but they are not so dehumanized. In the village environment there is always space to meet and talk, to cook, to wash clothes. There is always a place for the children to play.

Correa describes urban living as a series of spaces operating within a hierarchical system, under Indian conditions that appear to have four major elements: private space for the family (for cooking, sleeping, storage); areas of intimate contact (front doorstep for interaction with neighbours; children's play spaces); neighbourhood meeting places (water tap or well for connection to the community); and a principal urban area (for example, Maidan used by whole city). Each of these elements consists of both covered and open-to-sky spaces. Chapter 3 questions whether, in informal urban settlements, this hierarchical system is in fact limited to the first three elements, omitting the 'principal urban area', and what residents do instead. The lack of connection to the city, physically, socially and legally

leave urban villages, such as Kachhpura, though situated within the city landscape, sitting as islands amongst the urban fabric.

2.6.3 Language and Hindi Terms

To begin to understand the significance of the order of the public realm in Indian culture, it is helpful to look at the familiar naming of these spaces and the terminology used. For the purposes of this discussion, I will refer solely to the primary language used in India, Hindi, though of course there are hundreds of dialects spoken in the country which all have their own versions of these words. If we take the term *'Panchayat Chowk'* as an example, this can be used in a general way to describe a community platform or a courtyard in a settlement, as well as a common meeting place. *Panchayat* is a village council - these are usually formed of village elders that represent the opinions of the community. Through working with NGOs in North India, I have found that the use of this word has been expanded and adapted to represent new councils in settlements such as *bal panchayats*, or youth groups.

Jain (2004) explains the broad use of the word *'chowk'* saying:

Etymologically, chowk is a Hindi term meaning 'a central space of gathering that has four corners'. In [the] Indian context, this term is used for any gathering space at the level of the city, the cluster and inside the Havelis.

She goes on to suggest that the use of the traditional word *'chowk'* has been retained today, although its meaning has evolved:

The significance of the social centre as opposed to the physical one is revealed in an interview with a haveli resident. Although residing in a modern apartment, the family members call the living room 'chowk' as it is a social centre of gathering for the family. In a Hindi dictionary one of the meanings of this term chowk is Bada Vedi i.e. a big altar used for Vedic fire rituals. This indicated the ritual associations of this space.

There are many similar phrases in English to describe a common meeting place in a community; village meeting place; open veranda; gathering place. Another commonly used word traditionally is *'chaupal'*. The *chaupal* is a community building or space that served as a platform for democracy in early rural settlements. It was also used as a place for celebrations and was the hub of community life in villages. In smaller villages, a *chaupal* can be a simple raised platform that is shaded by a large tree, typically a *Neem*[9], *Banyan* or *Peepal* tree. In larger villages, the *chaupal* may be an elaborate structure that also doubles as a community guesthouse.

9 The *Neem* tree is a sacred Indian tree, known throughout India as the 'village pharmacy'. Its leaves, flowers, branches and oil are used for a variety of medicinal purposes.

Mishra (2002 p.123) provides an expanded description of a *chaupal* as:

... a public place, fixed or changing, in the Indian villages where the villagers sit and discuss their problems, celebrate their pleasures, share the pains of an individual, family or a particular group, sort out their disputes in consultation with the village elders and traditional panches (judges) and retain the communal harmony by maintaining tradition, norms, rituals of village life. As a sacred place of secular nature, chaupal guarantees freedom of speech and expression to everybody in the villages without discrimination on the grounds of sex, religious affiliation, caste, rank, status, majority, minority.

'Angan' was a Hindi word traditionally used to describe the courtyard of a house, perceived as a sacred place or 'heart of the house'. In rural areas an *angan* is where people get together to discuss, greet, and socialise. In contrast to *chaupal* this space has no political or democratic association, though it is linked with cosmo-religious symbolism and in this respect is also the sacred centre or 'womb' of the dwelling.

Another example of the evolving complexities of Hindi vocabulary in the context of shared spaces is *'gram'* - a social meaning for village. Combined with other words, this can be used to describe various institutions, such as *gram jharoka* (common facility) or *gram panchayat* (village council group).

When dealing with the shared environment in an informal urban settlement, the scale of spaces has to be considered. Comparisons between public spaces at city level and shared spaces in settlements can be made, such as *maidan* (park) v. *chowk* (square), lake v. *talao* (pond), although the difference in scale affects their place within the larger institutional order of town and city.

Today, words such as *'angan'* are being revived in an attempt to bring back traditional ways of thinking about shared spaces into the contemporary city. In addition, new words such as *'sarvajanik'* (Mehrotra and Nest 1996 p.68) meaning 'common' are being introduced into the vocabulary of 'public spaces' in an attempt redefine the modern public domain.

This research investigates how these words are used in my two case study settlements, in order to understand the nature of shared spaces in these examples.

2.7 SUMMARY

The evolutionary character of the methodology has developed through a journey of continual learning by reflecting on making throughout the process. Understanding the cultural and physical topography (Architect as Anthropologist) through a narrative lens (Architect as Author) and through spatial practice (Architect as Craftsperson) is a cyclical process. These modes of interaction, and the nature of this practice can be represented through understanding the resources in a place and making appropriate (small scale) interventions that build on understood traditions and respond to individual and group aspirations. An on-going gradual process, that is adaptable and empowers people at different levels (through placemaking and appropriation of the new places), allows them to take control and make something their own, leading to open-ended interventions that follow certain traditions but also invite meaningful change through practical responses to current (modern) demands. This process has allowed me to derive insights into the nature of shared spaces in my two case study situations.

The notion of negotiation is viewed in the context of this study as a culmination of dialogue, cooperation, participation and engagement. We should encourage a culture of learning from making, shifting the focus from decisions made at the top or from the outside. The project and partnership cycle offers a flexible programme and a forum for discussion inside the project - neither case study project followed the exact same process or involved the same levels of participation. Proposals usually developed at the start are then modified to take into account of the resources available - materials, skills, labour and time.

The framework for methodology followed in the two case studies has led to the emergence of themes that develop through the methodological process. By identifying a site and a programme [2], a project is found that takes advantage of scarce resources on the site; the familiarity [4] of the vernacular is used to identify with the culture of the settlement, linking people with place and architecture. The role of the architect and idea of partnering [1] has created new collaborations, income generating livelihood groups and community identity and conviviality, leading to social change. The engagement of different constituents at various stages of the process [3] allows those who are willing and able, to contribute and be involved. Key individuals emerge, such as Meera and her toilet in Kachhpura, that embody the process, leading to empowerment. Her role as a catalyst has led to change in the people and the community, and empowerment towards Sen's (1999) 'substantial freedom'. Recording change through small details and events [5] is about placemaking - the life memory and organisation of a place, enhanced by the architecture of opportunity, instigated through small interventions and catalysts. This is achieved through community

ownership and appropriation leading to sustainability (holding in trust for future generations), and the notion of avoiding being 'caretakers' (Hamdi 2010).

Everyday limitations caused by conditions of scarcity are overcome by transforming places through improvisation – what Sennett (2012) calls 'users' art'. Dealing with physical conditions of scarcity releases immense resources of creativity within the people. A cyclical process of negotiation, adaptation, resistance and accommodation, as opposed to problem and solution, can be used to find and sustain a good fit between places and people. The notion of scarcity can begin to be addressed through the idea of fit with topography.

At stake is a more concrete and nuanced understanding of the nature and settings of what is too-often generalised as 'public space'. The provision of amenity buildings and of such post-hoc infrastructure as purification drains creates situations of negotiation with constituents, who in turn develop a civic commitment and solidarity in the course of the work. These negotiations depend upon subtle and rich cultural contexts, which become evident during the course of the project, and which properly characterise 'public' in this non-Western culture. In this way the projects are vehicles of research and understanding, not applications of a theoretical approach divorced from the concrete conditions.

CHAPTER 3
Creating Shared Territories Through Negotiated Interventions

3.1 INTRODUCTION

In informal peri-urban settlements in India, what are the conditions for collective life at horizons that range from the domestic to the civic? The *gali* (street) as part of the institutional order of public life and of town is embedded in the domestic levels of involvement of everyday life. The *chowk* (square) provides a setting for people to come together and embodies the cultural identity of a community. What, then, is the role of amenity buildings and the effect of the post-hoc introduction of infrastructure on the creation of shared spaces?

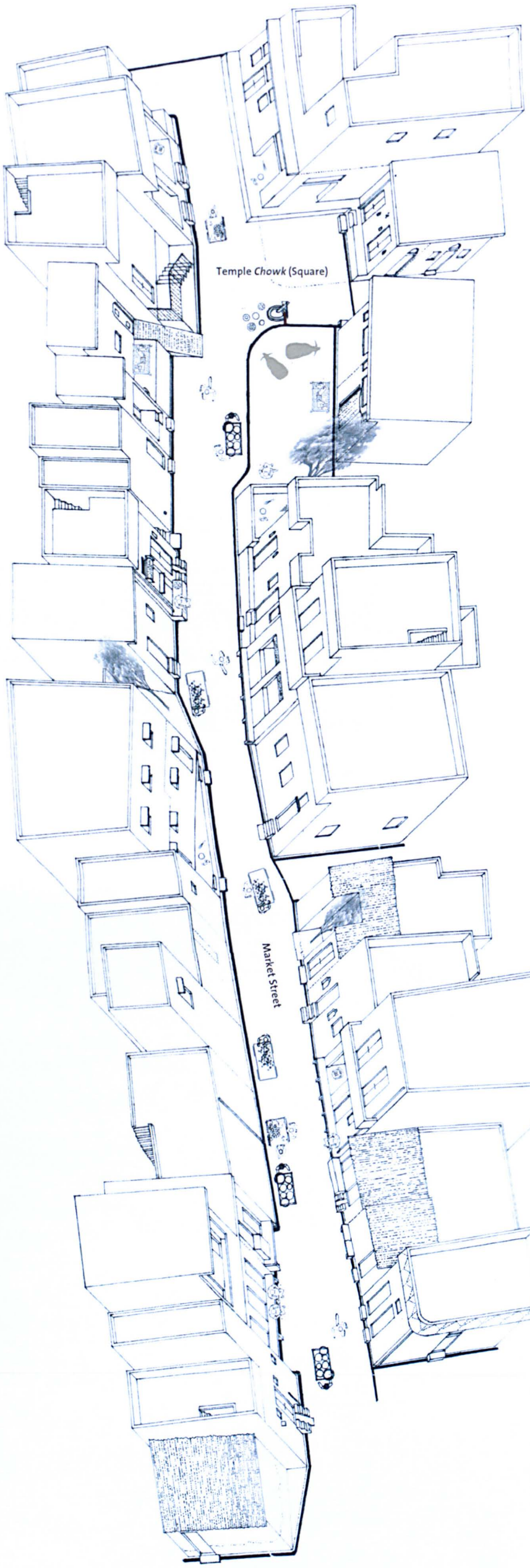
Chapter 3 builds up the key settings central to this research, and includes more detailed discussion of the case study interventions. This chapter concerns itself with town as institutional order, and my exploitation in the live projects of this basic, fundamental order to effect not only adaptation and amelioration in particular settlements, but also the making of town, civic-ness and empowerment.

Section 3.2 *Dwelling and Street* addresses the role of the *gali*, *otla* (threshold) and dwelling as settings in the everyday negotiation of domestic shared territories. Notions of cleanliness and permanence are explored through the narratives of Meera, Brijesh and their families, together with the introduction of household toilets in Kachhpura.

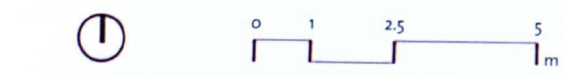
Section 3.3 *Neighbourhood* explores ideas about individualism and collectivism through the incremental development, and creation of shared spaces and amenity buildings such as the community toilet complex, celebration places and emergence of a new clean pedestrian thoroughfare.

Section 3.4 *Settlement and Town* examines collective cultural identity, secular and sacred places through the upgrading of civic places and buildings such as the *Mandir Chowk* (Temple Square) and *Panchayat Chowk*. Places for civic, social and political engagement are explored through temporary and permanent settings such as the meeting mat and community platform.

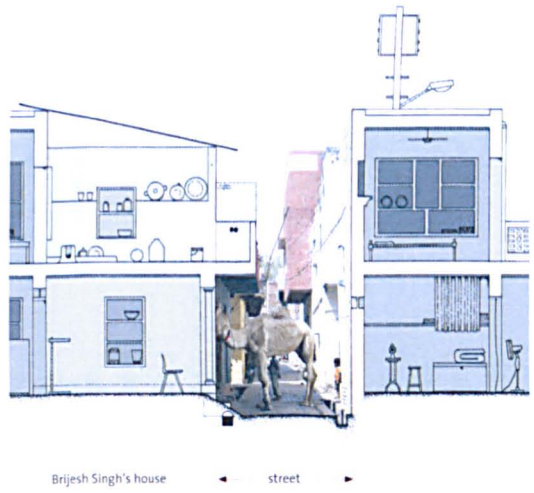
3.2 DWELLING AND STREET



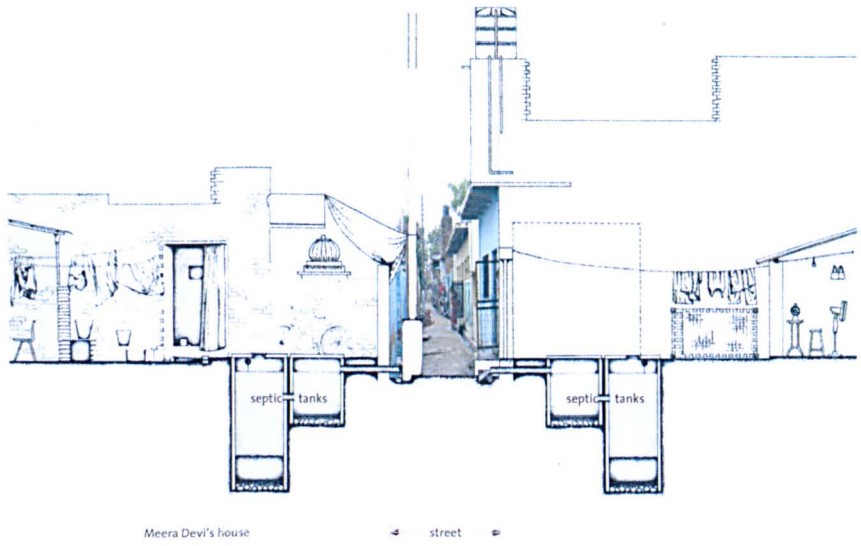
A - Sketch Plan of Market Street



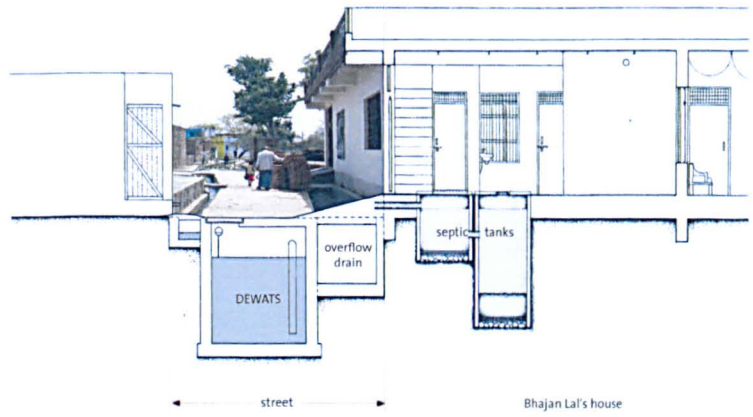
3.2.1 *Galis* and *Otlas* - Market Street, Kachhpura, Agra



B - Section Through a Street in the *Purani Abadi* (Old Area)
(Brijesh Singh's House)



C - Section Through *Swaach Gali* (Clean Street) in the *Nai Abadi* (New Area)
(Meera Devi's House)



D - Section Through the New DEWATS Thoroughfare in the *Nai Abadi*
(Bhajan Lal's House)

Kachhpura Key Plan

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.2.1: *Galis* and *Otlas*, Market Street, Kachhpura, Agra.

3.2.1 *Galis* and *Otlas*

In informal peri-urban settlements in North India where the climate for most of the year is hot and dry (apart from the monsoon season - June to September), the street serves as a replacement for domestic activities usually carried out in the home. With the lack of space inside the dwelling and also of the availability of basic connected services such as water supply and drainage, the *gali* (narrow street or alley) outside of the home is used for daily chores such as washing and bathing. The *otla*[1] (threshold entrance) built over an open street drain provides an outdoor platform for household tasks to be carried out in close proximity to the home. These streets become social spaces for interaction for residents undertaking domestic chores whilst conversing with one another. The narrowness of the *gali* and upper floor building overhangs create a sense of enclosure, welcoming only residents who are familiar with the area. This intimate quality of the *gali* allows these activities to take place in the open with a moderate level of privacy and low risk of interruption from outsiders. The physical setting of the *gali* provides the opportunity for residents to share their domestic everyday life with their neighbours, and is characterised by the variety of activities that take place throughout the day.

Fig. 3.1. Morning on a *gali* in Kachhpura settlement showing women sitting on *otlas* chatting and carrying out domestic chores, Agra, August 2008.

1 An *otla* is a threshold entrance of a building that is an element of transition between the street (public) and house (private).

In the village of Kachhpura, Agra, this can be observed in the early morning, where a variety of domestic tasks are performed such as bathing and cooking are carried out over casual conversation across the narrow streets. Later, income generation activities take place such as sewing and shoe-making. Young children play in the streets throughout the day, and older kids study on the *otla* in the evening. Life in these neighbourhood streets tends to continue late into the night. Within the settlement, the *gali* can be seen as a vibrant place where daily activity becomes lifestyle and cultural practice.

At Baban Seth quarry settlement, there are fewer *galis* with the rugged terrain making the carving of streets out of the landscape a difficult task. From the west entrance to the settlement, one major pathway passes through and branches off, leading to clusters of dwellings around shared courtyards or outside areas (fig. 3.3). With the exception of this pathway leading to the *Mandir Chowk* (Temple Square) which was concreted in 2011, the streets are unsurfaced with no formal drainage infrastructure. Shallow channels are crudely dug out of the ground to facilitate the flow of surface water particularly during the heavy monsoon season. The older blocks of *kuchha* housing built by quarry owners and rented to workers are arranged as barrack type rooms – one room shacks in two rows facing inwards with a narrow 'street' between them. Up to five male single migrant workers (or whole families) share each small dwelling, so residents use the makeshift *gali* and *otlas* between dwellings to carry out most household chores.

Fig. 3.2. Morning on a *gali* in Baban Seth quarry worker settlement, Navi Mumbai, November 2011.

Fig. 3.3. Sketch plan of Baban Seth settlement showing layout of dwellings and 'street' structure:

1. *Mandir Chowk* (temple square)
2. new classroom (2009)
3. main quarry road
4. west entrance
5. new concreted pathway (2011)

courtyard

narrow 'street'

The *otla* is a physical extension of the house providing a transition threshold between dwelling and street. In Kachhpura settlement, these range from a small step formed from a slab of sandstone to large semi-closed verandas, some personalised and decorated with a great deal of care. The domestic *otla* is seen as a woman's place, but the multipurpose and adaptable functions of the threshold platform in public settings and institutions (e.g. shop or temple) can be seen throughout the village and potentially shared by all.

The negotiation between *gali, otla* and dwelling (or small public institution) along a streetscape interacts with the flow of linear movement and activity. Incremental extensions and additions can be made through negotiation within a customary framework. Domestic *otlas* extend just enough onto the street to bridge the drain and provide a platform for household chores, but not so much as to cause a dispute with a neighbour. A larger *otla* as an extension to a local shop (to display goods) is usually accepted by the neighbourhood, as long as the width of the street is adequate for traffic passing through (e.g. cart vendors).

(a)

(b)

(c)

Figs. 3.4 a, b & c. The *otla* as an (a) extension to a shop used to display vegetables throughout the working day; (b) as a place for a child to do homework in the evening; and (c) for women to gather and chat in the morning, Kachhpura, Agra.

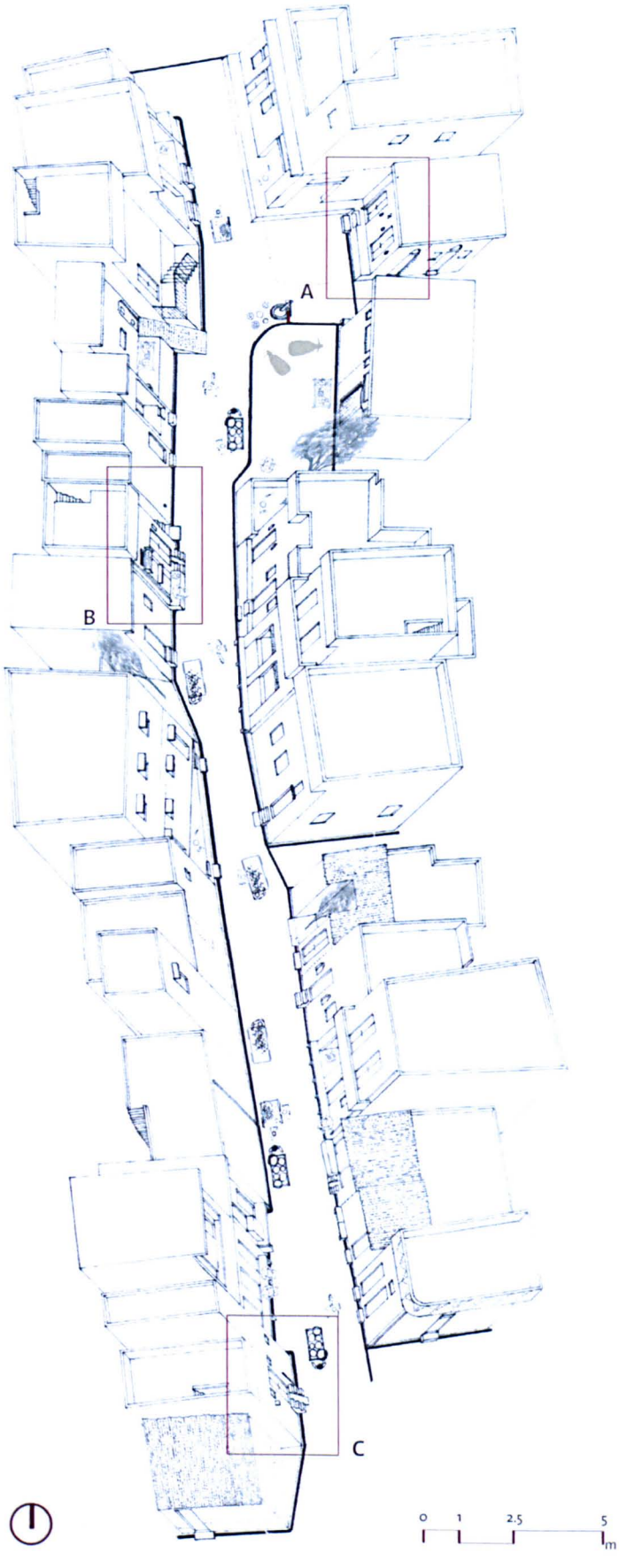


Fig. 3.5. 'Market street' in Kachhpura.

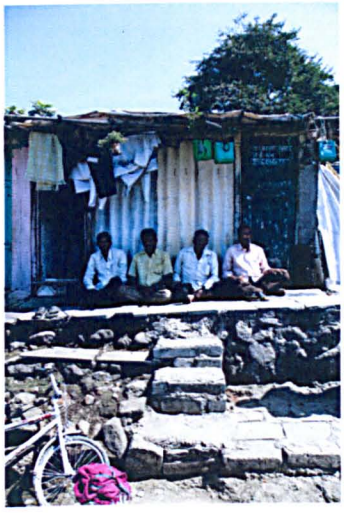


Fig. 3.6. Men relaxing on the *otlas* of their shared dwellings at Tata Press quarry worker settlement, April 2012.

In the quarry settlements, the less developed settings of streets with predominantly *kuchha* dwellings do not provide much scope for the involvement of traditional *otlas*. Where they do exist, they are often solid stone plinths on which the dwellings are perched, set back to provide a platform at the front and raised up high (to prevent flooding during the monsoon). Occasionally, buildings such as this former quarry office (fig. 3.7) in Baban Seth settlement have large veranda-style *otlas*. This threshold platform provides a comfortable shaded social place for workers now renting the building as accommodation, outside of the cramped, hot conditions of the rooms inside.

Fig. 3.7. Men relaxing on the *otlas* of their shared dwellings at Baban Seth quarry worker settlement, April 2012.

Fig. 3.8. Upgraded street in Kachhpura, Agra, 2007.

In Kachhpura, KSUP has led to the construction of a total of 235 individual household septic tank toilets in the village to date. In order to keep up with the rapidly increasing number of septic tanks and levels of effluent being discharged into open drains, it was proposed that infrastructural development at street level would have to be implemented in parallel. The Detailed Project Report (DPR) produced by CURE for the local authority (ANN) suggested an improved drainage system including the repair of drains and outfall points and relaying of brick pathways (*kharanja*) throughout Kachhpura, linked to a waste water disposal system (CURE 2007).

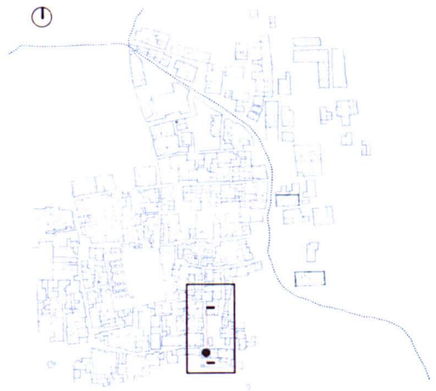
With limited funds, CURE began to remediate drains and repair pathways in Kachhpura, focusing on streets along the Mughal Heritage Walk (MHW). Following the repair of streets, residents set about remediating the threshold between their dwellings and the street. *Otlas* were reinstated over the new drains, some with significant improvements and additions such as bathing cubicles, others simply using a single slab of sandstone to connect back to the street. Two neighbouring houses with similar frontages were upgraded together with a single consistent platform spanning across the entire facade of both dwellings. In fig. 3.9, all the houses on this

newly rehabilitated street have painted all their houses in the same shade of blue ready for the new year (*Diwali*) celebrations, giving the impression of a united community or collective street. The visible improvement of the streets along the MHW assisted with furthering CURE's discussions with the ANN regarding the upgrading of *galis* in other areas of the settlement, beginning in particular with the streets with the most new toilets installed, such as *Swaach Gali* in the New Area of Kachhpura (chapter 3.2.3).

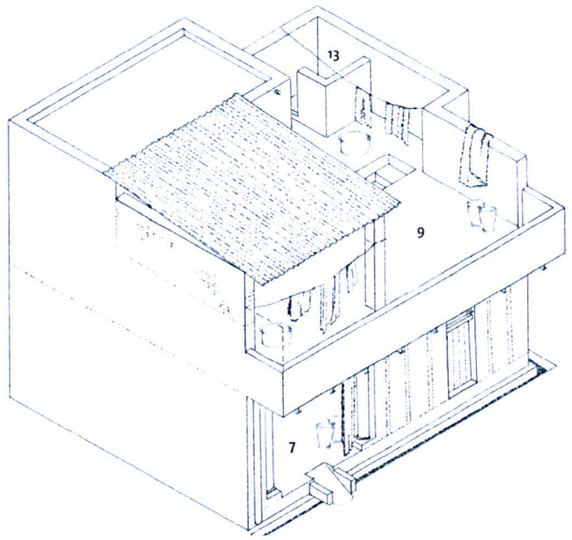
Fig. 3.9. New *otlas* over a recently repaired street and drains, August 2008.

Fig. 3.10. Women chatting on the newly concreted pathway, Baban Seth quarry settlement, Navi Mumbai, November 2011.

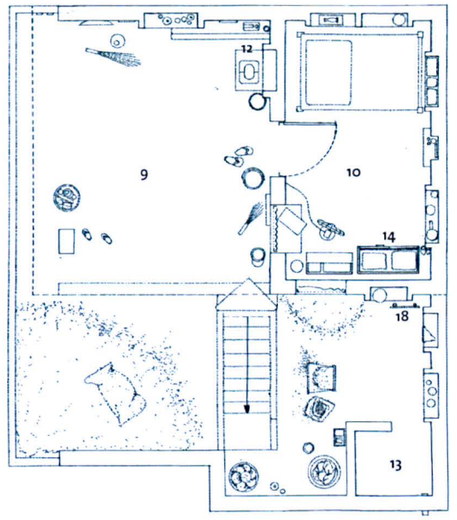
At Baban Seth, the concreting of the main pathway by the Navi Mumbai Municipal Corporation (NMMC) in 2011 instantly turned it into a recognisable *pucca* street, highlighting the importance of infrastructure in establishing permanence in the village. The permanence of the street together with the new quarry classroom building suggests the beginning of rapid development of the settlement eventually leading towards the establishment of a more permanent neighbourhood (chapter 3.3.3).



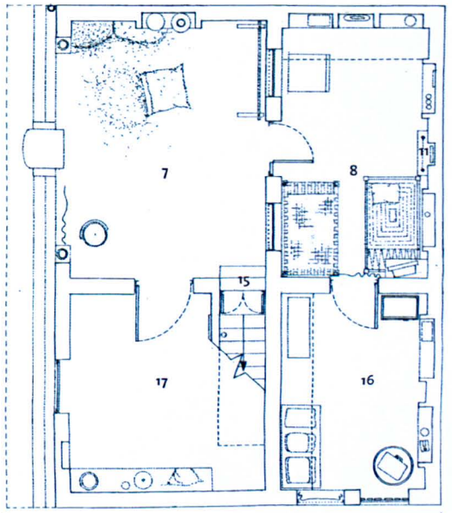
Kachhpura Key Plan



Axonometric Sketch of Brijesh Singh's Dwelling



1st Floor Plan



Ground Floor Plan

Section Through the *Panchayat Chowk*, Brijesh Singh's Family Home and the Local Primary School

0 1 2.5 5 m

3.2.2 Brijesh Singh's Family Home, Kachhpura, Agra

PANCHAYAT CHOWK

1 Local primary school
2 New septic tank system (for children's toilets)
3 Water handpump
4 *Neem* tree
5 *Soochna Sansadhan Kendra* (SSK) - NGO site office
6 New street lighting (solar powered)

BRIJESH SINGH'S FAMILY HOME

7 *Otla* (transitional threshold veranda)
8 Brijesh's parents' and siblings' room
9 *Chhat* (roof terrace)
10 Brijesh and his wife's (Preeti) room
11 *Puja* (prayer) corner
12 *Chula* (cooking stove)
13 Wash area
14 Lockable cupboard
15 Lockable door to staircase
16 Storeroom
17 Motorcycle store
18 Ladder to roof

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.2.2: Brijesh Singh's Family Home, Kachhpura, Agra.

3.2.2 Brijesh Singh's Family Home

In multi-occupied residences, where multi-generational families each live in one room within a larger dwelling, what constitutes privacy? Shared spaces facilitate activities that can be performed in less private areas, within view of the rest of the family. Extended households live as small communities cooperating with one another through careful negotiation of multi-generational living arrangements within the dwelling.

Brijesh Singh's family house in the *Purani Abadi* (Old Area) of Kachhpura is an example of vertical multi-generational living. Brijesh's family claim to be descendents of one of the original settlers in Kachhpura (17th century), and have many relatives residing in the village. Like other established families, the Singh's have inherited significant land holdings in and around the settlement including many fields, some of which have been sold over the generations (see Project Diary 1.4.1 p.69). Today, the family still own and cultivate a large proportion of the fields to the north east of Kachhpura as a means of livelihood, growing vegetables such as *baigan* (aubergine), *bajra* (pearl millet) and oil seed.

Fig. 3.11. Brijesh Singh (second from right) and his family (from left: brother, mother and sisters) at their home in Kachhpura, July 2011.

(a)

(b)

Figs. 3.12 a & b. The dwelling shared by the extended family in (a) 2006; and (b) 2008.

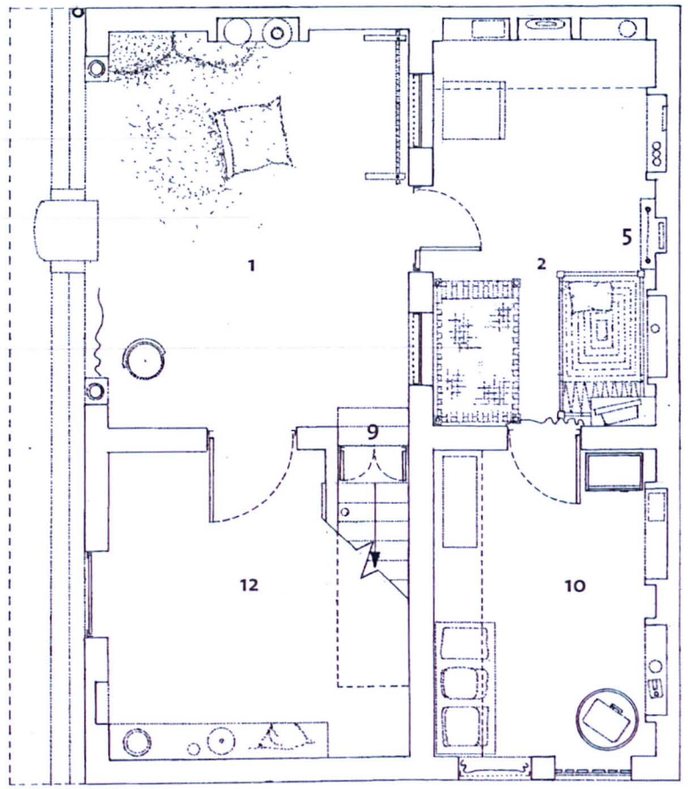
I have known Brijesh since I first visited Kachhpura in November 2006, when he was a small, 14 year old boy, famed for being the kid with the camel in the Taj Mahal tourist photographs and postcards. Brijesh was married in an arrangement made by his parents in May 2011 at the age of 18. It was at this significant time that transition of the family dwelling from extended family living to multi-generational living took place. Today, as the eldest son, Brijesh lives in the family house with his mother, father, two brothers and two sisters, and his wife, Preeti. The dwelling is located on the main *Panchayat Chowk* in Kachhpura (chapter 3.4.3). Up until early 2010, Brijesh's family lived in the ground floor room, whilst the upper level (1st floor) room in the dwelling was occupied by Brijesh's uncle, Attar Singh, and his family, with all members sharing the ground floor *otla* (veranda), side room, and *chhat* (roof terrace) for household tasks and livelihood chores. After a number of years residing at the shared property, Attar Singh and his family moved to the *Nai Abadi* of Kachhpura (also family owned land) close to the fields.

Since Brijesh's marriage, the living arrangement in the two-storey dwelling has been reorganised - Brijesh now lives in the upper floor room with his new bride, and the rest of his family live in the ground floor room. All other areas are shared as before. Despite the Indian tradition of the eldest son inheriting the family home, Brijesh plans to build his own home, shifting to the *Nai Abadi* where his family own land (chapter 3.2.4).

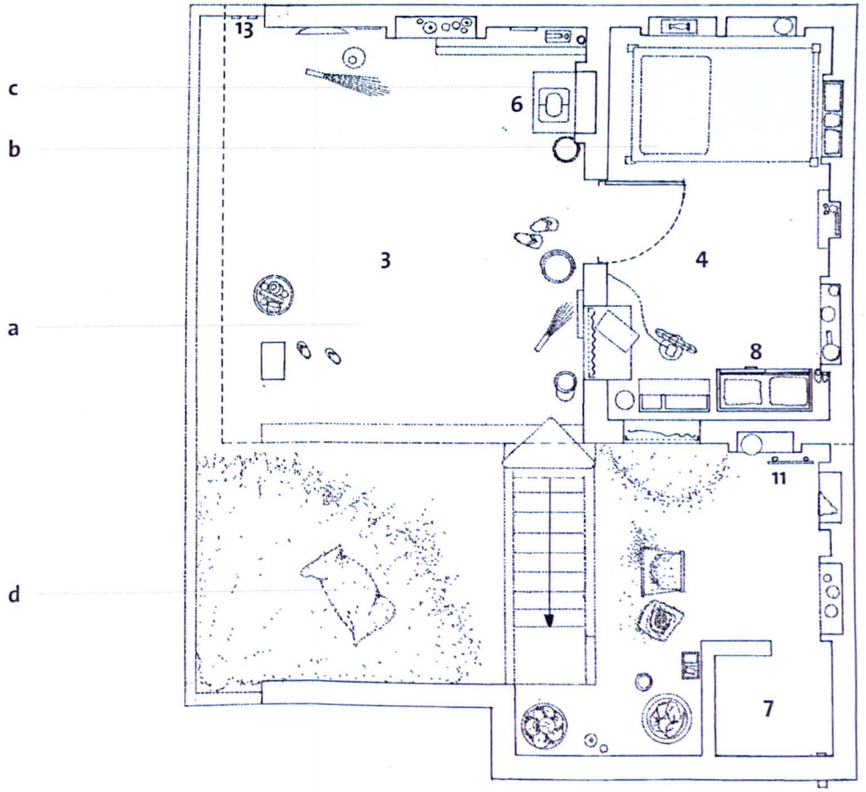
Preeti does all the cooking for the family on the *chhat* but Brijesh's mother purchases all the food provisions from the vegetable cart *wala* (vendor) that visits the *Panchayat Chowk* daily. With no direct supply to the house, Brijesh's sisters fetch water from the hand pump in the *chowk*. The whole family eats together on the *chhat*, where a small bathing area is located. The female members of the household use this, with the men bathing on the ground floor *otla* with a curtain for privacy.

Fig. 3.13. Preeti and Brijesh Singh, August 2011.

After marriage, Preeti relocated to Kachhpura from a rural village in Kandali, 20km outside of Agra. In March 2012, although she had been residing in the settlement for almost a year, she had not left the dwelling except to travel to her home village or to use the fields at night. This is not uncommon as it is traditional in North Indian villages for families to sequester new brides until they have learnt to conform to the ways of the new family and community (Heitzman and Worden 1996). Preeti remained on the *chhat* throughout the day carrying out chores such as cooking and washing, and would retreat to her room if outsiders (guests or visitors) were in the property. Since she moved to Kachhpura, Preeti would visit her family once a month in their village accompanied by Brijesh on his motorbike, easing her transition to a new environment and providing catharsis for any nostalgic sentiments for her family and home.



(a)



(b)

Figs. 3.14 a & b - (a) Ground floor; and (b) first floor plans of Brijesh Singh's family house in Kachhpura, 2012.

Brijesh Singh's family home, as of 2012

1 *otla* (transitional threshold veranda)
2 Brijesh's parent's and siblings' room
3 *chhat* (roof terrace)
4 Brijesh and his wife's (Preeti) room
5 *puja* (prayer) corner
6 *chula* (cooking stove)
7 wash area
8 lockable cupboard
9 lockable door to staircase
10 storeroom
11 motorcycle store
12 ladder to roof
13 Preeti's conversation wall

Activities, seasons and locations

a sleeping - hot/dry season
b sleeping - monsoon season
c cooking - all year
d harvesting grain - hot/dry season
e preparing fodder - monsoon season
f entertaining guests - all year

Fig. 3.15. Preeti's 'conversation' wall between the neighbouring dwellings, March 2012.

Fig. 3.16. Brijesh's mother preparing fodder for the camel on the ground floor *otla*, March 2012.

Fig. 3.17. Preeti processing oil seeds on the *chhat*, March 2012.

Fig. 3.18. Preeti (second from right) with her family (from left: sister, father, mother, sister) in their rural village home in Kandali, March 2012.

Once the first year of marriage has passed, Preeti will be allowed some freedom outside of the dwelling to participate in the community and village life. Until then, her only social interaction in Kachhpura outside of the family members is with her neighbour in the house next door, who is also married and moved to the village a few years ago. Although they cannot see one another over the party fence wall, they can still converse with one another during the day and in the late evenings/early mornings, as neither household has a toilet, they visit the fields behind the dwellings together. These brief social encounters are vital moments for Preeti in her journey towards social integration in the community.

Traditionally, there are two main livelihoods in Kachhpura – farming and shoemaking. As farming is seasonal, shoemaking provides most residents with income for eight months of the year. Brijesh's father, however, took up a more lucrative business offering camel rides to tourists in 1984 which really picked up after 1995 (when excavation of the *Mehtab Bagh* began). His uncle, who now lives in the *Nai Abadi* manages the fields. During the short farming season (January to April), the whole family gets together to harvest and sell the crops, and the *chhat* is used as a place to process oil seed from harvested cuttings. In the hot dry season (March to May), the entire family sleeps on the terrace, taking advantage of the cool night time conditions. Brijesh's mother cuts up vegetation as animal fodder on the ground floor *otla* and Raja III (the camel) leans over to feed, standing in the middle of the street.

In a conversation with Brijesh at his home in March 2012, he mentioned that his priority was to construct a toilet on the *chhat* of his home so that his wife would not have to defecate in the open. With almost fifty percent of the households in Kachhpura now owning a toilet (largely through the KSUP), his mother was putting pressure on him to do the same. Although

households without toilets are not considered suitable for newly wed girls (CURE 2007 p.55), Brijesh's wife did not seem particularly anxious regarding this issue, admitting that visiting in the fields in the evenings and early mornings was her only opportunity to go outside and socialise with her neighbouring friend, even for the briefest time. The issue of new brides and toilets has been a subject of the press in recent months with newlywed women leaving their marital homes in protest over the lack of household toilets (*Times of India* 2012). However, this is a counter example showing that the move to individualisation reduces social exchange, emphasising the reactionary elements of tradition.

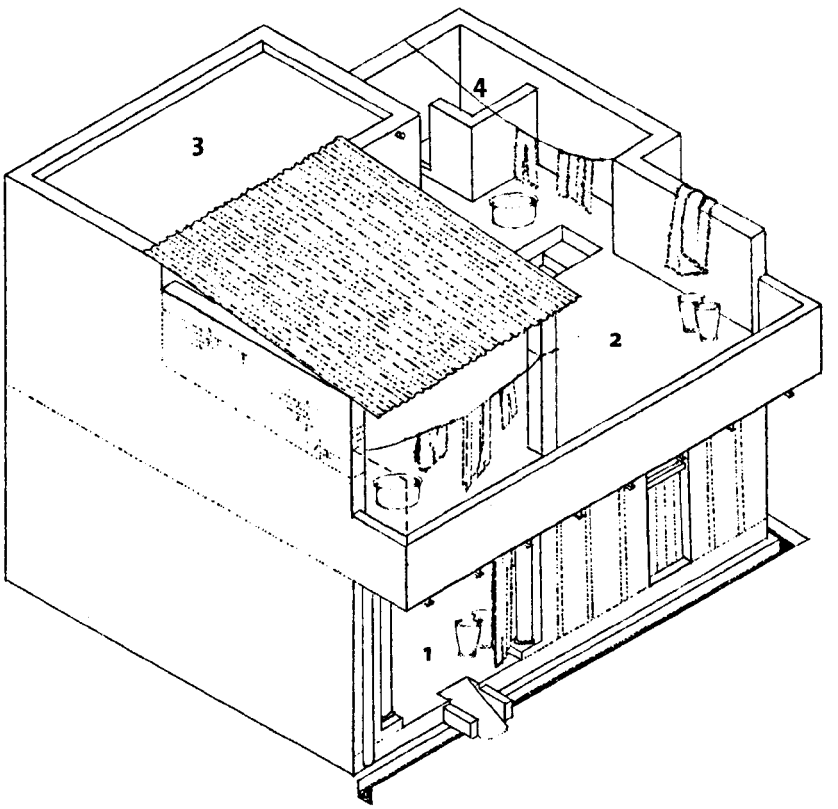
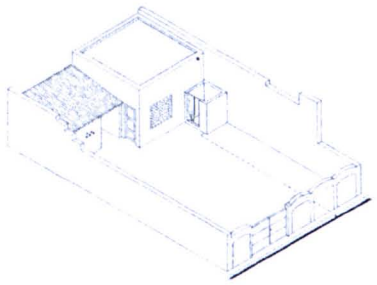


Fig. 3.19. Axonometric drawing of Brijesh Singh's family dwelling, 2012:

1 *otla*
2 *chhat*
3 Brijesh and Preeti's room
4 wash area

In multi-generational living situations, the negotiation of common areas and the sharing of activities in the dwelling are essential for assisting with the integration of new members into the family structure and way of life. This is the first stage of several levels of involvement towards the eventual integration of newly married wives into a new institutional setting. This process of adapting to a new family society also affects new migrants to a village in a more collective manner.



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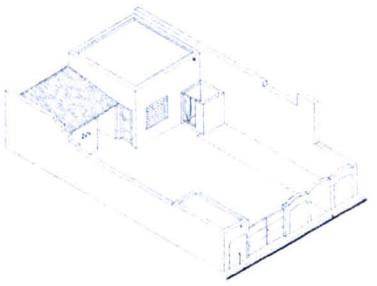

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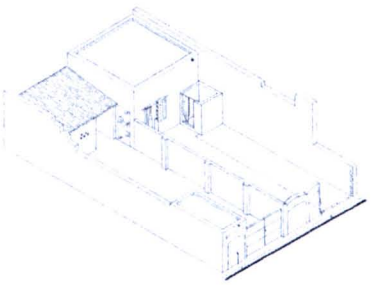
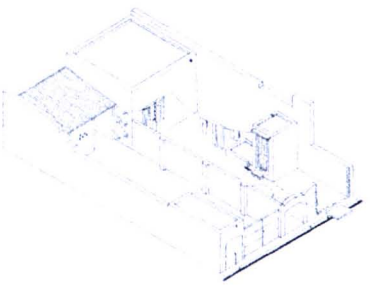
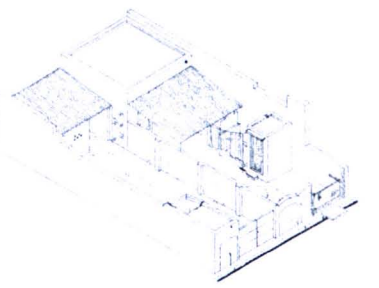


Early 2007



July 2007

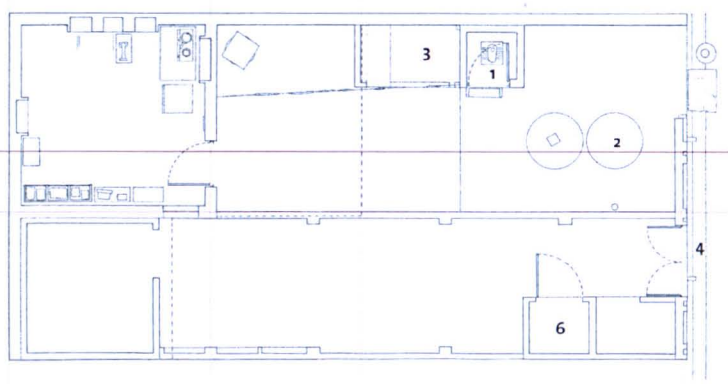


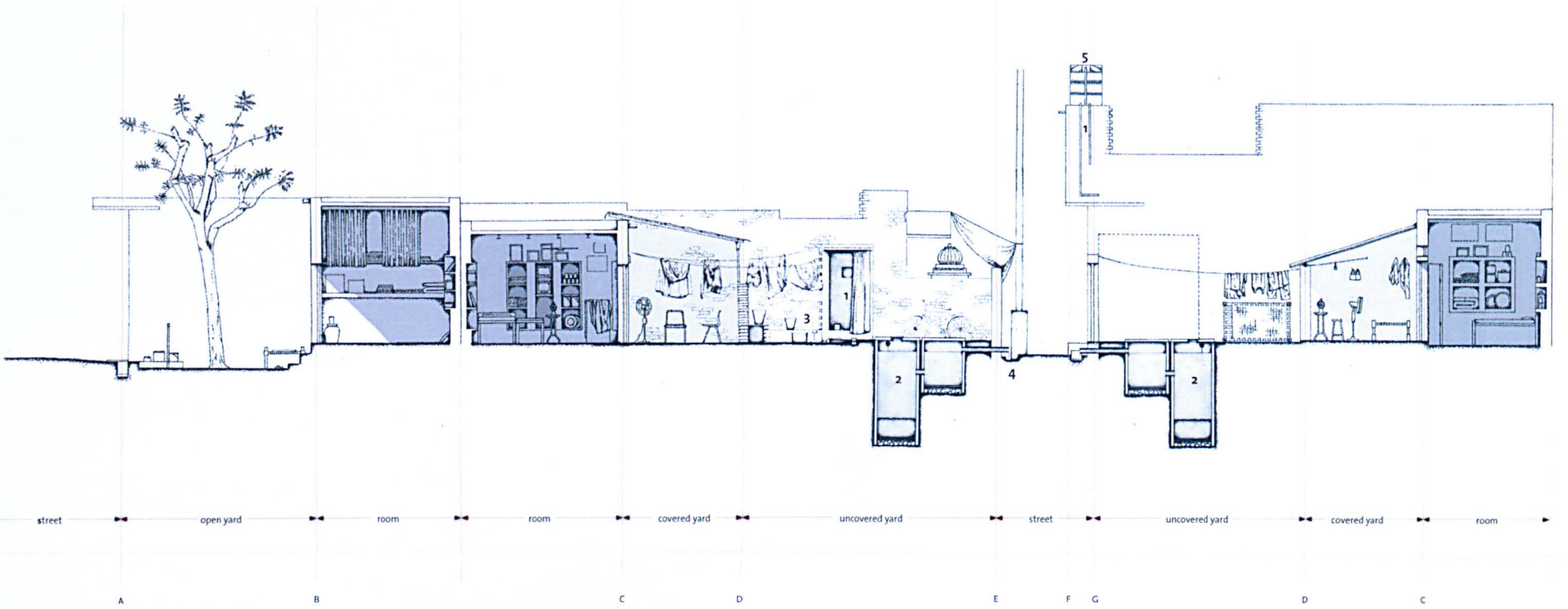
2008-2012

Development of Meera's House
The Toilet Dispute

1992	Meera gets married and moves to from Belaganj (in Agra) to Kachhpura with her husband at the age of 20. They reside in a shared dwelling with her younger brother-in-law.
1995	A toilet is constructed in the yard, paid for and instructed by Meera's husband.
Early 2007	Meera's elder brother-in-law dies. The younger brother-in-law demands that the ownership of the land is divided between the two brothers, despite protests from Meera and her husband. A wall is constructed dividing the plot into two parts. The toilet ends up in the younger brother-in-law's plot and Meera no longer has access to a toilet.
July 2007	Meera signs up for the pilot toilet scheme and becomes the first person to construct an improved septic tank toilet in her home in Kachhpura. Younger brother-in-law sells his land and moves out of Kachhpura. The plot is locked up and the property is left to fall into disrepair.
2008-12	Meera makes improvements to her home incrementally (solid doors replace temporary curtains on the toilet and house and a lean-to is constructed providing a shaded open area in the yard). The old toilet structure collapses on one side due to poor construction.

Swaach Gali (Clean Street) Key Plan

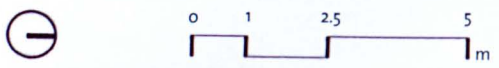




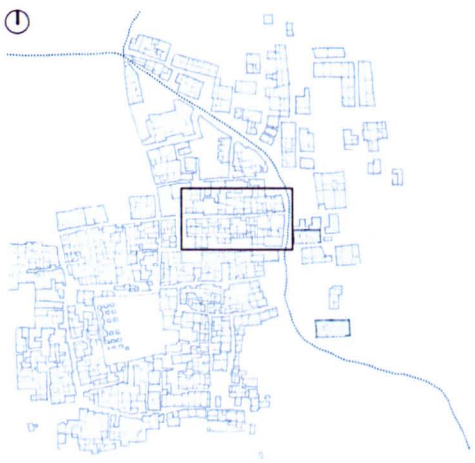
Plan and section through Meera's toilet and *Swaach Gali* (Clean Street)

A	Street - open yard (over drain)
B	Open yard - room (through doorway)
C	Room - covered yard (via steps and through doorway)
D	Covered yard - uncovered yard
E	Uncovered yard - street (through wall opening and over drain)
F	Street - *Otla* (via steps)
G	*Otla* - uncovered yard (through gate)

1	New toilet
2	Septic tank system
3	Washing platform
4	Street drain
5	Water butt
6	Old (non-functioning) toilet



3.2.3 Meera's Toilet, Swaach Gali, Kachhpura, Agra



Kachhpura Key Plan

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.2.3: Meera's toilet, *Swaach Gali*, Kachhpura, Agra.

3.2.3 Meera's toilet and *'Swaach Gali'* (Clean Street)

In the *Nai Abadi* of Kachhpura, the majority of dwellings have a similar open/closed house layout: an enclosed *pucca* room at the back of the plot with an open yard at the front, facing the street. Here in the *Nai Abadi*, houses are relatively new (built within the last 25 years) and there is more space available for each plot, compared with houses in the *Purani Abadi* that have been around for over 100 years.

Meera Devi is a facilitator working for NGO CURE. In the house which she shares with her husband, Girraj Singh, and three children, the size of the internal room is minimal compared to the size of the open yard at the front. The yard is used for almost all daily activities apart from sleeping and is viewed as a significant part of the family dwelling, This is similar to the role of internal courtyards in old *havelis* but unlike the separation of front or back yards in houses in the West.

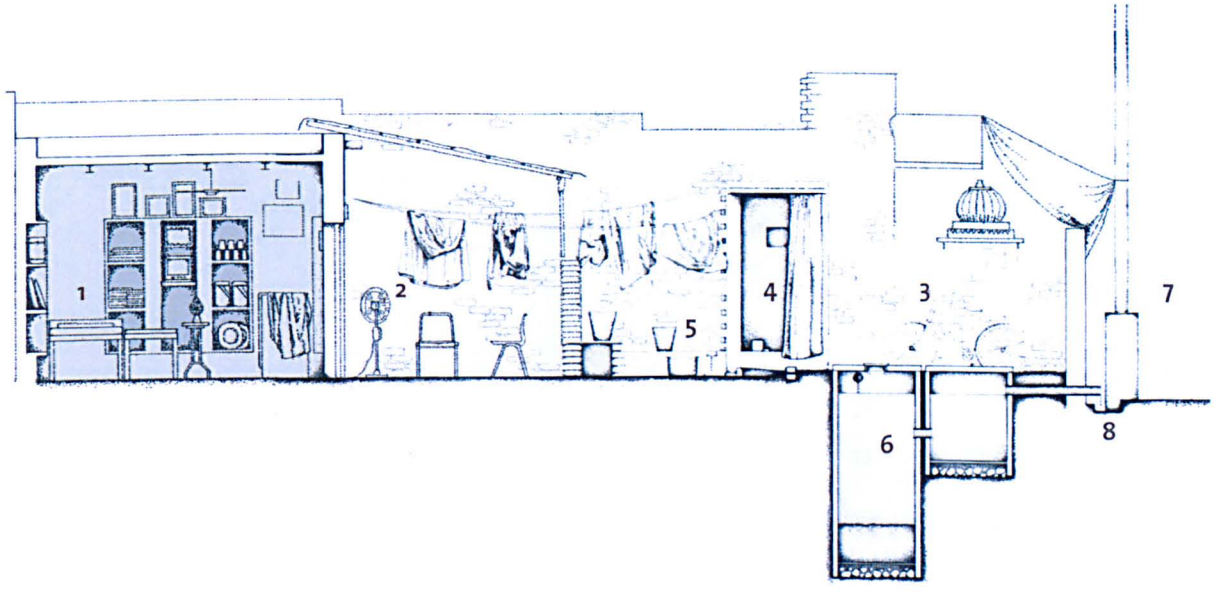
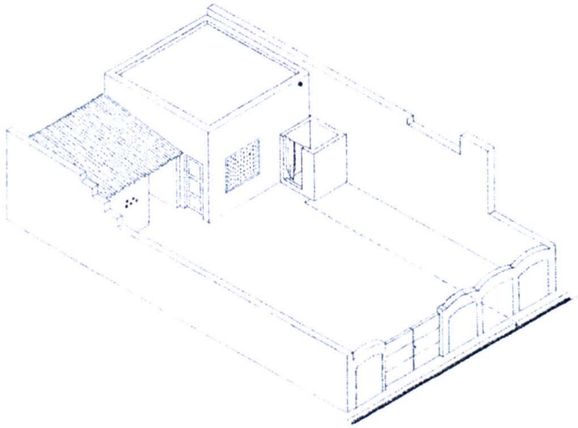


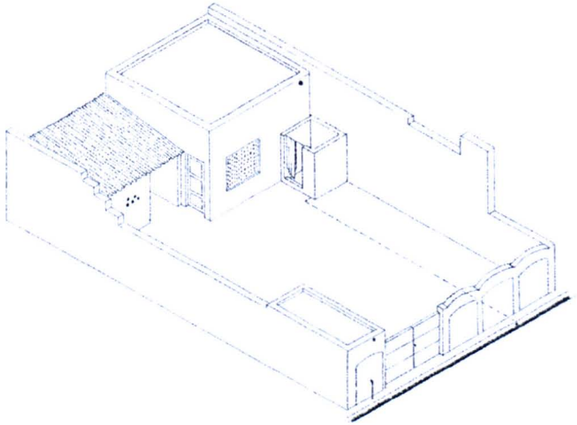
Fig. 3.20. Section through Meera's dwelling and new septic tank toilet system, 2011:

1 bedroom
2 covered yard area (lean-to roof)
3 open yard
4 new toilet structure (2007)
5 new washing platform (2007)
6 new septic tank toilet system
7 street
8 open drain

In July 2007, Meera became the first householder to have an improved household septic tank toilet system installed under KSUP. She wanted a toilet desperately as she had recently fallen out with her brother-in-law following a dispute which resulted in them dividing up the shared courtyard at the front of the house with the construction of a new wall. The existing (poor quality) toilet installed by her husband ended up on the brother-in-law's side (fig 3.23). Meera's story highlights the complex relationship of shared territories on a domestic level, with family members often falling out over the ownership of land (typically inherited), commonly due to desires for personal monetary gain.



1992



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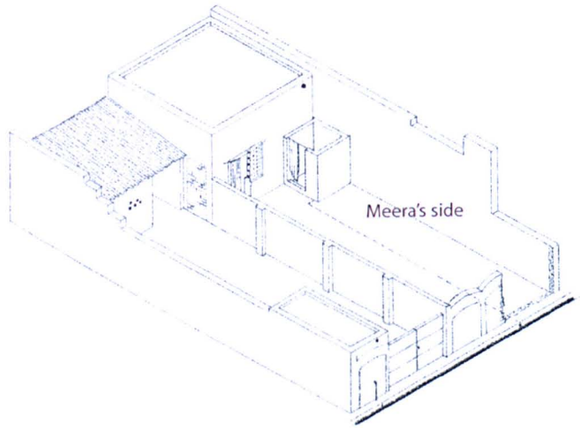
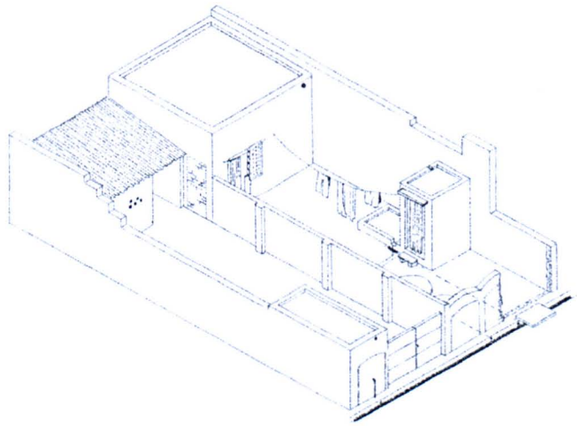
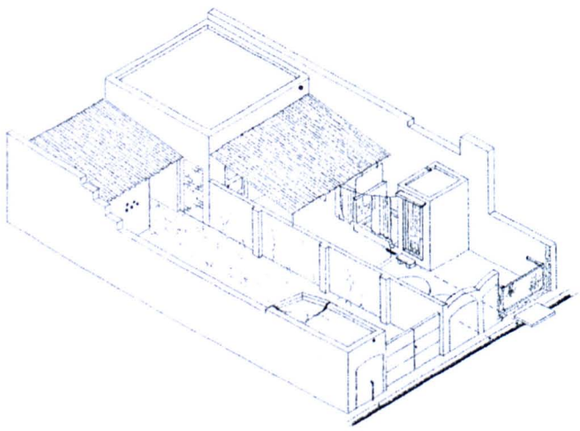


Early 2007



July 2007



2008-2012

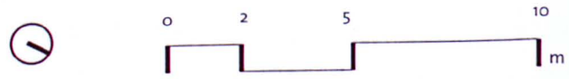


Fig. 3.21. Meera outside the shared dwelling, November 2006.

Fig. 3.22. Meera's dwelling soon after the property was divided, July 2007.

Fig. 3.23. Development of Meera's House
The Toilet Dispute, 1992-2012.

1992	Meera gets married and moves from Belaganj (in Agra) to Kachhpura with her husband at the age of 20. They reside in a shared dwelling with her younger brother-in-law.
1995	A toilet is constructed in the yard, paid for and constructed by Meera's husband.
Early 2007	Meera's elder brother-in-law dies. The younger brother-in-law demands that the ownership of the land is divided between the two brothers, despite protests from Meera and her husband. A wall is constructed dividing the plot into two parts. The toilet ends up in the younger brother-in-law's plot and Meera no longer has access to a toilet.
July 2007	Meera signs up for the pilot toilet scheme and becomes the first person to construct an improved septic tank toilet in her home in Kachhpura. Younger brother-in-law sells his land and moves out of Kachhpura. The plot is locked up and the property is left to fall into disrepair. The old toilet structure collapses on one side due to poor construction.
2008-12	Meera makes improvements to her home incrementally (solid doors replace temporary curtains on the toilet and house and a lean-to is constructed providing a shaded open area in the yard).

Fig. 3.24. *'Swaach Gali'* sign on the wall at the end of the street, 2008.

Construction of Meera's toilet in her yard took a week, each day drawing more and more interest from nearby householders, beginning with close neighbours on the same street. Her pregnant neighbour, Meena, was the next householder to install a toilet, followed swiftly by another neighbour, Sunita. A knock on effect took place with several other residents in the same street expressing interest for toilets. Eight toilets were installed in the street within the month. This rapid development led to Meera's street becoming known as *'Swaach Gali'* (Clean Street) within the Kachhpura community. The naming of the street was a significant step forward for the toilet project as it showed that residents were beginning to recognise the impact of the sanitation scheme in creating clean zones within the settlement that were the result of a collective effort between neighbouring residents to improve their own domestic street. The women of *Swaach Gali* also enthusiastically put up a sign at the end of their street (fig. 3.24), produced by CURE, displaying the benefits of household septic tank toilets and encouraging other residents to take part in the initiative.

Fig. 3.25. Plan of *Swaach Gali* showing locations of the first eight household toilets in Kachhpura, 2007.

When the toilet project was first proposed in Kachhpura by CURE, the majority of male residents did not consider private sanitary facilities a priority, remaining apathetic towards the problems open defecation posed for women with regards to privacy as well as health. The initial brave actions of Meera led to several other women in the community pressuring their husbands for a household toilet. The local press (see Project Diary 1.4.1 p.39) even labelled her the city's 'Toilet Missionary'. Meera says:

When my toilet was being constructed, the residents would come one by one to see the toilet. In the three days of the toilet's construction, more than 30 people came to me and said that they also wanted to have toilets in their homes. It was a big thing for me.
Bhardwaj 2009

As the waiting list for toilets grew steadily in 2008, it emerged that there were several cases of residents who had been waiting for a long time to have toilets installed under KSUP but lacked the space or access for the septic tanks. Initial attempts to encourage neighbouring householders to share septic tanks with individual household toilets were not well received. Families were concerned about shared tanks filling up too quickly increasing maintenance costs. With the bad experience of the failed government CTC in Kachhpura (chapter 3.3.2) and a mindset of keeping (dirty) defecation areas at a distance to the (clean) house ingrained in their culture, it was very difficult to convince residents to change their views on this.

Ricoeur (1967) states that the first primary symbol of evil is defilement, or unclean contact. Defilement as a symbol is expressed as an experience of evil when a 'quasi-material something' infects as a sort of filth, that leaves a 'stain'. Experienced as irrational dread or terror, one feels 'dirty' as the result of breaking a taboo. Defilement is the first schema of the rationalisation of suffering and creates ambiguity between physical contamination and ethical contamination.

Students opted to produce informative leaflets explaining how septic tanks work, which were distributed to households (see Project Diary 1.4.1 KSUP p.47). Meetings were held with interested householders who lived in clusters but were lacking space, to discuss suitable sites for common septic tanks and the sharing of toilet/bathing facilities for the poorest families who would struggle to afford a toilet even with a loan. Once concerns over operation and maintenance (O&M) were addressed, most neighbouring residents were much more open to the idea of sharing a septic tank system, though very few were willing to share the actual facilities (CURE 2008 p.15).

Figs. 3.26 a & b - (a) Women meeting with Meera (as a CURE facilitator) to discuss toilets; (b) Two toilet cubicles connected to one septic tank constructed in Katra Wazir Khan under the KSUP scheme. The facilities are shared by a large extended family in a communal courtyard, August 2008.

(a)

(b)

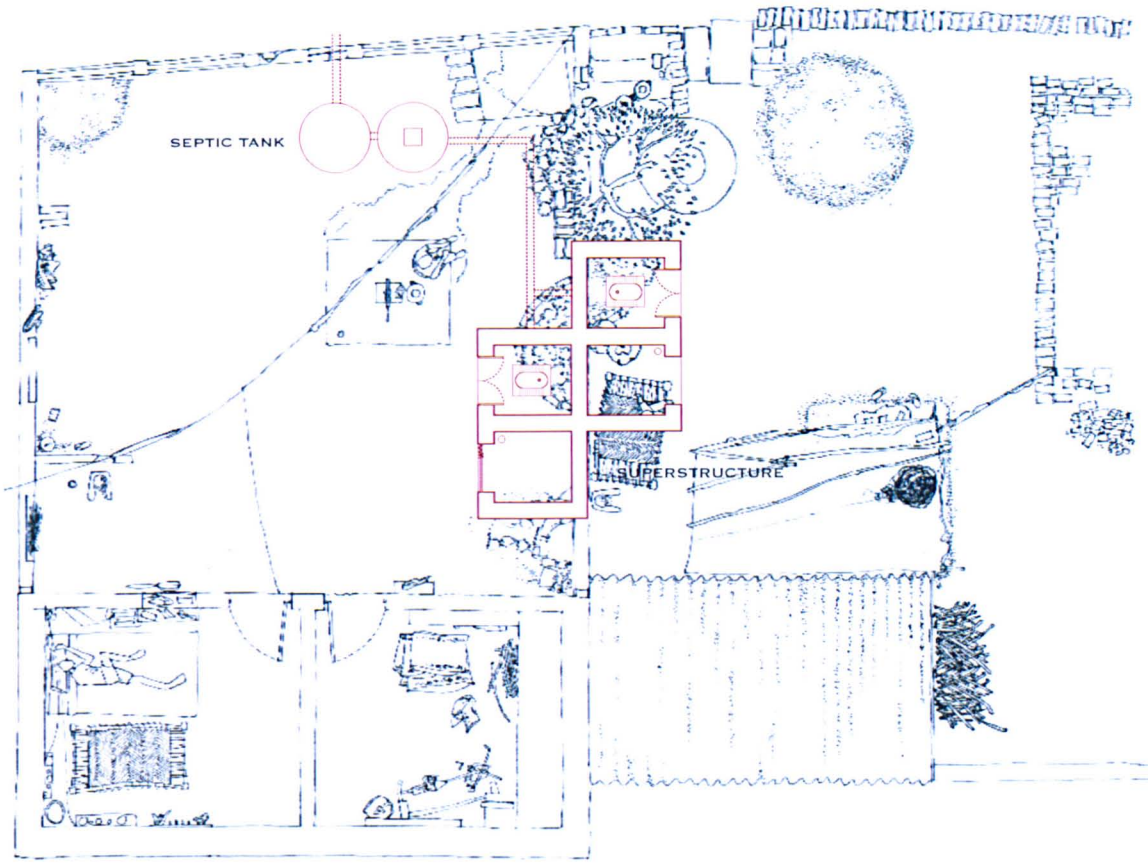


Fig. 3.27. Two toilet and washing cubicles in adjacent plots connected to one septic tank proposed in Kachhpura under KSUP, 2007.

In subsequent visits to Kachhpura since the toilet project first began, there have been notable signs that the introduction of toilet infrastructure has transformed the way in which the yards are used in dwellings. The toilet is seen as a symbol of status, and housewives personalise them by painting the structures (usually to match the rest of the house), using cost-saving methods such as fabric curtains for privacy instead of permanent doors and adding shelves, hooks and even shower pipes. Women keep the toilets maintained and functioning properly with pride, encouraging others to follow suit.

Fig. 3.28. Meera's personalised toilet, 2007.

The visible presence of permanent sanitation infrastructure (brick washing and toilet cubicles and concrete septic tanks) has led to adjustments to domestic spatial configurations in the yard (Mitchell 2010 p.179). Where previously most daily activities could take place anywhere in the yard, arrangements are now made to create small designated zones for cooking and eating for example, away from the washing and toilet structures. In addition, the yard is now kept clean and tidy at all times.

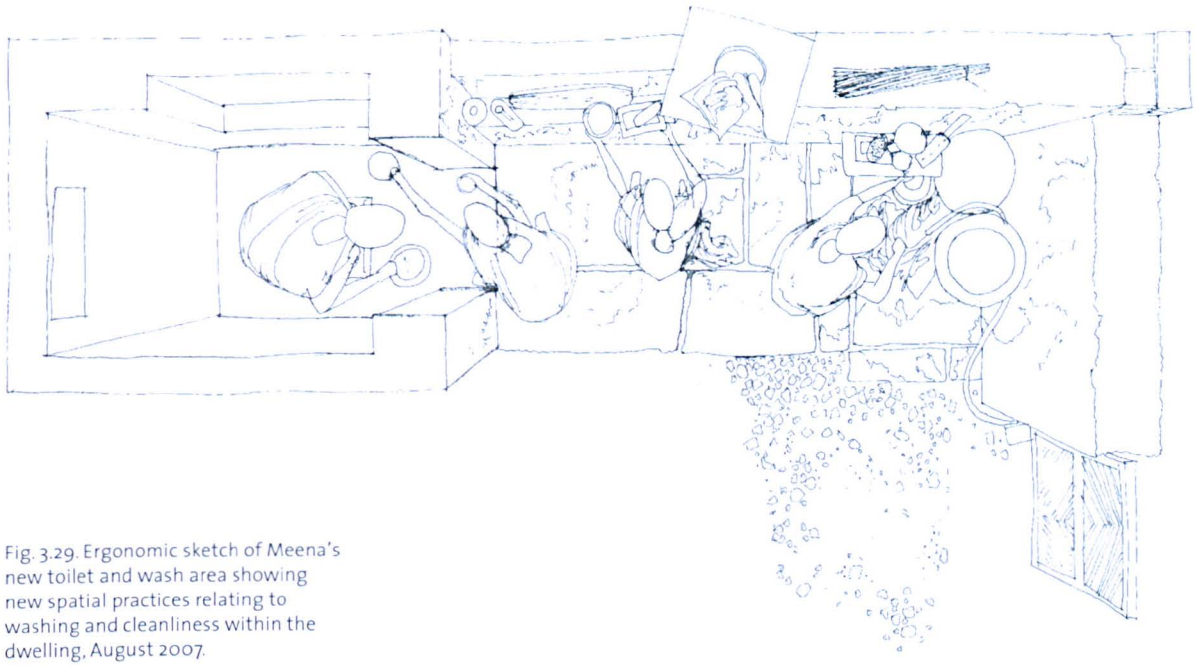


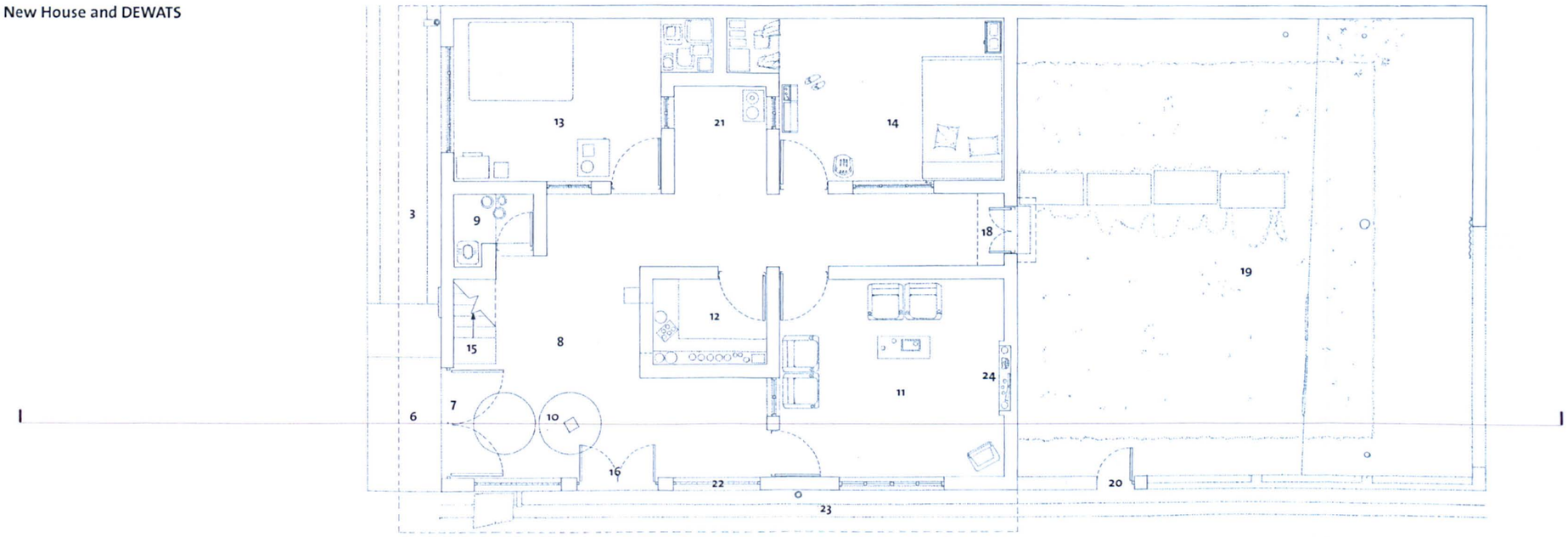
Fig. 3.29. Ergonomic sketch of Meena's new toilet and wash area showing new spatial practices relating to washing and cleanliness within the dwelling, August 2007.

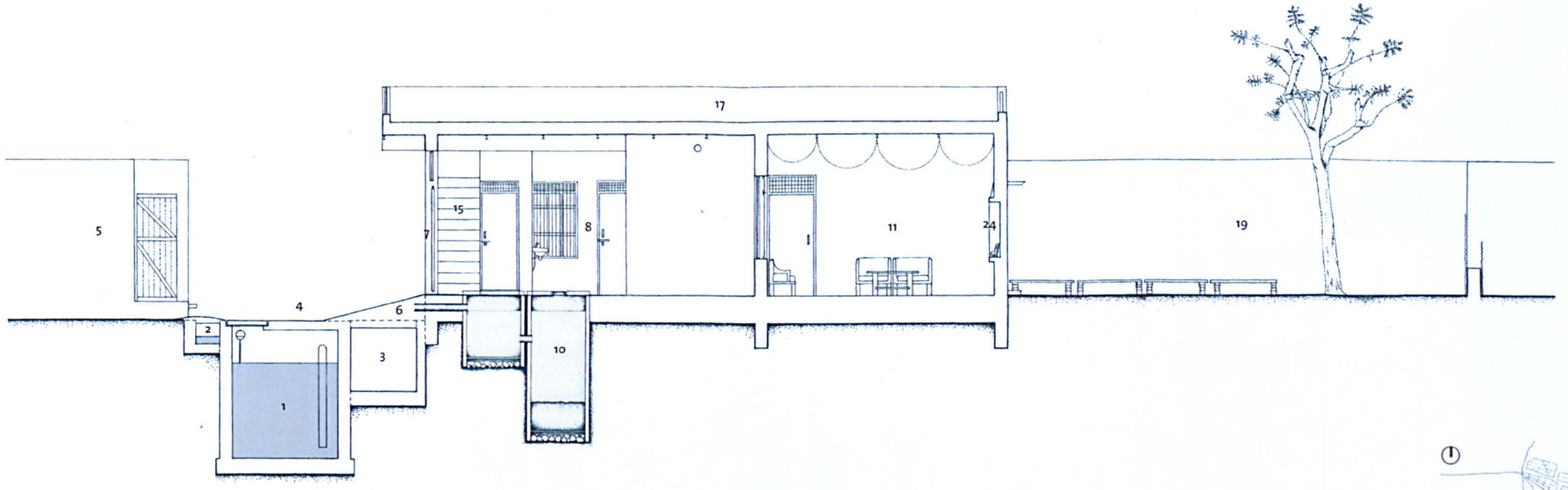
Fig. 3.30. Sunita standing proudly in front of her new toilet, 2007.

This change in the way the yard is kept and used by the household has affected the levels of social interaction that now take place within the dwelling. Before dwellings had toilets, meetings would take place in a common place outside of the domestic dwelling. Today, guests are proudly invited into tidy yards, with Meera in particular, opening hers up as a gathering place where women's livelihood workshops can be held as well as savings group meetings (chapter 3.4.1). In the six years since Meera's toilet was installed, she has since upgraded her dwelling with a lean-to roof against the original *pucca* room providing a separate shaded area in the yard so group activities can take place throughout the day. The general move to bring activities within the dwelling suggests a possible shift in the way old and new shared spaces are being made and remade within the community.

Plan and Section Through Bhajan Lal's New House and DEWATS

1 Baffled septic tank (DEWATS)
2 Primary overflow (everyday) drain
3 Secondary overflow (monsoon) drain
4 New clean pedestrian thoroughfare
5 Side street
6 Entrance ramp
7 Front entrance gate to house
8 *Otla* (veranda)
9 Bathroom with toilet (under stairs)
10 Septic tank toilet system
11 Living room
12 Kitchen
13 Bedroom 1
14 Bedroom 2
15 Staircase to roof
16 Side entrance to house
17 Roof terrace
18 Back door to garden
19 Garden
20 Gate to garden
21 Storage area
22 Glazed windows with metal grilles
23 Street drain
24 *Puja* (Hindu prayer) corner





0 1 2.5 5 m

3.2.4 Bhajan Lal's New House, Kachhpura, Agra

Kachhpura Key Plan

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.2.4 Bhajan Lal's New House, Kachhpura, Agra.

3.2.4 Bhajan Lal's New House

Bhajan Lal began constructing his new house in late 2010, completing in July 2011. Treated water from the DEWATS was used to construct the dwelling as it was the closest source of clean water available. Bhajan Lal has lived in Kachhpura for over thirty years, originally in the *Purani Abadi* until he moved into his new house on the plot of land he owns the *Nai Abadi*. He is originally from a rural village in Etmadpur, an Agra *Tehsil* (divisional district) in Uttar Pradesh, 20km east of Kachhpura. He moved to Kachhpura in the 1980s as he had relatives who already lived in the village, and he enjoyed the proximity of the village to the fields, markets and Agra city centre.

Prior to retirement, Bhajan Lal was a schoolteacher at a junior high school in the neighbouring village of Nagla Devjeet. He has two sons, both of whom are married, and four grandchildren. Bhajan Lal's eldest son, an advocate (barrister) paid for the construction of the new house. He and his wife, RIta, and children also reside there, whilst the younger son is away studying for a Masters degree.

Fig. 3.31. Bhajan Lal with his daughter in law, Rita, and grandchildren, April 2012.

Bhajan Lal's new house is significantly larger than most dwellings in the *Nai Abadi* and suggests that his family have a larger income than most families in the village. The style and layout of the house (and garden) has similar features to middle class houses found in more affluent areas of the city. The internal room configuration consists of two bedrooms as well as a separate kitchen and living room to entertain guests, and a toilet under the stairs to the roof. Western mattress beds are used as opposed to the traditional *charpoi* (Indian rope bed, used as seating and/or a daybed during the day). Mass produced furniture contrasts with the Indian squat style toilet located under the stairs.

0 1 2.5 5 m

Unusually for dwellings in Kachhpura, the only open area in the dwelling is at the back of the house and resembles a typical Western garden (it is even laid out with grass). No expense has been spared for security with glass windows and metal grilles on all exterior windows, as well as ornate metal gates on both front entrances to the *otla* (veranda). An internal staircase to the roof implies potential future upgrading vertically with an additional storey. The unconventional location of the toilet inside the house implies a shifted mentality from the normal perception in the old part of Kachhpura, of toilets as being dirty places which should be kept away from the (clean areas of the) house (i.e. in the yard). The commonly found *otla* at the front of the house here is not used as a space to loiter or undertake household chores, but as a transitional corridor or hallway. Guests are ushered straight into the living room and sat down on sofa chairs (to await the offer of *chai*), away from view from the street. Houses are becoming more private, with guests being invited into more intimate areas of the home.

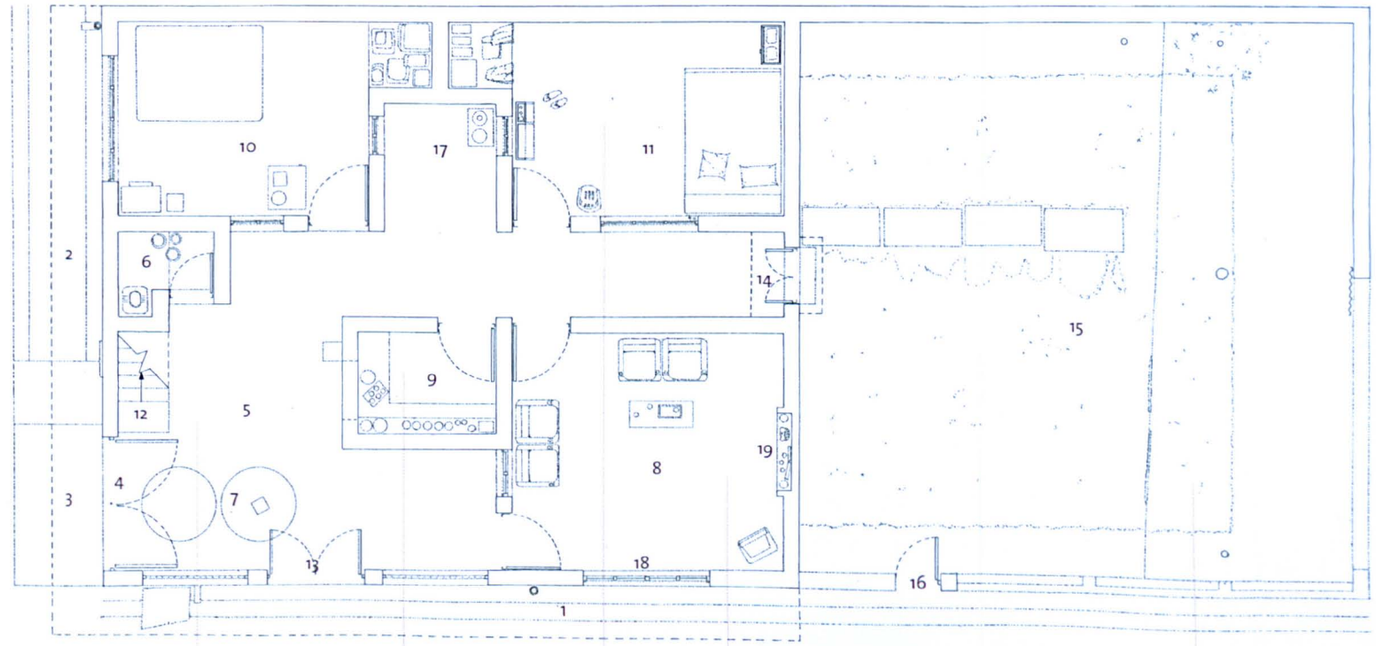
Key to drawing

1 street drain
2 secondary overflow (monsoon) drain
3 entrance ramp
4 front entrance gate to house
5 *otla* (veranda)
6 bathroom with toilet (under stairs)
7 septic tank toilet system
8 living room
9 kitchen
10 bedroom 1
11 bedroom 2
12 staircase to roof
13 side entrance to house
14 back door to garden
15 garden
16 gate to garden
17 storage area
18 glazed windows with metal grilles
19 *puja* (Hindu prayer) corner

Key to photographs

a gated *otla* within the house
b kitchen with gas burners
c mass produced bedroom furniture (dressing cabinet)
d mass produced living room furniture (sofa chairs)
e back garden with lawn

Fig. 3.32. Plan of Bhajan Lal's house, April 2012.



(a)

(b)

(c)

(d)

(e)

Figs. 3.33 a-e. Photographs of Bhajan Lal's house, April 2012.

The luxury of space in Bhajan Lal's new house allows for rooms that have their own individualised function (sleeping, cooking, entertaining guests), rather than being multi-functional shared spaces. The all important provision of a private piped water supply to the dwelling (connected to a modern wash basin located by the toilet in the hallway), a rare sight in Kachhpura, allows for washing and bathing to be carried out within the house, in the small 'bathroom' with a toilet beneath the staircase.

Fig. 3.34. DEWATS alongside Bhajan Lal's house, November 2011.

Bhajan Lal relates the reduction of mosquitoes in the former waste-land edge of the village to the introduction of the DEWATS, which has minimised the areas of open stagnant drains which attract and provide breeding grounds for the insects. In an interview (2012), he stated that he considered himself lucky that the DEWATS was constructed adjacent to his plot of land. He also mentioned that he anticipated improvement in the area[1], which was immediately visible (cleaner and less foul smelling) - the change directly influencing his decision to begin constructing his house just after the DEWATS was initially completed.

1 CURE held several meetings with the community to discuss the proposed location and proposal for the DEWATS, and to gain approval from residents and the *panchayat*, prior to commencing construction.

(a)

(b)

Figs. 3.35 a & b - (a) Bhajan Lal's house under construction; (b) negotiating the DEWATS overflow drain adjacent to the foundations of the house, both November 2010.

During construction, the location of the DEWATS along an area with a limited width meant building close to several houses located adjacent to the main *nala*. At the early stages of excavating the deep pits for the underground tanks, the foundations of one or two dwellings were in danger of being compromised. An agreement was made between CURE (overseeing the construction work) and the residents of the identified houses, to take down particular exterior walls (surrounding internal courtyards) to ensure the safe construction of DEWATS. The demolished walls were rebuilt by the contractors following completion of the tanks, without any complaints from the residents regarding the inconvenience.

In addition, the digging of a 50m diversion drain was required at the start of the build, to divert the flow of the main *nala* during the construction of DEWATS (CURE 2010). This affected residents on adjacent streets where channels had to be dug to carry the wastewater around the site to connect back to the *nala*, but householders were happy to cooperate, accepting the wider benefits of the DEWATS to the area once completed. These examples reinforce the concept of cooperation and fit by negotiation.

In September 2010, immediately after the construction of DEWATS was initially completed and prior to construction of Bhajan Lal's new house, heavy monsoon rains in Agra caused severe flooding in the *Nai Abadi*. Several houses were affected, and a proposal was made to introduce a large secondary overflow drain to the DEWATS to alleviate future possibilities of monsoon flooding in the area. In November 2010, when construction of Bhajan Lal's house had reached the foundations of the building, students, CURE and the research team made an assessment of the space available between the corner foundations and outer wall DEWATS baffled septic tank, which showed that there was only a space of 3.5 feet. As this was the only point along the length of the DEWATS where there was contention with another structure or building, the corner of Bhajan Lal's house ended up determining the maximum width of the overflow drain. The difficulty of digging a new 3 foot deep drain between the DEWATS tank and foundations of the house without either structure being compromised was resolved through discussions between the DEWATS team and Bhajan Lal's contractors. A careful collaborative approach between contractors ensured that both structures remained intact whilst the overflow drain was completed before the monsoon rains returned in June 2011.

Bhajan Lal's is the kind of house that other residents in the village aspire to. Brijesh Singh pointed at Bhajan Lal's new house when asked how he imagined his future house would look (except larger and with the addition of a central courtyard). He identified the garden as something he would like to have (filled with lush plants and trees) as well as the separation of rooms for different activities such as sleeping, entertaining and cooking (and the toilet) rather than multi-use. Since the construction of the overflow drain to the DEWATS, Bhajan Lal has built his *otla* ramp over the drain

connecting to the new DEWATS thoroughfare (chapter 3.3.3). He proudly displays a poster with information on the DEWATS (see Project Diary 1.4.1. p.20) on the front wall of house, furthering the grand status of this new house in the village. Whilst evidently seeking privacy, Bhajan Lal's new house nevertheless remains engaged with the DEWATS and the village.

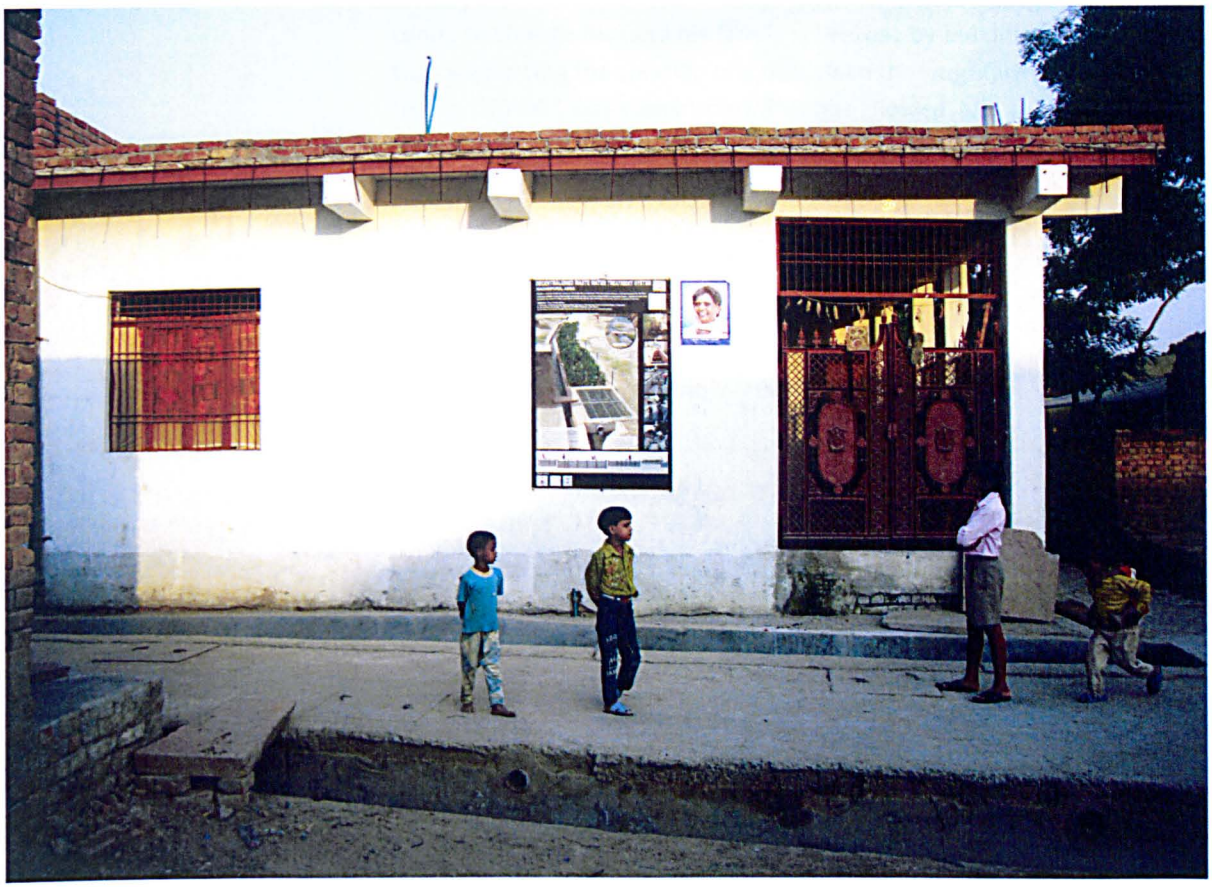


Fig. 3.36. DEWATS poster (produced by myself and Odel Jeffries for CURE) displayed on the wall of Bhajan Lal's new house, November 2011.

Bhajan Lal's new house is an example of the shift towards a middle class lifestyle - an aspiration for an improved quality of life above survival - represented through the design and layout of the dwelling. *Pucca* materials (glass, concrete, bricks, tiles) are used throughout the building, with a strong emphasis on privacy. The tradition of multi-functional spaces typically found in most houses in Kachhpura has been replaced with individual rooms for sleeping, cooking and entertaining; even the furniture is different - more mass-produced than hand-crafted and less sitting on mats or squatting. The addition of a back garden is the reverse of the commonly found front yard (facing the street); the garden is there almost purely for pleasure, whilst the yard performs an important function as an extension to the dwelling. The *otla*, although still present in the new house, is not used for activities such as washing or doing homework, but functions as a transitional entrance threshold where guests are greeted before moving into the entertaining room inside the house. With Bhajan Lal's new house,

the rejection of the former traditional village lifestyle common throughout Kachhpura suggests aspirations towards a higher class of living, and is reflected in the success of his children (educated and in well-paid jobs).

The post-hoc introduction of infrastructure such as the DEWATS required careful on-going negotiation with the topography as well as with residents directly affected by the build. Bhajan Lal took full advantage of the opportunity to change his (and his family's) lifestyle by building his new house, thus supporting the creation of a new clean thoroughfare immediately after the DEWATS was constructed. This has allowed him to benefit directly from the improvements made in the area, as well as future development that is likely to follow.

3.3 NEIGHBOURHOOD

KUCHHA (TEMPORARY)

PUCCA (PERMANENT)

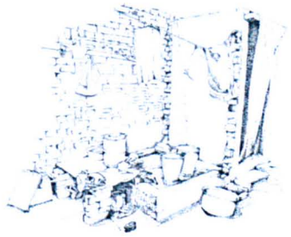
PRIVATE

PUBLIC

1

2

3



4

5

6

7

Chart Showing Different Types of Bathing Spaces Within Kachhpura

[Photograph no. 3 by Banak, K., 2006; Sketch no. 6 by Patwari, S., 2007]

1 Boy bathing with a pan of water next to a open drain

2 Concrete washing platform with a water tap in the open front yard of a dwelling

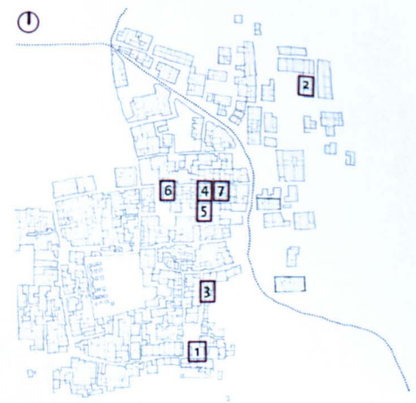
3 Woman and girl washing her hair on the *otla* (threshold step) over a drain to their dwelling

4 Meera's toilet and rendered brick washing platform in the enclosed front yard of her dwelling

5 Waist-height unrendered brick washing structure in the open front yard of a dwelling

6 Meena's toilet and washing area in the enclosed (gated) front yard of her dwelling

7 Sunita's full-height rendered brick toilet and washroom structure with doors in the enclosed front yard of her dwelling



Kachhpura Key Plan

3·3·1 A Place to Wash, Kachhpura, Agra

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.3.1 A Place to Wash, Kachhpura, Agra.

3.3.1 A Place to Wash

The choice of a place to wash is primarily determined by the sourcing and supply of water. At both Kachhpura and Baban Seth settlements, women often use the household *otla* as a place for washing clothes and cooking items. Water is collected from a communal water hand pump (Kachhpura) or a weekly water tanker (bowser) and stored in plastic barrels outside the dwelling (Baban Seth).

Figs. 3.37 a & b - (a) A community water handpump in Kachhpura village, August 2008; (b) Residents collecting water from the weekly water tanker in Baban Seth worker settlement, March 2009.

Bathing requires more privacy for women, whilst men and children tend to wash themselves in open places close to drains. In Kachhpura, women without access to a *pucca* bathing cubicle will pull a curtain across a household veranda or construct a temporary screen out of fabric and timber poles in a front yard (or in the street if no outdoor space is available within the dwelling), strategically positioned to acquire temporary privacy whilst they bathe. Hair washing is carried out separately and women and girls tend to do this together on their *otlas*, or at public water points. This has traditionally been a social activity for female residents.

Figs. 3.38 a & b - (a) Women and girls washing on their *otlas*, November 2006; (b) washing at the community water handpump, November 2011.

(a)

(b)

(a)

(b)

Figs. 3.39 a & b - (a) A semi-*pucca* private bathing cubicle in Kachhpura, October 2007: (b) A *kuchha* shared bathing cubicle in a quarry worker settlement, September 2008.

At Baban Seth, bathing takes place in *kuchha* cubicles constructed with fabric scraps and timber poles. These are typically located next to a drainage channel within clusters of dwellings, and are collectively constructed and shared by residents. The presence of private cubicles is non-existent, and with limited drains running through the settlement, there are very few cubicles available to the women. It is worth noting that in these settlements, there are many more men than women.

There is a history of communal water places in Indian villages, with *baolis* (stepwells) having played an important role in the social and religious life of a community in the past. Although this tradition does continue today with some communities doing their washing together at a shared source of water, such as the edge of a river, mostly this activity has gradually become individualised.

The introduction of hand pumps and taps (piped water) as a method of supplying water to settlements has replaced most manual wells in peri-urban villages, making it easier to collect water (usually with shorter distances to walk). Despite this change, the social function of these water places remain as a place for women to converse whilst collecting their daily supply of water and to leisurely wash their hair together. In Kachhpura, with several hand pumps located throughout the settlement (as well as taps), this social interaction tends to take place on a neighbourly level in clusters, rather than on a community-wide basis (as with a village *baoli*).

(a)

(b)

Figs. 3.40 a & b - (a) *Dhobi ghat* (laundry place) along the Yamuna River, November 2006; (b) Community washing at the edge of the Yamuna River, Agra, November 2010.

In 2006, prior to the inception of KSUP, CURE (2007 pp.29-33), under their Cross-Cutting Agra Program (CAP)[1] facilitated the development of an action plan to improve wastewater drainage in Marwari Basti settlement in Agra (close to Kachhpura). This included the improvement of standpipe platforms linked to open drainage channels with an outfall into the stormwater drain. CURE agreed to provide bricks and other materials, and to cover

1 CURE's Cross-Cutting Agra Programme (CAP) - see glossary.

the costs for a trained mason from the CAP bridging fund. The community offered to provide manual labour. All old and new taps were cemented and linked to a simple drain that used the natural gradient in the settlement to carry off wastewater overflows into the city stormwater drain.

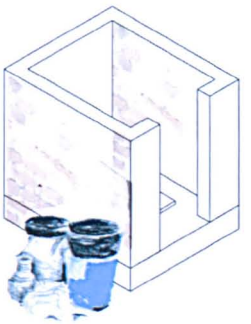
(a)

(b)

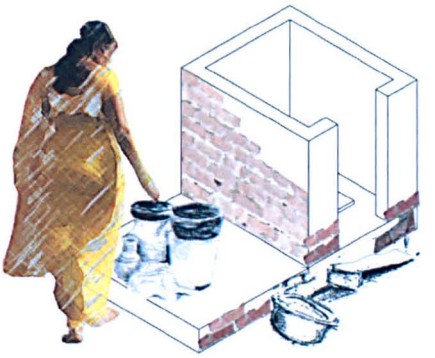
Figs. 3.41 a & b - (a) A temporary private bathing space created with saris, Marwari Basti settlement, Agra, August 2008; (b) New concreted standpost platform, Marwari Basti, November 2006.

Besides improving the community environment, the physical construction of the drain led to several significant outcomes in a nomadic community that had been resisting change for nearly 80 years. The success of the intervention was visible in the way that residents had appropriated the improved standpipe platforms. Sanitation became prioritised and women used saris to enclose the platforms (fig. 3.41 (a)), creating temporary privacy for their new bathing spaces.

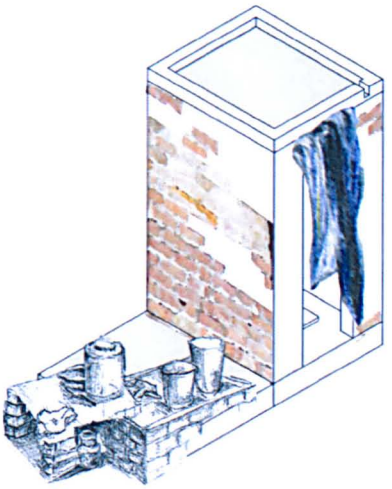
Householders signing up for toilets under KSUP were offered options for toilet and washing structures, to assist with the decision making process. Individuals needed to assess their choices based on income, affordability, and availability of space within the dwelling, as well as individual need and preference. For those who could afford to construct a washing area in addition to a toilet cubicle, these were often built together where possible, creating new sanitation (clean) zones within the dwelling. Gradual improvements, such as permanent doors, rendering to the walls and upgrading of half-cubicles to full structures, were made incrementally as householders accrued savings, and the beneficial value (and status) of these facilities grew over time.



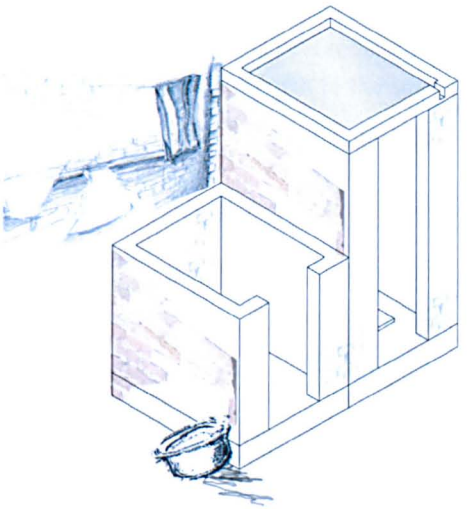
1. HALF TOILET ENCLOSURE



2. HALF TOILET ENCLOSURE
WASHING PLATFORM



3. FULL TOILET ENCLOSURE
WASHING PLATFORM



4. FULL TOILET ENCLOSURE
HALF WASHING ENCLOSURE

5. FULL TOILET ENCLOSURE
FULL WASHING ENCLOSURE

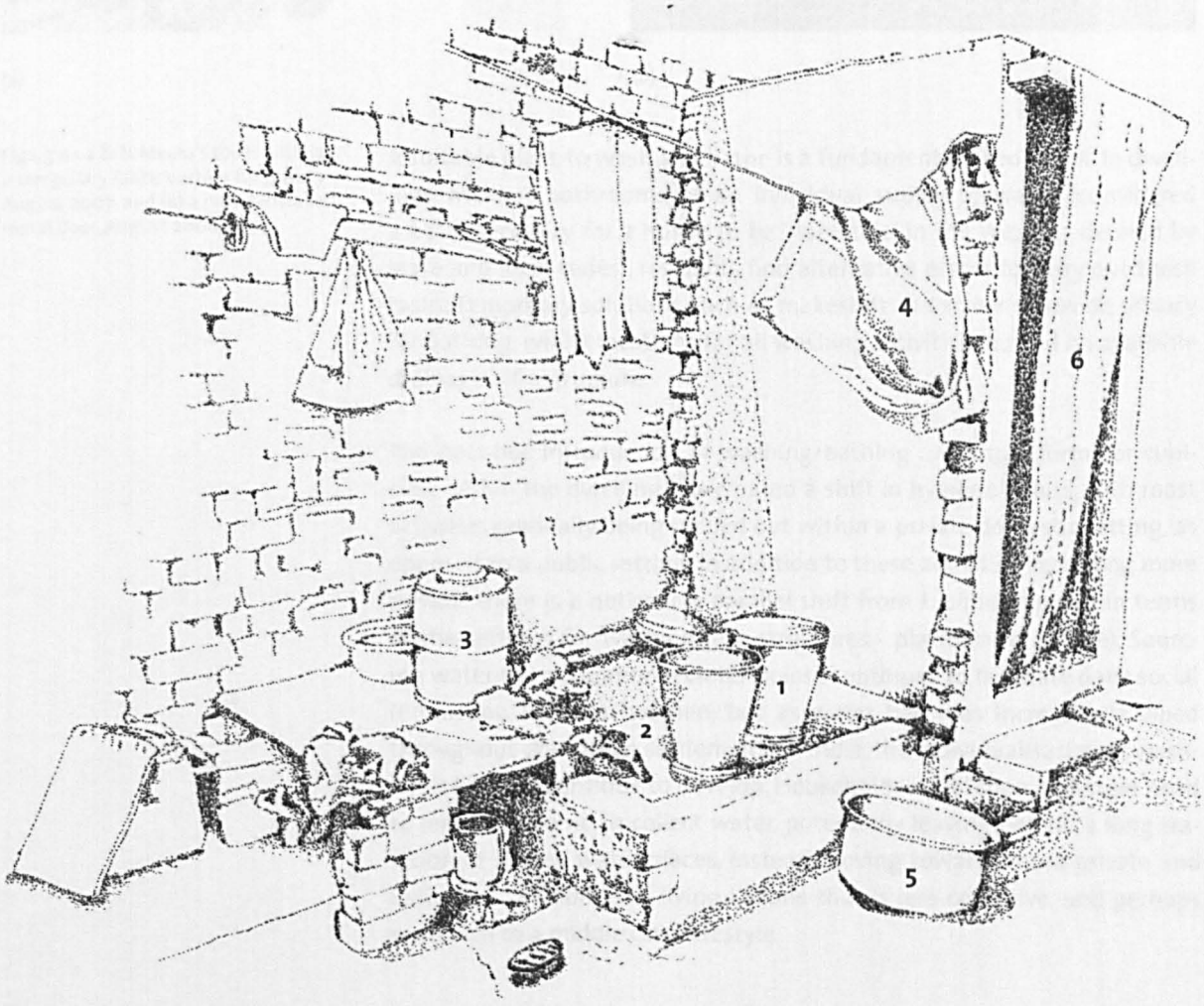
Fig. 3.42. Options for toilet/washing structures for household septic tank systems developed by students, August 2007.

The post-hoc introduction of household toilets and wash spaces has created private places for bathing and washing within the dwelling, shifting these daily practices from the public to the domestic realm. Mitchell (2010 p.179) describes the effect of these facilities on place through *'the acquisition [by householders] of a new set of hygiene habits, ergonomic procedures and adjustments to domestic spatial configurations.'*

The pairing of washing/bathing areas and toilet facilities within the dwelling has created a designated area for water and sanitation, changing the way that residents carry out daily activities. Water collected from a nearby hand pump or tap and brought back to the dwelling can be used to wash cooking utensils after meals on the washing platform, and then left to dry close by. Clothes washed on the platform can be hung up to dry overhead, creating a temporary privacy screen for bathing on the same platform. Grey water from the laundry can be reused for flushing the toilet next to the platform, making the daily water supply collected in the morning go further, saving time and effort going back and forth to the source.

Fig. 3.43. Meera's new toilet cubicle and washing platform showing new ergonomic procedures and hygiene habits, July 2007:

1 water collected from a nearby handpump and stored in buckets.
2 washing area.
3 cleaned cooking utensils drying.
4 laundry hanging up to dry on a line, providing a temporary privacy screen for bathing on the platform.
5 grey water collected from washing and stored in a bucket for flushing the toilet.
6 toilet cubicle.



(a)

(b)

Figs. 3.44 a & b. Meera's toilet with (a) a temporary fabric curtain for privacy, August 2007; and (b) a newly installed metal door, August 2008 (b).

A suitable place to wash and bathe is a fundamental need for all. In dwellings without bathrooms or an individual supply of water (considered a basic necessity for a house to be 'habitable' in the West, as defined by state and local codes), residents find alternative places to carry out these tasks. Temporary solutions such as makeshift *sari* screens provide privacy for bathing, whilst locations for all washing activities depend on available drainage infrastructure.

The post-hoc introduction of washing/bathing areas (platforms or cubicles) within the dwelling has created a shift in hygiene habits, with most activities gradually being carried out within a private domestic setting, as opposed to a public setting. In addition to these activities becoming more private, there is a noticeable parallel shift from *kuchha* to *pucca* in terms of the settings for washing (e.g. structures - platform to cubicle). Sourcing water from communal water points continues to facilitate daily social interaction between women, but as water becomes increasingly piped throughout peri-urban settlements in India, the individualisation of washing is likely to continue to develop. Householders will soon no longer need to leave the home to collect water, potentially leaving behind a long tradition of shared water places, instead moving towards more private and individualised domestic living i.e. one that is less collective, and perhaps even akin to a middle class lifestyle.

Proposed View of DEWATS and the Community Toilet Complex as a New Shared Clean Setting
[Image by Tang, B. (2013) after Lee, V. (2011)]

DEWATS:

1 Completed root zone planted with *Cayhna* (Gladioli)
2 Completed storage sump (treated water)
3 Proposed handpump
4 Main overflow drain
5 Secondary overflow drain (monsoon)
6 Treated water outflow to *nala* (open drain)

COMMUNITY TOILET COMPLEX:

7 Male toilets
8 Female toilets
9 Caretaker's office
10 Water butt (connected to DEWATS to utilise treated water for flushing toilets)
11 Proposed nursery garden (irrigated with treated water)

Kachhpura Key Plan

3.3.2 Community Toilet Complex, Kachhpura, Agra

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.3.2 The Community Toilet Complex, Kachhpura, Agra.

3.3.2 The Community Toilet Complex (CTC)

The only existing communal toilet facilities in Kachhpura are located along 'Poo Road'[1], a path that leads to Kachhpura from the *Mehtab Bagh*. A two-cubicle urinal sits open to view at the southern entrance point to Kachhpura and an abandoned *Sulabh Shauchalaya*[2] Community Toilet Complex (CTC) lies derelict at the north-west corner of the *Mehtab Bagh*. The municipal corporation constructed both facilities; the urinal is still in use and untreated effluent flows directly into an open drain that services Kachhpura and thirteen other settlements upstream. Construction and management of the CTC was contracted to NGO, Sulabh International in 1998 (ANN 2012) but fell into disrepair soon after it was completed. The location of the toilets in a sump (low point) in the fields resulted in annual flooding of the facilities leading to its demise.

Fig. 3.45. Map of Kachhpura:

1 drop-off point for tourists
2 'Poo' Road
3 old CTC and sump
4 south entrance to Kachhpura
5 new CTC
6 new road to CTC

1 Nicknamed by students in 2007, as it is one of the primary open defecation areas for residents of Kachhpura. Although it would make an ideal tourist path (for the Mughal Heritage Walk), connecting the village entrance with the *Mehtab Bagh*, the smell and sight of the road in its current condition would discourage tourist access to the village.

2 *Sulabh Shauchalaya* - see glossary.

(a)

(b)

Figs. 3.46 a & b - (a) Existing urinals; and (b) abandoned Community Toilet Complex (CTC), in Kachhpura, both constructed by the local municipal corporation, *Agra Nagar Nigam* (ANN), 2008.

CURE's Community Sanitation Plan (CSP) in 2007 included the reconstruction of the defunct CTC. Its location at an entrance to Kachhpura close to a tourist drop off point was significant (fig. 3.45). A proposed design by students and CURE was submitted to the ASI, from whom permission was required to undertake any construction work within the restriction zone around the *Mehtab Bagh*[3]. The proposal to 'renovate'[4] the existing toilet was initially approved by the ASI, but later revoked after work began on the site. The proposal for a CTC with facilities for five cubicles each for men and women, as well as two separate cubicles for tourists[5] was challenged by the ASI because the existing structure had been completely demolished, therefore voiding the 'renovation' status of the project. The uncooperative attitude of the ASI towards the CTC renovation was determined by its location adjacent to the *Mehtab Bagh*. With no concern for village issues and only the interests of the historic gardens, the ASI had no compunction about changing their mind. CURE then decided to abandon the CTC proposal, opting to pass responsibility onto the local authority.

To replace the demolished CTC, a new community toilet facility was constructed in Kachhpura in 2011, managed and funded by the ANN. To avoid issues with the ASI protected zone, a new site was selected on *nazul* (government) land, and the toilet was redesigned for the sole use of the community (and not tourists). The final site is close to the southern end of the DEWATS at the edge of the settlement. Construction began in 2010

3 The Ancient Monuments And Archaeological Sites And Remains (Amendment and Validation) Act, 2010, specifies that beginning from the boundary limit of the protected area or protected monument, a minimum of 100 metres is defined as prohibited area in all directions. Beyond the prohibited area, in all directions a minimum of 200 metres has been specified as a regulated area (Tripathy 2012).

4 The Ancient Monuments And Archaeological Sites And Remains (Amendment and Validation) Act, 2010 included an amendment stating: '"repair and renovation" means alterations to a pre-existing structure or building, but shall not include construction or reconstruction' (UNESCO, 2012).

5 The toilet was to have been dependent on paid use by visitors (tourists) to make its maintenance system viable. The construction cost was to be borne from the municipal budget (ASCI 2010).

and it was opened by a government minister in December 2011. However, the facility was unexpectedly closed only a few weeks later. This was not surprising as there was no water connection (even though it had a water butt on the roof), resulting in users having to bring their own flushing water. The lack of an Operation and Maintenance (O&M) plan, including the appointment of *safai karamcharis* (municipal cleaners), together with the water issue led to the CTC becoming dirty and unpleasant, and residents stopped using the facility. Brijesh Singh's wife, Preeti, stated that she tried visiting the facility, but found it too dirty after only two days and decided to return to the fields.

A new road connecting the complex to the settlement was begun in February 2012 (just prior to local elections) but is still incomplete. Residents of Kachhpura believe that the road was only started so that officials visiting the site could see progress taking place. All work halted immediately after the visit. Residents claim that Local Authorities often begin infrastructural improvements and upgrading to low-income settlements in order to influence voters, stopping work after the elections.

Fig. 3.47. Unfinished road construction (2012) leading to the new CTC completed by the ANN in 2011, but to date still closed and without water connection.

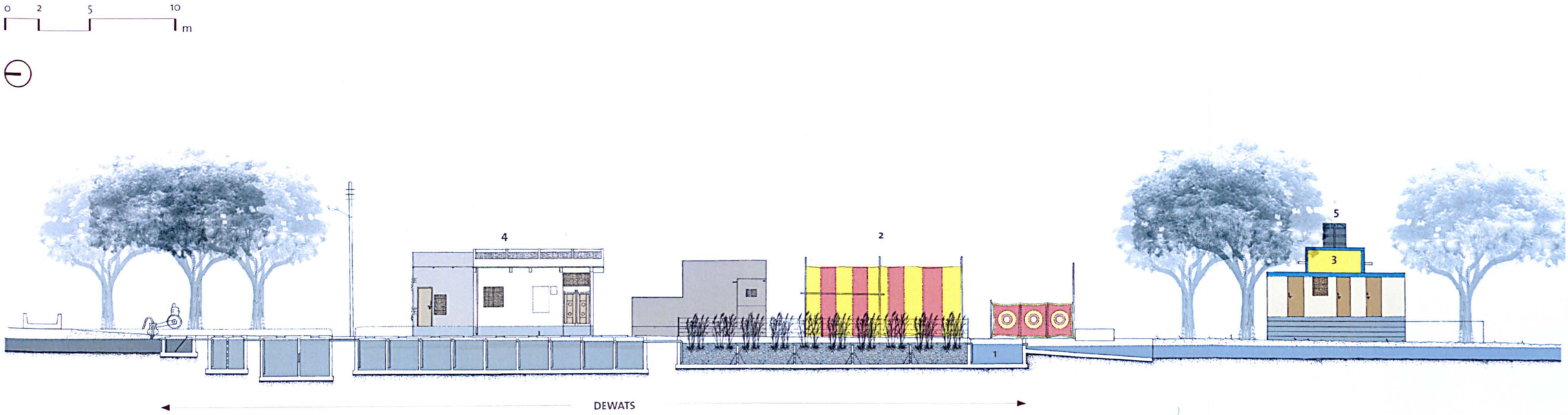


Fig. 3.48. Section through the DEWATS, showing relationships and opportunities for connecting up and creating a new shared clean setting in Kachhpura, 2013.

Key to drawings:

1 DEWATS storage sump (treated water)
2 temporary marriage *pandal* (tent structure)
3 Community Toilet Complex (CTC)
4 Bhajan Lal's new house

Proposed opportunities:

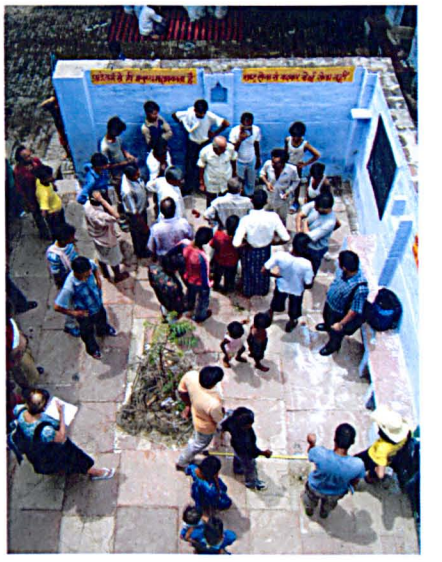
5 water butt (connected to DEWATS water storage sump via pump to utilise treated water for flushing toilets)
6 nursery garden irrigated with treated water

Although the new government built CTC in Kachhpura is not yet functional, there is potential for local residents, facilitated by NGO, researchers and the local authority, to jointly investigate the possibility of connecting the DEWATS with the toilet facility, using treated water to flush toilets. Market gardens, run by local residents and irrigated with water from the DEWATS, could be cultivated on the adjacent unbuilt land, providing additional income for the community. The CTC also requires the appointment of a local caretaker to clean and maintain the facility on a daily basis in order for it to be sustained (in the same way that the DEWATS is maintained by a local resident in the community).

Fig. 3.49. Proposed view of DEWATS and the Community Toilet Complex as a new shared clean setting, 2013.

Toilets were constructed in the only local government primary school in Kachhpura in 2008[6] (fig. 3.51). CURE and students had proposed this in 2007, but there was an initial reluctance from *panchayat* members. Students met with the *panchayat* (figs. 3.50) to explain the proposal in detail and address concerns. Members of the *panchayat* living close to the school explained that they were worried about pollution in the streets around the main *chowk* and loss of valuable space in the school courtyard. Students explained that the effluent would be partially treated in the septic tanks prior to outflow into the open street drain, and that no solid waste would enter the drains.

(a)



(b)

Figs. 3.50 a & b - (a) Meeting between the students and the *panchayat* facilitated by Rajesh Kumar from CURE; (b) Meeting to discuss the location of the toilets in the schoolyard, both July 2007.

The space required for the toilets (one cubicle each for boys and girls) was marked out with chalk to show that only a modest area was required. In addition, the benefits were put forward, such as the introduction of a water supply and hand washing area improving hygiene for the children, and the subsequent increased attendance leading to better education. Following the meeting, the *panchayat* gave their approval for the toilets to be constructed. As a result, the enrolment rate of children in the school (particularly girls) has increased (ASCI 2010).

6 The school is attended by 65 children between the ages of 4-10 years. The school had no toilets and children had to go outside the school premises to defecate/urinate. Lack of toilets also affected the teachers who found it difficult to teach and ensure attendance in classes without this facility (ASCI 2010).

Fig. 3.51. Completed toilets in the courtyard of the local government primary school, Kachhpura, 2008.

An example of the consequences of providing communal toilet facilities without the involvement and education of the community or O&M plans in place, can be seen in the nearby village of Marwari Basti. Dr Simon, a Lecturer at St. John's College, Agra, offered to fund the construction of the community toilet. Detailed discussions were held with the contractor on septic tank design and soil quality. Marwari Basti residents identified a new site for a much larger complex and agreed to provide labour and oversight (CURE 2008).

Fig. 3.52. Completed communal toilet facilities located at the edge of Marwari Basti (with no water connection), 2008.

Since completion in 2008, the new block of communal toilets have never been used, mainly due to the lack of water supply and of an O&M strategy. A lack of demand for toilets and understanding of daily habits and an

unmanaged approach to the construction, led to the failure of the intervention. Perhaps, most importantly, the facilities were never connected to a water supply, rendering them redundant. Within weeks, the lack of ownership was apparent with metal doors and fixtures removed and most likely traded for financial gain.

Abandoned CTCs are common in informal settlements, and there are very few successful working examples, questioning the relevance of shared facilities and their role as communal spaces.

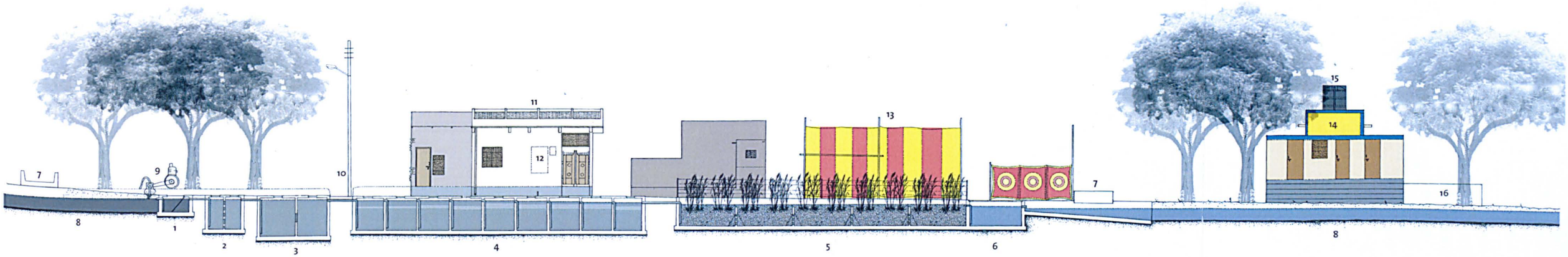
Fig. 3.53: Abandoned CTC in an urban settlement in the Taj Ganj area, Agra, August 2011.

In the stone quarry settlements of Navi Mumbai, the only toilets are adjacent to the site offices of quarry owners. These are for the use of the quarry owner and visitors, and are kept locked when not in use. Occasionally, government CTCs can be found on the side of the main quarry road. These are used by workers, though their foul condition mean they are more often not. Though water and sanitation is a priority, the reality is that the conditions of the majority of drains is not adequate to support septic tank toilets. If introducing a system similar to that used in Kachhpura, rendered brick lined drains are a minimum requirement to carry the partially treated effluent to a DEWATS or underground piped sewage system for further treatment. The recent upgrading of drains, pathways and housing (2011) around the new classroom building at Baban Seth has provided the opportunity for individual household toilets to be introduced.

This review of CTC projects shows that failures occur where decisions are made without involving the residents. Municipal corporations often prioritise speed, putting quality at risk and giving appropriateness and good practice little consideration. Cooperation and involvement of all parties is required for successful implementation of communal facilities. The initial reluctance of the *panchayat* to cooperate with a proposal that would ben-

efit children was prompted by individual members residing close to the school, who did not have children at the school and did not want effluent polluting their neighbourhood.

Some residents in Kachhpura showed a lack of trust in the municipal corporation due to past experiences (dilapidated CTC by the *Mehtab Bagh*, incomplete new CTC and road adjacent to the DEWATS), and often expressed cynicism towards the intentions of outside agencies. The needs of the residents and their cultural habits need to be considered when assessing the suitability and location of the proposal. Operation, maintenance and management within the community is necessary to ensure sustainability through collective ownership and responsibility.



Section Through DEWATS and the New Clean Pedestrian Thoroughfare

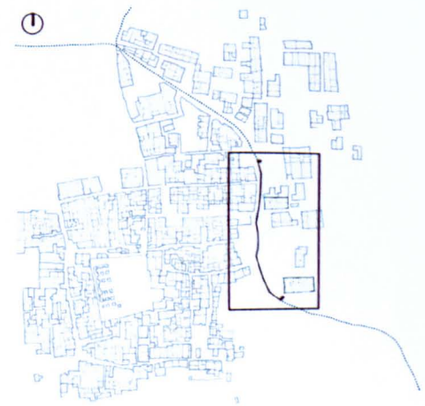
DEWATS:

1 Screen chamber
2 Pre-process filter
3 Anaerobic filter
4 Baffled septic tank
5 Root zone planted with *Cayna* (Gladioli)
6 Storage sump (treated water)

7 Bridge
8 Primary *nala* (open drain)
9 Pump for irrigation (owned by Brijesh Singh's family)
10 *Swaach Gali* (Clean Street) intersection
11 Bhajan Lal's new house
12 DEWATS information poster
13 Temporary marriage *pandal* (tent structure)
14 New community toilet complex
15 Water butt
16 Septic tank

0 2 5 10 m

3.3.3 A New Clean Pedestrian Thoroughfare, Kachhpura, Agra



Kachhpura Key Plan

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.3.3: A New Clean Thoroughfare, Kachhpura, Agra.

3.3.3 A New Clean Pedestrian Thoroughfare

In the *Nai Abadi* of Kachhpura, the introduction of a DEWATS has shifted the existing edge of the settlement eastwards beyond the main *nala*. Historically, *nalas* were old streams or canals which made convenient locations for establishing settlements. Usually, strategic development of the settlement with the *nala* at the edge allowed the use of a pre-existing topographical situation, to facilitate rainwater and wastewater runoff. Today, there is visible improvement of the area around the DEWATS - it is cleaner and no longer foul smelling. The effect of cleaning up the area and *nala* has led to the rapid development of new dwellings. Bhajan Lal's home (chapter 3.2.4) is an example - he began constructing his home just after the DEWATS tanks had been installed. When we spoke in April 2012, he explained that the cleaning and covering up of the *nala* gave him a reason to relocate from the *Purani Abadi* to the new plot of land he owns adjacent to the DEWATS.

Fig. 3.54. Children's places along the new thoroughfare, August 2011.

A new clean pedestrian 'thoroughfare'[1] has been created where children play cricket and games along the concreted surface of the DEWATS, providing an extension to the existing village and leading to the expansion of the *Nai Abadi*. This has created new settings for temporary events to take place - colourful tents are erected in the undeveloped plot adjacent to the root zone planted with *Cayhna* (Gladioli) for marriage ceremonies. The appropriation of this place by residents emphasises the transformation of the *nala* area from an unpleasant dirty edge land to a clean, thriving street, full of possibility and opportunity.

Fig. 3.55. DEWATS: a new clean pedestrian thoroughfare in Kachhpura, October 2011.

1 The term 'thoroughfare' here is used in the Western sense of a substantial route through the settlement, as I have not been able to find an associated equivalent Indian term.

Fig. 3.56. Wedding *pandal* (tent) and ceremony, adjacent to the DEWATS root zone, November 2011.

CURE are currently in discussions with the local authority (ANN) to cover the overflow drain to make them safe and prevent rubbish from causing blockages. In addition, there are plans to connect the DEWATS to the CTC using treated water for flushing toilets. This would facilitate the making of a new shared place associated with a connected DEWATS/CTC which would enable the cleaned pedestrian thoroughfare to be extended southwards. Proposals by CURE/LMU for further water treatment systems in settlements upstream of the *nala* from Kachhpura could extend this thoroughfare further, beyond the settlement northwards. The ANN are also considering DEWATS as a way of extending the Trans-Yamuna underground sewerage system.

In 2008, the ANN agreed to build new drains and paved streets in new areas that were being developed in Kachhpura. Migrants have been steadily moving to the village for a number of years and the settlement has become recognised by the ANN as an 'urban village' (see chapter 2.6), moving away from its status as rural and as a 'listed slum' (CURE 2008). Prior to the installation of DEWATS, new houses were being built in the *Nai Abadi* without the necessary infrastructure such as paved streets and drains. Residents, CURE, and the ANN see the benefits of working towards an 'open defecation free' settlement, particularly with the advantage of boosting tourism in the area.

In Navi Mumbai, a new thoroughfare has also begun to emerge in Baban Seth settlement. The main pathway from the western entrance of the village *Mandir Chowk* and the new classroom has become more established since it was concreted by the local authority in July 2011.

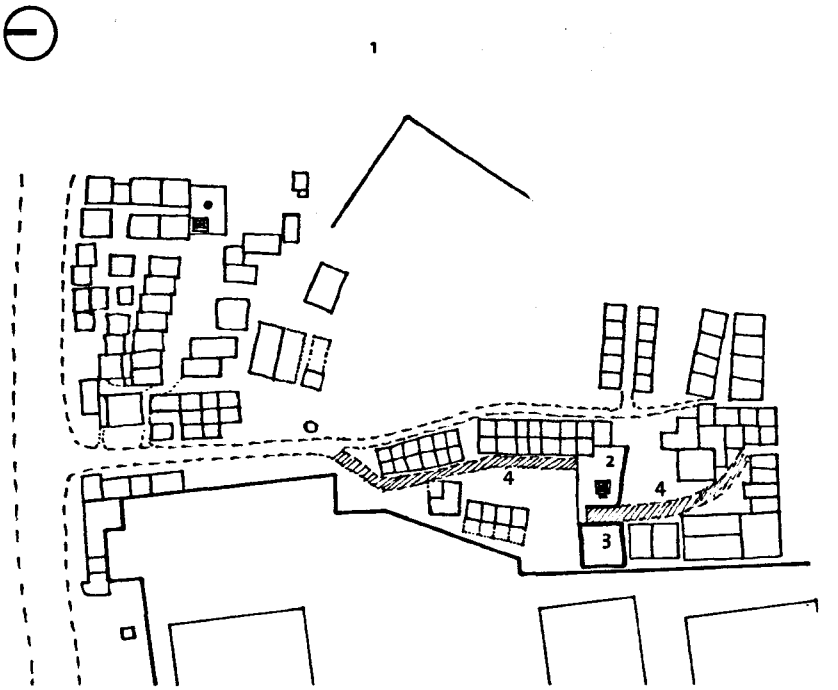


Fig. 3.57. Sketch plan of Baban Seth quarry settlement showing location of the classroom site and new thoroughfare, 2012:

1 to quarry
2 *Mandir Chowk*
3 classroom
4 concreted pathway

Since completion, both quarry classrooms have been used regularly for community and women's SHG meetings, providing a permanent space for Bridge classes and *balwadis* which take place daily. ARPHEN (2010) provided statistics showing that since the opening of the community classroom at Baban Seth, the number of local children not attending a school had decreased from twenty-five to three. Other activities such as religious festivities and local weddings also take place, and ARPHEN is in the process of setting up evening adult literacy classes in the classrooms, to extend the reach of education in the settlements.

After the classroom was constructed, the Lions Club[2] of Navi Mumbai decided to sponsor the teacher's salary for the Bridge class at Tata Press. The club also donated teaching aids and educational toys, and sewing machines to facilitate sewing classes for women. The classrooms are also used to further the work of ARPHEN in setting up women's savings groups, temporary health screening camps, awareness programs, and allow single migrant workers to consult an ARPHEN counsellor.

2 The Lions Club network in Navi Mumbai is part of Lions Club International, a secular organisation founded in the United States in 1917 with over 44,500 clubs in 191 countries, who strive to meet the needs of local communities and the world.

(a)

(b)

Figs. 3.58 a & b. (a) *Balwadi*; (b) Women's sewing class, both at Tata Press classroom, September 2011. After struggling to maintain funding for Bridge class teachers, ARPHEN (2011) state that they are now finding it easier to find sponsorship since the classrooms were constructed. However, funding partners remain limited to pledging support for activities held at the new two classrooms.

Since the official inauguration of the classroom buildings, the residents have made gradual improvements, paid for by contributions from everyone in the community. Research assistants and the community made further improvements such as lighting and fans in the Baban Seth building in March 2010. Electricity services had not been possible previously due to the lack of connection, but following the opening of the building, the quarry owner agreed to cover the provision and running costs of power, much to the delight of the community. Prior to this, the only artificial lighting in a shared space after dark was at the *Mandir Chowk*.

The variety of activities taking place in the new classroom has increased the flow of movement along the main pathway, which has become a new thoroughfare through the settlement. Residents have begun to use new materials in the repair and upgrading of their dwellings, and the annual repair of houses prior to monsoon is giving way to more permanent upgrades to houses by long-term residents.

Fig. 3.59. Men transporting new materials for upgrading houses at Baban Seth settlement, August 2011. Materials such as profiled coloured plastic roofing sheets (used for the roof of the classroom building) are replacing cheaper more commonly used corrugated metal sheets and cement sheets (which are harmful as they contain asbestos).

Tayama moved to the quarries with her husband in 1996 and after 15 years has decided that she will not leave the settlement anytime in the near future (she was recently appointed President of the *Amba Mahila* women's SHG at Baban Seth settlement). This decision led to her making *pucca* improvements to her house in Baban Seth (July 2011), with the replacement of *kuchha* metal sheet clad walls with rendered brickwork, and additional utilisation of spaces between dwellings to add more internal space and install a toilet. Recent additions (April 2012) include an electricity supply powering internal lighting, a ceiling fan and flat screen television.

As the same time, Tayama's neighbour also upgraded her house, utilising room between dwellings to add more internal space whilst making small improvements such as upgrading and rendering her entrance and doorway. The two remaining access points still allow residents to navigate around the cluster of houses, with the third former access point now making the communal place more private (less accessible to outsiders).

Figs. 3.60 a & b. Tayama's neighbour's upgraded dwelling - the new door (a) fills in the area formerly offering access to the courtyard beyond (b), August 2011. The extension of her dwelling onto the shared courtyard area has not led to any disputes between the surrounding householders.

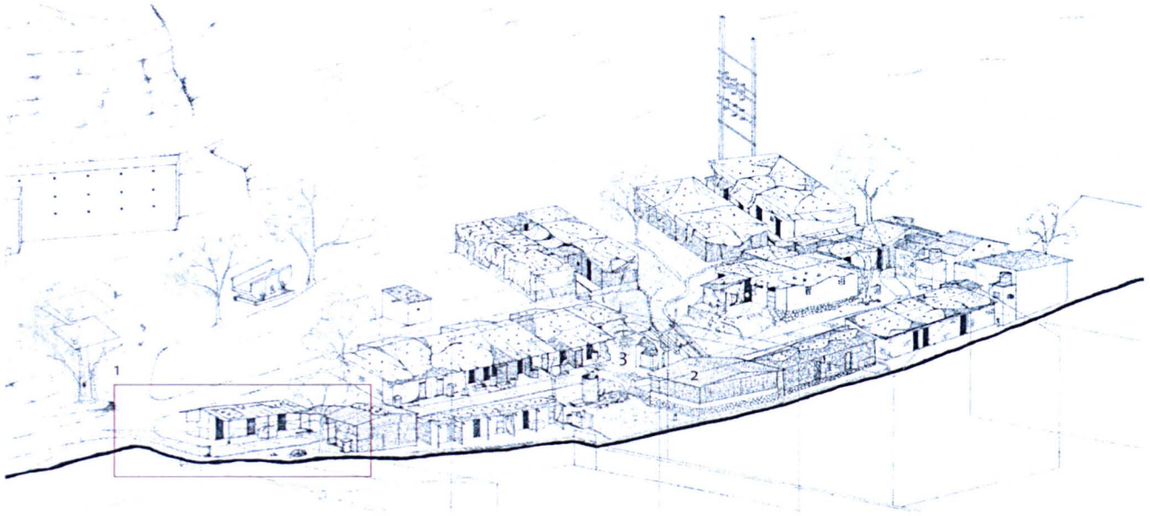
(a)

(b)

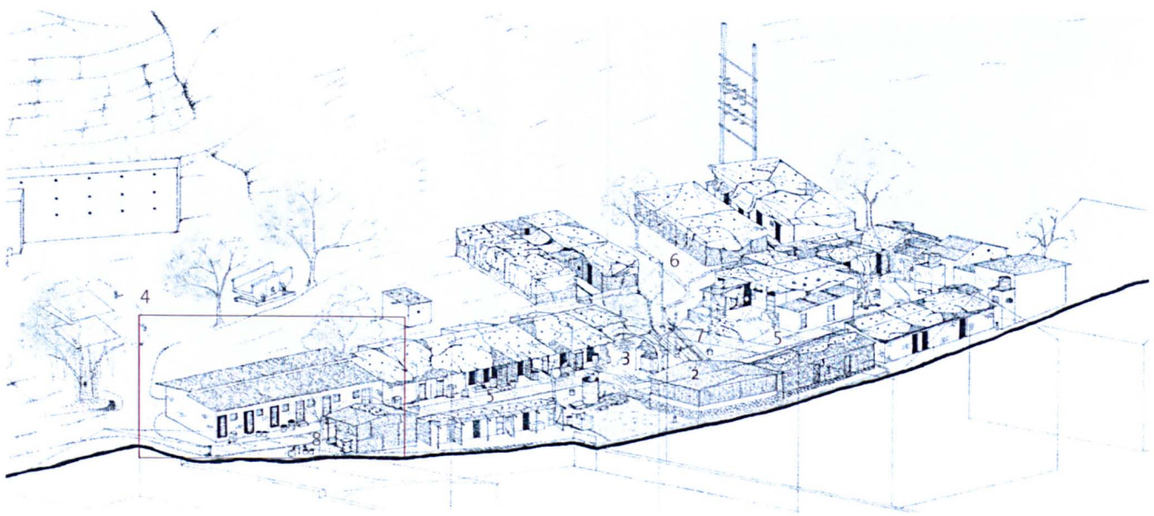
In March 2012, there was a noticeable change in the fabric of Baban Seth settlement. An entire tenement of *pucca* (brick and cement rendered) dwellings was constructed along the new concreted pathway replacing inferior semi-*kuchha* houses. The quarry owner had recently agreed to lease the quarry to a Baban Seth resident, Tayama's son, Rajesh. Since taking up the leasehold of the quarry in March 2012, he has begun to build new *pucca* housing for workers due to arrive from rural areas.

The decision to build permanent housing for workers is an unusual and risky investment and change in thinking by the quarry owner, and somewhat risky given the temporary nature of the quarries themselves. Notably, the former quarry owner and his father, Baban Seth, are well respected in the worker community[3] (compared to other settlements where residents and quarry owners are often in conflict) - this influenced the decision to build the first classroom here.

3 The residents of Baban Seth commissioned a large-scale painting by a local artist of the quarry owner after his death about 5 years ago. This is displayed in the new classroom



(a)

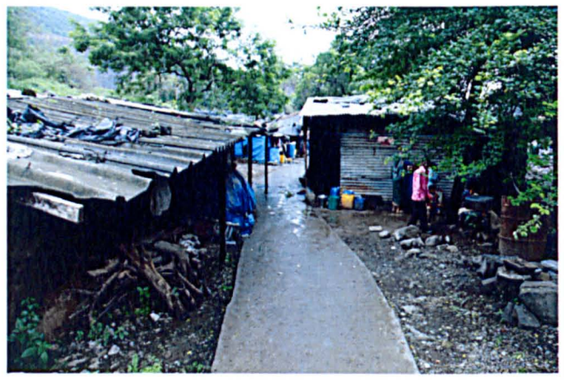


(b)

Figs. 3.63 a & b - (a) Part of Baban Seth quarry worker settlement, April 2010; (b) Part of Baban Seth quarry worker settlement, April 2013:

1 *kuchha* dwellings
2 new classroom building
3 *Mandir Chowk* (Temple Square)
4 *pucca* dwellings
5 new concreted pathway
6 new street lighting
7 new formalised drains
8 new water taps

Figs. 3.62 a, b & c. (a) *Kuchha* dwellings along the main pathway in Baban Seth quarry worker settlement, November 2011; (b & c) New *pucca* dwellings along the new thoroughfare, April 2012.



(a)

(b)

(c)

Government and local authority support has been essential to ensuring the continued improvement of conditions in the settlements. Since completion, the local ward Corporator[4] from the NMMC has addressed some of the most pressing issues facing quarry residents. At Baban Seth, these include formalised drains constructed around the classroom dealing with household wastewater and monsoon runoff and concreting of major pathways through the settlement (both July 2011). New water taps have been installed at both settlements, and are managed by ten local residents. The cost of the water supply is shared by each community. The local ward Corporator (August 2011) explained that he had chosen these two settlements as starting points for making improvements to the wider physical infrastructure of all the quarry settlements, as the new classrooms had given them more prominence in the area.

(a)

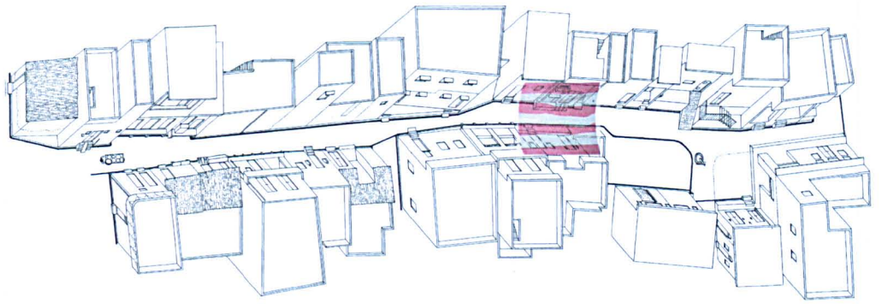
(b)

Figs. 3.61 a & b - (a) New concreted path; (b) covered drainage infrastructure, both constructed by the NMMC, November 2011.

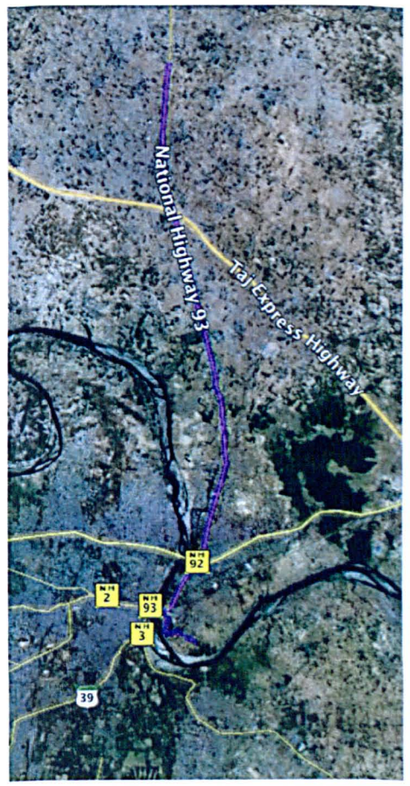
The creation of a new thoroughfare in both Kachhpura village and Baban Seth quarry worker settlement suggests new stages in the development of the settlements. Both thoroughfares were in some way instigated by the introduction of post-hoc infrastructure; DEWATS in Kachhpura, and roads, drains and amenity building in Baban Seth. The permanence of the interventions and cleaning up of the areas has provided an incentive for both old and new residents to make their homes there with a more long-term sense of future in the settlements. This reassurance has led to a renewed sense of value by residents who have begun to invest in *pucca* improvements and upgrading of their dwellings. The cultivation of a new thoroughfare provides a new kind of communal setting for collective development to take place between neighbours.

4 There are 89 wards in Navi Mumbai; a Corporator is elected from each of the wards as a representative who ensures that all the facilities provided by the NMMC are in order.

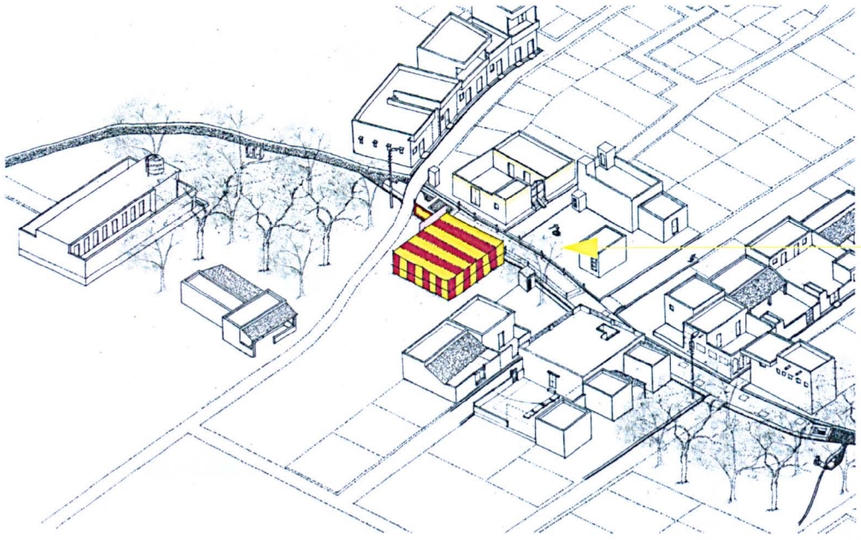
A Section through the *Panchayat Chowk* - Brijesh Singh's marriage place



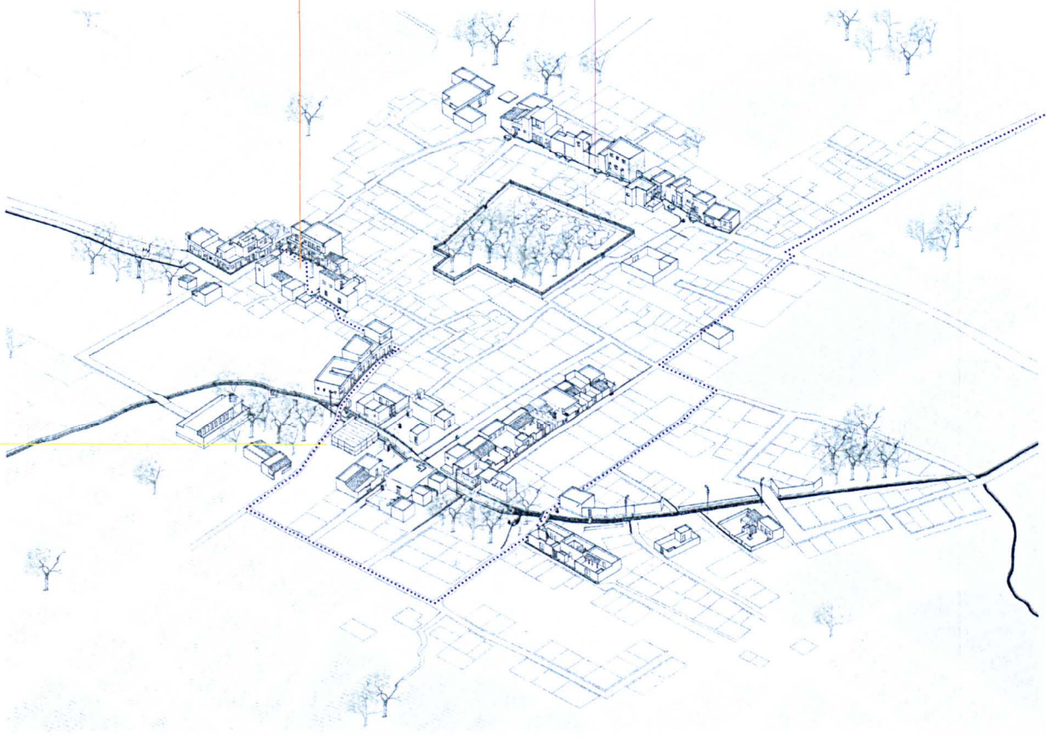
C A temporary covered marriage place created on Market Street



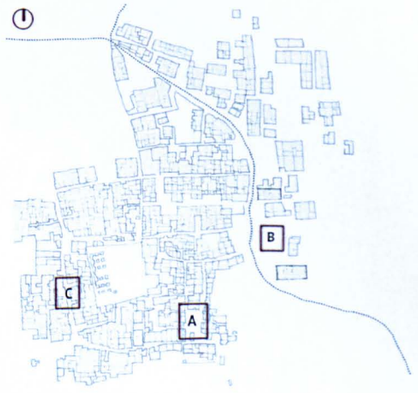
Brijesh Singh's marriage procession route from Kachhpura to his bride's home in Kandali, 20km away



B A temporary marriage *pandal* (tent structure) erected next to the completed DEWATS



Brijesh Singh's marriage procession route through Kachhpura on horseback



Kachhpura Key Plan

3.3.4 A Celebration Place, Kachhpura, Agra

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.3.4: A Celebration Place, Kachhpura, Agra.

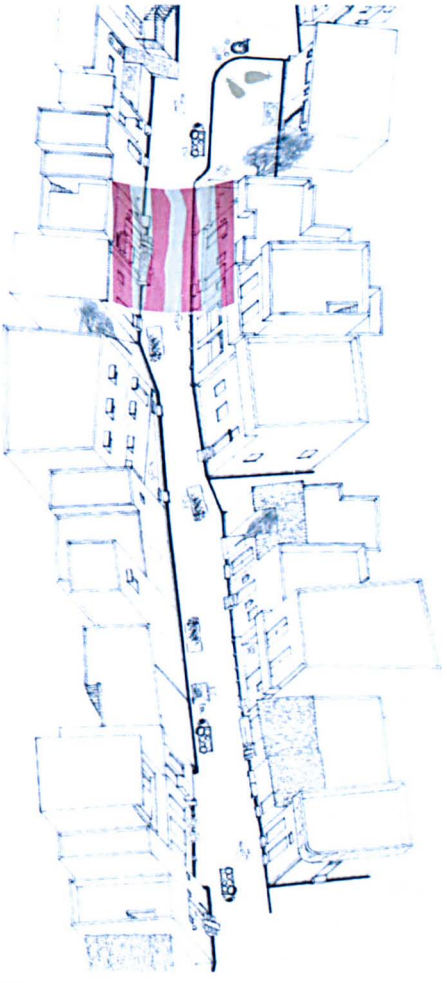
3.3.4 A Celebration Place

Hindu marriage celebrations take place over several days and typically begin with a ceremony hosted in the groom's village. One of the most important and boisterous ceremonies is the *baraat*[1]. In Kachhpura, the main event areas for guests of the family to gather are usually located close to the groom's family home, either in an open space, *chowk* or *gali*. A *pandal*[2] (temporary marquee structure) made of bamboo or timber poles clad in bright fabric provides a tented space to entertain guests. If the marriage place is on a *gali*, fabric is strung up between the buildings to create a temporary celebration area. A loud music band follows the *baraati* (wedding procession group) providing entertainment and music for dancing along the journey.

(a)

(b)

(c)



(d)

Figs. 3.64 a, b, c & d. A wedding place created on a street in Kachhpura by hanging fabric across the *gali*, August 2008.

1 Traditionally in north India, the *baraat* is the procession of the groom on the day of the wedding from his family village to the bride's home. He will be dressed in his wedding attire and seated on a white decorated mare, accompanied by the *baraati* (groom's friends and relatives) who follow on foot.

2 The *pandal* provides an enclosure for guests shaded from the sun for events during the day, and is brightly lit inside for evening festivities.

Brijesh Singh's (chapter 3.2.2) marriage ceremony took place in the main *Panchayat Chowk* where his house is located. A *pandal* was put up in the *chowk*, and his family home was decorated with lights. The *baraat* gathered outside his house and followed a route around the settlement, before leaving towards the bride's rural village in Kandali, 20km north of Kachhpura. Brijesh invited me to watch his wedding video, which showed him on a white horse with his *baraati* passing through the main square, through *galis* and past the DEWATS, before heading east away from the village.

Fig. 3.65. Map of Brijesh Singh's *baraat* (wedding procession) route through Kachhpura, May 2011.

In November 2011, preparations for a pre-wedding ceremony were being made on a site adjacent to the DEWATS. A *pandal* had been put up in the open space next to the root zone with a temporary wooden plank bridge[3] placed over the newly constructed overflow drain to create a makeshift crossing for easier access to the celebration place. Cleanliness is an important theme in wedding rituals – the groom's family residence is cleaned, and both the bride and groom have ceremonial baths to cleanse the body, before the main marriage ceremony. In particular, the *Matkor* ceremony (rite of digging clay) is customarily undertaken in a clean place just outside the bride's home (Das 2010). The choice of this site as being a suitable place for hosting the ceremony suggests a renewed perception of the DEWATS area by residents as a 'clean place' where the dirty open *nala* once flowed.

3 Permanent concrete slab bridges over the overflow drain for easy crossing were constructed in February 2012.

(a)

(b)

Figs. 3.66 a & b. The ceremonial *pandal* next to the DEWATS, November 2011. The groom's family dwelling is opposite the *pandal* to the right of the DEWATS root zone, November 2011.

Fabric tents or canopies are often coupled with community platform structures or meeting mats to create places for large gatherings for community events or festivities. The event below is a community *mela* (fair) held in a *chowk* in the Yamuna Bridge area in Agra, where a large number of attendees from local communities were invited to enjoy dance performances by local girls' dance groups.

Figs. 3.67 a & b - (a) The public *chowk* on a typical day, November 2010; (b) Hosting a community *mela* (fair), September 2007, Yamuna Bridge Colony.

(a)

(b)

Figs. 3.68 a & b - (a) Opening ceremony for the new classroom building at Baban Seth quarry worker settlement, March 2009; And (b) at Tata Press quarry worker settlement, November 2009. NGO ARPHEN noted an eager request from a resident of the settlement for an upcoming marriage celebration to be held in the classroom building even before the structure was fully completed (March 2009). The wedding took place there later in the year.

At Baban Seth, the *Mandir Chowk* has long been the main area for hosting celebratory events within the community such as religious festivals or weddings. Since the construction of the classroom building, these festivities and events have continued to take place there, with the building as an extension to the *Mandir Chowk*, providing more room for participants to gather and enjoy the celebrations[4]. In discussions (2012) with women's Self-Help Groups (SHGs) at both Baban Seth and Tata Press settlements, the women spoke excitedly about the number of weddings, birthdays and other such celebrations that often took place in the classroom buildings.

(a)

(b)

4 The site for the classroom building was the former rubbish dumping area for the community, rendering it unusable in its current state before the classroom was constructed.

In March 2010, NGO ARPHEN organised a Women's Sports Day event for women living in the quarry settlements. The event took place on an open patch of land between two neighbouring settlements (Baban Seth and Chuna Batti), adjacent to a disused water tower. Chalk dust was used to mark out tracks on the ground, and a large *pandal* was erected by a local hire company to shade spectators from the scorching afternoon heat. Women from many different quarry settlements along the 15km stretch of quarry belt were invited and approximately 150 quarry residents attended the event.

(a)

(b)

Figs. 3.69 a & b. Women's Sports Day event organised by NGO ARPHEN, Navi Mumbai, March 2010.

The temporary appropriation of an area that is usually empty with a fun-filled community event offers those involved a sense of collective identity, if only for a short time. In the barren quarry landscape, the bold colours of the *pandal* stand out offering a celebratory respite from the difficult working and living conditions of the residents. Participants, encouraged by the prizes on offer (cooking utensils such as metal plates and pots) enthusiastically took part in the planned races which included the marble and spoon race, water bottle filling relay, and even musical chairs. The prize-giving was presented by representatives of the event sponsors (Avert Foundation[5]) to loud cheers from spectators giving a sense of pride and empowerment to the participants.

The colourful fabric and *pandal* structures put up on streets, squares, and outside dwellings are identifiable throughout villages, towns and cities in India, and are a representation of gathering and festivity. The bold colours exclaim celebration in the most extravagant ways, sharing the festive spirit with the hosts, guests and outsiders alike, through the visual splendour of the display. This coupled with typically roaring live band music prevents anyone within a 200m radius from not being involved in some way (spectator or participant or simply passer-by). The simple colourful sheets of fabric is often the only infrastructure that is required to create a setting for celebration and gathering, whether on a *gali* or *chowk*, or open place.

5 The Avert Foundation is an international non-profit organisation devoted to promoting healthy lifestyles and eliminating disparities in low socio-economic populations.

Temporary celebration can take place in areas with little obvious significance beyond the duration of their performance. As an experience that is collectively shared, it will stay in the memories of the participants even if the place itself offers no reminder. The open area where the Women's Sports Day was held in the quarries for one day returned to being a disused space after the event was over and everyone had returned to their homes. The fragile changing nature of the quarry environment offers little scope to engage the senses and memory in order to sustain a permanent collective cultural identity for the residents.

The permanence of the quarry classroom at Baban Seth has allowed it to become an institution for continual collective gathering and celebration. The community have embraced the building as an extension of their sacred centre (*Mandir Chowk*) and it is treated and appropriated by residents accordingly (for example, the building is cleaned daily together with the *Mandir Chowk* and shoes are not worn inside the building). The association of the quarry classroom with gathering and celebration (as well as its primary function as an educational place) has created a permanent collective cultural identity known throughout the quarry settlements. Residents from several settlements along the Thane-Belapur quarry belt are often invited to attend and join in with activities and events organised by ARPHEN at the quarry classroom, making it accessible to and shared by all, and not simply by the immediate residents of the settlement in which it is located. This may lead to the improvement of cross-settlement communication as well as to connections to the city.

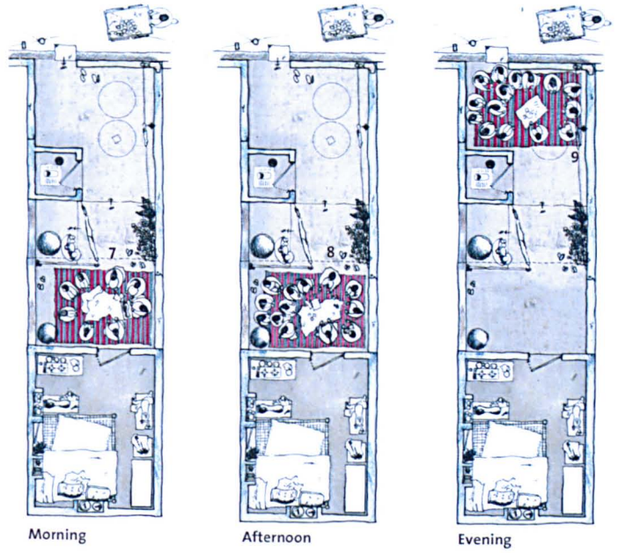
3.4 SETTLEMENT AND TOWN

1st Floor/Roof Terrace (*Chhat*) Plan

A Plan of the *Panchayat Chowk*
[Drawing by Tang, B. (2013) after Lee, V. (2011)]

0 2 5 10 m

3·4.1 The Meeting Mat, Kachhpura, Agra



Morning Afternoon Evening

B Plan of Meera's Dwelling
[Drawing by Lee, V. (2011)]

C Plan of the West Entrance to Kachhpura
[Drawing by Lee, V. (2011)]

A *PANCHAYAT CHOWK:*

1 *Panchayat* (village elders) meeting under the *Neem* tree in the *chowk* (square)

2 Class at the local primary school

3 Meeting (toilet discussion) between NGO, LMU students and teachers in the school courtyard

4 Women's Self Help Group (SHG) meeting in the *Soochna Sansadhan Kendra* (SSK) - NGO site office

5 Interview between researcher and Brijesh Singh's family on his *chhat* (roof terrace)

6 Meeting (tea terrace structure conversation) between LMU students and Shri Ram on his *chhat*

B MEERA'S DWELLING:

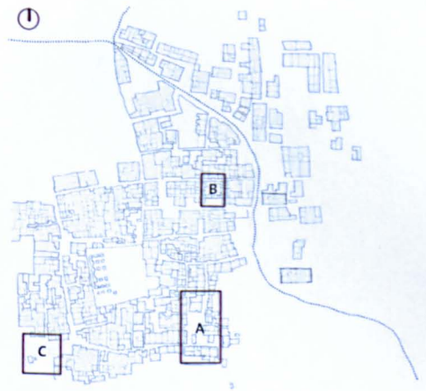
7 Morning - interview between students and Meera in her yard

8 Afternoon - women's livelihood (bag making) workshop in Meera's yard

9 Evening - discussion between students and women's SHG in Meera's yard

C WEST ENTRANCE:

10 *Sanjhi* Art (paper cutting) workshop under the *Neem* tree at the West entrance to Kachhpura



Kachhpura Key Plan

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.4.1: The Meeting Mat, Kachhpura, Agra.

3.4.1 The Meeting Mat

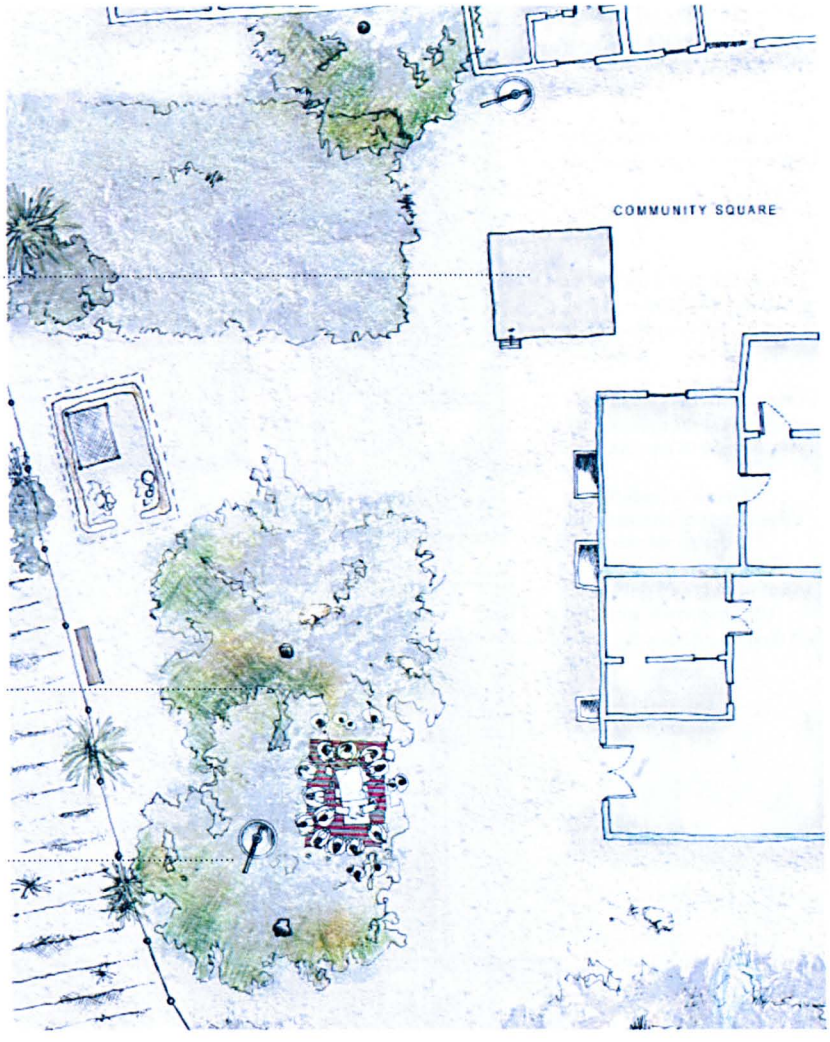
Chapter 3.2.3 describes how Meera's yard was upgraded with the introduction of a septic tank toilet system, transforming the way the yard has been occupied since. With the host of collective initiatives set up by CURE in parallel with KSUP since 2007, particularly focused on empowering women (SHGs, toilet saving and livelihood generation groups), Meera was soon busy conducting meetings and workshops, bringing women and youth together from all parts of the community. At first, most of these meetings took place in her yard, but soon other gathering places in the settlement were required to accommodate the number and variety of events taking place at different times throughout the day.

Fig. 3.70. Meetings and workshops in Meera's yard, November 2010.

As each of these collective initiatives became more established and were able to be self-managed (with minimal assistance from Meera or other CURE facilitators), the creation of new meeting places emerged. Women getting together in small groups to work on livelihood generating initiatives such as bag making would gather in the front yard of a dwelling. Young girls would sit under a large *Neem* tree at the west entrance to the settlement after school finished mid-afternoon and develop their *Sanjhi* (paper cutting) artwork together. On each of these occasions, a simple mat was laid down underneath them, turning the bare dusty ground into a platform for collective participation.

(a)

(b)



(c)

Figs. 3.71 a, b & c. Girls' *Sanji* Art workshop on the meeting mat under a tree at the west entrance to Kachhpura, November 2010.

The particular mats discussed here are low-cost and available at the local market. The red and black stripe pattern is simple to reproduce and the material used is not of high quality. The mats are stored in the *Soochna Sansadhan Kendra* (Information Resource Centre) in the *Panchayat Chowk* in Kachhpura (chapter 3.4.3), a centre started by CURE and managed by women in the community (including Meera). Shade and light often dictates where the mat is placed and meetings held – under trees with large canopies and under covered yards in the hot afternoons, out in the open and on rooftops during the evening before the sun sets and inside rooms artificially lit at night.

Fig. 3.72. Plan of the *Panchayat Chowk* showing activities and locations of the meeting mat.

1 *Panchayat* meeting under the *Neem* tree in the *chowk*.

2 class at the local primary school.

3 meeting (toilet discussion) between NGO, LMU students and teachers in the school courtyard.

4 women's SHG meeting in the *Soochna Sansadhan Kendra* (SSK) - NGO site office.

5 interview between researcher and Brijesh Singh's family on his *chhat*.

6 meeting (tea terrace conversation) between LMU students and Shri Ram on his *chhat*.

Collective activities that take place on the mat are separated by gender and/or age. *Panchayat* meetings take place once a month and are attended only by men.[1] Similarly, men do not participate in women's groups (self-help, savings, livelihood generation). Children and youth have their own groups for sport, craft, and skills training. Most of these groups welcome young people of all ages and are not gender biased. As young outsiders working with the NGOs, the male members of our student groups were allowed to sit in with the women's SHG meetings, and equally the female students could participate in meetings between the *panchayat* and NGO. Children and youth welcomed us in every situation to take part in their workshops and activities.

Fig. 3.73. Students meeting with the *panchayat* under the *Neem* tree in the main *Panchayat Chowk* (facilitated by Rajesh Kumar from NGO CURE), to discuss putting toilets in the local primary school, 2007.

The meeting mat is used to hold *balwadi* classes for very young children, particularly in situations where there is no formal school or building available for such activities. The usually highly active children learn discipline from participating and being included on the mat, resisting the temptation to venture beyond the boundaries of the mat, for fear of being excluded completely from the class activities (fig. 3.74a).

The meeting mat demarcates small areas for temporary gathering, much like the canopies constructed out of bamboo poles and colourful fabric for larger events and festivities such as weddings (chapter 3.4.2). The nomadic nature of the mat enables these gathering areas to be arranged in a matter of minutes. The simple gesture of being ushered to sit on the mat translates into a warm invitation and welcome into the group. The removal of

1 In 2009, the Union Cabinet of the Government of India approved the increase from 33 percent to 50 percent of seat reservation for women by direct election in PRIs (*Panchayati Raj* institutions). The state of Uttar Pradesh has been slow in implementing this legislation resulting in minimal or no change to *panchayats* in villages in Agra (Government of India 2009).

shoes before stepping onto the mat keeps it clean whilst creating a temporary respected place for collective gathering (comparable to removing shoes when entering a sacred place of worship). Large groups of people can be accommodated with several mats laid down together to form a vast shared territory for enjoying a dance performance.

(a)

(b)

Figs. 3.74 a & b - (a) Meera teaching a *balwadi* class on a platform with a tree and shrine in a neighbouring settlement, Marwari Basti, Agra, November 2006; (b) Watching a girls' dance performance at a local *mela* at Yamuna Bridge Colony, Agra, 2007.

In November 2010, I led a five week field trip where students designed and constructed a tea terrace canopy on the rooftop of a dwelling near the southern entrance to Kachhpura. The plan was to assist CURE with improving the MHW, through small interventions. From guest book feedback kept by CURE and through observation, students noticed that whilst visitors enjoyed the 2 hour tour given by local residents (mobilised and trained by CURE as tour animators), they found that having tea on the *chhat* (terrace) of a house (with a view to the Taj Mahal) was often unbearable due to the lack of shade in the scorching afternoon sun.

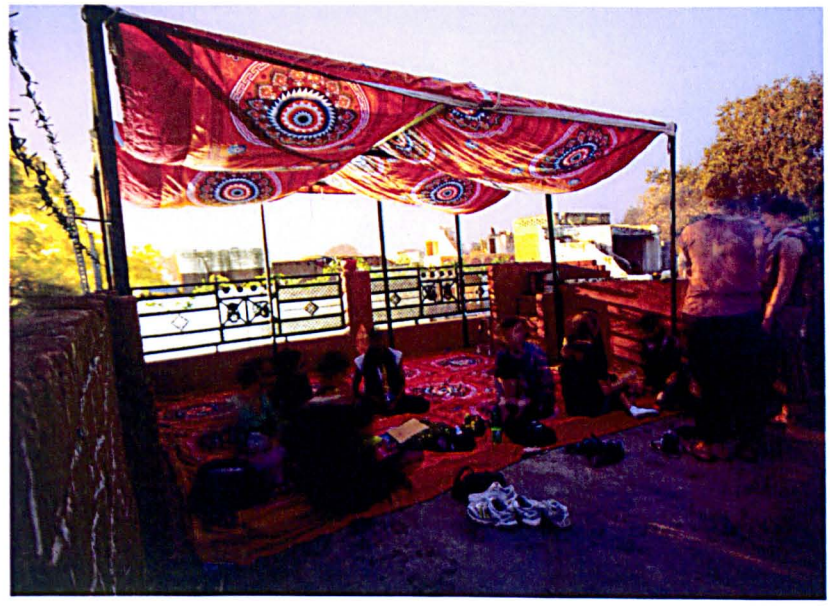


Fig. 3.75. Tea terrace structure built by students on Shri Ram's *chhat*, Kachhpura, November 2010.

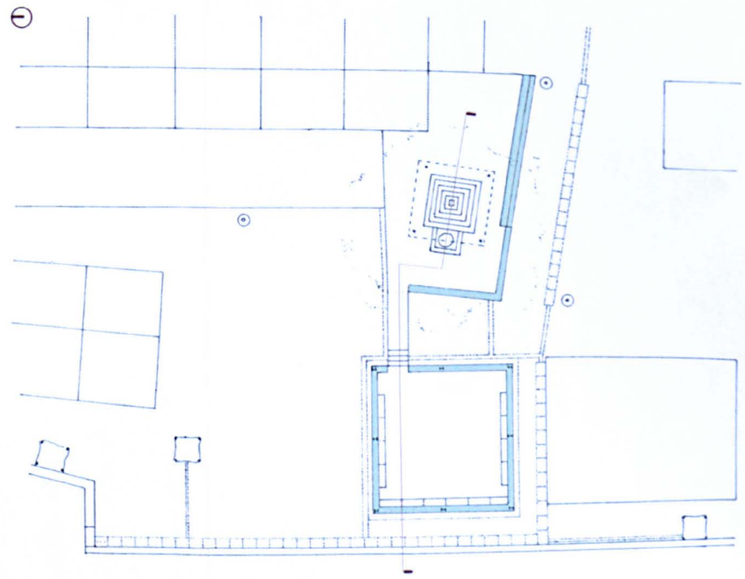
As a result, a permanent canopy structure was built (a steel frame with removable fabric). To prevent the issue of one resident in the community monopolising the trade from tourists on the MHW, several other householders have since volunteered to improve their roof spaces and host the MHW visitors for tea. The tea terrace structure performs its function as a shade for tourists, whilst providing a play area for Shri Ram's children and their friends. A new gathering place has been created - one that is now a permanent feature of the *chhat*, but does not necessarily embrace the nomadic nature of the meeting mat.

In Kachhpura, the mat facilitates the gathering of people in a variety of contexts, from a quiet meeting between a small group of women in a yard, to busy drawing workshops with young people under a tree. There is a *pucca* brick and sandstone platform for formal meetings in the community located at the western entrance to the village (chapter 3.4.3). However, it is apparent that this is only used for important occasions planned in advance such as weddings and political campaigning events. Though the ancient platform (evident from the use of *Lakhori*[2] bricks and an inscribed plaque) has historic significance as a community meeting place, *panchayat meetings* now often take place in the main *Panchayat Chowk* and in the grounds of the adjacent primary school. In these situations, the black and red mat acts as a temporal substitute for the *panchayat* platform as a forum for collective decisions to be made, disputes to be resolved and justice served in the community.

2 A type of brick traditionally used to construct buildings during the Mughal era, identified by its thin proportions compared to standard bricks used today.

Section Through the New Classroom Building and *Mandir Chowk* (Temple Square)

1 Temple shrine and Neem tree
2 Plinth
3 Low brick wall
4 Steel frame
5 Corrugated plastic roof
6 New tiled path
7 Bamboo blinds
8 Portrait of Baban Seth - (deceased) quarry owner
9 Moveable blackboards
10 NGO banner
11 Stone slab seating
12 Lockable storage cupboards
13 Lockable entrance gate to classroom
14 Brick-lined drain
15 Donated sewing machines
16 Boundary wall to factory sites
17 *Kuchha* (temporary) dwelling
18 Low wall surrounding *Mandir Chowk*
19 Ceiling fans
20 Strip lighting



Temple Square Key Plan

3.4.2 The *Mandir Chowk*, Baban Seth Stone Quarry Worker Settlement, Navi Mumbai

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.4.2 The *Mandir Chowk*, Baban Seth Stone Quarry Worker Settlement, Navi Mumbai.

3.4.2 The *Mandir Chowk* (Temple Square)

At the centre of Baban Seth settlement, a small temple shrine sits amongst clusters of basic shelters comprised of tarpaulin and corrugated metal sheeting, scattered along the hillscape. The shrine structure is clad in patterned tiles surrounded by a low wall with built-in seating, all shaded by a large *Neem* tree.

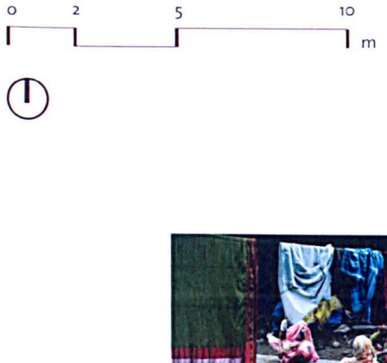
Fig. 3.76. *Mandir Chowk* at Baban Seth quarry worker settlement, Navi Mumbai, April 2010. The ground area around the shrine has a smooth tiled surface, contrasting with the bare uneven terrain throughout the rest of the settlement. The *Mandir Chowk* was constructed in 1989 by a quarry supervisor, following requests from the workers. He died in 2006, leaving behind a widow who lives in the green painted house adjacent to the temple. She continues to take care of the shrine, with help from other women in the community - together they share the responsibility for keeping the *Mandir Chowk* swept and cleaned on a daily basis.

As a community setting, the *Mandir Chowk* brings together domestic, social, religious and sacred realms, negotiating through daily cycles of leisure and play, people and interaction, and privacy and tranquillity. As a spiritual realm, the tiled area functions as a religious gathering place, surrounding the sacred temple shrine (*Mandir*) – the abode of the Gods, in this case the Goddess *Lakshmi*[1]. The large canopy of the respected *Neem* tree envelops the whole place from above, protecting people from the sun, whilst the temple shrine has its own shading structure, protecting the deities inside. Everything beyond the tiled edge is secular in nature; the edge is often lined with shoes taken off before entering the sacred place. Many of the residents visit the temple every Tuesday and Friday to pray and make offerings to *Lakshmi* for wealth and prosperity for their children.

1 *Lakshmi* is the Hindu goddess of wealth, prosperity (both material and spiritual), fortune, and purity. See glossary.

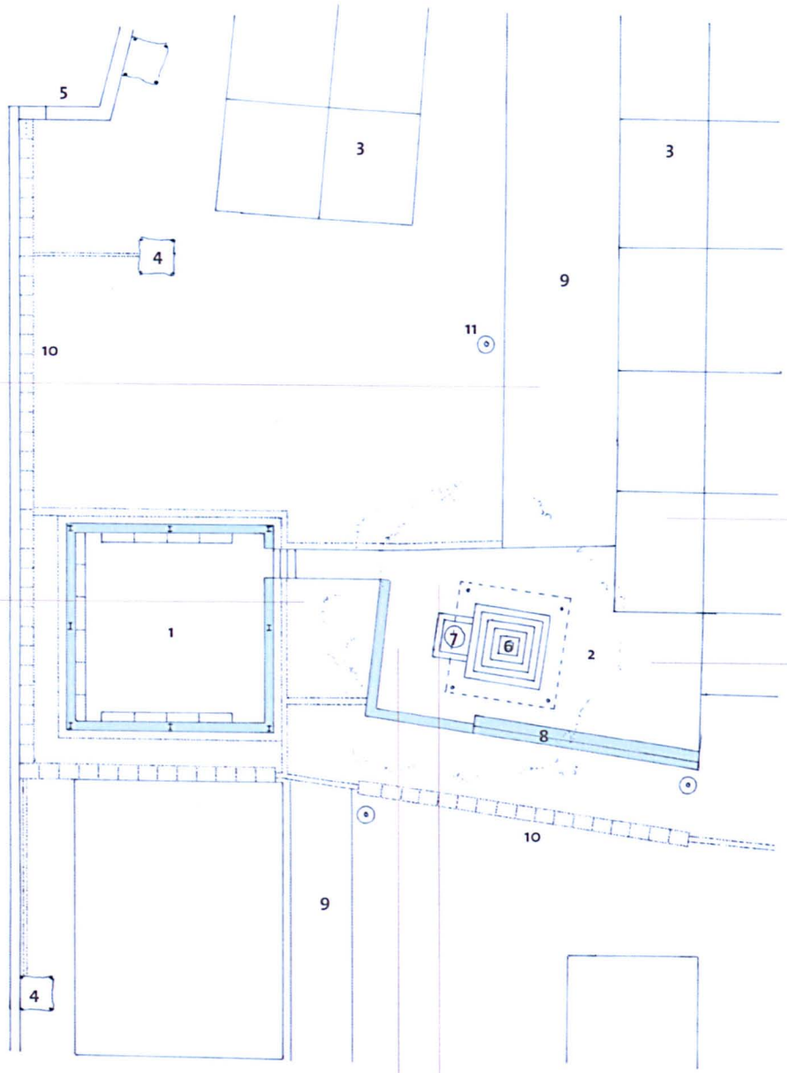
The *Mandir Chowk* plays an important role in the daily lives of the quarry worker residents. It is the primary gathering place for children to play, women to do embroidery and men to play cards. Various *walas* (vendors) pass through the settlement throughout the day, stopping at the *Mandir Chowk* to offer their wares, from bangles and fruit (for the women) to *kulfi* (ice cream) and candy (for the children). The *chowk* as an inviting collective setting outside the dwelling provides a safe place for women to congregate for SHG meetings. Women travel together in small groups to the local town market in nearby Turbhe every Sunday to purchase their weekly household groceries and necessities, but rely on *walas* stopping at the *Mandir Chowk* for any additional goods required during the week. The owner of Baban Seth quarry provides the *Mandir Chowk* with electricity to light it in the evenings, and for community events (marriages and religious festivals).

Fig. 3.77. The *Mandir Chowk* as a community setting at Baban Seth quarry worker settlement, Navi Mumbai, August 2008.



(a)

(b)



(c)

(d)

Fig. 3.78. Sketch plan and photographs of the *Mandir Chowk* and classroom building showing activities taking place, April 2013.

(e)

(f)

Key to plan

1	classroom building
2	*Mandir Chowk* (tiled sacred area)
3	*kuchha* dwellings
4	*kuchha* wash cubicles
5	drainage outflow point (through factory sites)
6	shrine with shade over
7	*Neem* tree
8	low wall and seat
9	new concreted pathway
10	new formalised drains with concrete covers
11	new street lighting

Key to activities

a	women chatting
b	shoes left outside the classroom
c	girl doing homework
d	woman sewing a blanket
e	men playing cards
f	fruit *wala* (seller)

Fig. 3.79. Shoes left outside the classroom building, March 2010.

Community members paint the low wall surrounding the *Mandir Chowk* annually during *Diwali*[2], and today the classroom building is painted at the same time. The classroom is connected to the sacred shrine area, physically via a tiled pathway and through direct views out of the building towards the temple shrine. People take off their shoes when entering the building, and the interior floor is swept every day together with the *Mandir Chowk*. The building is seemingly perceived as an extension of the existing sacred *Mandir Chowk* as opposed to a separate entity.

Fig. 3.80. The new classroom building as an extension of the *Mandir Chowk*, March 2010.

Religious places are one of the most common institutions for gathering in traditional rural villages in India. Temple buildings and shrine platforms found in Hindu settlements play host to a variety of community activities, events and gatherings and form a significant part of the collective existence of the community. For the migrant quarry workers in Navi Mumbai, building a temple shrine in their temporal place of residence provides a shared sense of home. Traditional values and beliefs are retained through the kind of sacred institutional setting that would be found back in the villages. Migrant quarry workers are generally of scheduled caste and are not normally allowed to enter a public Hindu temple, but instead build their own (*Dalit*) shrines and temples.[3] The presence of these temple shrines makes the place more ecumenical, with the constant flow of migrants moving in and out of the settlements.

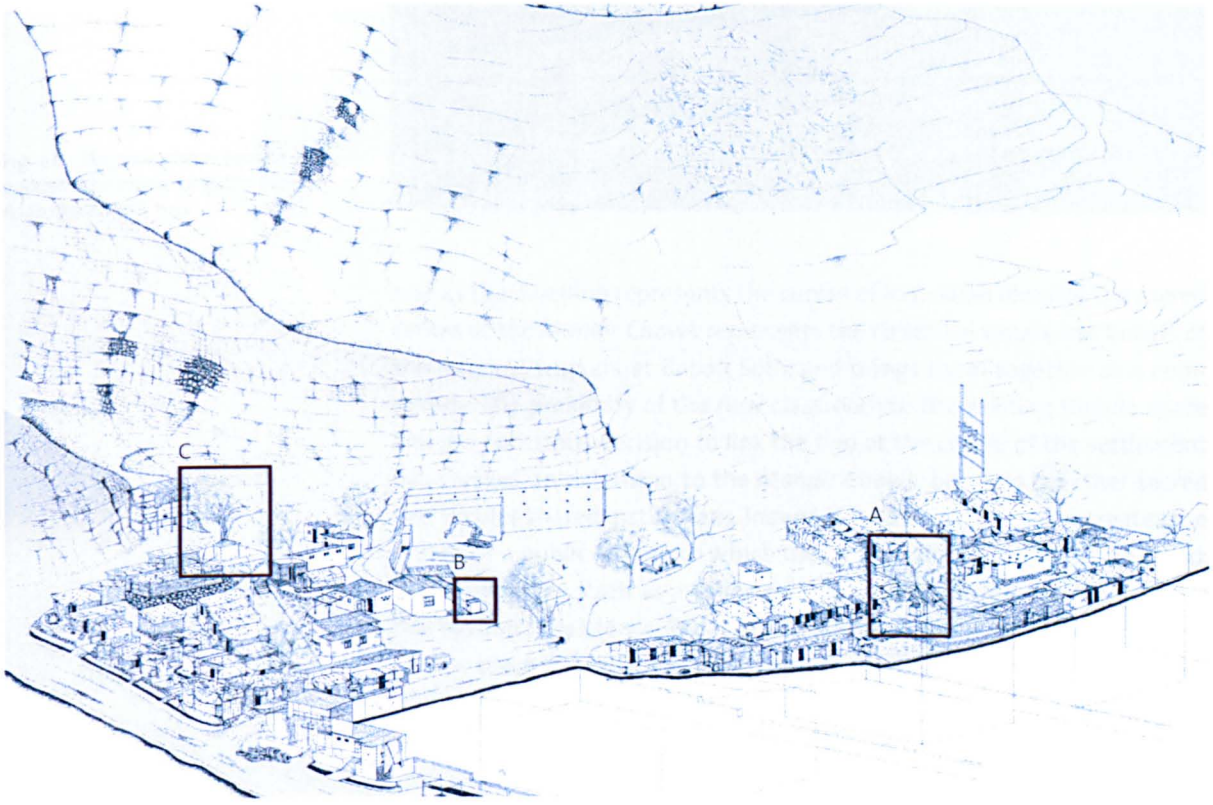
2 *Diwali* is a major Hindu religious celebration, also known as the 'Festival of Lights'. See glossary.

3 Caste discrimination was abolished under the Constitution of India in 1950, but there are regular reports that *Dalits* are still being prohibited from entering temples all over India.

There are three temple shrines at Baban Seth - *Lakshmi* temple (at the *Mandir Chowk*), Heera Bai temple and Tayama temple. Tayama temple is the oldest shrine in the settlement, constructed by community people and workers in 1976. It is located at the highest point in the settlement. Heera Bai temple, located next to the former quarry office building (now rented as accommodation for workers) was constructed by the quarry master of Gabkari quarry in 1991. Both Tayama and Heera Bai temples house several deities (Durga, Rama and Shiva, Ganesh, and Hanuman being the primary Gods worshipped in the community). Residents offer prayers to different deities on particular auspicious days of the week. The shrines are considered to be very important shared institutions within the settlement, though all the residents have a *puja* corner in their houses. The shrines are particularly important for festival gatherings, but with large temples located in the village, a great proportion of residents choose to celebrate major festivals (*Diwali, Holi*) in their home villages.

Fig. 3.81. Locations and photographs of the three temple shrines in Baban Seth quarry worker settlement, Navi Mumbai, 2012:

A *Lakshmi* temple *(Mandir Chowk)*
B Tayama temple
C Heera Bai temple



A

B

C

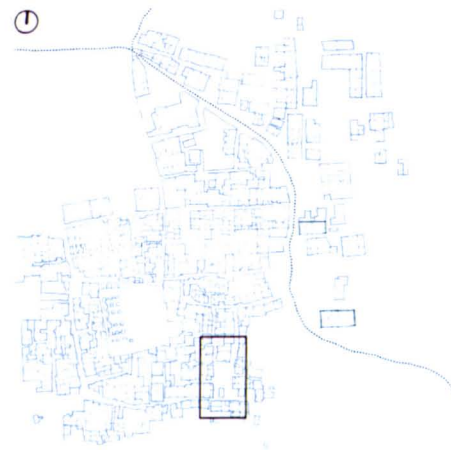
In Kachhpura, a *Dalit* shrine platform is located adjacent to the *Mehtab Bagh*. Residents from the village (including Brijesh Singh) frequently visit the temple shrine, where the God Hanuman[4] is worshipped at this public shrine temple[5]. Every Hindu household in Kachhpura has a *puja* corner in their dwelling (some even have a more prominent shrine in their yard) and temples are often used as a method of encroachment on public places, within a settlement as well as on *nazul* land.

Fig. 3.82. The *Dalit* shrine temple opposite the entrance to the *Mehtab Bagh*, Agra, April 2012.

Just as the dwelling represents the centre of individual identity, the sacred centre of the *Mandir Chowk* represents the collective values and beliefs of the migrant workers at Baban Seth, and brings them together as a community. The proximity of the new classroom to the existing temple space and the conscious decision to link the two at the centre of the settlement has created an extension to the *Mandir Chowk*, bringing together sacred and secular shared institutions. Indeed the classroom building creates the notion of a public setting to which the community can commit itself, and, in turn, discover itself as a collective with a political voice and opportunities beyond subsistence. Today, the extended *Mandir Chowk* is a respected central place for social gathering, worship, education and empowerment of the community as a whole.

4 The deity Hanuman is worshiped as a symbol of physical strength, perseverance and devotion. Hanuman temples are among the most common public shrines found in India (Das 2012).

5 This public shrine is mentioned in the 1994 survey (Moynihan 2000) undertaken by the Indo-US team working on the restoration of the Mehtab Bagh.



Kachhpura Key Plan

1 Local primary school
2 New septic tank system
3 New toilets for school children
4 Water butt
5 Water handpump and tap
6 *Neem* tree
7 *Soochna Sansadhan Kendra* (SSK) - NGO site office
8 New street lighting (solar powered)
9 Brijesh Singh's family home
10 Shri Ram's home (with tea terrace rooftop)
11 Street drain leading to secondary *nala* (open drain)
12 Vegetable cart *wala* (seller)

Plan of the *Panchayat Chowk*

0 2 5 10 m

3.4.3 The *Panchayat Chowk*, Kachhpura, Agra

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.4.3 The *Panchayat Chowk*, Kachhpura, Agra.

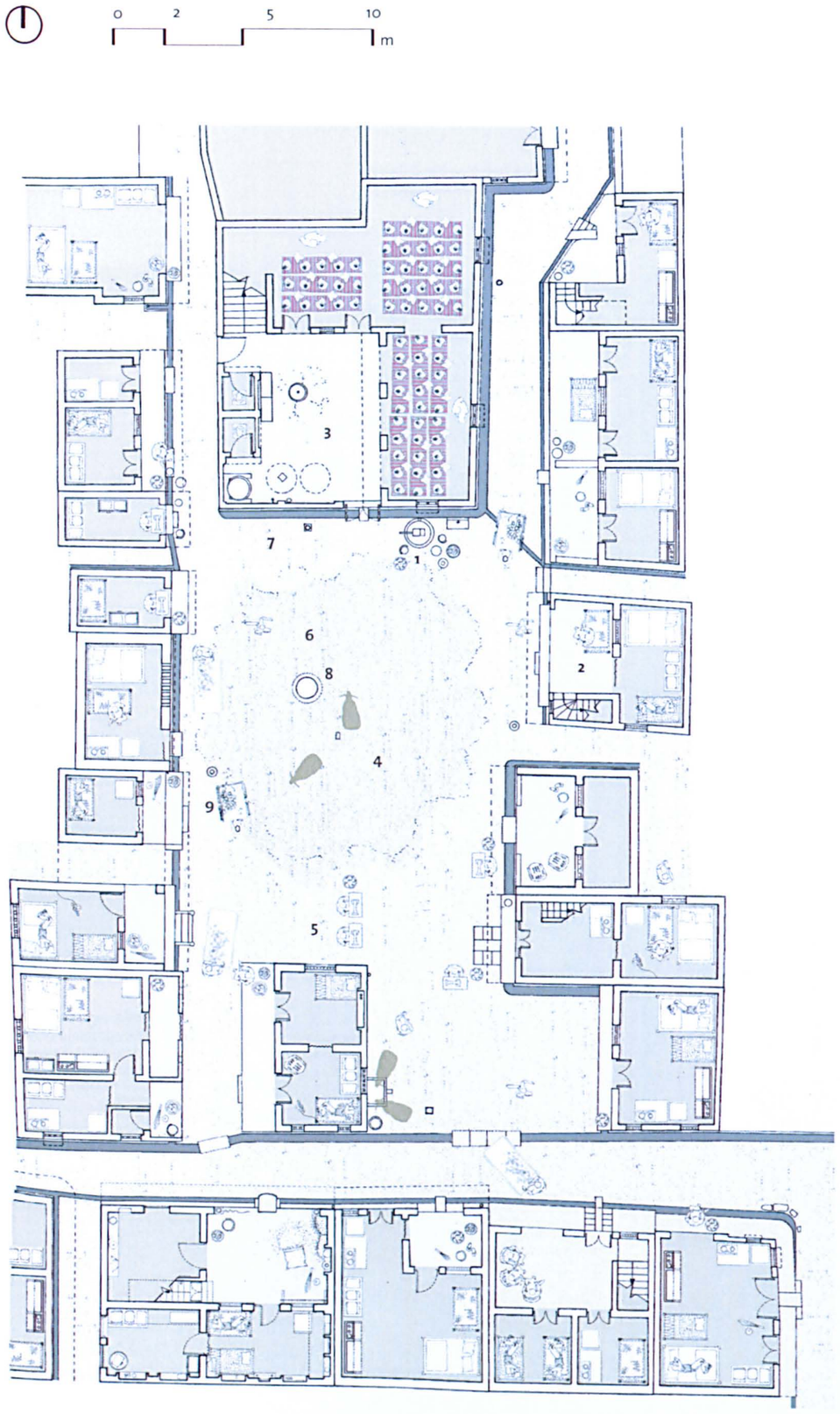
3.4.3 THE *PANCHAYAT CHOWK*

There are two *panchayat* groups in Kachhpura, one in each of the two defined *abadis* (Old and New areas) of the village. Kisan Singh[1] is *Sarpanch* (head) of the *panchayat* in the *Purani Abadi*, and Amar Singh is *Sarpanch* of the *panchayat* in the *Nai Abadi*. The *panchayat* deals with problems and conflicts within the settlement, such as stealing, cheating and land ownership, as well as family and domestic issues such as abuse. They deal with issues related to the Hindu community only (issues that arise within the minority Muslim community are dealt with amongst themselves). Problems that are beyond the resolution of the *panchayat* (such as serious crimes like murder) are handed over to the police.

The *Panchayat Chowk* in Kachhpura is located to the south of the centre of the village. It is the largest open space where major community events take place (weddings, religious festivities) as well as daily practices (see fig 3.83). In early 2006 when NGO CURE had just begun to work with the community in Kachhpura settlement, they established a *Soochna Sansadhan Kendra* (SSK), an Information Resource Centre. It is designed as a multi-purpose centre and is located in the *Panchayat Chowk*, providing a place for women to gather, for the conducting of community meetings and awareness workshops and also serving as a place for providing information to tourists. Located in a building facing the courtyard (rented from a local resident), the SSK is ideally positioned to serve as both a tourist information point as well as a place for women's activities. Presently the centre has awareness material on sanitation, health, hygiene and livelihoods for local knowledge building. It also contains community maps, MHW maps and souvenirs. Women take pride in the centre, and have decorated it with traditional wall motifs and colours.

The *chowk* can accommodate large numbers of people for temporary community wide events, that do not require any additional infrastructure other than mats on the ground. Hired stages or *pandals* provide temporary event places for festivities and celebrations within the community. These include religious festivals, marriage celebrations and children's theatre group events.

1 Kisan Singh is an uncle of Brijesh Singh (chapter 3.2.2). He has been the head of the Old Kachhpura *panchayat* for 50 years, and was elected by committee. Prior to this, his father held the role of *Sarpanch*.



1

2

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9

Fig. 3.83. Plan and photographs of the *Panchayat Chowk* showing key institutions, activities and locations, 2012.

The multi-functional status of the *Panchayat Chowk* is fulfilled by the flexible spatial arrangement of the square. The *chowk* has a simple layout with permanent community facilities located around the edges, such as the local government primary school. A well-used water pump serves as a conversation point where women and young girls engage whilst gathering water. A large *Neem* tree in the middle of the open space provides an infrastructure for village *panchayat* meetings by offering a shaded space under its canopy (chapter 3.4.1). Its sturdy branches support homemade fabric swings for children to play together, creating an informal shaded playground.

Key to activities and institutions

1 water handpump
2 *Soochna Sansadhan Kendra* (SSK) - information resource centre and NGO site office
3 primary school
4 children's performance watched by women
5 children's street play performance watched by residents and tourists
6 *panchayat* meeting with researchers and NGO, held on the meeting mat under the *Neem* tree
7 temporary stage for a children's theatre group event located outside the local government primary school
8 the *panchayat chowk* as a playground
9 women making purchases from a vegetable cart *wala* (seller)

In 2008, CURE renovated the *Panchayat Chowk* through re-paving of the open space, under CAP. Drains were formalised in the process and the deteriorated uneven ground surface was repaired using traditional techniques of brick paving. The result was a visibly tidier square - the level ground increased the flow of movement through the *chowk* by people and carts, and the square was kept cleaner as it was easier to sweep it on a daily basis. The most notable change was in the way the *chowk* was occupied by residents throughout the day.

Fig. 3.84. The renovated *Panchayat Chowk* occupied by both male and female residents of all ages, Kachhpura, Agra, November 2011.

Prior to the renovation project, the *chowk* was occupied at different times of the day by different age groups of residents, and by men and women. Following the upgrade, children could be seen playing in the courtyard whilst elderly residents watched from the sides, and men took their livelihoods outside (shoe-making) whilst women collected water from the pump. The introduction of a solar charged street floodlight enabled the residents to use the square in the evening, extending its use beyond daylight hours. The remaking of the *chowk* as a Western style 'square' or piazza through re-paving and installation of the streetlight created a safe and inviting environment for the mixing of age groups and gender throughout the day.

The introduction of community or amenity buildings in new peri-urban settlements as a way of upgrading settlements has been a long-standing government method to address the needs of low-income informal communities. The majority of these are constructed from a government standard typology, with little or no regard to context or particular requirements. The example below (fig. 3.85) shows the inappropriate nature of these structures when placed within their adopted environments. For example, a large community centre was constructed in Savda Ghevra Resettlement Colony in the outskirts of Delhi, with a potential capacity to hold thousands of people and house a multitude of community amenities. However, since its construction in 2008, this building has remained unused by the community who simply do not know what to do with it.

One of the problems lies with the enormous leap from having no formal gathering place to suddenly being presented with a large community structure (that requires significant funds to run and maintain). Another problem is that the scale of these buildings when compared to dwellings requires very large sites, so that the community centre has to be located at the edge of these relatively dense settlements, away from the majority of dwellings making it more difficult to reach, and removed from everyday life.

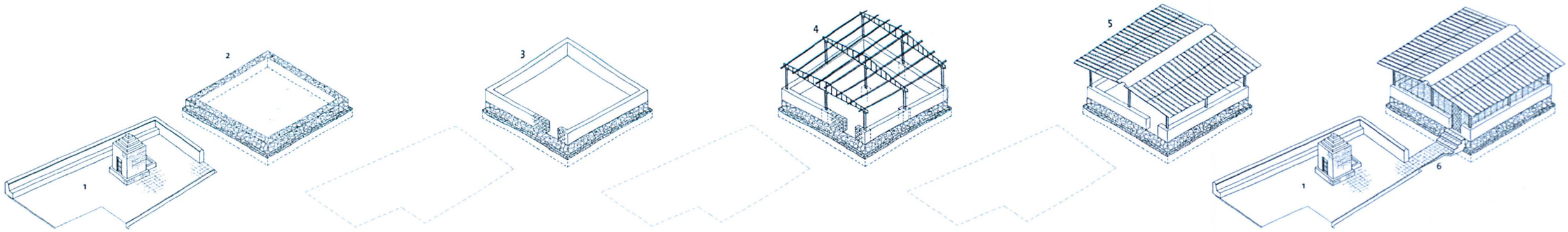
Fig. 3.85. Government built community centre in Savda Ghevra resettlement colony, Delhi, March 2009.

These vast government built community centres are a contrast to the modest SSK in Kachhpura. Instead of building a new structure for housing community activities, CURE simply rented an existing building in an ideal location within the settlement. The location of the SSK allows it to be easily run and managed by local women. The SSK was established at a time

when CURE were assisting women and residents with creating collective groups, such as toilet savings, self-help and livelihood groups, and a place was needed for the increasing number of group meetings to be held. The parallel development of both the SSK and group structures allowed for the integration of one into the other.

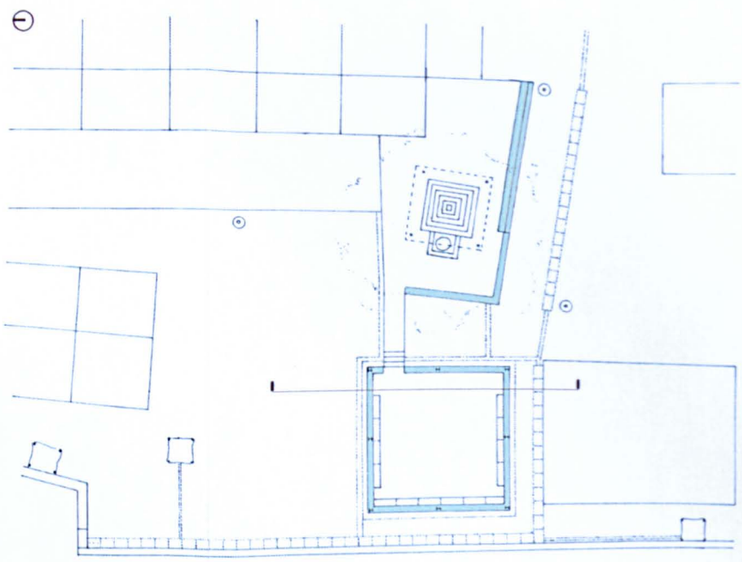
The *Panchayat Chowk* in Kachhpura has long been a place for gathering in the community, though separation of groups by age and gender was evident in the way the square was used throughout the day. Since the renovation of the *chowk* by CURE, there has been a noticeable change with more integration between children and the elderly, and men and women, and the negotiation of various activities taking place within the square. The rejuvenated *Panchayat Chowk* brings together the political, social and economic faces of the community of Kachhpura and provides them within a collective cultural identity that is shared by all the residents of Kachhpura.

Development of the New Classroom Building



Section Through the New Classroom Building

1 Temple shrine and *Neem* tree
2 Plinth
3 Low brick wall
4 Steel frame
5 Corrugated plastic roof
6 New tiled path
7 Bamboo blinds
8 Picture of Babaji
9 Moveable white/black boards
10 View out to the *Mandir Chowk* (Temple Square)
11 Stone slab seating
12 Storage under seating
13 Lockable entrance gate to classroom
14 Brick-lined drain
15 Ceiling fans



Temple Square Key Plan

3.4.4 The Community Platform, Baban Seth Stone Quarry Worker Settlement, Navi Mumbai

For a larger representation of the previous page to be read in parallel with this chapter, refer to A1 portfolio drawing 3.4.4: The Community Platform, Baban Seth Quarry Worker Settlement, Navi Mumbai.

3.4.4 The Community Platform

We have seen how the *chowk* provides a place for collective gathering within a settlement. Most informal settlements at the edge of a city still have one or more forms of *chaupals* or *chowks*. The community platform[1] is another form of gathering structure that is typically found in peri-urban settlements. Most community platforms are constructed around trees such as the sacred *Banyan*, *Neem* or *Peepal*. Small shrines, often built on these platforms, provide an association with sacredness and usually means that they are respected and therefore well looked after by Hindu residents in the local vicinity.

Kachhpura has one very old community platform, located at the entrance to the west of the settlement. This is a square plinth structure of brick construction, with a sandstone surface for sitting, raised off the ground, and accessed by small steps. Traditionally this was used as the village *panchayat* meeting place, but today, the *panchayat* groups tend to meet elsewhere, such as in the *Panchayat Chowk* (chapter 3.4.3). This relocation may have developed from the formation of two *panchayat* groups as the settlement expanded creating the *Nai Abadi*. New alternative (and less formal) gathering places being created in the village may have led to both *panchayat* groups deciding to abandon use of the old platform.

Fig. 3.86. The old community platform in Kachhpura (west entrance), August 2008.

1 As discussed in chapter 2.6, the Hindi word '*chowk*' can also be used to describe a community platform, as well as a square. However, I will refer to these structures as community platforms and not *chowks*, in order to maintain the differences between the two identified gathering places.

A second community platform is located at the entrance to the south of Kachhpura. Not much is known about this platform except that it is not as old as the former *panchayat* platform to the west of the village. In keeping with other such platforms, this has a small shrine on it. Residents who live close to it make offerings to the shrine daily, but it does not really fulfil its intended function as a community gathering place. Residents do not meet at the platform, and it is only the children who have found a use for it as a play area. Given the similar construction and style of the platform, it is possible that it was built as a second *panchayat* meeting platform (for the *Nai Abadi panchayat* group). However, given its location in relation to and distance from the *Nai Abadi*, it is not an ideal site representative of the New Kachhpura area.

Fig. 3.87. A community platform at the south entrance to Kachhpura, November 2010. The appropriation of the unused platform as a temple area by locals residents, with the addition of a simple shrine comprised of stones painted orange to represent the deity Hanuman, has prevented it from failing into further ruin. In doing so, a small *chowk* has been formed amongst the cluster of houses surrounding the platform.

The location of the two community platforms at the entrances to the village appears to be significant. The platform would have once functioned as a forum for the upholding of justice within the community, where important decisions are made by the elders, and where the community gather to form a collective whole. The platform could be seen as a representation of the village identity, symbolic of its cultural togetherness, and this is announced by the platform to outsiders entering the settlement. This form of local governance now takes place in less formal settings, such as under the *Neem* tree in the *Panchayat Chowk* or in the courtyard of the local primary school.

In the neighbouring settlement of Marwari[2] Basti, a community platform marks the formal entrance to the settlement. Located on the side of the road, the platform houses a small shrine and is constructed around a

2 Although historically Marwari are nomadic, the settlement of Marwari Basti in Agra has been in the same location for at least 100 years, no longer travelling but yet maintaining their nomadic traditions with temporary constructed houses made of low mud wall/parapets with bamboo structures covered in tarpaulin.

Peepal[3] tree. It is on this platform that Meera Devi[4], a local teacher from Kachhpura used to teach young children basic lessons.

Fig. 3.88. Location of the community platform in Marwari Basti, June 2007. When I first visited the settlement in 2006 the modest platform, constructed around a *Peepal* tree and housing a small shrine, was used by residents as a space to make small handicrafts from waste materials such as leather off-cuts (their main livelihood). The *balwadi* was held on the platform daily, leading to it being known locally as the '*Balwadi Chowk*'.

In 2007, the existing community platform built by the residents was redesigned and upgraded by CURE in response to a felt need by residents for community space and for bringing the pre-school centre inside the settlement, and also to create space for marketing merchandise. The platform was also expected to serve as a point where tourists could take a walking break and relax with a tea/cold drink service set up by residents. Residents participated in cleaning up the space and in decorating the platform.

In 2008, it appeared that the multipurpose platform was no longer in use or being maintained (in terms of cleanliness and repairs). The *balwadi* classes had ceased to take place (possibly due to lack of funding for a local teacher) and the community had stopped using the platform almost completely, even as a place for making leather whips. The only activities that did still take place on the platform were planned events such as

3 The *Peepal* tree is sacred - Hindus worship it and perform a *puja*.

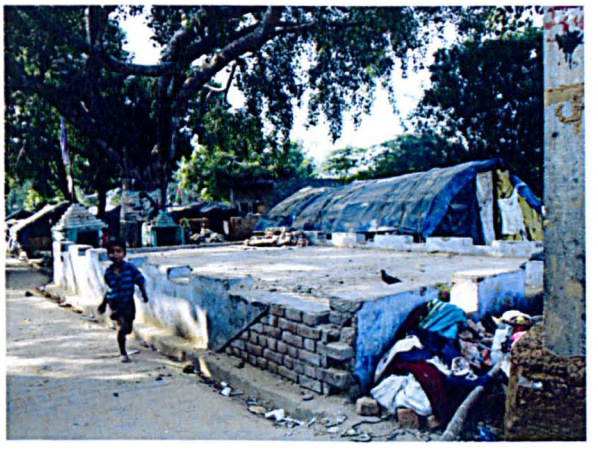
4 Meera is also a community facilitator for NGO CURE (chapter 3.2.3).

plays performed by residents and watched by the community. These observations suggest that the upgrading project transformed the scale (and level of involvement) of the activities that used to be carried out on the platform. Increasing the size of the platform (the capacity has increased from approximately twenty-five to seventy people) has altered the level of sharing and responsibility for the platform within the community.

After the size and height of the platform were raised, the residents appear to have used it just for occasional community wide events. This is probably because the location of the platform was shifted closer to the road, resulting in the sacred tree and original shrine no longer being part of the platform. This highlights the importance of the relationship of the platform to other respected institutions in the settlement (shrine, tree), as well as perhaps the notion of centrality (v. periphery) with regards to location. The *Balwadi Chowk* platform now sits alone offering no association with the identity of the community, or its former place as part of the sacred temple shrine setting.

Fig. 3.89 a & b - (a) *Balwadi* class taking place on the *chowk*, November 2006; (b) The upgraded *chowk*, Marwari Basti, November 2010.

(a)



(b)

Fig. 3.90. Performance of a play watched by community residents on the *chowk*, Marwari Basti, April 2012.

In the quarries of Navi Mumbai, there are examples of platforms constructed close to or at the edge of settlements, usually funded by quarry owners (or rather their political sponsors). At first notice, these appear to be community platforms, such as the ones found in rural villages. However, it appears that these platforms are generally only used for political campaigns by local candidates hoping to gain large banks of votes from migrant quarry worker communities.

The implications of siting platforms is that if located centrally within the settlement, the platform can become a part of the intrinsic everyday institutional life of the community, whereas platforms located at the periphery of the settlement can provide a connection to the citywide political process.

(a)

(b)

Figs. 3.91 a & b - (a) Temporary bamboo structure *(pandal)* with colourful fabric erected on a platform in preparation for a political rally, March 2009; (b) A temporary political *pandal* (and banners) put up on a permanent concrete platform next to a water supply pipe. The location of the platform is at the edge of Gandhi Nagar settlement, Navi Mumbai (accessed via steps over the pipe) next to the quarry owner's office, September 2008.

The design of the Baban Seth quarry classroom building began as a simple raised platform. During initial discussions with the residents, key issues of the site and fundamental requirements for the classroom were raised. The problem of flooding of the site[5] during monsoon was a major problem, leading to a proposal for a raised stone[6] platform (fig. 3.92). The quarry classroom place evolved from a platform to a building, consolidated with the introduction of the final major element: security. During the construction of the rendered brick walls, several women approached the project team, to express concern that drunken men would misuse the building in its open state. This led to the addition of steel grilles and a lockable gate, securing the building, whilst allowing for ample light and ventilation. The result of this process was a classroom building that had developed from an initial imagined gathering place as a raised platform to a covered, gated enclosure.

5 The site for the classroom was located at the lowest point in the settlement, draining down through a small opening in the boundary wall to the industrial factory buildings (much lower level).

6 The quarry owner donated stone from his quarry to construct the classroom. Large stones were used for the foundations and platform structure, crushed stone as aggregate, and stone powder as a substitute for sand (for the cement render).

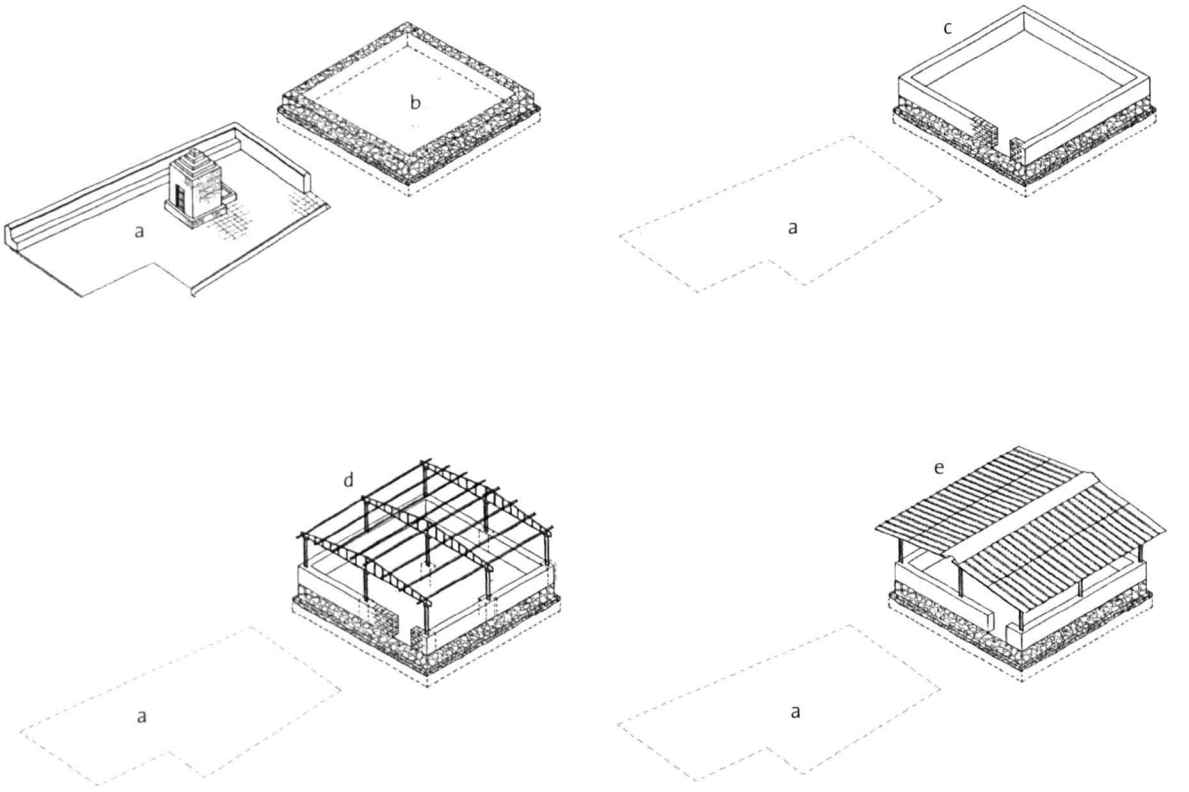


Fig. 3.92. Incremental development of the classroom building at Baban Seth quarry worker settlement, March 2009:

a. temple shrine
b. plinth
c. low brick wall
d. steel frame
e. corrugated plastic roof
f. new tiled connecting path

Once the stone platform had been constructed, residents expressed a need for a roof structure that would provide shelter from the sun and rain (as well as stray rocks from the quarry blasting). A simple lightweight roof was proposed, made from a prefabricated steel truss structure, clad with profiled plastic sheeting. Whilst having discussions regarding the steel to stone platform connection, members of the community suggested the provision of a low wall surrounding the building to create more of an enclosure (and to prevent children falling off the one foot high platform).

The modest scale of the quarry classrooms in Navi Mumbai, and their relationship to the surrounding vernacular (in terms of materials used and design) are what make them appropriate to the settlements in which they are located and belong. The low maintenance requirements (daily sweeping of the floor) and minimal costs to run the fans and lighting[7] are suitable attributes for a community that has very little. The building does not stand out within the settlement, but fits within the topography as a *pucca* (permanent) representation of the evolving migrant worker community.

7 The quarry owner already provided electricity to the residents for lighting the *Mandir Chowk*, and since the completion of the classroom building has agreed to extend this provision of electricity to the building, whilst continuing to cover the running costs.

3.5 SUMMARY

Chapter 3 has been concerned with a review and analysis of existing institutional order and the exploitation of this 'familiar' order to effect not only the adaptation and amelioration of the existing situation, but also contribute to the making of town, civic life and to community self-empowerment. The timeline diagram (fig. 3.92. p.173) lays out the impacts and effects of the practical (workshops, awareness campaigns) and built (toilets, classrooms) interventions on making town at three scales: dwelling (household), street (neighbourhood) and settlement (community).

stage of involvement

Kachhpura Settlement Upgrading Project, Agra

Dwelling Household scale | **Street** Neighbourhood scale | **Settlement** Community scale

significant events

2006 — conversation initiated between CURE and ARCSR

Nov 2007

Meera as 'Toilet Hero' - Clean yards — 10 x — Clean Street

hygiene awareness

2008

June

2 x — school

hygiene awareness

2009

old CTC

2010

treated water for irrigation

Oct 2011

HEAVY MONSOON

Bhajan Lal's new house - towards middle classness

Brijesh Singh's marriage procession

DEWATS as a clean place

treated water for flushing toilets

marriage *pandal*

DEWATS as a clean place

2012

2013

235 x — total to date

Oct 2014

485 x — total proposed

Kachhpura as an 'open defecation-free' settlement

Diploma student work

Research (ASD Projects)

PhD Research

Quarry Classrooms, Navi Mumbai

Dwelling Household scale | **Street** Neighbourhood scale | **Settlement** Community scale

conversation initiated between ARPHEN and ARCSR

opening ceremony — 1

marriage ceremony

opening ceremony — 2

re-opening ceremony

upgrading 1

upgrading 2

Diwali festival celebrations

Tayama upgrades dwelling to *pucca* - towards permanence

proposal for public bus route to serve quarry settlements

government pathways/drains - investment

sewing classes

children's birthday party

pucca dwellings for quarry workers - towards permanence

government street lighting - investment

government water taps - investment

festival celebrations

3

100% quarry worker children enrolled in education

Fig. 3.93. Making Town

Sharing of spaces begins within the dwelling, between members of a family or families. Where multi-generational and extended family living exists, the successful negotiation of communal areas is determined by collaborative patterns of daily practice. Shared spaces within the dwelling can also function as a political setting for conflict between relations (which in Meera's case was only resolved by dividing the property). In Kachhpura, Brijesh Singh is making a gradual transition from extended family to nuclear family since his marriage in 2011. This is reflected in the new configuration of the family home and his move to individualisation is coupled with an aspiration of modernisation (and more space), embedded in his desire to move out of the generation-old family home in the *Purani Abadi* to a larger plot (and house like Bhajan Lal's) in the *Nai Abadi* area. This aspiration seems at first to imply rejection of the collaborative or collective or civic qualities evident elsewhere. Bhajan Lal made a decision to construct his house based on precedents that perhaps represent middle class affluence - i.e. a certain form of status - but at the same time, his engagement with the context (DEWATS) suggests that he retains his commitment to town.

Otlas provide transition between dwelling and street, and are settings for particular situations of daily life. How a householder chooses to build or place their *otla* becomes a gesture of choice towards cooperation in the streetscape and a symbol of how willing they are to share their everyday life with their neighbours. Therefore choice begins on the threshold between dwelling and street. Set in the domain of everyday life, the street is perceived as an extension to the dwelling, and the (court)yard as an integral part of the home as a whole. Shared streetscapes providing daily *gali*-life are vital for women in Indian informal settlements. With less freedom in society, most women are confined to the house, carrying out mundane household chores and raising children. During the day, the *gali* provides a safe and secure environment for moments of social involvement between women watching over their children playing outside.

The meeting mat serves a utilitarian purpose (stopping dust getting on clothes) but it is more than that. The meeting mat as a metaphor for improvised community suggests a conflict with permanent, formally defined places for gathering within a settlement. The flexibility and nomadic nature of the meeting mat, allows for more freedom for gestures of inclusion and invitation to participate/be involved. The general move to bring activities within the dwelling suggests a possible shift to individualisation in the way old and new shared spaces are being made and remade within the community.

Fig. 3.94. A women's meeting with students from London Metropolitan University on the meeting mat held in Meera's yard, October 2010.

The introduction of toilets in Kachhpura has led to the changing of daily habits within the household. Tidy yards create better-utilised common places within the dwelling, and the permanent infrastructure acts as a catalyst for improvements to streets and drains. In turn, *pucca* streets lead to shifting choices with regards to the sharing of *otlas* and threshold infrastructure, all contributing to increased collective *gali* life. The introduction of permanent infrastructure at Baban Seth settlement suggests the significance of street towards changes that are beginning to establish neighbourhood and collective identity. With the emergence of a new clean pedestrian thoroughfare, the introduction of post-hoc infrastructure is important as it suggests there was something there before which was connected to and reinforced.

There is an emerging cleanliness agenda in Kachhpura related to tourists, changing attitudes to having a toilet in your house and the cleanliness disciplines required to support this. Cleanliness and tidyness can act as indicators of residents' intense engagement with the concreteness of place. The DEWATS is symbolic as an outlet of clean water representing the whole idea of cleanliness, whilst also standing for the resident being engaged with cleaning water (rather than just covering up dirt).

The two case study settlements have revealed a range of secular and sacred structures from temple platform to *chowk*, to wedding tent and meeting mat. In Baban Seth, the temple setting provides confidence in identity, whilst the classroom is a secular place reaching out to a wider world - the two places together are more powerful as shared ground than each would be on its own. The establishment of permanence and a permanent collective cultural identity is not so much to do with ownership but with the idea of consolidated presence being established. Confidence that the settlement is permanent is supported through investment by people in the permanence of their homes.

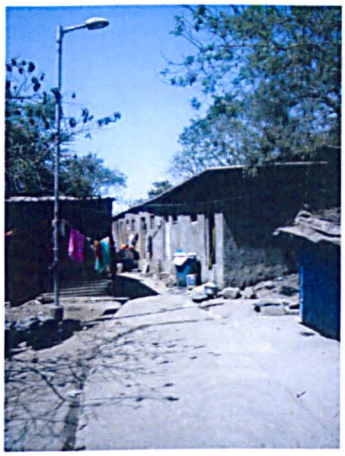


Fig. 3.95. New concreted thoroughfare (2011), *pucca* dwellings (2012) and street lighting (2013) at Baban Seth quarry worker settlement, Navi Mumbai, April 2013.

The development of classrooms involved participation, incrementalism and negotiation, taking an approach of not envisioning the whole, but only the part to begin with, following a process of sequential stages which involves imagining the next part once the first has been carried out. Following on from the construction of the community classroom at Baban Seth, the most recent improvements made to the settlement: government water taps (November 2012) and street lighting (February 2013) indicate a commitment by the newly elected local Corporator, Ms. Vandana Thakar, to invest in the migrant worker settlements through upgrading of infrastructure and services. This has been followed by investment in *pucca* housing provided to migrant workers and their families by the new quarry contractor who is sub-leasing the quarry operations.

The community choosing to paint the classroom building and *Mandir Chowk* in the same colour (fig. 3.96) signifies a unified appropriation of secular and sacred places as a shared whole – the temple concretises relationships with neighbours, whilst the school creates neighbourhood and connects the settlement with a wider network of neighbours. The place as a whole is a theatrical setting for celebration and festivities. Fuller (2004 p.151), in his study of popular Hinduism and society in India states that *'collective festivals... ritually express village unity'*. The creation of the classroom building effectively extended the *Mandir chowk* as a shared place for individual and collective celebration. The new temple-classroom centre can be viewed as a collective place that is a part of the cycle of life as put forward by Alexander (1977 pp.139-145) – a vital setting that supports several rites of passage for an individual that is shared, experienced and celebrated by others. These include birthdays, schooling, marriages; as well as small work (livelihood) groups (for example sewing), community gatherings and a place to meet with outsiders.

Fig. 3.96. The newly painted classroom-temple centre at Baban Seth quarry settlement, March 2010.

The installation of artificial lighting in a shared space at night (both in the *Panchayat Chowk* in Kachhpura, and around the *Mandir Chowk* classroom place in Baban Seth) consolidates community and extends the use of these spaces beyond dusk. In addition, the street light in Baban Seth gives residents confidence to stay in the settlement, and possibly lay down roots. Individual insertion of household toilets has led to the local authority working with NGO CURE to sensitively upgrade the local infrastructure (from the bottom up). Streets (and the *Panchayat Chowk)* have been repaved and drains repaired, raising consciousness.

The creation of a new thoroughfare in both Baban Seth and Kachhpura settlements introduces a new level of hierarchy to the institutional order of collective life involving *chowks* and *galis.* The role of different constituents in this is important and the principal contribution of the interventions has been to consolidate the making of town, creating, empowering and enabling the diverse players to see the opportunities available.

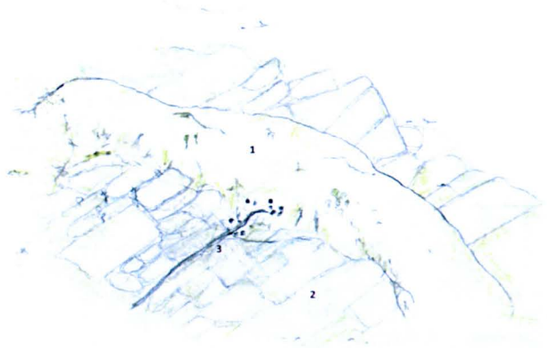
CHAPTER 4
CONCLUSION

4.1 UNDERSTANDING THE CHANGING NATURE OF INFORMAL PERI-URBAN SETTLEMENTS

This study is an attempt to understand the development of spatial practices through an analysis of the experience of small-scale interventions in two peri-urban settlements. These case studies have acted as a vehicle for gaining insights into the civic and institutional order of town for all constituents (including myself as PhD by Practice). The thesis offers two contributions to knowledge: (a) a methodology for collaborative making, and (b) an understanding of how interventions can create town and lead residents to greater awareness, commitment and political empowerment, in their journey from subsistence to civic creativity. The research is concerned with and focused on people who have just migrated to the city, or are part of a city that is expanding. The idea of small-scale (built) interventions that are adaptable and encompass an intelligent use of scarce resources can provoke commitment to collective participation in, and make a contribution to, official civic life. Through the approach of architectural making as a catalyst for civic empowerment, this study makes explicit a process that was implicit before, and enables the creation of institutions for marginalised people to engage creatively not only with their families in their own act of dwelling, but also with their neighbours and fellow citizens, with the formation of streets and other shared places which are part of the burgeoning city.

Fig. 4.1. East-West sector plan of Navi Mumbai, 2010.

1 Thane Creek
2 Middle class apartment buildings
3 Fruit, veg and spice *bazaar* (market)
4 Planned housing
5 Turbhe train station
6 Turbhe *Gaon* (village)
7 Disused quarry
8 Baban Seth quarry settlement
9 Existing quarries



A **PRE - 1960s FARMLAND**

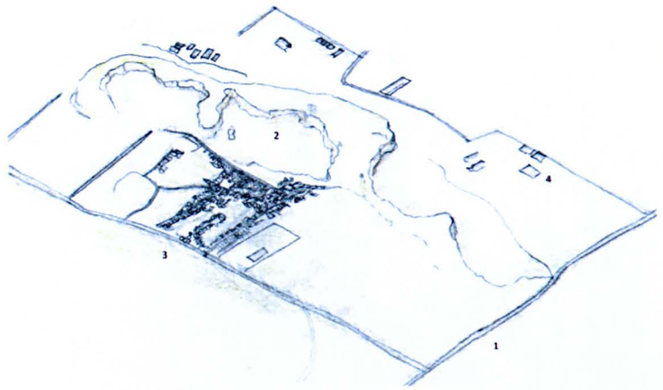
The land now known as Navi Mumbai was home to Adivasi villages and farmlands.

1 Hill to be used for stone quarry
2 Farm land used by the original Adivasi indigenous people
3 Road begins towards the newly opened quarry site

B **POST - 1960s MINING**

Stone quarry mining begins while small communities grow around them.

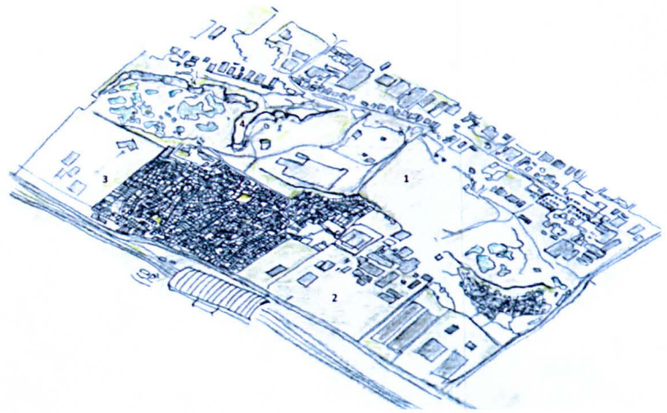
1 Quarry work begins at various sites
2 Further access roads constructed
3 Quarry building and residential housing is now constructed



C **1970S MASTERPLANNING**

Formalisation of road and rail networks and land allocation by the NMMC sees many villages swallowed up in the master planning of Navi Mumbai.

1 Planning of the roads now under new master planning control. wider roads constructed
2 Quarries nearing end of use
3 Road to the west prevents the spread of Turbhe
4 Industrial buildings beginning to be constructed



D **2010 PRESENT DAY**

After the quarries have finished mining Turbhe Village still exists and has found alternative ways of supporting itself. Turbhe village is now located within the NMMC allocated MIDC area.

1 Quarry mining now finished leaving a barren landscape
2 Growth of the industrial area now surrounds Turbhe Village
3 Turbhe Village now fully occupied and flanked on three sides
4 Quarry work does not continue through hill side here due to an electricity pylon

Fig. 4.2. Development of Turbhe quarry from village, pre-1960 to present day.

A pre-1960s farmland
B post-1960s mining
C 1970s masterplanning
D present day (2010) Turbhe *Gaon*

An understanding and recognition of a process that has been occurring for a number of years has developed in both case study settlements. The two projects may not offer a complete narrative of that process but they do offer a significant contribution to that narrative. Since the 70s in the quarries of Navi Mumbai, quarrying has led to the arrival of temporary settlements associated with migrant workers. In the decades that have passed, some of these settlements have disappeared whilst others have stayed. An example of the latter is Turbhe *Gaon* (village) located West of Baban Seth – one of the few organic mining settlements to survive the shifting patterns of quarrying, industry and finally new middle class town planning which is emerging as a mosaic metabolism where pockets of industry are juxtaposed with planned neighbourhoods laid out in a grid (figs. 4.1 & 4.2).

Saunders (2011) proposes transition into the urban middle class as the solution to mass poverty in the 'arrival city'. He argues that this can be achieved through bourgeois freedom and infrastructural upgrading by people coming together. He documents the degree to which Asian nations invest in future generations, rationing for the betterment of their children. In Kachhpura, there are signs of a move towards urban middle classness, where parents are creating future improved conditions for their children. Residents such as Bhajan Lal (chapter 3.2.4) have invested in constructing a large and modern home compared to the majority of dwellings existing in Kachhpura. Brijesh Singh (chapter 3.2.2) also shares these aspirations for his new family life. Relocation of existing residents to the *Nai Abadi* from the *Purani Abadi* may see more people move into the village (renting the older, smaller dwellings), which is likely to become a more desirable place to live at the urban fringe of the city as Agra becomes more urbanised.

Saunders' concept of middle classness is a secular concept (as opposed to religious or traditional), dominated by notions of technology, commodification, democracy and consumerism. In Kachhpura, the association of livelihoods with tourism is growing, thus making an exhibit of traditional crafts and cultures which are currently under threat from free-market capitalism. Meanwhile, traditional home-based work (such as shoe making) is being decanted into medium-scale industries on the other side of town, with the younger generation (such as Brijesh's brother, Anand) now commuting to work at a medium sized shoe factory close to Sikandra (north-west Agra). Symbols of progress to middle-classness are generally associated with positive change, and in Kachhpura, the usual signs of individuals moving up are through symbols of status. Typically these have included the presence of a temple shrine within the dwelling (as opposed to just a small *puja* corner), the kinds of technology that can be afforded (televisions and refrigerators), and how *'pucca'* is the house itself (including front gates). Today, individual status in Kachhpura includes the addition of a septic tank toilet and washing structure - the design, cleanliness and quality of which can raise the perceived standing of a householder, as well as pride in their own dwelling.

This status associated with cleanliness and *'pucca'-ness* is also apparent at a collective level in the village: the spontaneous naming of *'Swaach Gali'* adjoining the new clean pedestrian thoroughfare (DEWATS, formerly a foul *nala*), adjacent to which an open area is regularly appropriated for hosting weddings and festivities. These incremental improvements at dwelling, street and neighbourhood levels have led to changes in the metabolism of the village as a whole affecting the way Kachhpura will continue to regard itself, develop and grow.

In both case study settlement areas, the wider issue is of place within the city. Both can be viewed as urban villages in their own right, though with very different conditions. In Kachhpura, the question of connecting to the city's infrastructure and services is juxtaposed with the traditional, rural ways of self-governing that still take place through the *Panchayati Raj* system. A recent article 'Panchayati Raj: Failing the urbanization test' (Livemint April 2013) criticises the lack of decentralisation of governance claiming that: *'the 74th amendment to the Constitution notified on 24 April 1993, empowering urban local bodies to work as vibrant democratic units of self-government, "is notoriously weak"'.*

Conforming to the article, communities notified as 'urban villages' such as Kachhpura are now unsure of where they stand in terms of governance, finding themselves negotiating the shift of power in a rural-urban situation where the *Panchayati Raj* Act was originally intended to strengthen the structure of representative democracy and political representation at the local level. In part this is due to the sheer lack of experience of collaborative/democratic politics and discrimination on the part of official bureaucracies. The interventions carried out in KSUP create the conditions for this kind of discourse, anchoring it in tangible improvement whilst bringing together purely local constituencies and more remote bureaucracies. There is an experience of the shift from subsistence to town-pride, whilst avoiding the excesses of 'formal'.

In the quarry settlements of Navi Mumbai, safety and security hold precedence alongside access to basic needs and services. The establishment of inclusive collective solidarity is a step towards creating civic identity (community) in a place where people are arriving on a weekly basis from rural districts all over Maharashtra as well as other states[1]. The sheer number of temple shrines dotted throughout the temporary settlement landscape evidences the wide variety of cultures, beliefs and religious views. For those who have made the decision to stay for longer than a generation[2] (such as Tayama at Baban Seth), investment in a new 'home' is a risky investment unless backed up with support from both employers and the local author-

1 A survey of 50 households at Chuna Bhatti, a settlement neighbouring Baban Seth undertaken by Mistry (2001) found 78% of workers were from Maharashtra with 22% from Bihar, Uttar Pradesh, Karnataka and Andra Pradesh (Shaw 2004).

2 The same survey (1) found that over 50% of sample quarry workers at Chuna Bhatti village had been in the Mumbai area for over 15 years (ibid).

ity, to help generate a sense of permanence and belonging. 'Consolidation' is a process involving a rich interplay of physical improvements to houses, streets and services, along with the development of political institutions and initiatives, and is required to enable a sustainable future for these communities.

The idea of permanence suggests a new direction for transitional villages such as Baban Seth. Migrant workers are returning to their rural villages less frequently than when they first arrived in the new planned city. The recent construction of *pucca* dwellings, both by individual residents such as Tayama and quarry owners/managers, are moves towards permanence through investment in a more settled inhabitation – a step forward for migrant settlers towards laying claim to rights of citizenship. Current quarry leases from CIDCO are due to expire at the end of 2016 (less than three years away); but the likelihood is that the leases will be renewed for another 25 years without much hesitation or resistance. News articles over the past 5 years reveal the conflicting ambitions of local NMMC politicians who show support for environmental activists petitioning to close down the quarries, whilst a large proportion of key political figures are known to benefit from quarrying through stakes in construction companies linked to mining operations/contractors (*Times of India* August 2009 and July 2010, *DNA*, December 2011 and July 2012).

Although the two case studies embody very different conditions, histories and ways of development, together they can provide a greater understanding of the process of contemporary city making in India. With Kachhpura, the settlement is much more established (and has a long history) and the quality of life is improving steadily. At Baban Seth, there exists today a working generation of countryside migrants that came to the city around fifteen years ago. A commitment to place is guided by the need to consolidate and make permanent, and as evidenced in the settlement, a sense of belonging and commitment to place can lead to investment by both residents and local authority in infrastructure to make a better connection to the city. This coupled with a sense of collective identity may see the migrants move from being temporary settlers to recognised established citizens that can actively and creatively engage with the metabolism of the host city and are a vital resource for the changing nature and metabolism of Mumbai's twin city. The Baban Seth project has acted as a catalyst in energising the bid by its residents to consolidate their settlement and create a viable, enduring organic city neighbourhood which can fit within the mosaic topography of Navi Mumbai as Turbhe has already done (fig 4.1 p.143). The extent to which such mosaic topographies can promote multiple forms of exchange and overlap between diverse peoples providing the potential for participation in creating shared ground at the city scale must be the subject of further research.

4.2 THE ROLE AND EFFECT OF SMALL INTERVENTIONS ON THE CREATION OF COMMON PLACES

Education

The methodology for small-scale built interventions developed in this study is centred around building/making relevant to a situation and appropriate to the physical and cultural context. In the quarry worker settlements, the decision by the NGO to build a 'Bridge classroom' instead of a school for quarry worker children facilitated a connection to the state education system, thus helping integrate the marginalised citizens into wider city practices.

An NGO, Santulan, working with stone quarry workers based primarily in Pune (20km from Navi Mumbai) has established 'Pashan Shala', an innovative educational program to promote appropriate education. Pashan Shala provides the right to education for the hard to reach category of children and child labourers in the stone quarry sector. In 1997 the first school began with 119 children in Pune. In 2007, the government of India approved the 'Pashan Shala' as an Alternative Innovative Educational (AIE) programme for the 'Hard to Reach' category children of migrant stone quarry workers. It is a milestone in the history of the stone quarry workers struggle towards their rights and entitlements and a welcome step towards achieving the universalisation of education and freedom from child labour (*Pune Mirror* October 2012).

In both case study settlements, education enables children to have better chances and more diverse opportunities than their parents. For example, being able, at least, to sign one's name rather than having to use a thumbprint provides the basis for political participation the world's largest democracy. However, there is a dichotomy between traditional life-knowledge (which is rooted in immediate concrete negotiations) and education or 'national' knowledge (which sets horizons at a national level). The promotion of appropriate education advocated by Santulan enables a programme that leaves open the issue of what is taught (local history, folklore, spelling, curricular subjects) to local educators familiar with regional cultures.

'Participation', placemaking and permanence

The interventions discussed in this study have resulted in two kinds of shared space: in Kachhpura, the post-hoc introduction of infrastructure has led to the creation of clean places (yards and streets); in the quarries, the addition of amenity buildings which embody collective identity has led to the establishment of more permanent places within a landscape of temporary dwellings. Permanence can make a place a more effective 'archive'

for collective memory leading to the development of a collective history and potential destiny. If local authorities or NGOs are to get involved with the provision and creation of common places in informal urban settlements, they must first look at the existing situation and explore how this has evolved through the history of the settlement (in the case of migration settlements, this includes the memory of the rural village with its *chowks, otlas* and *galis* from which the migrants came).

When the scale of an amenity building fits with the scale and patterning of the vernacular and the morphology of the settlement, then the surrounding spaces are more likely to be appropriated for common use. When addressing the subject of shared spaces in informal urban settlements, the concept of place making not space making should be considered. Placemaking is an organic process that enables self-expression, bringing together people, places, rights and value. Working with the resources that are locally available (people, materials, skills) as well as notions of character, specificity, locality and identity can contribute to commitment by migrants to the longer term occupation of these places.

The design and eventual form of a built intervention, such as the quarry classrooms derived from traditional community platforms, must provide the improvements and adaptations (enclosure and security, lighting and fans) that respond to the current needs and desires of the users whilst retaining symbolic and familiar notions of a traditional gathering place within a rural Indian village. In this way quarry worker migrants, in establishing a new home at the periphery of the city, can maintain a distant sense of home in familiar structures embodying collective identity.

Cleanliness

Kachhpura is developing steadily with the growth of tourism whilst acquiring the perceived attributes of middle classness. The Kachhpura Settlement Upgrading Project has enabled cleanliness to be actively expressed, so that having an internal toilet and/or DEWATS is symbolic. Children's education charts used widely throughout India emphasise the importance of individual and community (collective) cleanliness (and freedoms through choice). The traditionally distinct separation of these two notions is addressed through the interventions in Kachhpura at the household/dwelling and settlement scales. Places that are clean, or easy to clean are places where people will gather - tidiness is required to operate effectively at a community level and to provide effective options for choice. The idea of individual and collective cleanliness are joined in a vision of (perhaps bourgeois) civic dignity. To be sure, it is possible to imagine the stage beyond subsistence to be consumed by bourgeois anxieties of privacy, neatness and even lurid extravagance (Bhatia 1994), although Turbhe suggests a preferable urban condition, replete with semi-legal activities.

Fig. 4.3. Children's education charts, 2012.

Visibility and re-presentation, scaling up

The visibility of the DEWATS (as *opposed to underground* sewerage systems) presents its process without hiding or disguising it. Although many residents may still not understand the process in its entirety, the visible difference in the quality of the water between that which flows into the system and that which flows out is enough to convince observers that it works. Whilst the general tendency towards upgrading and urbanisation has been covering up infrastructure and services – cleaning up a place – here the infrastructure is used as a resource. The DEWATS system works with the natural slope of the ground, creating a 'clean place' without disguising the fundamental process of treating waste water from a *nala*. It becomes a species of urban garden, attracting wedding ceremonies (chapter 3.3.4).

The idea of the project intervention as a 'performance' allows it to generate scaling up, not by planning and major capital investment but by individual example from within the community (for example, Meera at Kachhpura and Tayama at Baban Seth). The performance advocates quality and appropriate fit to the particular site topography over a standardised 'system' applied unthinkingly to all, and also attracts attention from outside (UN-Habitat 2012, UNHSP 2012), serving as precedent for a DEWATS approach elsewhere in the city, thus lifting horizons to the city scale.

The idea of treating *nalas* and providing a pathway along the route is recent but also rooted in the past. Student Vanessa Lee (London Metropolitan University 2010-11) proposed a hypothetical scheme for implementing a DEWATS in another settlement area of Agra (in the Old City) alongside a large *nala* that carries rainwater and sanitation away from the city. Additionally, CURE are in discussions with the ANN regarding suitable locations around the city for further DEWATS[3]. Elsewhere in Tier 1[4] cities such as Delhi and Mumbai, Indian architects such as Delhi based architecture practice, Morphogenesis[5] (2010) and PK Das have looked at regenerating *nalas* by cleaning them (through treatments such as phyto-remediation which are also part of the DEWATS process) to create public places such as parks, footpaths and cycleways at a city scale. The Kachhpura Settlement Upgrading Project has added confidence that such schemes are feasible.

3 A DEWATS is currently (2013) being developed by CURE and the ANN in the Taj Ganj area to treat the East Taj *nala*.

4 For an explanation of the tier based classification of Indian cities (Tier I, II or III), see glossary.

6 In 2009, Morphogenesis proposed a scheme for rejuvenating *nalas* throughout the city of Delhi, creating new alternative transport networks (foot/cycle paths), whilst treating the water using reed beds and aerators, leading to the generation of a number of new urban activities such as sport and tourism.

4.3 THE NEGOTIATION OF SHARED SPACES FOR SOCIAL CHANGE

Negotiation

'Negotiation' in this context refers not only to a process of arriving at a consensus, but also to the life and ever-evolving negotiation between people and the places they make for themselves.

This study deals with buildings relating to city institutions generated by interaction without preconceptions, usually mediated by an NGO. In Agra, CURE began by talking to women in Kachhpura, empowering and helping them to set up self-help groups and small livelihood programmes. This engagement led to the identification of toilets as the most urgent need. In Navi Mumbai, ARPHEN began by raising awareness of basic rights (to ration cards, services, education) within the migrant quarry worker communities. The identification of access to state education as a priority issue led to the initiation of ARPHEN's Bridge class programme, followed by the building of classrooms to provide improved places for conducting these classes.

The two projects/interventions investigated aim to bring about change by making places dedicated to a common use as a vehicle for interest, commitment and collaboration. In turn these places make explicit the significance and importance of shared ground and collective endeavour - a civic consciousness. The ongoing development of these projects is the result of conflict, mediation and negotiation, and of sharing through collective making. Places have been made whose horizon of reference is the community, *through platform, placement and articulation, typically manifest in varied situations of gathering (such as celebration).*

My consistent involvement and engagement with the two case study projects from their inception and over a number of subsequent years has allowed insights to be discovered along the way, and often only after reflection (i.e. as part of this PhD). This has involved frequent visits to both areas of study and a commitment to the ambitions shared by the communities, NGOs and other constituents involved. Although the projects are currently ongoing, their flexible and incremental nature allows each player to join in or take a step back as necessary,: as opportunities arise or do not. At the root of all of this is the belief in and commitment to facilitating community and civic self-empowerment and social change. This iterative process of collaborative architectural making has facilitated not only positive social changes through the civic self-empowerment of residents but has also facilitated access to the reflective process necessary to understand and pursue this endeavour.

Live projects and the 'Mangle of Practice'

Negotiations are inherent in the process of making, both with the materials and with collaborators, so in any live project, changing attitudes and behaviour are essential to start making progress. There needs to be a move away from the 'professional expert' - who tends to treat people as hapless and ignorant, and trains the people to regard amelioration as a service to be paid for rather than a collective responsibility or opportunity - through the re-education of engineers, architects and other development practitioners. The engagement of local citizens is achieved through (access to) knowledge sharing, transfer, and exchange. Mutual respect between those involved is necessary to enable engagement, without hierarchy. The challenge at local level is facilitating the engagement of residents with the process of change, and therefore focus should be on the process and not simply outcomes.

'Heroes' emerge and there should be recognition for individuals bringing about change through solidarity. These are people such as Meera in Kachhpura who was the first to sign up for an improved septic tank toilet in her yard and then had the generosity, enthusiasm and political skills to become an advocate. This is not a case of allowing certain vocal individuals to dominate negotiations, so much as encouraging others who are less forthcoming to be heard. Working with community requires recognition not simply for the NGO and outsiders, but within the communities themselves – engagement in the making process gives them a voice through a physical act of building. Building and making can facilitate engagement of less vocal but more practical actors.

The flexible approach adopted for the interventions in this study has operated in an open manner, seeing the process as cyclical and adaptive. This is a process which builds on the insights of Pickering, Ingold and Latour reviewed in chapter 1: a process that thinks through resistances and accommodations. Emphasis on the positive impacts of the interventions should not disguise the resistances encountered throughout the process. Accommodations made and lessons learnt have averted project failure, which could so easily have happened if one or more of those involved in the process chose to give up. In Kachhpura, the initial negative community reaction following the monsoon flooding around the DEWATS site in 2010 was alleviated by the NGO maintaining communication with residents to provide reassurance and optimism where there could have been frustration. Cooperation from those living close to the site who were particularly affected by the flooding enabled negotiation to take place instead of conflict. Negotiation provides the conditions for possibilities where improvisation meets system, metier meets capitalism and tradition meets empowerment.

The role of the NGO

The changing role and engagement of the NGO whilst implementing built interventions within their wider ambitions of reducing poverty can be reviewed by following the progression of the NGO staff themselves. At ARPHEN, Kulsum Sheik, was a Counsellor in 2008 when we began our collaboration. Kulsum has since been promoted to Project Manager, a role that requires more time spent doing administrative duties in the office. However, I have observed that this has not prevented Kulsum from spending much of her time in the field working with the people. The two classroom buildings provide places for Kulsum and the ARPHEN Outreach Workers (ORWs) to meet with individuals and groups of residents to discuss often sensitive issues. The process has created a collective commitment, and now ARPHEN, the institution, is very much part of the 'community'.

In Agra, the same project manager has been involved for all the interventions carried out in Kachhpura since 2005 when CURE first set up an office there. Early meetings with him were often in their air-conditioned office housed in the ANN building in Sanjay Place (the Central Business District in Agra), and visits to the settlement were scarce and reluctantly agreed to. As improvements were made and particularly after the DEWATS was finally completed and started functioning in 2011, it became apparent that the same project manager was now making trips to the settlement almost on a daily basis, proudly showing off the achievements and improvements in the village. The steep learning curve he had gone through overseeing and managing the project had thrown him into complicated technical, political and social situations that took sustained commitment to see the project through to completion. His increased presence in the village has improved his and the NGO's relationships with the residents (whose initial trust was compromised by his lack of engagement with the people early on in CURE's work in the settlement).

Local Authority Engagement

It could be said that support from the government/local authority brings about the fastest change. Consolidation such as that evident in Baban Seth and Tata Press quarry worker settlements has been recognised by city authorities (ANN, NMMC), although we are still awaiting promises to be fulfilled in Agra. However, the unfinished community toilet and road leading to Kachhpura are typical of local authority projects initiated prior to elections. The publicising of the DEWATS since its completion in 2011 (United Nations Human Settlements Programme 2012, UN Habitat 2012 and NUWA Award shortlisting 2011) has given it identity and recognition, which will hopefully shame the ANN into taking action. Though they have yet to complete what they have started, as is too common with local governing bodies throughout India, there remains optimism amongst the

population for connecting the toilet and finishing the road and thereby extending the clean places associated with the DEWATS intervention.

In 2002, five years prior to CURE's involvement with Kachhpura settlement, the Uttar Pradesh tourism department identified the historic village as one of nine selected for promoting rural tourism. The villages were chosen for their 'feel of rural life' with Kachhpura in particular chosen for its location with a 'view of the Taj at all times of the day' (*Times of India* August 2002). The concept of 'tourist villages', slum tours and eco-tourism are highly controversial. In the case of Kachhpura, initial interventions by CURE (supported by the state tourism department) to create a Mughal Heritage Walk (MHW) through the village began with the improvement of the infrastructure of streets (*galis*) - repaving the road surfaces and upgrading the open drains. These low-cost improvements would most likely not have happened had the tourism agenda bypassed the settlement at its initial inception. These small improvements gave the NGO access to the community and allowed them to address the most pressing needs of the people – for toilets. Through this discourse, and subsequent government initiatives (RAY, JNNURM), the idea of the 'tourist village' was temporarily sidelined and superseded by an ambition for Kachhpura to become the first open-defecation free 'slum' in Agra, leaving the more pressing issues of sanitation and connection to city-scale sewage infrastructure to be addressed later.

Small-scale interventions acts as a provocations, both reaffirming and challenging the natural order and historical trajectory of village development. In both case studies, the limits of the interventions in terms of scale and ambition were bounded by time, funds and human resources. The approach of small-scale architectural making through a methodology that begins with little or no preconception of what might be done has led to more integrated outcomes. DEWATS can work independently or can be connected to the city sewerage system (when it eventually reaches Kachhpura). DEWATS can be seen as a larger series of household septic tanks with urban implications. As an example of local involvement in the construction and maintenance of sanitation facilities producing compost, clean water, and clean places in situ, DEWATS operates at the neighbourhood scale. If and when mains sewage systems are introduced and dispersed DEWATS arrangements connected in to them, the unused run off might be removed more efficiently whilst still retaining the capacity for local engagement. So when a dispersed array of DEWATS initiatives are combined there is the potential for a more strategic effect combining local with city wide institutions.

The idea of incremental change practised In the projects is a non-planned exploratory process which involves refining the fit of proposals to the topography over time using a heuristic process of trial and error as described by Pickering (1995). It is not the same as the idea of phasing based upon

pre-planning. With the classroom building at Baban Seth, it became apparent that people did not realise what they had or indeed what they wanted until it was realised. The project began on site with no predefined design, and progressed as an incremental development of a traditional community platform to a community classroom building which fitted easily into the emerging settlement morphology. The potential for creativity and innovation from within the community was underestimated, and could probably be harnessed to an even greater extent, following Hamdi's (2010) notion of PEAS but involving more engagement with making, to provide a continuous process of resistance and accommodation. In Kachhpura, the idea of turning wastewater in to a resource addressed issues of health (cleanliness) and place, leading to civic decorum and solidarity.

Similarly in Kachhpura, new house builders located adjacent to the DEWATS began *using* the treated water for constructing their houses as soon as the sump was completed and water could be stored. Rather than *building* everything at once, re-visiting the process of making allowed time between increments for adjustment and accommodation that revealed a more appropriate next step, rather than predetermining the next step and forcing people to conform to its limitations. The incremental development of the interventions described here illustrates the cyclical process of negotiation that continues to take place between people and places in the two case studies. As suggested by Amin and Thrift (2002) in chapter 1 an intervention should not be seen as finished or complete, but as a living process that continually adapts and changes as various actions affect its life. There is no life without error and improvisation otherwise interventions are just lifeless systems. Similarly, the evolution of the interventions always proceeds alongside a social and political evolution - negotiation includes treating the interventions and places as 'actors' (Latour 2004).

This study has shown that there is value in real engagement that leads to long-term investment for lasting change. Social change in the built environment is about people and places, and the social production of habitat. The sustainability of temporary settlements, not by masterplanning but small scale, dispersed incremental making initiatives can contribute to the creation of enduring settlements such as that of the migrant workers in Navi Mumbai. Working from first principles, a bottom up approach might meet a quasi-top down approach (involving post-colonial, late capitalist bureaucracy), however further research is need to investigate whether these two approaches can come together and lead to towards a greater understanding of social complexities and have a positive impact on lives.

4.4 THE UPGRADING OF INFORMAL PERI-URBAN SETTLEMENTS IN INDIA

The dominant level of institutional order in a 'slum' town (as well as cities in general in terms of area) is the dwelling. Topographically, the difference between a 'slum' and a more developed city is mainly in the compression of hierarchy - less difference in decorum of buildings, fewer materials, a narrower range of sizes and distances, all concentrated at a level at or just above subsistence. There are temples and platforms and some areas or parts of streets have more collective value than others. Shared places play an important role as settings in the everyday negotiation of the territories required for the act of dwelling. In Kachhpura, provoked by the project intervention, an idea is developing about cleanliness and its relationship to the spatial identity of public and private places within a community. The two projects described in this thesis involve modest small-scale built interventions that develop gradually. This suggests that in order for this approach to have an impact at the city scale there would need to be a process of scaling up through different horizons of involvement instead of the conventional approach of involving the mass production of standardised solutions. Whilst the idea of a mosaic city might be a way forward for Navi Mumbai and the city wide rolling out of DEWATS for Agra, both as discussed above, there is a general need for further research and experimental live project work to investigate diverse ways to connect these marginalised peri-urban settlements with the wider context and build a more socially inclusive city. The projects studied have shown how positive urban change tuned to local demands can be achieved through negotiation and collaboration between individuals and institutions. Further work is required to understand how through anchoring progressively broadening and deepening horizons of involvement in shared places from the dwelling and settlement to the town and city might uncover ways to make a truly inclusive city scale topography.

Indian Democratic Context, Partnering and Contracts

In the upgrading of settlements, local authorities can become involved, acting as facilitators and providing enabling frameworks (corruption aside), without such involvement the horizons of involvement are limited. In both case studies, engagement with local authority bodies at various stages through the project has not only been necessary but often instrumental in the continued consolidation and upgrading of the settlement. In Kachhpura, the ongoing construction of household toilets towards the shared goal of an open-defecation free village is being continued by DUDA and the efforts to treat wastewater in the area have led to discussions with the ANN of extending the planned underground sewerage proposal to the Trans-Yamuna region. In Navi Mumbai, following the construction of the

community classroom, the local Corporator took action and constructed proper drains and pathways in the settlements, as well as providing better access to water and electricity for quarry workers. This only happened after the classroom was constructed, initiating consolidation leading to quarry owners beginning to provide better accommodation for their workers, providing a perception of a move to permanence.

National[6] government frameworks for cities (urban regions) involving the upgrade of low-income settlements include the Jawaharlal Nehru National Urban Renewal Mission[7] (JnNURM) and Rajiv Awas Yojana[8] (RAY). These frameworks often come from thinking based on top-down perceptions of the problems of 'slum' settlements, and not reality. Middle government has the most power to deliver, but it is the local government that has more direct input to actually implement. From the start, CURE 'partnered' up with the ANN to implement their Citywide Slum Upgrading Project (CSUP) under the umbrella of JnNURM (funded by Cities Alliance[9]) with an overriding ambition to make Agra 'slum free' (thus creating a 'good city'). This followed on from CURE's slum upgrading initiative, the Crosscutting Agra Programme (CAP) started in 2005 (funded by USAID). The association/ partnership of the NGO with the local government (ANN and DUDA) has *'helped to consolidate the early interventions and to create the enabling environment for sustainability'* (Khosla 2011). CURE chooses to avoid direct involvement in built interventions, focusing primarily on social and economic issues. The idea of partnering here between residents, NGO, research institution and local authority allows for each party to contribute in their own way and learn from each other, whilst sharing responsibilities without a formal contract.

Since 2006, a donor trust (The Water Trust) provided financial support to the ARCSR research area at London Metropolitan University in a unique arrangement that emphasises the hands-on education of architecture students through the implementation of live projects in transitional settlements in developing countries. This philanthropic venture has enabled opportunities for meaningful change on a host of levels through small levels of investment (compared to large funding organisations such as USAID). Lessons can be learned from this unusual set up for individuals seeking engagement with the research area, and institutions seeking to change the way their students learn.

6 India has three levels of government - national, regional and local. Local government consists of *panchayats* in rural areas and municipalities in urban areas, both elected directly or indirectly by the people.

7 JnNURM - see glossary.

8 RAY - see glossary.

9 Cities Alliance is a global partnership for urban poverty reduction and the promotion of the role of cities in sustainable development.

4.5 TOWARDS AN 'INDIGENOUS MODERNITY'

Hosagrahar's notion of 'indigenous modernities' mentioned in chapter 1 was formed from her study of colonial Delhi but has a curious resonance here. The nature of informal peri-urban settlements in North India lies somewhere between rural villages and urban towns and cities, and between *agrarian life and capitalist* consumerism. Traditional shared spaces in rural settlements in India encompass *the customs, rituals and cultural* identity of a community. Migrant peri-urban colonies such as the quarry worker settlements in Navi Mumbai begin as transient villages with little or no identity. Over time, they develop a permanence of place that requires a sense of collective identity to develop into civic towns. Embodied in the topography is a social change from which a new kind of shared territory and town is emerging, that is situated somewhere between traditional order and urban modernity. The conflict between traditional order and urban modernity exists somewhere between custom and reason, that addresses and accepts certain (static) traditions but also practices responses to current pressures and the (dynamic) progress of modernity.

In villages, more 'practical' modern community buildings are replacing traditional spaces such as *chaupals*. The new classroom building and existing *Mandir Chowk* at Baban Seth offer a compatible and innovative way to address traditional and modern collective places, reconciled by the tiled flooring and painted walls which connect the two. The way forward is neither one of nostalgia, nor of attempting to re-create home, but of harnessing the social structures and topographies that make up 'community' to make the places which support the civic life of a city. Examples of abortive community centres constructed by local authorities (such as those in Savda Ghevra described in chapter 3) show an inappropriate attempt to fast-forward development. This is one example of a deeper malaise inherent in supposedly more advanced architecture and planning. Whilst the incremental development of low-income peri-urban settlements studied here has sustained the civic integrity embodied by the residents to date, this is so often not the case in the open-ended, terrain vague of raw capitalist topographies where existing residents tend to be 'swept off the map' (Menon-Sen & Bhan 2008).

The significance of the *otla* and its continuity as a vital place for social interaction bridging the domestic dwelling and street can be seen in the way that *otlas* have been adapted for modern urban living today. The wide variety of *otlas,* ranging from a simple doorstep to a large veranda not only highlights their importance as a threshold, but as a shared place. A large proportion of the *otlas* found in Kachhpura incorporate central ramps built into the *otla* steps to allow bicycles, motorcycles and other two wheelers to be conveniently wheeled into the house where they are commonly stored. Will the arrival of the next generation see a significant shift from farmers

and shoemakers to tour guides and souvenir crafters? Or quarry workers to educated public servants? A children's drawing workshop[10] conducted at Baban Seth settlement (April 2012) revealed that the majority of quarry worker children in the village aspired to be policemen, traffic wardens or soldiers. Only one child drew a picture of a stone quarry worker (see *Project Diary* 1.4.2 p.44 for original drawings produced at the workshop). The quarries themselves are *currently experiencing a shift in management* as original owners, mostly PAPs, are reaching retirement and passing down their businesses to a new generation of (laptop carrying) quarry owners.

Throughout rural India, a 'No toilet no bride' campaign has emerged and is a crucial step forward for the empowerment of women for better lives after marriage (*Times of India*, October 2012): *'By convincing young women - and their parents, who must give consent for arranged marriages - that men without toilets do not have high enough status to be bridegrooms, a mini-surge in demand for toilets has been kicked off.'* However, as reported in *The Hindu* (May 2013): *'Superstitious beliefs, religious sentiments and vasthu shastra are making construction of toilets in rural areas... an uphill task.'*

Projects reviewed in this thesis, whether they are a toilet, classroom or infrastructure, have grown by stages. Toilet structures are upgraded and personalised by householders, classrooms are adapted for different activities and the DEWATS becomes and is perceived as a performance and representation in making a place as opposed to a technological system that simply provides a service. New partnerships between NGOs, academics, students and communities can explore the mixed world of tradition and innovation and address notions of Sen's (1999) ethical perspective and vision of capitalism as a framework for capacity building and empowerment. In situations where the primary order is rooted in tradition, the introduction of small scale provocative interventions have set the horizons of involvement beyond survival (subsistence) to conditions of commitment and capacity building eventually lead to meaningful change. However, such a cultural shift towards engagement within free market democracy can introduce new anxieties or ambiguities since the forms of belonging associated with democratic capitalism often conflict with traditional meanings and customs. It may be that the modest topographies of migrant settler communities can offer respite from the anxiety inherent in the metabolism of late capitalist cities. The qualities of mutual commitment and richness of collaborative creativity displayed in the case study settlements contrast sharply with the individualised middle class concerns evident in gated urban communities or with the anomie of the industrialised, mass produced, masterplanned, modernist city. Perhaps further study of these settlements can help bring back some of the profound mystery and drama of civic life back into the shared spaces of the city.

10 At the workshop conducted by myself, Shamoon Patwari and Kulsum Sheik, twenty children were asked to draw pictures of what they wanted to be when they grew up.

4.6 SUMMARY

The characterisation of informal settlements as 'unplanned' implies a disorder and lack of organised spatial, economic and social structure. The case study interventions in both Kachhpura and Baban Seth have demonstrated how focusing efforts on places such as the *Panchayat Chowk* (repaving the square) and the *Mandir Chowk* (constructing a community building) unleashes their potential as places for collective identity and solidarity. The changing physical and cultural topography must be understood before existing available resources can be leveraged to harness latent creativity. Can the idea of negotiating shared spaces be scaled up, leading to a shared urban commons?

This research has addressed the difference between Western notions of 'public space' and Indian notions of shared spaces at the dwelling and settlement scales, as well as the connection between settlement and city through infrastructure. What this study has not addressed is the realm of public spaces at the scale of the city, and the ways in which informal peri-urban settlements struggle to engage with the city as a whole. Further studies are required to understand the concept of 'public space' at the city scale as understood by Indian citizens, compared to those in the West (from which the notion of 'public space' originated). The focus on shared spaces in this research maintains its limits within peri-urban villages and settlements with little connection to the wider city. The question remains: can there be reconciliation between the public sphere and shared civic spaces?

The notion of a small-scale architectural intervention as a catalyst for community self-empowerment takes a less deterministic approach than large-scale masterplanning and is a challenge to traditional models of city making (where the focus is typically on goals, results and outputs) and where 'public' generally reflects impersonal, quantitative trends expressed as numbered statistics. The idea of the collaborative making of an amenity building or sanitation infrastructure provides communities with individual and collective confidence for social change. Understanding the character of the village/settlement and maintaining a sense of identity is crucial, whilst improving standards, enabling people to negotiate their own collective localities. Community buildings become collective places through inhabitation, just as a house becomes a home through adaptive use. In contrast to the idea of the masterplan, this approach is unpredictable, incremental and fuelled by energy put in by a coalition of the willing. This process allows for the expression of individual and collective needs, and can be used as an institution for transforming subsistence topographies to those of town. Two classrooms do not serve the entire migrant quarry worker region. More communities need to come together, and will require continued facilitation by civil society groups such as ARPHEN

and Santulan. However NGO priorities and agendas change, particularly in ARPHEN's case, often dictated by sources of funding. It will take time and sustained commitment from a common coalition of the willing to see whether a difference can be made at a larger scale, beyond that of one or two individual settlements. An example of this is Delhi - as a city of cities, Delhi offers a paradigm for local urban clusters with their own civic ethos, first metabolised organically before being enclosed and enveloped by the expanding metropolis. For example: Chirag Dilli, Khirki, Mehrauli, and Lado Serai, to name but a few, are all urban villages, each contributing their own clear spatial identity to the overall hybrid city topography of south Delhi (Drakakis-Smith in Davis 2006 p.10).

In Navi Mumbai, the idea of mosaic topography can be used to capture the different processes of transformation and the creation of meaning over time (figs. 4.1 & 4.2 p.143), and the metabolism of town creation. Each process/piece has a different character, but together they make town over time. Migrant workers become constituents and with the possible future demise of quarrying in the area, it is just possible that a developer will eventually take over, turning the entire region into middle-class towns full of high-rise towers sweeping away the current migrant workers. In the meantime, a composite mosaic identity is being formed, a bulwark against raw capitalist development, where the different pieces and processes of the whole, whilst remaining distinct, are gradually becoming more and more connected.

In both case studies, the life of the intervention is ongoing, its identity visible, continually performed and changing according to the relationship to and on-going negotiation with inhabitants (through appropriation). The insights gained during this research by practice have been both necessary and sufficient to engage those in the creative process of city/town building. It will probably take several generations to really understand these communities and how they will develop, how and if the interventions and the unplanned improvisations that negotiate its current daily existence have affected its enduring growth. It also remains to be seen whether the engaged metabolism demonstrated within the projects will be replaced by a more individualised remote topography once the population has achieved middle-classness. This research indicates that, in order to harness and consolidate the civic potential inherent in informal settlements effectively, responsibility should be a shared between the state (local, regional and national), NGOs and poor citizens (mediated by civil society)

The lives of the interventions *continue to grow and transform* within the metabolism of their settlements. The next step will be to see whether the DEWATS can be connected to mainstream sewerage when (or if) it reaches Kachhpura. If this does indeed happen, we may be able to see if the infrastructure of an informal settlement can become a part of the citywide technical system, and whether this will extend the site of collective mem-

ory from the settlement to the city as a whole. Similarly, in the quarries, the question is whether the introduction of a public bus (transportation) system along the Thane-Belapur quarry belt that is accessible (and affordable) to the poor (migrant workers) will create more connectivity between the quarry settlements, allowing more children to get to school; and, as their villages find their place as established towns, whether this brings them closer to being connected to the city, whether despite all the efforts to consolidate their position they are eventually simply swept off the map as land values rise.

Cities can learn from the organic development of unplanned peri-urban settlements – the *life of shared spaces* in the existing conditions provided by the 'informal' topography has put the village back into the city. Amin (2011) takes a different view and argues that it is in fact middle-class elites that are the city within the city. Perhaps creating 'indigenous modernities' (Hosagrahar 2011) is just what these unplanned settlements and urban villages in the cities are doing. Traditional ways of living and making can be reinterpreted and revalued as a resource, a collective memory underpinning confident engagement (with the city) allowing its citizens to move resolutely forwards, particularly in the context of a globalising world. In informal peri-urban villages, transference from the rural village and subsequent consolidation of communal spatiality (much lost in the modernist city) suggests an evolved, hybrid, rapidly changing environment consisting of a mosaic of urban villages whose citizens are continually reinterpreting their shared spatial structures as they adapt to the push and pull of the great city.

VI GLOSSARY
(Hindi in italics)

Aangan	Courtyard within a dwelling.
Abadi	Population (used to refer to rural residential area).
Archaeological Survey of India (ASI)	The Archaeological Survey of India (ASI), within the Ministry of Culture, is responsible for the regulation of archaeological research and the protection and maintenance of the cultural heritage of India.
ARPHEN (NGO)	An NGO with whom the studio has carried out two of its live projects and who has provided access to migrant stone quarry communities.
Bagh	Garden.
Balwadi	Largely, a pre-school day care centre. Some functions vary from state to state. In some states works for not much more than two hours a day.
Banyan (tree)	Sacred Indian tree similar to a Fig tree.
Baoli	Mughal step well.
Baraat	Hindu wedding procession.
Baraati	Groom's friends and relatives (part of the wedding procession group)
Bazaar	Market.
Brahmin	Priestly caste.
Cross-Cutting Agra Programme (CAP)	A programme initiated by CURE in August 2005, with the aim of improving the quality of life of slum dwellers in Agra by better access to sanitation services and sustainable livelihoods linked to tourism. The project is designed around a trail of lesser known monuments linked together called the

	Mughal Heritage Walk (MHW), and five low-income settlements in the area (CURE 2007).
Caste	Traditional Indian social class system.
Cayhna	Gladioli plant.
Chai	A type of mixed spiced tea.
Charpoi	*Traditional Indian bed made from a lightweight timber frame strung with woven rope for relaxing.*
Chaupal	A community building or space in the rural areas of North India.
Chhat	Roof terrace.
Chirag Dilli	An urban village in south Delhi. The *Chirag Dilli* shrine itself is a collection of old (starting from the 14th century onwards) and new buildings set haphazardly in a small open space surrounded by the village. *Chirag Dilli* grew around the dwelling and then shrine of the Sufi saint known as *Chirag Dilli* (literally meaning 'Light of Delhi'), who lived at this site in the 14th century. The settlement grew within the 18th century walls built around the shrine. This wall, though now nearly completely destroyed, still gives the urban village its present shape.
Chowk	A place where paths intersect or meet with the emphasis on place; courtyard.
Chulha	Charcoal fuelled domestic cooking stove.
CURE (NGO)	An Indian NGO with whom the studio has carried out two of its live projects and who has provided access to slum communities. The Centre for Urban and Regional Excellence works in a range of low income, mostly illegal settlements promoting the livelihoods of women.
Dalit	A member of the lowest caste. See also *Harijan.*
Dalao	Pond.
Dhobi Ghat	Riverside washing/laundry place.
Diwali (festival)	*Diwali* is a major Hindu religious celebration, also known as the 'Festival of Lights' held annually during the period October to November honouring Lakshmi, the goddess of wealth. It is marked by sharing of sweets, new clothes and gifts with family and friends, making it popular with children.
Gali	Narrow street.
Gaon	Village.
Gram	Village (social).
Gram Sabha	Sub-sect of a *panchayat* and coterminous with a revenue village. The smallest unit of electoral democracy. (See also *panchayat.*)
Harijan	A member of the lowest caste. See also *Dalit.*
Haveli	A traditional courtyard house.
Hindu	Follower of Hinduism.
Jali	Arrays of small openings giving ventilation whilst maintaining privacy.
Jal Kumbi	Water Hyacinth plant.

Jats	Farmers.
Jawaharlal Nehru National Urban Renewal Mission (JnNURM)	A large-scale, seven year government city-modernisation scheme launched in 2005 under the Ministry of Urban Development. The scheme is intended to improve the quality of life and infrastructure in the cities by encouraging cities to initiate steps for bringing phased improvements in their civic service levels, with a strategy of upgrading the social and economic infrastructure in cities, and provision of Basic Services to Urban Poor (BSUP).
Kachhpura	A peri-urban village situated to the North of the Taj Mahal in Agra.
Katra Wazir Khan	An east bank riverside community in Agra.
Kharanja	Mughal brick pathway.
Kuchha	Temporary, short life, reducing in value.
Kulfi	Indian frozen dairy dessert.
Lakhori (brick)	A type of brick traditionally used to construct buildings during the Mughal era, identified by its thin proportions compared to standard bricks used today.
Lakshmi (Hindu God)	Hindu goddess of wealth, prosperity (both material and spiritual), fortune, and purity. She is said to bring good luck and is believed to protect her devotees from all kinds of misery and money-related sorrows. Lakshmi is the household goddess of most Hindu families, and a favourite of women who worship her daily.
Maidan	Park.
Mandir	Temple / Shrine.
Marwari	Wandering traders from Rajasthan.
Marwari Basti	Settlement of the *Marwaris* in Agra.
Masjid	Mosque.
Matkor (ceremony)	Rite of Digging Clay (part of Hindu wedding).
Mela	Fair.
Mughal	A corruption of 'Mongol' and refers to the Empire which dominated northern India from the 14th to the 19th centuries.
Muslim	Follower of Islam.
Nai (Abadi)	New (residential area).
Nala	Natural water course in an urban area into which sewage and waste water flows from the surrounding area.
Namaz	Muslim prayer.
Nazul (land)	Government (land belonging to).
Neem (tree)	Sacred Indian tree.
Otla	A raised threshold or porch at the entrance to a house where residents sit and chat to passers by.
Panchayat	The *panchayat* is an institution of self-government in rural areas (73rd Amendment Constitution of India) originally comprised of five members. The *panchayat* acts as a local village council and court of law that provides informal dispute resolution to

	neighbourhood residents dealing with issues such as public drunkenness or domestic abuse.
Panchayati Raj	The oldest system of local governance in India.
Pandal	Temporary tent structure erected for large events.
Peepal, or *Bo* (tree)	A sacred tree - Hindus worship it and perform a *puja*. Women circumambulate the *Peepal* tree to be blessed with children.
Pucca	Permanent, finished, proper, increasing in value.
Puja	Hindu prayer. Many Hindu homes have a personal shrine set aside somewhere in the house that includes pictures of various gods. A daily *puja* is a ritual which may include offerings such as light, water and incense to the family's personal deity.
Purani (Abadi)	Old (residential area).
Rajasthan	The largest Indian state, situated to the West of Delhi and bordering Pakistan.
Rajiv Awas Yojana (RAY)	Rajiv Awas Yojana (RAY) was a five year government scheme introduced in 2009, focusing on slum dwellers and the urban poor. The scheme aims to promote a slum-free India and focuses on property rights for slum dwellers and the urban poor. Also part of the scheme is the provision of basic amenities such as water supply, sewerage, drainage, internal and approach roads, street lighting and social infrastructure facilities in slums and low income settlements adopting a 'whole city' approach.
Safai karamchari	Municipal cleaner.
Sanjhi (Art)	Indian art of paper cutting.
Sarpanch	Head of a *panchayat*.
Slums	A term used in India to denote poor, illegal settlements usually built of temporary materials.
Soochna Sandhasan Kendra (SSK)	Information Resource Centre.
Sulabh Shauchalaya	A popular pour-flush, leach-pit latrine technology developed by Sulabh International, a social service organisation founded in 1970, that today constructs many of the public toilet facilities all over India. It translates directly as 'easy access to sanitation'.
Swaach (Gali)	Clean (Street).
Tehsil	Geographical divisional district in India.
Tier (city classification)	The tier based classification of Indian cities (Tier I, II or III) is based on the stage of real estate development (market maturity). Tier I cities have well established real estate market, Tier II are growing markets with increased demand and investments, Tier III cities have potential for real estate market to be established. Another method of classifying a city in Tiers is on the basis of its population.
Tilak (ceremony)	Hindu pre-wedding ceremony.
Uttar Pradesh	An Indian state to the north of Delhi.
Vasthu Shastra	Precepts born out of a traditional view on how the laws of nature affect human dwellings, applied to Hindu architecture.
Wala	Vendor/seller.

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KACHHPURA SETTLEMENT UPGRADING PROJECT, AGRA, INDIA

PROJECT DIARY 1.4.1

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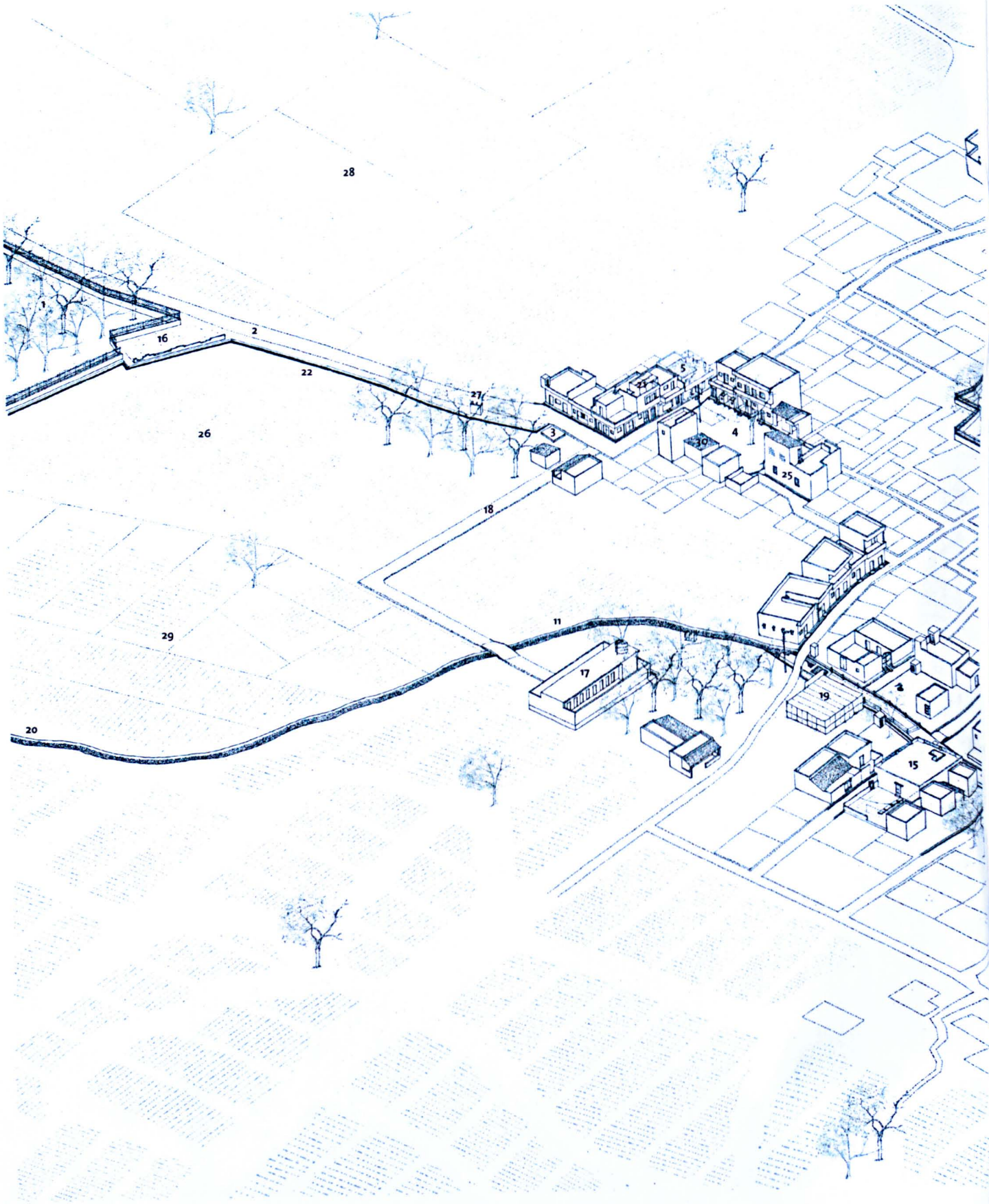
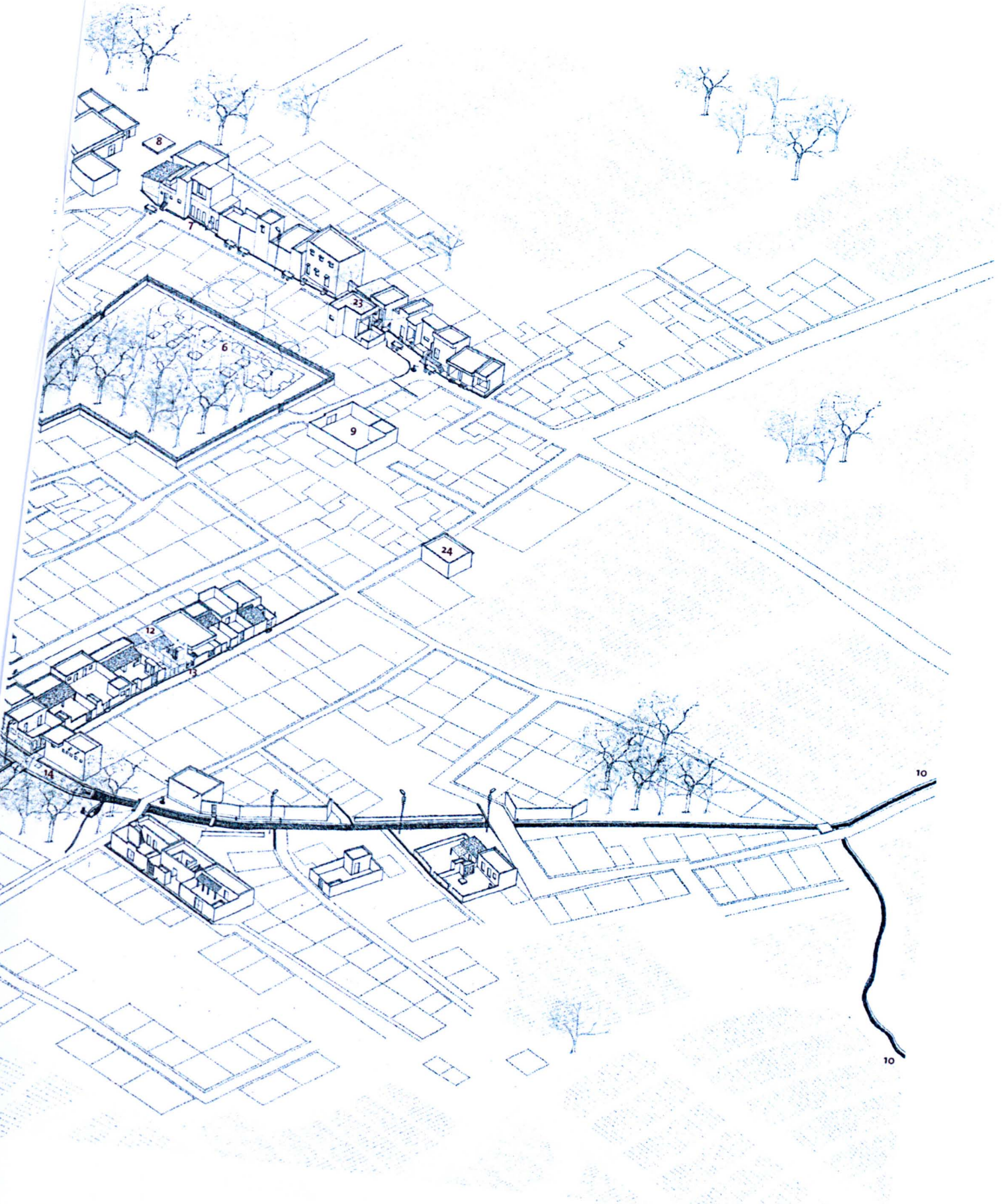
Bo Tang
Architecture of Rapid Change and Scarce Resources



1.4.1 Kachhpura Settlement, Agra

1 *Mehtab Bagh* (Moonlight Garden)
2 "Poo" Road
3 Community Platform (South entrance)
4 *Panchayat Chowk* (Main Square)
5 Brijesh Singh's dwelling
6 Humayun's Mosque
7 Market Street
8 Community Platform (West entrance)
9 Gym
10 Untreated effluent from settlements upstream
11 Primary New Kachhpura *nala* (open drain)
12 Meera Devi's dwelling



Swaach Gali (Clean Street)
Decentralised Wastewater Treatment System (DEWATS)
Bhajan Lal's dwelling
Old community toilet complex
New community toilet complex
New road to community toilet complex (unfinished)

19 Temporary marriage *pandal* (tent structure)
20 Partially treated effluent to Yamuna River
21 New tea terrace structure
22 Secondary Old Kachpura *nala*
23 Hindu temple
24 Former NGO site office (CAP)

25 Primary school
26 Low lying fields flooded in monsoon
27 Disused urinal structure
28 Fields irrigated with water from primary *nala*
29 Fields irrigated with water from secondary *nala*
30 Current NGO site office (CAP)

For a larger representation of the previous page to be read in parallel with this project review, refer to A1 portfolio drawing 1.4.1: Kachhpura Settlement Upgrading Project, Agra.

KACHHPURA SETTLEMENT UPGRADING PROJECT, AGRA

Project Review

INTRODUCTION

The Kachhpura Settlement Upgrading Project (KSUP) began in 2007 in Agra, as a partnering between students and research assistants from London Metropolitan University's Faculty of Architecture and Spatial Design (ASD), a local (Delhi based) NGO – Centre for Urban and Regional Excellence (CURE) and Kachhpura residents. The ongoing sanitation project has progressed from small individual interventions on a single street to larger settlement-wide schemes in the Trans-Yamuna area east of the river. The first phase of KSUP was the introduction of individual household septic tank toilets, initially funded by the Water Trust, which began in July 2007. To date (April 2013), 235 toilets have been constructed in Kachhpura and surrounding settlements. The second phase of KSUP, which began in 2009, was a proposed community toilet facility and de-centralised waste water treatment system (DEWATS) to treat sewage from the settlement. The official inauguration of the DEWATS took place on 15th April, 2011 attended by Ms. Nivedita, Director-LSG (Local Self Governance) of the Ministry of Urban Development. The intention within this project was to create common places through the post-hoc introduction of water and sanitation (WATSAN) services/facilities, linking shared spaces and infrastructure in the community.

Background

Kachhpura is a village over 300 years old, located in Ward 17 of the Trans-Yamuna area of Agra. The village was established in the 16th century, on the east bank of the Yamuna river directly opposite the famous Taj Mahal, and originally the property of the Hindu King of Kachh, Raja Maan Singh (from

where the village got its name), who also owned the lands on which the Taj Mahal was built (1631-48). Over a century ago, the village was a small cluster of about sixty farmers' huts surrounded by fields. The settlement has since been built up around Humayun's Mosque[1], which was constructed in 1530, early on in Mughal colonisation (CURE 2007). Kachhpura settlement is part of the history of the famous Taj Mahal and Mughal dynasty, and in particular associated with Emperors Babar and Humayun as they developed their city on this river bank[2]. The *Mehtab Bagh* (Moonlight Garden)[3], rediscovered in 1995, is located 120 metres from the settlement (p.6).

Humayun's Mosque in 1987. [© James Wescoat, Rotch Visual Collections]

Kachhpura is listed as a notified slum by the District Urban Development Authority (DUDA) and has been incorporated into the city limits. In 2007, the settlement had approximately 448 households (2352 residents) located in the *Purani Abadi* (old area) and *Nai Abadi* (new area) of Kachhpura (CURE 2007). Despite there being an ancient mosque in the centre of the village, the majority of residents are Hindu. Nearly 90% of the residents belong to the Scheduled Castes[4], with a small percentage of Muslim and other groups (CURE 2007 p.7).

Access to Water and Sanitary Services

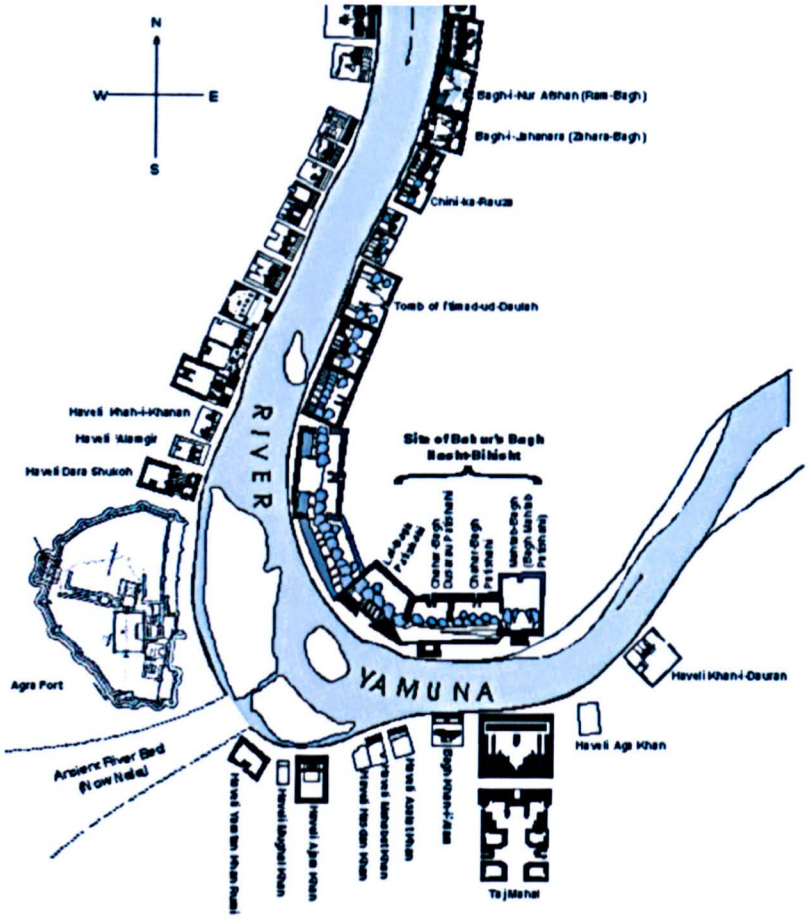
In 2007 when the Kachhpura Settlement Upgrading Project began, existing street level infrastructure in Kachhpura was basic but adequate in the sense that almost all households were connected to an open street drain and the majority of alleys were paved. Water pumps were sufficient despite the limited supply of piped water to the settlement. At household level, a small number of residents owned private toilets, which were usually located on rooftops or in courtyards of houses, and often connected to poorly designed and constructed septic tanks, or even opening directly into street drains.

1 Humayun's Mosque was built by Humayun and is one of the very few monuments existing in India from this early Mughal period. The mosque is under the protection of the Archaeological Survey of India (ASI) and has been restored using traditional materials such as lime and mud mortar. It is still used as a place of worship and people from the surrounding settlements offer *namaz* (Muslim prayer) daily in the mosque (CURE 2011).

2 As the primary source of water to the city, Mughal Agra was developed along the banks of the Yamuna River. The riverfront was lined with houses with elaborate gardens of the nobles serving the Emperor in the court (CURE 2011).

3 The Mehtab Bagh was constructed in the early 17th century, and is the last of eleven Mughal (*charbagh*) gardens that used to sit along the riverside of the Yamuna. The 25 acre garden mirrors the layout of the Taj Mahal and the low lying area was continuously flooded. In 1871, the floods exposed an ancient wall, leading to false speculation about the existence of a Black Taj Mahal. In 1995, an Indo-US project began to excavate and restore the flooded site (Moynihan 2001). Since its opening to the public in 2000, this has had a huge impact on the level of tourism on the Trans-Yamuna side of the river.

4 The Scheduled Castes is a group of historically-disadvantaged people recognised in the Constitution of India, which lays down the general principles of affirmative action for this 'untouchable' group (also known as *Harijans* or *Dalits*) since Independence.



Map of Agra showing riverside Mughal *havelis* (after 1722 map). [http://archnet.org/courses/MughalIndia/HistoricIndia.html accessed on 26 April 2012]

Part of 1868-69 map of Agra showing Kachhpura next located adjacent to a canal, now a *nala* (open drain). [Survey of India, 1870, Maps, Huntington Digital Library, accessed 15 August 2013]

Kachhpura has poor access to basic services due to its location at the city's periphery; the settlement is not linked to the city sewerage system and underserved with respect to solid waste management, electricity and housing. Two main *nalas* (open drains) service the settlement, flowing southwards through the village and across the fields into the Yamuna River. The primary *nala* carrying waste water is lined with cement until it reaches the fields where farmers extract from it using pumps to irrigate their fields (CURE 2007 p.9).

CURE's detailed survey of Kachhpura (2007) revealed that nearly 85 percent of households defecated in the open, in particular along the southern path connecting the village to the *Mehtab Bagh*. Along this path, there used to be a dilapidated government built Community Toilet Complex (CTC). Residents would also defecate into the main *nala* section at the edge of the settlement. Women waited until dark to go to the fields, which was also a cause of many health problems as well as safety and security issues (LMU 2006). The lack of dignity experienced by women due to the absence of access to toilets highlights deeper issues of tension in relation to place and civic culture in the community and village as a whole.

Existing main *nala*, Kachhpura, March 2009. [Helena McDermott]

Map of Kachhpura and surrounding area, Agra, showing key locations of KSUP interventions, 2010. [ASD Projects]

1. Humayun's Mosque
2. Primary *nala* (open drain)
3. Secondary *nala*
4. *'Swaach Gali'* ('Clean Street')
5. DEWATS
6. 'Poo Road' (open defecation zone)
7. Field edges (open defecation zone)
8. Existing Community Toilet Complex (CTC)

HOUSEHOLD TOILETS

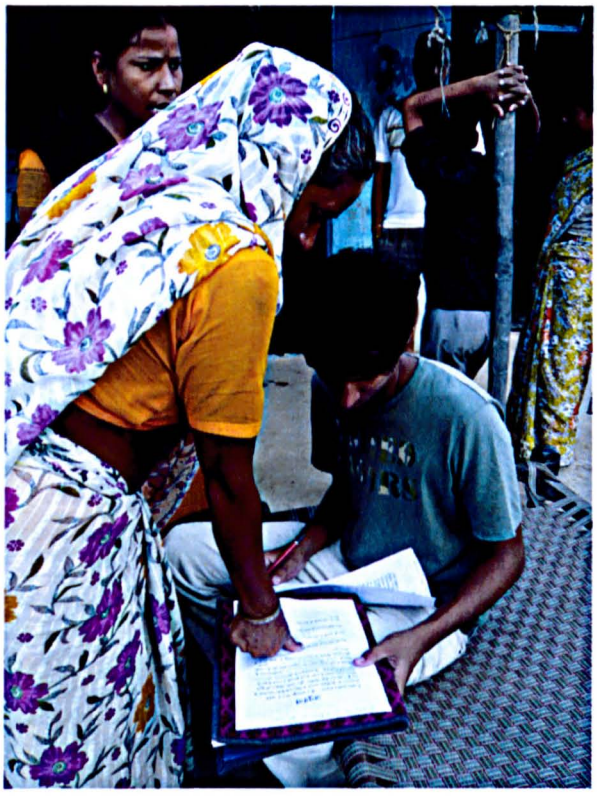
The village of Kachhpura is located north of the heritage-protected *Mehtab Bagh*. Immediately prior to the start of constructing the first household septic tank toilet in the village under KSUP, the Archaeological Survey of India (ASI) introduced a new regulation outlining a 100 metre restriction zone around protected monuments and heritage sites where new construction would no longer be permitted. Toilets were first installed under KSUP by LMU students in a street in the *Nai Abadi* (new Kachhpura area) which became known as *Swaatch Gali*, or Clean Street (chapter 3.2.3).

As the project reached a point where a large number of toilets had been installed in the *Nai Abadi*, more and more requests for toilets emerged from the *Purani Abadi* (old Kachhpura area). A solution was found to the 100 metre rule issue - the project had been proposed just prior to the introduction of the new ASI regulation, and the fact that most of the toilets in the *Purani Abadi* would be internal (due to lack of backyard space in comparison to *Nai Abadi* houses) meant that they should be considered home upgrading and not new build. On this basis, and with the added pressure of the insistence of the community, permission was granted to construct toilets in this area.

Community Credit Fund (CCF) and Toilet Savings Groups (TSGs)

The toilet project worked on a subsidised basis with the Water Trust providing initial funds to pay for the construction of 100 septic tank toilet systems. A revolving Community Credit Fund and several Toilet Savings Groups were set up for householders to take out loans to pay for the construction of the toilet and washing structures. Borrowers would pay back a small amount every month according to their household income, allowing other individuals to take out loans[5]. Applications for household toilets would be on a first-come first-served basis as long as the requirements were met (space for the toilet, access to the site and adequate street drainage infrastructure). The waiting list grew steadily following completion of the first street of toilets (*Swaatch Gali*), eventually leading to a current total of 235 toilets installed in Kachhpura.

5 It was decided by CURE that after two years, any loans which had not been paid back by March 2008 (end of the project) would be written off (CURE 2007).



Householders signing toilet contracts facilitated by CURE staff, 2007. Illiterate women used the common practice of thumbprints as signatures. [Shamoon Patwari]

Pre-Fabricated Cast Concrete Tanks

Students[6] worked closely with the local septic tank fabricator, Vinod Kumar, to improve the concrete mix and reinforcement used in the construction of the pre-cast concrete septic tanks (and lids) at his yard. The contractor had an exclusive contract with CURE to construct all the proposed toilets in Kachhpura and nearby settlements under KSUP, and was provided with a certificate of quality following cube tests on the improved septic tank concrete mix.

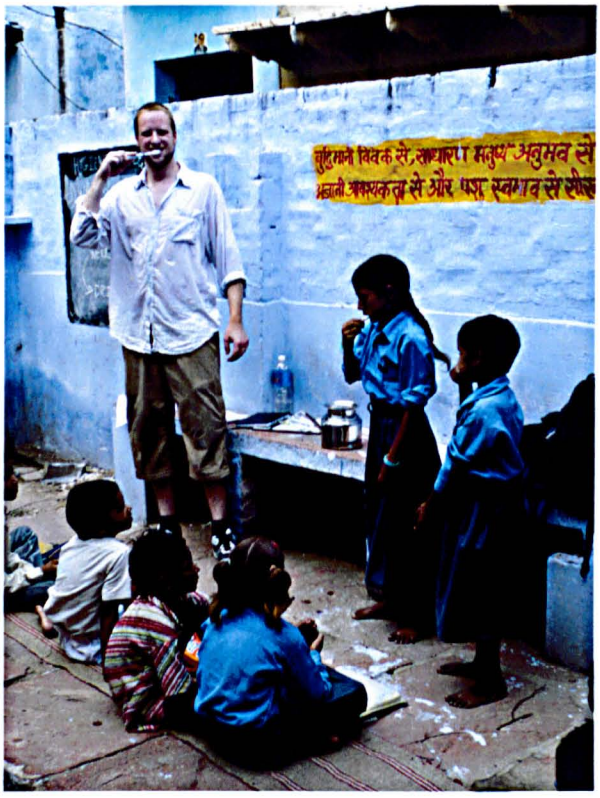
Cube samples from concrete mix testing for septic tank construction, August 2007.

6 The students involved were myself, Shamoon Patwari, Katarzyna Banak and Spencer Owen.

Student constructing a pre-cast concrete septic tank at the fabricator's yard, Agra, August 2007.

Hygiene Awareness Building

An essential part of the process of integrating sanitation infrastructure into the community was the involvement of the residents themselves. *Panchayat* (village governing committee) meetings were held regularly to ensure everyone was aware of what was happening and were given the opportunity to voice their opinions and any concerns regarding the proposals. A Hygiene Awareness Campaign was instigated to inform and educate the community. This involved a basic hygiene workshop with schoolchildren at the main primary school in Kachhpura, and distribution of informative leaflets to every householder in the village developed by the students, explaining how septic tank toilets work. The potential of educating children for advocacy in their households was apparent - lessons on good hygiene practice learnt in the classroom were taken home and shared with parents and other family members, discouraging accustomed bad habits whilst encouraging changing collective cultural behaviour to emerge based on young members of the household setting an example.



Hygiene Awareness Workshop with children in the local primary school, Kachhpura, August 2007. [Shamoon Patwari]

Following the hygiene workshop with the children at the primary school in Kachhpura, the teachers expressed the need for toilets for the children attending the school. A series of meetings with the *panchayat* followed and permission was delayed due to a few objections from local residents (particularly those living adjacent to the school), who believed the toilets would be unsanitary for the area. Although householders were now keen

to install toilets in their own homes, the idea of shared or communal toilets (even for children) was initially approached with scepticism, citing responsibility for maintenance of the facility as one of the main concerns.

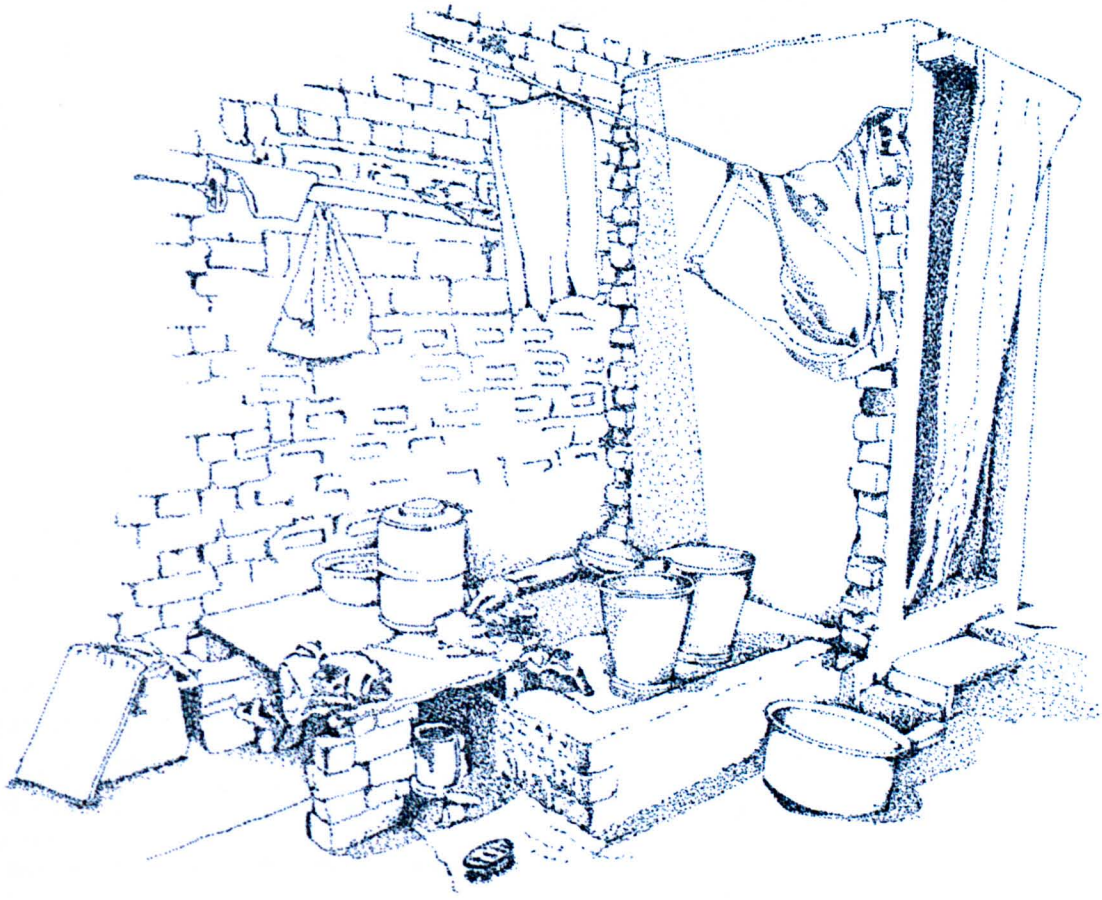
Sanitation as Status

Once the installation of the septic tank toilet system was completed, a series of options for superstructures (toilet, washroom/area) were offered to the householders. From these options, they could select and adapt the designs of the structures above ground based on their personal needs, preferences and financial situation. Customisation and personalisation of the new sanitary space often followed with householders painting the structures (usually to match the rest of the house), using cost-saving methods such as fabric curtains for privacy instead of permanent doors and adding shelves, hooks and even shower pipes over the toilet.

Householder with his new septic tank toilet system in Katra Wazir Khan, Agra, August 2008.

Following subsequent inspections since the septic tank toilet project first began (November 2007, July 2008), it became clear that these new household sanitary spaces were kept immaculately clean and were valued as a symbol of status in the community, encouraging others to follow suit (Tang 2008).

Meera's toilet with a washing line used as a screen for privacy when bathing, and a makeshift fabric door on the toilet cubicle, August 2007.



COMMUNITY TOILET COMPLEX (CTC)

When I first visited Kachhpura in 2006, the existing community toilet complex was located along the corner of the north wall of the *Mehtab Bagh*. In 2008, a toilet reconstruction project was proposed by CURE and LMU researchers[7]. It was classified as an upgrading and refurbishment project, to adhere to ASI regulations. The Municipal Corporation - Agra Nagar Nigam (ANN) agreed to fund and oversee construction of the community toilet facility. However, once the builders arrived on site and began to take down crumbling parts of the existing structure, the project ground to a halt, with the ASI claiming the existing structure was completely demolished so the approved application for upgrading and renovating the toilet building was no longer valid. At this point, the project was put on hold.

Existing abandoned community toilet facility on the corner of the *Mehtab Bagh* wall, August 2008.

An operations and management plan was devised that would include a monthly payment plan for residents using the facility, including the option for household/family cards. Women were already expected to benefit most, but it was hoped that the facility would encourage men and children to use hygienic toilet facilities. Tourists visiting the adjacent Mehtab Bagh would pay a slightly higher fee to subsidise maintenance of the toilets. The CTC was expected to reduce open defecation in the village by 25 percent (Kumar 2011).

Relocated to an area in the fields north of the original site and closer to the settlement and primary *nala*, CURE handed over responsibility for the CTC to the ANN who took over the project. The new CTC was completed in November 2011, but at present is not open for use (except for a brief

7 The LMU researchers were myself and Shamoon Patwari, both recent architecture postgraduates at the university.

two week period in December 2011 when it was officially opened). The CTC currently awaits connection to a water supply (a water butt sits empty on the roof of the structure) and construction of a road leading to the facility was started in 2012, but is still incomplete.

Completed but inoperational Community Toilet Complex constructed by the ANN, November 2011. [CURE]

DECENTRALISED WASTEWATER TREATMENT SYSTEM (DEWATS)

Locating the DEWATS

The final phase of KSUP was a proposed de-centralised wastewater treatment system[8] to treat waste water from the primary *nala* servicing the settlement. The initial proposed location, along the north wall of the *Mehtab Bagh* was rejected by the ASI due to its proximity to the protected site. An alternative location was identified beyond the 100 metre restriction zone surrounding the *Mehtab Bagh*, on a site at the edge of the *Nai Abadi* within the settlement itself.

8 DEWATS is based on simple anaerobic and root zone treatment techniques put together in different combinations according to the assessed need. In this system for the pre-treatment before the DEWATS components, there is a simple filter chamber to filter out solid debris. A baffled septic tank acts as a primary treatment, a baffled filter reactor as secondary, and root zone treatment system as the tertiary process. The treated water is stored in an under ground sump for use at the site, and its overflow continues downstream to the Yamuna River (CURE 2010).

The new proposed site was located on *nazul* (government) land, along the main nala exiting Kachhpura and permission was granted by the ANN. CURE discussed the new location of DEWATS with the *panchayat* in Kachhpura to seek their agreement and address any concerns. Construction was expected to begin on DEWATS in May 2009, but was delayed until July 2009, as careful assessment had to be made regarding the available slope in the area for the DEWATS to flow naturally (i.e. without the need for pumps).

Constructing the DEWATS: Monsoon Rains

Following a lack of response from local contractors bidding for the DEWATS construction contract[9], CURE and the ANN agreed to jointly oversee the build to be undertaken by Vinod Kumar, the contractor who was also constructing the household toilets in Kachhpura.

Commencement of DEWATS construction on site was postponed by an early monsoon rain which delayed construction until November 2009, after which the first trenches for diverting the drains were dug. However, further delays occurred due to unexpected late monsoon rain resulting in the trenches filling up. The ANN arranged a mechanical digger (JCB) for excavation works for the baffled tanks and base preparations, and it is understood from CURE (2010) that there was a significant level of contribution and enthusiasm from local youth in the project, not only through their direct involvement with clearing the area and safe-guarding construction materials, but by addressing the doubts of sceptical adults. However, once the initial tanks were excavated, further heavy rains caused the pits to fill up, so they had to be re-dug after the monsoon season was over.

In 2010, Agra saw severe monsoon rains, which raised the level of the Yamuna by four feet above the danger (low flood) height of 495 feet above sea level (Indian News, September 28 2010). Flooding occurred in the immediate and surrounding areas to the DEWATS, including the flooding of 30-40 houses in Kachhpura. This led to concern throughout the community. As construction of the DEWATS had just been completed, the young nursery plants in the root zone were completely washed away, and new render on the tanks was eroded by the flooded *nala* and rains.

Although the DEWATS was never designed to function during the monsoon (instead allowing the water to flow straight through primarily via the surface drain that runs alongside the system allowing nature to clean the drains and river), the unusually heavy rains that year together with the new infrastructure caused higher levels of flooding than had been

9 Local contractors had no experience of constructing a system such as the proposed DEWATS and therefore were not willing to take on the risk or responsibility of attempting something so different.

previously experienced. The primary flaw of the system was its location in place of a section of the *nala*, effectively causing a blockage when the flow increased due to monsoon rain. The system should have been located in parallel to the drain as originally proposed on former sites further away in the fields (p.55), so that the flow could be controlled, allowing the nala to flow freely during heavy rains, and to not exceed the 50kl per day capacity of the DEWATS at any time.

Following the flooding experience, making the DEWATS functional became the priority for everyone. It was apparent that the build up of sludge and solid waste upstream of the DEWATS (beyond the system) was causing severe blockage of the *nala*. CURE approached the ANN to have the blockage cleared and this was carried out in January 2011. In May 2011, a storage sump at the end of the system to store treated water was constructed, and the root zone that had been washed away by the monsoon rains was replanted[10]. This completed the construction of the DEWATS.

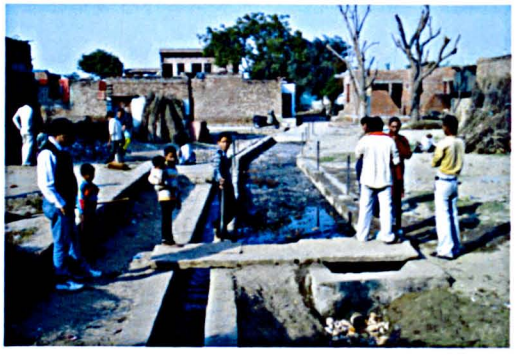
The inauguration of the DEWATS followed in April 2011. Although the monsoon in 2011 did not cause flooding like in the previous year, a large (3ft x 3ft) overflow drain and sluice gates (to control the flow of water into the system) were proposed in August 2011 and completed in October 2011. Meera's husband, Girraj Singh, currently works as a caretaker for the DEWATS, clearing blockages from the screen chamber at the start, and removing debris that falls into the storage sump at the end. Following the completion of the system, samples from the treated and untreated waste water were taken and tested in a laboratory to determine Bio-Oxygen Demand (BOD) levels. The results showed significant reduction in the treated water from 250mg/l to 30mg/l, making it suitable for irrigating agricultural crops as well as flushing toilets.[11]

10 The project team considered replanting the root zone with *Jal Kumbi* (Water Hyacinths) instead of *Cahyna* (Gladioli), as there was concern that goats kept in the vicinity by some residents would eat the plants. However, at the time of sourcing the new plants, the local nurseries (near *Ram Bagh*) did not have any *Jal Kumbi* available, so *Cahyna* plants were used and a protective fence was constructed around the root zone, until the young plants were established enough to avoid damage by goats. The plants require careful maintenance throughout the year including replanting at the end of their life cycle (every few years) and trimming to prevent the plants growing too dense and becoming an ideal habitat for snakes.

11 The ideal BOD level for effluent entering in the Yamuna River is stated by the local authority as being 3mg/l (ANN 2011).

(a) July 2010 - DEWATS flooded

(b) November 2010 - post monsoon flooding



(c) January 2011

(d) March 2011 - preparations for addition of water storage sump at the end of DEWATS

(e) May 2011 - completed functioning system with storage sump

(f) August 2011 - overflow drain constructed

(g) November 2011 - wedding celebration adjacent to DEWATS

(h) April 2012 - drain crossings constructed

(a) - (h). Development of DEWATS - 2010-2012 [a, c, d & e: CURE]

Treating Waste Water (as a Resource)

Following on from extensive discussions between the ASI and CURE, the ASI are now open to the possibility of using treated water from DEWATS to irrigate the *Mehtab Bagh* gardens for a fee that could contribute to the generation of funds for sustaining the operation and maintenance of the system. Although the treated water could benefit farmers with fields nearby, the pumps that they use for irrigation require much larger quantities of water than the system can store given its 50kl per day capacity for treatment. A second system to treat the secondary *nala* was initially proposed together with the primary *nala*, but this is currently on hold until the first DEWATS has been tuned to work and be sustainable. At the time of writing, there are still improvements that could be made to the DEWATS to allow it to function better - discussions are underway regarding the design of a weir system between the entrance to the DEWATS and the bridge upstream. In addition, proposals are being made for further interventions upstream to reduce pressure on the current system by providing further levels of water treatment at key places along the primary *nala*.

The completed DEWATS was the first of its kind in Agra, and gained much publicity during construction, being shortlisted for the Government National Urban Water Awards (NUWA) in 2010, and mentioned as a good practice by UN-Habitat in 2011. The system has since been adopted by ANN for the City Sanitation Plan (CSP), who are looking for other sites to install the decentralised waste water treatment systems to treat similar nala situations and conditions around the city.

There are now approximately 235 household toilets constructed under KSUP in the Kachhpura area, with an additional thirty in neighbouring communities. As there is a general move in North Indian cities towards urban and peri-urban settlements which are completely free of open defecation, the District Urban Development Authority (DUDA) agreed in 2012 to sanction funds for the subsidised construction of the remaining 213 toilets required in the settlement to make it 'open-defecation free'.

The DEWATS provides an important service in cleaning up some of the waste water entering the Yamuna River. In addition, there are plans to connect the new public latrine facility with DEWATS so the treated water can be used for flushing the toilets. Alternative uses for the clean water include the possibility of the creation of a market garden or new nursery, as well as for irrigation of the existing surrounding fields.

DEWATS information poster, also translated into Hindi, July 2011, produced by myself and Odel Jeffries.

The process of implementing the DEWATS project took almost two years and required continual involvement between the parties (NGO, ASD researchers, ANN government officials, community members, contractor and ASI) on an number of different levels. Locating the DEWATS was a long and complicated process of negotiation within the topography of Kachhpura. The eventual renewal of the village nala has created new shared ground where residents and visitors can learn about WATSAN (water and sanitation), as well as providing an infrastructural resource for treated water.

Although the Kachhpura Settlement Upgrading Project continues with on-going discussions between partners regarding ways forward, there has since been a general shift from focus on sanitation issues to tourism. In 2011, Kachhpura was officially declared a 'Tourist Village'[12] in a state level initiative by the District Administration of Agra and there are currently plans to introduce a new level or concept of tourism to the village. These plans are supported by CURE, though the NGO's direct involvement is yet to be decided. Proposals for upgrading the settlement as part of this initiative include providing guestrooms, an information/exhibition centre and small scale eating establishments, whilst retaining the all important 'heritage look' of the village. At the centre of these plans is the goal of achieving the first 'open-defecation free' settlement in Agra.

12 In 2002, Kachhpura was named by Uttar Pradesh tourism department (UP Tourism) as one of the nine villages identified in the state that would be set up as model villages to promote rural tourism (*Times of India* 2002).

PROJECT TIMELINE

stage of involvement

field trips

significant events

Artefact

Toilets and Tea Terrace | Paving and drains | DEWATS

2006

conversation initiated between CURE and ARCSR
pp.23-27

Diploma (RIBA Part II)

2007

FT1

p.38

FT2

2008

FT3

p.49

p.51

FT4

Research (ASD Projects)

2009

FT5

p.59 p.15

FT6

2010

FT7

HEAVY MONSOON

Oct

FT8

2011

p.60

FT9

PhD Research

FT10

2012

p.67

FT11

2013

FT12

Oct

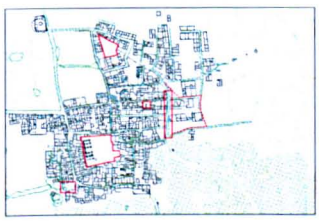
2014

Goal: Kachhpura as an 'open defecation free' settlement

Methods

Findings

Dissemination
(refer to pp.72-73)



pp.28-34

Agra Narratives - studio booklet

pp.35-36

pp.40-43

student theoretical schemes

KSUP exhibition, LMU, London

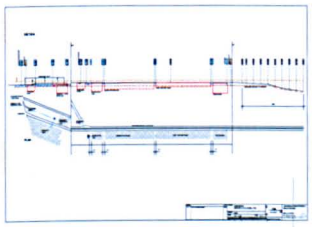
p.37

pp.44-47

pp.50-51

p.48

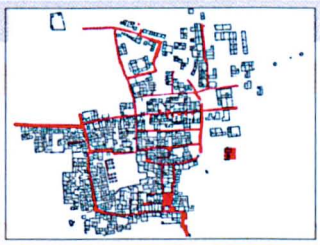
ASD Projects exhibition, LMU, London



pp.52-55

Learning From Delhi exhibition
SPA, New Delhi

pp.56-57



pp.58-59

Agra Beyond Taj - studio booklet
Learning From Delhi book published
DEWATS shortlisted - Water Awards
student theoretical DEWATS proposal for Gokulpura, Agra
Live Projects paper published
Intercultural Interaction publication

pp.64-65

Learning From Delhi book launch exhibition, LMU, London

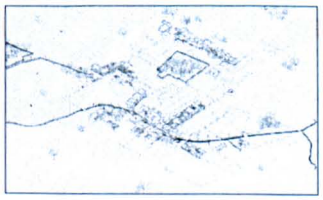
pp.66

Live Projects as Research exhibition
LMU, London

pp.68=69

pp.71-71

Methodology paper presented at
Scarcity conference, Westminster Uni



pp.2-3

PhD Thesis

Methodology paper to be published
in *Planum Journal*

2006

NGO CURE
Centre for Urban and Regional Excellence

CENTRE FOR URBAN AND REGIONAL EXCELLENCE

CURE (Centre for Urban and Regional Excellence) India is a development NGO that works with poor communities and local governments on pro-poor policy reforms, improved access to basic services, inclusive and participatory governance and building of Community Based information Systems. CURE organises and empowers low-income communities, especially women and young people in urban areas, to access water supply, sanitation, power, livelihoods, education, healthcare and housing. It works at all levels of government – national, state and local.

left:
CURE facilitators, Agra office, from left: Meera Devi (2008-13), Geetika Jaswal (2006-08), Sukant Shukla (2007-13)

right:
City wide mappings/surveys of 'slum' settlements in Agra carried out by CURE (funded by Cities Alliance), 2007. [Shamoon Patwari]

above:
Leaflet for a Mughal Heritage Walk (MHW) developed by CURE as part of the Cross-Cutting Agra Programme (funded by USAID), 2006-07. [CURE]

left:
CURE's site office (rented) and *Soochna Sansadhan Kendra* (SSK), or information resource centre. The building is located in the *Panchayat Chowk* (main square) in Kachhpura, Agra (2007-2013). [Victoria Timberlake, 2011]

Contracts and Partnering
Memorandum of Understanding (MOU)

Memorandum of Understanding between the Department of Architecture and Spatial Design, London Metropolitan University (DASD) and the Centre for Urban and Regional Excellence, Delhi (CURE).

A. **Provided by DASD**

1. The project design material developed by the DASD students during the course of the academic year through workshops and at the end of the year the substantial portfolio work of the studio.
2. The networking of CURE to other academic and/or architecture and planning institutes/professionals for research and collaboration on different academic and live projects as necessary.
3. Via the Water Trust the opportunity for match funding of live construction projects designed by or developed from the designs of DASD students.
4. The involvement of London Metropolitan University students and staff for up to 14 days each year on-site carrying out physical and cultural site investigations and participatory design strategies with the local community.
5. The involvement of London Metropolitan University staff in the conception, design and aspects of the management of live projects supported by the DASD Projects Office as appropriate.
6. Collaboration with fund raising locally and internationally.
7. The opportunity for the training of local students, architects, community groups and officials in aspects of participatory and low energy design as part of projects. This can include formal arrangements for credit transfer and progression onto London Metropolitan University courses.

B. **Provided by CURE**

1. The facilitation of access by DASD to areas of slum upgrading where CURE are working and help with communication with the communities involved.
2. Help and support for the networking of DASD to other academic and/or architecture and planning institutes/professionals for research and collaboration on different academic and live projects as necessary.
3. Support for interaction with local authorities and professionals about the way forward for slum upgrading.
4. Support for the development of live projects with CURE in the areas studied including the placement of post graduate and PhD students to help carry out such live projects. This will include support for establishing the necessary local professional infrastructure to deal with all aspects of the technical, legal and financial procurement and management of such projects.
5. The publication jointly with DASD of papers and the hosting of seminars /conferences/exhibitions that are linked to student designs and

implementation in the area where CURE is or will be working in the future. Help with the dissemination of research and other outputs as appropriate.

6. CURE will share their knowledge of participatory planning and PLA (Planning Learning and Action) tools with the students in the form a short (one or two weeks) online/onsite course which will be a useful technique for the students interested in working in this sector.
7. Collaboration with fund raising locally and internationally.
8. As far as resources allow support for staff and students of London Metropolitan University including accommodation, working space, IT support and translation services.
9. CURE will provide local support to ensure that London Met students and staff are fully appraised of local working conditions, site specific health and safety issues and cultural issues that may affect how London Met students and staff conduct themselves on a daily basis whilst in India.

C Timing

This agreement will last for five years in the first instance with the option for extension after a review by both parties towards the end of this period.

....

Robert Mull
Head of Department
Department of Architecture and Spatial Design
London Metropolitan University

date

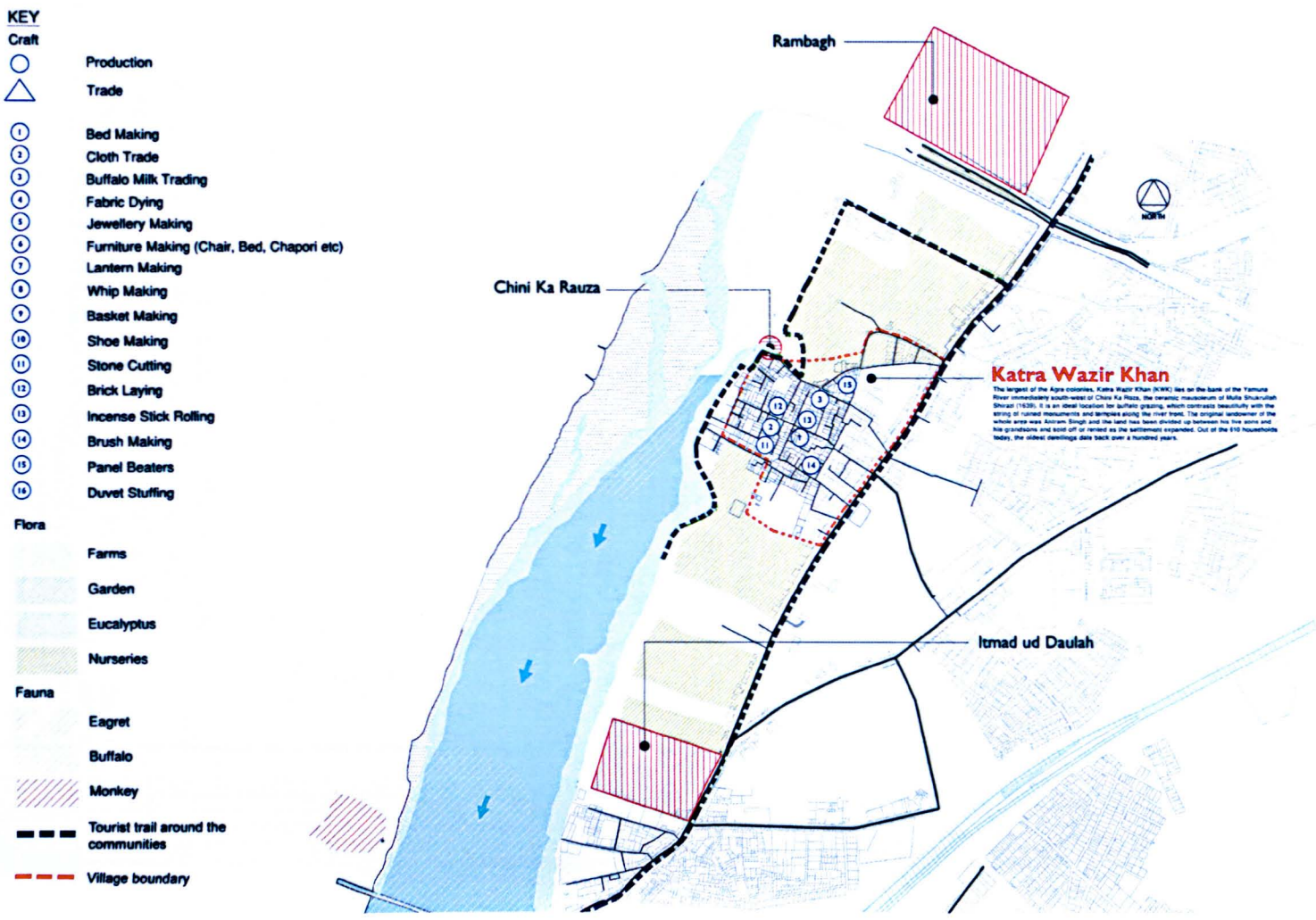
....

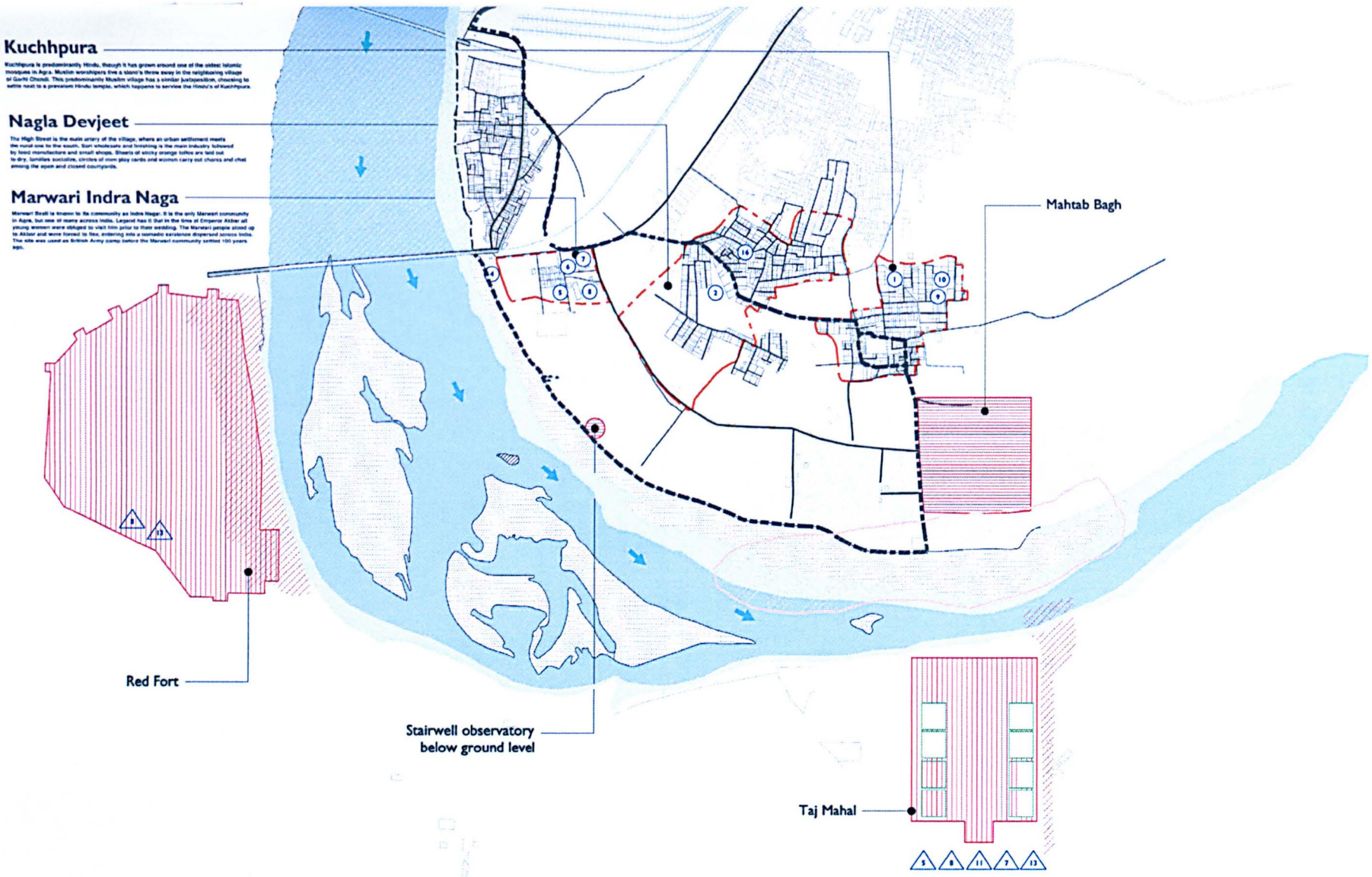
Renu Khosla
Director,
Centre For Urban and Regional Excellence
Delhi

date

above:
Memorandum of Understanding (MOU) between London Metropolitan University (LMU) and NGO CURE, 2006.

Yamuna Bridge Villages and settlements





above:
Map of Trans-Yamuna area showing the 4 settlements we surveyed as students, Agra, 2006. [Anthony Corke]

2006

EXPLORING CITY TOPOGRAPHY
Preparing the Ground

Architect as Anthropologist: Physical mapping and collecting particular narratives.

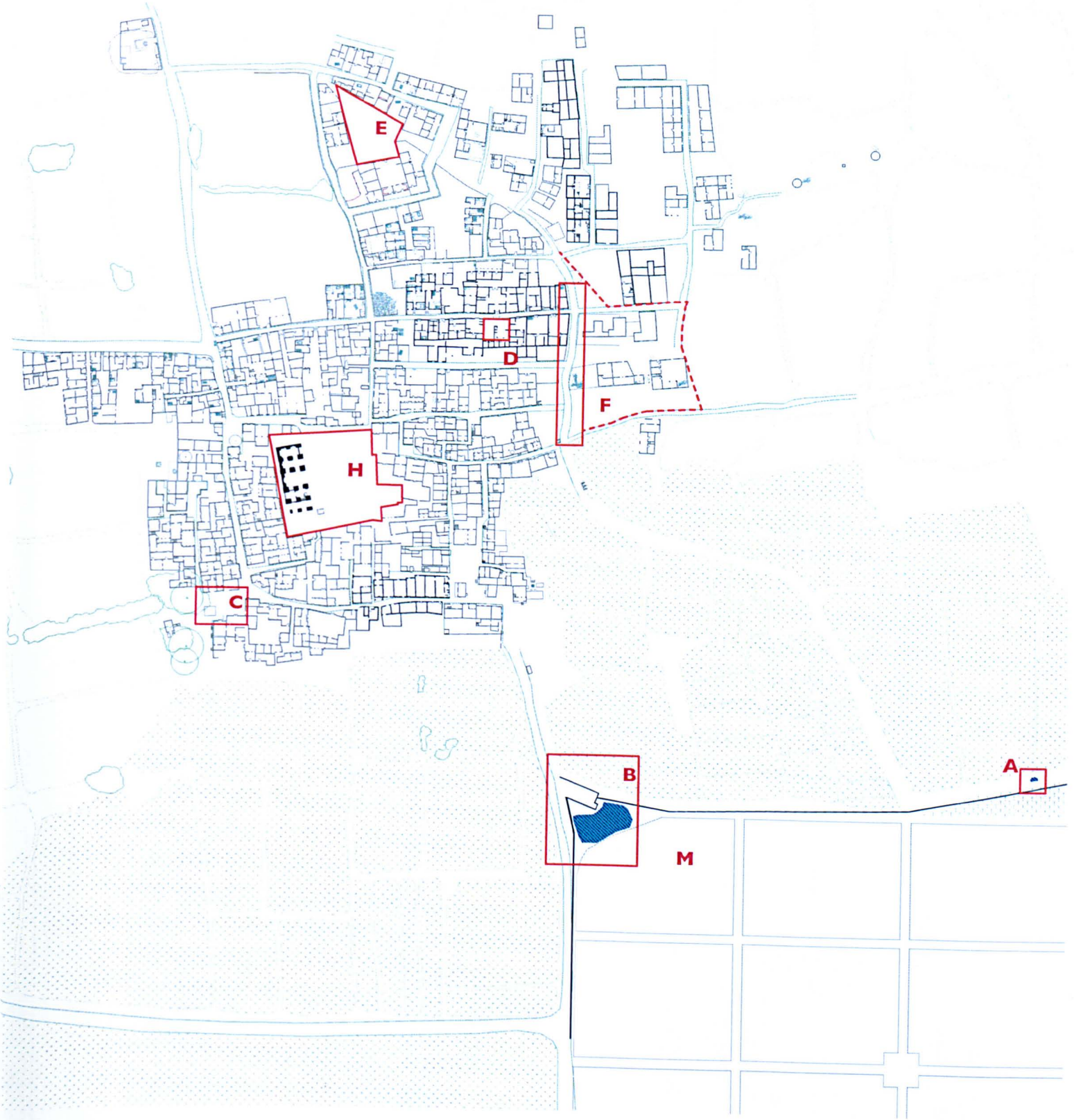
right:
Map of Agra showing locations of 4 Trans-Yamuna settlements surveys by undergraduate and postgraduate students during a two week field trip in November 2006. [Shamoon Patwari]

left:
'Poo Road' - The road leading to the Southern entrance to Kachhpura settlement. Highlighting the issue of open defecation in the village and wider city of Agra. [Mitchell 2010]

facing page:
Map of Kachhpura, places and drains, 2007. [Mitchell 2010, citing Studio Booklet 2006/07]

KEY

A	Place A: the shaded pond
B	Place B: the flooded depression
C	Place C: Pump House *Chowk*
D	Place D: Meera's yard
E	Imagined Place E: Spencer Owen's public bathhouse
F	Imagined Place F: DEWATS location
H	Humayun's Mosque
M	*Mehtab Bagh* Wall

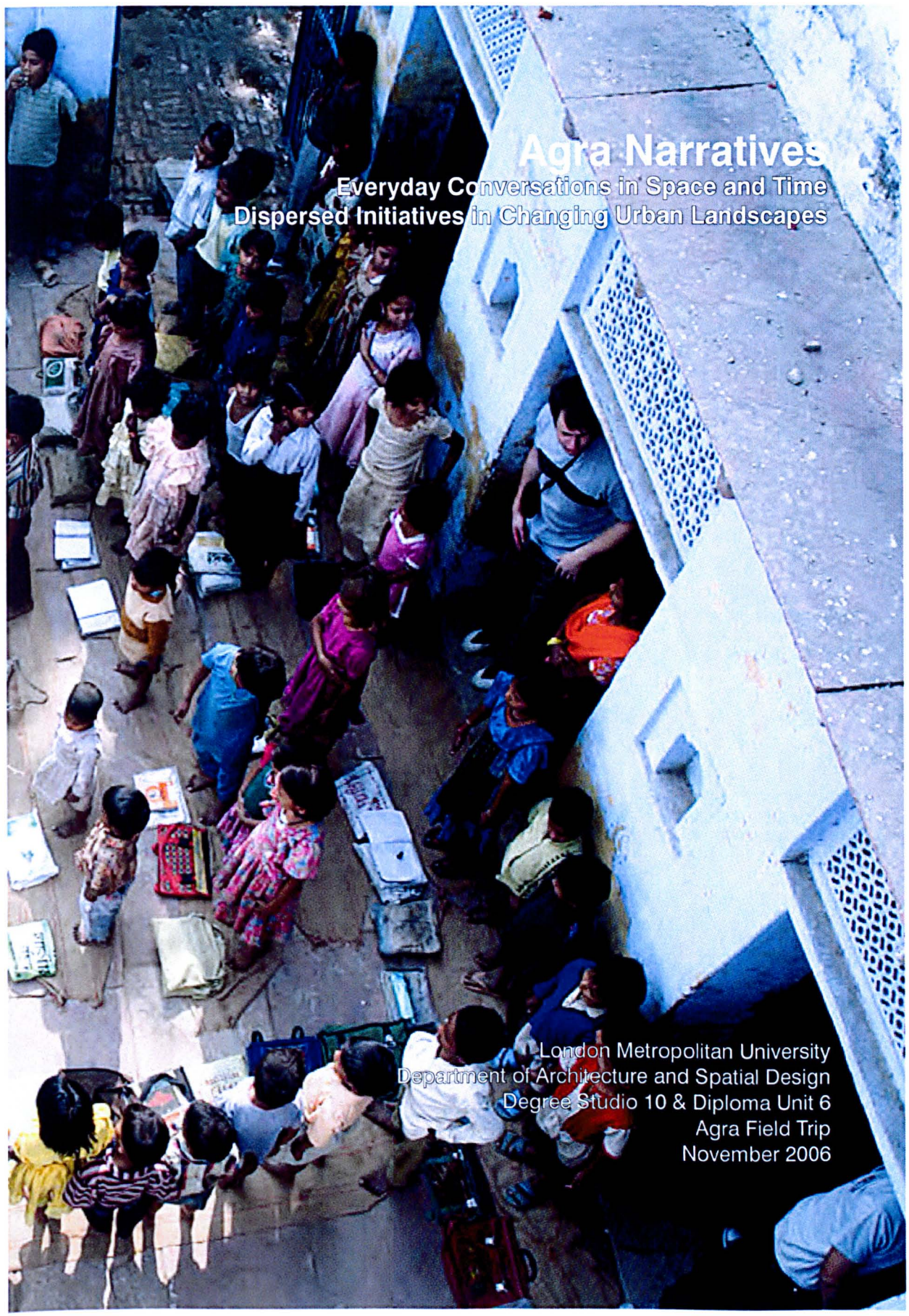

E
D
F
H
C
B
A
M

STUDIO FIELD TRIP AND BOOKLET
Recording Fieldwork and experiences

right:
Surveying a house in Kachhpura, 2006. [Shamoon Patwari]

facing page:
Undergraduate and postgraduate studio booklet, 2006/07.

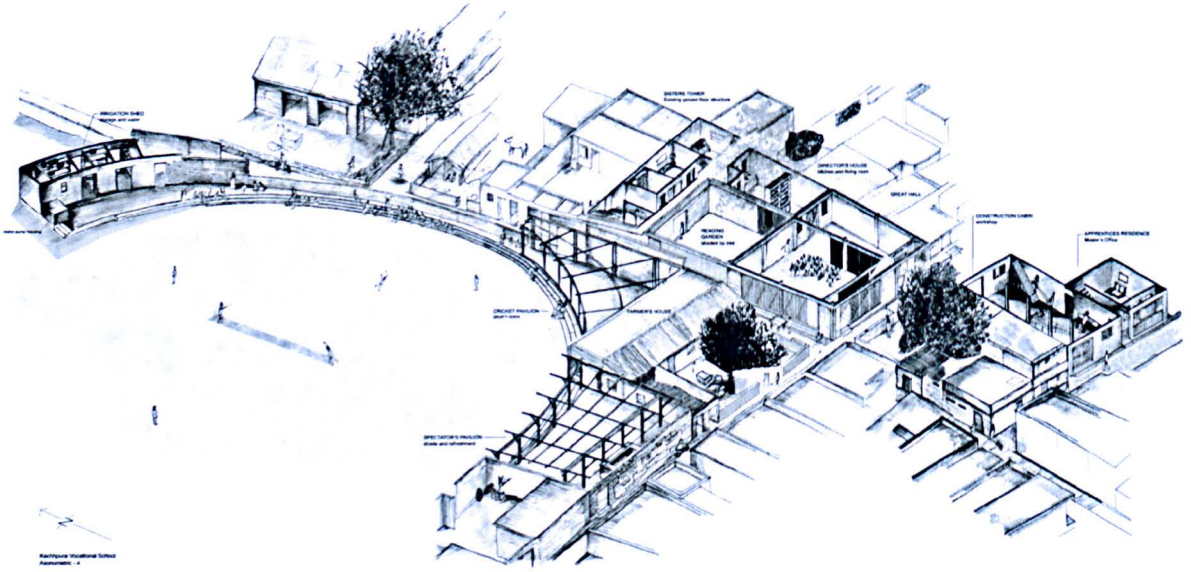
below:
Cricket game with Kachhpura residents organised by students, November 2006. [Je Ahn]


Agra Narratives
Everyday Conversations in Space and Time
Dispersed Initiatives in Changing Urban Landscapes
London Metropolitan University
Department of Architecture and Spatial Design
Degree Studio 10 & Diploma Unit 6
Agra Field Trip
November 2006

2007

IMAGINING CHANGE
Proposing Dispersed Initiatives

Architect as Author: Constructing meaning from an interrogation of place.

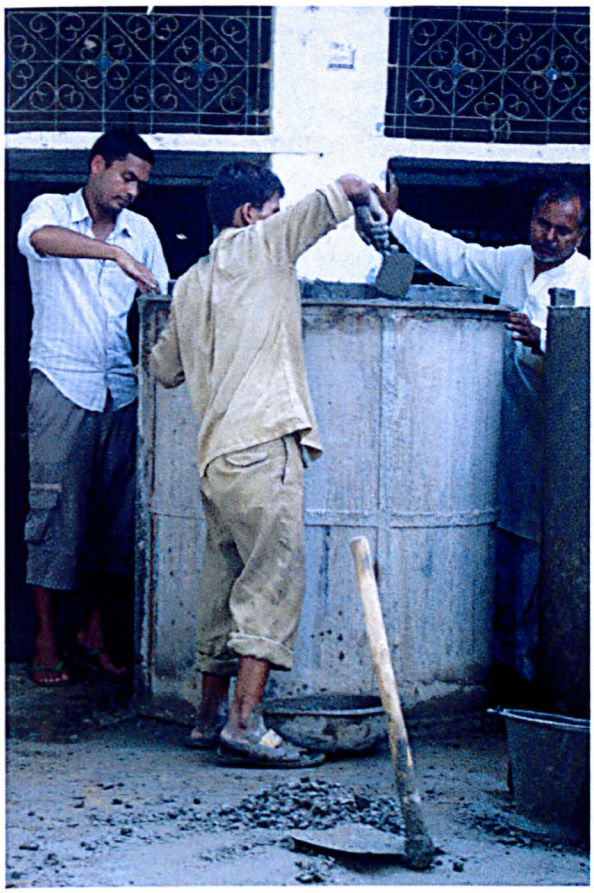


above:
Axonometric drawing showing proposed cricket ground and community facilities in Kachhpura, 2007. [Anthony Corke]

right:
View of the Taj from a proposed guesthouse in Kachhpura, 2007. [Jaroslaw Engel]

LEARNING FROM MAKING
Constructing Improved Septic Tanks

Architect as Craftsperson: engaging experimentally, establishing competence, accepting a duty of care.



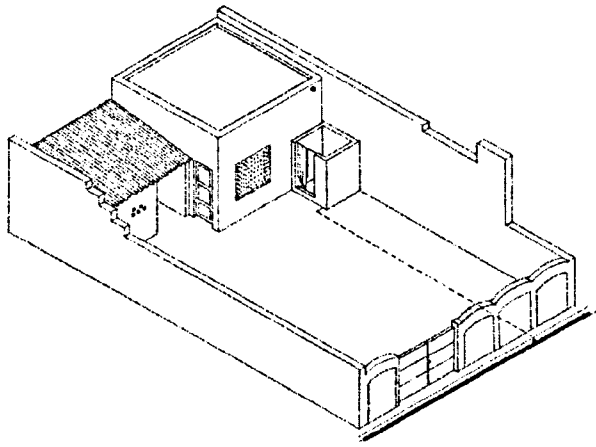
left:
We worked closely with a local fabricator to develop a high quality precast concrete septic tank prototype, July 2007.

below:
Carrying out quality checks and a cube test on the improved septic tanks, July 2007. [Shamoon Patwari]

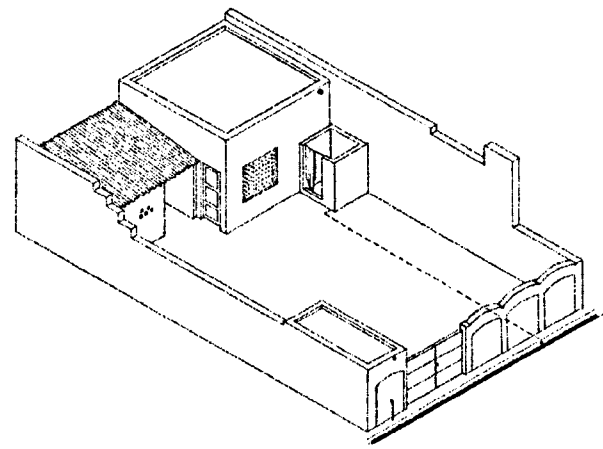
2007

LEARNING FROM MAKING
Constructing Household Toilets

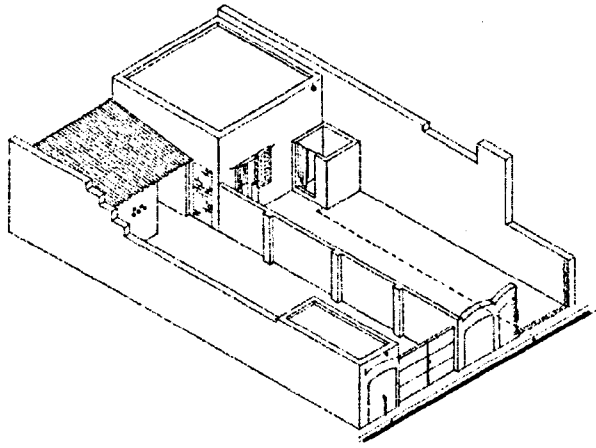
this page:
Process of surveying a site (dwelling), installing a pre-cast septic tank and constructing a toilet/wash structure, 2007. [Katarzyna Banak]



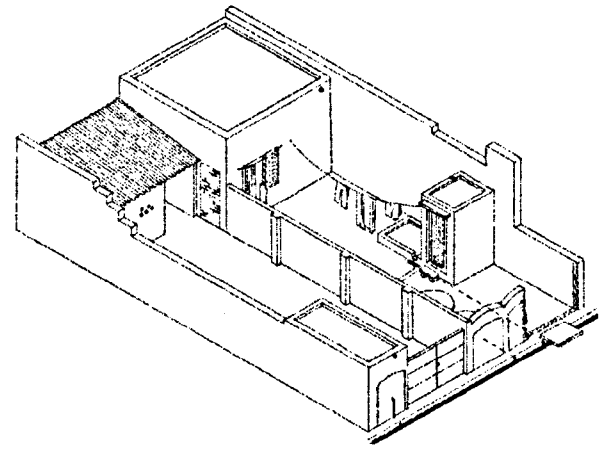
1995, existing house and yard



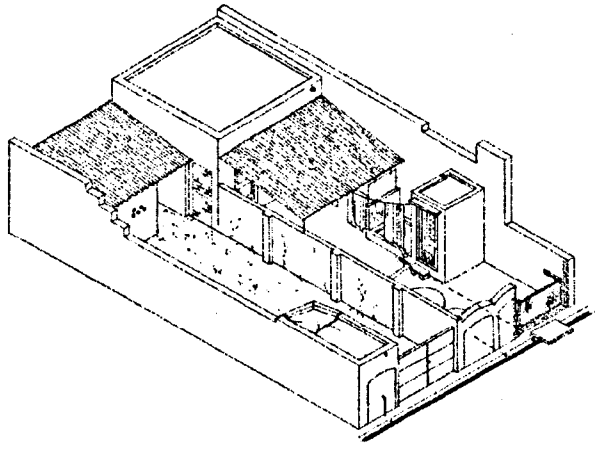
2005, toilet constructed in yard



June 2007, wall constructing dividing property between Meera and her brother-in-law



July 2007, improved septic tank toilet and wash area installed in Meera's dwelling



2012, new covered veranda constructed in Meera's yard

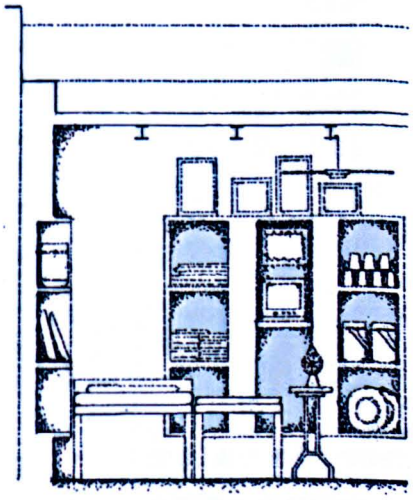
above:
Incremental development of Meera's dwelling, 1995-2012,

SMALL INTERVENTION, DEEP IMPACT
Changing Social Practices

Building Institutions.

overleaf (pp.40-41):
KSUP toilet contract we produced with CURE in Hindi and English, signed by householders (both members if a married couple), July 2007.

right:
Meera's personalised toilet, 2007.



left:
a householder proudly posing with her new toilet, Kachhpura, July 2007. [Shamoon Patwari]

hindustantimes

htlive AGRA

THURSDAY, SEPTEMBER 03, 2009 4 Pages www.hindustantimes.com

Meet city's 'Toilet Missionary'

THIS WOMAN has devoted her life to mobilise the community for building toilets

Atul Bhardwaj

AGRA: A joint effort by Water Trust, a UK based NGO, and London Metropolitan University along with the help of a US based NGO, USAID, has been changing the scenario of a locality of the Taj city.

Kachpura, a locality in the background of Taj, is also known for its "Toilet wali". Till now, this 'Toilet wali' has taken initiative of building 47 toilets in this small locality.

"Meera played an important role in mobilizing the community for toilets. No resident was ready to have a toilet in his or her house due to bad odour and traditions. But Meera took this responsibility and it is due to her hard work that a street in Kachpura locality is known as swachchh gali ('Clean street)," said Rajesh Kumar, Project Manager.

Meera, also called 'Toilet wali', was born in Belanganj, Agra. She was the only girl in her family. After marriage, Meera reached a rural community where she was not able to adjust. The unavailability of a toilet was a major trouble. Meera was not ready to go in open area. At last, her husband got ready to build a toilet in her home.

"I was shocked when my brother-in-law (husband's brother) started demanding for distribution of property. He also wanted the toilet to be in his share of the property. Finally, the toilet was given to him," said Meera.

"That was the time when the community got a chance to tease me. They used to say, 'Dekho, toilet wali aa gayi' (see, meera is coming.) I was very depressed and wanted a toilet at any cost," said Meera.

At the same time, USAID started a project to build toilets in the locality. Students of the Metropolitan University were trying to build toilets for proper sanitation but the residents were not ready to have toilets built in their homes due to their kitchens. Meera joined the project as a facilitator to mobilize the community. After some time, the project manager suggested her to build the first toilet in her home. She accepted this proposal within a second.

In the evening, the NGO asked her to dig out a hole for the toilet chamber because, on the next day, the head of the NGO was coming to inaugurate the first toilet. Meera and her family members kept digging the whole night and till early morning they completed the work.

"When my toilet was being constructed, the residents would come one by one to see the toilet. In the three days of the toilet's construction, more than 30 people came to me and said that they also wanted to have toilets in their homes. It was a big thing for me," said Meera.

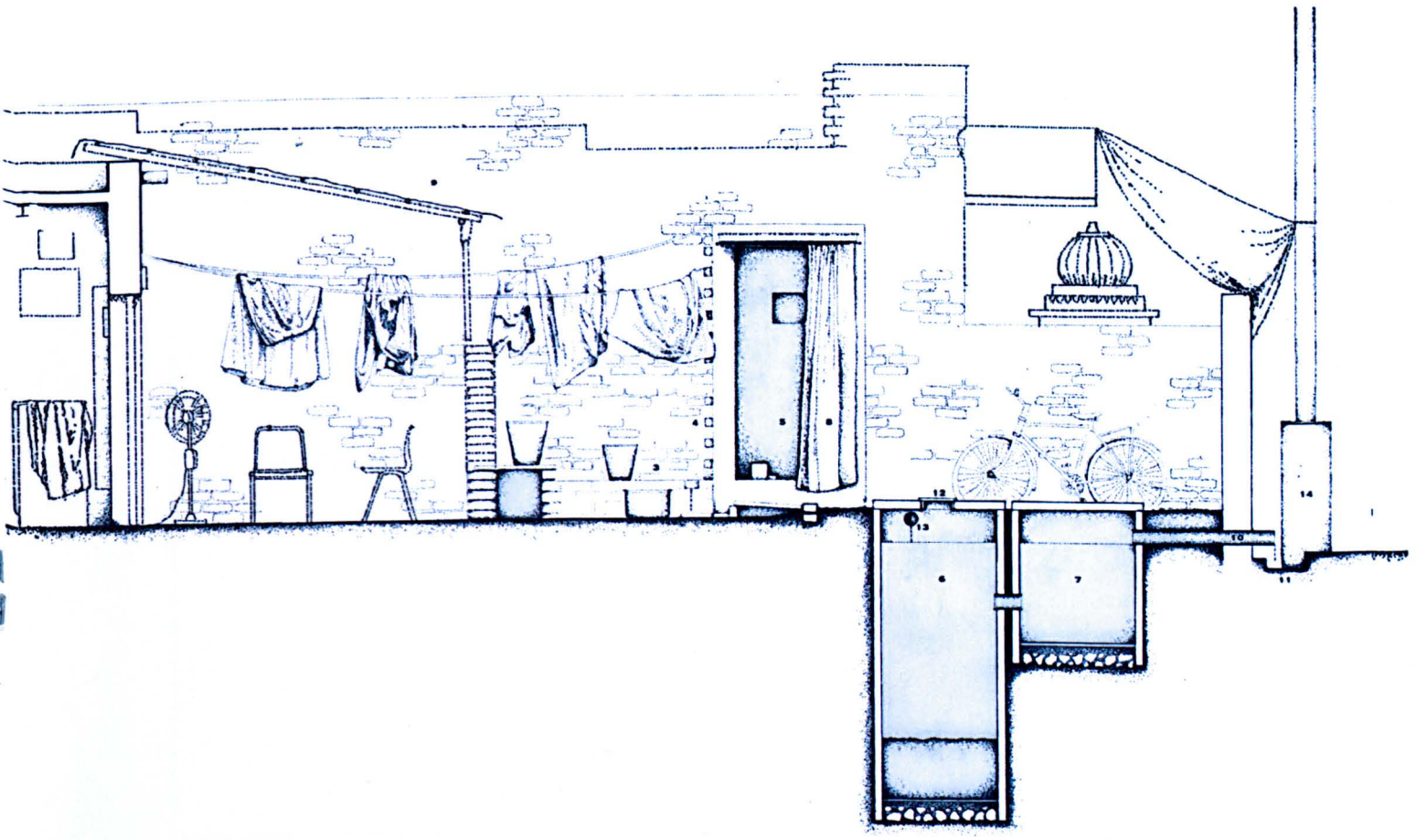
Now the girls and women don't go to open areas. They have their own toilets in their homes.

Meera, who is popularly known as 'toilet wali' is on a different mission.

TILL NOW, THIS 'TOILET WALI' HAS TAKEN INITIATIVE OF BUILDING 47 TOILETS IN THIS SMALL LOCALITY

left:
Newspaper article hailing Meera's achievements in Kachhpura, 2009.

below:
Section through Meera's dwelling and yard with new septic tank toilet system, 2011.



Ranveer Singh S/o Ishwar Das, Kachhpura, Agra

SITE (K).

Contract

I am taking technical help from the Cross Cutting Agra Program - KSUP for construction of my household individual toilet. The total cost of septic tank with fitting will be 5500 Rs. and cost of upper structure will be additional. I taking ---- Rs 5500 five thousand five hundred only ---------- Rs. from the Cross Cutting Agra Program - KSUP, out of this amount 3000 Rs is subsidy and I will return rest loan amount in monthly installments of Rs 100 hundred rupees ---------- Rs. in ---- 25 ---------- months with out any interest to the community Credit Fund.

Left: 'Poo Road' - The road leading to the Southern entrance to Kachhpura settlement. Highlighting the issue of open defecation in the village and wider city of Agra.

1. Signature Of the Household Woman उर्मिला
2. Signature of the Household Man - [illegible]
3. Signature of the CAP – KSUP Facilitator Sukant.
4. Signature of the CAP- KSUP Officer [illegible]

Date: 13/09/07

रणवीर सिंह S/O ईश्वर दास, ~~Kachchpura~~ कच्चपुरा, आगरा

SITE (K).

अनुबन्ध (3)

मैं कॉंस कटिंग प्रोग्राम — के 0 एस0यू0 पी 0 से अपने शौचालय के जीर्णोद्धार कराने के लिए तकनीकी सहायता ले रहा हूँ । सेप्टिक टैंक, फिटिंग, शीट आदि सामान की कुल कीमत 5500 रूपये है तथा ऊपरी कोठरी बनवाने में इसके अलावा पैसा लगेगा । मैं कार्यकम से 5500 रुपये पाँच हजार पाँच सौ रुपये रणवीर सिंह रूपये ल रहा हूँ, जिसमें से मुझे 3000 रूपये का अनुदान मिल रहा है । बाकी पैसा मैं 2500 रु सौ रुपये रूपये की मासिक किस्तों के रूप 25 महीनों में बिना ब्याज के लौटा दुंगा ।

घर की महिला के हस्ताक्षर उर्मिला

घर के पुरूष के हस्ताक्षर – रणवीर सिंह

कैप फैसिलिटेटर के हस्ताक्षर Sukesh

कैप के अधिकारी के हस्ताक्षर

दिनांक 13/09/07

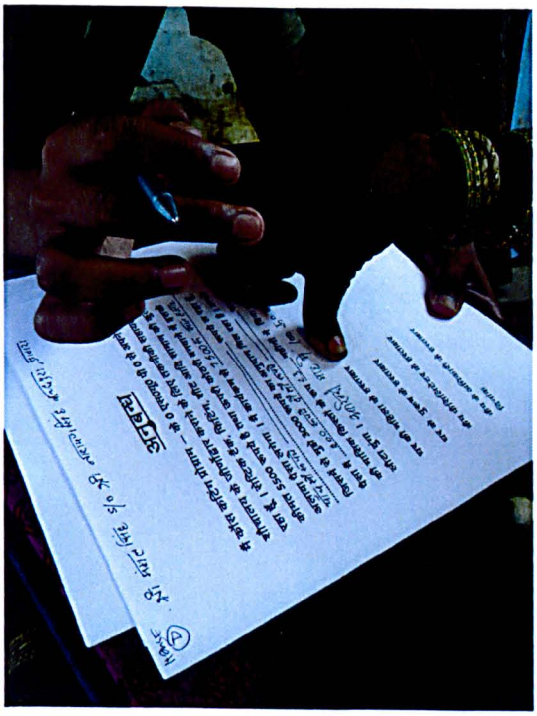
2007

SMALL INTERVENTION, DEEP IMPACT
Establishing New Practices

Consolidating Institutions.

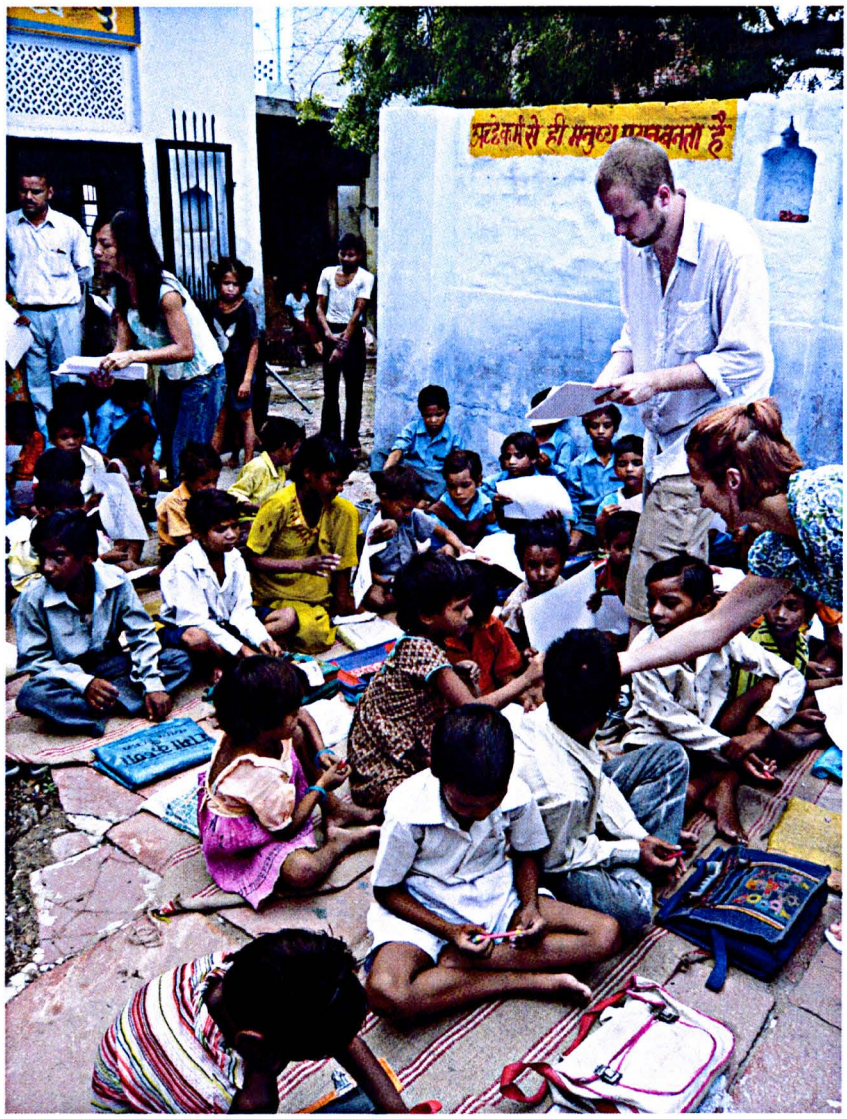
left:
Ergonomic sketch of Meena's new toilet and wash area, Kachhpura, Agra, 2007. [Shamoon Patwari]

left:
Householder signing a toilet contract developed by students and the NGO CURE, alongside the setting up of a community credit fund and toilet savings groups, July 2007. [Shamoon Patwari]



right:
Illiterate householder signing a toilet contract with a thumbprint, 2007. [Shamoon Patwari]

HYGIENE AWARENESS CAMPAIGN



right:
As students, we conducted a Hygiene Awareness Workshop with children at the local primary school, facilitated by the schoolteachers and CURE. The Hygiene Awareness Campaign included posters and information leaflets about good hygiene practice and septic tank toilet systems, distributed to householders in Kachhpura, July 2007. [Shamoon Patwari]

left:
Hygiene Awareness Workshop with children at the local primary school conducted by students. The Hygiene Awareness Campaign included posters and information leaflets about good hygiene practice and septic tank toilet systems, distributed to householders in Kachhpura, July 2007. [Katarzyna Banak]

left:
As part of the Hygiene Workshop, we handed out printed illustrations of good hygiene practice to each of the children, along with colouring pencils to as part of the learning activity, July 2007. [Spencer Owen]

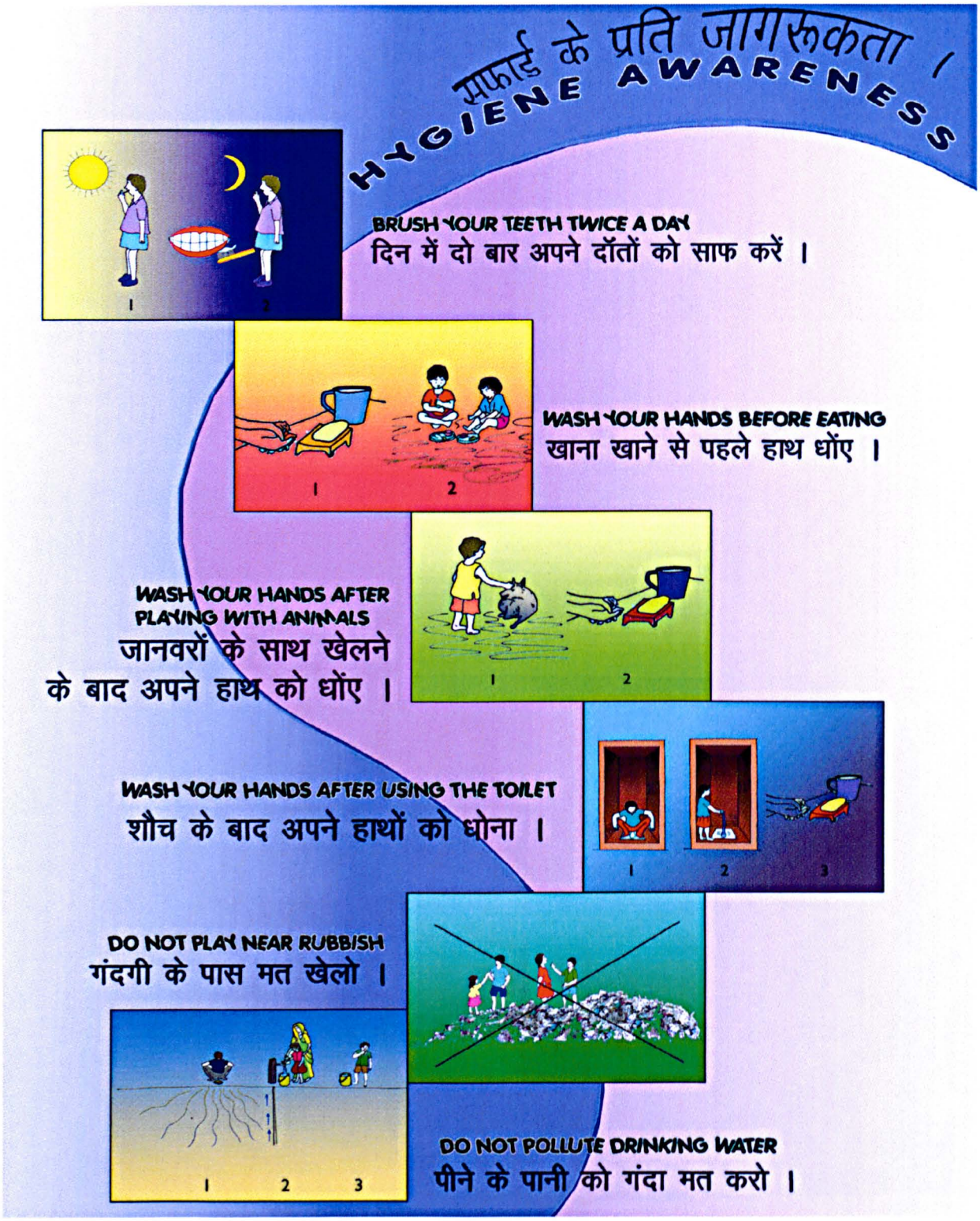
below:
During the workshop, we demonstrated basic hygiene and offered good practice suggestions to children including brushing teeth everyday, washing hands regularly and not playing in rubbish heaps, July 2007.

HYGIENE AWARENESS CAMPAIGN

Producing posters and household leaflets

below:
Following the workshop with children, we produced a Hygiene Awareness poster which was displayed at the school, August 2007. [Spencer Owen]

facing page:
We produced septic tanka and hygiene awareness information leaflets which were distributed to households in Kachhpura, August 2007. [Katarzyna Banak, Spencer Owen, Shamoon Patwari and Bo Tang]



WASH HANDS BEFORE EATING

Your hands are covered by germs that can cause sickness. These should be removed be washing hands throughly with soap., especially before eating.

WASH HANDS AFTER PLAYING WITH ANIMALS

Animals carry harmful germs and parasites. Washing hands with soap reduces risk of disease transmission.

DO NOT PLAY ON/NEAR RUBBISH

Rubbish is a pile of germs and disease. Playing on rubbish means that these germs will be carried into your home.

HYGIENE AND SANITATION WORKSHOP

The workshop was undertaken in order to promote personal and environmental hygiene amongst the youngest ones. Through educating children we believe that we can encourage hygienic practices in the families and the whole community.
LMU students

FACILITATORS:

THE WATER TRUST

A charitable organization established to address issues of inaccessibility to basic sanitation and scarcity/crisis of clean water in the developing world.

CAP

Cross Cutting Agra Program was established to strengthen the livelihoods and living conditions of selected slum settlements in Agra. CAP aims to improve economy of low-income areas through participatory process, community partnership and involvement of key government actors and stakeholders.

CENTRE FOR URBAN AND REGIONAL EXCELLENCE

CURE

The Centre for Urban and Regional Excellence is a non-profit organization set up practitioners in the field of sustainable development, governance, urban and rural reforms and infrastructure development.

LONDON metropolitan university

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Spring House
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London W7 8BD (UK)

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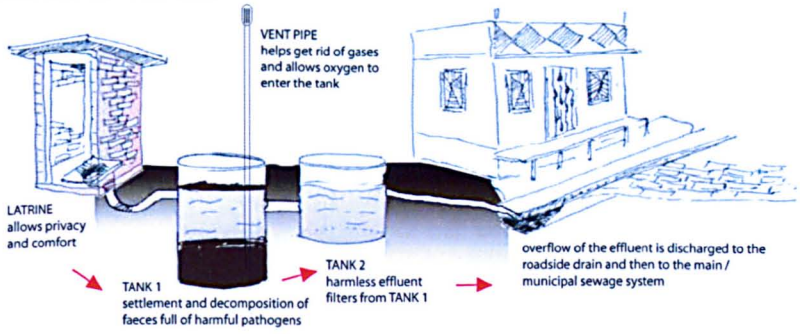
SEPTIC TANK & HYGIENE AWARENESS

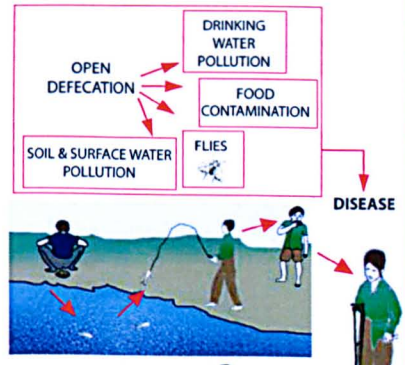
What is a septic tank system?
Septic tanks are chambers that hold sewer from a single house or group of households. They receive human excrement which will settle and decompose in the tank therefore prevent pollution of the surrounding environment. There is a link between health improvement and access to adequate sanitation.

Why hygiene is important?
Good sanitation and hygiene is important in preventing transmission of *some diseases* and contribution to children's health and well being of the whole community.

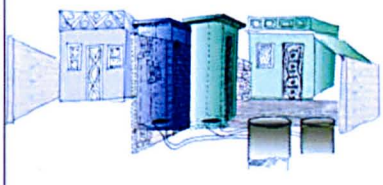
HOW A SEPTIC TANK WORKS?



THE DANGERS OF OPEN DEFECATION



SEPTIC TANK VARIATIONS



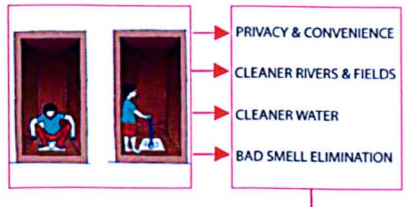
Septic tank system can be shared between more then one household. Although it has to be emptied / desluged more often its cheaper since the expenses are shared. it is particularly beneficial for those households which do not have enough space for tank installation.

MAINTENANCE

To ensure that sanitation is effective is using latrines properly and keeping them clean.

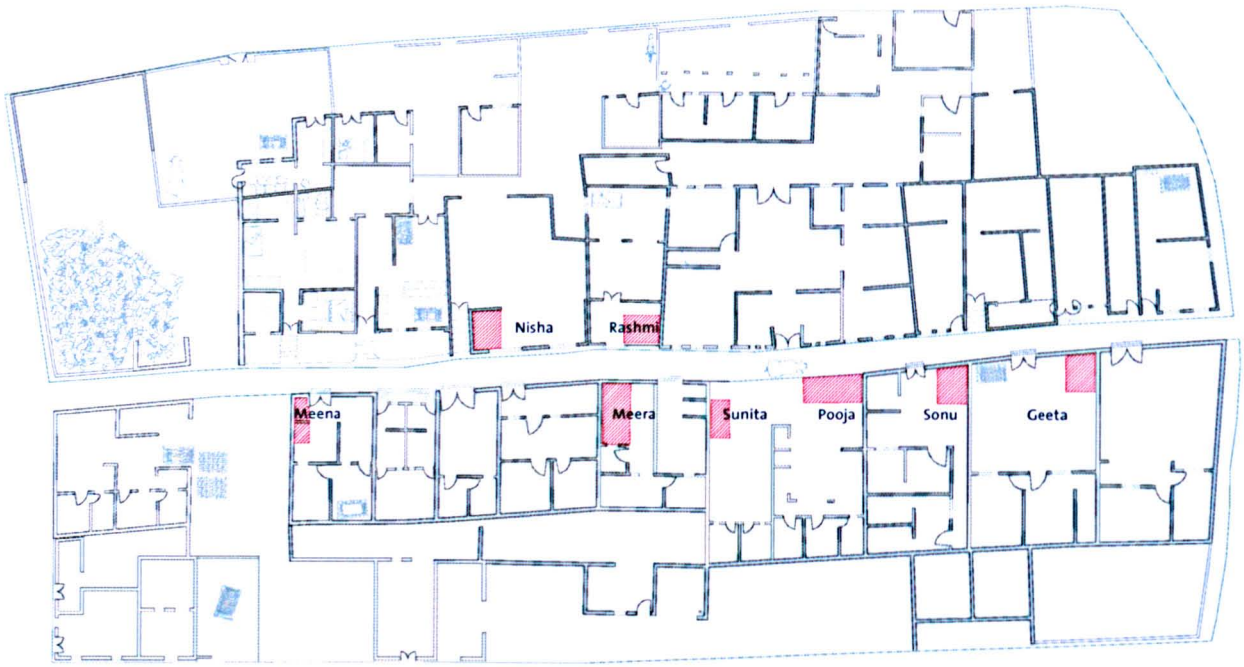
The process of empting the tanks is very inexpensive, easy and needs to be carried out periodically, only every 4 years.

THE BENEFITS OF LATRINE TOILETS



SUPPORTING CHANGE
Upgrading Local Infrastructure

Paving and Cleaning the street.



above:
Plan of *'Swaach Gali'* (Clean Street) showing locations of the first eight household toilets in Kachhpura, 2007

right:
Swaach Gali' (Clean Street), named by local residents after the first toilets were installed in the settlement, 2007.

above and right:
Repaving streets and upgrading drains in Kachhpura, 2008. [CURE]

left:
Upgraded street in Kachhpura, 2008. [Maurice MItchell]

ENCOURAGING CHANGE
Panchayat (Village Elders) Meeting

Constructing toilets in the local primary school.

right and below:
We met with the *Panchayat* in the main square in Kachhpura, to discuss and obtain permission for the installation of toilets at the local primary school, August 2007. [Brijesh Singh]

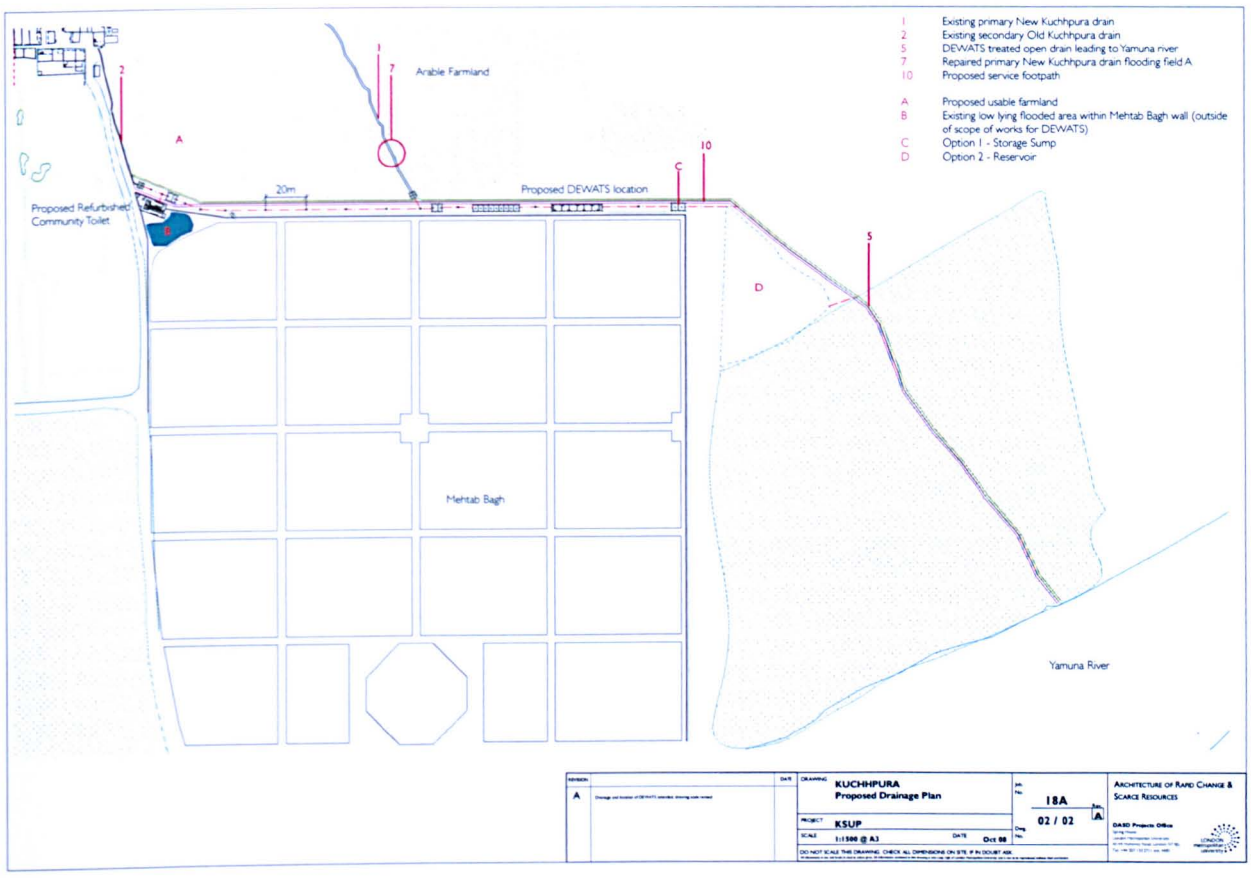
left:
Panchayat members reading the toilet contract prepared by CURE/LMU as part of KSUP, Kachhpura, 2008. [Spencer Owen]

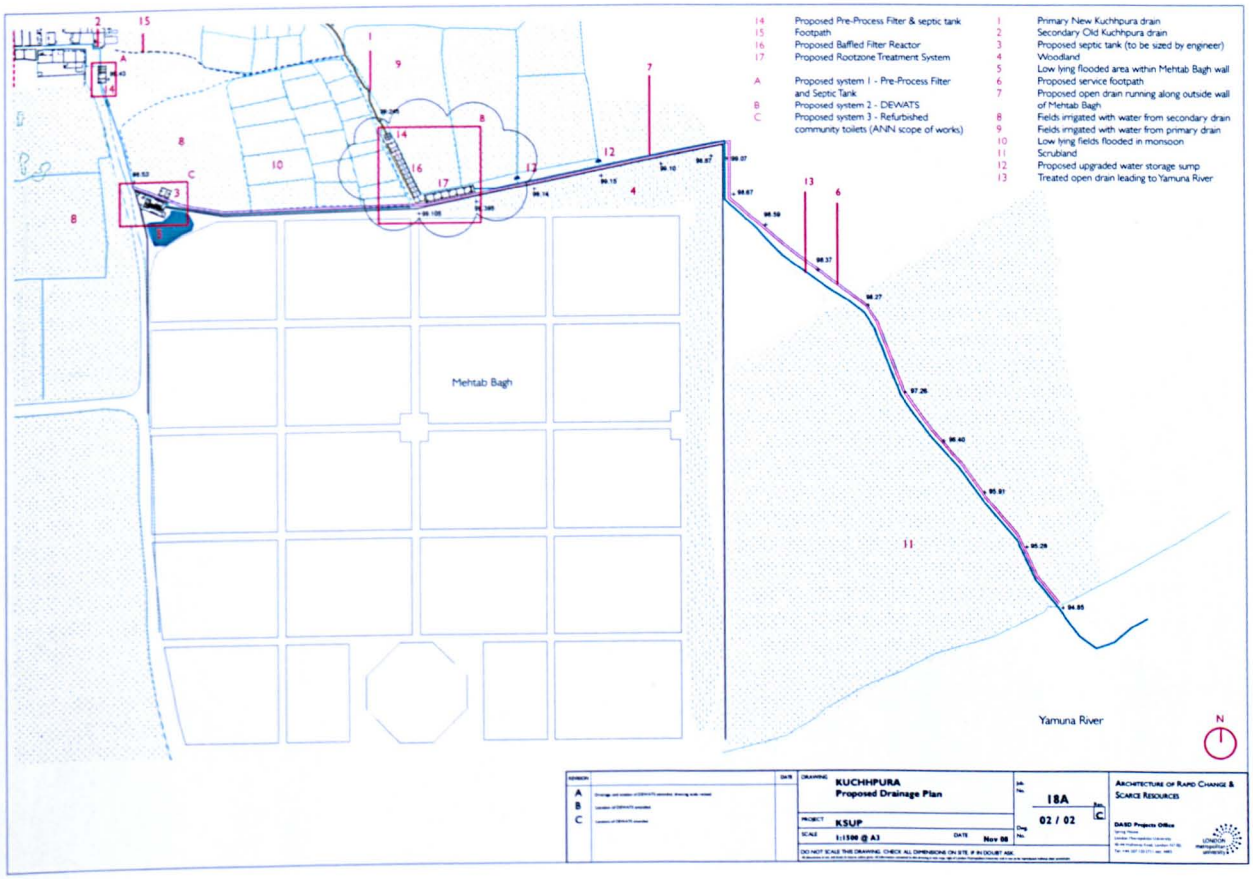
below:
Completed toilets at the local primary school, Kachhpura, 2008. [Shamoon Patwari]

DEVELOPMENT OF DEWATS
Sites and locating the system

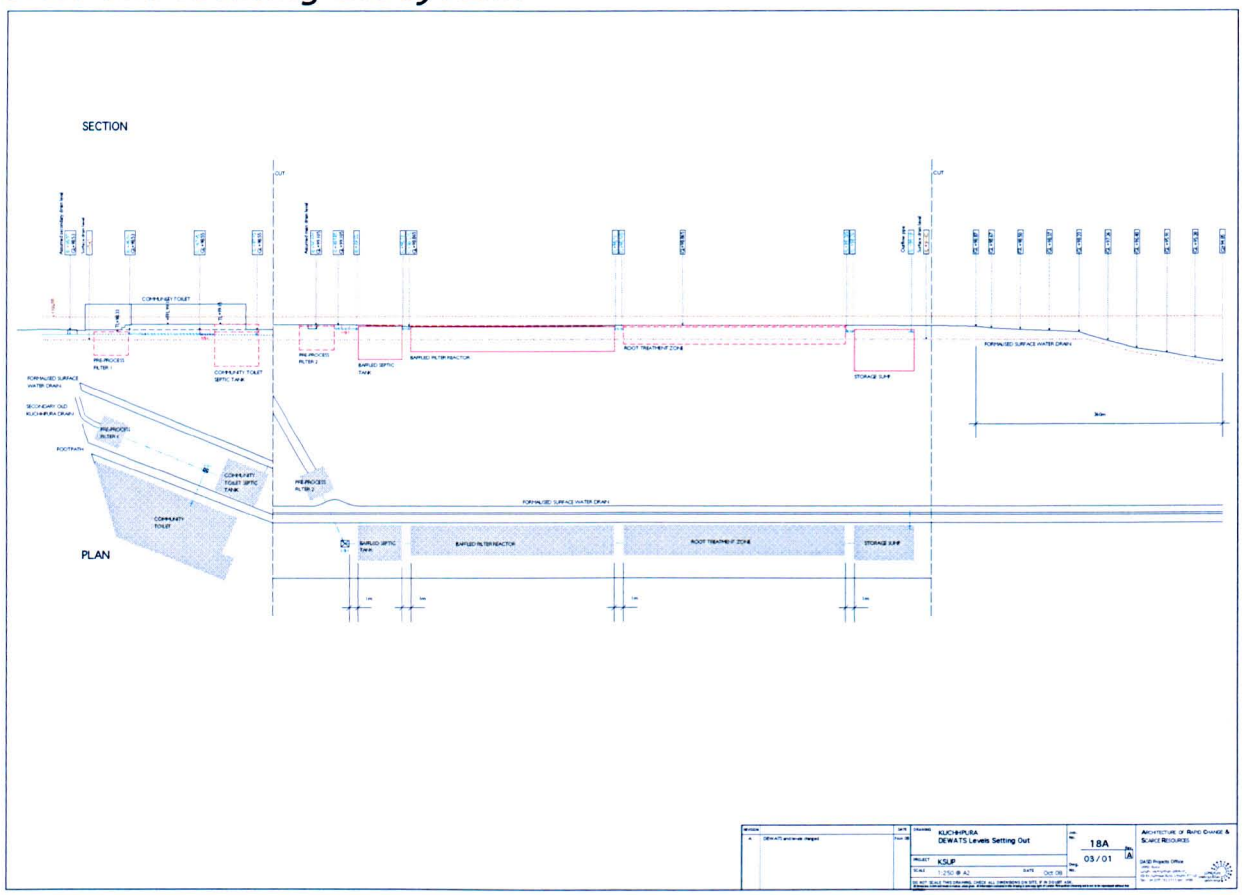
this page:
Images of possible sites for the DEWATS along the primary nala in Kachhpura, 2008. [Shamoon Patwari]

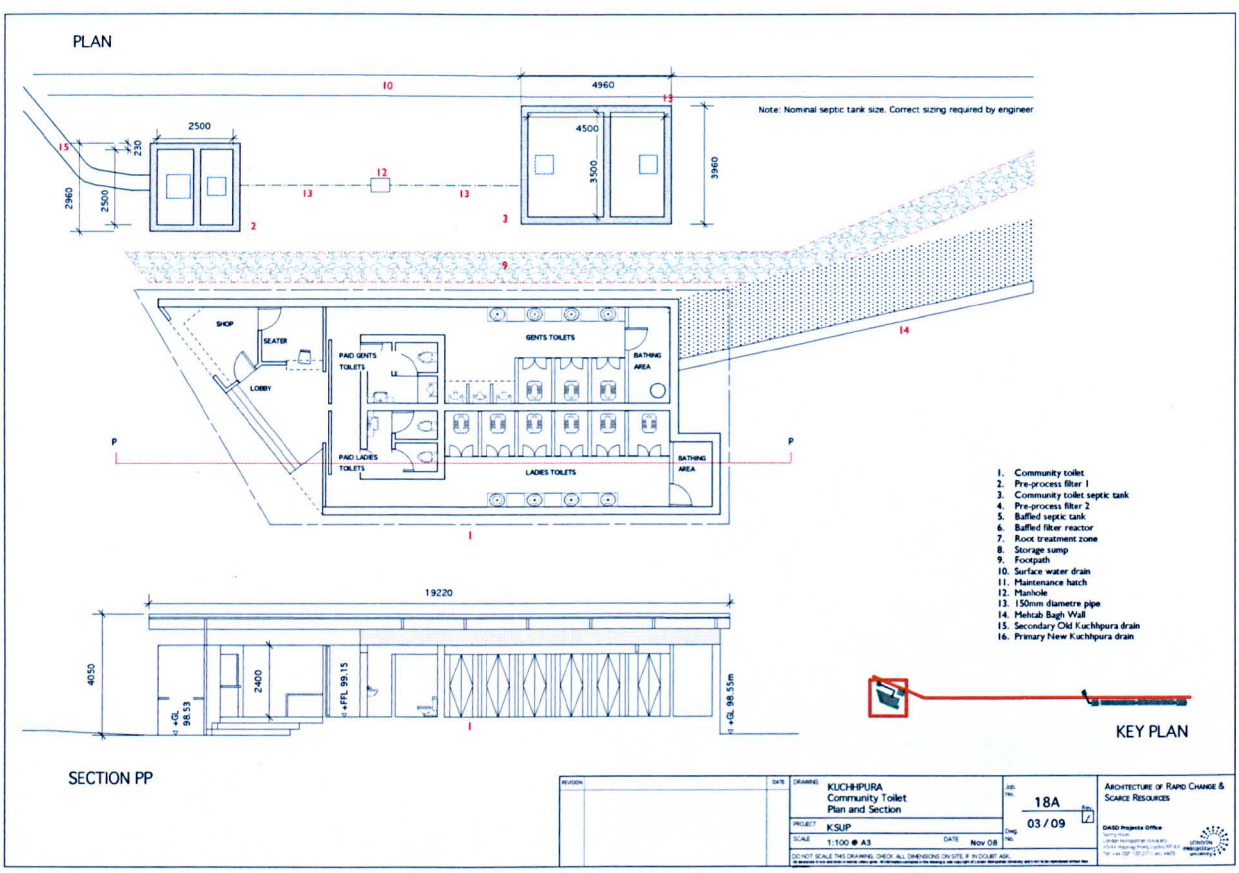
facing page:
Design drawings for DEWATS. From 2008-09, development of the DEWATS involved several stages of shifting sites further north along the *nala*, as permissions from the ASI were refused (mainly due to the 100m restriction zone around the protected *Mehtab Bagh* site. [ASD Projects]


1 Existing primary New Kuchhpura drain
2 Existing secondary Old Kuchhpura drain
5 DEWATS treated open drain leading to Yamuna river
7 Repaired primary New Kuchhpura drain flooding field A
10 Proposed service footpath
A Proposed usable farmland
B Existing low lying flooded area within Mehtab Bagh wall (outside of scope of works for DEWATS)
C Option 1 - Storage Sump
D Option 2 - Reservoir
Arable Farmland
Proposed DEWATS location
20m
Proposed Refurbished Community Toilet
Mehtab Bagh
Yamuna River
KUCHHPURA
Proposed Drainage Plan
KSUP
1:1500 @ A3
Oct 08
18A
02 / 02
ARCHITECTURE OF RAPID CHANGE & SCARCE RESOURCES
DASD Projects Office


14 Proposed Pre-Process Filter & septic tank
15 Footpath
16 Proposed Baffled Filter Reactor
17 Proposed Rootzone Treatment System
A Proposed system 1 - Pre-Process Filter and Septic Tank
B Proposed system 2 - DEWATS
C Proposed system 3 - Refurbished community toilets (ANN scope of works)
1 Primary New Kuchhpura drain
2 Secondary Old Kuchhpura drain
3 Proposed septic tank (to be sized by engineer)
4 Woodland
5 Low lying flooded area within Mehtab Bagh wall
6 Proposed service footpath
7 Proposed open drain running along outside wall of Mehtab Bagh
8 Fields irrigated with water from secondary drain
9 Fields irrigated with water from primary drain
10 Low lying fields flooded in monsoon
11 Scrubland
12 Proposed upgraded water storage sump
13 Treated open drain leading to Yamuna River
Mehtab Bagh
Yamuna River
N
KUCHHPURA
Proposed Drainage Plan
KSUP
1:1500 @ A3
Nov 08
18A
02 / 02
ARCHITECTURE OF RAPID CHANGE & SCARCE RESOURCES
DASD Projects Office

DEVELOPMENT OF DEWATS
Sites and locating the system





left:
Image of the final site agreed for locating the DEWATS, Kachhpura, 2008.

facing page -
top:
Drawing setting out levels for the DEWATS using the natural slope of the site, 2008. [ASD Projects]

bottom:
Proposed drawing for reconstructing the old Community Toilet Complex (CTC), 2008. [ASD Projects]

below:
The dilapidated old CTC located at the corner of the *Mehtab Bagh*, 2008.

2009-10

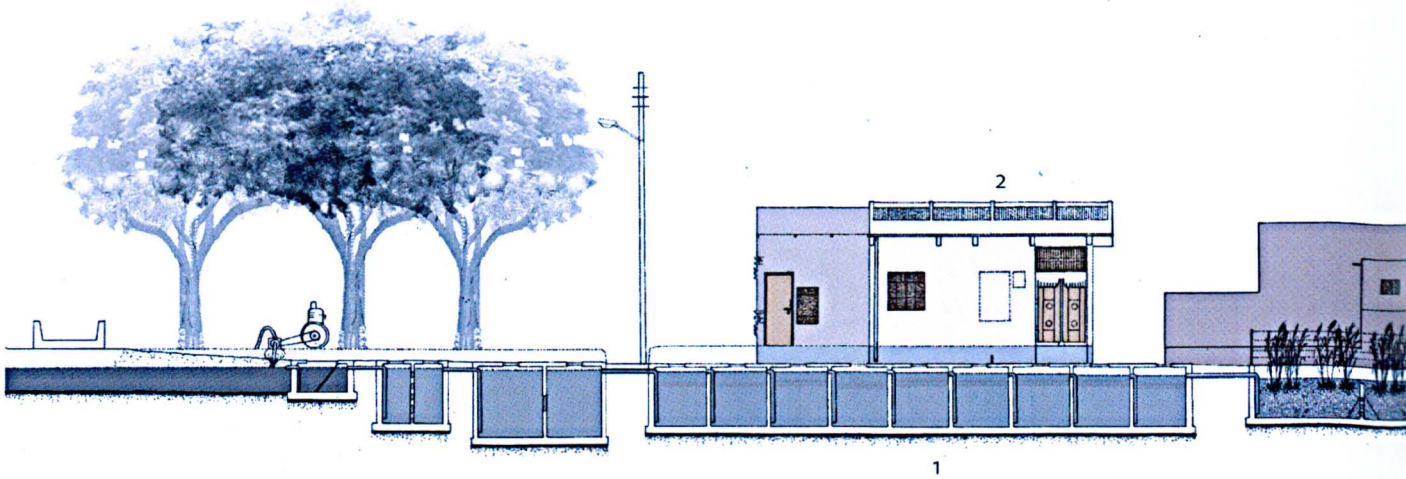
LIFTING HORIZONS
Waste Water Treatment at the Neighbourhood Scale

Tuning technology.
Imagining and narrating the spatial opportunities.

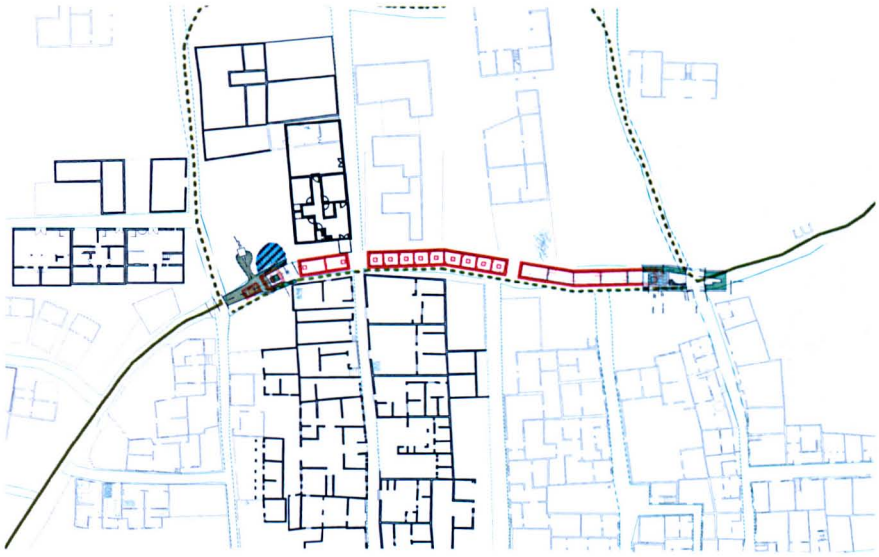
below:
Section through completed DEWATS and surrounding area, 2013.

Key

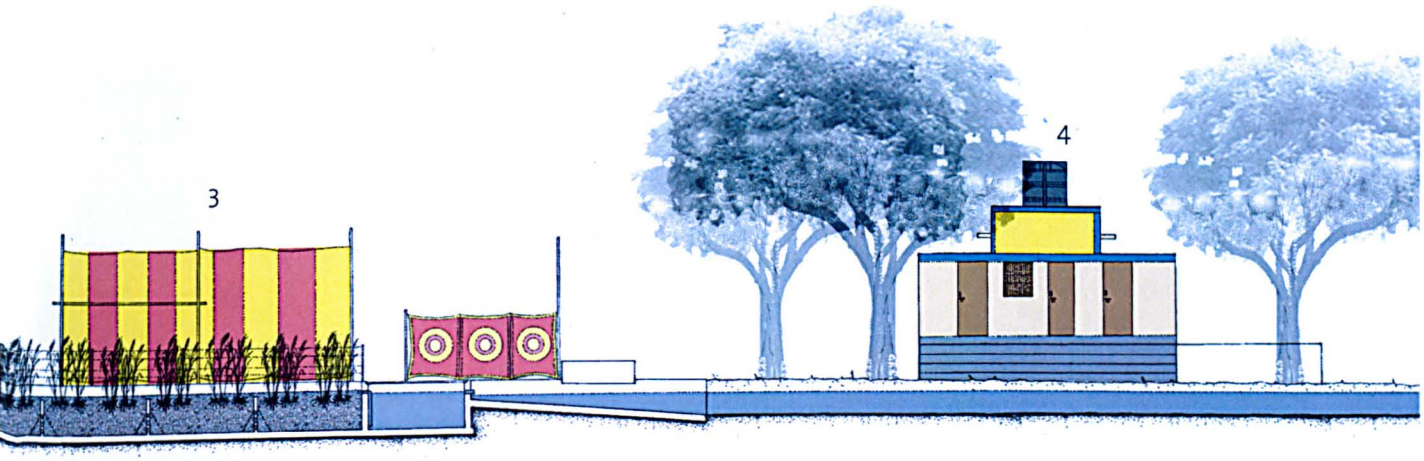
1. DEWATS
2. Bhajan Lal's new house
3. temporary wedding tent
4. new Community Toilet Complex



below:
Process of constructing the DEWATS, 2008-2010. [CURE]

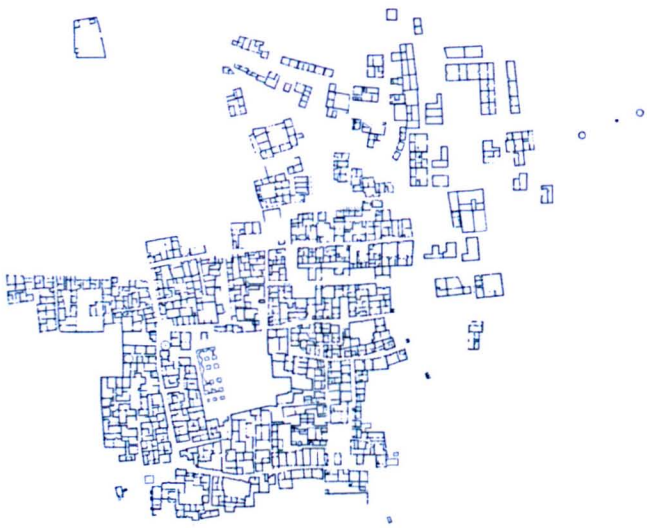


right:
Location map of DEWATS in Kachhpura, 2010. [ASD Projects]

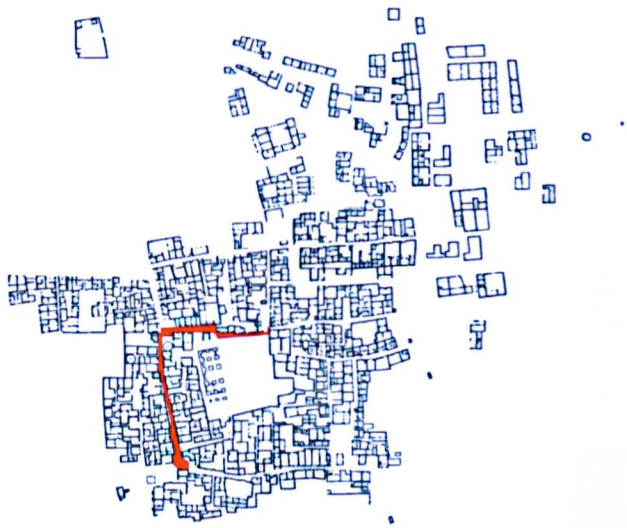


CONSOLIDATING CHANGE
Celebrating Newly Shared Territories

Broadening the spatial paradigm.
Making new spatial connections.

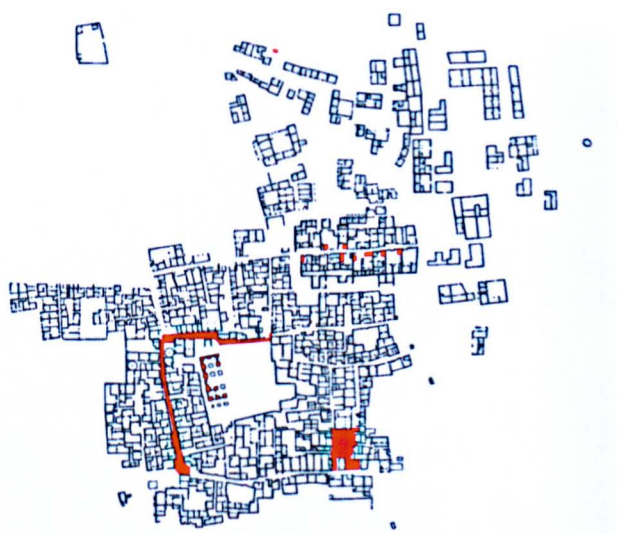


1. Until 2007



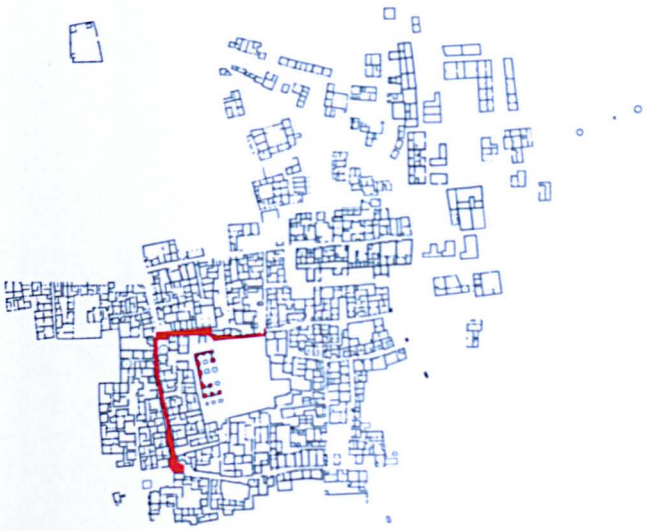
2. 2007

3. 2007



5. 2008

this page and facing page:
A series of maps showing locations of CURE/LMU interventions carried out between 2006 and 2010 in Kachhpura. [Eds. Timberlake and Weaver 2011 pp.13-14]



3. 2007

1. Kachhpura as existing, prior to involvement from outside agencies.

2. CURE begin to develop a Mughal Heritage Walk (MHW) through Kachhpura, linking monuments in the area whilst providing a glimpse of settlement life for tourist.

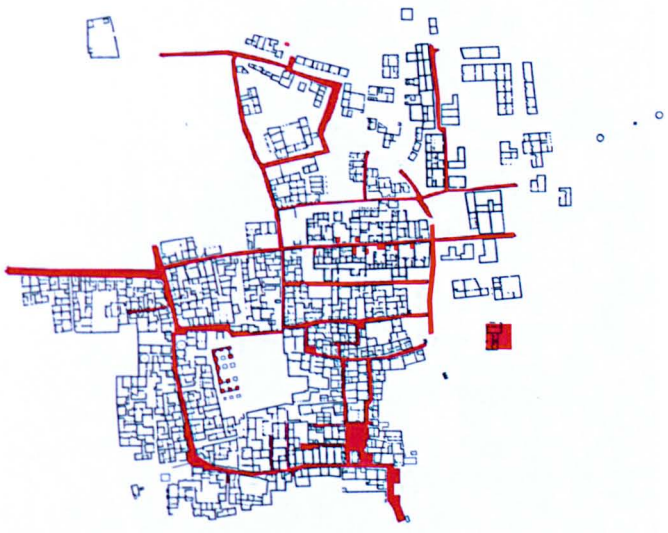
3. The Archeological Survey of India (ASI) begin a project to restore Humayun's Mosque. This links in with the heritage walk.

4. CURE, together with the local government authority (Agra Nigar Nigam - ANN), pave the main square (*Panchayat Chowk*).
5. LMU and CURE begin a sanitation project to construct household septic tank toilets in Kachhpura.

6. As part of a city wide slum upgrading programme, CURE and the ANN upgrade streets and drains in the settlement to create cleaner pathways and more efficient drainage.

7. LMU and CURE develop a DEWATS to treat the water flowing through the drain on the western edge of Kachhpura before it flows into the Yamuna River. The project faced a number of set-backs due to planning restrictions and was eventually constructed further north than was originally intended, and as a result only treating the water flowing from the northern most part of the village. In 2010, LMU/CURE plan to resolve some of the problems with the DEWATS, such as monsoon flooding, whilst the ANN make plans for a Community Toilet Complex (CTC) in Kachhpura.

6. 2009



7. 2009-2010

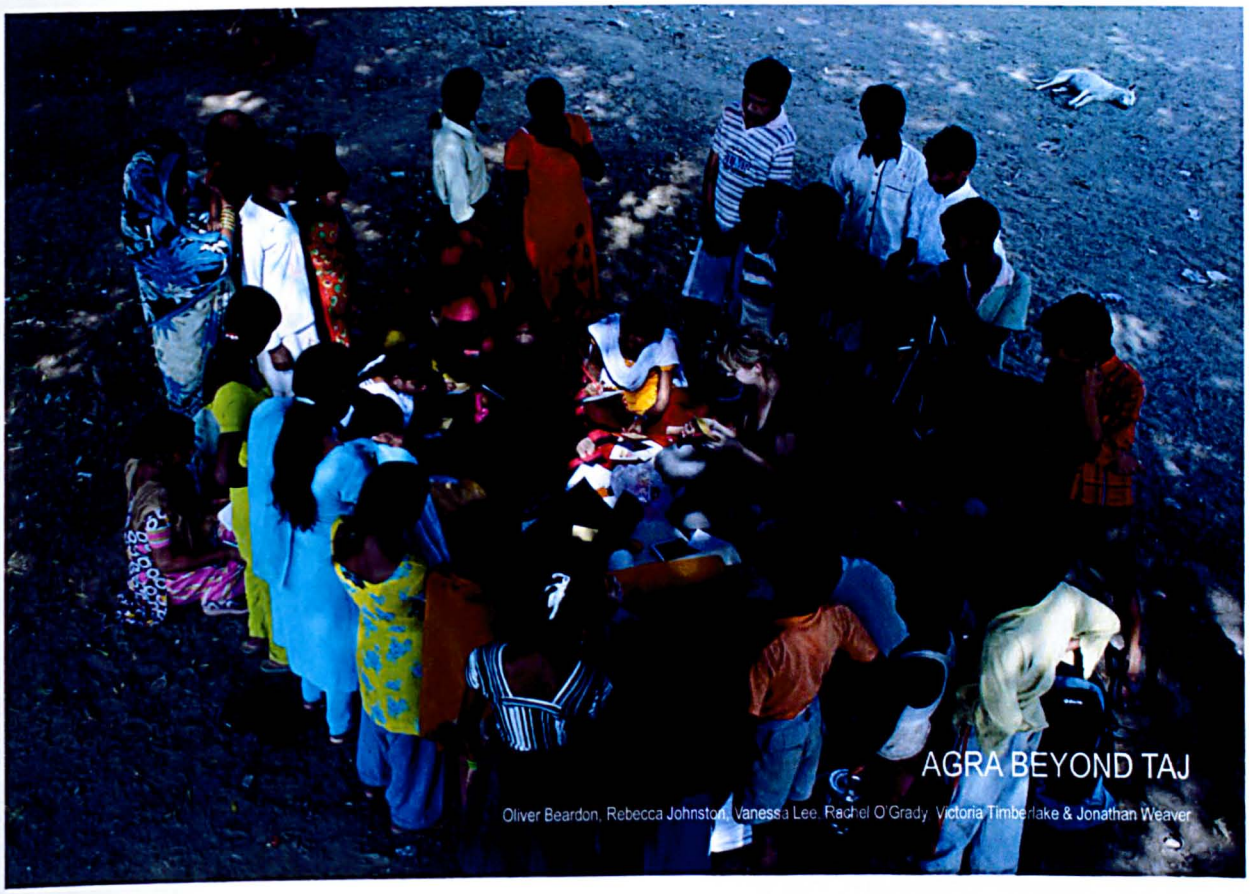
CREATING A TEA TERRACE

right and below right:
Tea terrace structure constructed by myself and students on a rooftop with a view to the Taj Mahal, Kachhpura, November 2010. [Oiiver Beardon]

below left:
Newspaper article on the livelihood workshops we carried out in Kachhpura, November 2010.

below:
Studio booklet *Agra Beyond Taj*, 2010-11.

above:
Newspaper article reporting on the work being carried out by students in Agra during their field trip, November 2011.



STUDIO BOOKLET 2010-11
Walking City: Agra Affinities, Mediations and Perambulations

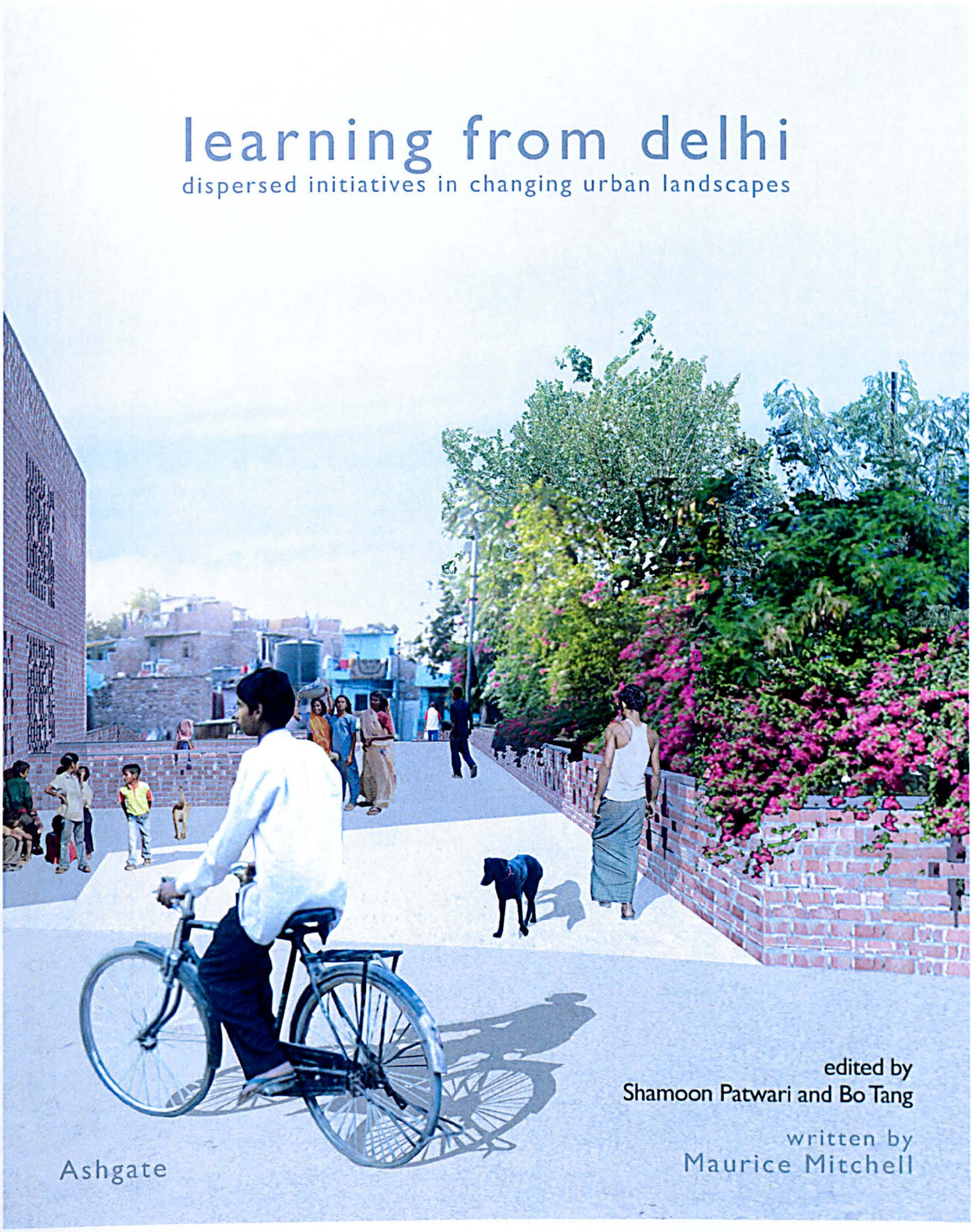
WALKING CITY

Agra Affinities, Mediations and Perambulations

LEARNING FROM DELHI

Written by Maurice Mitchell, Edited by Shamoon Patwari and Bo Tang

Book published by Ashgate, London, December 2010.



TESTING THE BOUNDARIES
Negotiating the Edges

Crafting adjacencies.

right:
View of junction where DEWATS meets Clean Street, 2011.

below:
Newspaper article printed during field trip visit, Agra, November 2011.

पुरातात्विक धरोहरों के प्रति भारतीय सजग

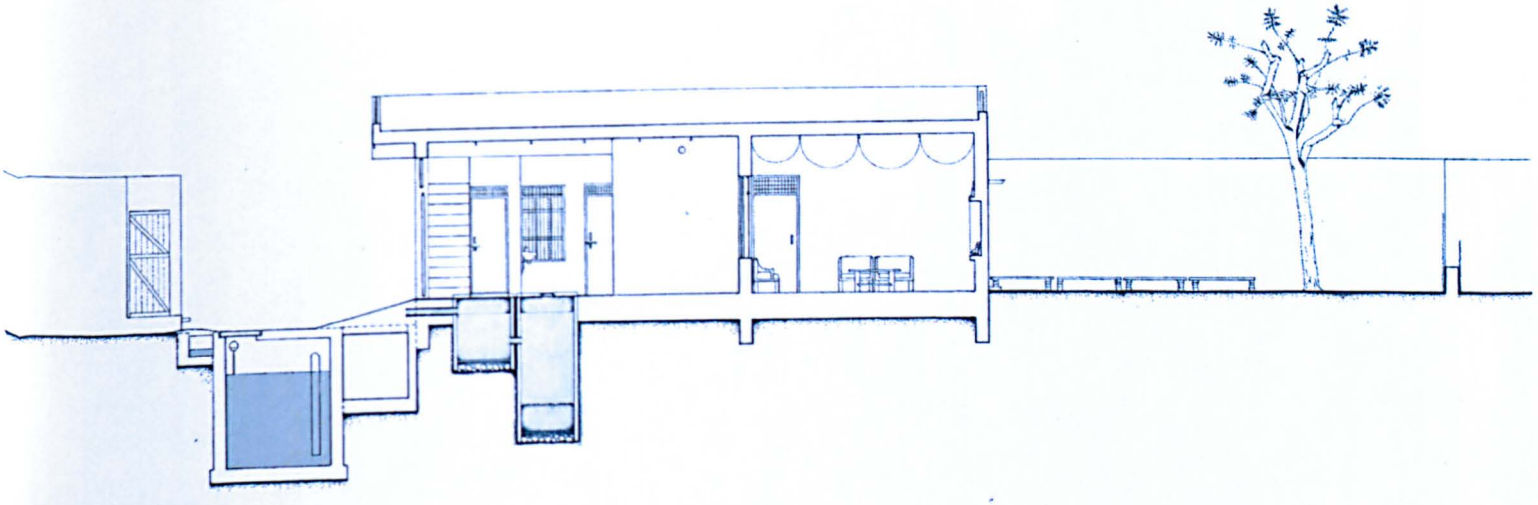
• लंदन मेट्रोपोलिटन यूनिवर्सिटी का दल आया है अध्ययन यात्रा पर

आगरा, जागरण संवाददाता: भारत के लोगों को अपनी पुरातात्विक धरोहरों और इनका अनुरक्षण करने के प्रति भारी लगाव है। यहां तक कि ब्रिटिश स्मारकों के प्रति भी उनके मन में प्रेम है। यह कहना है 22 सदस्यीय दल के साथ एक सप्ताह की अध्ययन यात्रा पर आगरा आए लंदन मेट्रोपोलिटिन यूनिवर्सिटी के प्रो.मौरिस का।

प्रो.मौरिस ने कहा कि यहां ताज के अलावा भी ऐसा बहुत कुछ है, जिसकी जानकारी विदेशी पर्यटकों को रोमांचित करती है। प्रोफेसर ने बताया कि अध्ययन दल को कछपुरा क्षेत्र का ग्यारह सीढ़ी घाट खासा आकर्षक लगा, जहां अंग्रेज चित्रकार विलियम्स होगो ने ताज की सबसे पुरानी मानी जाने वाली पेंटिंग बनाई थी। इस समय दल उखर्रा और शमासाबाद रोड से लगे उन क्षेत्रों का अध्ययन कर रहा है, जो कभी हरे-भरे थे और नागरिक अवस्थापना सुविधाओं के लिए महानगर में अपनी अलग पहचान रखते थे। मध्यान्ह इंग्लिश दल ने पालीवाल पार्क स्थित नगर निगम के ताज म्यूनिसिपल म्यूजियम भी देखा। क्रॉस कटिंग प्रोजेक्ट आगरा के मनीष कुमार और म्यूजियम के राज किशोर राजे ने मेहमान दल को प्रदर्शों के बारे में जानकारी दी।

पालीवाल पार्क स्थित ताज म्यूनिसिपल म्यूजियम में लंदन मेट्रोपोलिटन यूनिवर्सिटी का दल पहुंचा। जहां भारतीय संस्कृति से संबंधित विशेषज्ञ प्रो. मौरिस और वोरेमैंग ने अपने सहयात्री दल को विभिन्न प्रकार की जानकारियां दीं। जागरण

above:
View of DEWATS root zone at full growth with new house behind, 2011.



above:
Section through new house and DEWATS, Kachhpura, 2012.

MARKING CHANGE
Staking Out and Celebrating Newly Shared Territories

Establishing a new narrative.

www.jagran.com

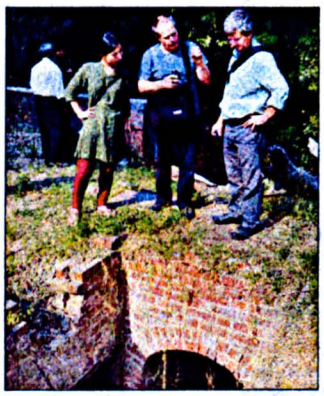
आगरा जागरण

आगरा, 16 नवंबर 2011

एक नजर

प्रभात रंजन ने संभाला कुलसचिव का कार्यभार

आगरा: अंबेडकर विवि के नये कुलसचिव प्रभात रंजन ने मंगलवार को कार्यभार ग्रहण कर लिया।
उन्होंने अशोक कुमार अरोड़ा के स्थान पर कुलसचिव का दायित्व संभाला है। नये कुलसचिव को सुबह करीब 10.30 बजे कुलपति प्रो. डीएन जौहर ने कार्य भार ग्रहण कराया।
इसके बाद उन्होंने वित्त एवं लेखा अधिकारी राम सागर से औपचारिक मुलाकात की। काम के पहले ही दिन कुलसचिव प्रभात रंजन ने छात्रों की समस्या को प्राथमिकता के आधार पर निबटाना शुरू कर दिया है।
पत्रकारों से बातचीत में उन्होंने कहा कि उनका प्रयास होगा कि छात्रों को किसी समस्या के निस्तारण के लिए विवि में भटकना न पड़े। उन्होंने स्वीकार किया कि विवि में समस्याएं बहुत है, लेकिन उन पर काबू पाने के लिए भी कुलसचिव दृढ़ संकल्पित नजर आए।



ताज हेरिटेज प्रोजेक्ट में शामिल हो पार्क माईनर

- इंग्लैंड के विशेषज्ञ दल ने माईनर और तालाबों का निरीक्षण किया

आगरा, जागरण संवाददाता: ताजमहल के नजदीकी क्षेत्र को हरभरा रखने और वायु प्रदूषण पर अंकुश के लिए 100 साल पहले इंग्लिश हॉर्टीकल्चरिस्ट ग्रीसन द्वारा तैयार गई योजना ही कारगर साबित होगी। मंगलवार को आए इंग्लैंड के विशेषज्ञ दल ने पार्क माइनर के निरीक्षण के बाद यह बात कही।
इंग्लैंड की मेट्रोपोलिटिन यूनीवर्सिटी के प्रो. मौरिस ने मंगलवार को अपने विषय विशेषज्ञ साथियों के साथ सर्किट हाऊस और शाहजहां गार्डन के तालाबों को पानी पहुंचाने वाली पार्क माईनर का निरीक्षण किया। प्रो. मौरिस ने नहरी सिस्टम की मौजूदा स्थिति को बदहाल बताते हुए कहा कि इसका महत्व तत्काल समझा जाना चाहिए। यह नहर उस दौर में बनी थी, जब खर्च करने की धन सीमित होता था और इसकी उपयोगिता पर निगाह रखी जाती थी।
प्रो. मौरिस ने बताया कि पुराने सिस्टम का जो कुछ बचा है, उसके आधार पर इसे सुचारू करने के लिए कार्ययोजना तैयार करेंगे। अनुरक्षण के लिए इस सिस्टम को ताज हेरिटेज प्रोजेक्ट में शामिल कराने के लिए भी प्रयास करेंगे। उन्होंने बताया कि सर्किट हाऊस स्थित टेल में सिंचाई के लिए लगा हाइड्रोलिक सिस्टम अब भी इंग्लैंड में प्रचलित है। इससे पहले इंग्लिश दल ने रोहता नहर के उस स्थान का भी निरीक्षण किया, जहां से पार्क माइनर शुरू होती है।

डॉक्टर करेंगे कम करने की

आगरा, जागरण संवाददाता: सूपी में मातृ मृत्यु दर कम करने के लिए करीब 500 स्त्री एवं प्रसूति रोग विशेषज्ञ आगरा में जुट रहे हैं। यूपीकॉन ऑब्सगाइनी 11 कांफ्रेंस (18 से 20 नवंबर) में डॉक्टर महिलाओं की विभिन्न बीमारियों पर चर्चा करेंगे।
मंगलवार को एसएन के स्त्री रोग विभाग में पत्रकारों से बातचीत में विभागाध्यक्ष डॉ. सरोज सिंह, डॉ. मुकेश चन्द्रा ने कहा कि सूपी में मातृ मृत्यु दर एक लाख पर 54 है। इससे घटाकर 20 से 25 करने का लक्ष्य रखा गया है। वहीं आगरा ऑब्स एवं गाइनी एवं एसएन मेडिकल कॉलेज द्वारा 23वें राज्यस्तरीय कांफ्रेंस का आयोजन 18 से 20 नवंबर के बीच किया जा रहा है। पहले दिन यानी 18 नवंबर को रवि हास्पिटल में बच्चेदानी के 12 ऑपरेशन किए जाएंगे। डॉ. रजनी पचौरी के कहा कि फॉग्सी संस्था

above:
Newspaper article printed during field trip visit to Circuit House, Agra, November 2011.

below:
Temporary marriage tent erected adjacent to DEWATS, November 2011.

CONNECTING WITH THE CITY
Imagining and narrating spatial opportunities

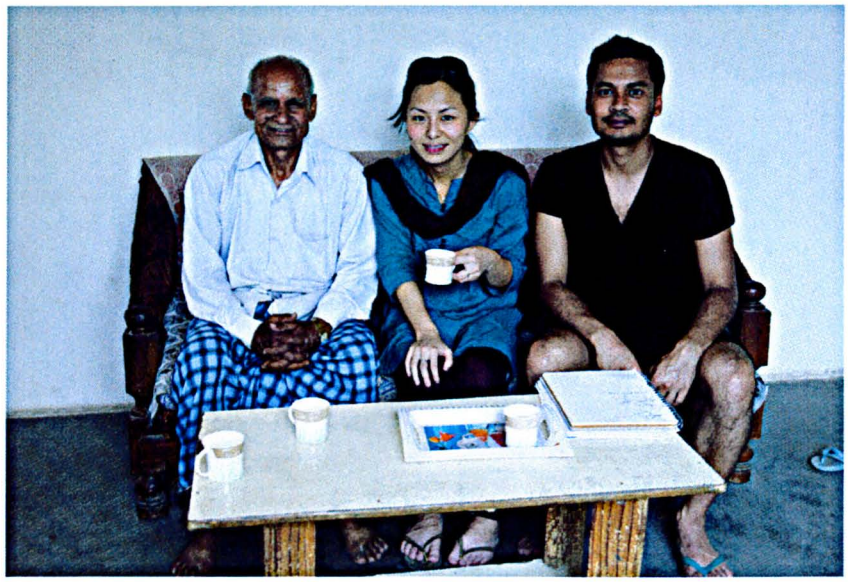
above:
Completed Community Toilet Complex (CTC) under construction by the local authority near DEWATS, Kachhpura, July 2011. [Oliver Beardon]

above:
CTC under construction by the local authority near DEWATS, Kachhpura, November 2010. [Oliver Beardon]

below:
Imagined place connecting DEWATS with the CTC, 2013. [Bo Tang after Vanessa Lee (2011)]

INTERVIEWS AND CONVERSATIONS
Recording stories, experiences and aspirations

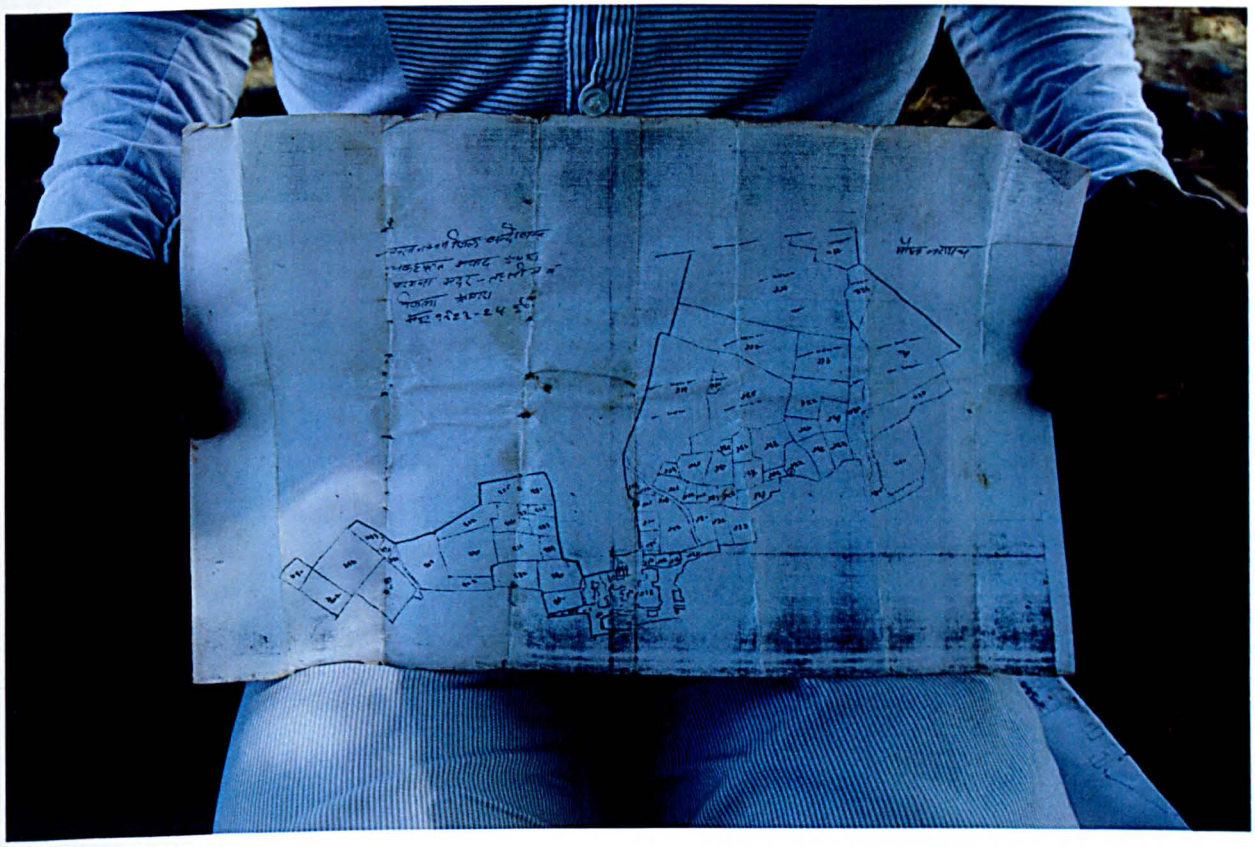
right:
A conversation over *chai* (tea) with Bhajan Lal at his new house in Kachhpura, April 2012. [Brijesh Singh]



below:
Meera Devi tells the story of the dispute with her brother in law, leading to her being the first householder to install an improved septic tank toilet system in her yard, Kachhpura, April 2012. [Shamoon Patwari]

left:
Interviewing Kishan Singh, head of the *Panchayat*, Kachhpura, April 2012. [Shamoon Patwari]

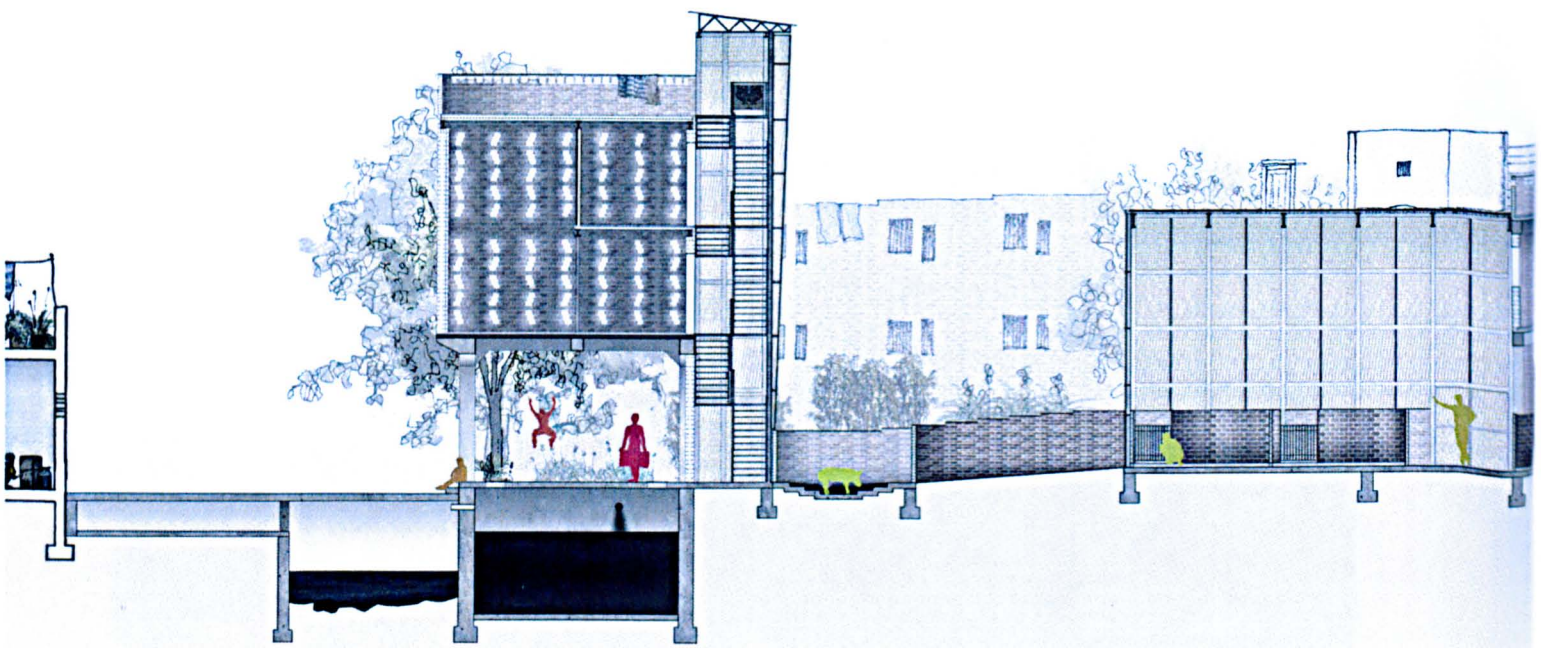
below:
Land deeds showing ownership of abadi and farm land in and surrounding Kachhpura presented by Brijesh Singh's uncle, Attar Singh, during conversation, April 2012.

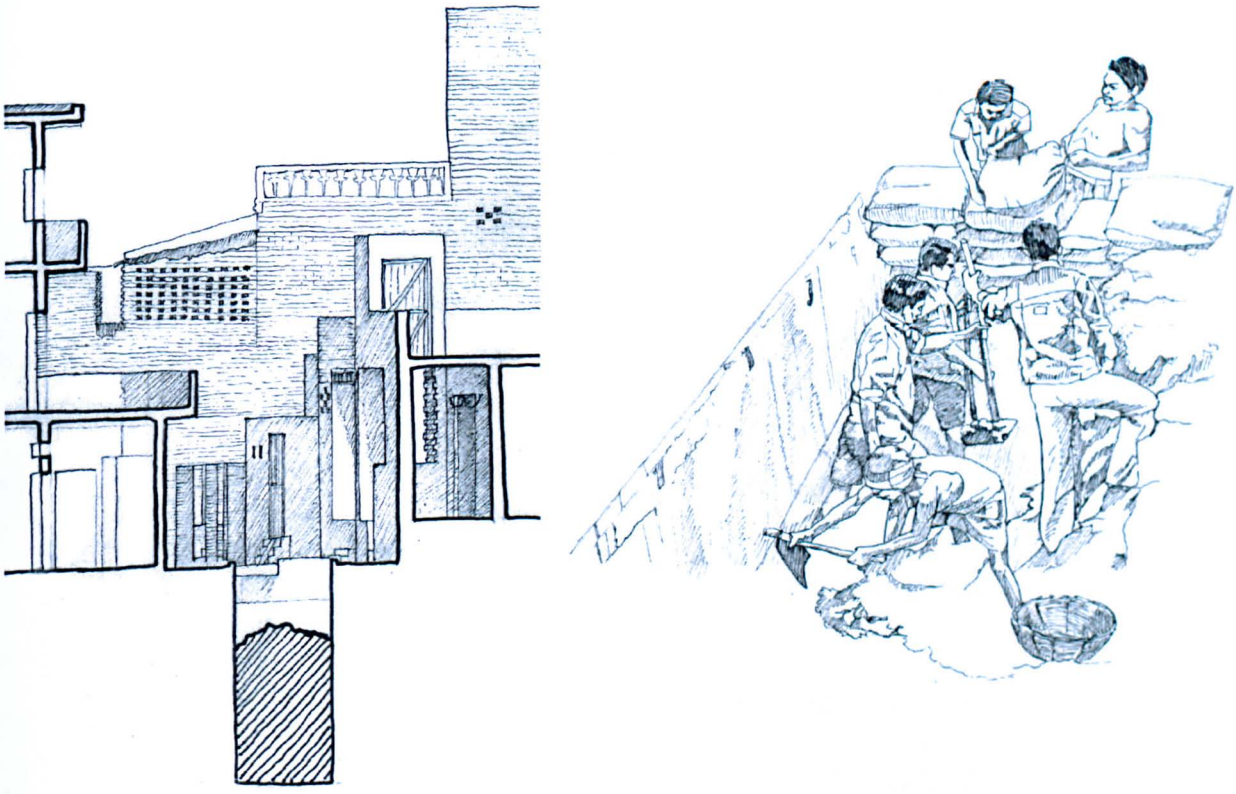


LIFTING HORIZONS
Acting as a Precedent at the City Scale

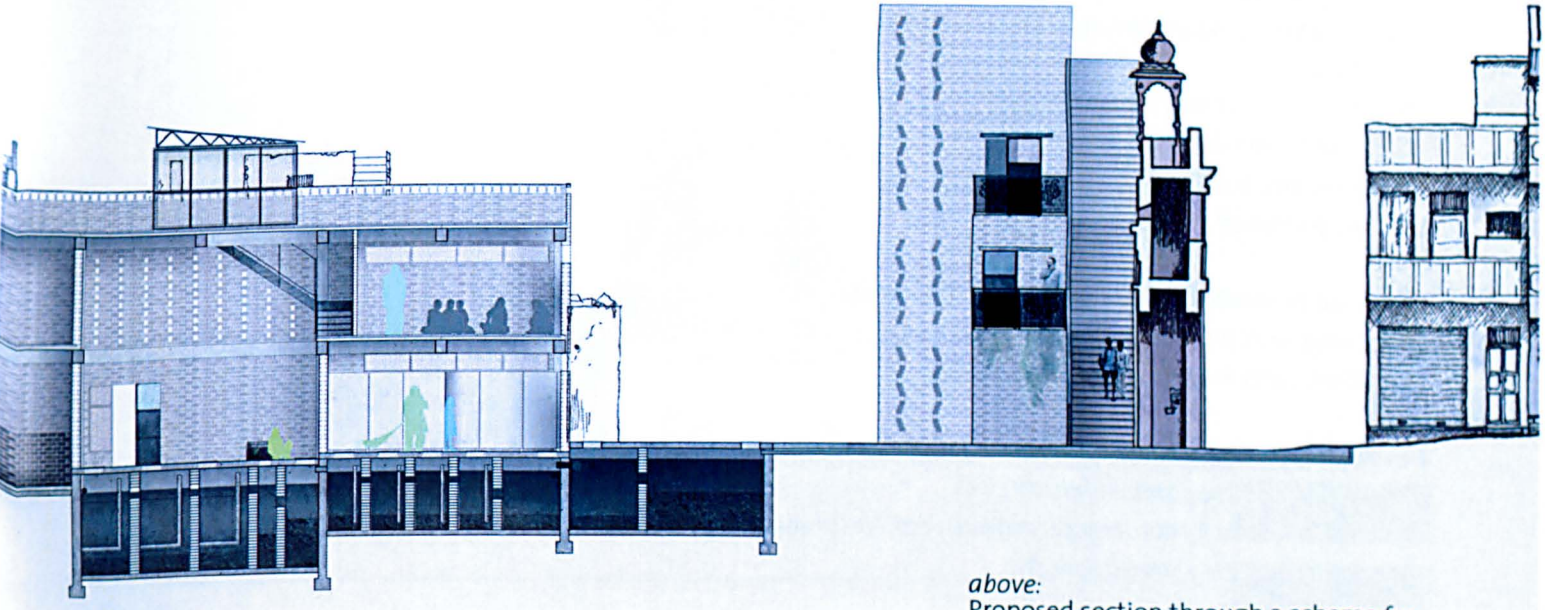
Investigating new territories.
Extending the narrative.

right:
Map of Agra locating three areas of study, November 2011. [Jonathan Weaver]





above:
Student section and sketch illustrating cleaning of a *nala* (drain), Taj Ganj, 2012. [Phuntsok Tsering]

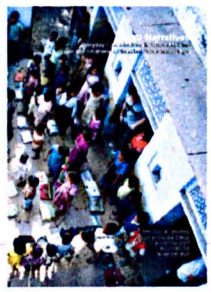


above:
Proposed section through a scheme for 'Cleaning the Vision of Gokulpura' using DEWATS, 2011. [Vanessa Lee]

Dissemination

2006 2007 2008

Generating brief:
- Eds. Rhodes, S. & Tang, B. - *Agra Narratives*
Studio Booklet, London Metropolitan University
- Student portfolios -theoretical design projects



Attracting student researchers:
- *Kachppura Settlement Upgrading Project*
Exhibition, London Metropolitan University
- *ASD Projects*
Exhibition, London Metropolitan University

Raising profile within India:
- *Learning From Delhi*
Exhibition, SPA, New Delhi

Establishing academic credibility:
- Mitchell, M. *Learning from Delhi*
Published book
- Pear, T. & Mitchell, M. *Live Projects... Studio Teaching*
Academic paper: Intercultural interaction
- *Learning From Delhi* - Book Launch
Exhibition, London Metropolitan University

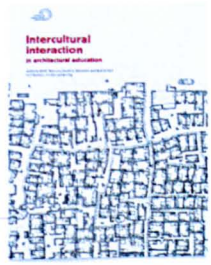
Establishing practice credibility:
- National Urban Water Awards (NUWA), India
Shortlisted

Deepening the discourse:
- *Agra Beyond Taj*
Studio Booklet, London Metropolitan University
- *Walking City*
Studio Booklet, London Metropolitan University
- *Agra and London*
Studio Booklet, London Metropolitan University
Student portfolios -theoretical design projects

Discourse as seedbed for establishing early careers:
- *Provoking Architecture: Live Projects as Research*
Exhibition, London Metropolitan University

Developing theoretical discourse:
- Tang, B. *Negotiating Shared Spaces...*
Presentation, Scarcity conference, University of Westminster
- Tang, B. *Negotiating Shared Spaces...*
PhD by Practice thesis
- Tang, B.. *Negotiating Shared Spaces...*
Journal paper: Planum, The Journal of Urbanism

2009 2010 2011 2012 2013



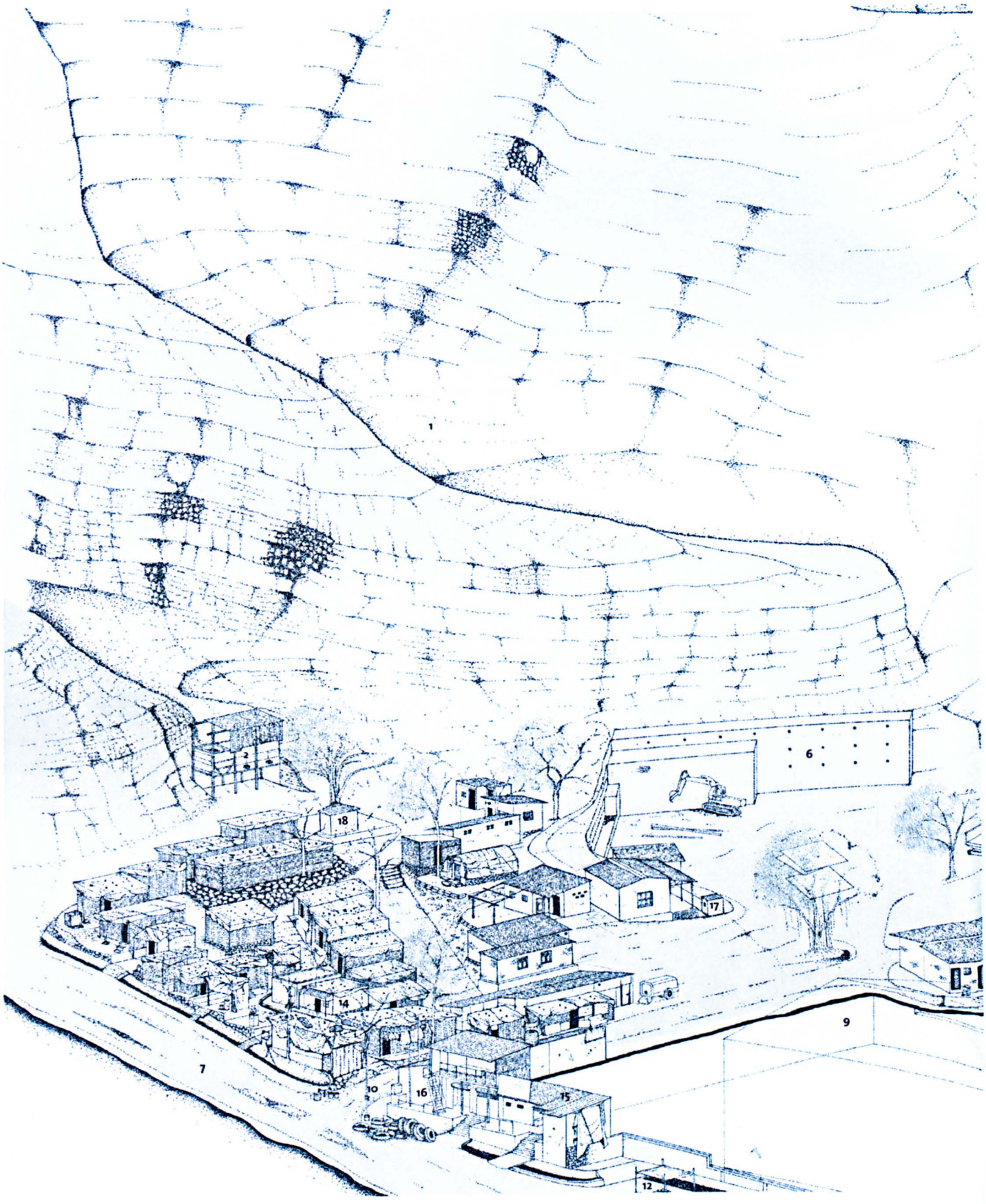
QUARRY CLASSROOMS PROJECT, NAVI MUMBAI, INDIA

PROJECT DIARY 1.4.2

Contents:

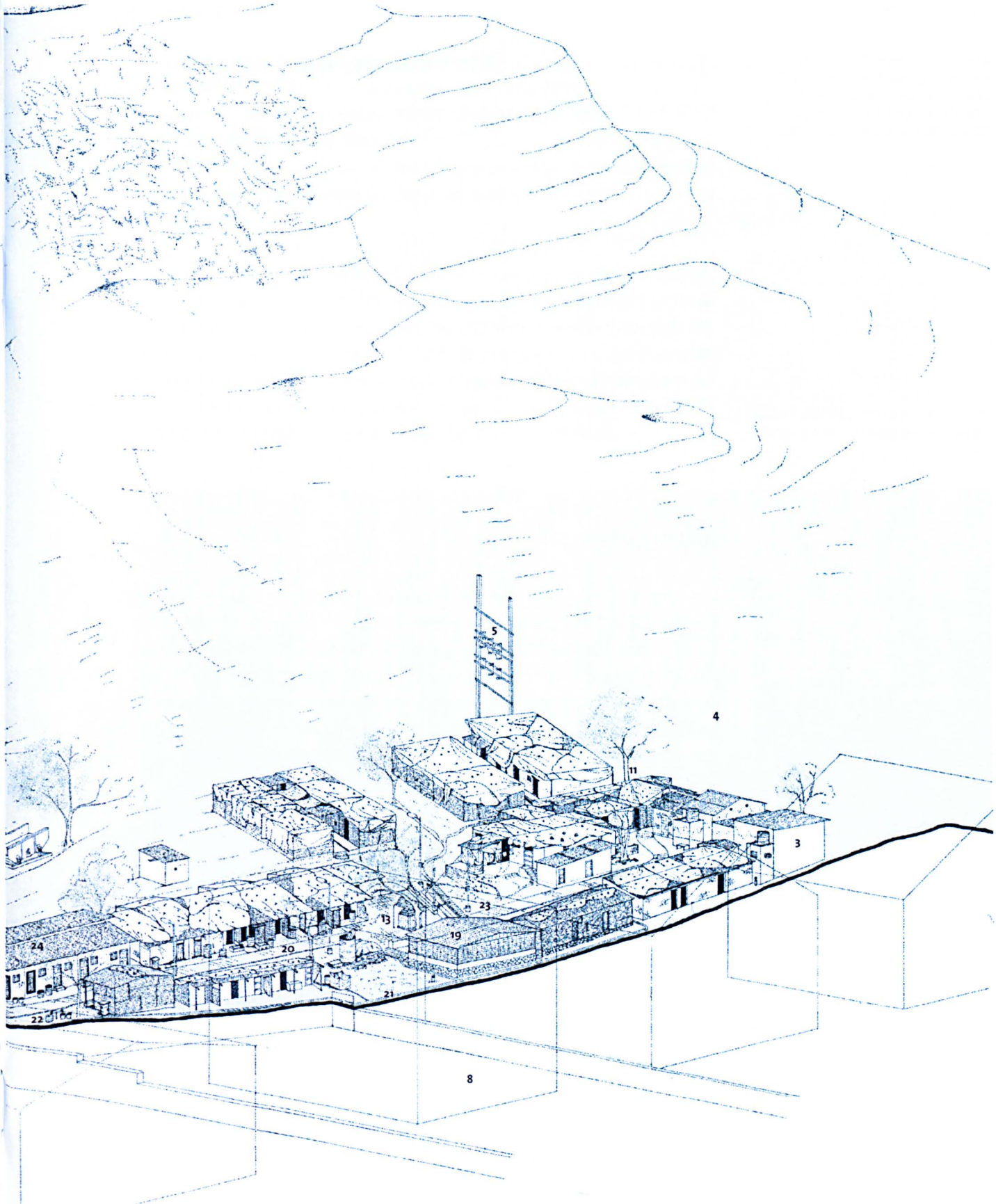
Key Drawing 1.4.2	pp.2-3
Project Review	pp.4-17
Timeline	pp.18-19
Diary	pp.20-49

Bo Tang
Architecture of Rapid Change and Scarce Resources



1.4.2 Baban Seth Stone Quarry Worker Settlement, Navi Mumbai

1 Quarry zone
2 Disused crushing machinery
3 Quarry owner's office
4 Stone crushing area
5 Electricity pylon
6 Retaining wall



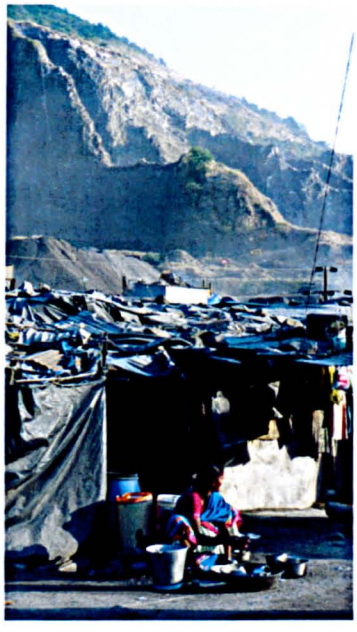
7 Main road
8 Factory buildings
9 Boundary wall
10 Main entrance street to settlement
11 Back entrance alley to settlement
12 *Kuchha* (temporary) market stall
13 *Mandir Chowk* (Temple Square) and Lakshmi temple
14 Tayama's house
15 Worker's lunch stop
16 Tyre repair shop and guesthouse
17 Tayama temple
18 Hera Bai temple
19 New classroom building (former rubbish site)
20 New concreted pathway
21 New covered drains
22 New municipal water taps
23 New street lighting
24 New *pukka* (permanent) housing

For a larger representation of the previous page to be read in parallel with this project review, refer to portfolio drawing 1.4.2: Quarry Classrooms Project, Navi Mumbai.

Quarry Classrooms Project, Navi Mumbai

Project Review

INTRODUCTION



Existing quarry worker settlement, October 2009. [Odel Jeffries]

The Quarry Classrooms project began in 2008 in Navi Mumbai (New Bombay), India, as a partnering between students and research assistants from London Metropolitan University's Faculty of Architecture and Spatial Design (ASD) and a local NGO—Association of Rural People for Health and Educational Needs (ARPHEN), stone[1] quarry owners and worker settlement families. In 2009, the partners constructed two quarry classrooms in the quarry settlements of Baban Seth and Tata Press in Navi Mumbai. The research aim in carrying out this project was to create shared common ground in these existing informal settlements through a process of participatory design and making.

Background

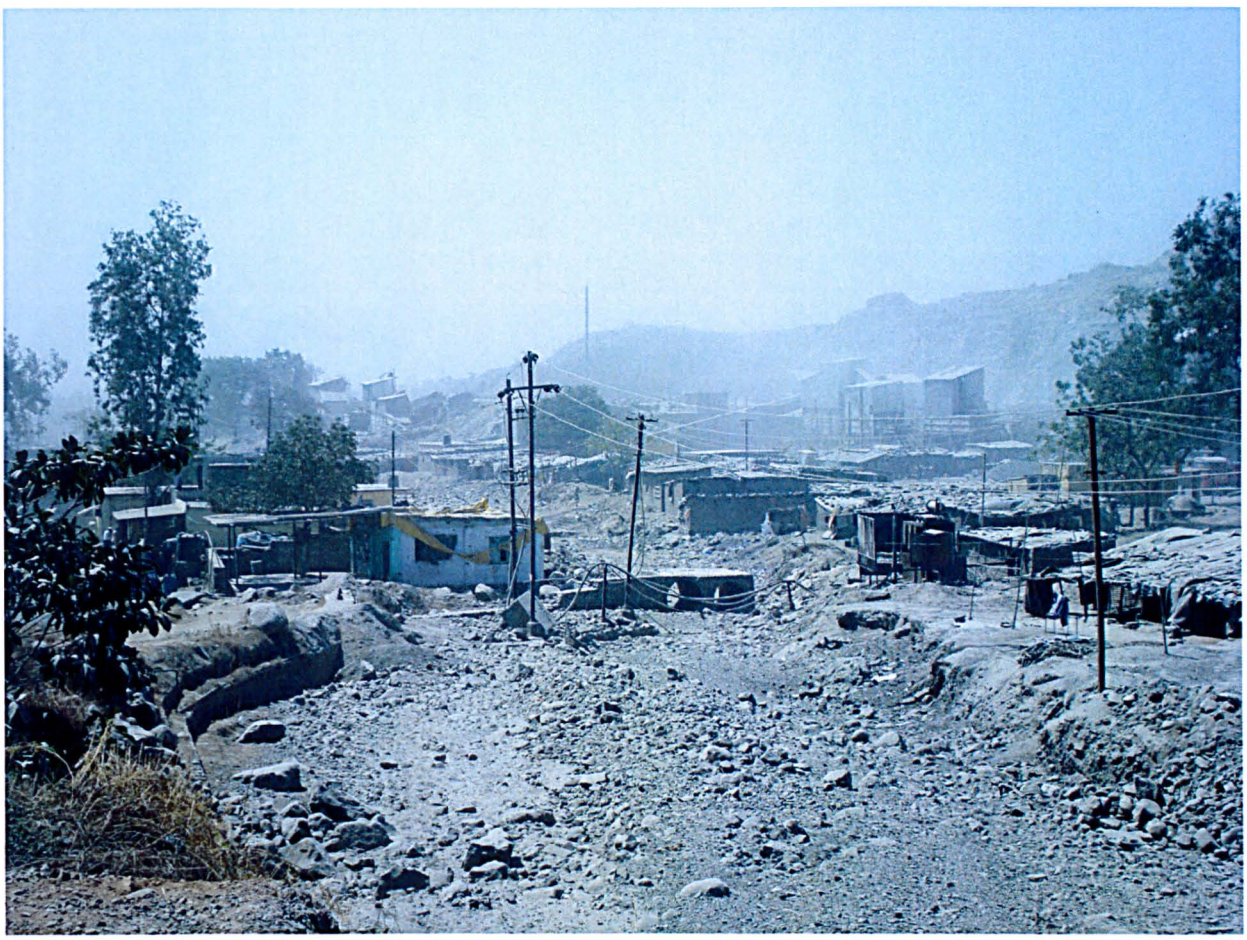
The stone quarries of Navi Mumbai were established in the 1970s following the expansion of Mumbai, which saw mountain villages swept away in the process. The land was originally leased to project-affected persons (PAPs)[2], who became quarry owners, though some of these holdings have been sub-let. Some of the present workers are descendants of the original inhabitants; many sons and daughters of the first families now work in the quarries.

1 The quarry stone is a crushed stone (angular rock), primarily used as construction aggregate and for road building. It is typically produced by mining a rock deposit that is then broken down to the desired size using crushers.

2 Project-affected persons (PAPs) are 'local people who lost land during the building of the city and have been compensated with licenses for opening quarries as a means to an alternative source of income' (Shaw 2004 p.234).

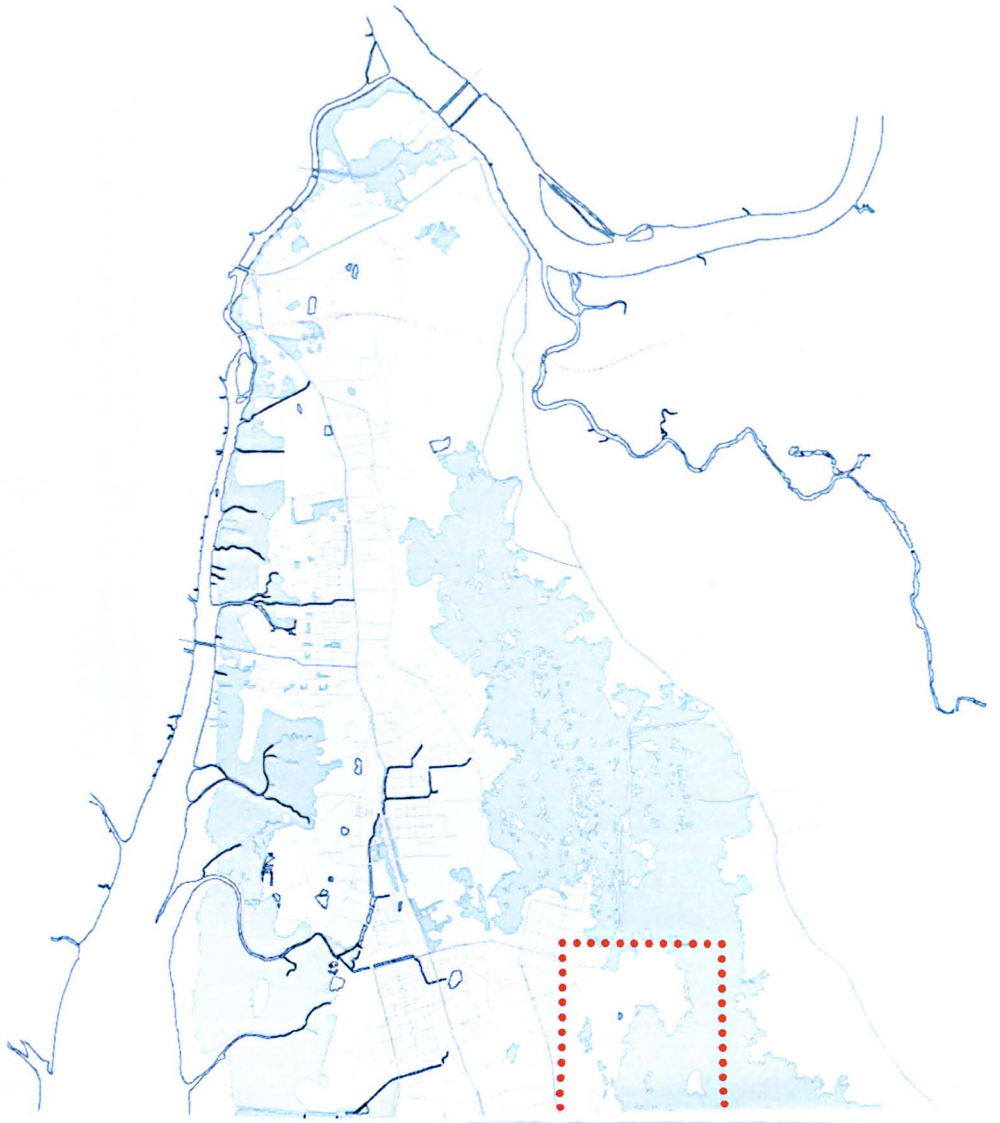
There are 122 quarries in the Thane-Belapur quarry belt area, of which about 84 are currently operating. The quarries were initially owned by the Navi Mumbai Municipal Corporation NMMC, but are now under the control of the City and Industrial Development Corporation of Maharashtra Ltd. (CIDCO), who lease the land on short 8-10 year contracts to independent quarry owners, complicating the issue of land ownership (Saavedra and Watson 2008).

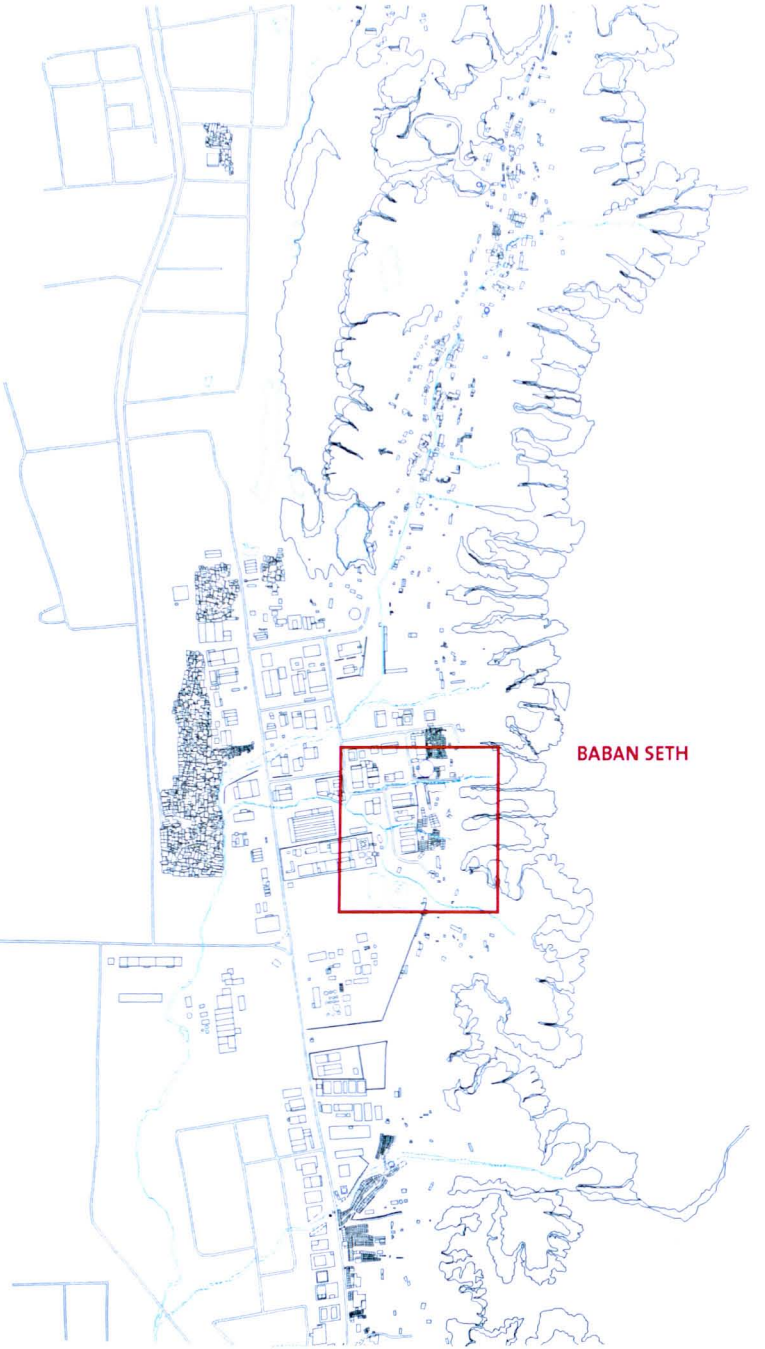
Workers and communities residing in the Maharashtra Industrial Development Corporation (MIDC) area where the quarries are located are exposed to high levels of pollution and heavy industrial road traffic. Several of the worker settlements are situated at the base of quarries that are at present actively being mined, so there is constant danger of falling rocks from dynamite blasting on the quarry face, meaning the risk of accidents are high, and fatalities of both workers and their families are common.[3]

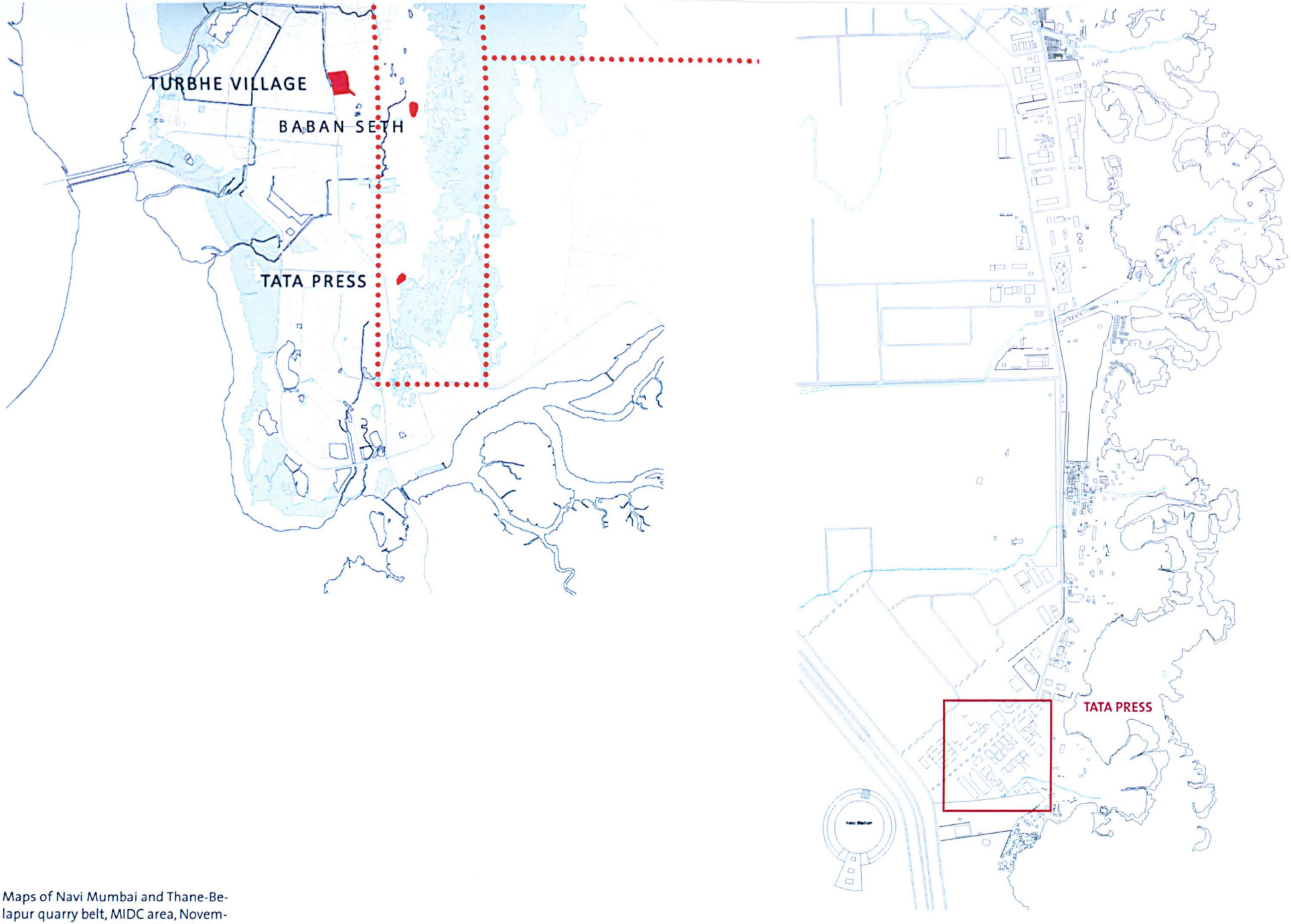


Quarry worker settlement landscape, February 2009. [Helena McDermott]

3 An intervention application filed in July 2012 in the Bombay high court by an environmental activist compares the stone quarries to 'killing fields' claiming 96 workers have died in the past 20 years (*Times of India* 2012).




BABAN SETH



Maps of Navi Mumbai and Thane-Belapur quarry belt, MIDC area, November 2009. [Odel Jeffries after Valerie Saavedra and Paul Watson (2008)]

Worker Children and NGO Bridge Classes

In summer 2008, two undergraduate architecture students[1] conducted a survey of the quarry worker settlements along the quarry belt, on behalf of the NGO ARPHEN. The NGO has been working with quarry workers, Adivasi[2], Industrial workers and slum dwellers since 1986 (ARPHEN 2010). Their assessment of the worker population revealed that almost half had been in quarry work for 15-20 years. Shaw (2004 p.235) explains that:

...lack of job mobility becomes understandable when we look at the level of literacy of the quarry workers. About 61 percent of the sample or 186 individuals had no schooling at all. Only 12 percent had primary education and 4.5 percent had middle school education.

In 2009, when the LMU students first arrived in the area, it was evident that few children or youths in the worker communities attended school. ARPHEN had initiated a program of 'Bridge' classes[3] that were held in temporary locations throughout the area, wherever space could be found. These ranged from dark, cramped rooms in huts belonging to quarry owners, to open spaces shaded by large trees. Children who did attend government schools would usually have to walk for up to an hour to get there, negotiating the dangerous Thane-Belapur road used by quarry trucks to transport stone. During the university students' stay in the area, a young boy riding his bike with his brother was run over and killed in a hit-and-run incident involving a quarry truck.

Following the Maharashtra state syllabus, ARPHEN's Bridge classes taught around two hundred and fifty quarry worker children who previously did not attend school. Basic reading, writing and mathematics were covered in these classes to prepare the children for exams that would enable them to enrol in government schools. The introduction of Bridge classes overcame the issues of lack of birth certificates, permanent addresses and legal status that would normally prevent the children from entering into the state schooling system. The teachers running these classes were women from the quarry communities who had been trained by ARPHEN.

1 The two undergraduate students who carried out the original survey of the Thane-Belapur quarry belt are Valerie Saavedra and Paul Watson, from London Metropolitan University.

2 Three Adivasi (umbrella term for indigenous ethnic and tribal groups in India) settlements three to four generations old occupy the hillsides facing Thane-Belapur in Navi Mumbai. ARPHEN claims that the tribal people were overlooked when the government took away land for development of the industrial area, and therefore were not compensated as PAPs (Shaw 2004).

3 Bridge classes provide out-of-school children with the opportunity to take informal classes for one year as a bridge into the formal public school system. ARPHEN's approach centres on the involvement of locally hired teachers who are trained in an intensive two-week program - sharing a common background with their students enables the teachers to relate to the situations of the children they teach.

Alongside Bridge classes, ARPHEN assisted women with setting up Self-Help Groups (SHGs) in the settlements, raising awareness of health and educational rights issues. This enabled migrant worker residents to access government poverty schemes which included obtaining ration cards (part of the Public Distribution Service) to buy basic goods like food grains, sugar and kerosene, as well as access to free health clinics (HIV, tuberculosis and cataracts testing).

Existing Bridge class conditions, July 2008. [Valerie Saavedra]

Following the student survey of the stone quarries, which involved meetings and conversations with several groups of quarry worker communities, it was evident that there was a desperate need for larger spaces that offered better conditions in which children could be educated. ARPHEN was keen to expand the Bridge classes to provide more opportunities for children to gain access to education in the quarry settlements. The university students identified several potential sites within the quarry settlements that would be suitable for locating permanent classroom buildings.

QUARRY CLASSROOMS

Locating the Classrooms

The following year, as a research assistant[4] at London Metropolitan University's ASD Projects Office, I travelled to Navi Mumbai to construct the first of ten proposed community classroom spaces with ARPHEN, funded by The Water Trust[5]. Several of the initial sites identified by the university students along the quarry belt were immediately deemed unfeasible, as the quarry landscape had drastically changed since the last visit due to the continually shifting nature of the mining activity. The settlement at Baban Seth quarry seemed to be the ideal choice for a first classroom, due to its location in the middle of the quarry belt and proximity to several other surrounding villages.

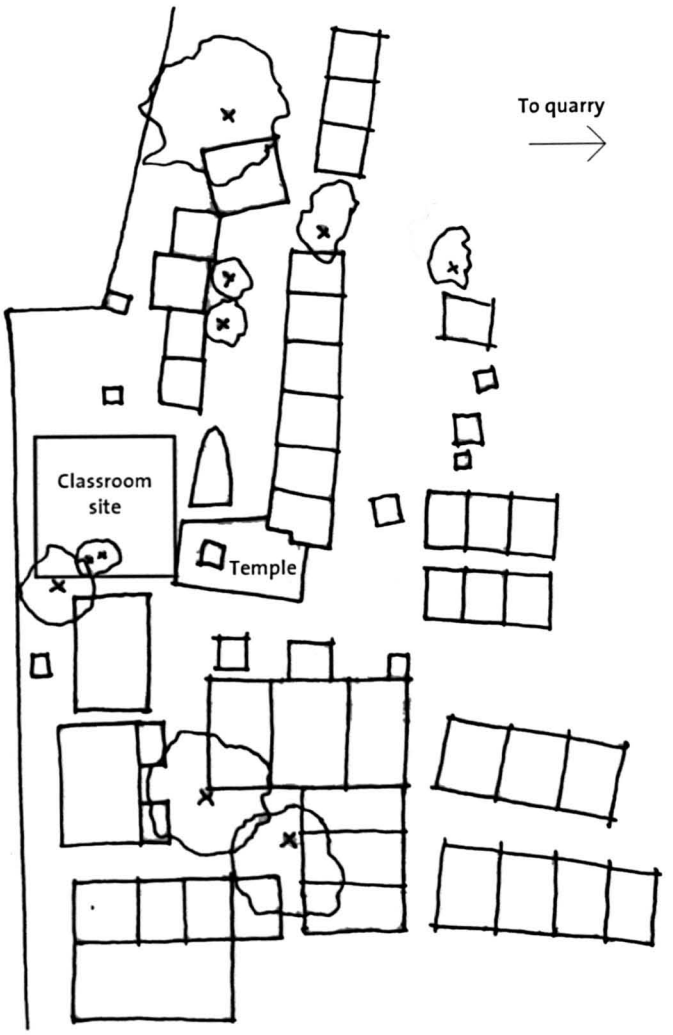
Baban Seth quarry settlement is located just north of the mid-point of the surveyed quarries. There are approximately 70 households in the settlement. At the centre of the village, there is a temple square, adjacent to the local rubbish area where the identified site was located. This site was chosen due to its close proximity to the surrounding housing and its relatively sheltered position from the recurrent blasting from the quarry. On the other hand, this site was also a low point for all the monsoon water flowing from the quarry and often flooded up to two feet deep. Any design would need the drainage to be reworked in order for the site to be viable. In order to gain the approval of the local community for any planned construction, the research assistants and ARPHEN conducted a series of community meetings with local groups, which stimulated enthusiasm for the project.

A Memorandum of Understanding (MOU) was also drafted prior to the trip to verify the use of the land by the quarry owner, and to begin the process of preparing the site. The process of gaining the quarry owner's signature was slow and frustrating, and eventually only possible due to pressure put on him by the local residents.

4 Myself and another research assistant, Shamoon Patwari, were employed full-time at LMU's Architecture and Spatial Design (ASD) Projects Office (now known as Cass Projects) from July 2008 to September 2010.

5 The Water Trust has been supporting student education and development within the field of the Architecture of Rapid Change and Scarce Resources (ARCSR) at LMU's Faculty of Architecture and Spatial Design since 2007.

Survey map showing the location of Baban Seth quarry settlement in the Thane-Belapur quarry belt, 2009. [Odel Jeffries after Valerie Saavedra and Paul Watson (2008)]



Sketch plan of Baban Seth quarry settlement showing location of the classroom site. [Shamoon Patwari]

Building Through Engagement

Engaging the community was key to ensuring the sustainability of the project. There was initial reluctance by adult residents to get involved, but the level of community involvement increased steadily as residents gained a sense of ownership and pride in the project. Children in the settlement could not wait to get involved, and turned the mundane task of clearing the site into a game. Once the site was cleared and levelled, the outline of the school was marked on the ground with chalk, and the children stood along the lines to get an impression of where the classroom would stand.

Envisioning the proposed classroom through children and games, March 2009. [Shamoon Patwari]

Formal and informal consultation with community members (from planned meetings with self-help groups to passing comments) influenced the development of the building design as it progressed. Throughout the project, residents shared their experiences of living in the extreme environmental conditions of the quarry settlement, while offering their opinions on the design of the classroom. Issues emerged from local knowledge that then informed the design of the building.

Community meeting at Baban Seth quarry settlement, March 2009. [Helena McDermott]

A local contractor, Ayoub, was hired to carry out the majority of the wet trade work, with the steel truss frame prefabricated by a local steel contractor, Bittu. The proportions of the classrooms were based on minimum classroom standards of 10 square meters per child[6] (total area of 400 square meters). They were designed to be in keeping with the local quarry vernacular, using existing local skills and materials, including stone from the quarries. Where labour-intensive but unskilled work was required, youths and adults from the community came forward and offered to carry water, bricks and stone, and dig trenches for the foundations.

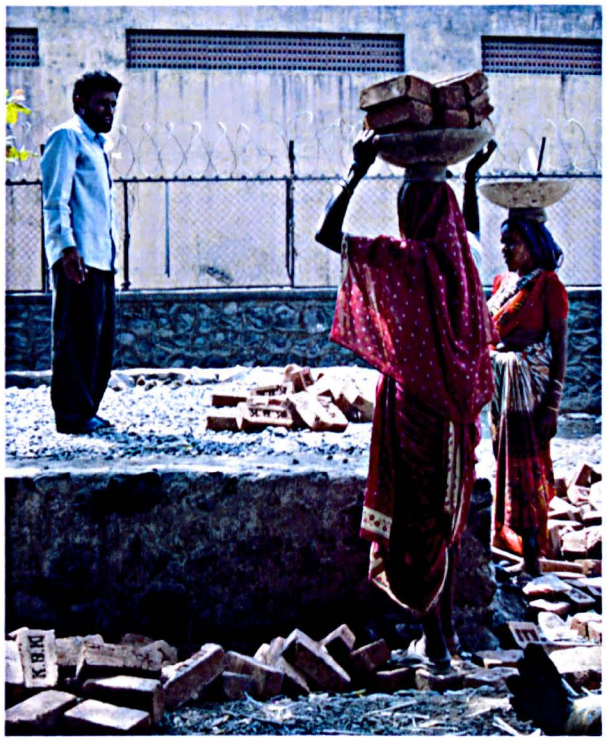
There was an ongoing problem with insufficient water supply on site, which slowed down the building process. One water tap in the settlement, provided by the quarry owner, only supplied water for a few hours a day; this was supplemented by a weekly water truck which would see queues of women scrambling to fill as many buckets as they could carry. One woman, Tayama[7], frustrated by the slow pace of the build, rounded up several other households around the site, who all agreed to contribute a few buckets of water each from their personal supplies so construction could progress without being slowed down by the water shortage issue. This gesture was generous, given the scarcity of water[8] in the settlement, and showed a desire for the building to be completed.

6 Norms and standards from the National Council for Teacher Education (NCTE), a Statutory Body of the Government of India.

7 Tayama, aged 47, has lived in the quarry for 30 years and is President of the Amba Mahila women's self help group, one of several community groups set up under the facilitation of ARPHEN.

8 Access to water in the community is from a water tanker (bowser) that visits the settlement once a week.

(a)



(b)

(a) Student laying foundations at Tata Press, November 2009; (b) women carrying bricks at Baban Seth, March 2009. [(a) - Shamoon Patwari]

During the last stages of the build, local women from the community gathered together to clean the building and get it ready for the opening ceremony. The same women have since continued to look after the classroom, cleaning the floor and interior surfaces on a daily basis. Two hundred local residents from several nearby and surrounding communities attended the opening ceremony.

Finishing stage of improvements to the classroom at Baban Seth, March 2010.

Three keys were handed out: to P. K. Nayak, director of ARPHEN; Tayama, head of Amba Mahila women's self-help group; and the Bridge class teacher for the community. This was done in public at the inauguration to ensure fair use and access to the building. The opening ceremony was dedicated to Vaneeta, one of the bridge class teachers, who was unfortunately killed on the previous day by a drunk truck driver on a quarry lane on her way to make arrangements for the ceremony.

Opening ceremony at Tata Press, November 2009. [Shamoon Patwari]

Following the opening of the classroom at the Baban Seth quarry settlement, ARPHEN was overwhelmed by requests for classrooms from other communities further north and south of the quarry belt. The following November (2009), six students[9], together with the two research assistants, travelled to Navi Mumbai for six weeks to construct a second classroom with ARPHEN and the community at the Tata Press quarry, a live project that would contribute towards the students' final year of studies.

The Tata Press settlement was chosen as the site for the second classroom due to its isolated location at the southern end of the quarry belt, and lack of access to basic services and amenities. The settlement is located at the top of a steep slope, overlooking the Nerul Stadium. For the Tata Press

9 The six students involved in the Tata Press quarry classroom project were Odel Jeffries, Toby Pear, Will Notley, Cian Mckay, Audrey LeMatte and Harjeet Singh - Professional Diploma in Architecture students from LMU's Faculty of Architecture and Spatial Design, undertaking their final year of studies.

classroom, the university students designed a building similar to that at Baban Seth but slightly larger, taking into account a sloping site, with the addition of an open veranda area at the front (so part of the building could be locked while maintaining a space that was permanently open).

Completed classroom at Tata Press quarry worker settlement, November 2009. [Audrey LeMatte]

Students brought enthusiasm to the project while being rewarded with hands-on experience. Challenges they faced, such as constructing a plinth and retaining wall required large quantities of materials and water to be brought up the hill to the site with wheelbarrows and often donkeys, offering the students a substantial learning experience.

Following suggestions from members of the community, bamboo blinds were installed on the inside of the building to keep direct sunlight and rainwater out, whilst providing ventilation throughout. A small pot-planting exercise by students with women and children encouraged the community to take social ownership of the building.

Building on the success of the first two classrooms, other communities have been putting pressure on their local quarry owners. This has led to the quarry owners offering to match-fund the costs of construction of a

third quarry classroom at Royal Stone quarry, in the northern sector of the quarry belt. They have also offered to oversee the build, donating stone and aggregate. Residents of the surrounding quarry settlements also have pledged to assist with the construction of the classroom.[10]

ARPHEN is now looking towards creating more quarry classrooms as the value of embedded community centres is accepted; the NGO is in a strong position through its close and long-established community links to ensure that this approach continues to be successful in the future. Whether the quarrying in this region of Navi Mumbai should continue to operate is currently being widely debated, and has been a re-occurring subject in the press in recent years (*Times of India* 2009, 2010) fuelled by environmental, and health and safety activists citing pollution and extensive damage to the hillside, in addition to high levels of danger, risk and health issues to workers. However, with local government leaders often having ownership stakes in the quarries and construction sector, for now, quarry owners rest assured that they have the political backing to continue their livelihood.

10 At the time of writing (2013), the project proposal for a third classroom is on hold, pending site/land negotiations between the Royal Stone quarry owner, NGO ARPHEN and LMU.

PROJECT TIMELINE

stage of involvement

significant events

Artefact

Baban Seth Quarry Classroom

Tata Press Quarry Classroom

2008

conversation initiated between ARPHEN and ARCSR
pp.20-21

FT1

2009

FT2

p.31

Research (ASD Projects)

FT3

p.34

2010

p.37

FT4

HEAVY MONSOON

p.37

Oct

FT5

2011

p.38

FT6

FT7

2012

PhD Research

FT8

2013

FT9

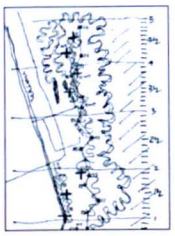
Oct

2014

Goal: 100% quarry worker children enrolled in state education

fatality of quarry worker/child due to road/work related incident in the quarries

Methods



pp.22-27

p.28

p.29

p.30

pp.32-33

p.36

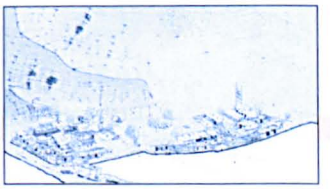
pp.38-39

pp.44-45

Findings

pp.40-41

pp.42-43



pp.2-3

Dissemination
(refer to pp.48-49)

Quarry Classrooms Report

ASD Projects exhibition
LMU, London

Learning From Delhi exhibition
SPA, New Delhi

Aiding the Forgotten - documentary

Baban Seth classroom - shortlisted for AJ Small Projects Award

Shifting Places - studio booklet
student theoretical projects
Proposals for Turbhe, Navi Mumbai

Learning From Delhi book published

Live Projects paper published
Intercultural Interactions publication

Learning From Delhi book launch exhibition, LMU, London

Live Projects as Research exhibition
LMU, London

Quarry Schools paper published
CYE Journal

Methodology paper presented at Scarcity conference, Westminster Uni

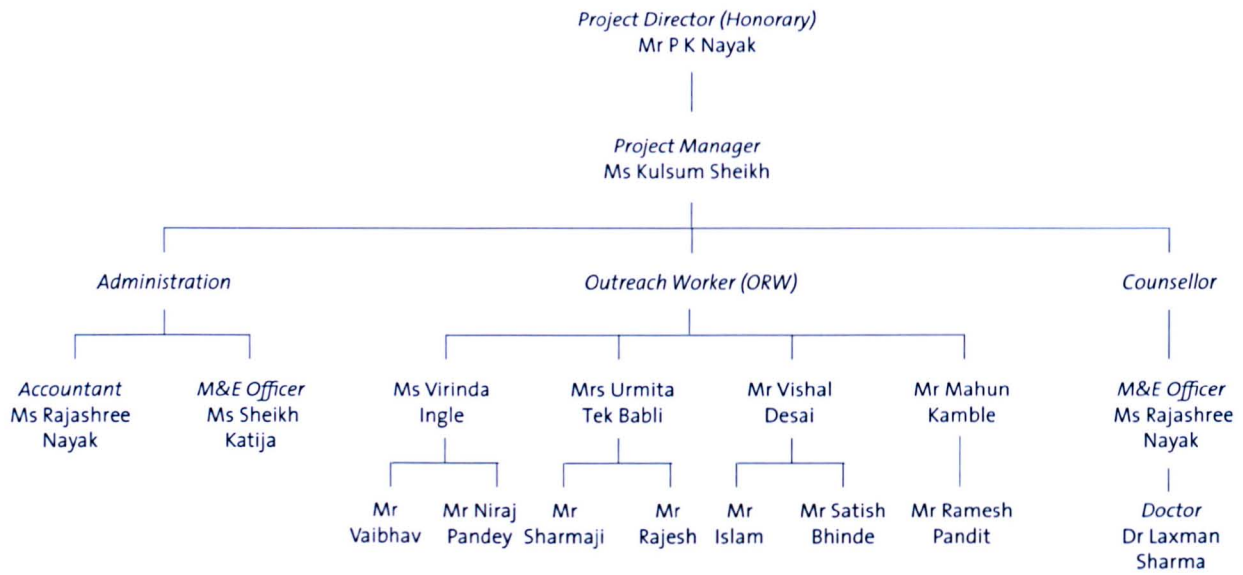
Quarry Schools Project presented at Shelter Forum Pecha Kucha

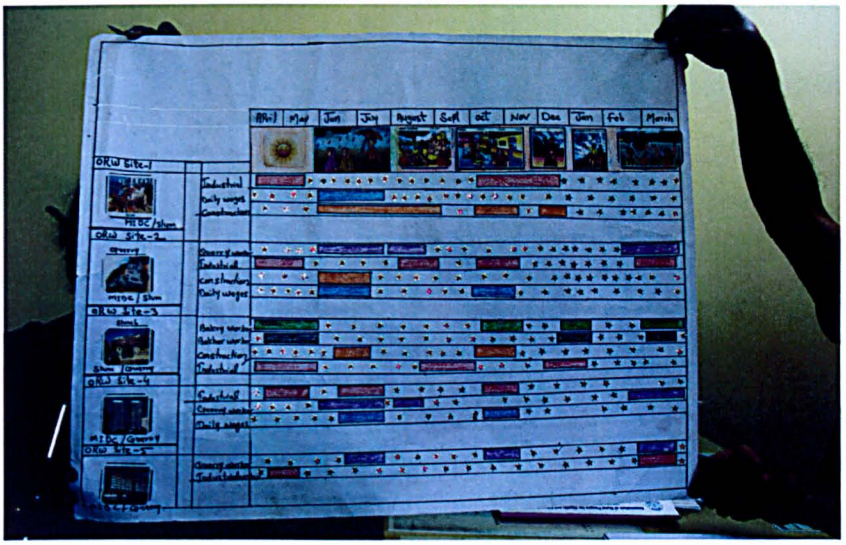
PhD Thesis

Methodology paper to be published in *Planum Journal*

NGO ARPHEN
Association of Rural People for Heath and Educational Needs

ARPHEN (The Association of Rural People for Health and Educational Needs) was established in 1988 and works in support of almost 25,000 quarry workers, Adivasi and slum-dwellers in the Thane-Belapur Kharghar belt of Navi Mumbai who live in basic shelters. The Non-Government Organisation along with the organisation's networking partners facilitates the provision of basic healthcare and education for the communities. The focus is on empowerment of the groups and assisting them in gaining access to basic facilities.

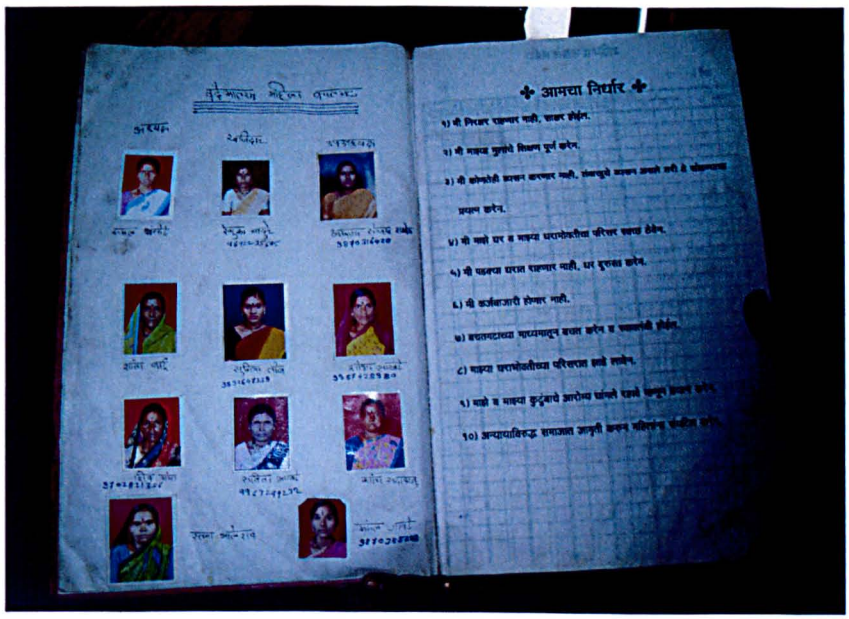




left:
ARPHEN survey map showing seasonal activities/ occupations in the quarry settlements, 2012.

left:
ARPHEN survey map of Turbhe area, used as an aid for discussions with single migrant quarry workers, 2012.

facing page
top:
ARPHEN 'Organogram' - organisational diagram, 2013.
bottom:
Meeting with ARPHEN at their office in Kharghar, Navi Mumbai, February 2009. [Shamoon Patwari]

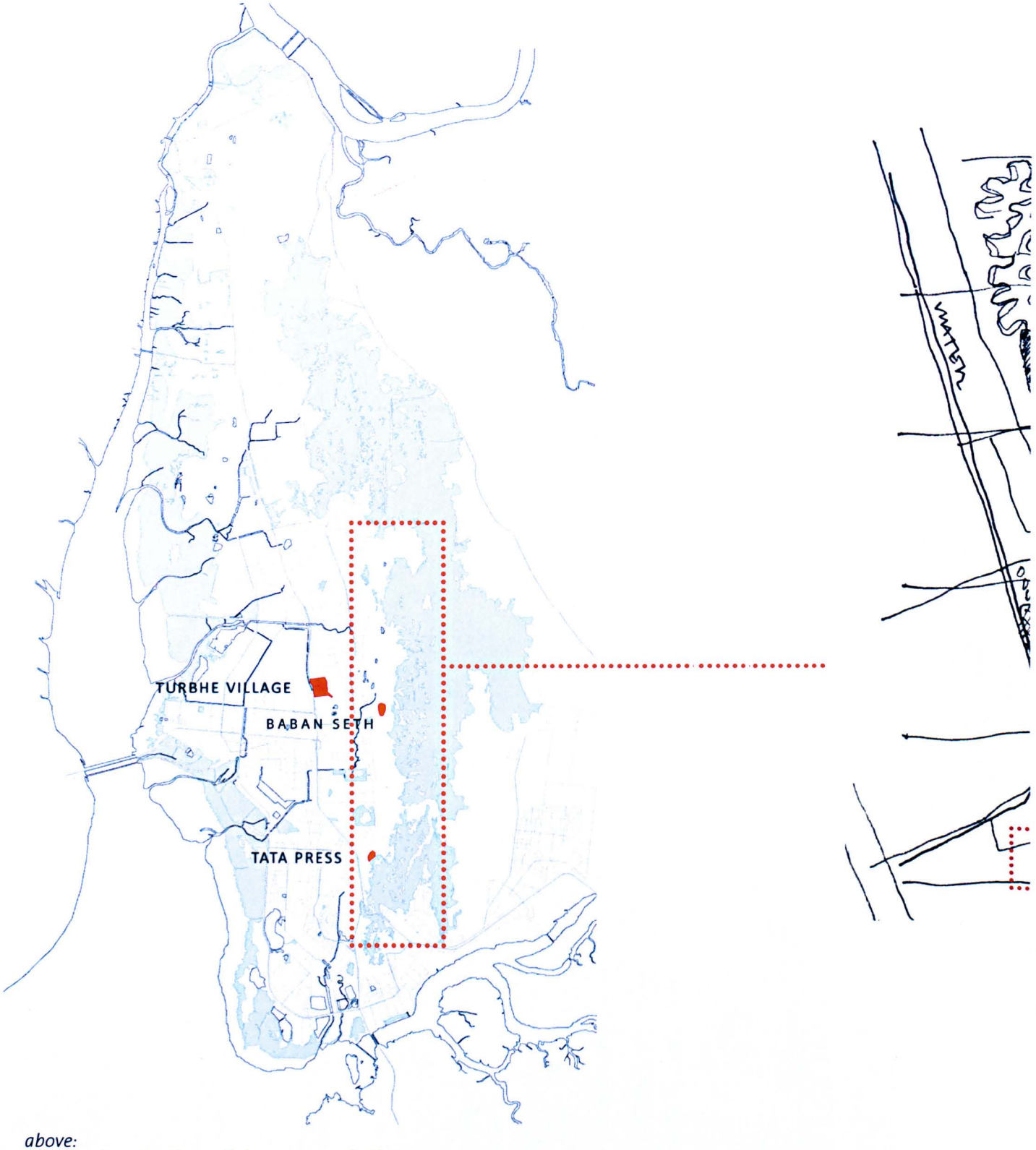


right:
ARPHEN records for newly set up women's Self Help Groups in the quarry settlements, 2009. [Helena McDermott]

2008

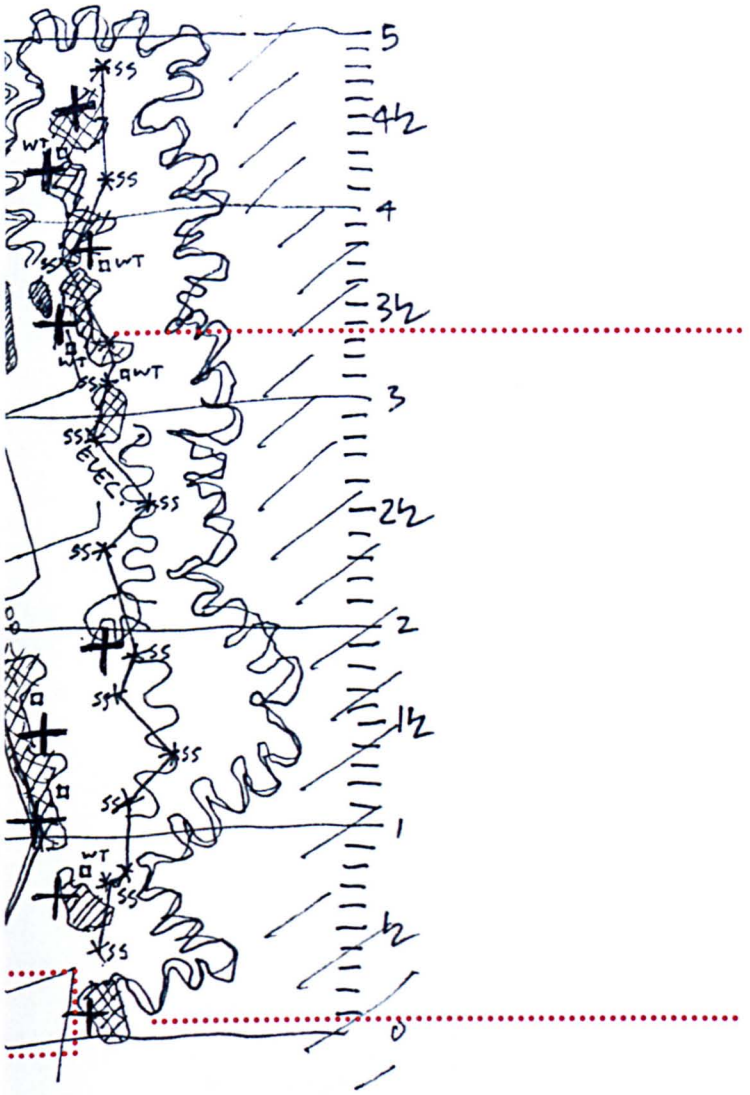
EXPLORING CITY TOPOGRAPHY
Surveying the Ground, Collecting Narratives

Looking for a site, establishing a programme.



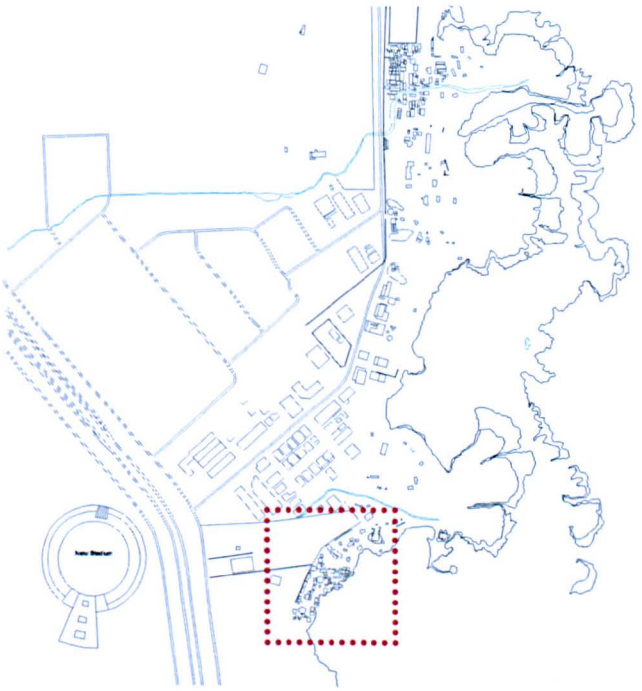
above:
Map locating the Thane-Belapur quarry belt within Navi Mumbai, 2010. [Odel Jeffries]

alternative sites investigated and identified in July 2008.



above:
Sketch map of the Thane-Belapur quarry belt, 2008. [Robert Barnes]

above:
Baban Seth quarry, 2010. [Odel Jeffries after Valerie Saavedra and Paul Watson (2008)]



above:
Tata Press quarry, 2010. [Odel Jeffries after Valerie Saavedra and Paul Watson (2008)]

2009

PARTNERING, COMMUNICATION AND CONTRACTS
Memorandum of Understanding (MOU)

Negotiating a site and land ownership.

facing page and overleaf (pp. 26 & 27):
Signed Memorandum of Understanding between London Metropolitan University, ARPHEN and the Tata Press quarry owner, for use of a site to construct a classroom building for the worker community, 2009.

below:
Celebrating the receipt of a signed MOU at Baban Seth quarry settlement, March 2009. [Shamoon Patwari]

ARPHEN

LONDON metropolitan university

MEMORANDUM OF UNDERSTANDING:
FOR THE USE OF A PEICE OF LAND FROM TATA PRESS QUARRY SITE*

Name of participants:

Project title: **Construction and Facilitation of Community Space**

This **AGREEMENT** is made on the 29th of April 2009.

BETWEEN

LONDON METROPOLITAN UNIVERSITY (LMU), and the Architecture and Spatial Design Projects Office, established to carry out live research projects in conjunction with local partners, in particular looking at the field of the architecture of rapid change and scarce resources.

And
Association of Rural People for Health and Educational Needs (ARPHEN), an NGO based in Navi Mumbai, Maharashtra, and focuses on supporting large numbers of disadvantaged quarry workers, Adavasi and slum dwellers in Navi Mumbai, through providing education for non-school going children, health facilities and community development.

And

Vejnath Haige, current owner/leaseholder of the land proposed as the site for the construction of a permanent Community Space.

Herein after referred to as "the site owner".

This is a written agreement between LMU, ARPHEN and the Site Owner between whom it is proposed that a joint venture be established for the purposes of the construction and facilitation of a permanent Community Space. This agreement shall not constitute a partnership between the parties.

This agreement is specifically limited to the Programme. Any further programme will be subject to a further agreement. The agreement confirms the rights and obligations of LMU, ARPHEN and the Partner covering both the relationship of LMU, ARPHEN and the Partner and aspects of the relationship relating to the Programme in the following areas.

*Please refer to p35 of NAVI MUMBAI STONE QUARRY SETTLEMENTS: 10 COMMUNITY SPACES Document by LMU

2. PROGRAMME AND DURATION

The Sites Owner will agree to the use of the aforementioned site by LMU, ARPHEN and agreed collaborators, to design and build a permanent structure, which will serve as a community facility, servicing the needs of the quarry workers and residents for an agreed period of time 7yrs . Upon completion of this duration, and with the agreement of the site owner, the use of the Community Space may be extended. Any alternations made to the site will be prior agreed with the site owner.

3. MANAGEMENT OF PROGRAMME

P.K. Nayak, ARPHEN Director will be the overall manager of the programme. Bo Tang and Shamoon Patwari will have primary responsbility for the LMU Team ensuring maintenance of quality and standards, including the appointment of and roles/responsibilities of manual tasks.

Site Owner will be directly consulted/informed of any changes made to the programme by the manager.

4. RULES AND REGULATIONS

LMU will issue site-specific regulations covering areas such as Health and Safety, to which all participators must adhere.

5. QUALITY ASSURANCE

LMU and ARPHEN take responsibility for ensuring the quality of construction and any further works carried out.

6. SUSPENSION AND WITHDRAWAL FROM THE PROGRAMME

LMU reserves the right to withdraw from the programme should the feasibility of the site not meet requirement.

Should the site owner or ARPHEN wish to withdraw from the agreement, they should serve on the other parties a written notice of intent to withdraw from the agreement no later than weeks prior to the desired date of withdrawal.

7. DURATION OF THE AGREEMENT AND REVIEW ARRANGEMENTS

The agreement is established for an initial period of 24 months from the date of this agreement and is subject to extension by agreement.

Agreed on Behalf of *(TATA PRESS)*

Date

29/4/09

Agreed on Behalf of ARPHEN

Date

20/4/09

Agreed on Behalf of LMU

Date

18/10/09

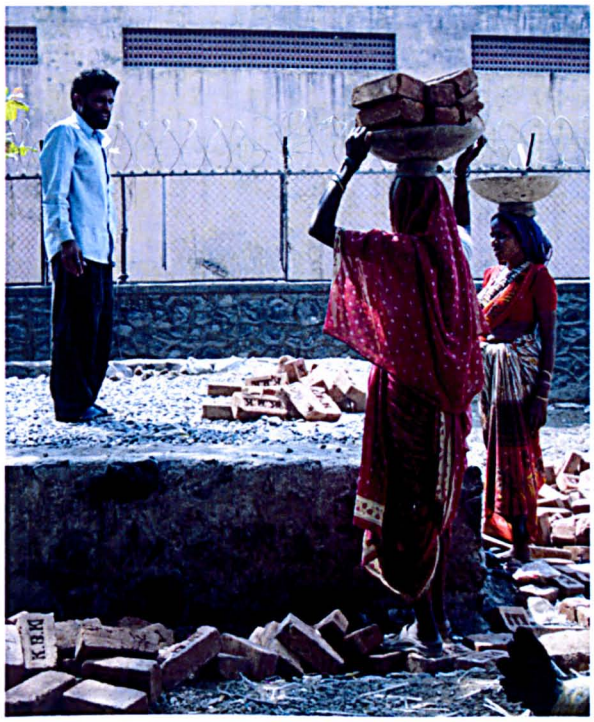
2009

A WAY OF MAKING
Constructing Baban Seth Quarry Classroom

Imagining, representing, engaging, collaborating.

above:
Facilitated by staff from NGO ARPHEN, we conducted a community meeting with residents from Baban Seth quarry worker settlement, held at the temple square. March 2009. [Helena McDermott]

left:
We used games to engage children in the community classroom construction process. Here, we were envisioning the size of the building prior to digging foundations, March 2009. [Shamoon Patwari]



above:
Working closely with local residents and contractor, Baban Seth settlement, March 2009.

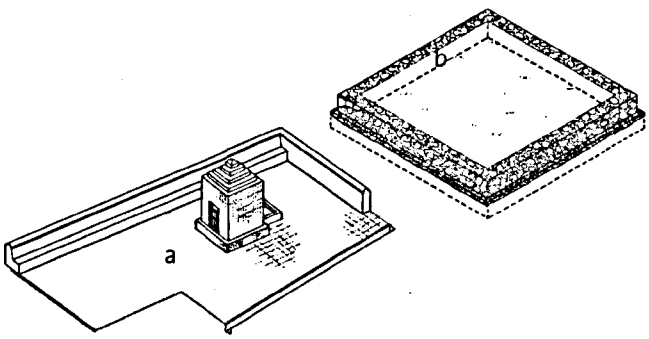
above:
Setting out the site with the help of local volunteers, March 2009. [Helena McDermott]

below:
Laying the marble chip flooring at Baban Seth quarry worker settlement, March 2009.

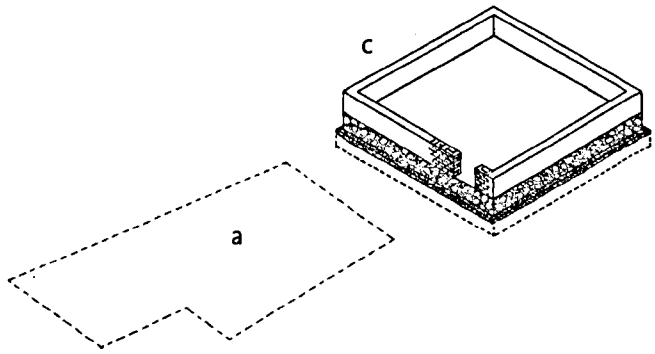
A WAY OF MAKING
Constructing Baban Seth Quarry Classroom

Ensuring fit, engaging experimentally, proceeding incrementally, establishing competence, accepting a duty of care.

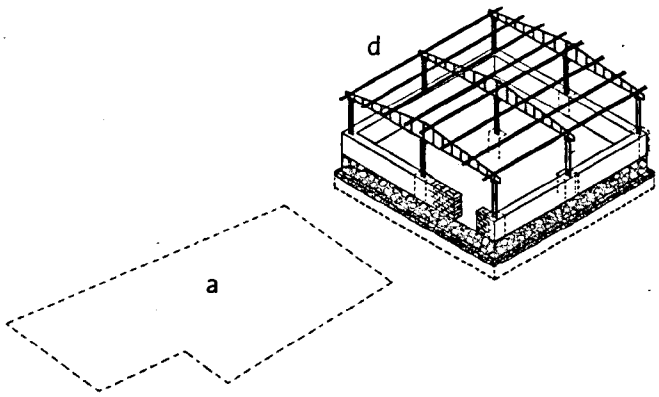
Week 1



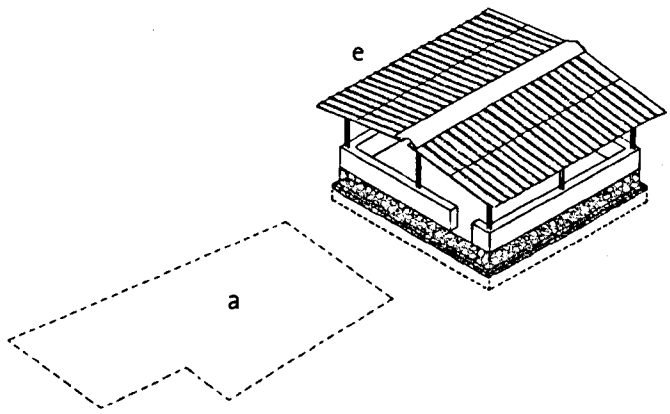
Week 2



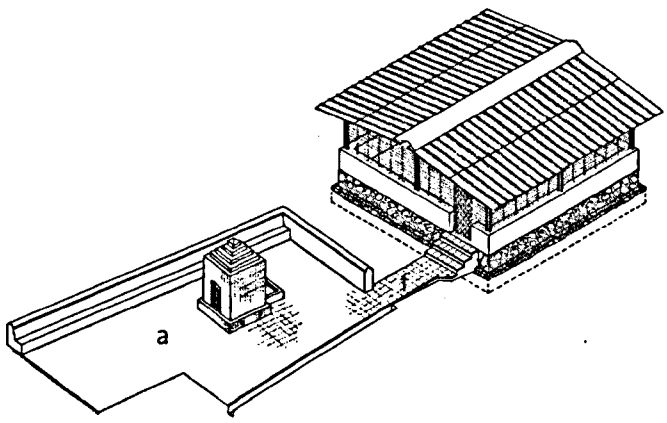
Week 3



Week 4



Week 5



this page:
Development of the classroom building at Baban Seth quarry worker settlement, March 2009.

Key

a. temple shrine
b. plinth
c. low brick wall
d. steel frame
e. corrugated plastic roof
f. new tiled path

BABAN SETH QUARRY CLASSROOM

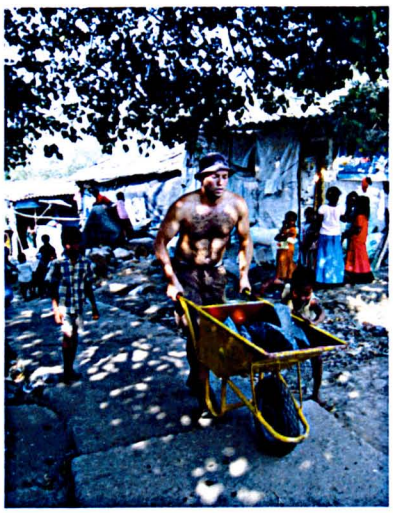
above:
Completed classroom building at Baban Seth quarry worker settlement, March 2009. [Helena McDermott]

right:
The classroom building during construction. The design and materials used fit the context of the local quarry vernacular, Baban Seth quarry worker settlement, March 2009. [Shamoon Patwari]

2009

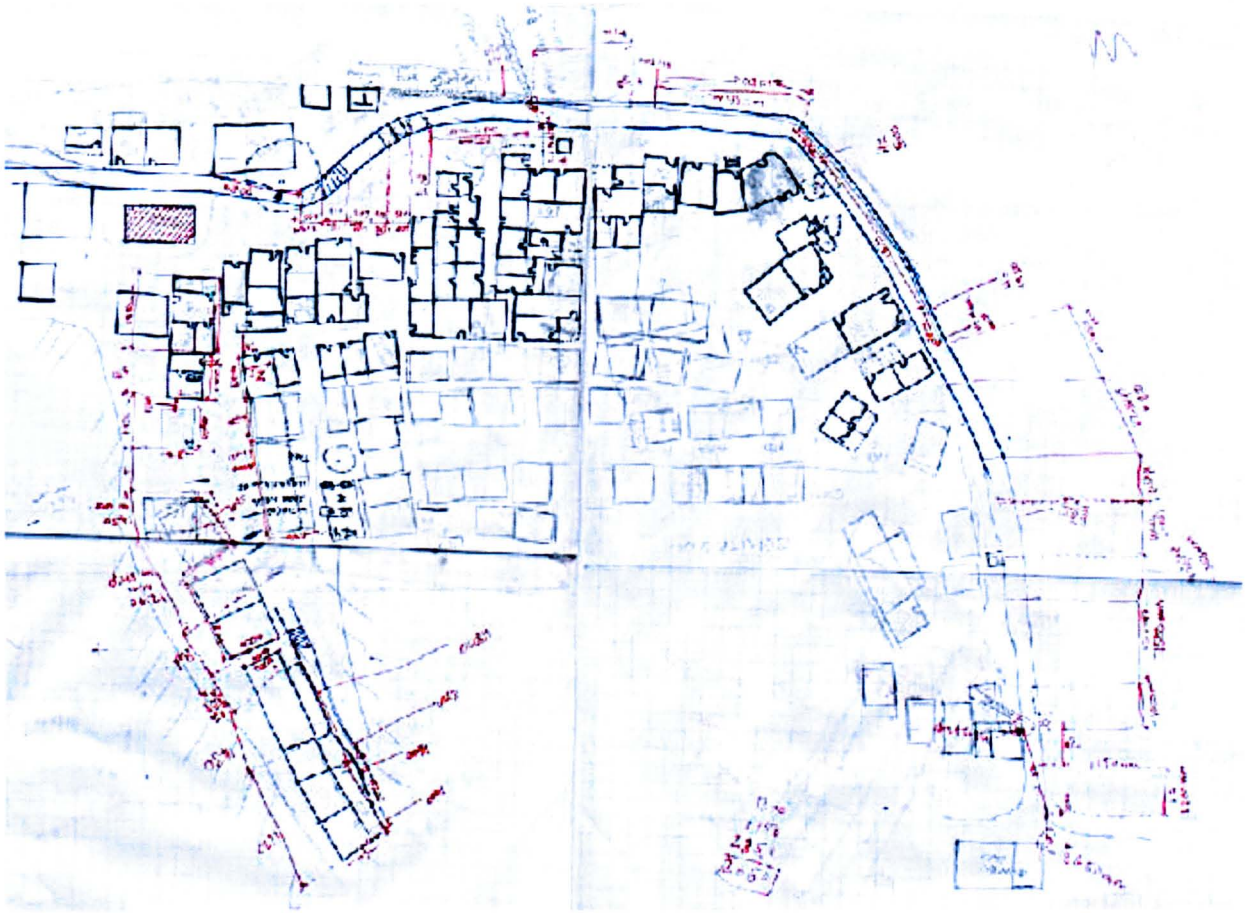
...AND REMAKING
Constructing Tata Press Quarry Classroom

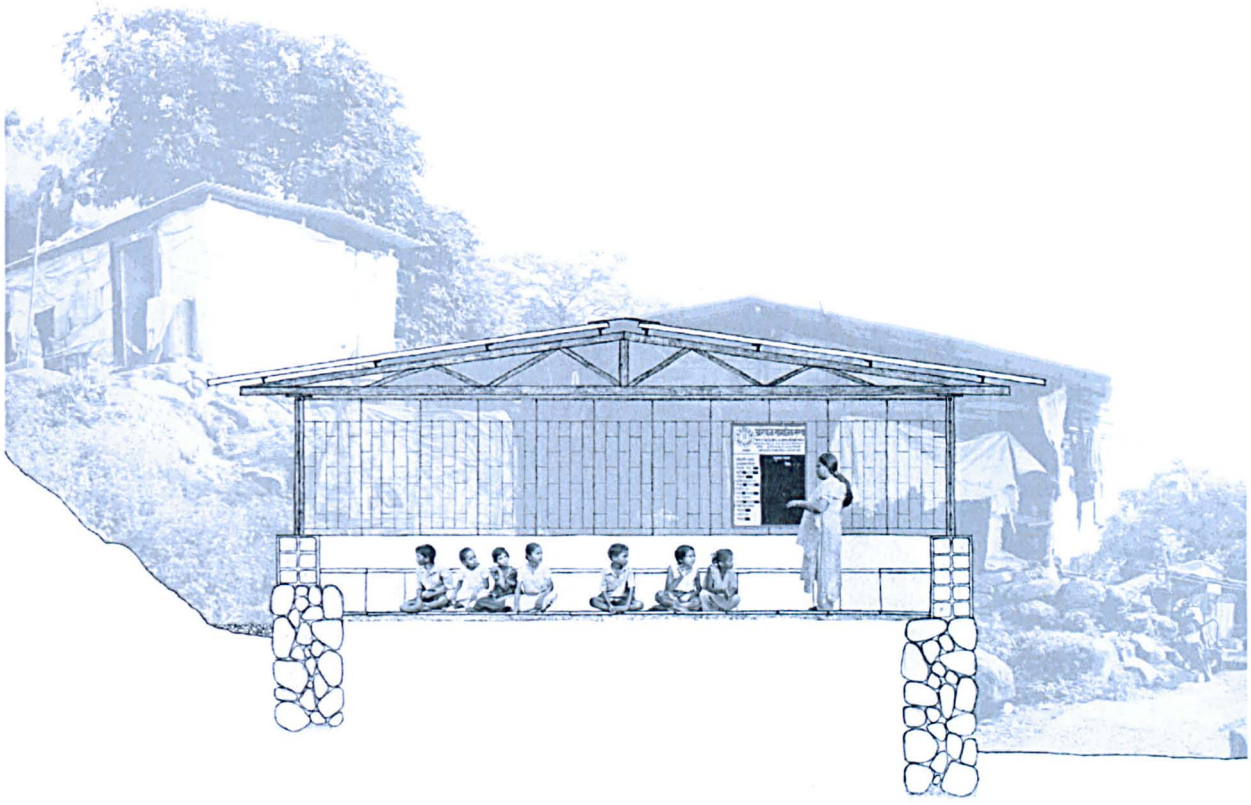
Casting around and investigating new territories.
Establishing what is typical and what is not.
Adapting the narrative.



left:
Together with LMU students, we worked with local resources - skills and materials (such as stone from the quarry), October 2009.

below:
Student survey of Tata Press quarry settlement and classroom site, Nov 2009. [Hawar Sargalo]





above:
Section through Tata Press quarry classroom showing the sloping topography of the site, 2009. [Toby Pear]

left:
Constructing the entrance steps at Tata Press quarry settlement, Nov 2009. [Shamoon Patwari]

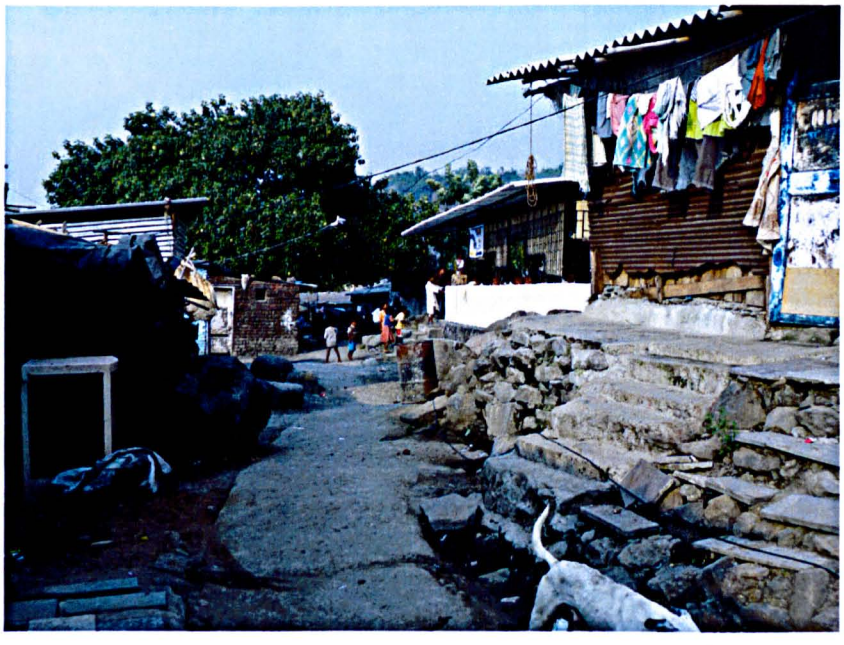
2009

TATA PRESS QUARRY CLASSROOM

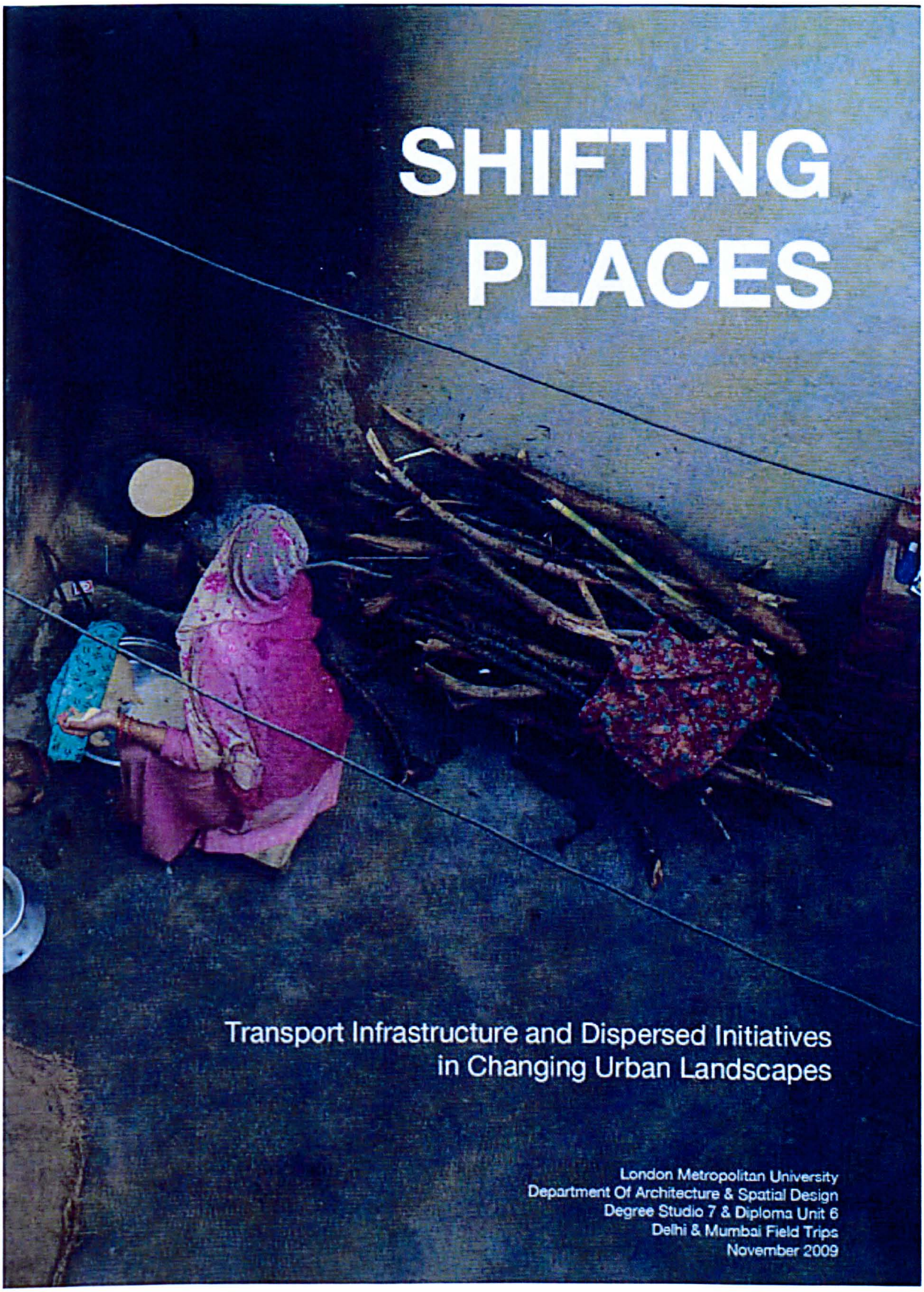
Contributing to streetscape.

above:
Completed classroom with additional open veranda at Tata Press quarry worker settlement, Nov 2009. [Audrey LeMatte]

facing page:
Shifting Places studio booklet 2009/10.



right;
View of Tata Press quarry classroom along the street, Nov 2009.


SHIFTING
PLACES
Transport Infrastructure and Dispersed Initiatives
in Changing Urban Landscapes
London Metropolitan University
Department Of Architecture & Spatial Design
Degree Studio 7 & Diploma Unit 6
Delhi & Mumbai Field Trips
November 2009

MARKING CHANGE
Celebrating newly shared territories

Representing new practices.
Building Institutions.

right:
Inauguration ceremony at Baban Seth quarry classroom attended by local residents, quarry owners, students and NGO staff, March 2009. [Helena McDermott]

below:
Inauguration ceremony at Tata Press quarry classroom attended by local residents, quarry owners, students and NGO staff, November 2009. [Shamoon Patwari]

UPGRADING CLASSROOMS
Celebrating change

Engaging community in upgrading and making improvements to the building fabric.

left;
Additional steel grilles and lockable gate installed at Tata Press quarry classroom by the community to provide security around the open veranda area, November 2010.

below:
Improvements including fans, lighting, new tiled floor and monsoon blinds and shades made to Baban Seth quarry classroom in March 2010.

SUPPORTING CHANGE
Consolidating Local Institutions

Testing the boundaries.
Negotiating the edges.

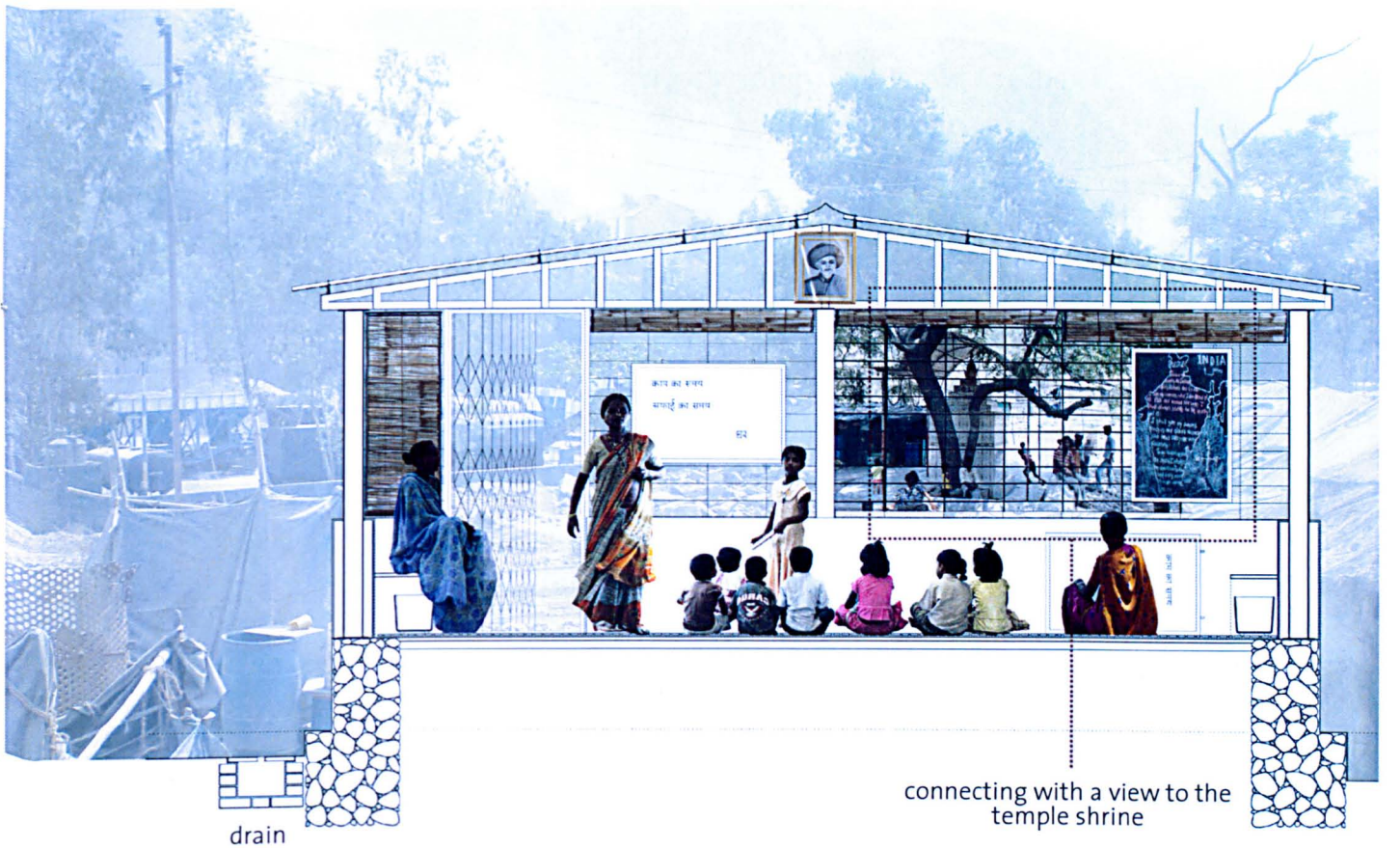
left:
Upgraded classroom building at Baban Seth settlement, March 2010.

right:
Section drawing through the completed classroom showing a bridge class at Baban Seth settlement, 2011.

below:
A new shared space bridging the sacred and secular - temple square and classroom building, 2013.

tiling and

CRAFTING ADJACENCIES



FREEDOMS AND OPPORTUNITIES
Process of embodied making

Making better engagement with city opportunities.

left:
A *balwadi* (pre-school group) taking place at Tata Press quarry classroom, August 2011. [ARPHEN]

below:
Sewing class at Tata Press quarry classroom, August 2011.

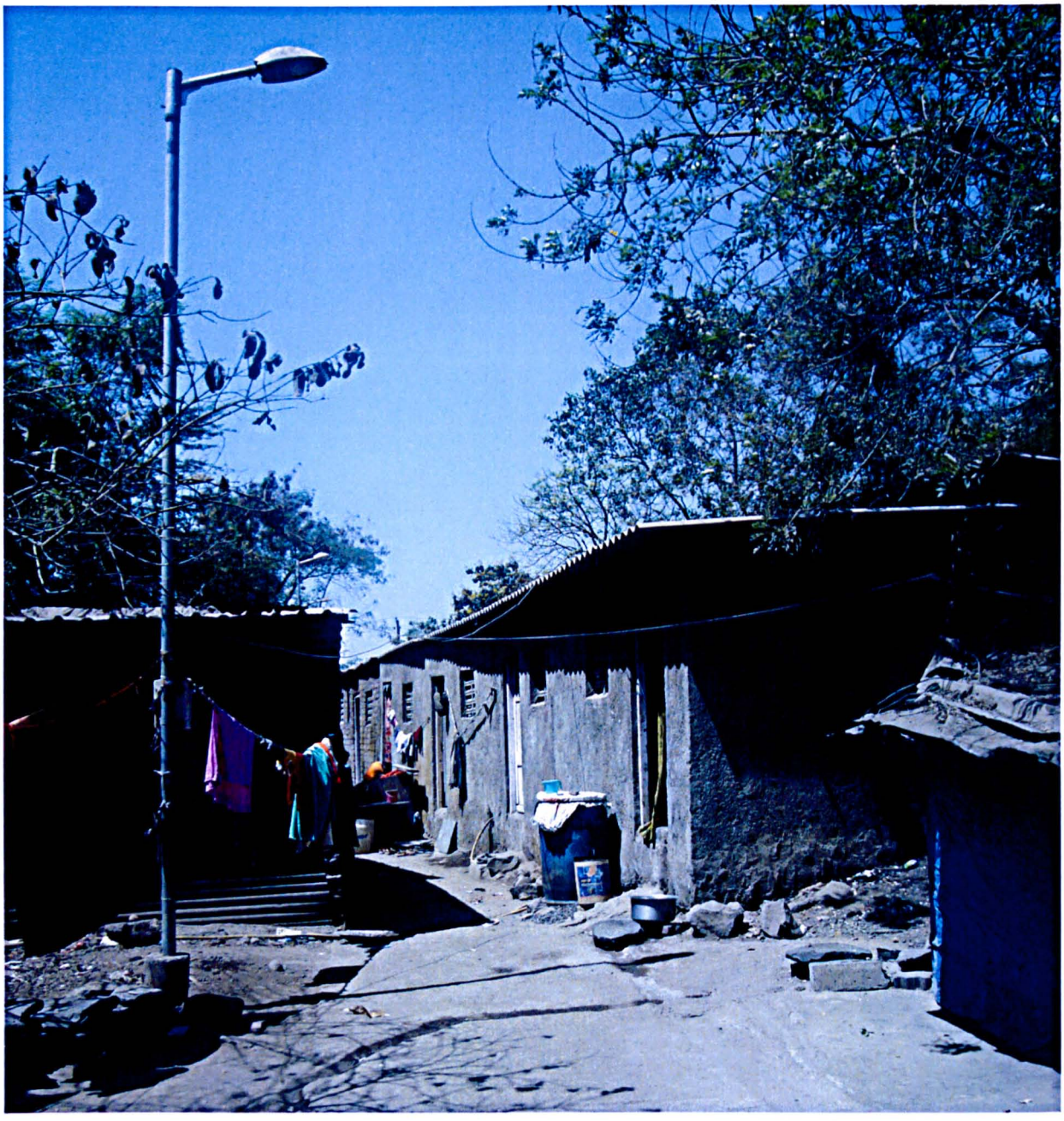
right:
Health workshop and awareness campaign at Tata Press quarry classroom, April 2011. [ARPHEN]

below:
Women's Sports Day held on a open patch of land adjacent to Baban Seth quarry settlement, March 2010.

CONSOLIDATING CHANGE: BUILDINGS AND STREETS
Moving From Temporary to Permanent Settlement Fabric

Migrant to citizen.
Inviting a civic presence.
Linking with city infrastructure.

below:
New '*pucca*' (permanent) housing constructed by the quarry owner for workers following the completion of the classroom building at Baban Seth settlement, April 2012, New street lighting was installed in January 2013 by the local Corporator (local authority governing official). The pathway was concreted in August 2011. These improvements have been implemented since the construction of the classroom building in March 2009.

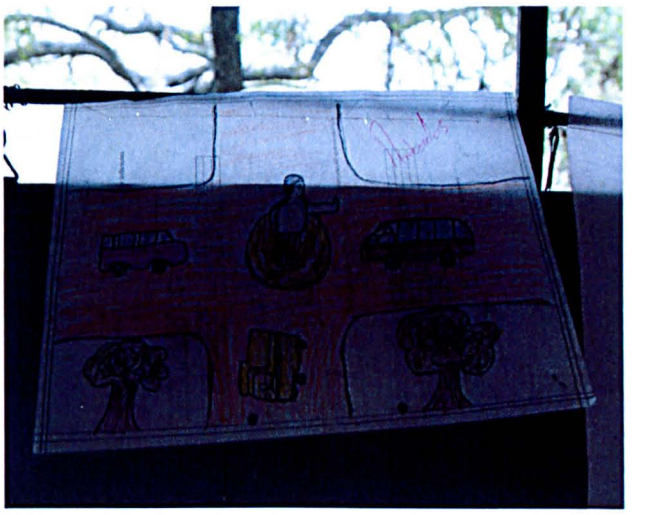


above:
New water taps installed by the local Corporator at Baban Seth settlement, November 2012.

left:
New formalised drains with concrete covers installed by the local Corporator throughout the settlement at Baban Seth quarry worker settlement, 2011.

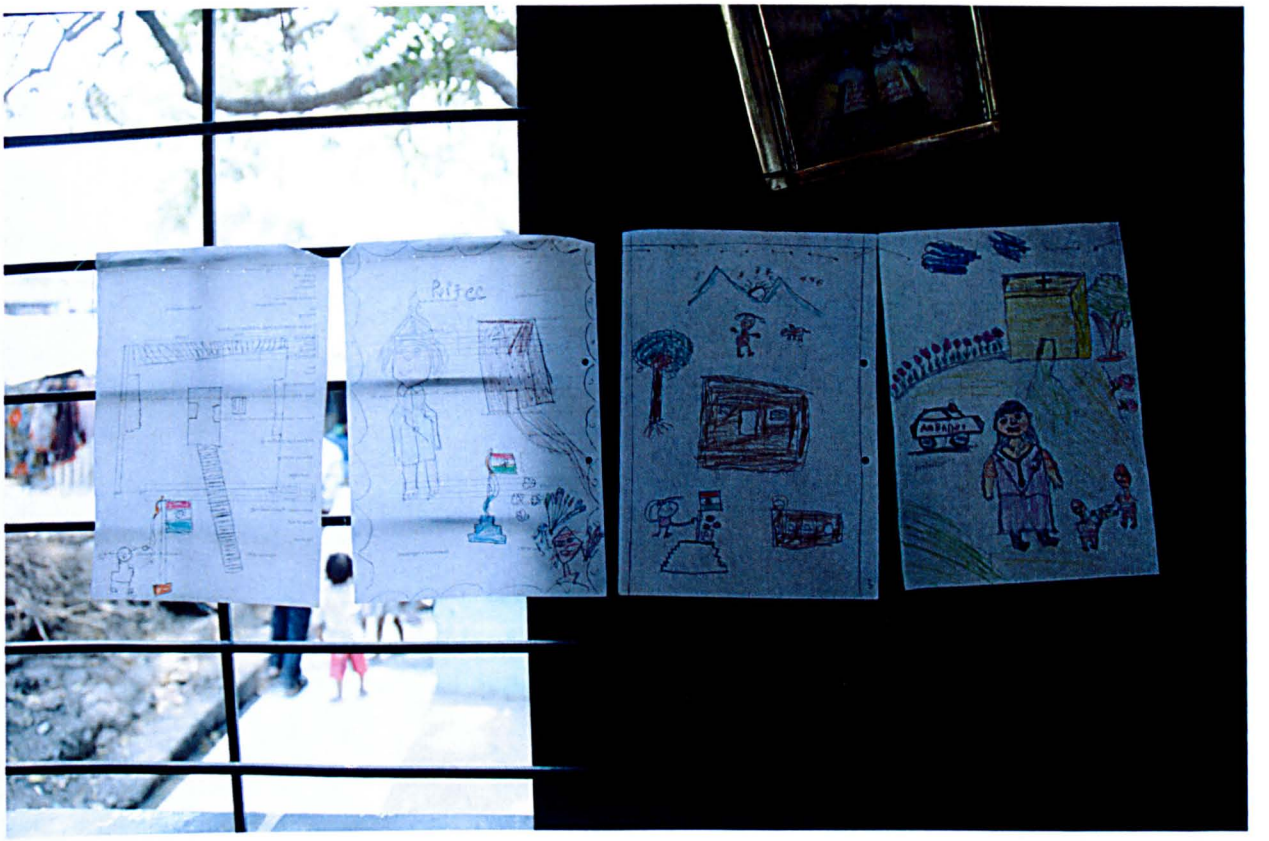
DRAWING WORKSHOP
Baban Seth Quarry Classroom

below from left to right:
Drawing of a quarry worker, policeman and farmer.



above:
Drawing of a traffic policeman.

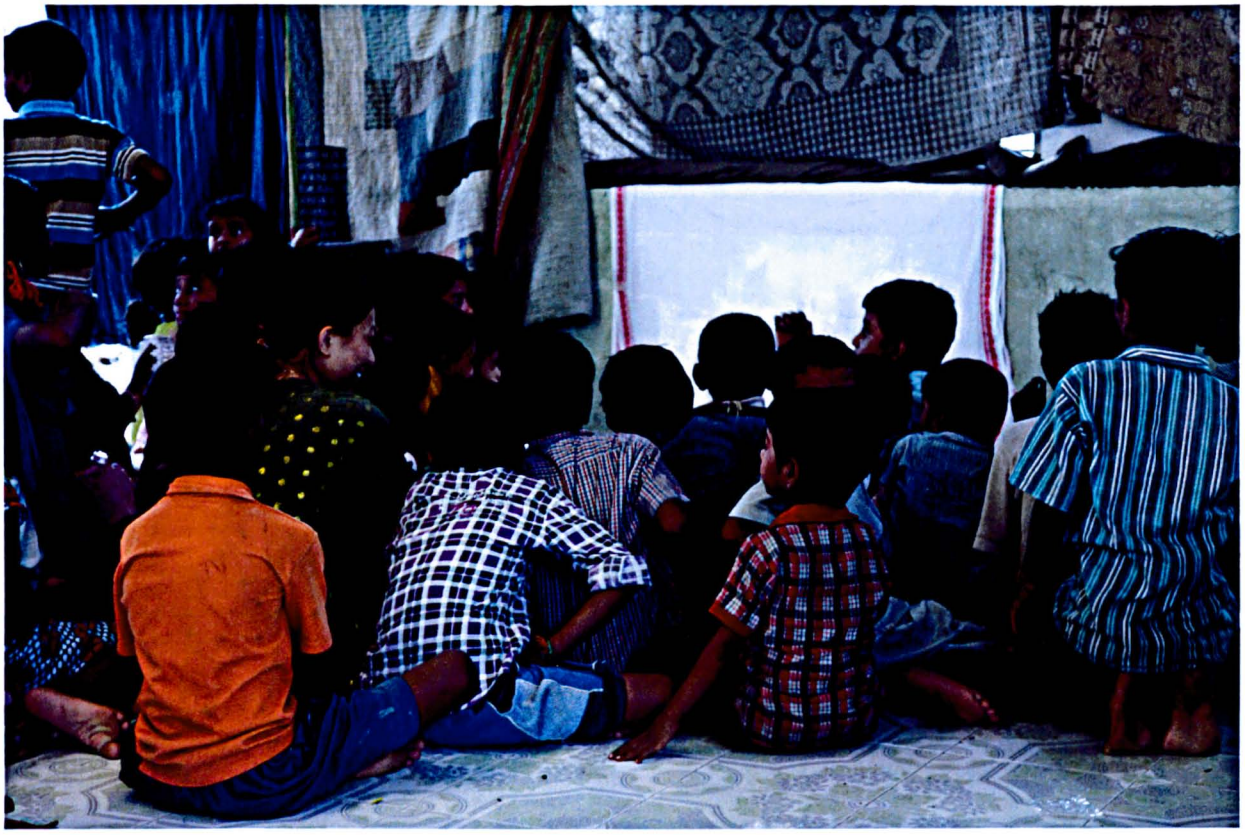
this page and facing page:
I conducted a drawing workshop with children, asking them to draw their family trees and 'what you want to be when you grow up', Baban Seth quarry classroom, April 2012.



PROJECT ACTIVITIES
Engaging Quarry Worker Communities

right:
Whilst we were constructing the classroom building at Baban Seth quarry settlement, film maker Blake Hodges volunteered to make a short documentary exploring the lives of migrant quarry worker communities and the work of ARPHEN whilst documenting the build process, March 2009 (documentary completed in 2010). [Helena McDermott]

below:
During a visit to the quarry settlements, I brought with me the documentary and a projector to show to the residents of Baban Seth in the classroom building, July 2011. [Odel Jeffries]



left:
Facilitated by ARPHEN, I had conversations with newly set up women's Self-Help Groups (SHGs) in the quarry settlements. Rather than prepare finite questionnaires using an interview format, I kept the discussions casual and open to allow for free conversation that could take any direction, April 2012. [Shamoon Patwari]

below:
In order to generate a discussion about constructing a third classroom with the community and quarry owner at Royal Stone quarry (northern sector), I showed them images of the completed classroom buildings at Baban Seth and Tata Press, April 2012. [Shamoon Patwari]

Dissemination

2008 2009

Generating brief:
- Saavedra & Watson - 10 Community Classrooms.
Field Report, London Metropolitan University

Attracting student researchers:
- *ASD Projects*
Exhibition, London Metropolitan University

Raising profile within India:
- *Learning From Delhi*
Exhibition, SPA, New Delhi

Raising profile and attracting funding:
- *Aiding the Forgotten* - Blake Hodges
Documentary

Establishing practice credibility:
- Architect's Journal Small Projects Award
Shortlisted

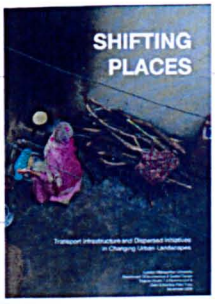
Deepening the discourse:
- *Proposals for Turbhe / Shifting Places*
Student theoretical design projects and studio booklet

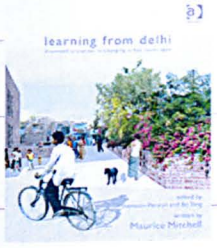
Establishing academic credibility:
- Mitchell, M. *Learning from Delhi*
Published book
- Pear, T. & Mitchell, M. *Live Projects... Studio Teaching*
Academic paper: Intercultural interaction
- *Learning From Delhi* - Book Launch
Exhibition, London Metropolitan University

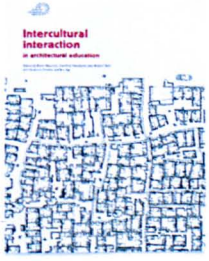
Discourse as seedbed for establishing early careers:
- *Provoking Architecture: Live Projects as Research*
Exhibition, London Metropolitan University
- Tang, B. *Quarry Schools: Building Community Classrooms*
Journal paper: Children, Youth and Environments

Developing theoretical discourse:
- Tang, B. *Negotiating Shared Spaces...*
Presentation, Scarcity conference, University of Westminster
- Tang, B. *Negotiating Shared Spaces...*
Presentation, Shelter Forum Pecha Kucha, UCL
- Tang, B. *Negotiating Shared Spaces...*
PhD by Practice thesis.
- Tang, B.. *Negotiating Shared Spaces...*
Journal paper: Planum, The Journal of Urbanism

2010 2011 2012 2013







PROJECT DRAWINGS

1.4.1 Kachhpura Settlement Upgrading Project, Agra

1.4.2 Quarry Classrooms Project, Navi Mumbai

3.2.1 *Galis* and *Otlas*

3.2.2 Brijesh Singh's Family Home

3.2.3 Meera's Toilet

3.2.4 Bhajan Lal's New House

3.3.1 A Place to Wash

3.3.2 The Community Toilet Complex

3.3.3 A New Clean Pedestrian Thoroughfare

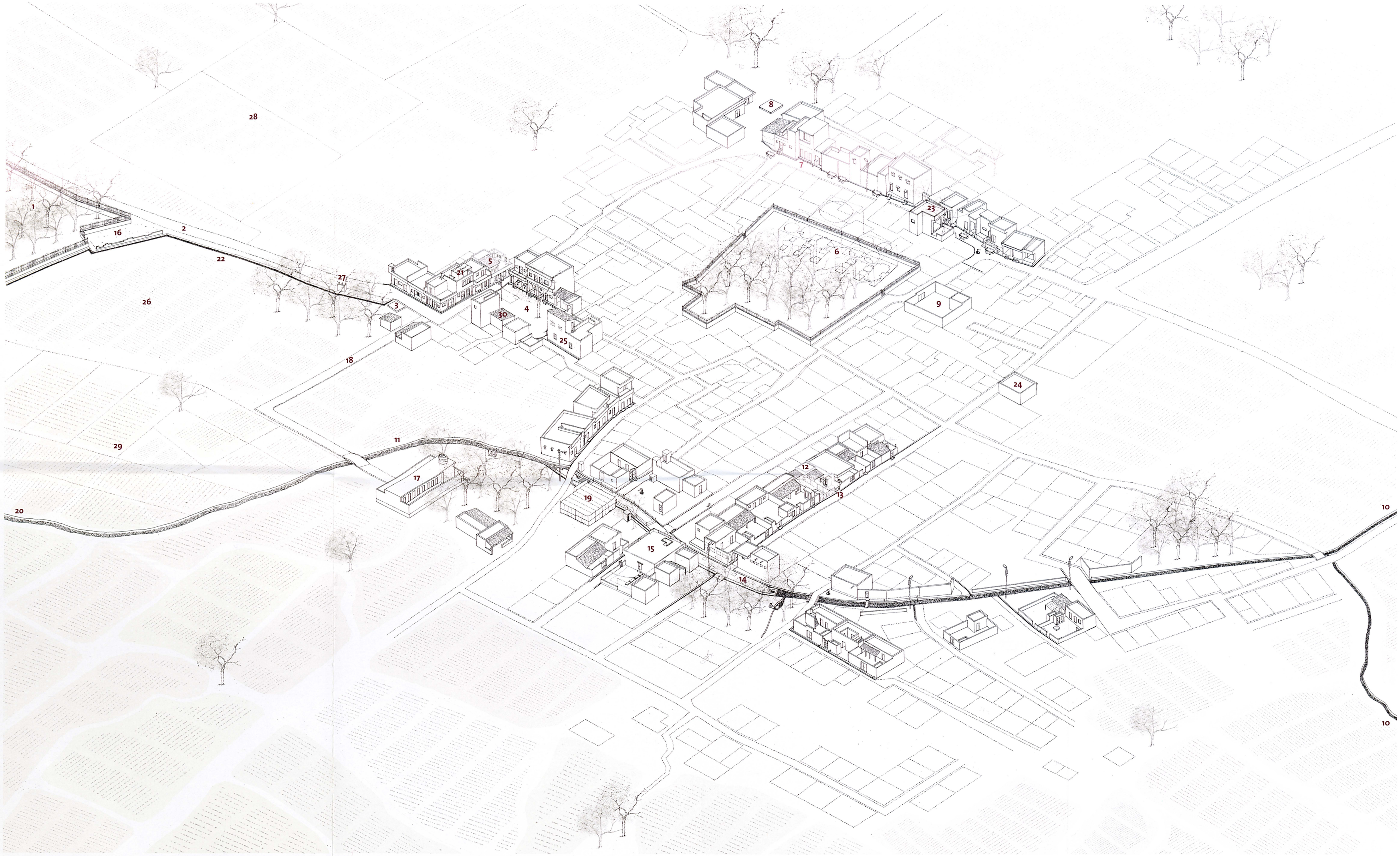
3.3.4 A Celebration Place

3.4.1 The Meeting Mat

3.4.2 The *Mandir Chowk*

3.4.3 The *Panchayat Chowk*

3.4.4 The Community Platform

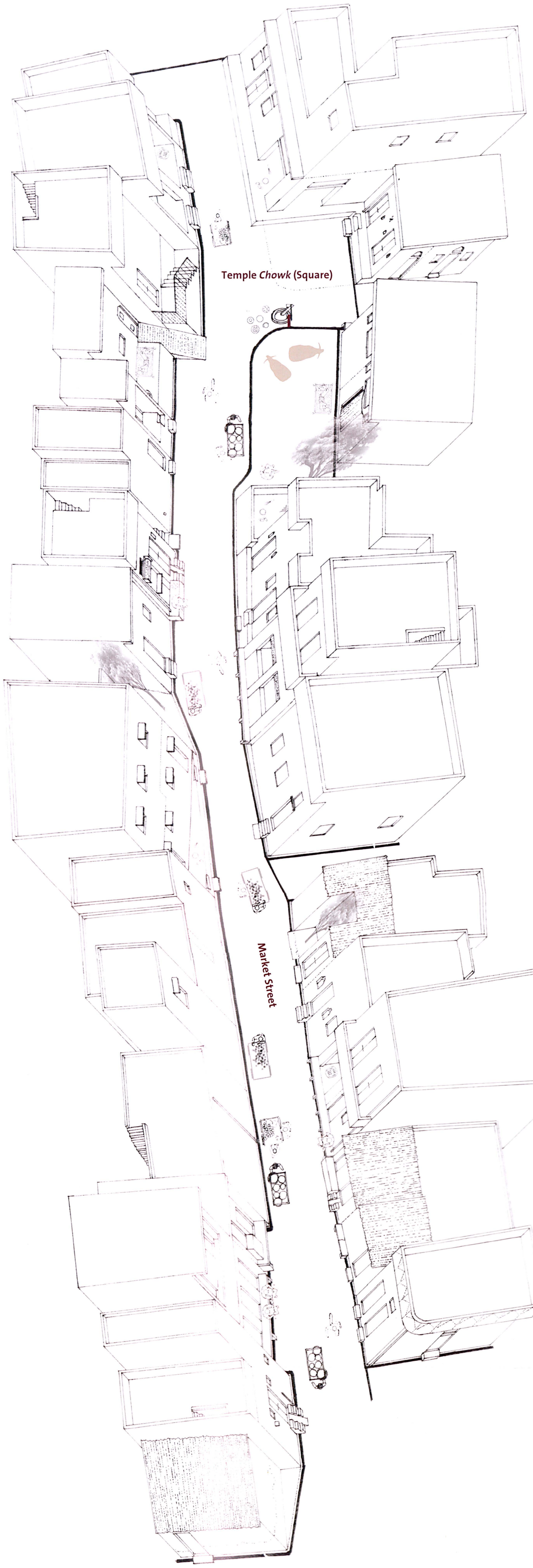


1.4.1 Kachhpura Settlement, Agra

1 *Mehtab Bagh* (Moonlight Garden)
2 'Poo' Road
3 Community Platform (South entrance)
4 *Panchayat Chowk* (Main Square)
5 Brijesh Singh's dwelling
6 Humayun's Mosque
7 Market Street
8 Community Platform (West entrance)
9 Gym
10 Untreated effluent from settlements upstream
11 Primary New Kachhpura *nala* (open drain)
12 Meera Devi's dwelling
13 *Swaach Gali* (Clean Street)
14 Decentralised Waste Water Treatment System (DEWATS)
15 Bhajan Lal's dwelling
16 Old Community Toilet Complex (CTC)
17 New CTC
18 New road to CTC (unfinished)
19 Temporary marriage *pandal* (tent structure)
20 Partially treated effluent to Yamuna River
21 New rooftop tea terrace
22 Secondary Old Kachhpura *nala*
23 Hindu temple
24 Former NGO site office (CAP)
25 Primary school
26 Low lying fields flooded in monsoon
27 Disused urinal structure
28 Fields irrigated with water from primary *nala*
29 Fields irrigated with water from secondary *nala*
30 Current NGO site office (CAP)

1.4.2 Baban Seth Stone Quarry Worker Settlement, Navi Mumbai

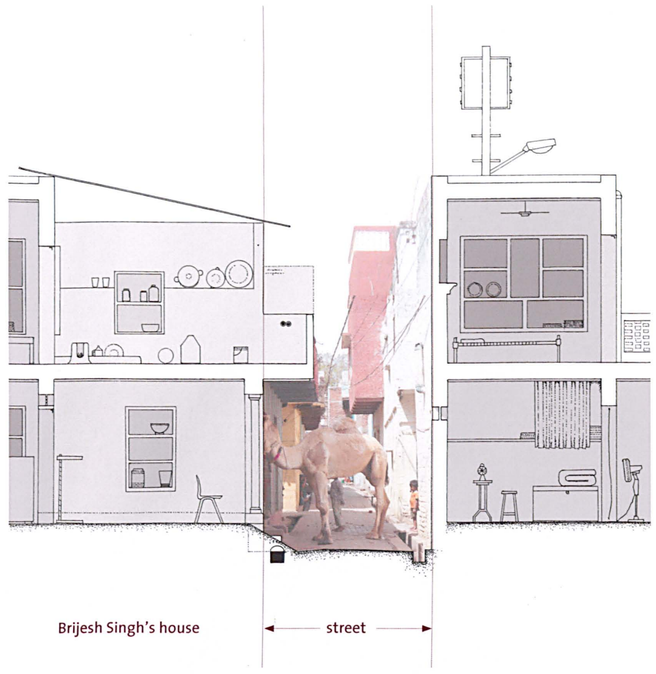
1 Quarry zone
2 Disused crushing machinery
3 Quarry owner's office
4 Stone crushing area
5 Electricity pylon
6 Retaining wall
7 Main road
8 Factory buildings
9 Boundary wall
10 Main entrance street to settlement
11 Back entrance alley to settlement
12 *Kuchha* (temporary) market stall
13 *Mandir Chowk* (Temple Square) and Lakshmi temple
14 Tayama's house
15 Worker's lunch stop
16 Tyre repair shop and guesthouse
17 Tayama temple
18 Hera Bai temple
19 New classroom building (former rubbish site)
20 New concreted pathway
21 New covered drains
22 New municipal water taps
23 New street lighting
24 New *pukka* (permanent) housing



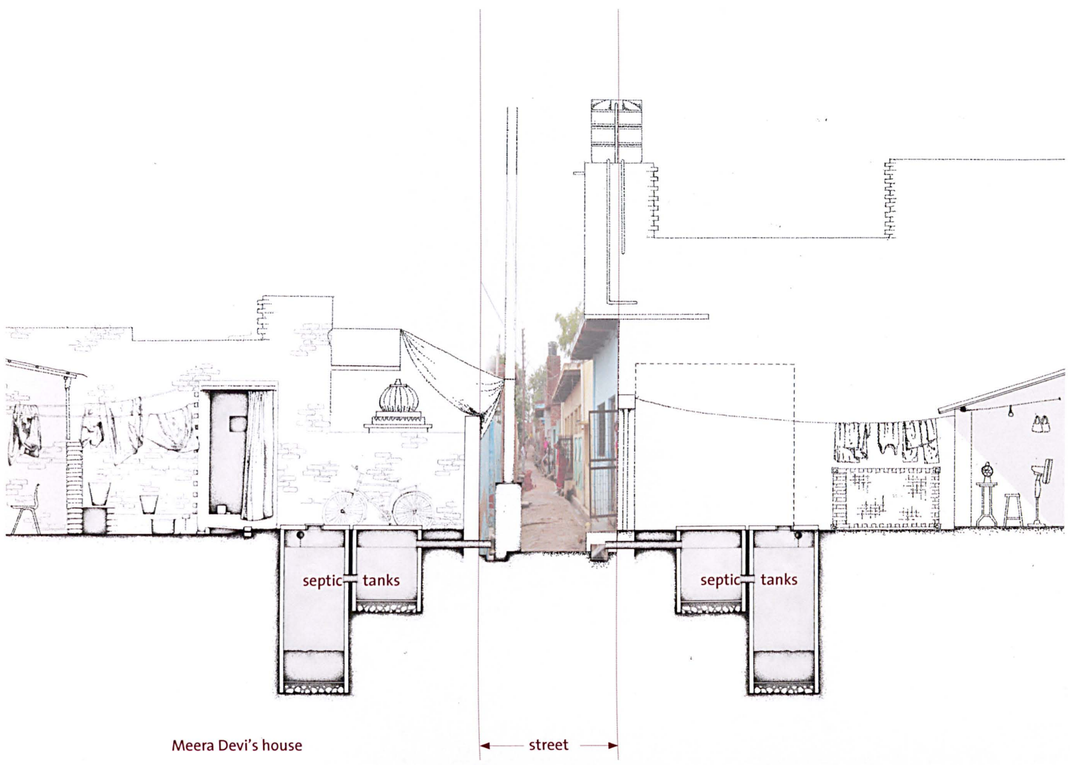
A - Sketch Plan of Market Street

0 1 2.5 5 m

3.2.1 *Galis* and *Otlas* - Market Street, Kachhpura, Agra

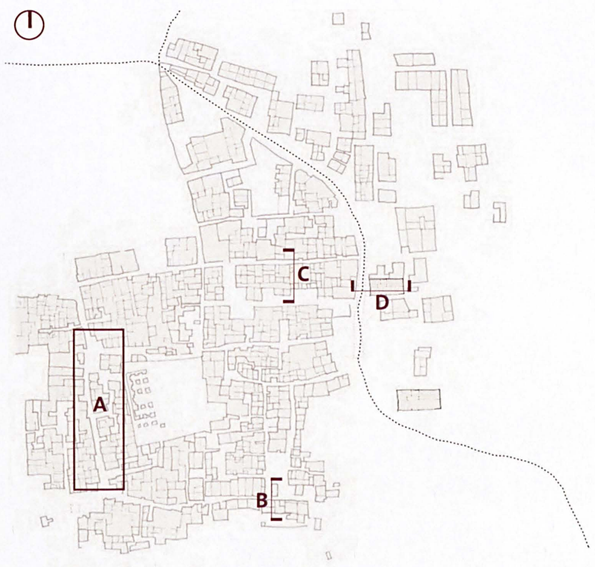


B - Section Through a Street in the *Purani Abadi* (Old Area)
(Brijesh Singh's House)



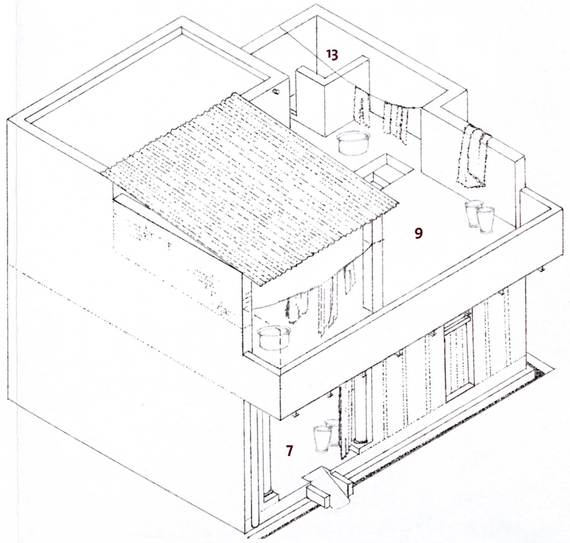
C - Section Through *Swaach Gali* (Clean Street) in the *Nai Abadi* (New Area)
(Meera Devi's House)

D - Section Through the New DEWATS Thoroughfare in the *Nai Abadi*
(Bhajan Lal's House)

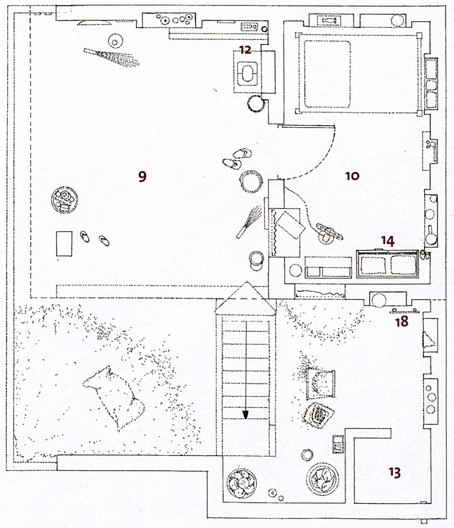


Kachhpura Key Plan

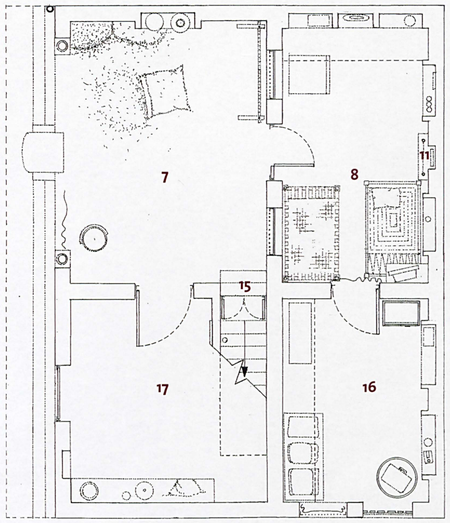
Kachhpura Key Plan



Axonometric Sketch of Brijesh Singh's Dwelling



1st Floor Plan



Ground Floor Plan

Section Through the *Panchayat Chowk*, Brijesh Singh's Family Home and the Local Primary School

0 1 2.5 5 m

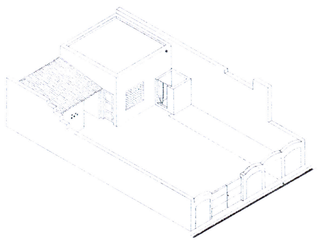
3.2.2 Brijesh Singh's Family Home, Kachhpura, Agra

PANCHAYAT CHOWK

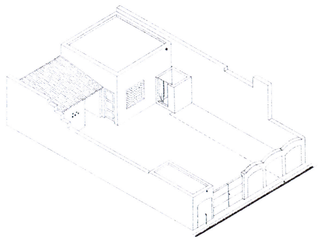
1 Local primary school
2 New septic tank system (for children's toilets)
3 Water handpump
4 *Neem* tree
5 *Soochna Sansadhan Kendra* (SSK) - NGO site office
6 New street lighting (solar powered)

BRIJESH SINGH'S FAMILY HOME

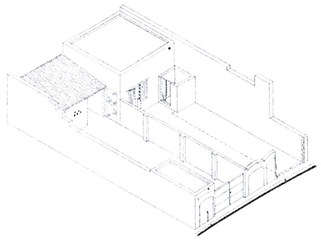
7 *Otla* (transitional threshold veranda)
8 Brijesh's parents' and siblings' room
9 *Chhat* (roof terrace)
10 Brijesh and his wife's (Preeti) room
11 *Puja* (prayer) corner
12 *Chula* (cooking stove)
13 Wash area
14 Lockable cupboard
15 Lockable door to staircase
16 Storeroom
17 Motorcycle store
18 Ladder to roof



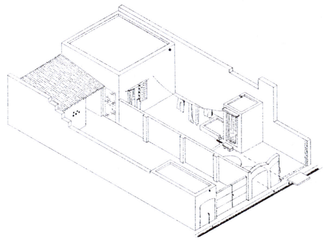
1992



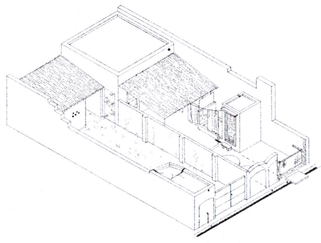
1995



Early 2007



July 2007

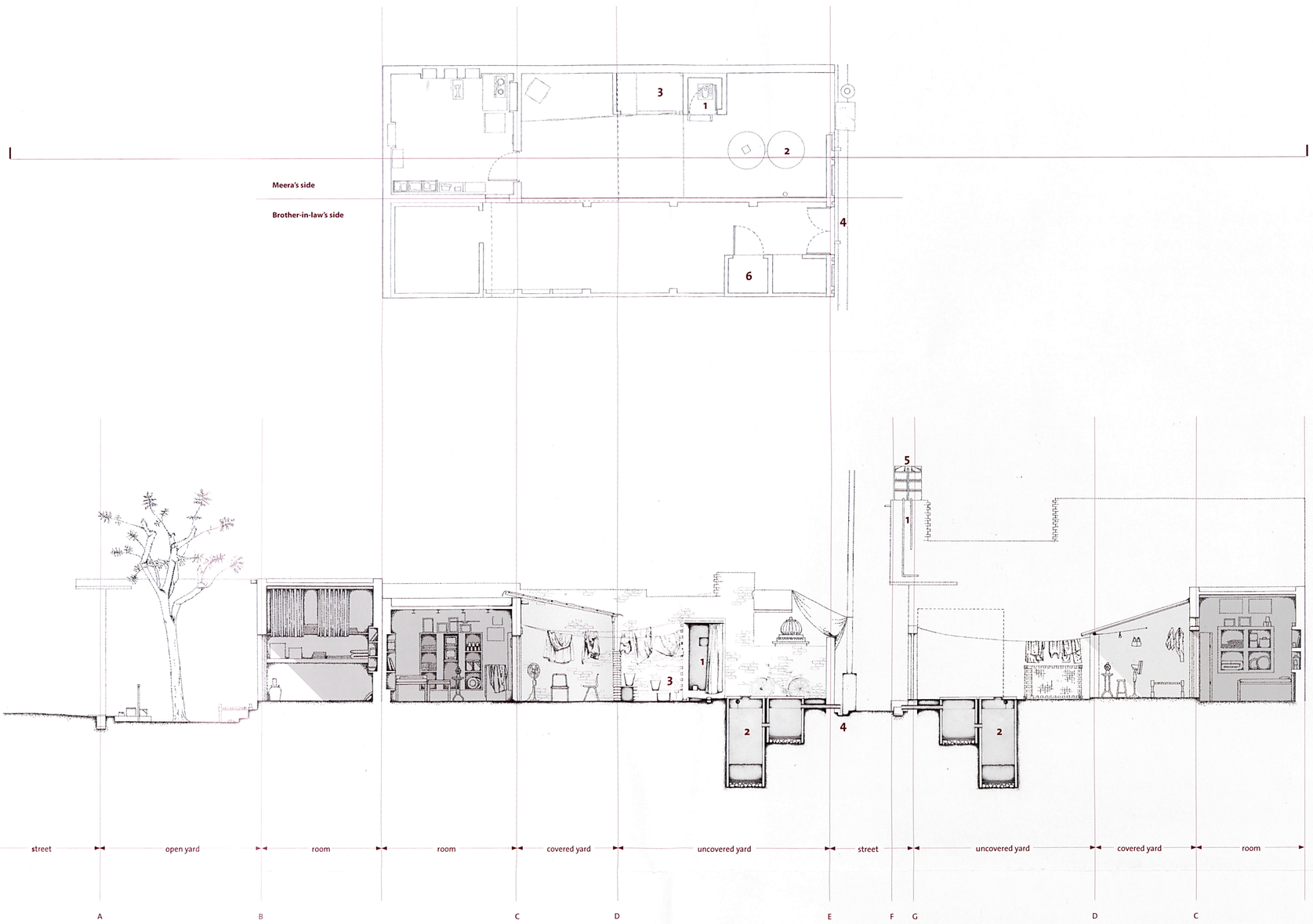


2008-2012

Development of Meera's House
The Toilet Dispute

1992	Meera gets married and moves to from Belaganj (in Agra) to Kachhpura with her husband at the age of 20. They reside in a shared dwelling with her younger brother-in-law.
1995	A toilet is constructed in the yard, paid for and instructed by Meera's husband.
Early 2007	Meera's elder brother-in-law dies. The younger brother-in-law demands that the ownership of the land is divided between the two brothers, despite protests from Meera and her husband. A wall is constructed dividing the plot into two parts. The toilet ends up in the younger brother-in-law's plot and Meera no longer has access to a toilet.
July 2007	Meera signs up for the pilot toilet scheme and becomes the first person to construct an improved septic tank toilet in her home in Kachhpura. Younger brother-in-law sells his land and moves out of Kachhpura. The plot is locked up and the property is left to fall into disrepair.
2008-12	Meera makes improvements to her home incrementally (solid doors replace temporary curtains on the toilet and house and a lean-to is constructed providing a shaded open area in the yard). The old toilet structure collapses on one side due to poor construction.

Swaach Gali (Clean Street) Key Plan



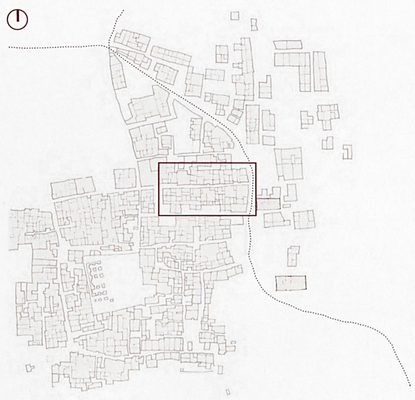
Plan and section through Meera's toilet and *Swaach Gali* (Clean Street)

A	Street - open yard (over drain)
B	Open yard - room (through doorway)
C	Room - covered yard (via steps and through doorway)
D	Covered yard - uncovered yard
E	Uncovered yard - street (through wall opening and over drain)
F	Street - *Otla* (via steps)
G	*Otla* - uncovered yard (through gate)

1	New toilet
2	Septic tank system
3	Washing platform
4	Street drain
5	Water butt
6	Old (non-functioning) toilet

0 1 2.5 5 m

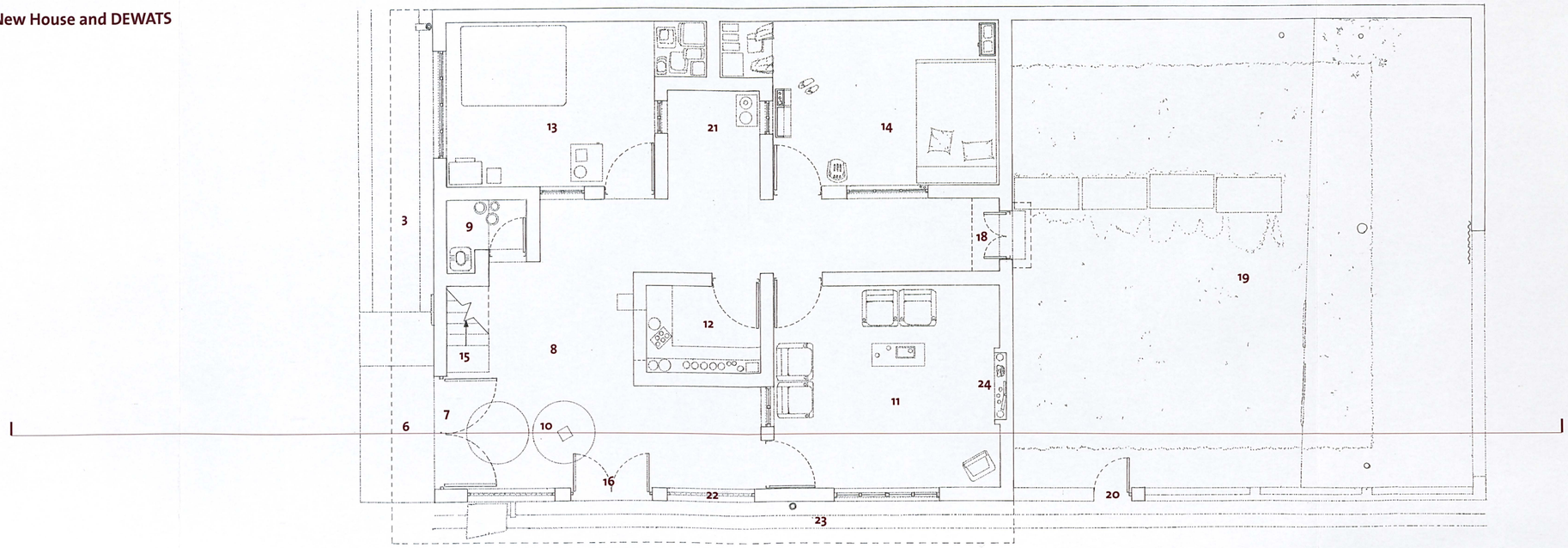
3.2.3 Meera's Toilet, Swaach Gali, Kachhpura, Agra

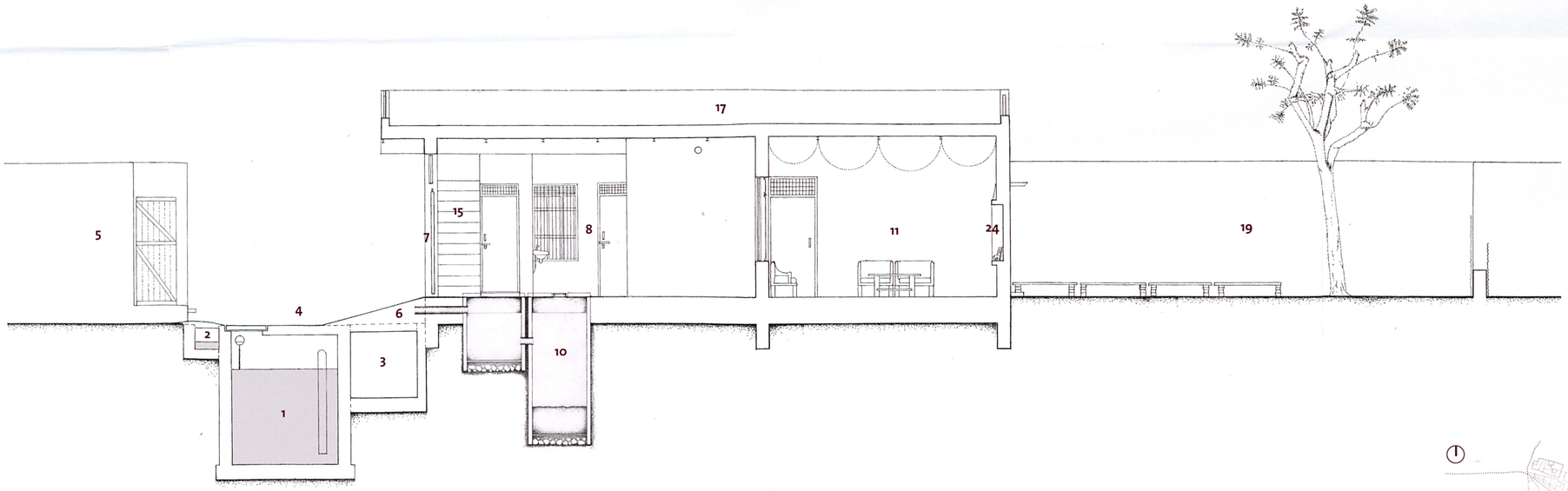


Kachhpura Key Plan

Plan and Section Through Bhajan Lal's New House and DEWATS

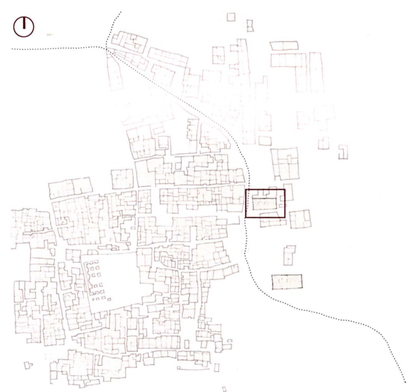
1 Baffled septic tank (DEWATS)
2 Primary overflow (everyday) drain
3 Secondary overflow (monsoon) drain
4 New clean pedestrian thoroughfare
5 Side street
6 Entrance ramp
7 Front entrance gate to house
8 *Otla* (veranda)
9 Bathroom with toilet (under stairs)
10 Septic tank toilet system
11 Living room
12 Kitchen
13 Bedroom 1
14 Bedroom 2
15 Staircase to roof
16 Side entrance to house
17 Roof terrace
18 Back door to garden
19 Garden
20 Gate to garden
21 Storage area
22 Glazed windows with metal grilles
23 Street drain
24 *Puja* (Hindu prayer) corner





0 1 2.5 5 m

3.2.4 Bhajan Lal's New House, Kachhpura, Agra



Kachhpura Key Plan

KUCHHA (TEMPORARY) ← → *PUCCA* (PERMANENT)

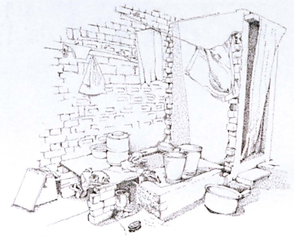
PRIVATE ↑

PUBLIC ↓

1

2

3



4

5

6

7

Chart Showing Different Types of Bathing Spaces Within Kachhpura
[Photograph no. 3 by Banak, K., 2006; Sketch no. 6 by Patwari, S., 2007]

1 Boy bathing with a pan of water next to a open drain
2 Concrete washing platform with a water tap in the open front yard of a dwelling
3 Woman and girl washing her hair on the *otla* (threshold step) over a drain to their dwelling
4 Meera's toilet and rendered brick washing platform in the enclosed front yard of her dwelling
5 Waist-height unrendered brick washing structure in the open front yard of a dwelling
6 Meena's toilet and washing area in the enclosed (gated) front yard of her dwelling
7 Sunita's full-height rendered brick toilet and washroom structure with doors in the enclosed front yard of her dwelling

3.3.1 A Place to Wash, Kachhpura, Agra

Kachhpura Key Plan

Proposed View of DEWATS and the Community Toilet Complex as a New Shared Clean Setting
[Image by Tang, B. (2013) after Lee, V. (2011)]

DEWATS:

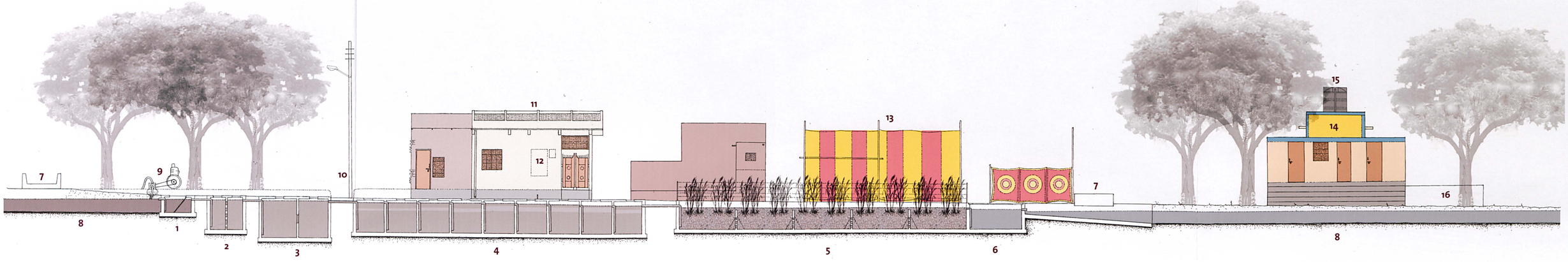
1 Completed root zone planted with *Cayhna* (Gladioli)
2 Completed storage sump (treated water)
3 Proposed handpump
4 Main overflow drain
5 Secondary overflow drain (monsoon)
6 Treated water outflow to *nala* (open drain)

COMMUNITY TOILET COMPLEX:

7 Male toilets
8 Female toilets
9 Caretaker's office
10 Water butt (connected to DEWATS to utilise treated water for flushing toilets)
11 Proposed nursery garden (irrigated with treated water)

Kachhpura Key Plan

3.3.2 Community Toilet Complex, Kachhpura, Agra



Section Through DEWATS and the New Clean Pedestrian Thoroughfare

DEWATS:

1 Screen chamber
2 Pre-process filter
3 Anaerobic filter
4 Baffled septic tank
5 Root zone planted with *Cayna* (Gladioli)
6 Storage sump (treated water)

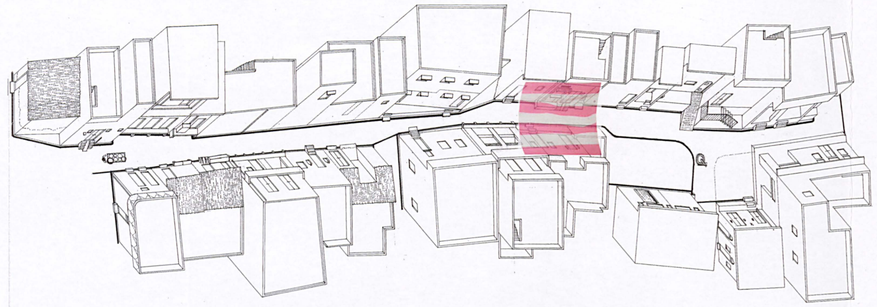
7 Bridge
8 Primary *nala* (open drain)
9 Pump for irrigation (owned by Brijesh Singh's family)
10 *Swaach Gali* (Clean Street) intersection
11 Bhajan Lal's new house
12 DEWATS information poster
13 Temporary marriage *pandal* (tent structure)
14 New community toilet complex
15 Water butt
16 Septic tank

0 2 5 10 m

3.3.3 A New Clean Pedestrian Thoroughfare, Kachhpura, Agra

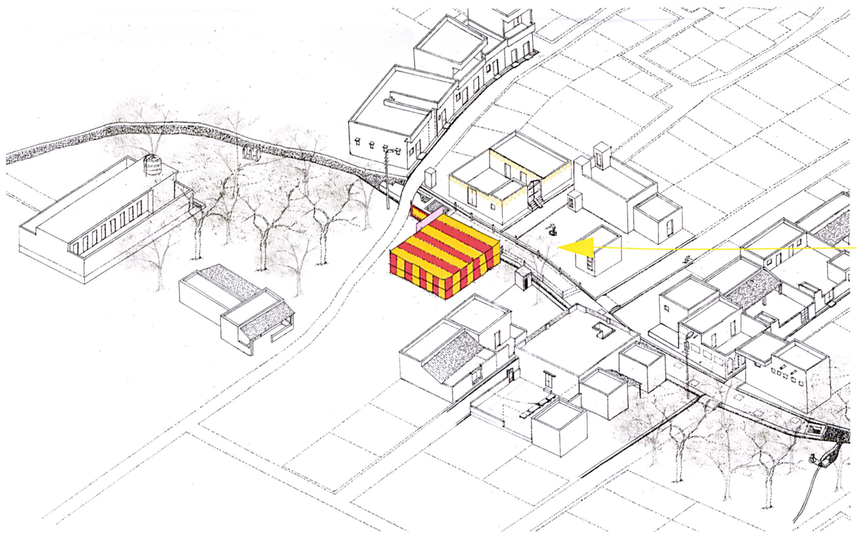
Kachhpura Key Plan

A Section through the *Panchayat Chowk* - Brijesh Singh's marriage place

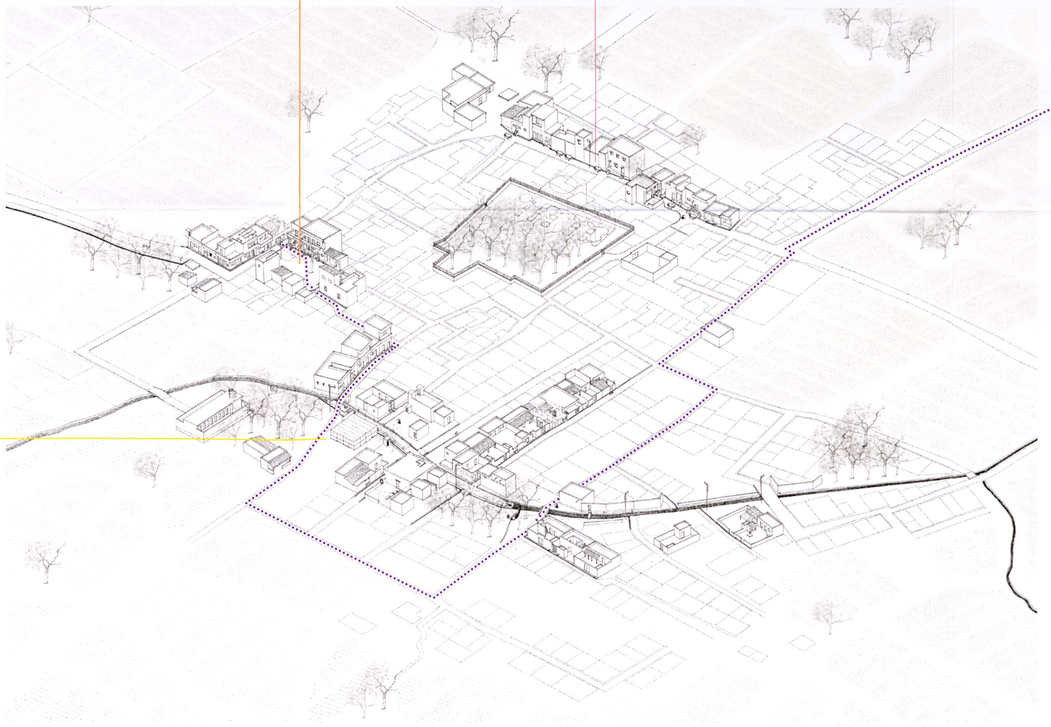


C A temporary covered marriage place created on Market Street

Brijesh Singh's marriage procession route from Kachhpura to his bride's home in Kandali, 20km away



B A temporary marriage *pandal* (tent structure) erected next to the completed DEWATS



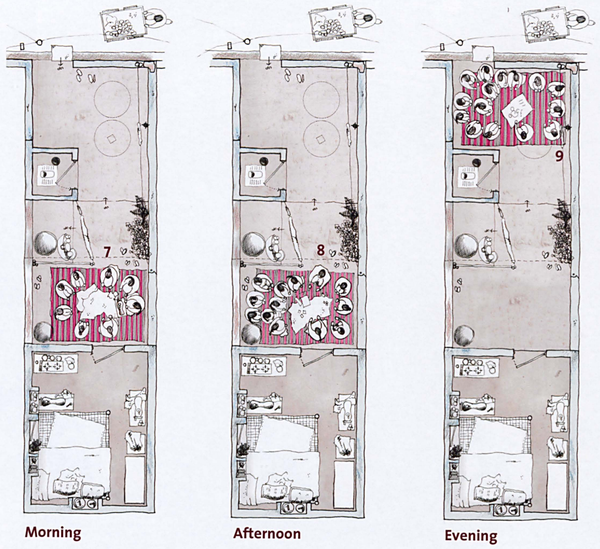
Brijesh Singh's marriage procession route through Kachhpura on horseback

Kachhpura Key Plan

3.3.4 A Celebration Place, Kachhpura, Agra

1st Floor/Roof Terrace (*Chhat*) Plan

A Plan of the *Panchayat Chowk*
[Drawing by Tang, B. (2013) after Lee, V. (2011)]



B Plan of Meera's Dwelling
[Drawing by Lee, V. (2011)]

C Plan of the West Entrance to Kachhpura
[Drawing by Lee, V. (2011)]

A ***PANCHAYAT CHOWK:***

1 *Panchayat* (village elders) meeting under the *Neem* tree in the *chowk* (square)

2 Class at the local primary school

3 Meeting (toilet discussion) between NGO, LMU students and teachers in the school courtyard

4 Women's Self Help Group (SHG) meeting in the *Soochna Sansadhan Kendra* (SSK) - NGO site office

5 Interview between researcher and Brijesh Singh's family on his *chhat* (roof terrace)

6 Meeting (tea terrace structure conversation) between LMU students and Shri Ram on his *chhat*

B **MEERA'S DWELLING:**

7 Morning - interview between students and Meera in her yard

8 Afternoon - women's livelihood (bag making) workshop in Meera's yard

9 Evening - discussion between students and women's SHG in Meera's yard

C **WEST ENTRANCE:**

10 *Sanjhi* Art (paper cutting) workshop under the *Neem* tree at the West entrance to Kachhpura

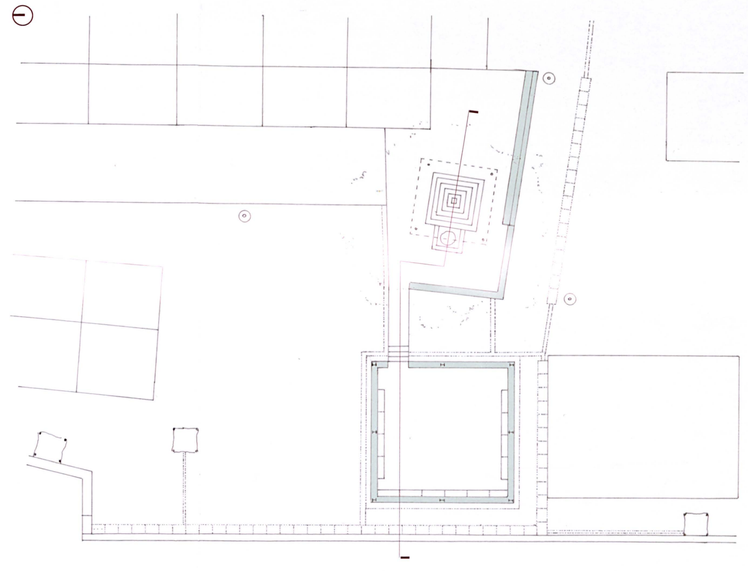
Kachhpura Key Plan

0 2 5 10 m

3.4.1 The Meeting Mat, Kachhpura, Agra

Section Through the New Classroom Building and *Mandir Chowk* (Temple Square)

1 Temple shrine and Neem tree
2 Plinth
3 Low brick wall
4 Steel frame
5 Corrugated plastic roof
6 New tiled path
7 Bamboo blinds
8 Portrait of Baban Seth - (deceased) quarry owner
9 Moveable blackboards
10 NGO banner
11 Stone slab seating
12 Lockable storage cupboards
13 Lockable entrance gate to classroom
14 Brick-lined drain
15 Donated sewing machines
16 Boundary wall to factory sites
17 *Kuchha* (temporary) dwelling
18 Low wall surrounding *Mandir Chowk*
19 Ceiling fans
20 Strip lighting



Temple Square Key Plan

3.4.2 The *Mandir Chowk*, Baban Seth Stone Quarry Worker Settlement, Navi Mumbai

Kachhpura Key Plan

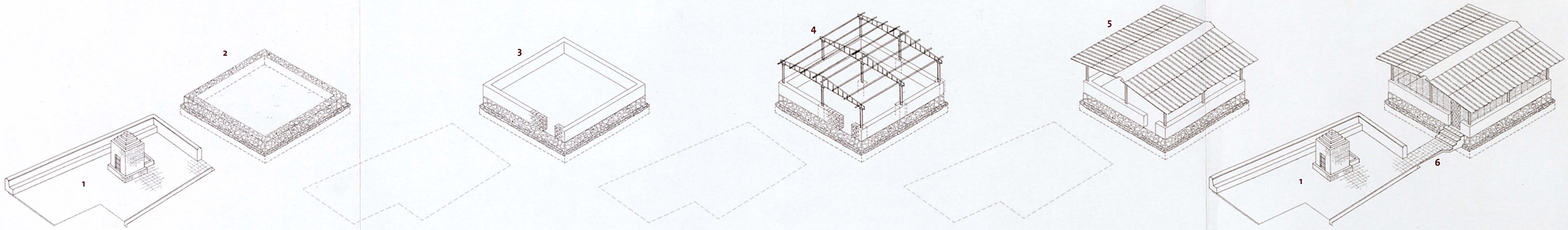
1 Local primary school
2 New septic tank system
3 New toilets for school children
4 Water butt
5 Water handpump and tap
6 *Neem* tree
7 *Soochna Sansadhan Kendra* (SSK) - NGO site office
8 New street lighting (solar powered)
9 Brijesh Singh's family home
10 Shri Ram's home (with tea terrace rooftop)
11 Street drain leading to secondary *nala* (open drain)
12 Vegetable cart *wala* (seller)

Plan of the *Panchayat Chowk*

0 2 5 10 m

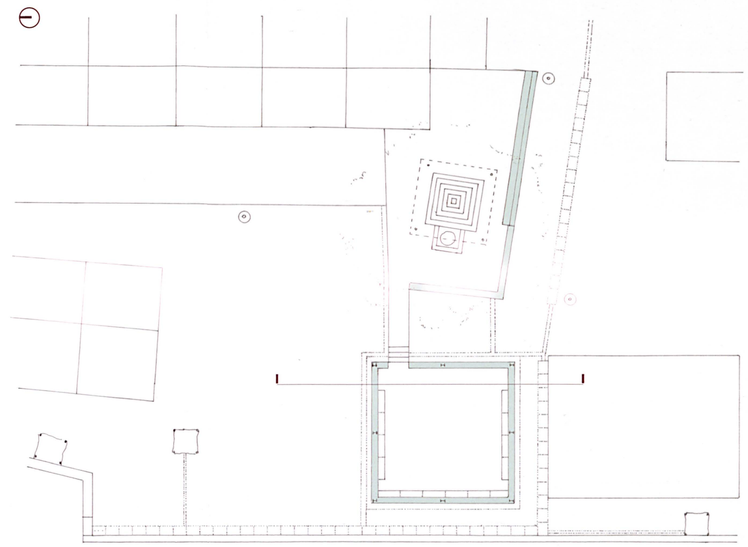
3.4.3 The *Panchayat Chowk*, Kachhpura, Agra

Development of the New Classroom Building



Section Through the New Classroom Building

1 Temple shrine and *Neem* tree
2 Plinth
3 Low brick wall
4 Steel frame
5 Corrugated plastic roof
6 New tiled path
7 Bamboo blinds
8 Picture of Babaji
9 Moveable white/black boards
10 View out to the *Mandir Chowk* (Temple Square)
11 Stone slab seating
12 Storage under seating
13 Lockable entrance gate to classroom
14 Brick-lined drain
15 Ceiling fans



Temple Square Key Plan

3.4.4 The Community Platform, Baban Seth Stone Quarry Worker Settlement, Navi Mumbai