

## **D I S C U R S I V E   N O N - D I S C U R S I V E**

Abstracting dwelling logics from the historic settlement of Chirag Delhi, India



## **COLOPHON**

**Honours Programme 2016-18**

**Deepanshu Arneja**

4615972

M.Sc Architecture

Faculty of Architecture and Built Environment

**Mentor**

**Frederique Van Andel**

March 2018



# **D I S C U R S I V E   N O N - D I S C U R S I V E**

Abstracting dwelling logics from the historic settlement of Chirag Delhi, India

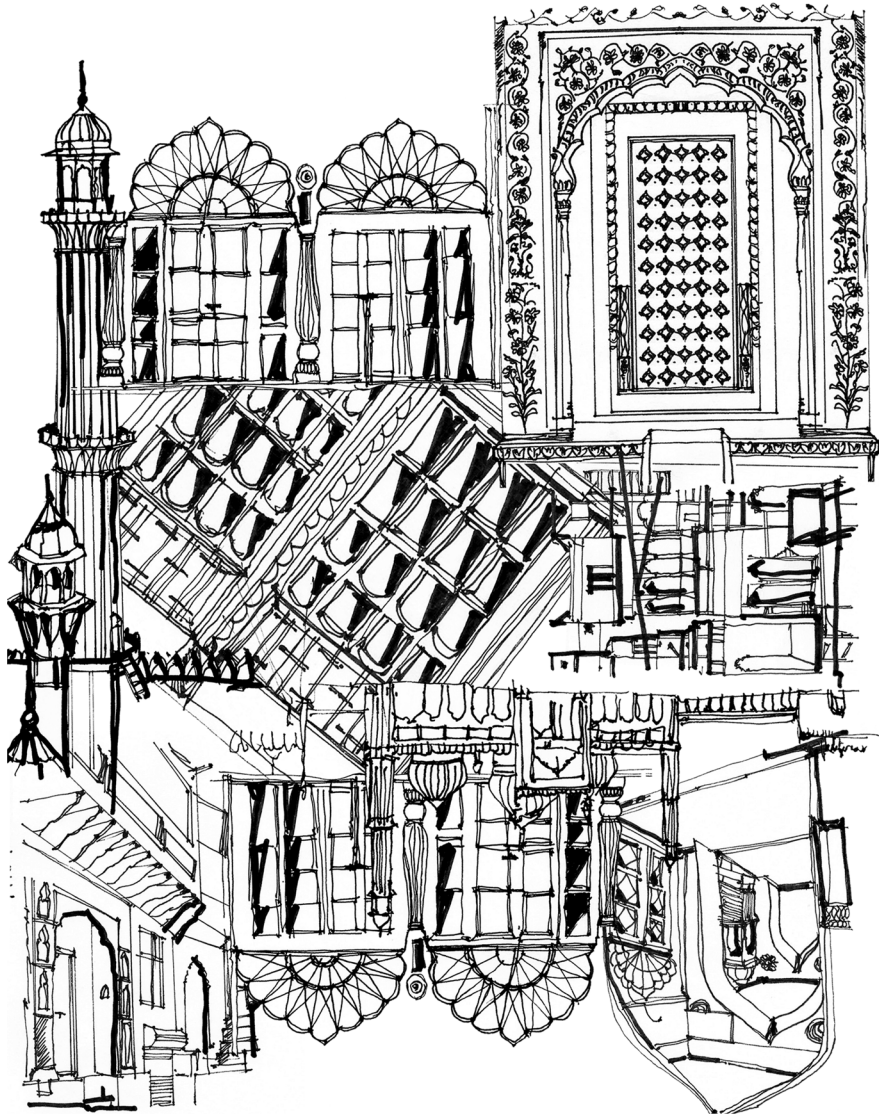
**Deepanshu Arneja**

>>

## FIRST IMPRESSIONS

Visual illustrations from Chirag Delhi

I visited Chirag Delhi for a popular dimsum restaurant in the spring of 2016. Entering through the well-defined east archway, I walked for a few minutes from street to street and automatically came out in center of the settlement. Feeling a bit lost, I opened the Google maps and started following the route diligently but in no time I reached the western gate and was out of the settlement again. Still not able to trace the restaurant, I asked a fellow resident who gave me clear instructions. To help me at way finding, his instructions were unusually descriptive - walk straight and from a corner shop take a left...from the traditional house with green doors and red rose windows, take a steep left...on seeing the turrets and arches, take the broader street and reach the next traditional house but this time look for people sitting on the ornamented porch and then ask someone for directions again. I got lost twice again, maybe somewhere sub-consciously aware of my choices but did manage to reach the restaurant about 25 minutes later than what I had anticipated. This experience opened the gates of my curiosity. I came home and sketched this montage for my Instagram page. The maze that is Chirag Delhi became my muse from that day and eventually the focal point of my research for the honours programme at Delft.

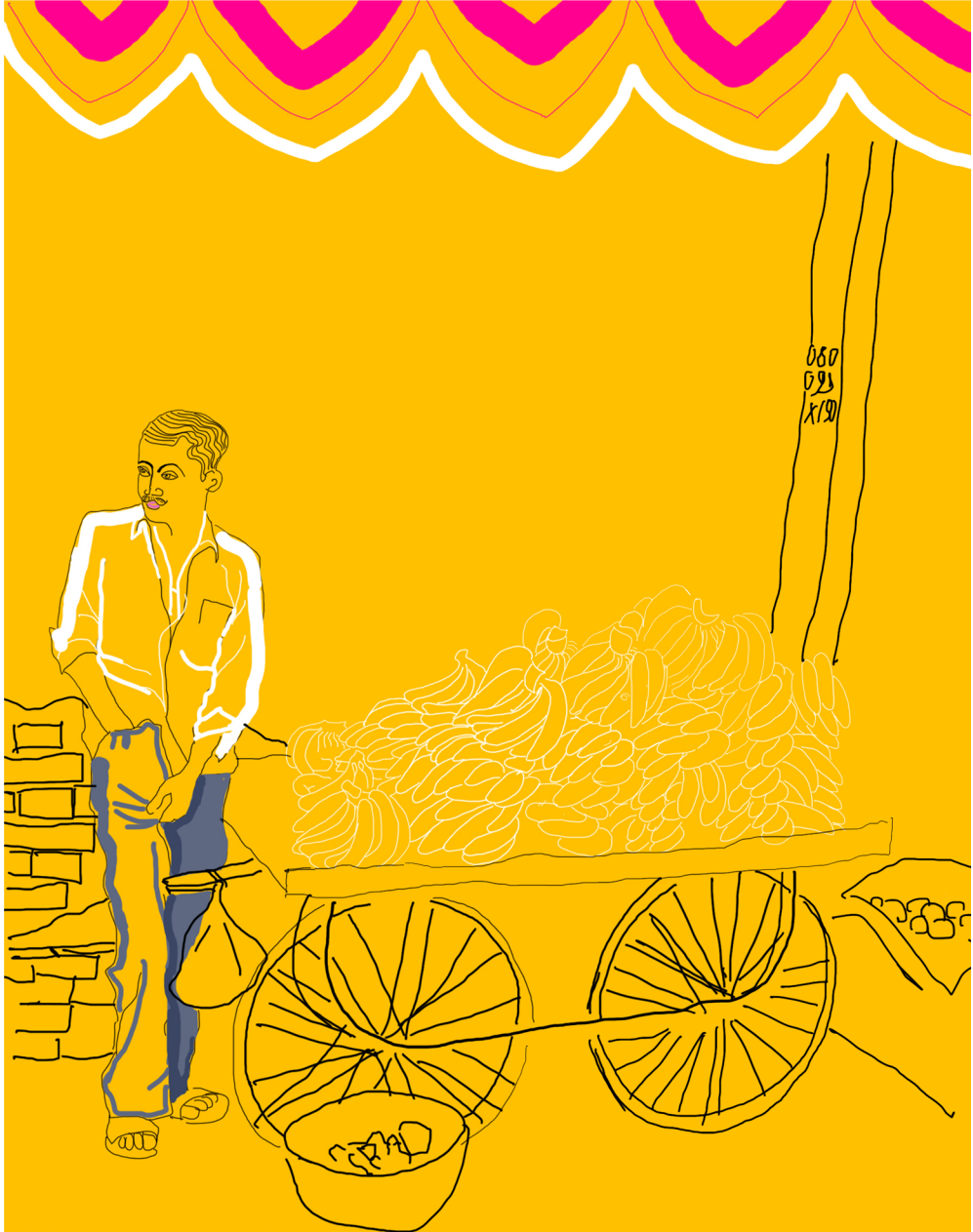


>>



Street off the Eastern Gateway

>>



The Direction man





## ACKNOWLEDGEMENTS

In ways more than one, this research is a collaborative 'vision' with Frederique Van Andel without whose guidance and support it would not have become what it has. She not only navigated and guided me through the whole process, but meticulously curated the content and the quality of work. She has been patient with time and suggestions, helping me build this at every stage from research to graphics. Her resources and archives has not only structured my honours but various bits of my graduation thesis as well. As a mentor, Frederique has been there at each step and I am hugely indebted.

Thank you for overlooking my shortcomings and motivating me through this process, which I must confess is far more significant than the content.

To my Friends and Family in India, Mansi and Manik, for walking those seemingly dangerous streets of Chirag Delhi that became friendlier by the minute,

and here in Delft, Nilofer and Vanshika, for mid-night conversations, introspections and for hearing my thoughts again and again until I made your ears bleed.

And finally to Surbhi, you are the force and face behind this paper.

Thank you all and as they say, Aaila Mandaoli.

*Aaila Mandoli is a phrase that is used to initiate a festive event in my hometown in India.*

## **CONTENTS**

|           |  |
|-----------|--|
| 09        | <b>PREFACE . FINDING MEANING IN THE PAST</b>                 |
| 16        | <b>METHODOLOGY</b>   |
| <b>18</b> | <b>DELHI DRAMA . OUTLINING RELEVANCE AND CONTEXT</b>         |
| 27        | No Plan's Land . Marked by Red Lines                         |
| <b>33</b> | <b>CASE OF CHIRAG . LOOKING CLOSELY FROM A DISTANCE</b>      |
| 47        | Non-permeable and Non-Visible . Territoriality               |
| 57        | Reflections . Cluster syntax in a non-designed urban village |
| <b>59</b> | <b>FORCES, ORDERS AND SPACES . THEORETICAL FRAMEWORK</b>     |
| 60        | Composed whole > sum of parts . Orders and Self organisation |
| 63        | What makes Mi Casa, Su Casa ? . Common gain                  |

|            |  |
|------------|--|
| <b>77</b>  | <b>HOUSE, FORM AND TYPE . DWELLING LOGICS</b>              |
| 79         | Zooming into dwellings . Type Making                       |
| 87         | Type 1. Traditional Houses or Havelis . Subtractive houses |
| 93         | Type 1. Case Study . Vikas Dojnara House, 1902             |
| 104        | Type 2. Single Family Hujuras . Additive houses            |
| 106        | Type 2. Case Study . Stair House, 1968,2004                |
| <b>112</b> | <b>BREAKING THE LAAL DORA. REFLECTIONS AND WAY FORWARD</b> |

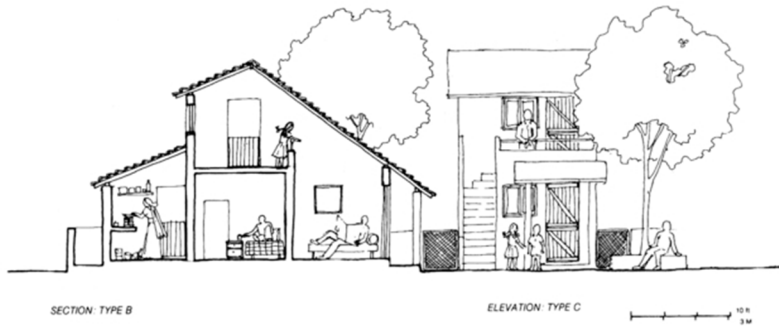


Figure 1. Top : Belapur incremental housing - shared courtyard, Bottom : Correa's sketch for Belapur ( Charles Correa Foundation)

## **PREFACE**

### *Finding meaning in the past*

Charles Correa's writings compiled under the title 'A place in the shade' actively look at dwellings, especially in the context of the urban poor in India, for its 'performative' nature while housing a family in an urban environment. Performative why? Because the sequence of spaces and the harbored activity within an 'Indian dwelling' is required to or rather dramatically change with various external forces. Correa uses climate for his discourse and categorically analyses the 'domestic space' in a rural Indian household for its ability to perform under extremely warm, extremely cold and in between state of shade. His findings are quite extraordinary as he brings the focus on not just the spatial qualities of shelters housing the urban poor, but to their ability to conceive, visualize and self-build their homes. He claims that in the situation where land or space is probably one of the biggest resources, people come up with ingenious ways to produce low-rise and high-density living conditions. The products are usually economically efficient patterns of space sharing where the mix of spaces is 'just-enough' for inhabitants to meet, interact, cook, sleep, play and wash.<sup>1</sup>

Why is it important to understand 'dwelling' or 'domestic space'? Even if there is a reason, why does Correa urges the discipline to look at rural environments where people self-build or visualize their domestic space? Can understanding this 'latent genius' that Correa actively argues for, is of any use to us today? I think it is, and especially today more than ever.

Cities play a critical role in our lives; they serve as engines of economic growth, centers for productivity and thresholds of social development. In most developing countries, unprecedented population growth coupled with rampant developmental activities has resulted in rapid and unplanned urbanization. Recent urban sprawl and migration studies in the Global South show an imperative need for newer theoretical frameworks in understanding and analyzing empirical observations to ideate and provide for affordable dwelling options for all. The case of New Delhi, capital to world's fastest growing economy India, however, is very distinctive within its counterparts that are struggling with this urgency



**THE POLITICIAN**



**VS**



**THE POOR**

**DISCIPLINE**

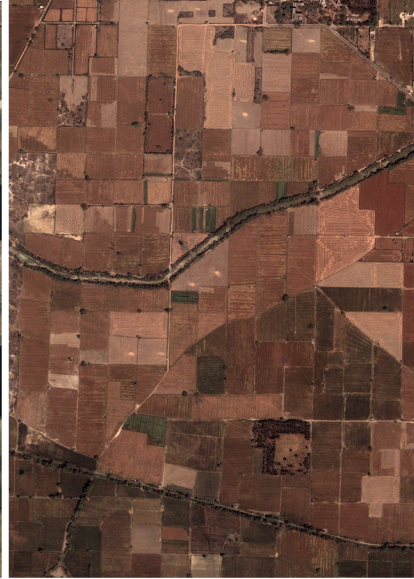
Figure 2. Left : Image of Nehru by Raghu Rai, Nehru 1937. Right: Image of Kathputli Poor by Satyajit for Daily Mirror (Illustration by Author)

in housing the urban poor. Conceptualized and planned as a low-density, low-rise capital, the landscape of affordable housing in Delhi is challenged with a massive population of 18.2 million in 2015. With a projected growth rate of 3.87%, the population is expected to reach 23 million by 2021.<sup>2</sup> This situation is aggravated by the scale of migration, where the city witnesses 78,000 migrants per annum on an average.<sup>3</sup> The staggering numbers and the scale of poverty clearly put forwards the pressing need for affordable dwelling typologies for housing the urban poor. In hindsight, one would expect the government to be already aware and steered into, actively restructuring the city in terms of job opportunities, residential zones, densification benchmarks and transportation infrastructure. However, the landscape of settlements for the urban poor is observed in the city as taking a very different direction.

The Indian government, instead of bracing for the population growth and incoming migrants, is driving high on a development desire of making Delhi into a world-class city. The widespread presence of the urban poor in its built environment is seen as the biggest hurdle in this vision. In an attempt to make Delhi 'beautiful', the government has adopted a rather peculiar propaganda of evicting the existing poor from their houses within the city and resettling them on the peripheries. One such case is of 'Savda Ghevra', Delhi's largest resettlement colony developed 24 miles outside the city core to re-house slum dwellers evicted from inner-city areas. Envisioned as a resettlement camp, it is home to more than 20,000 inhabitants for a ten year period within which they are either expected to rise the economical ladder until they are deemed fit to claim a position in the city or are expected to learn a way to stay out of the city infrastructure. The creation of the 'camp' led the government to invite disciplinarian aid in 2003. The design process and approach was found to be exceedingly limited in the understanding of the emergent qualities of a user-generated informal dwelling. The spatial translation was also widely criticized for its rigid dwelling typologies, unregulated open/shared space structure and an incoherent application of 'incrementality'.

Through a careful use of stringent policies, the urban poor were slowly and effectively excluded from the formal design processes and had no other option but to resort to inhabiting the informal settlements. In 2017-18, for phase two, a group of musicians and puppeteers living in a traditional informal quarter in the city called Kathputli, are being resettled to neighbourhoods in Narela, outside the peripheries of Delhi. At the moment, hundreds are being displaced and put in pre-transit camps for an interim period, ranging from one to five years until the resettlement schemes are been constructed.

On one side is Correa's advocacy of the ability of self-organized Indian dwellings and settlements to not only cater to high densities but also produce cohesive and livable domestic environments. In the case of Delhi, these ideologies of self-organization are manifested appropriately through the informal settlements, which in effect house 73% of Delhi's population, wherein about 76% of this population construct their own dwellings without any guidance or adherence to formal regulations of building design or formal aid offered by the architectural discipline (Sullivan, 2011). It is interesting to see here that morphologically and typologically these informal settlements are continuing to inhabit densities that are unimaginable to be replicated through the formal architectural design processes.<sup>5</sup>





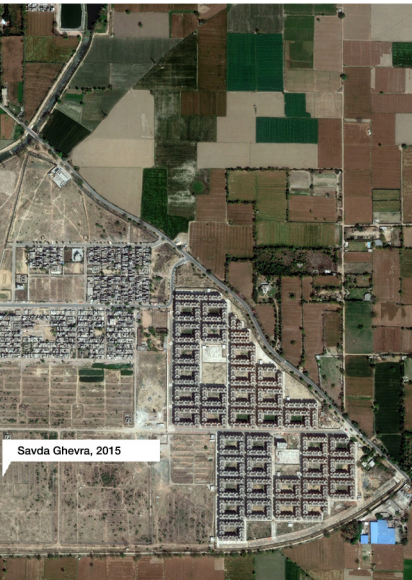


Figure 3. Imagery from Google Earth, LEFT : Yamuna Pushta Eviction, MIDDLE : Savda Ghebra Resettlement, RIGHT : Kathputli Colony Eviction



Figure 4. Kathputli Demolition and transit situation at Anand Parbat (Photographs by Sanjukta Bose)

On the other side of the coin is the Indian government's regressive attitude towards these settlements, which are incidentally hosting huge densities of the urban poor in affordable living environments. To bridge the gap, architecture as a discipline should position itself as a mediator. As Correa rightly theorized that the discipline in dwelling processes has a dual role to play: First is the conceptualization of new growth trends and the second is to create conducive conditions for housing to flourish.<sup>6</sup> Placed at this junction, this research paper is a step towards converging the gap by identifying the said 'latent genius' in dwelling designs of a non-designed environment to map out indigenous practices in space sharing, resource sharing, and sustainability.

To achieve the same, a 14th-century pastoral urban village, Chirag Delhi is sieved through for patterns of self-organization and dwelling typologies. Chirag Delhi has been inhabited continuously for almost 650 years now. Thus it offers a large range of traditional to extant dwelling types which have been self-organized since its inception. The community structure also is quite wide-ranging, offering the range of economic groups, caste groups, and religious groups. All these parameters made Chirag Delhi, an appropriate sample set to study the objectives set out in this paper over a constrained time-period of this research.

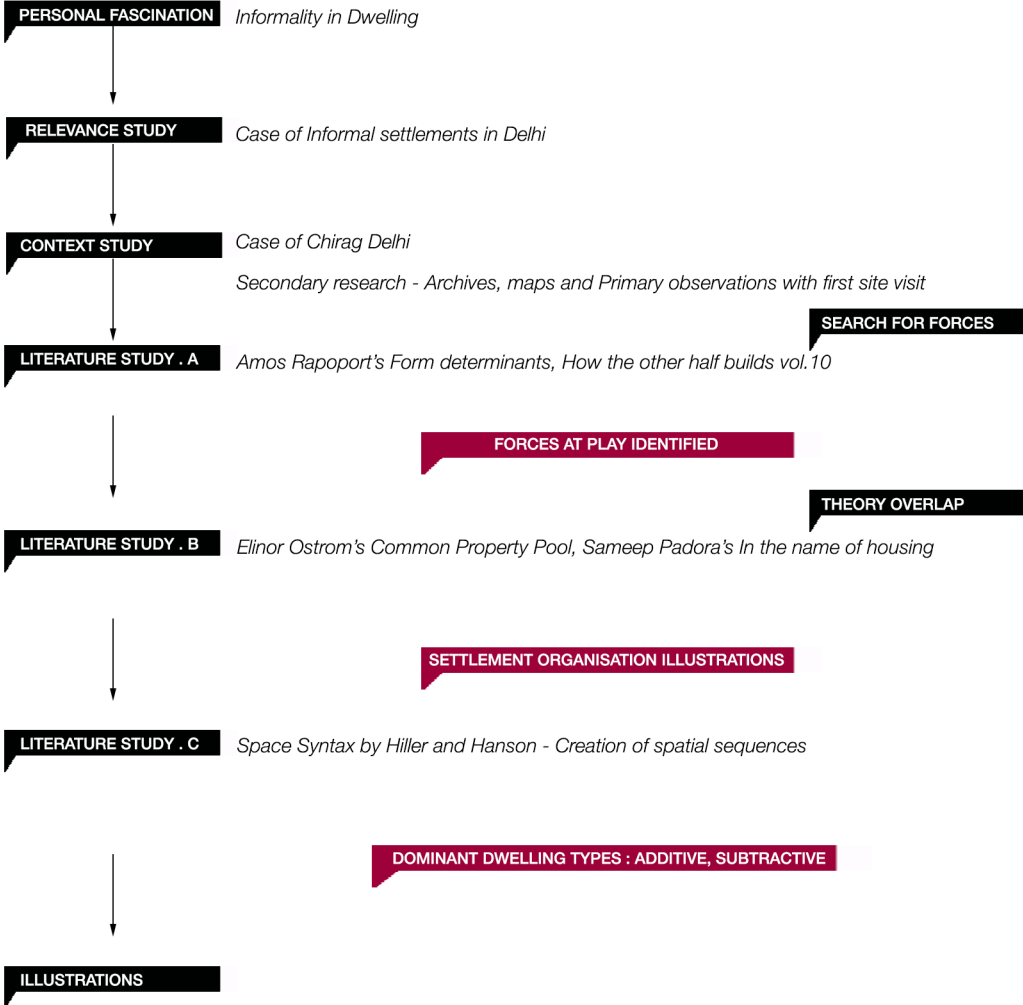
To study the settlement, two approaches are used. First, observation studies are conducted to observe how people appropriate domestic space and to capture its spatial qualities critically. Constant site visits and participatory research methods are used to immerse into the fabric. The second approach is more theoretical, where Elinor Ostrom's common property regime (2009) is deployed to logically articulate the observations. This research is been conducted parallel to my thesis that aims at innovating an alternate method to house the urban poor in Delhi which uses open space or shared space as an organizational tool to arrive at the dwelling grain. This research also serves as a knowledge base for designing dwelling types that resonate with the social and cultural affiliations of the urban poor. Finally, the space syntax as illustrated by Hillier and Hanson (1999) is used as a way to draw the observed spatial sequences.

The paper is divided into four sections - the first section introduces the context of New Delhi and elaborates the scientific and societal relevance of the problem. It also clearly lays out the position and stance of the author, representing the discipline as the spatial agency. The second section is the settlement study of Chirag Delhi, analyzing the play of spontaneous forces in the structuration of shared spaces through observation studies and plan analysis. It theorizes how caste system and natural drainage patterns define the hidden organization within the settlement. The third section uses Ostrom's common property principles to logically argue for the observations made so far. The last section is used for illustrating the observations for two dominant dwelling forms observed and concludes with a tool-kit that can be integrated with dwelling proposals for engaging with the urban poor of Delhi.

*Intention**Terrain*

What are the **organisational principles** structuring neighbourhoods in a **non-designed** environment of Chirag Delhi ? How does it percolate down to the dwelling design and the articulation of **domestic space** ?

*Toolbox*



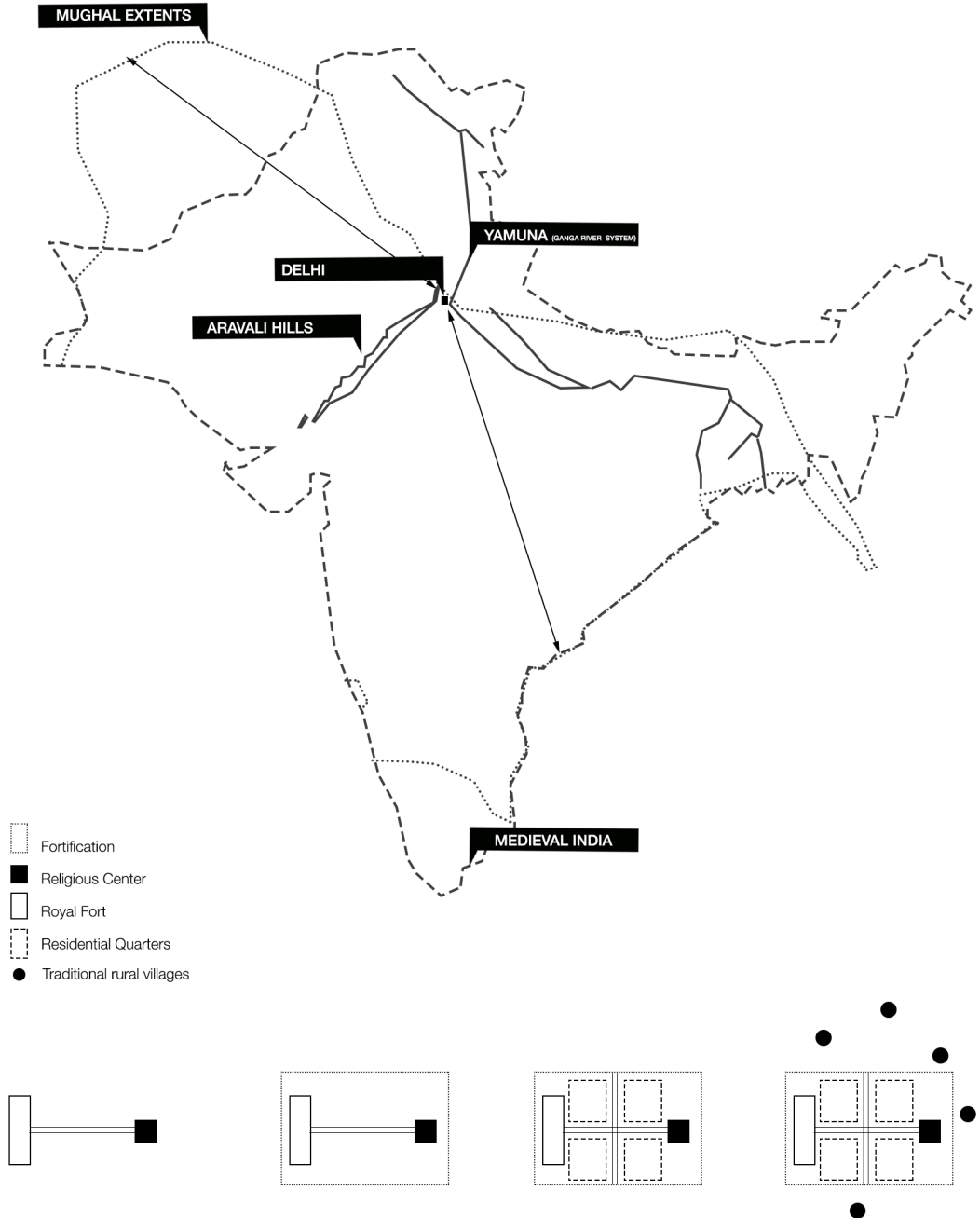


Figure 5. India before Independence, Mughal Extents, Aravalli Hills and Yamuna River - Delhi as the seat of Power ( Illustration by Author)

## **DELHI DRAMA**

### *Outlining Relevance and Context*

Delhi, the national capital to India is a vortex of Indian administrative, political and judicial forces at play. Quite understandably so, as the city was not only in the middle of the per-independence Indian terrain that was essentially a geographic combination of India and Pakistan but also well-endowed in terms of natural resources with the River Yamuna and the Aravalli ridges marking the boundaries (Figure 5). The Aryan populations which first inhabited the city settled between the river and the hill ranges so as to have a natural defense system around them and also to benefit from the fertile soil for agriculture. Over the years, the city was attacked and plundered various times, out of which seven moments are of significance as they resulted in a complete shift in the position of the settlement. These seven settlements in Delhi are cumulatively categorized as the historic settlements today (Figure 6).

An important aspect of this discourse comes from understanding the structure of these settlements. A typical historic city had three parts - the royal fort, a religious center (temple, mosque) and a commercial street connecting the two. These three components were laid in a fortification marking the boundary and thus, defined the grain and the morphology of the historic city. Left over parcels within the fortification were given off as living quarters to the commoners, forming the residential quarters. Quite understandably, the royal agglomeration within a fort attracted various other communities to live and inhabit areas around the fortification. These additional settlements were traditionally rural in nature and much like the fort had a religious center. For this paper would be categorized as traditional rural villages (Figure 5).

Eventually when the British, came to Delhi in 1803, the city comprised of seven smaller historic pockets, with the walled city of Shahjahanabad as Mughal stronghold and the political boundary of Delhi. The turning point came in 1911, when Delhi was annexed and declared as the new imperial capital of British India. The historic parts of the city – fortification as well as traditional rural villages - were deemed as cluttered and unsanitary for habitation. As a symbol of new imperialist ideas and limitless colonial power, the British laid out a new settlement, designed by Edward Lutyens and Herbert Baker, named as New Delhi.

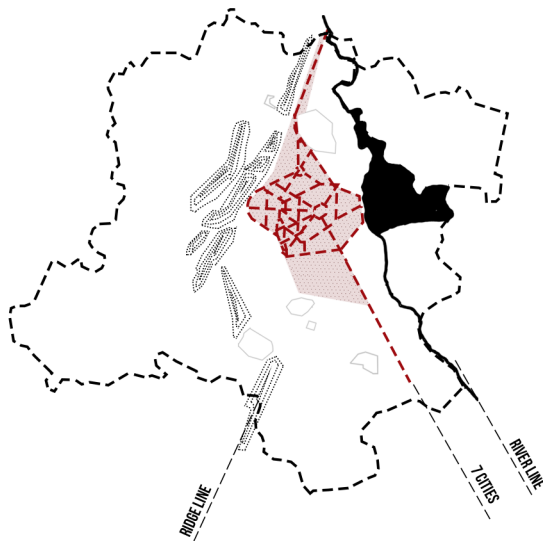
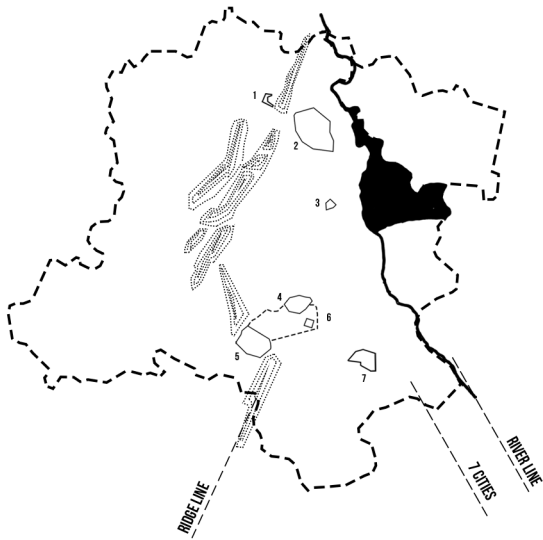


Figure 6. Top Left : Delhi and seven Historic pockets N ^ Top Right : Photograph from Delhi Memoir, Dharampur  
 Bottom Left : The extents of British Delhi (Red) N ^ Bottom Right : Photograph from Delhi Memoir, Viceroy Palace



New Delhi was carefully placed, segregated from the clutter (Figure 6) and this phenomenon resulted into three very significant events. Firstly, while the colonial and the elite simultaneously inhabited the new city, which stood as a symbol of luxury and power, the historic city was starved of resources, suffering a complete neglect and decay. Secondly, neither the people who were called in to construct the new Utopian city of Delhi nor the people who gave up their land for this construction were given a place in the new city. By forcing the native Indians as well as non-elite to live in the old city, the spatial patterns within the traditional quarters were permanently disrupted. Lastly, the traditional quarters witnessed a surge in small and large-scale markets and industries, inviting a widespread migration of people, increasing the density exponentially. Interestingly, on plotting a building density plan, one can observe that the densest parcels are in and around the seven pockets proving that the informal settlements are agglomerated around these traditional cores of the city (Figure 7,8).

Just before Independence, in 1931, the British forces declared New Delhi as the official urban boundary of the city. At this time around 25 rural settlements also got engulfed in the urban boundaries, however, these villages had already undergone 200 years of neglect and densification and it was impossible for the British to exercise planning controls over a presumably chaotic territory.<sup>7</sup> Thus, the British government segregated these areas as special zones, which were beyond repair and thus left as is in the new-formed urban boundary of Delhi. Post-Independence, New Delhi along with the walled city of Shahjahanabad was bounded in one geographic boundary for planning and revenue purposes. At this point, another 22 rural villages were added to the urban folds and by 1961, there were about 45 urban villages in the urban territory of Delhi.<sup>8</sup>

Since then, the boundary has been extended radially outwards engulfing the traditional rural villages within its boundaries, giving birth to the concept of urban villages (Figure 9). An urban village is a category that includes traditional rural villages that fell into the urban boundaries during the urbanization and town planning processes. As per Delhi Master Plan 1981, 111 villages within urban area were notified as urbanized villages. With the expansion of urban area, their number continued to increase and at present there are 362 urbanized villages in Delhi.<sup>9</sup> However, the most interesting aspect about the urban village type is the status of the 'special zone' given to it by the British. It is still intact and has informed the discourse on the urban villages massively. The concept and repercussions of this 'special zone' classification is discussed in the next section.



Figure 7. Illustrations by Author drawn over plans presented in 'Recentering Delhi', 2015, N ^

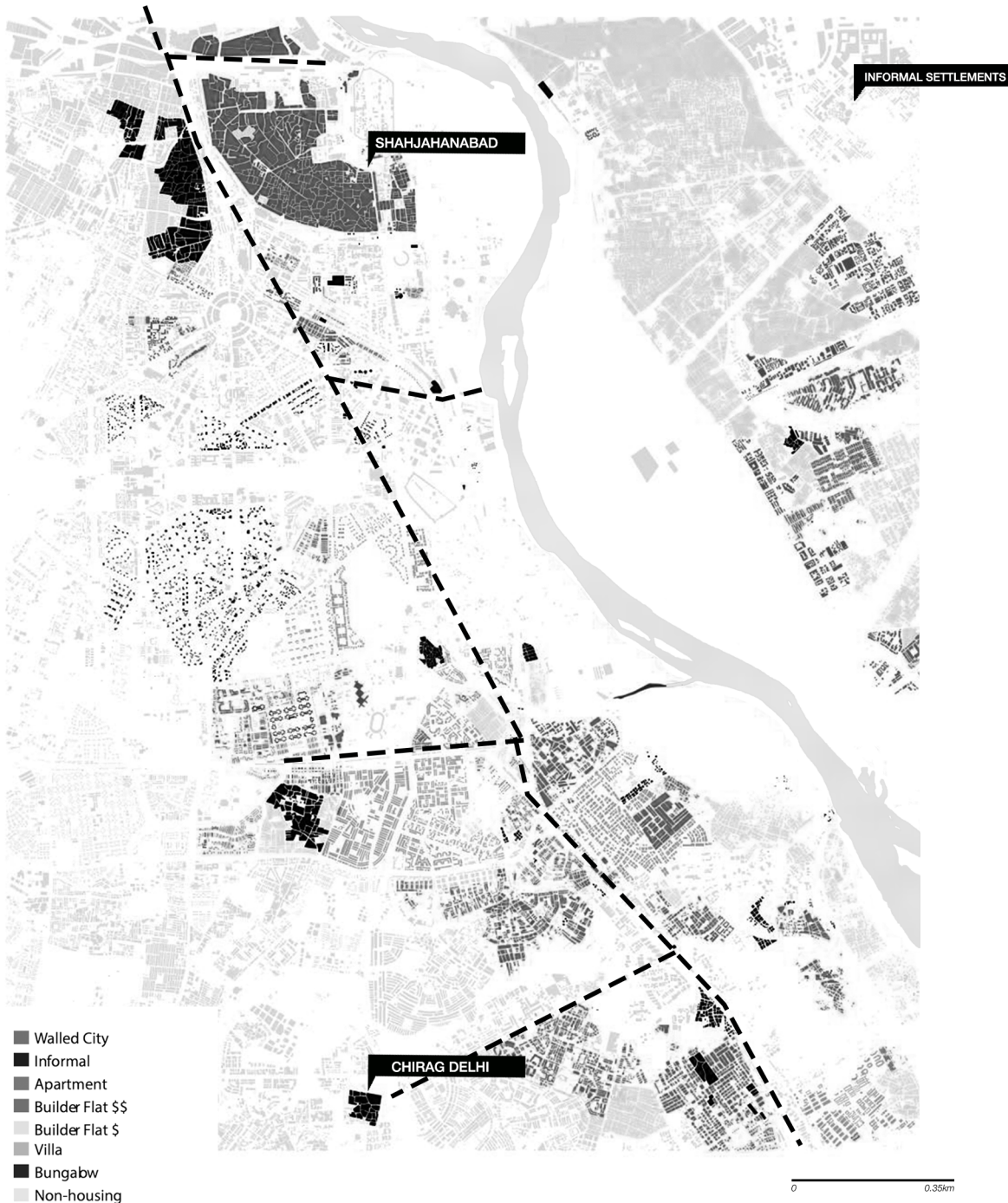


Figure 8. Illustrations by Author drawn over plans presented in 'Recentring Delhi', 2015 . N ^

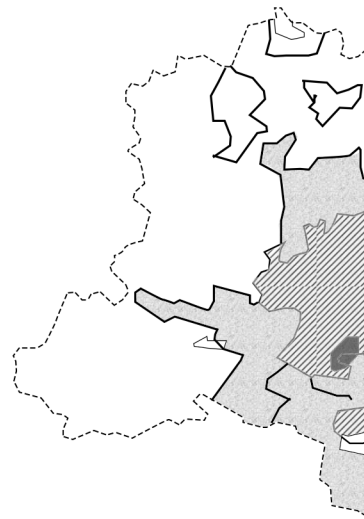
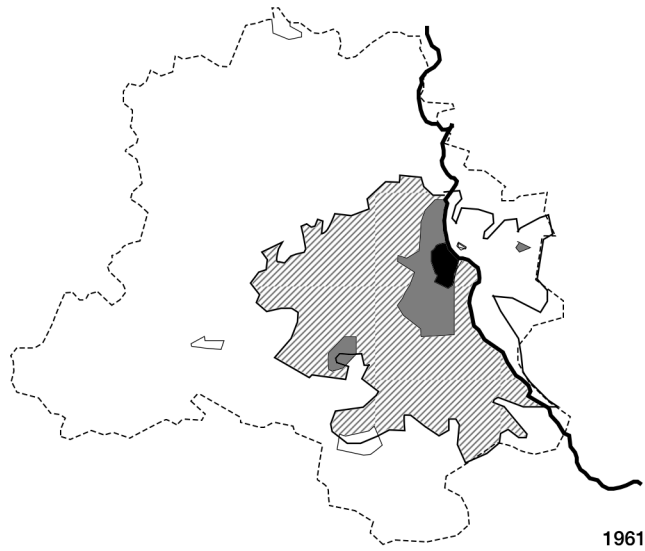
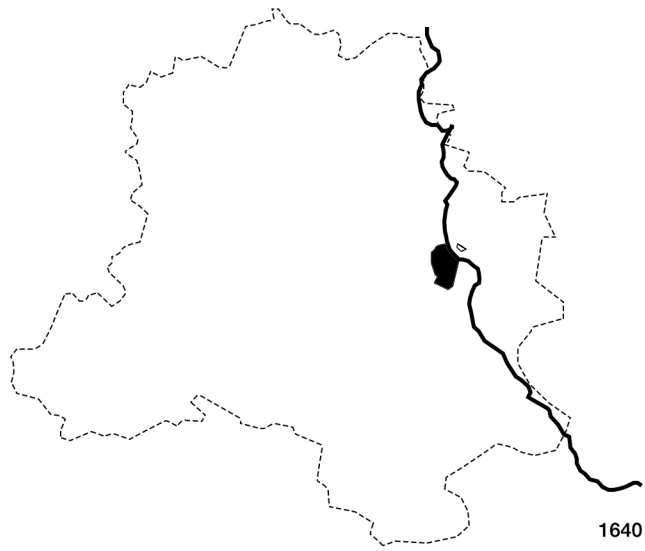


Figure 9. Expansion of Delhi ( Ba

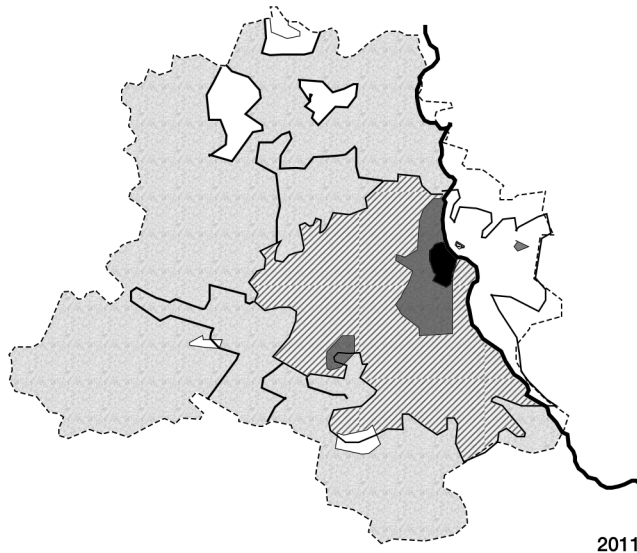
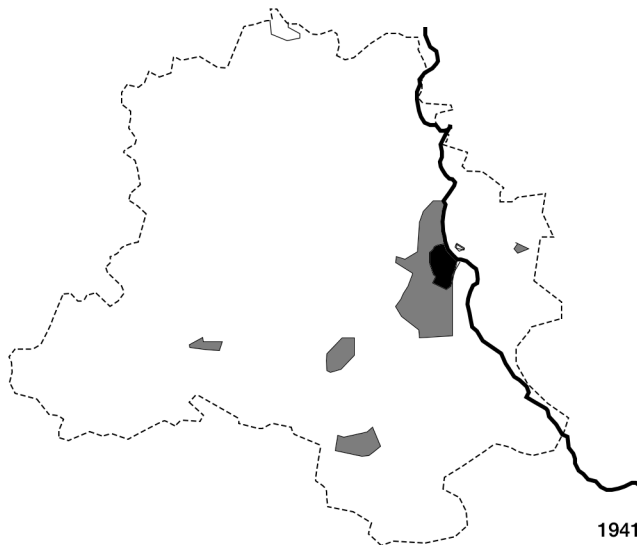
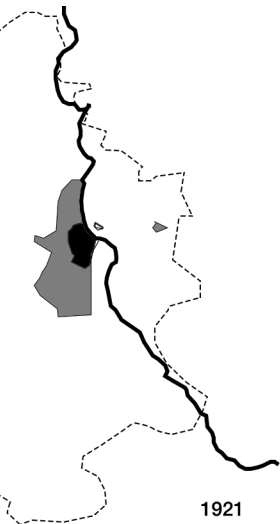




Figure 10. Top : Red thread or Lal Dora , Bottom : Location of 111 urban villages already inside the urban boundaries of Delhi (Observe Chirag)

## **NO PLAN'S LAND**

*Marked by Red lines*

Much of the urban growth in Delhi has been influenced by poverty-induced migration, from different parts of the country, particularly from the neighbouring States, in search of livelihood. The census of India qualifies any person 'migrant' only if he/she is enumerated at a different location than existing at the time of birth. Even though there was a radical surge in migrant influx, there was no government body controlling it. The notion of squatting on public space and agricultural land had no guidance or regulation till 1957, when Delhi Development board (DDA) was formed overseeing the land-use and planning of the capital city.

With the creation of DDA, a process of Land acquisition went into motion that had to be made available for public and private programs of commercial, industrial, housing and recreational nature. The area as marked in 1961 was about 18000 ha, which increased with an additional 22000 ha by 1981.<sup>10</sup> This process had two significant outcomes. As DDA was a fairly nascent organization, it couldn't control the geographic area efficiently. Various unscrupulous real-estate developers leased out lands to middle-class families illegally, leading to a massive unauthorized squatting. According to an estimate prepared by the Society for Development Studies, the rate of growth of squatter population in Delhi (natural growth of existing squatter population plus the fresh migration) during the period 1971-84 was four and half times larger than the non-squatter population. The squatter population during the period grew by 13.2 percent per annum as compared to the 2.9 percent growth of the non-squatter population.<sup>11</sup> The second outcome was the acquisition of agricultural land of various rural villages that now came under the urban boundary. This step disrupted the socio-economic structure of the urban villages that were largely agrarian in nature. The entire process of planning became a planner's nightmare and in order to stabilize the situation, DDA decided to carry forward with the idea of special zones for the urban villages as setup by the British.

DDA (Delhi Development Board) offered land security and tenure to the residents by marking the villages as a no-plan land in lieu of their agricultural land. In theory this meant that even though the urban villages were within the jurisdiction of planning and development of their respective zones, they were left relatively untouched by planning policies. These areas were then marked out by red threads or Laal Doras and known as Lal Dora regions (Figure 10). 'Lal Dora' can be understood as an imaginary boundary or red line that separates a zone between the urban village that is forced to be a part of the urbanizing process and the urban territory of the city. Eventually all the zones which lost their agricultural land to Land acquisitions by private developers or DDA and earned land security in lieu were termed as urban villages.

The process of absorbing new urbanizing qualities is much slower than that of classifying a settlement as urban. In practice, this meant that none of the building bye-laws or planning processes were conceived and imparted to these villages. Furthermore, the land security and affordable living options attracted various urban poor groups seeking accommodation and during the notification period in which the developmental authorities were acquiring and dividing the agricultural land

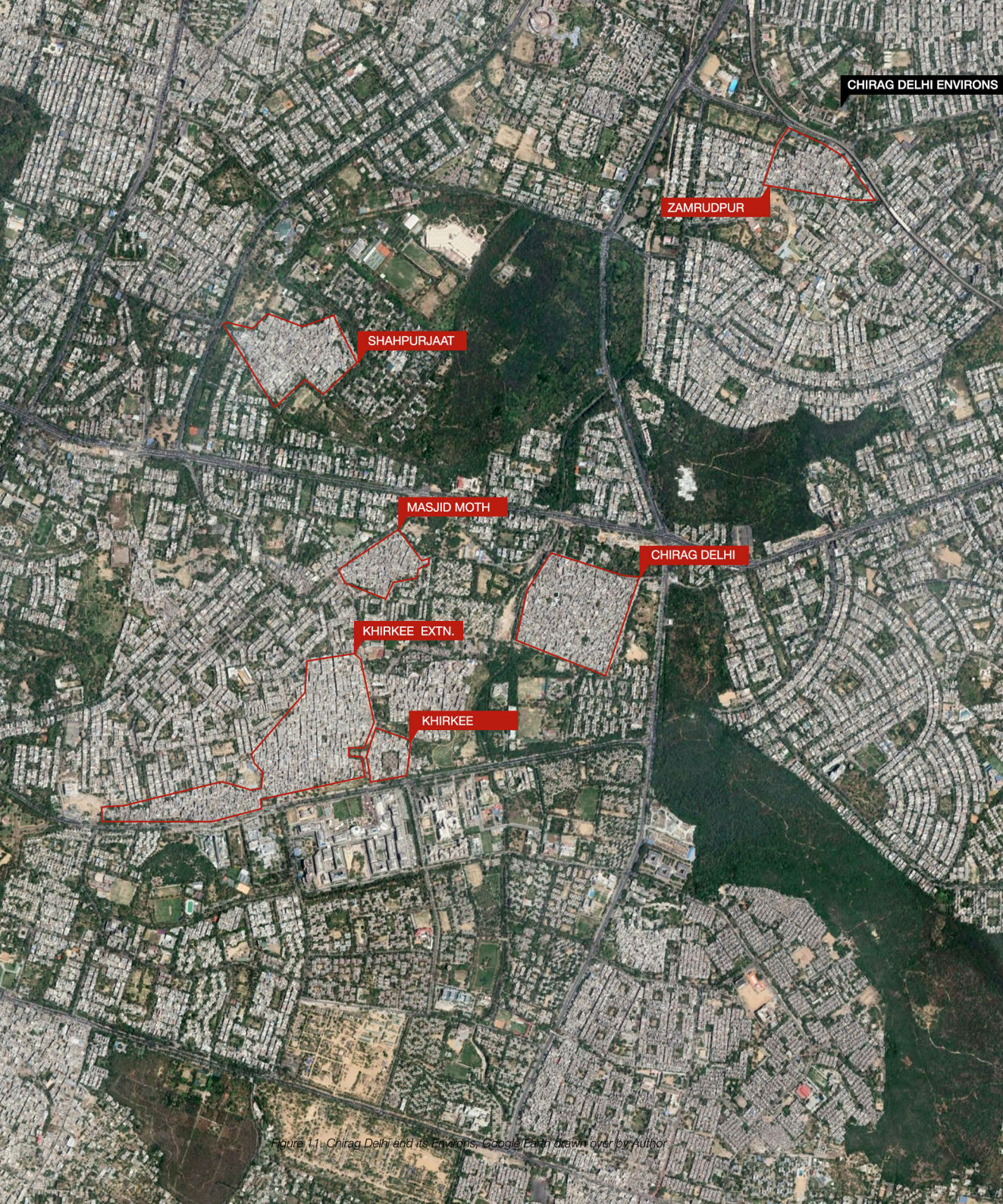


Figure 1.1: Chirag Delhi and its Environs. Google Earth drawn over by Author



for a new land-use, various sub-standard unauthorized construction unfolded in the urban villages. This process reduced the quality of the physical infrastructure of the traditional urban village. Thus, the urban villages were rendered as transfused settlements that look and feel exactly like slums or unauthorized colonies and in terms of landownership were like authorized neighbourhoods.

Apart from the physical infrastructure, the agrarian residents lost their agricultural lands. This also hampered subsidiary processes such as cattle farming or cattle based industries like oil production that had been traditional occupations within the rural settings. Instead, the residents are forced to take up new small-scale industries or rent out spaces for commercial activities. These small-scale industries are not as economically viable as were the traditional industries so the socio-economic structure was also massively disrupted. Also, uncontrolled and unsupervised construction took a toll on environment and natural resources leading to ground water contamination and loss of fertile soil.

Keeping the vices aside, the urban villages act as sponges for the urban poor and are widely recognized as friendlier, cohesive and resilient neighbourhoods. The set ways of building traditional homes are reflected in how land and resources are shared. Most of these were conceptualized and structured by the people as rural pockets traditionally and are now undergoing a state of transition coping with the urbanization trends and newer planning conditions. The urban village phenomenon is an extremely unique arrangement in India. From colonial annexation to urban annexation, the dwellings in these zones have undergone years and layers of structuration. The architectural discipline has always maintained a safe distance from them by positioning itself as outsiders, objectively observing and critically analyzing. However, almost all the attempts to tangibly engage with these zones have fallen apart. By binding them as special zones or Laal Dora zones, the discipline has conveniently dodged confrontations.

These dismissed confrontations form the basis of selecting urban villages as an apt type to study and formulate theories for Indian urban poor dwellings for their inherent genius. The case study for the settlement study is chosen for its strong religious center and a historic stonewall that has preserved its physical form till date. Chirag Delhi is one of the oldest and densest urban villages in Delhi (Figure 11). It was built around a shrine of a high order Sufi saint, roughly in the beginning of 13<sup>th</sup> century. It was quite strategically placed as during the time it was conceived, the city center of then Delhi and a forest zone called Jahanpanah surrounded it. As the settlement had a religious orientation (Islamic), a visible territory in the form of a wall was built around the shrine, protecting it against the warring rulers. At the advent of British colonialism and Independence period, various religious, social and ethnic user groups took refuge within the settlement boundaries and have continued to inhabit it since. The fortification around the settlement has protected the traditional houses and architecture within. Catering to the historic value, the government has ear marked the settlement as a heritage zone - Laal Dora and has refrained from interfering with the planning or development of the area within the wall.

Representing the informality under investigation, Chirag Delhi stands as an appropriate sample site to study the ephemeral and spatial qualities in informally designed dwellings within the urban villages of Delhi.





SETTLEMENT CENTRE

YAMUNA DISTRIBUTARY

FORTIFIED GRAIN

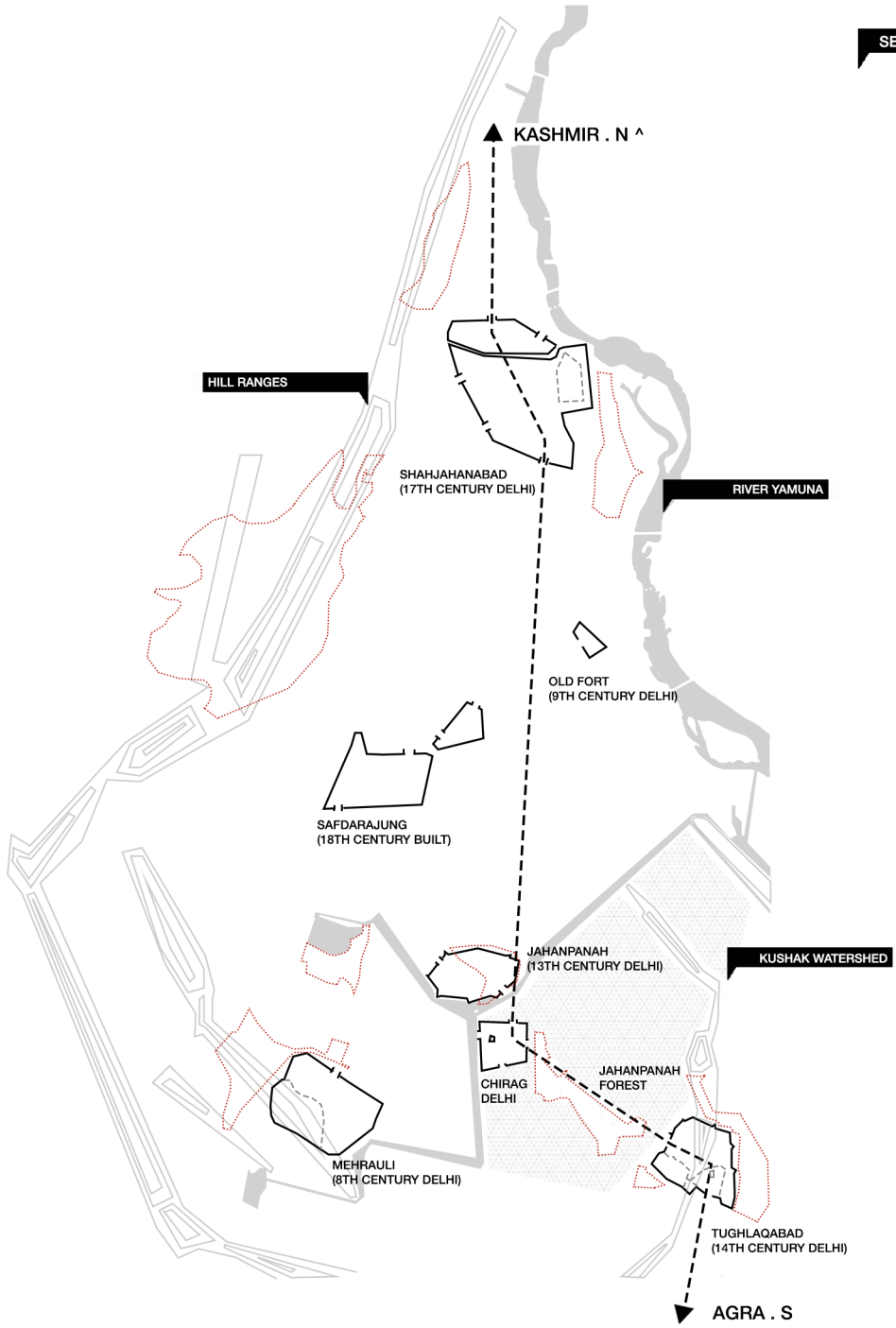


Figure 12. Sequence of Forts and gates . Visualizations for Chirag Delhi ( Illustrations by Author)

## **CASE OF CHIRAG**

*Looking closely from a Distance*

Chirag Delhi is chosen as a case example for this research paper to study and document dwelling typologies and organizational character. To better read and understand the settlement, techniques of immersive participation are deployed over two site visits of 10 days each between the period of June-July 2017 and January-February of 2018. The settlement has been studied in themes for its basic form and organization at the time of inception, circulation, housing and commercial clustering and unit designs. This helps in deriving conclusions about how self-organization principles operate and how and whether once respond to it as a designer.

Chirag Delhi is a densely populated 14th century urban village sitting in the heart of Delhi. Its existing location is adjacent to Tughlaqabad, the fourth medieval city of Delhi laid out by Muhammad Bin Tughlaq of Delhi Sultanate. Chirag Delhi was laid out as a religious center for preaching 'Sufism', especially the learning of Nizamuddin Auliya by his disciple Nasiruddin Mahmud Chirag Dehlavi. The tomb of Nasiruddin is the religious center of the settlement and the settlement is named after him as Chirag Delhi, which translates to 'light of the world'. Since Islamic teachings did not accord for Sufism faith as it was based on mysticism, the Tughlaq fortification did not include Chirag Delhi within its precincts. However, Muhammad Bin Tughlaq, the then monarch was open to the idea of having a parallel faith and allowed for a rubble masonry construction to enclose the shrine of Nasiruddin Chishti in 1325-51.<sup>12</sup> Thus, Chirag Delhi was rendered into a smaller fortification and since the members of the royal household were also meant to access it, a royal route connecting the fort and the shrine was added next. To accommodate the same, the east side of the wall was added with an archway. Additionally, there is a small forest called 'Jahanpanah' between Tughlaqabad and Chirag Delhi. 'Jahanpanah' is a Persian word that translates to 'refuge of the world' and was believed to be of a ceremonial nature by the Persian Monarchs hence, the trail was highly significant and still exists whereas the fort has largely disappeared due to natural calamities and subsequent plundering and successions (Figure 12).

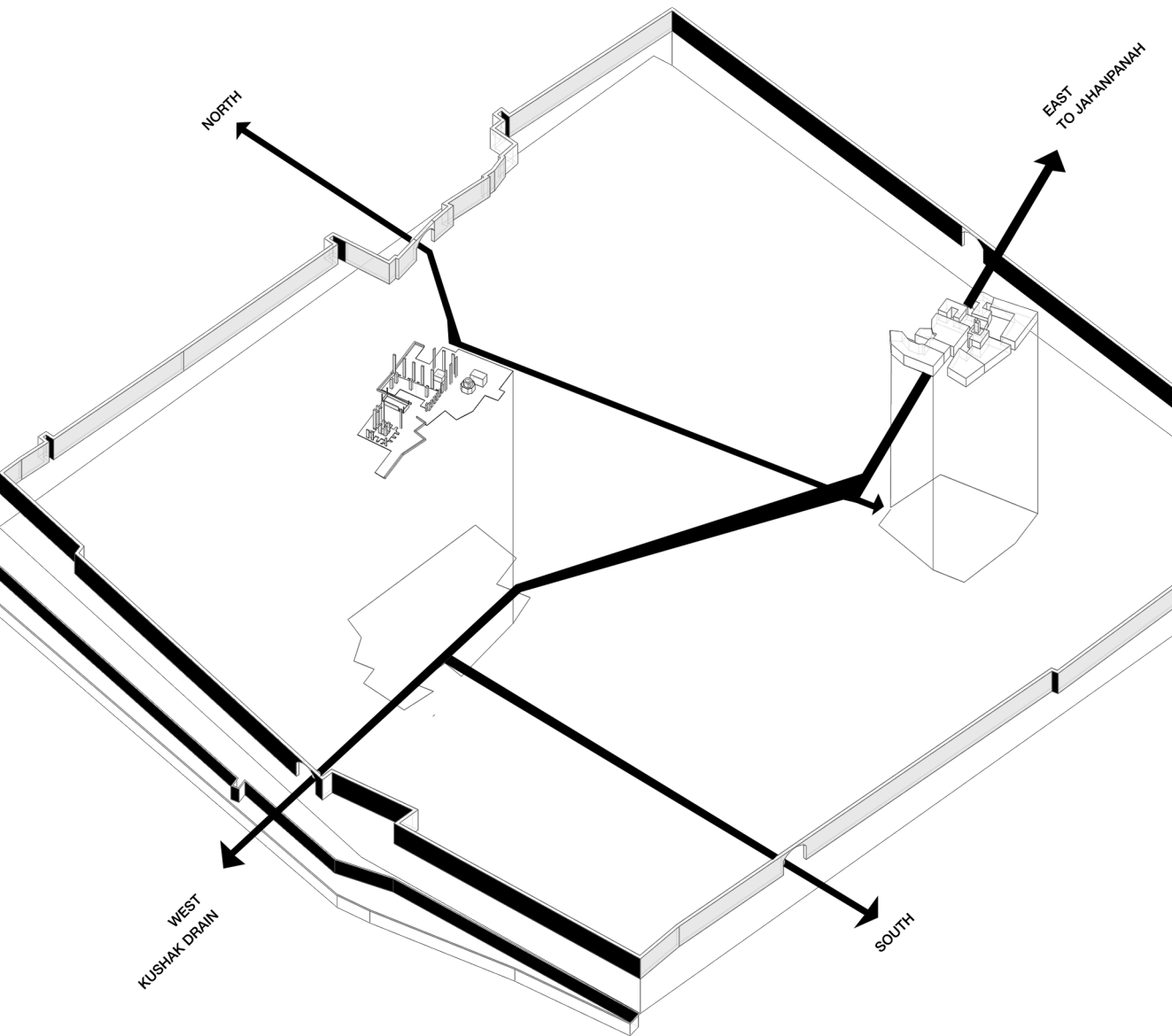
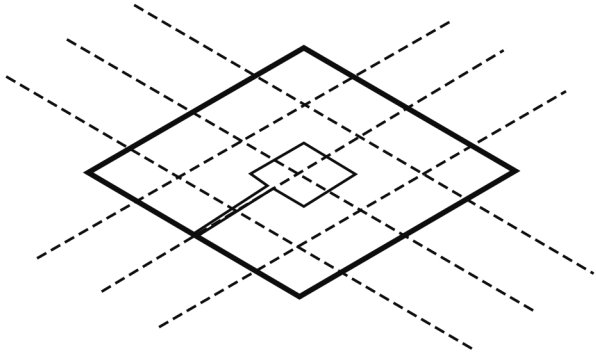


Figure 13. Basic form . Visualizations for Chirag Delhi, Illustrations by Author

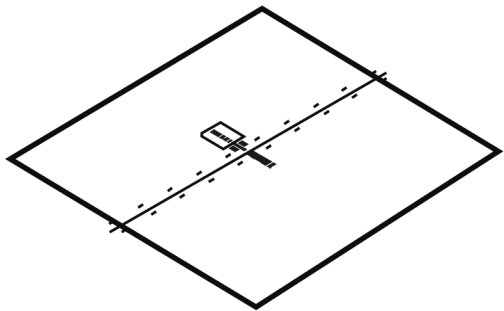
The other gated archway was planned on the west side of the fort that opened up to a small water distributary ( Distributary is a drain that diverges water from a river). Strategically, Chirag Delhi was placed in the middle of Kushak Basin, which is Delhi's oldest and second largest watershed. The soil was extremely fertile and the water banks were traditionally linked to the shrine for evening preaching and an avenue for religious poetry. Thus Chronologically, west and east gateways were laid out and the axis joining the two diametrically divided the shrine (Figure 13). This axis can be termed as the 'royal axis' as it connected the shrine to the royal fortress.

Zooming to the Historical core or the shrine of Nasiruddin has three architectural functions. First, it acts as a small space for Sufi gatherings and preaching. Since Chirag Delhi does not share affiliations with the Sufi Board in India due to difference in ideals, Sufi music and performances are rarely held in the complex. There are smaller tombstones in the complex, which gives its second function that is of a mausoleum. Nowadays, a small kitchen has been setup where community kitchens are usually held for offering food and shelter to the homeless of the city. In the daytime, the same space doubles up as a girl's school.

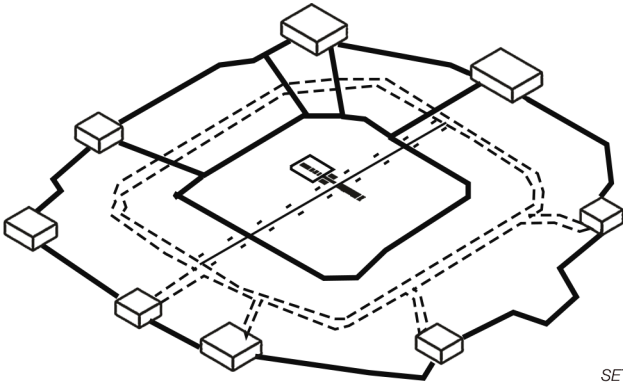
The shrine only has one entrance that is lined up with various small shops selling religious apparatus such as flowers to the visitors. The disciples and the descendants of the family of Nasiruddin take on the administration and preservation of the complex. They also carefully placed themselves to the south east of the shrine at the time of inception so that the Shrine as well as Mecca lies to the West. This formed the traditional settlement as marked in figure 16. Eventually, the seventh and the last medieval city of Delhi, walled city of Shahjahanabad was laid in 17th century by the Mughal King, Shahjahan, 12 kms north of Chirag Delhi. Like Tughlaqs, Mughals also shared Islamic faith but had even more acceptance and reverence towards Sufism. Owing to this, the royal fortification in Shahjahanabad had a gateway in its fortification that looked onwards to the south, towards which lied Chirag Delhi (Figure 12,13).



BOUNDARY AND CORE



PRIMARY CONNECTIONS



SETTLEMENT GATES

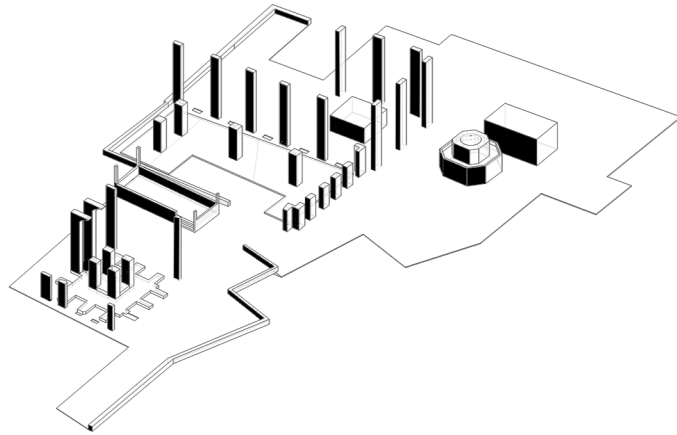
Figure 14. Settlement syntax for Urban Villages, Illustrations by Author



There were trade routes laid between the walled city of Shahjahanabad and Agra, Mughal City adjacent to Delhi. One of the traditional ways to create public avenues was to maximize the convenience in carrying goods in and out of the settlement. In earlier days when there were no compasses or maps, the placement of the exit and entrances to the settlement was done demarcating the direction of the nearby destinations. In each of the settlement, the historical gates were placed on the boundary pointing towards various centres of trade. The historical core was connected legibly to the gates, formulating the structure of the public realm. Thus a North and south connection or gateway were also made into the fortification walls of Chirag Delhi that symbolically overlooked to the walled City of Shahajahanabad in the North and Agra on the south. (Figure 12,13,14)

The Chirag Delhi village slowly grew around the Dargah for two reasons: disciples of the saint found a refuge and the fort acted as protection from the surrounding wildlife and invading forces.<sup>13</sup> Originally the enclosed area contained only a few scattered havelis (private mansions) and 'hujuras' (small single rooms) of the Khadims (custodians) of the Dargah.<sup>14</sup> Today, Chirag Delhi has 4 major entrances each on the north, south, west and east sides of the square plan. The traditional archways have almost dilapidated and only one remains. The streets and the alleyways have restructured and evolved overtime and thus form a maze or a web but no matter which turn or street a visitor takes s/he will always cross The 'Dargah Chowk' or the 'shrine square' and the old market chowk (square) making these two squares and the primary streets leading to them as the major axis of the settlement. This kind of arrangement is a typological arrangement that is observed in all the urban villages where the central core or the heritage core around which the settlement was once conceived has also become the prominent square (Figure 14).

SHRINE COMPLEX



MURID SETTLEMENT

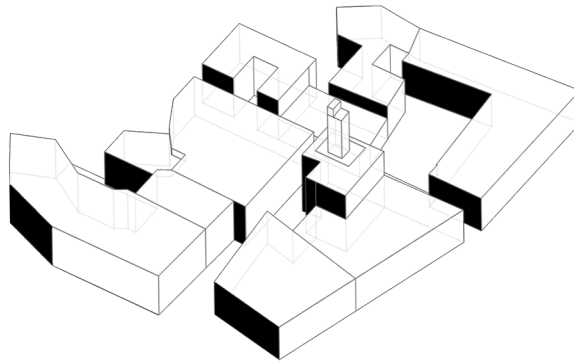


Figure 15. Top : Shrine Layout : Prayer rooms, grounds and tombstones; Bottom : Oldest Settlement in Chirag Delhi, Illustrations by Author

The water edge today has transformed drastically. The quality of the water has gone down and has been reduced to sewage water due to industrial and unregulated waste disposal in the drain. However, the recollection of the edge in people's minds and attitudes is still of the public nature where people organise their city level functions for example, weekly markets or festivals. The largest public space or the public interface which people use to hold city level interactions is termed as 'Maidans'. A maidan can be described as an open space where the inhabitants of an informal settlement hold city level interactions. In the case of the selected case studies the primary programs were fairs, games, temporary markets etc. In the chosen case examples, the maidan typology was observed as composed of two elements: a barren ground on the edge of the settlements without a defined boundary and an open-space next to settlement centre. Both the elements are observed as connected through a legible and accessible street. There was hardly anything built or grown on the barren edge.

The value of a space as big as maidans for informal settlements is similar to what urban parks hold for the city. They are used for leisure, recreation, temporal commercial activities and events, witnessing massive participation by the people from outside the settlements. Hence, in terms of formal language, they are organised to be highly accessible, porous and permeable public spaces. In fact, the extents are usually so wide-ranging and dynamic that one tends to enter, participate and exit the space almost unknowingly. Without any formal boundary, the maidan becomes highly flexible almost like a thoroughfare. This in sharp contrast to their counterparts, the urban parks, which are designed as popular destinations.

Carefully observe the dark patches in the illustrations drawn for the maidans. It is actually the same space occurring in various points of time. For an event like festivals which witness's massive participation from the city and the settlements, it enlarges and anchors itself firmly to the settlement centre to accommodate about 1500 people, on an average. However, it becomes quite localized and focussed around the settlement centre for an everyday market, a relatively intimate event of 400-600 people, attended only by the residents from immediate neighbourhoods. Thus, the maidan not only holds a wide range of occupants, it also becomes flexible in terms of area and programming, rendering it much more usable than an urban park formally designed elsewhere in Delhi (Figure 15).

Glossary:

Dargah : Religious terminology used to describe a Sufi shrine.

Chowk : Hindi traditional term for an intersection or square



*Localised Event eg. Weekly Market*  
Area : 3670 sqm., Person Count : 600 - 650



*City Scale Event eg. Fair Ground*  
Area : 9000 sqm., Person Count : 1500 - 1600



*City Scale Event eg Special markets*  
Area : 8400 sqm., Person Count : 1000 - 1200



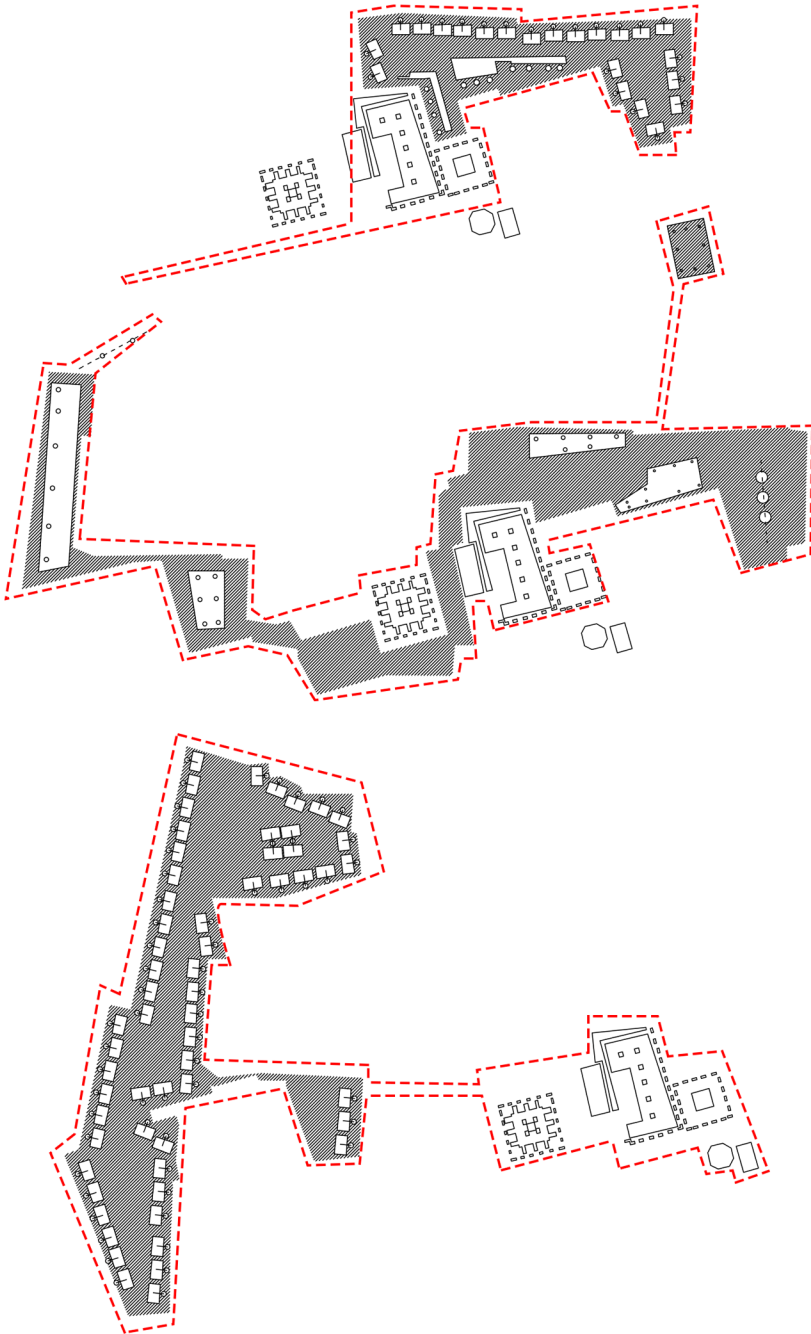


Figure 15. Maidan Forms in Chirag Delhi , Illustrations by Author.





ERENA  
WALVIYA NAGAR  
PH. NO. 4058440  
E-MAIL: ERENA@GMAIL.COM  
WWW.ERENA.COM







FIGURE GROUND



Figure 16. Figure Ground for Chirag Delhi. Illustration by author

## **Non- Permeable and Non-Visible**

### *Territoriality*

Pre-Independence, Chirag Delhi maintained its original population of about 45 people and a floating population of about 70-150 Sufi disciples. However, the turning point for the demographics of Chirag Delhi came around Independence and subsequent partition in 1947. India was envisioned as a Hindu majority nation, whereas Pakistan was primarily for Muslim majorities. The census of 1961 recorded a population of 5600, whereas till 1991 this number had jumped to 13000. The main religions followed are Hinduism, Islam and Christianity.<sup>15</sup> The Dargah unites the multi-religious community. Everyone prays to the Sufi saints regardless of religion. Ironically, whilst the inter-religion relationship is good, there is less tolerance amongst the Hindus due to the caste system, which has extreme implications on the economic status, education and gender treatment.

Caste system is a traditional Indian system of classifying various communities in a social hierarchy. The higher order castes are exposed to better economical, educational and cultural facilities, whereas the lower ones are highly discriminated against. The system had been traditionally the essence of Indian social structure, however, with time has been carefully abolished. Interestingly, it still exists in one form or the other in the environments which are completely user-generated like Chirag Delhi. The Brahmins and Jaats are the richer castes, with political power, money and access to education and opportunities overseas. Economic and social mobility is non-existing, implying that along with the caste, economic profiles are also passed down from one generation to the other. For instance, the potter's trade was established since 1632 and the families are still running the same, whereas the Muslims running the Dargah are from the same bloodline as those who built it.

Gender based role division and social hierarchy is extremely evident. In India, some of the caste groups perceive raising a girl an expensive proposition owing to prevalent social ailments such as dowry. 'Dowry' is an obligatory social construct where the bride has to bring money and property to the groom on her wedding day. Hence, while the richer castes could afford to have daughters, male infants predominate in the lower castes, suggesting widespread female infanticide.

The rare appearances of women in public are fleeting and reserved whereas men could loiter. Even highly educated women from privileged backgrounds are dictated by culture to have no career of choice other than marriage and domestic roles no different from uneducated women. Although education is available to all, dropout rates are high among poorer kids due to the lack of parental regard for higher education. Unemployment, drug and alcohol abuse problems affecting men are widespread. Women being confined at home are susceptible to violence from addicted husbands. The section underneath looks at how does all these religious and social idiosyncrasies manifest spatially, especially in the formation of communities in a non-designed setup.

During the Partition, the general sentiment towards Muslims and Sufis altered dramatically. Most of the Muslim lineages decided to displace to Pakistan, whereas the Hindu communities from Pakistan started moving into India. The freshly independent, Indian government was still not completely prepared to handle and accommodate the ingress of people and



thus illegal squatting became a commonplace strategy. Chirag Delhi also witnessed the egress of Sufi disciples and ingress of various castes and Hindu religious groups, however, India was tolerant towards the Muslim citizens who wanted to stay back and few of the descendants of Nasiruddin Chishti resultantly decided to stay put.

Most of the recently conceived central Delhi or the British Lutyen's Delhi were allocated or acquired by the Hindu elite and politically superior families. Various state representatives were also given accommodation here in Lutyens Delhi for their support in joining India during the partition. Thus, these neighbouring urban villages like Chirag Delhi were strategic locations to find accommodation for those who were second in hierarchy. Not only did these villages have fertility of soil to turn into revenue but also a fortification to defend them against any evicting or invading body. The warrior clan of Jaats were the first to inhabit Chirag Delhi post independence<sup>16</sup>. Joining them were Brahmin families who were wealthy enough to buy or lease out these pockets from the British managed municipality.

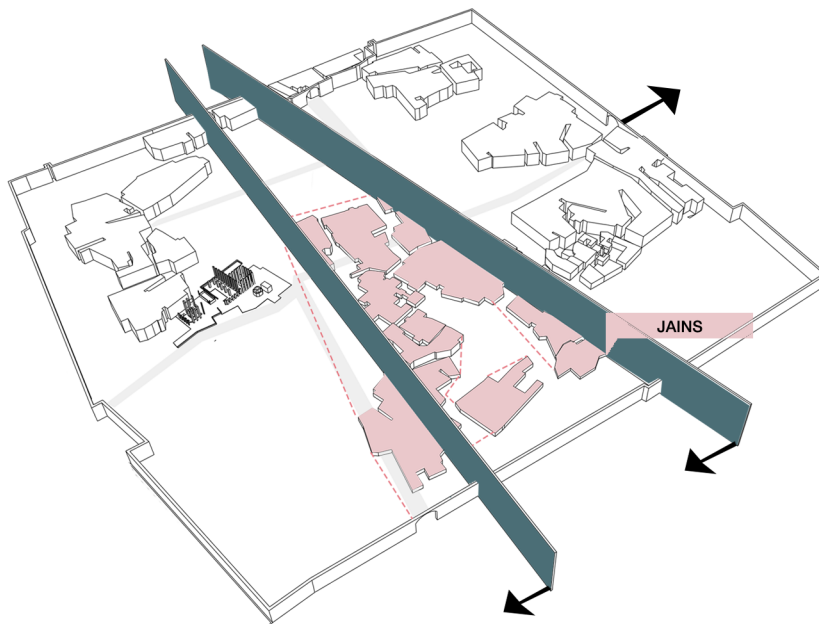
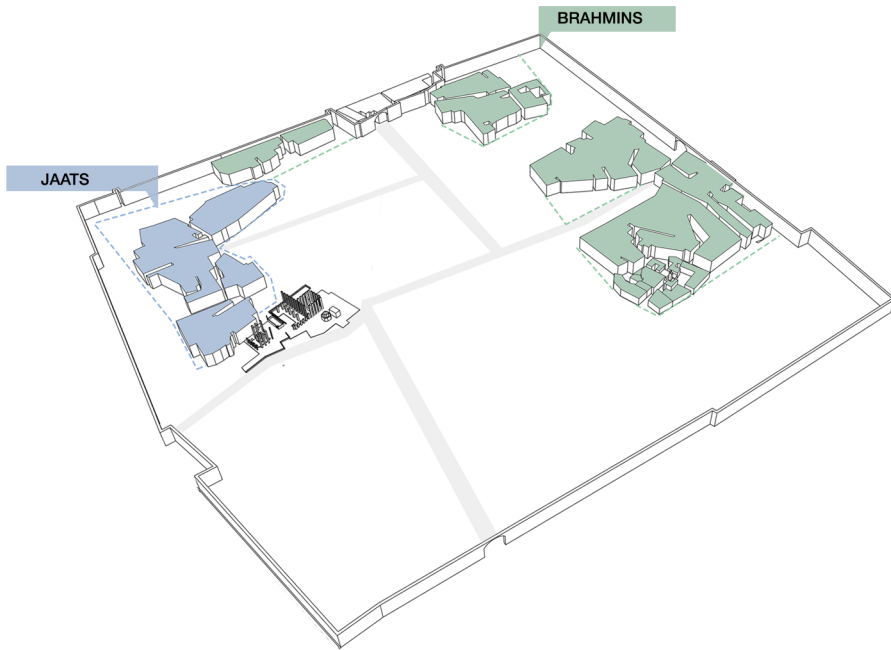


Figure 17. Top : Spatial make up by highest order castes, Bottom : Spatial make-up by second order castes, Illustrations by author

<<

The Hindu Brahmin groups as well as the warrior Jaat groups shared very different cultural affiliations than what Chirag Delhi had witnessed before. Predominantly, they did not share the same inclinations towards Sufi mysticism which was central to Chirag and that is why the settlement went through massive cultural restructuring. The warrior groups were first to inhabit the fortification, so they decided to place themselves close to the defensive fort wall. Since they were not too particular about intermixing with Islamic culture, the defensive wall adjacent to the shrine made a suitable choice. At present, the Jaats stay close to the wall, they are economically higher in the hierarchy and have easy access to education, healthcare and sports facilities. The Brahmins on the other end are higher caste Hindus that share a sense of superiority in the ancient caste system that was prevalent in India. The Brahmin community is considered as academicians and have shared a greater access to education, wealth and resources traditionally. Moreover, Brahmins are more reserved in inter-cultural mixing and hence occupied the defence wall diametrically opposite to the Sufi shrine, close to the Jahanpanah Forest. Here in Chirag Delhi, Brahmins share a wealthy lifestyle with access to high end education such as foreign universities and better health care. <sup>17</sup>

<<

Further on, the next community to occupy were the Jains. Jains are considered as upper order stem of Hinduism and are known to be the followers of Mahavira. An interesting aspect of their cultural ethos is animal welfare and 'vegetarianism' that prohibits them from rearing animals such as poultry for food. When the Jains had to inhabit the Chirag Delhi fortification, they decided to maintain proximity with the Brahmins, who also share similar dietary customs.<sup>18</sup> However, the adjacent traditional Islamic settlement had till then developed a square where poultry was reared and sold. The odour and the visual of the butchered meat is something that the Jains preferred to distance themselves and in the fabric one notices that although the Jain neighbourhoods start with Brahmins, they diverge near the south wall, creating ample distance between the traditional Muslim settlements and itself.

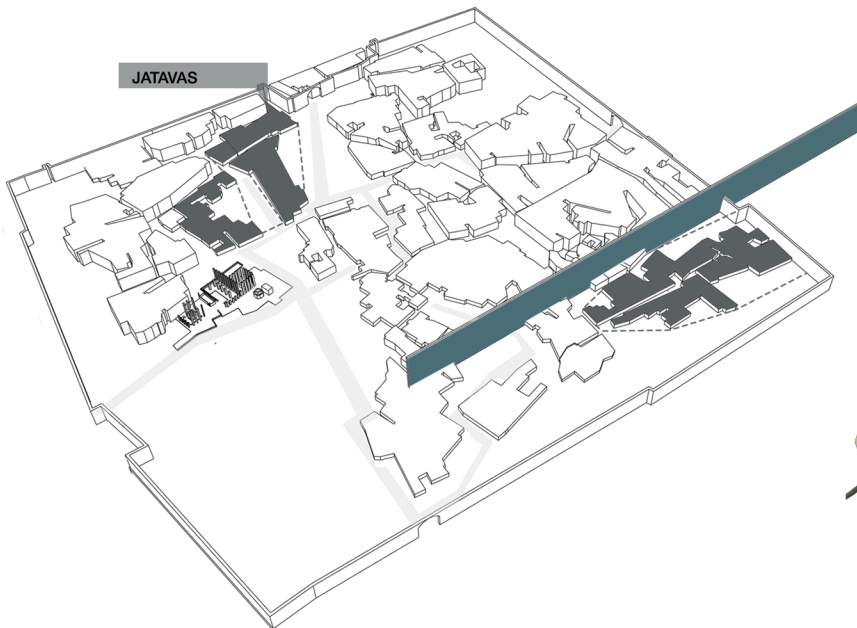
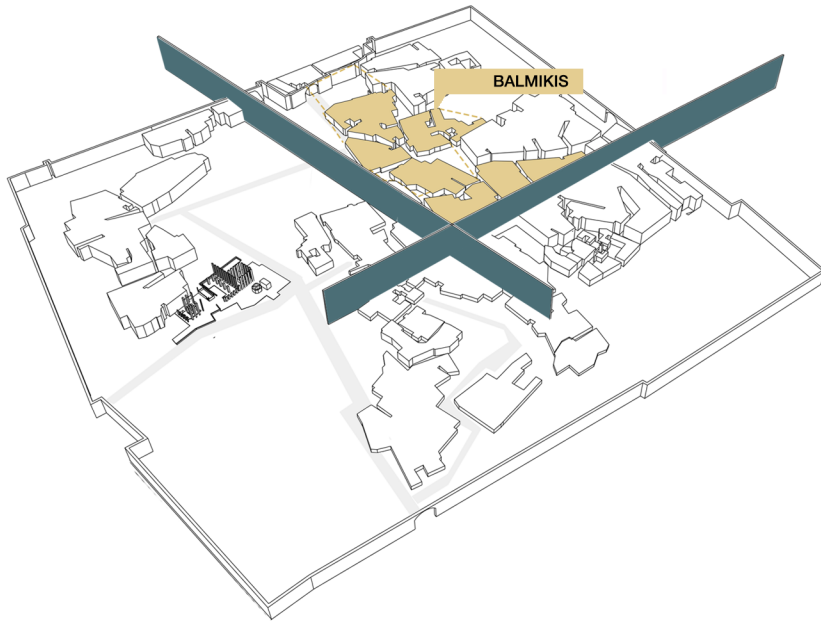


Figure 18. Layout of third order castes (Dalits and Scheduled Castes), Illustrations by Author



<<

The 1991 census recorded the inhabitation by migrants seeking work from neighbouring states such as Uttar Pradesh, Bihar, West Bengal as well as neighbouring countries such as Nepal and Bangladesh. A sub-caste group with its root in Uttar Pradesh known as Balmikis also inhabited certain pockets between the Brahmin and Jain zones in Chirag Delhi. This sub-caste have traditionally faced social exclusion and caste based oppression as it was categorised as a scheduled tribe or the lowermost in the caste hierarchy. Today, they shun the caste system but struggle with social discrimination of some order. Hence the Balmiki community within Chirag Delhi is a very introverted setup, hinging on the North Archway of the fortification popularly known as Delhi Gate (as it overlooked the then walled city of Shahjahanabad). One wall of the Archway has been modelled as part of a residence whereas the other wall has been modelled into a shop. The intention of the community is to anchor itself with one of the heritage structures so as to restrict any sort of eviction or shunning. The empty plot of land in front of this gate is the biggest public space used for various programs such as street performances, vegetable markets, flower markets that are organised by the people and for the people of Balmiki community.

<<

The other group of Scheduled tribe is an off-shoot of Jaats and is popularly known as Jatavas. The members of this community consider themselves as a warrior clan; however, as per the traditional caste system they belonged to the lower categories of Dalits or Untouchables. The community is actively fighting this categorization using two primary mediums – acquiring Brahmin education and conversion to Buddhism.<sup>19</sup> For better opportunities and employment, a section of Jatavas migrated to Chirag Delhi in 1990. By this period, social and caste groups higher than those of Jatavas already inhabited various zones in Chirag Delhi and they were forced to sort of occupy the margins left along the north wall and a corner left on the south east of the settlement.

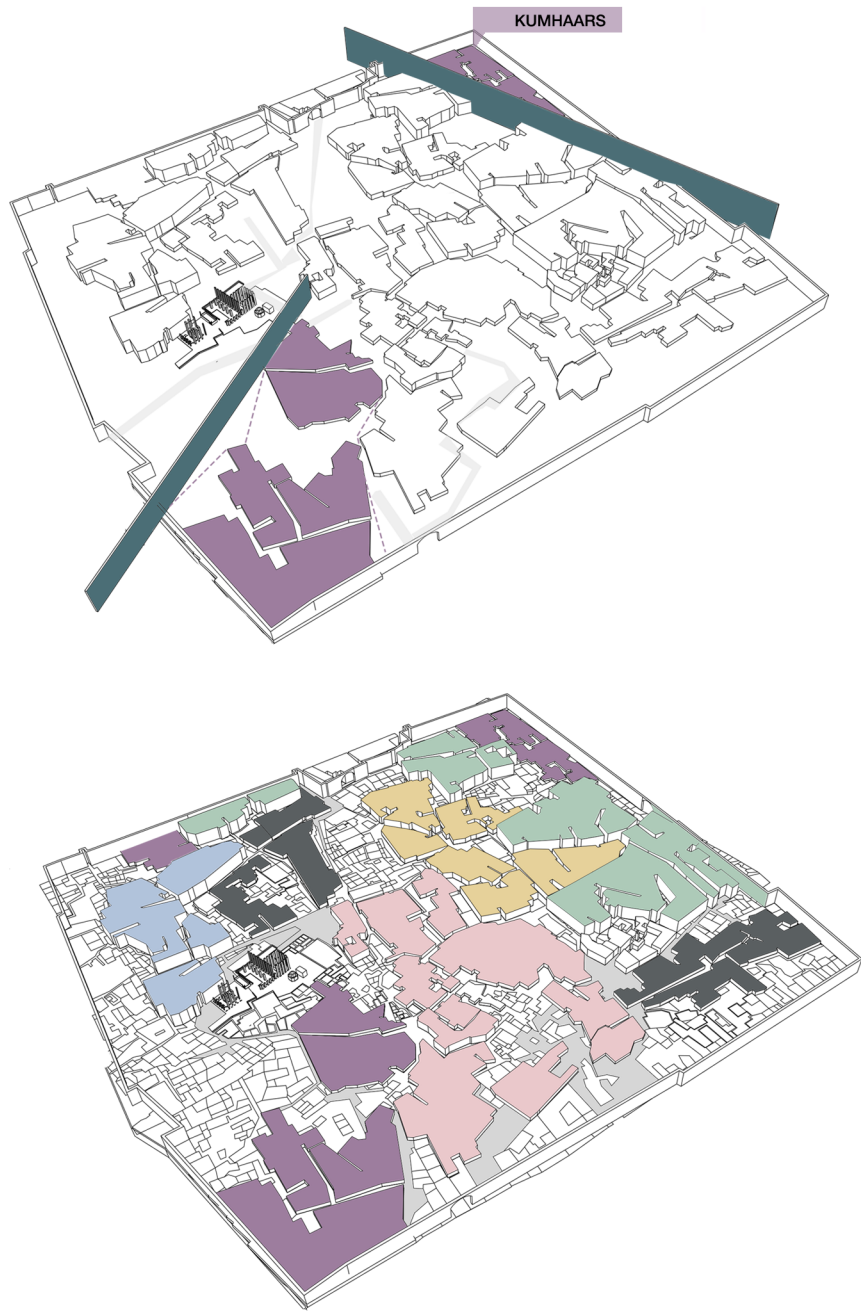


Figure 19. Neighbourhood formations by progressive castes, Visualizations for Chirag Delhi, Illustration by Author

<<

Urban Villages were encouraged to harbour small-scale industries at the time of their conception by DDA (Delhi Development authorities) and municipal authorities. As stated before, a section of potters (Known as Kumhaars) had been traditionally living along with the Sufi disciples since the 16th century. Due to the proximity to the drain as well as the lowest topographical level, the soil quality on the southwest edge was optimum for pottery and hence witnessed an agglomeration of the potter's settlement at this corner. At the time of annexation into the urban boundaries, various other small scale setup such as metal works, Brass artists and embroiders were also placed in the proximity to potter's colonies.

These small scale industries were massively benefited with the central location of Chirag Delhi and a transit-oriented development envisioned for the district.<sup>20</sup> Today, the 'Yakhtupuriyas' and 'Kumhaars' which are mostly the progressive castes of potters have aligned themselves to the south-western edge so as to invite maximum participation from the nearby residential areas. To maintain an economically viable venture within the settlement, a major node is dedicated to the potters to display and sell their work. This public square is named after the community as 'Kumhaar Chowk'.

A. BRAHMINS B. JATAVAS; C. JAINS; D. KUMHAARS; E. JATS

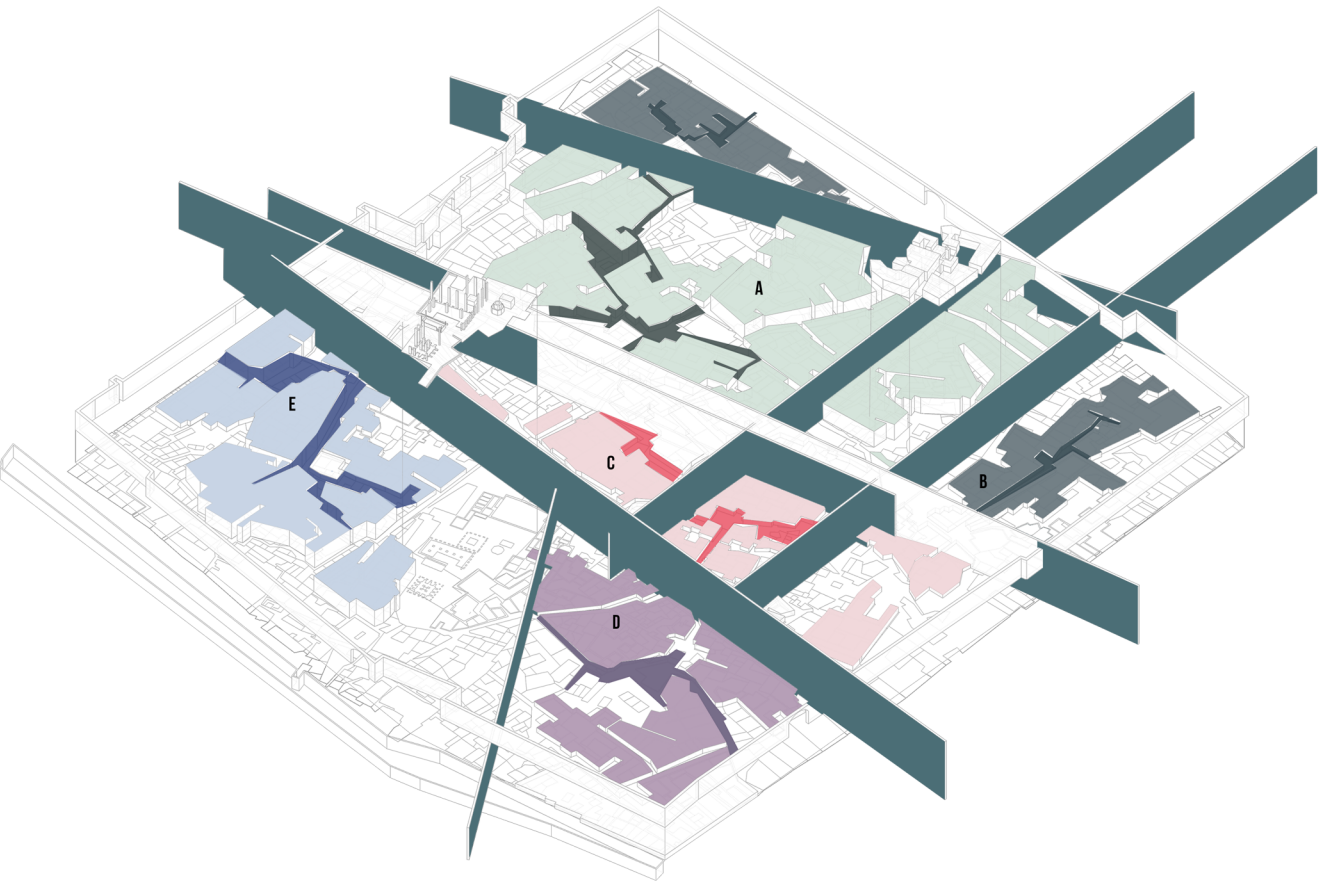


Figure 20. Superimposition drawing of various religious and caste groups in Chirag Delhi, Illustrations by Author

## REFLECTIONS

### *Principles for organisation in a non-designed Environment*

An inquiry into the economic profiles of Chirag Delhi led to identification of an ingrained and latent organizational pattern that emanates out of the traditional caste system of India. The richer and superior placed castes take central positions around the primary spines and around the mausoleum (the assumed center of the settlement), whereas the poor and the inferior assumed castes inhabit the margins as well as the decaying parts of the settlement like the edges with the traditional wall.

Furthermore, the settlement is identified to follow a natural fall or contour to the edge formations of various parcels. Maurice Mitchell in his work titled as learning from Delhi comments on how the agglomeration of the poor around the areas that are vulnerable to flood risk is actually a global pattern. He cites Parikh's example of New York and the path of Harlem, Queens and Bronx to demonstrate the association between the distressed areas and natural drainage lines (Parikh 2004).

On zooming out a bit, there is an instant connection between the areas inhabited by the poor sections of the city and the natural watersheds. Chirag Delhi sits in the middle of a prominent watershed and the mapping of the existing drainage pattern revealed the qualities of the traditional flow lines that sustained and serviced the communities efficiently and sustain-ably. Figure..

Shows how the 'parcellation' is almost placed and aligned along the natural contour going towards the distributary (Barapul-lah), which is quite contrary to the approach in designed processes where the ground is leveled and gridded with a tray of sewage and main water.

Even though, there is a strong parcel and neighbourhood formation on the basis of caste lines and natural drainage, it is surprising to note that the communities have been able to maintain these lines with minimal confrontation under a strong duress of the fortification and the imposed boundary lines of the Laal-dora. This is not possible without an umbrella layer that overrides the racial and drainage based distribution of various communities. For the purpose of this study, this layer is termed as an 'over-riding layer' and the next section attempts to investigate this over-riding layer through theoretical and empirical studies.



## C. FORCES, ORDERS AND SPACES

*Theoretical framework - The Over-riding Layer*

The process to analyse and substantiate the organizational behaviour of an informal settlement requires theoretical and scientific articulation. Thus, this section would de-construct the emergent and spatial characteristics to look into the various layers of spatial growth and their accumulation within the informal settlements of Delhi. Also, to critically establish relationships between them and the various forces involved in their spatial organization.

The most fundamental observation one can make while engaging with informality is the degree of spontaneity and its visible translation to space. According to Louis Wirth, the socio-economic value attached to the cities underwent a radical transformation at the end of nineteenth century as the discourse moved beyond development to the processes of density, social segregation, heterogeneity and emergence of survival mechanisms among the urban residents. It is at this point when the elements of a user generated physical environment were seen as relevant to the architectural discipline.<sup>21</sup> This led to three primary effects pertinent to this research paper. First, the physical form generated through forms of collective behaviour and social interactions was recognized as a scientific process and not arbitrary appropriation. Second, there was a strong emergence of academia, documenting and analysing the juxtaposition of collective behaviour onto dwelling formation, especially the non-designed physical environments. Thus, the informal settlements were deemed as highly 'systematized' processes that have undergone years of socio-spatial structuring and re-structuring. Third, is that the organization structure was scientifically verified as logical and patterned constantly mutating to align to the inhabitant's needs and choices. The underlying structure was described, as self-organization and its manifestation into spatial structure would be discussed further.

The intent behind understanding any organizational process is how an order is achieved. The order can simple or complex, legible or illegible, clearly defined or highly ambiguous. The 'spatial order' dictates the coordination between participating

actors. Most orders define how users operate in a vertical plane where there are hierarchical dissimilarities between the social, economic or religious positions and also at the horizontal plane, where the actors are non-hierarchical.<sup>22</sup>

## **C1: Composed whole > Sum of parts**

### *Order and self-organization*

There are three elements to be gained in terms of order and self-organization and they would be explained using analogies. The first comes from the advertisement and branding industries - Imagine standing in front of two cafés deciding for lunch, both of them offer same cuisine at similar prices and are empty at the moment. You choose the one on the left and enter it arbitrarily. Sometime later, two people pass through the cafés looking for lunch options. In most probability, they are going to choose the restaurant in which you are seated. William Whyte notes this process in context of public spaces stating that what attracts people most is usually the other people.<sup>23</sup> This explains the human behaviour and congregation patterns in and around the commercial centres, historical objects and communication routes, where number is usually associated with popularity.

The second analogy comes from 'herd behaviour' and is used to understand how does everyday decision-making gets formulated in bringing about self- organization. Quiet understandably, the space enclosed within an informal settlement is a highly contested terrain and typically in Delhi, the case where poor consciously mobilize to organize themselves is highly unlikely. Self-organization claims that in natural processes, sometimes it possible that a global pattern emerges out of localized interactions. For instance, in a fish of school, each fish places itself in accordance to the position and the velocity of the neighbouring fishes, mobilizing without being aware about the global knowledge. The theory argues that composed whole is larger than the sum of parts <sup>24</sup> and a certain pattern exists even if it is not legible immediately.

For instance, in Mumbai, another mega-city in South of India, there is a culture of lunch delivery by a group of people called 'Dabbawalas'. People prepare food out of their homes, which are spread all over the city. Each vendor has his/her clients to cater to. Every morning the 'Dabbawalas' collect the food boxes and use a localized system of stamps to mark which box goes to where in the city. The entire city is coded in zones and represented through stamps and markers that are only legible to all the 'Dabbawalas'. This proves that people are able to self-organize into genius circulation, diffusion and agglomeration patterns even if they are not immediately apparent and or of a positive nature. (Figure 15 and 16)

Theorists John Holland and Scott Page define this observation theoretically as complex adaptive systems. It states that regularly interacting components of a system are able to locally organize, thereby generating a more globalist organization pattern. There are three parameters that qualify a system into this category.

- A. Complex: There should be numerous components interacting with each other regularly generating multiple interactions, so much so that it is difficult to observe it at once.
- B. Adaptive: The system should be assimilative to global processes, such that it maintains its forms even if the



LUNCH DELIVERY SYSTEM OF MUMBAI

5000+ MEMBER TEAM

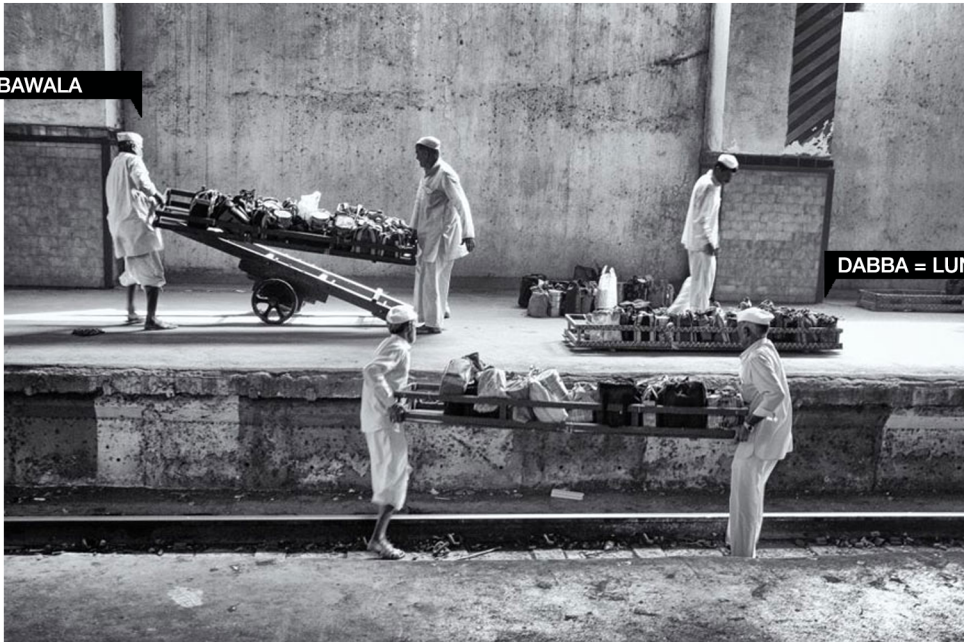
3,50,000+ ORDERS EVERYDAY

REGION WISE DIVISION

COLOR + SYMBOL = ZONE

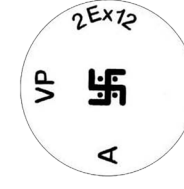
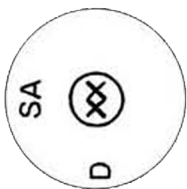
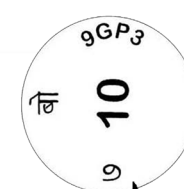
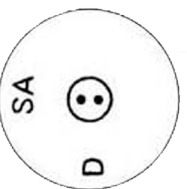
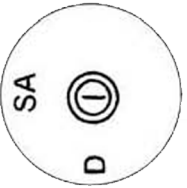
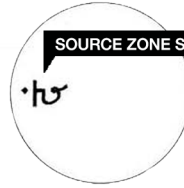
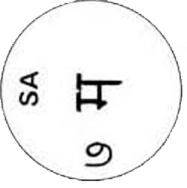
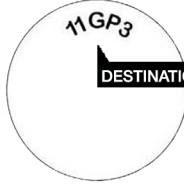
0.1% ERROR REPORTED\*

DABBAWALA



DABBA = LUNCH

Figure 21. Dabbawala In Transit, Photograph from a newspaper, Time of India, 02-12-14



SOURCE PICK UP SYMBOL



Figure 22..Left : Information from DabbaWala Association chart, Right : Map from STUDIOART, Etsy

environment is changing dramatically.

- C. Feedback system: The process should be non-linear and dynamic, meaning that the overall process is made responsive to feedbacks, rendering it systematized.<sup>25</sup>

An informal or squatter settlement categorically fits the brief as the inhabitants are regularly interacting and adapting to the social, economical and cultural processes occurring in the host environment. Since, people are constructing their own environment, the feedback is not only produced but also visibly adhered to.

## **C2: What makes Mi Casa, Su Casa?**

### *Negotiations through common gain*

After establishing existence of patterns and intelligence in their nature, one can dig deeper in how is this rationalized in a non-designed environment. What forces the people to structure themselves in a pattern that corresponds the composed whole? It is quite hard to imagine that the poor who are striving at an individual scale for basic necessities such as shelter, food, water, occupation, health care and education are able to construct an ordered environment. Elinor Ostrom attempts to break this dilemma with a theory called common property regime. She defines it as a regime or a social arrangement, which enforces a negotiation between participating agents to carry out a balanced exploitation and exploration of a common resource pool. The resource pool is broken down into two parts, one section that has to be preserved perennially (stock variable) and the other section that can be harvested by the community (stock fringe).

The resource chosen can be agricultural, water and irrigation, fisheries etc. that in terms of scale are difficult for harvesting individually and additionally be placed in a context where the user groups are also unable to harvest them individually, enforcing a social arrangement. In terms of informal settlements, for instance, the ground water well can be a good example. Locating and digging the bore-well for ground water is an expensive proposition for a poor household to handle singularly, whereas when decentralised in the community becomes an easier proposition.<sup>26</sup> It also limits the consumption to members who invested in construction of the bore-well, which in itself is a point of community creation.

Ostrom through her work 'Governing the commons' effectively ties the theory to eight design strategies for an effective spatial application.<sup>27</sup>

1. Clearly defined boundary – the boundary defines members entitled with discretion to either participate or move out of the resource pool
2. Set of simple and mutually decided rules on how would the resource be appropriated – The balance between exploitation and preservation is defined.
3. Forum where each and every member is free to put opinions and participate in the decision-making process
4. Monitoring and regulating mechanisms – effectively handles the flow and span of resource
5. A scale that defines the appropriation of the resource by all actors

6. A body regulating graduated sanctions in the cases of violation of the mutually agreed rules and conflict resolution
7. Expressing and representing the rights that are agreed the members within the community and also outside the community – mutually agreed or social arrangements
8. In a scenario where the resource can be connected to micro-economy of the community, a system that contains flow of capital within the community.

Ostrom's theory presents with it some pertinent questions regarding the ownership of the resources. She acknowledges that in the case of a misplaced ownership, there is a strong chance of the resource being over-used and eventually depleted. Furthermore, one can argue that the local ownership is highly meritorious when it comes to amassing and sieving through knowledge but ineffective in adapting to changing political and economical processes. At the same time, government ownership is effective in handling large scale of resources but ineffective in decentralising the perks of it in all tiers involved.<sup>28</sup> Ostrom suggest a mediatory arrangement between all the poles would be ideal and states that the context and the scale of resource deployed needs a careful examination.

In order to understand the concept better spatially, the author uses the example of community crop productions system called Baranaja by the farmers of Garhwal, a northern zone existing on the foothills of Himalayas. The Baranaja system of crop rotation is a traditional farming method with its roots in the ninth century. Bara-naja literally translates to twelve crops that are planted to maintain the soil health by fixing the nitrogen to the soil. (Figure 17,18). Cultivation period in India is a seasonal process, starting with the sowing period in March and ending with harvesting period in June. The thumb-rule of the cultivation system is to sow baranaja plantations consecutively to the millet and pulses, so that after every cycle of planting cash crops, the baranaja restores the qualities of the soil, preparing it for next season. If this cycle is not followed strictly, the plot of land could be rendered infertile after a period of time.

However, the bara-naja crops are not of a significant commercial value and planting them for six months could take away the expected income for that period. To avoid this situation, people have come up with a system to mitigate the monetary loss as well as maintaining the soil quality.

The community members within the same geographic boundary come up with a shared arrangement of crop cultivation. The members cultivating millets and pulses in one season are mandated to grow bara-naja in the next one. The monetary and food gained over a season of cultivation of crops is then distributed equally between all the members. In this way, the bara-naja growing members prepare their land for the next season, whereas the cash crop growing farmers sow cash crops sustaining the community.

The arrangement between the communities extends to sharing water and irrigation management systems. As the agricultural lands and irrigation canals are spread over a mountainous terrain, the monsoon water and glacial water



Figure 23. Baranaja Grain Farming, Photographs from a documentary - Down to Earth, Ritu Guha, 2014

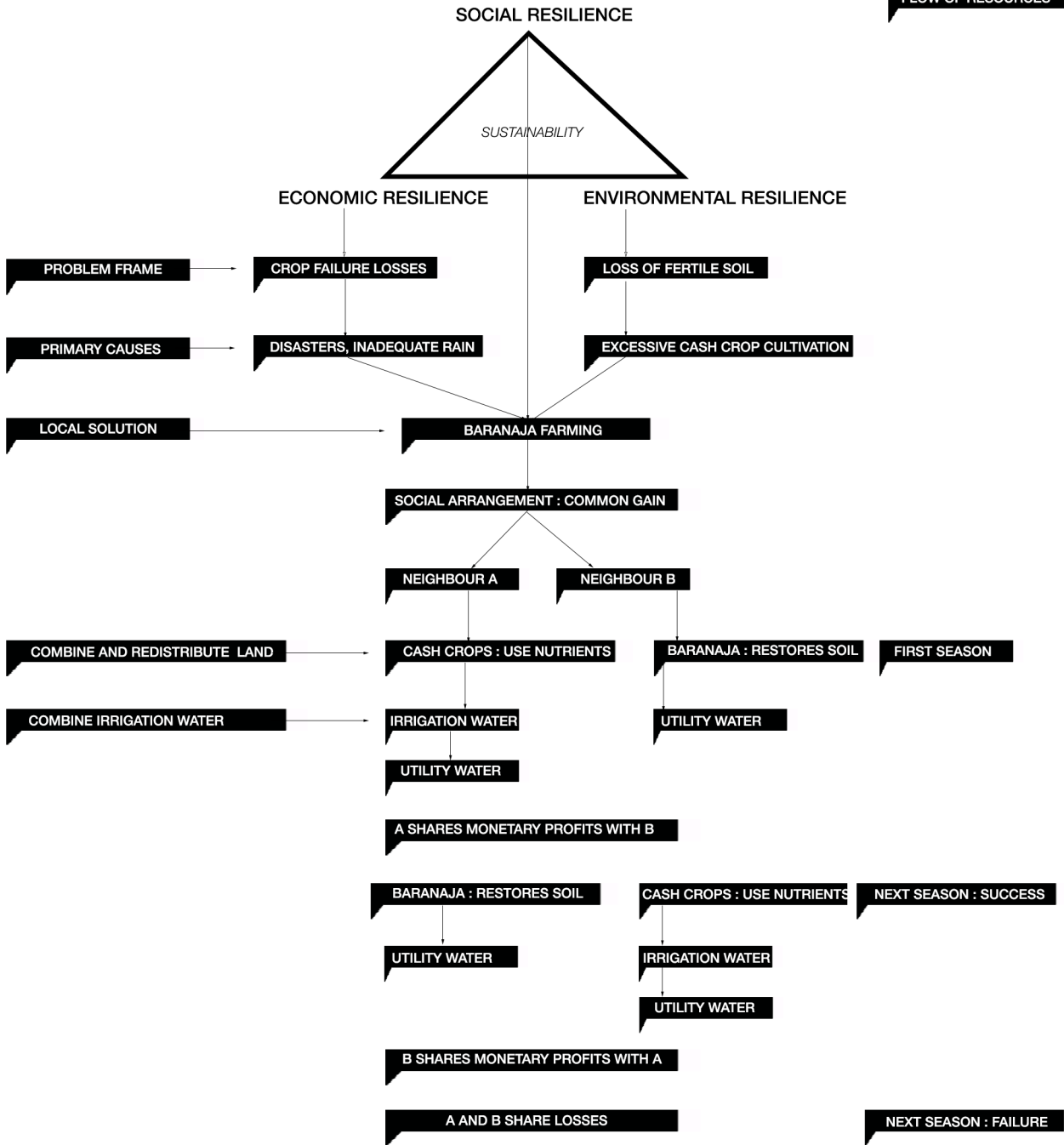


Figure 24. Baranaja societal structure and sharing resources, Illustrations by Author

running downstream becomes of the prime importance. The households above the terrain share a geographic advantage and since there is no official body governing the utilization of water, there is a chance of an unequal distribution of resources. To counter this, the communities have come up with a social arrangement to share irrigation resources such that all the fields are fallow concurrently (Figure 17,18).

Looking at the implementation, households at the same topographical level combine and become a community. These communities do not necessarily have to be geographically together, just at the same topographical range all through out. This ideological zone is called Choorna. Representatives from the zone congregate twice during the cultivation period to predict rainfall and cultivation trends and decide upon the water that has to be divided within various zones. Since, its quite difficult to map the amount of water stored, the communities use markers on water barrages to demarcate the water amassed for a zone. The collected water is taken to a central programmatic element, usually the village tank or the temple tank, from where it is distributed amongst the participating households. Even amongst them, since half are growing cash crops and the others growing bara-naja which requires much lesser water, there is a seasonal arrangement of water distribution in place.

This synchronised and coordinated sharing of resources especially water and land is highly ingenious user-generated method to equitably distribute resources as well achieve environmental sustainability. By becoming equal participants to gains and losses, the communities brace themselves in the cases of crop failures, floods, draughts and adverse effects of rodent/pest infestation. The long-sighted arrangement where a negotiation on the pretext of a common gain brings about a social arrangement that is evidently percolates down to space.

The theoretical studies conducted so far prove that there is a definite merit in the self-organisational strategies used by the communities. To overcome the economic limitations, urban poor communities show a patterned mobilization making them resilient to changing socio-economic and policy changes. Accepting this through a disciplinarian research does not minimize the role of a designer or a planner, in fact a careful overlapping of local knowledge to disciplinary knowledge could bring about a value addition to these processes.

The theories by Holland and Page, especially the complex adaptive system urges to look at the informal settlements closely, yet from a distance to understand the logical arrangements that could be easily missed. The second part of the study builds on these theories to de-construct the anatomy of an urban village, Chirag Delhi into its constituent forces.

## **B3 : REFLECTIONS**

### *Principles for Resource Sharing in a non-designed Environment*

In the case of Chirag Delhi, the resource sharing is manifested in the form of public squares and enclosures. A public space within the settlement can be visualized as a formal square. Programmatically, they hold community-centered interactions such as retail and everyday markets repeating multiple times within the settlement boundary and surprisingly have a very strong attachment to some sort of resource pool. In most cases, they are also named after the said resource. For instance, Chirag Delhi has a prominent square where the communities have organized a bore-well for extracting underground water and is named aptly as Borey-wala Chowk (square with the bore-well).

In the capacity of enclosures, they divide the settlements into smaller parcels, defining the grain of the settlement. The communities organize the squares around resources such as water, fertile soil, and underground water reservoir. These enclosures are organized for safeguarding the resource pool on one hand and visibly displaying the end product in the public space on the other. Thus, a gradation of privacy is introduced within the settlement through this typology and one of the ways by which the communities achieve this is by creating a loop. Akhtar in his seminal works on the walled city also enumerates similar findings. He analyses that the communities articulated a system for the public enclosures and categorizes them into two prominent types – tree like and closed loop.<sup>25</sup> (Figure 33) The resource rich squares are guarded more strongly in an introverted loop whereas the more public squares are plugged into everyday routes through an extroverted loop.

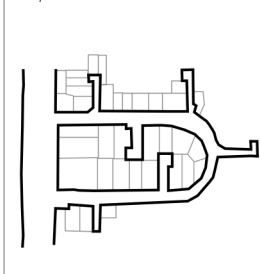
In terms of physical form, one needs to understand how are these enclosures placed and negotiated within a non- designed environment. The interviews with the local inhabitants revealed that the square formation is a result of local knowledge gained over time, sometimes ranging over decades. Users have been observing, identifying and harvesting resources traditionally. Ostrom's common property regime is observed at play since the resources here are gathered in a communal way to optimize the process.

As a true example of Ostrom's common property regime, squares are identified as self-organized, constructed gradually with time and superimposed by local knowledge. In the hindsight, mapping of resources and placing onto them, a community level public space comes across as a promising strategy. To achieve this process, Geographic Information System (GIS) can be used during the zoning phase to identify natural resources.

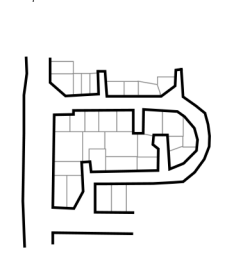
Furthermore, the looping of the public space and the resource pool in all the three cases makes it a patterned spatial typology, compelling for identification of the forces at play. In this case, economics is a visible form determinant as for systematizing the loop into public and private in the first place. However, the site visits to Chirag Delhi also revealed an inherent force at play. In the first few visits, the author could only penetrate the public loop of the settlement, completely unaware and unexposed



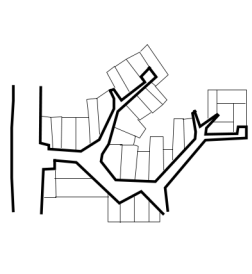
Loop - Like : One street connection



Loop - Like : Two street connection



Tree - Like : One street connection



Tree - Like : Two street connection

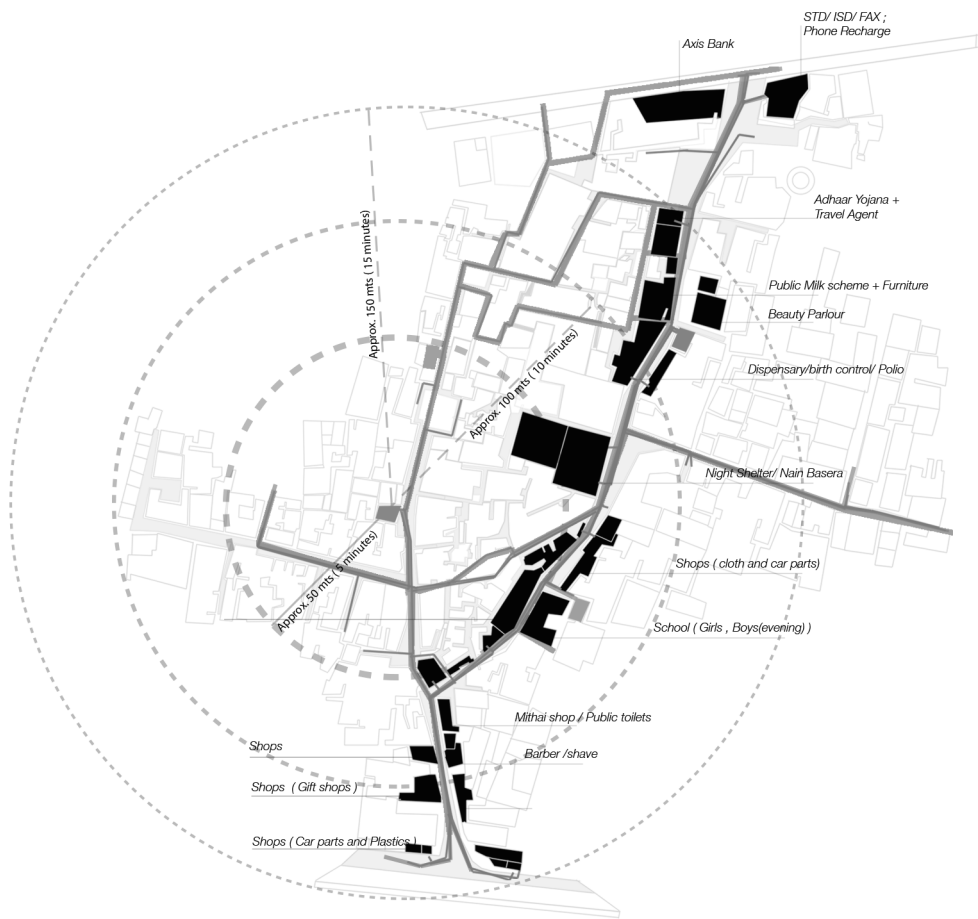
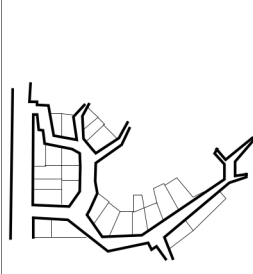


Figure 25. Programmatic disposition and street structure in the neighbourhoods of Chirag Delhi

to the resource loop of the squares. The settlement of Chirag Delhi has four gates as drawn (Figure 34) and no matter which was chosen as the point of entry the author kept circulating within the public loop. Thus, by making sure that only a person aware of the context can reach the resource pool, the inhabitants have used mazing as a technique to plug in defense.

The roughly rectangular geometry with numerous exit and entry also is an innovative defensive strategy as the visitor is compelled to cross a longer trajectory in a narrow section, knowing that the inhabitants are observing him. The rectangular geometries are usually paired with short sides of the dwellings giving each household a chance at using the front edge for public purpose. The connection of this public square is further detailed and grained as it connects to each of the smaller neighbourhood where a central open space is distinctively organized by member of similar familial, religious or occupational affiliations. However, at neighbourhood scale the resource sharing becomes more private and exclusive. Moreover, the exclusivity is based on a similar affiliation, in the case of Chirag Delhi, the religious and caste line come into play. For instance, various Islamic communities rear poultry and meat, which is forbidden in the other dominant religions in the settlement. Thus, a localized meat market is organized by the people within the neighbourhood open space. It is designed and placed inwardly, so much so that the odour of the meat does not attract attention. In another scenario, the indigenous community of Jaats practices arm and mud wrestling traditionally. To practice and participate, a wrestling rink is organized by the community. It is also placed privately within the neighbourhood as the activity is very exclusive to the community.

Through the redrawing of the looped streets of Chirag Delhi, a looping of resources manifested as squares is revealed to be the over-riding layer. It percolates down to each neighbourhood where the privacy and exclusivity increases in gradation. The looping system is a very well articulated system to overlap with boundaries which are predefined by race or caste and natural drainage. Maintaining a resource is a common benefit each member rears and in terms of ownership, they belong to everyone and no one at the same time.

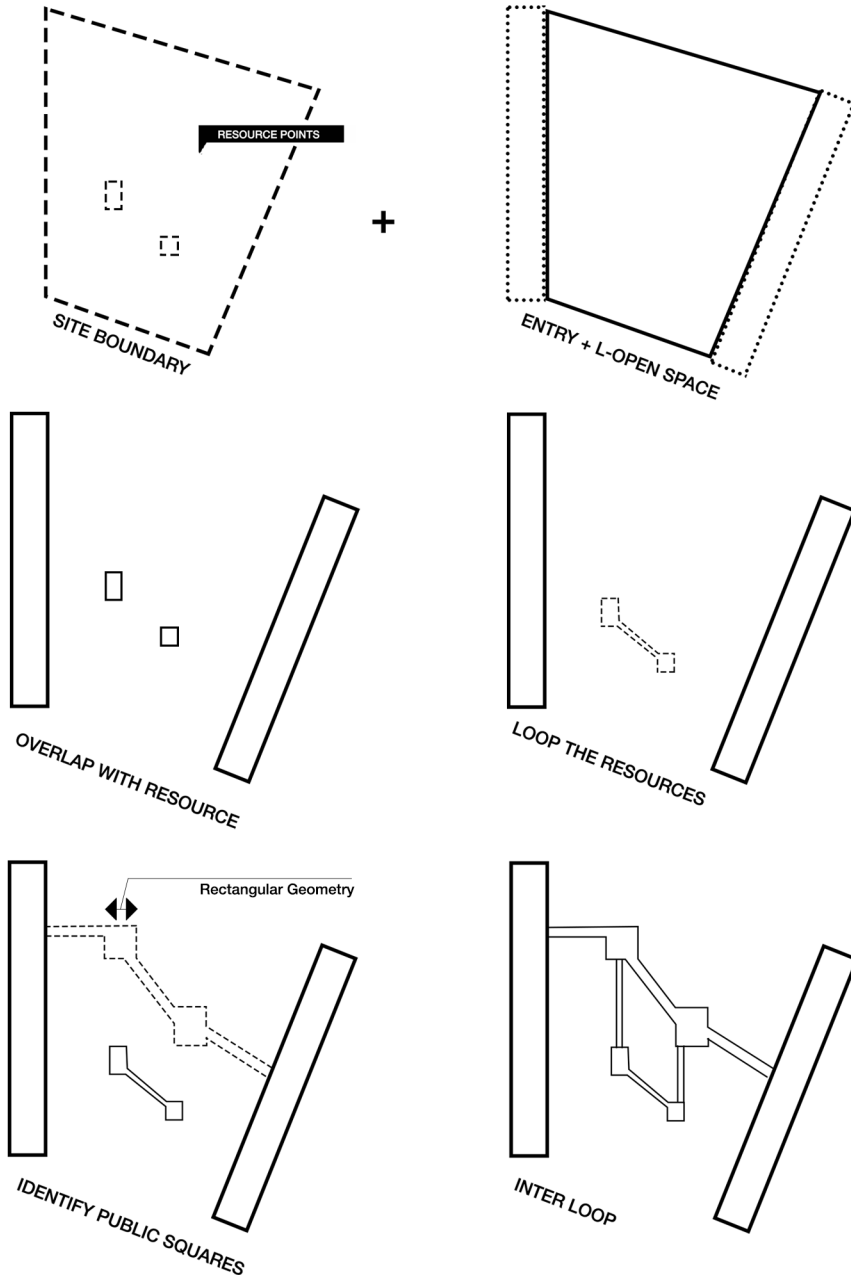


Figure 26. Street looping diagram around the resources, street syntax illustration by author





NOTHING BUT THE BEST FOR YOUR CHILDREN  
**SUMMER CAMP**  
FOR BOYS & GIRLS  
AGES 5 TO 12  
DAILY 9 AM TO 4 PM  
CONTACT NO. 9840178000, 9840178001

STD. ISD. T

PHILIPS MAX 36W TUBELIGHT

DL3CCA2146

DL3C807774





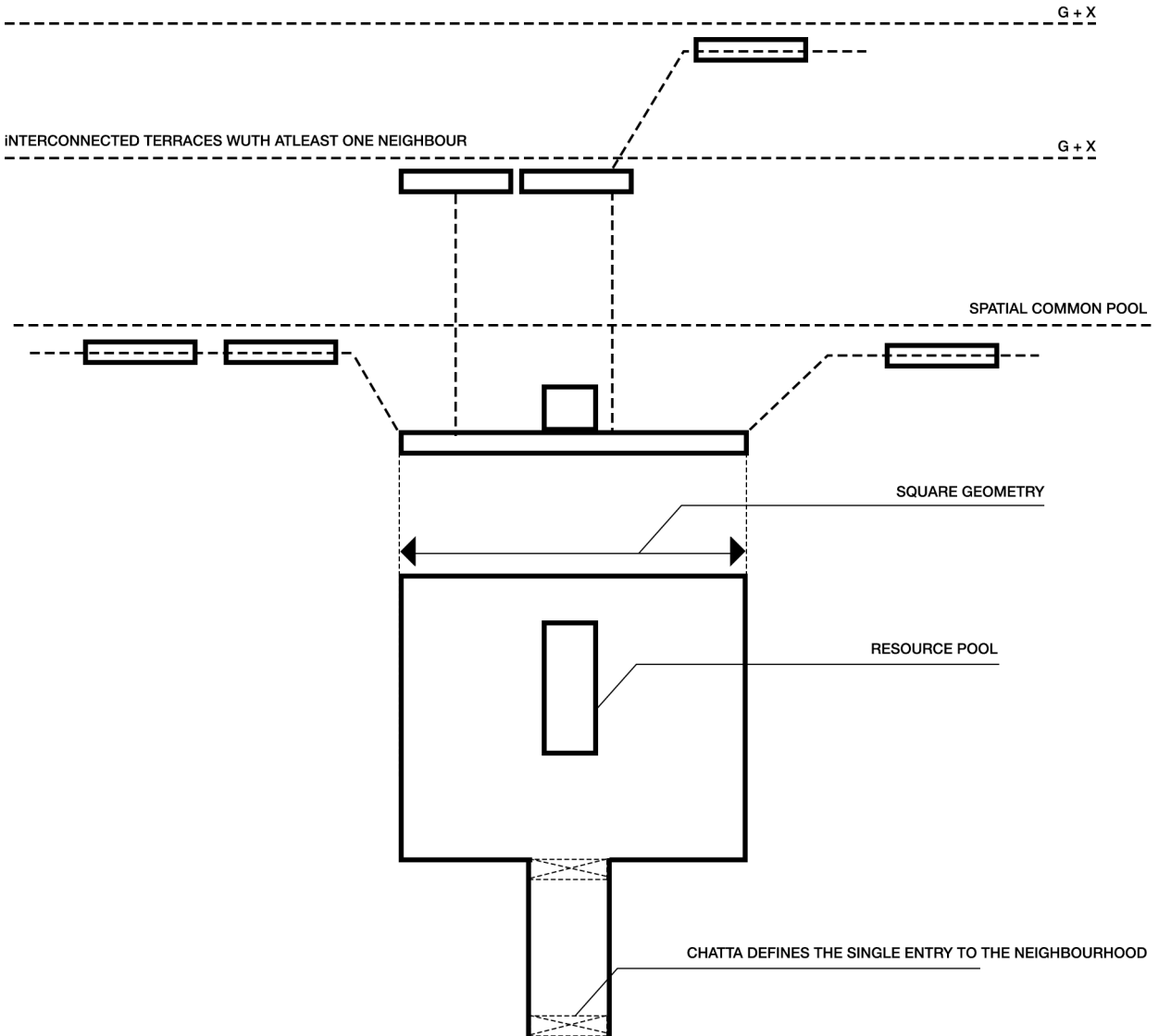


Figure 27. Generic cluster syntax, neighbourhoods of Chirag Delhi, Illustrations by Author



# HOUSE -FORM AND TYPE

## *Dwelling - logics*

The shape and size of the neighbourhoods were observed as varying in terms of scale, architectural articulation and number of households sharing it. However, it did have a formulaic spatial sequence. The living quarters begin with an easily recognisable architectural articulation of the entry point - arches or overhead connections change the look and the feel of space, marking territory like a gateway. Furthermore, a single entry point induces interaction between the members of the community, it also makes sure that someone has 'eyes on the street' at all time ensuring the security of the neighbourhood. Defining a territory through a spatial archetype is an intentional act to bring in defence.

The second component in the syntax is a common space defined by a common resource pool. The defined entry opens to a courtyard or a shared space that inhabitants can personalise as per their needs and requirements, attaching the much-needed value to land. The fact that the created resource belongs to one and all and to no one makes it much more resilient and adaptable for community participation. All the houses open up or can be accessed through this common pool and in theory should have a connected terrace with at least one of the neighbours. This leads to formation of a cohesive living environment on the terrace as well, which is a relief space in an otherwise tight knit settlement.

The spatial articulation of the shared space or the second component also can be categorised into two clear types. The traditional dwelling forms were built on larger plot of lands have courtyards. The size of the courtyard and the placement within the dwelling differed from caste to caste. However, the new dwelling forms are built on a limited and in some cases non-regular plots of land and often in the form of an amenities like staircases or common laundry or drying areas.

The dwelling forms built traditionally are defined for this research as the subtractive dwelling forms since the house was conceived as a volumetric block with living and shared spaces subtracted from the mass. The newer forms are defined as additive dwellings where the housing boundaries are added around a shared amenity much like 'Tetris'. For this section, the spatial qualities of both the types are documented through a series of illustrations.



Figure 28. Dwelling zoom : Figure Ground for Chirag Delhi, Illustration by author

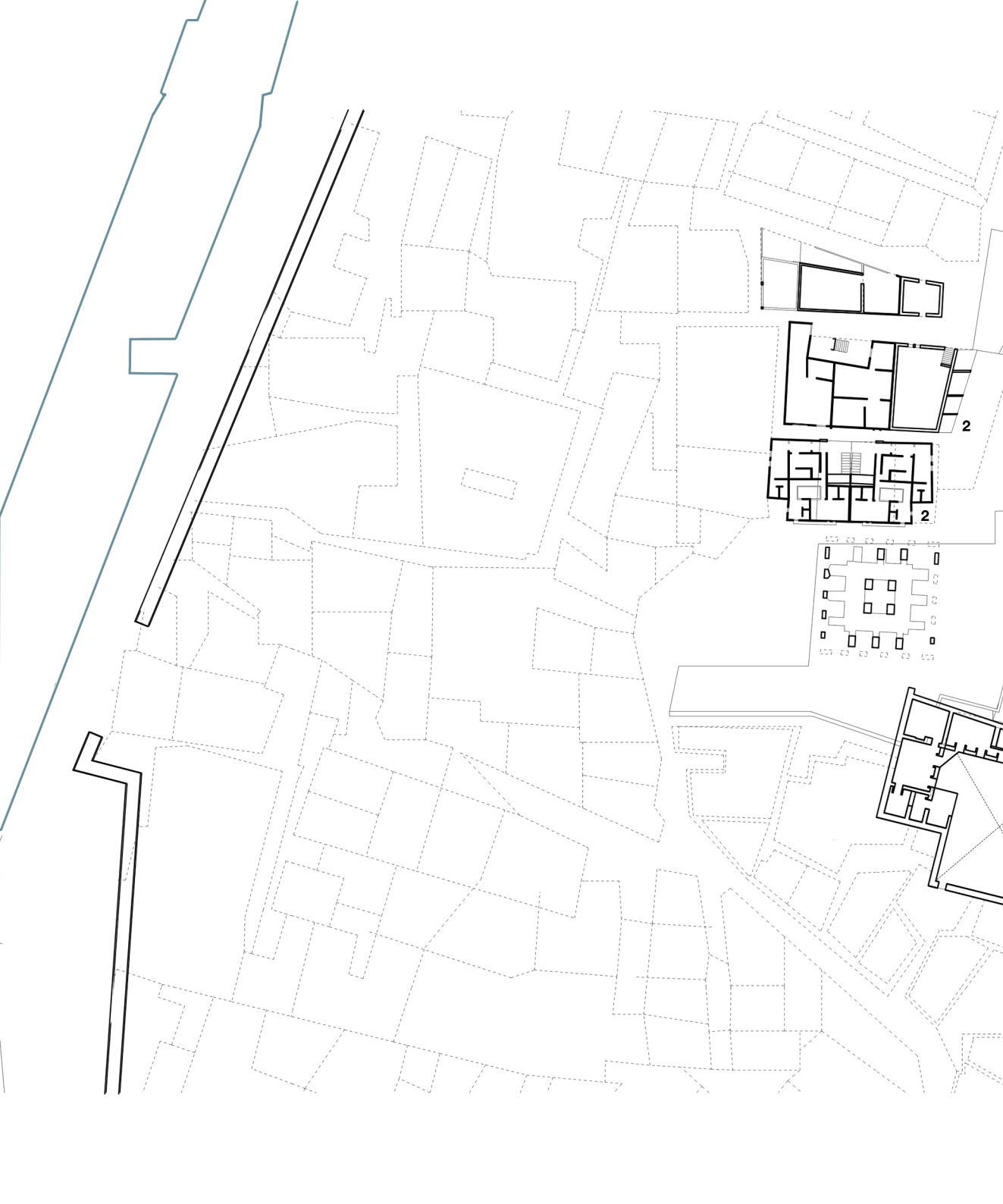
## ZOOMING INTO DWELLINGS

### *Type making*

During the site visits, 9 housing complexes were visited and documented. The houses chosen were to represent the broadest variety range of caste groups - traditional as well as new. The choice also took into account the two prominent dwelling types observed in the settlement study -

1. Traditional multi-family houses: Traditional Havelis
2. Multi-family one to two bedroom houses : Hujuras

The dwellings are studied for their spatial qualities in terms of space sharing, resource sharing, condition of open space, daylight and ventilation and ephemeral character or the activity as observed. For this research paper, one type of each of the above mentioned category is also detailed in the later half of this section.



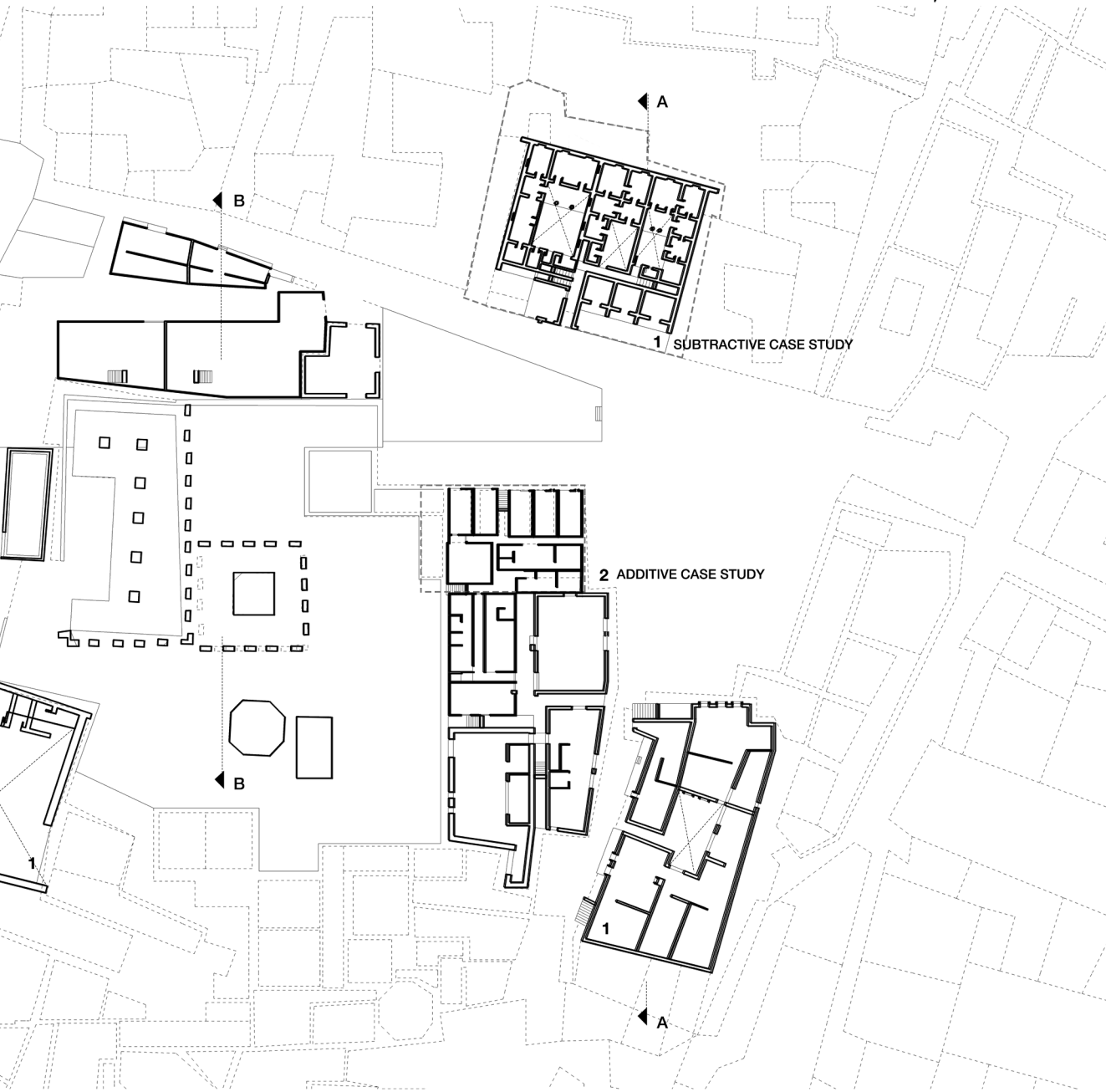
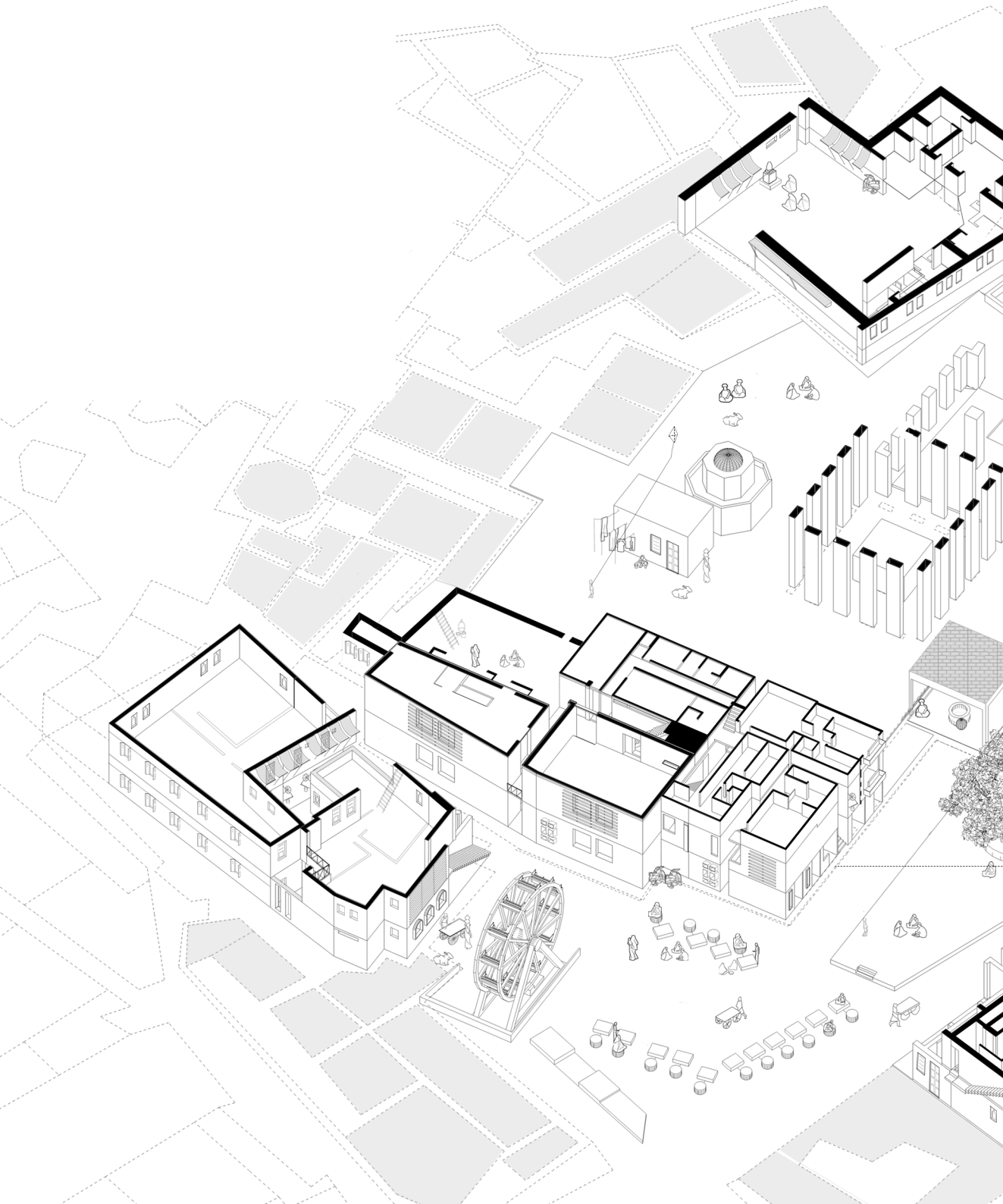
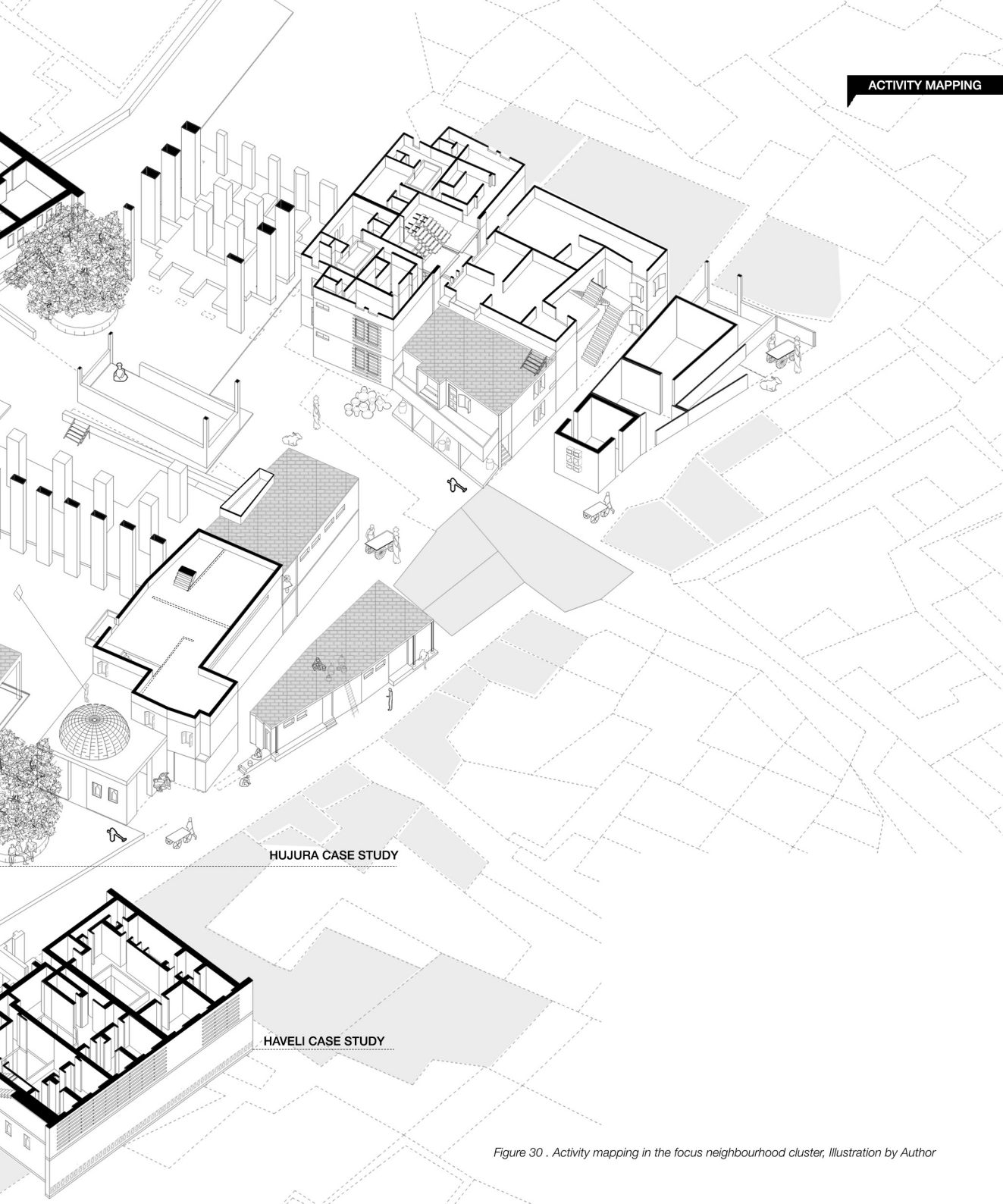


Figure 29 . Site plan for focus area : TYPE 1 : Traditional Housing types - Havelis, TYPE 2: Multi-family one bedroom - Hujura, Illustration by Author





HUJURA CASE STUDY

HAVELI CASE STUDY

Figure 30 . Activity mapping in the focus neighbourhood cluster, Illustration by Author

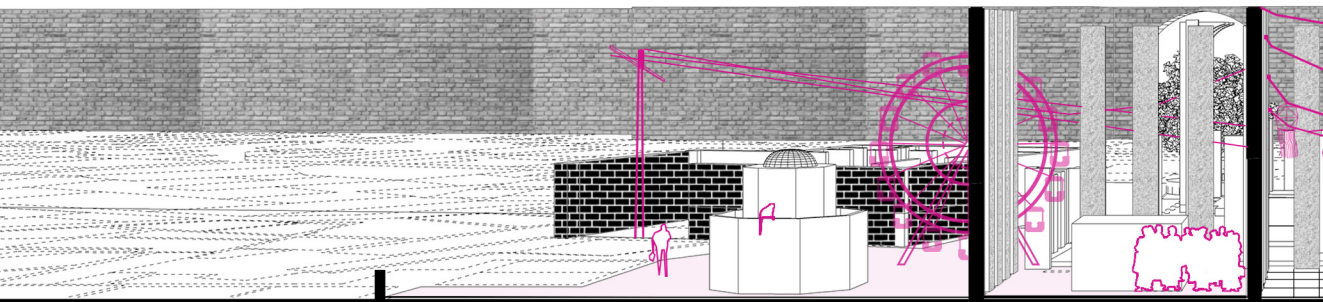
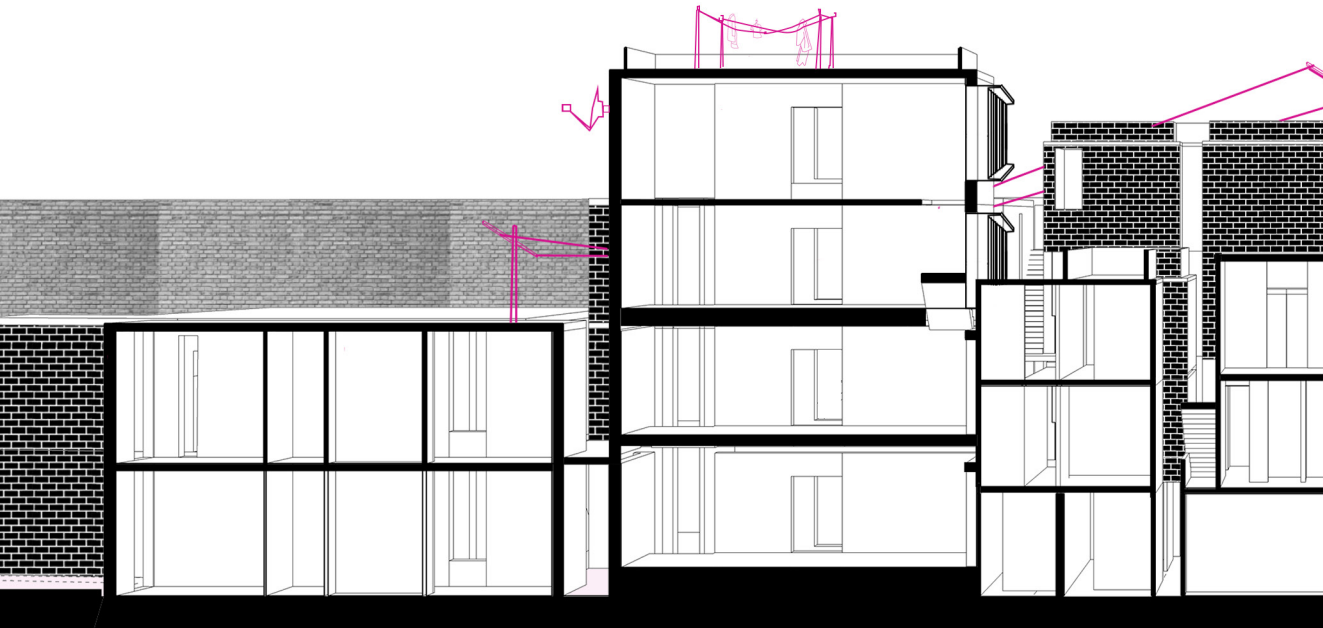
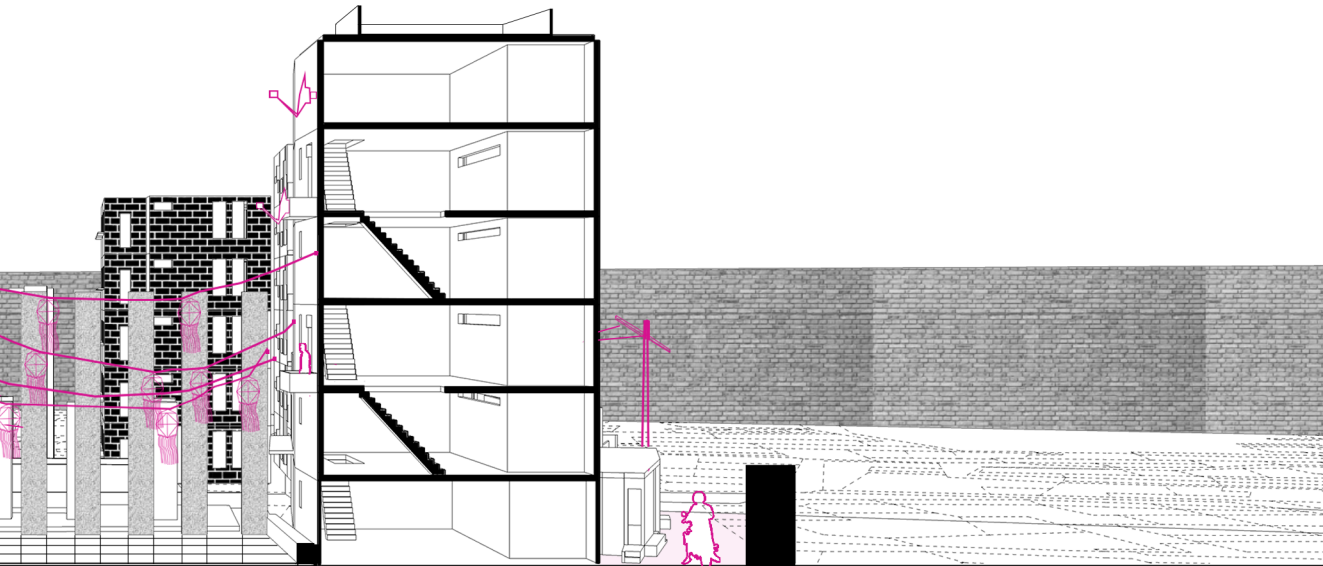
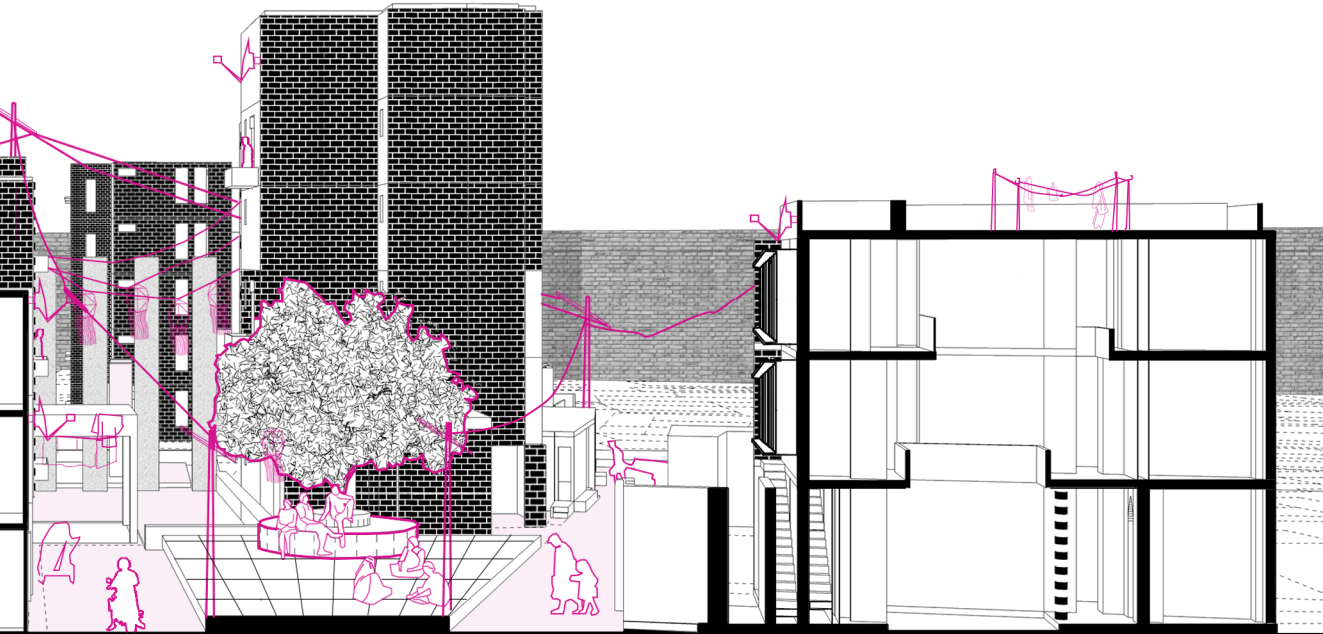


Figure 31 . TOP : Section through the main square, Bottom





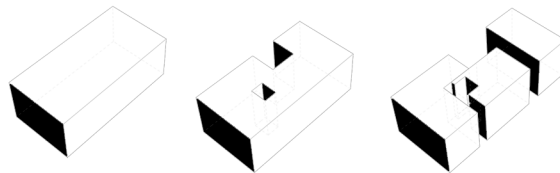
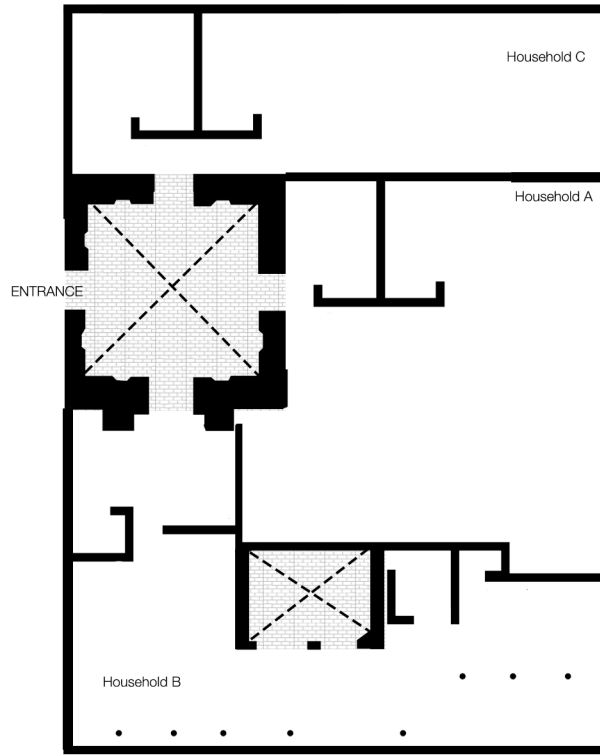


Figure 32. Subtractive Traditional Dwelling - Generic Layout and volume division , Illustrations by Author

## **TYPE 1 . TRADITIONAL HOUSES OR HAVELIS**

### *Subtractive Houses*

Traditional living quarters or mansions are categorically termed as Havelis. The word 'Haveli' in Persian translates to a 'private threshold' or 'private quarters'. The living quarters and the domestic space is placed around a courtyard or a series of courtyards which act as the centre for conducting various ceremonies and rituals. Since, the scale of the courtyard is the defining parameter, it was the first element conceptualised while designing a traditional house.

The time frame when these houses were constructed in Chirag Delhi dates back to 1400-1900s. Since the space was available more freely then, the traditional houses are larger in scale and could afford to have a (or a series) central courtyard. One can imagine, the household as a volumetric mass from which first the courtyards were subtracted and then the living or domestic spaces were subtracted around the courtyard. The subtractive dwelling design process adopted for a traditional haveli, makes it a subtractive dwelling type.

The scale, dimensions and the placement of the courtyards were analysed as varying from one caste group to the another, also suggesting that this architectural component is a direct spatial manifestation of the caste based social hierarchy. The illustration on the right represents a general syntax of a subtractive dwelling. The house extensions or rather the domestic space is found to be a more introverted phenomenon, maximising on the central courtyard space.

The internal courtyards are the most important element of the traditional havelis in Chirag Delhi. However, as the spaces grew tighter and the land costs went up, it became impossible to have courtyards within the dwelling. At this moment, the internal courtyards moved out from within the dwelling and were consciously shared between more than one households. The map on the right shows how the courtyards have morphed into various scales to become the determinants of the morphology.

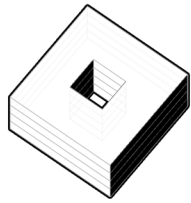
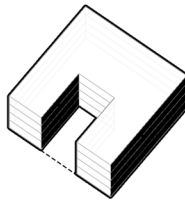
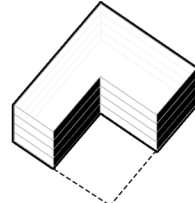
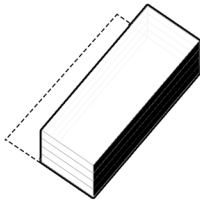
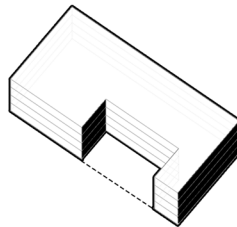
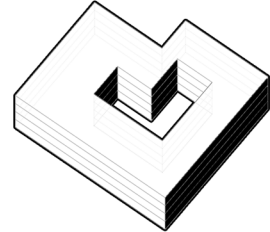
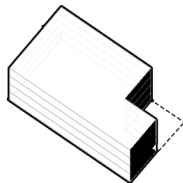
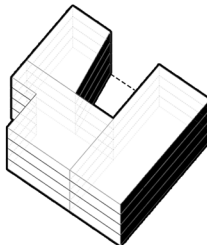
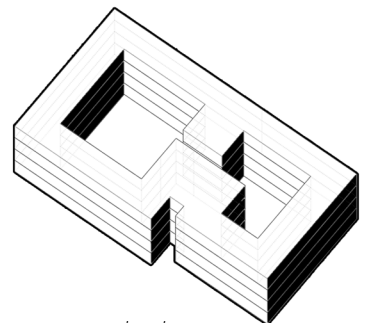
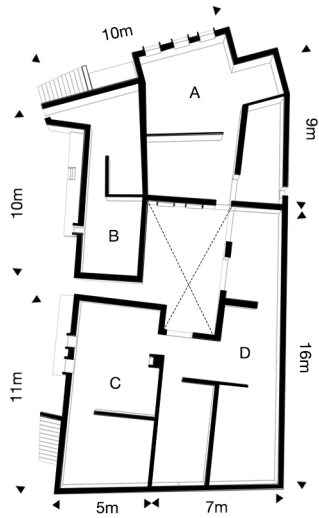
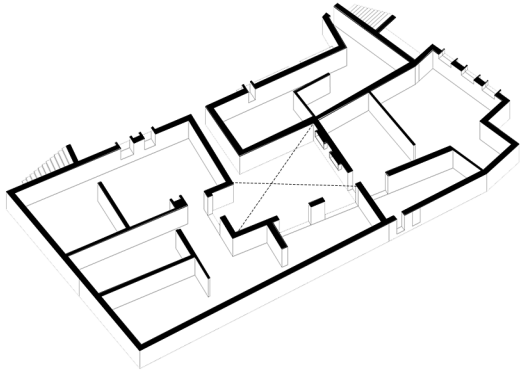
*center**u - court**side - court**set back**perforated**perimeter**edge**informal**chowk*



Figure 34. Typical House forms - Subtractive type marked in the focus area, Illustrations by author



1983 HOUSE - GROUND +2, LOW-RISE , 4 HOUSEHOLDS SHARING A COURT



EARLY 1800'S - GROUND +1, LOW-RISE, EXTENDED SINGLE FAMILY OF 9 SHARING A LARGE FRONT COURT

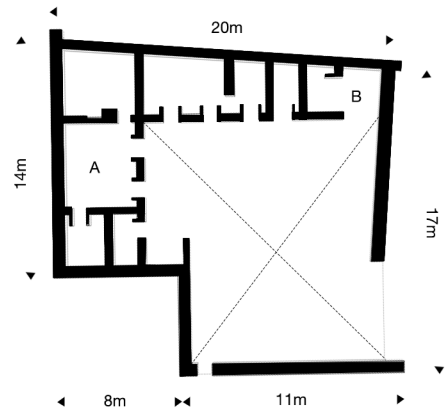
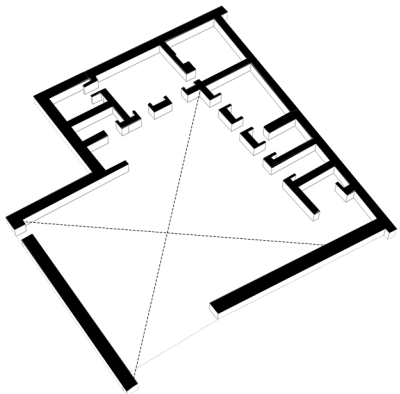


Figure 35. Subtractive houses observed in the focus area



Figure 36. Photograph by Author



## **TYPE 1 . CASE STUDY**

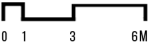
*Vikas Dojnara House, 1902*

### Inhabitants and Basic Form

Built in 1902 for housing the recently migrated Dojnara Family, the house panders the typical image of the Haveli. It was built by Susheel Dojnara and is currently inhabited by his grandchildren, Vikas and Hemant Dojnara and their families. At the time of its conception, Dojnaras had an in-house sweet and snacks business. Thus, the house was built to be adaptable to the growing family and economic needs.

Placed around three courtyards, the living clusters hold a family of 22 members. As expected, the life and activity is centred around these courtyards. As a visitor one enters the house in the middle courtyard as shown in the image on the left. This is the largest court space, which the family uses for storage and parking and is completely open to sky. The smaller courts on the eastern and the western sides of the house are much more private and can be visually and spatially shielded.

Since the ground space is restricted, the horizontal expansion is not possible to accommodate the requirements of the growing family. Also, vertical expansion is fairly limited as the structure is old and is unsuitable for heavy additions. Thus, the original composition of the house is divided and subdivided as per requirements using a network of stairs.



L1



L2

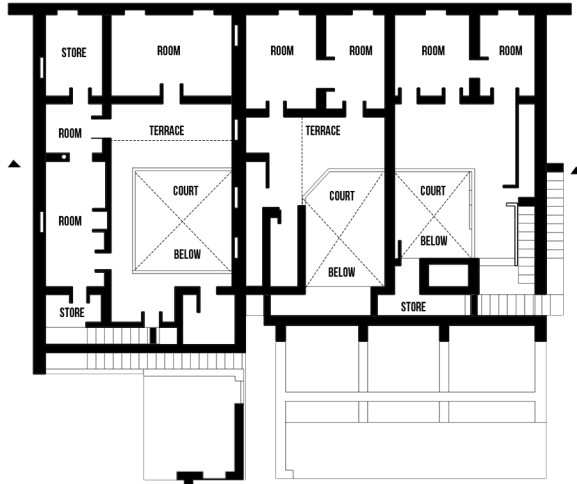


Figure 37 . Plan Disposition for the Vikas Dojhara House, Ground and Level 1, Illustration by Author over Akhtar's sketches

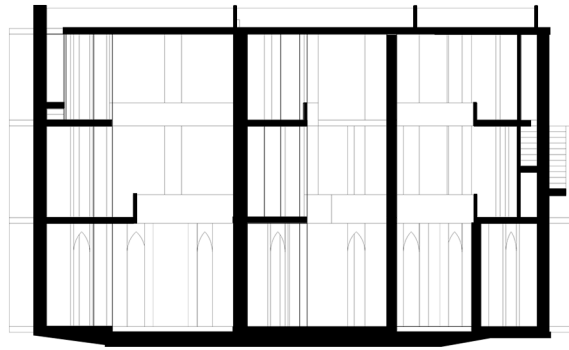
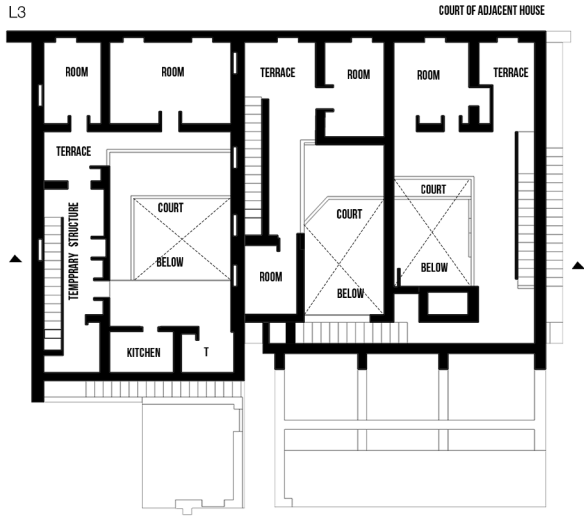
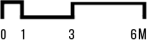


Figure 38 . Plan Disposition for the Vikas Dojhara House, Level 3 and Section AA, Illustration by Author over Akhtar's sketches

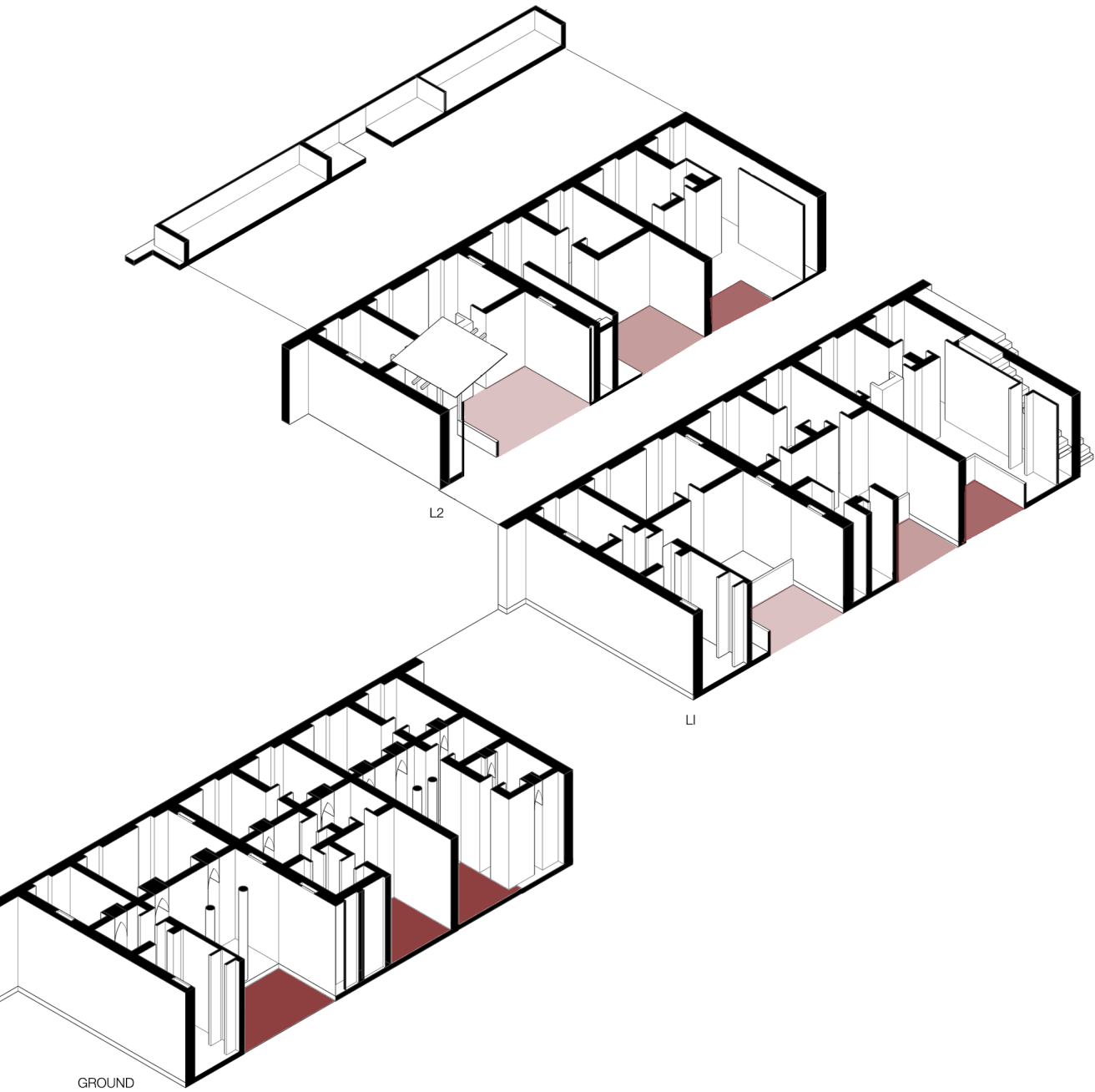


Figure 39. Volume division on various levels of the Haveli

### Circulation and spatial hierarchy

The circulation on the ground floor within the house is based on courtyards as each zone is interlinked with the courts. However, the vertical connections are outside the court space and are easily accessible and visible as one enters the Haveli. The presence of stairs outside the central space is critical as the condition does not disrupt the ongoing activities of the shared space, while people are trying to enter and exit the house premise. The stairs open to a common lobby space overlooking the central courtyards which then leads to each of the volumes above. Thus, the house which is a single entity on the ground level, breaks down into three volumes each sub-divided with a court. The sub-divided volumes are inhabited by sub-families of the Dojnara Lineage. This arrangement allows them to have constant visual contact, leading to everyday social exchange as well as offer the much needed privacy to each of the sub-families.

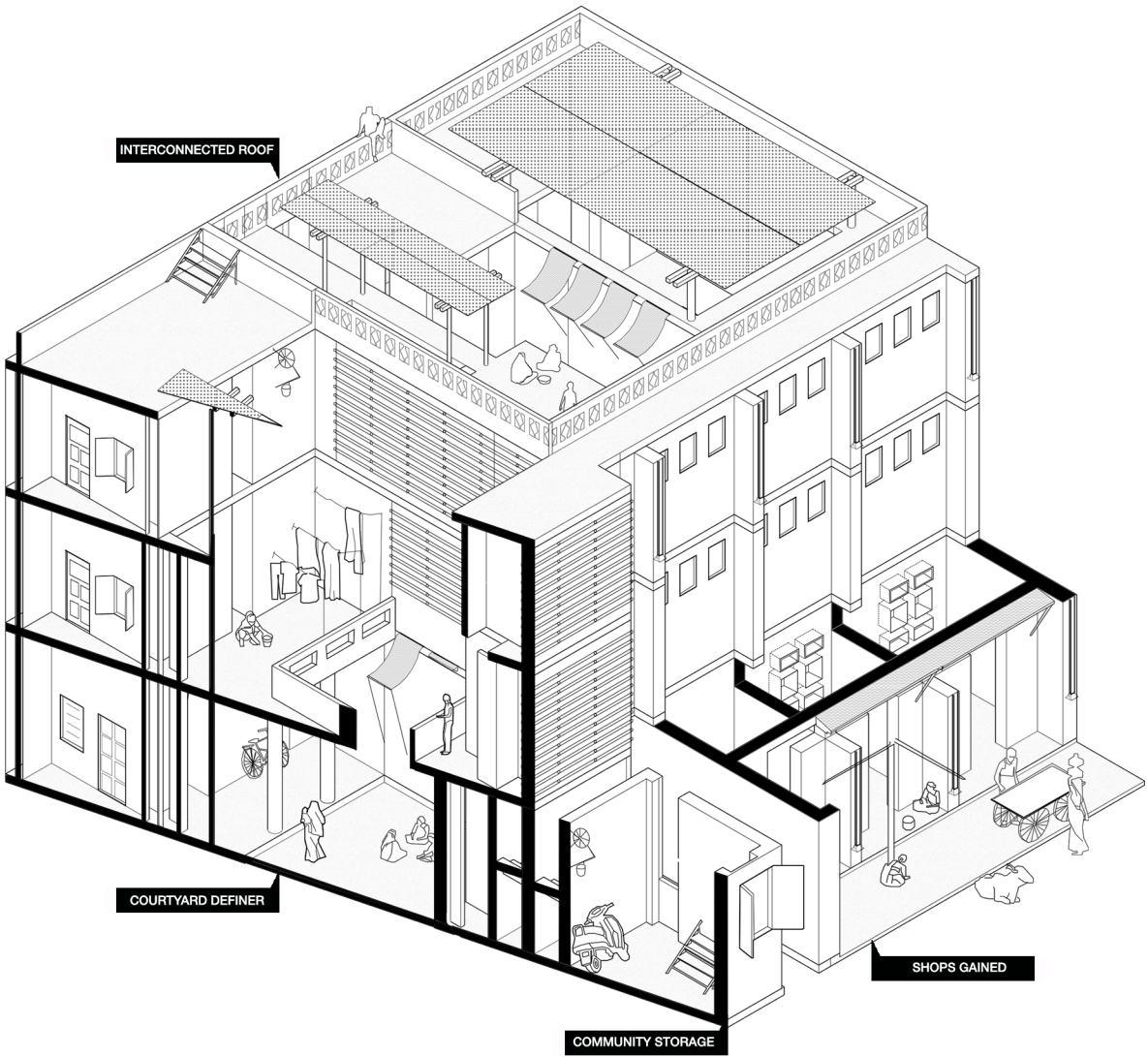


Figure 40. Activity Mapping, Illustrations by Author

## Envelope and Activity

The sophistication of the facade comes from the finer details that are deployed to maximize on daylight and ventilation in an affordable manner. Each family has a reserved space in terms of balconies and verandahs that are used for washing and drying clothes. These Verandahs are private and even though open or overlook onto a common shared courtyard, bamboo meshes and screens are used to achieve the required privacy. Bamboo is locally available and people are already aware of the joinery and installation techniques. These meshes are of various types, some with finer gradation to stop dust and smoke and the others with lighter grain useful for filtering just the daylight.

The array of courtyards help in bringing necessary light and air. Since the terraces are interconnected, the more private courtyards are often shielded with lockable shields to protect against theft and trespassing . As seen in the visual, the other important utility that the courts offer is the flexibility of transferring goods such as furniture and services such as ground water from the ground shared space to more private volumes above. The low height of the haveli allows people on the above levels to maintain an effective visual and verbal connection with the people on the ground level.

An important aspect to note is that the shops on the outside edge in this case are leased out by the family to various non-family members, thus the haveli has a very introverted facade with smaller windows on the elevation. Post-sunset, people use these shops to park their two-wheel vehicles and also store street furniture so as to protect them against robbery.



Figure 41 . Photographs of the western and eastern court of the Dojnara House, Chirag Delhi (Taken by Author)



## Analysis

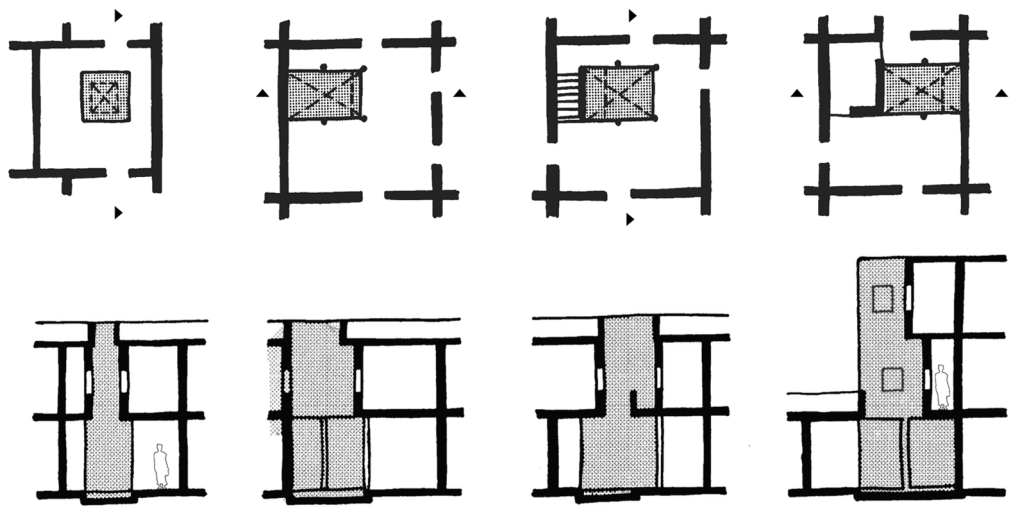
The placement and usage of courtyards in Chirag Delhi is quite inventive and unique. The courtyard essentially was designed as a response to the hot climate. However, its present spatial nature effectively links an individual to its family and a particular community. During the site visits and the documentation, the large variety of court spaces were observed. This called for an active classification of the same. For the purpose of this paper and for the case of Chirag Delhi, courtyards are classified on the basis of where they exist in a household and the associated gradation of privacy.

The first classification is that of a **space definer**. A courtyard which is roughly the size of a small living room with a privacy only limited to the immediate family can be categorised as a definer. In Dojnara house, the eastern courtyard was used for public gatherings and was shared between four sub-families. Functionally it was more of an extension of domestic space combined with a source for light and ventilation.

The second classification is of an **articulator**. When a court for daylight and ventilation, almost becomes a private extension of the domestic space of one family, it can be qualified as an articulator. In Dojnara house, the western court can only be accessed on invitation. It has a lockable and a clearly defined threshold, however is much larger in size than the definer type. The adjacent spaces are more for the approach or circulation. In most cases in Chirag Delhi, it is rarely shared and even if it is, between two different households, is solely for facilitating distribution of daylight. This more private type of the courtyard is seen most commonly in traditional Muslim homes, as a space where the women collect and gather, away from the eye of public and visitors collecting in the more public living spaces of a dwelling.

During the site visits, some exceptional cases were also observed. In some cases, the courts were the divider of the house itself and in some as a connector of living and cooking spaces. In more tighter grids, they solely existed as light courts. The third classification comes when the court functions as an entry. In the case of Dojnara, to enter the house as a visitor one has to first traverse the middle court. In some cases, it is even split into two levels where the mezzanine has a utility program attached to it. The **transitional** courts are usually smaller in scale but grander in ornamentation and are more commonly seen in the Hindu households.

COURTS AS DEFINERS



COURTS AS ARTICULATORS

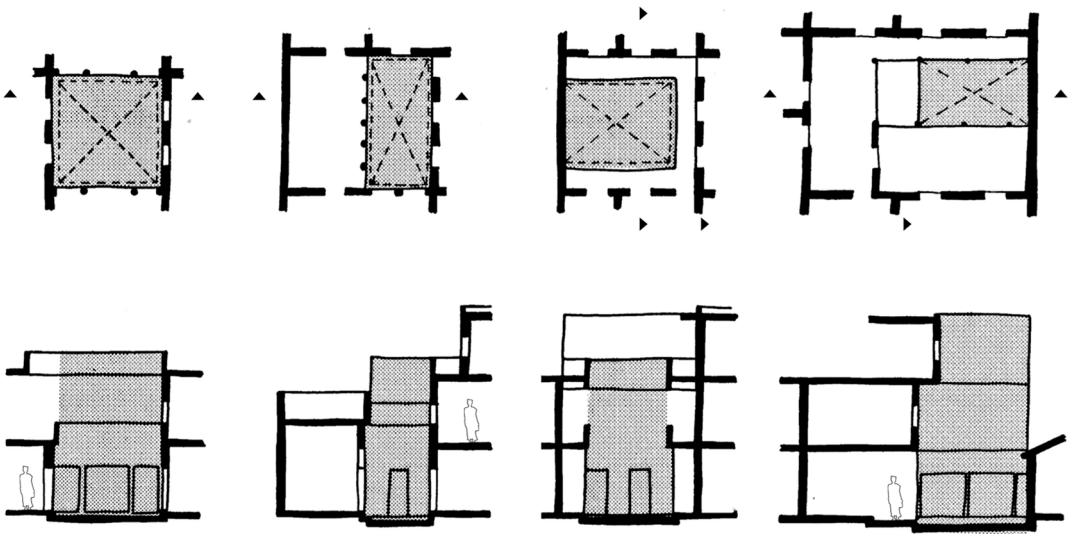
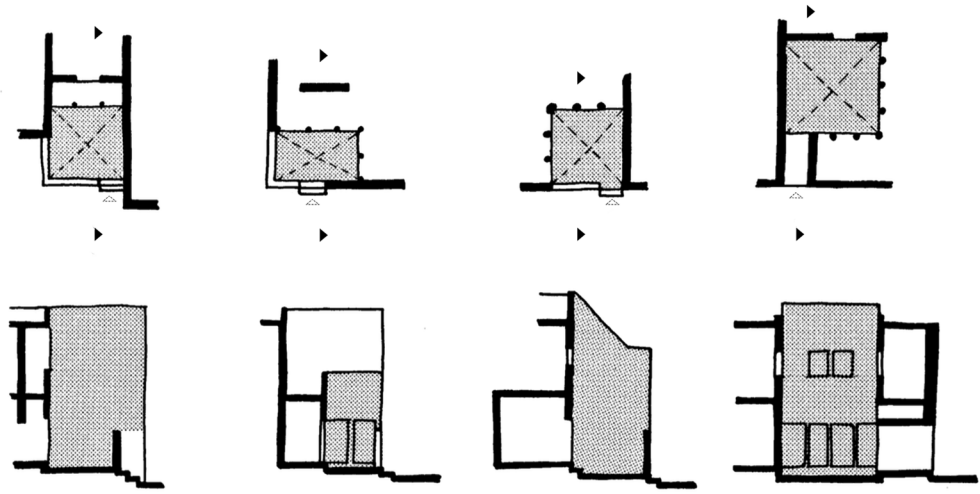


Figure 42. Courtyard diagrams as Definers and Articulators, Sketches by author over Akhtar Badshah's sketches

COURTS AS TRANSITIONAL SPACE



COURTS IN SPECIAL CASES

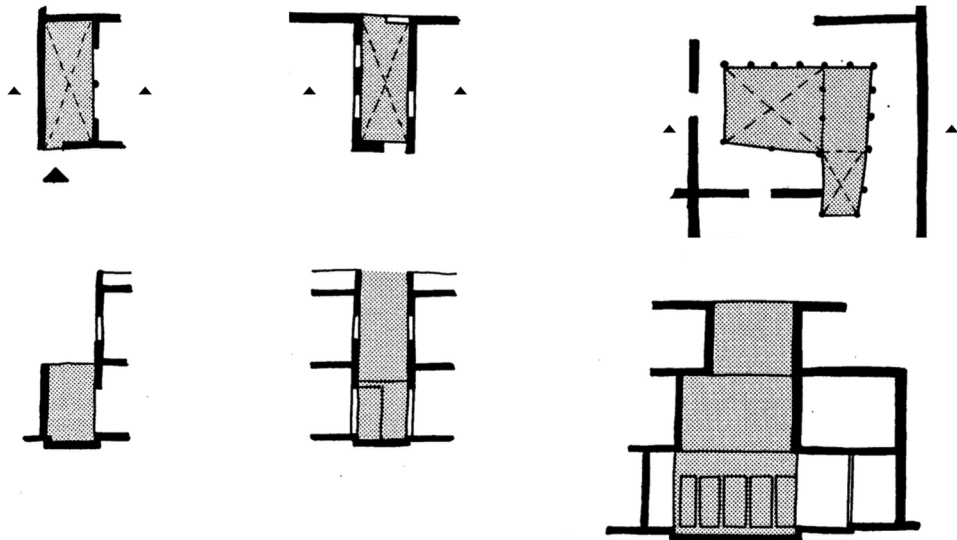
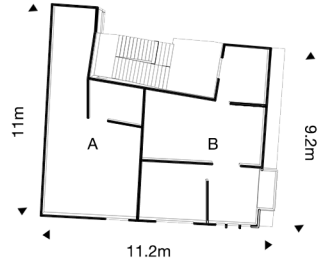
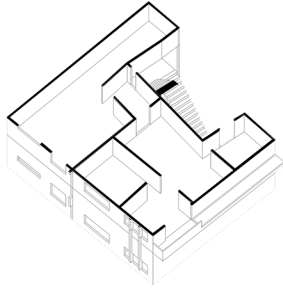


Figure 43. Courtyard diagrams as Transitional spaces and connectors, sketches by Author over Akhtar Badshah's sketches

2004 HOUSE - GROUND +6, MID-RISE, 12 HOUSEHOLDS ( 2 ON EACH LEVEL) SHARING STAIRCASE



EXTENSION TO HERITAGE HOUSE (1800'S) - GROUND +3, LOW-RISE, MULTIPLE FAMILIES SHARING A COMMON LOBBY AND STAIRCASES

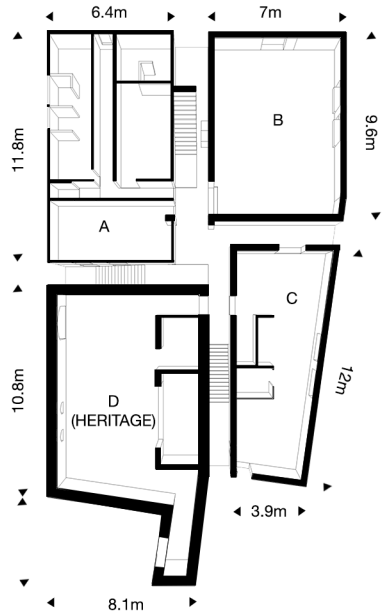
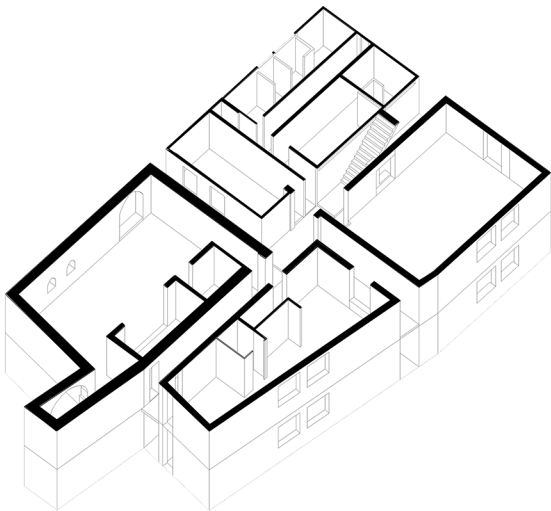


Figure 44. Additive Houses as observed in the Focus Area, Illustrations by Author

## **TYPE 2 . SINGLE FAMILY HUJURAS**

### *Additive Houses*

The concept of multi-family one to two bedroom units emanates from the nuclear family concept which is fairly nascent in the Indian society. A nuclear family is a family group of parents and their dependent children and is an estimated social group of four to five members. Where traditional houses were built as generation homes, Hujuras were added to the fabric of Chirag Delhi by migrants. With families back in their respective home towns, a requirement for affordable smaller accommodations grew and manifested as Hujuras.

A Hujura can be visualised as an apartment system, only that it is self-organised by the inhabitants. The approach of flexibility or incrementality is usually observed as playing a key role when these houses are first conceptualised. With the possibility of going vertical to upto about four storeys (usually), people come up with ingenious ways to share circulation spaces like staircases to bring about the said flexibility.

Since the circulation spaces are key form determinants, they are placed first as the spine on a site. Along this circulation spine, the living units are then added. Owing to this additive design approach, Hujuras are categorised as additive dwelling types. Along with sharing circulation spaces, people were observed as sharing washing, drying and in some cases eating spaces as well. Interestingly, most of the housing units had individual bathing, sanitation and kitchen spaces. This demonstrates that the element of privacy is another key ingredient after affordability that plays a role in fabricating the overall form of the Hujuras in Chirag Delhi.



Figure 45. Photograph of the stair house taken by the Author

## **TYPE 2 . CASE STUDY**

*Stair House, 1968, 2004*

### Inhabitants and Basic Form

Built as an array of shops in 1968 around the mausoleum by Wakhaf fund of Chirag Delhi, this building was recently renovated in a three storey low-rise. Wakhaf fund is the finance and monetary organisational wing of the Khadims, who are the direct descendants of custodians of tomb complex. The shop complex was originally designed as a set of five shops and a small storage alley behind them. They were deliberately placed close to the mausoleum so that the crowd visiting the heritage complex can be tapped into. As described before, the Khadims have a small traditional pocket on the south east of the tomb where the member of the Wakhaf fund used to live. However, due to subsequent densification of the settlement, they decided to renovate the shops close to the Tomb into living quarters in 2014.

The living quarters was designed to provide for four families and since the number of families is subject to increase, an incremental typology was required and desired. The shop blocks and the storage alley was divided into four small quarters and distributed within the families. To make the renovation affordable, the families decided to share the staircases and the resultant lobbies.

At present, there are eight family units - six two bedroom and two one bedroom with private bathrooms and kitchens. These units are serviced by a staircase spine and distributed over two floors. The ground level still has the traditional five shops with a renovated shared storage space behind them. The idea of sharing a storage and staircase is an incredibly suitable strategy as owning this at an individual scale is an expensive proposition.

Much like the traditional haveli, one enters the ground level as one entity which breaks down into various volumes on the upper floors. However, since the space is tight, the building extends vertically and has the potential to increase further vertically. The courtyards are understandably missing, however the circulation space is not covered and brings in daylight and ventilation within the interiors of the precinct.

STAIR HOUSE - 1968

STAIR HO

Two bedroom - unit 4

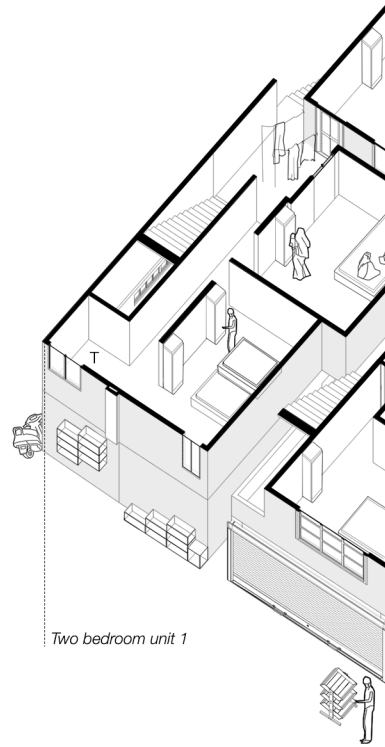
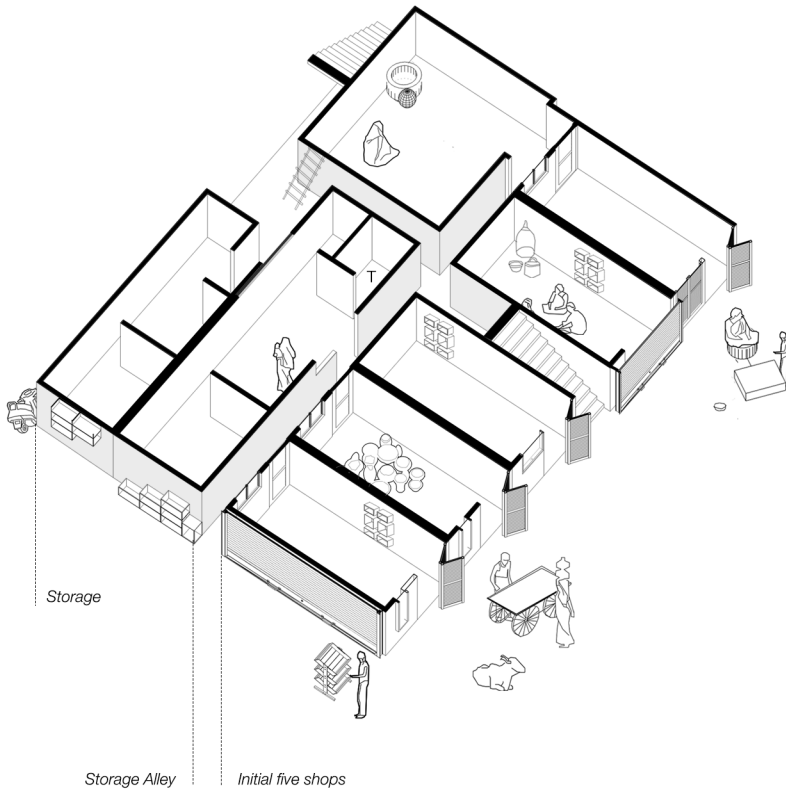
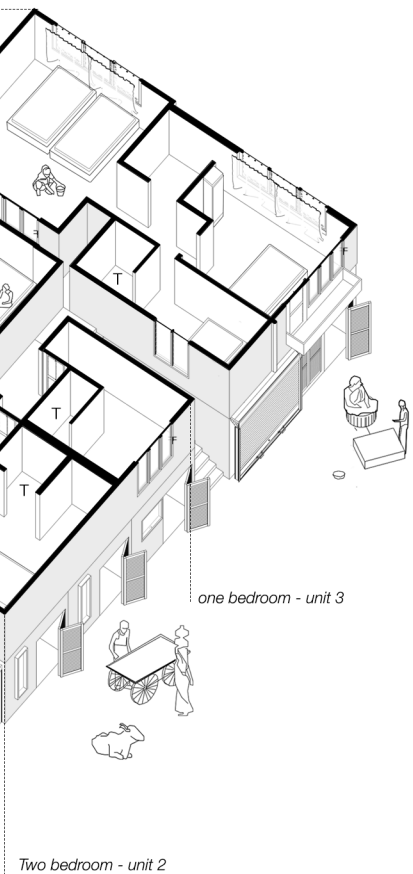


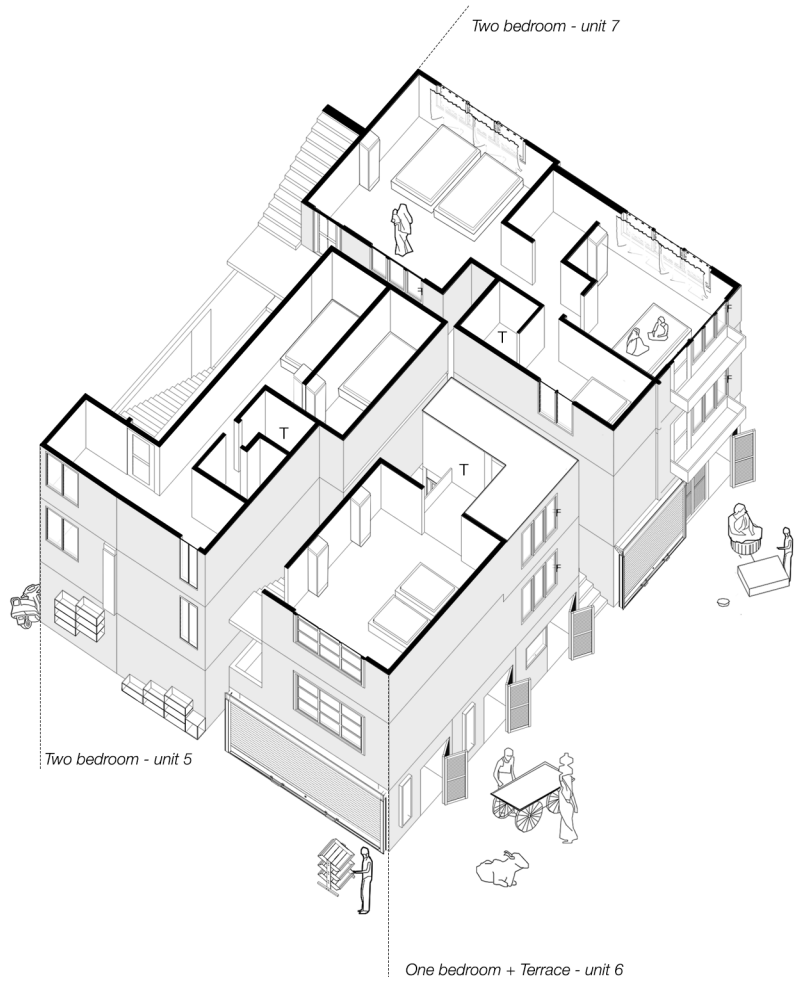
Figure 46 . Levels and share of a



HOUSE - 2004



STAIR HOUSE - 2018



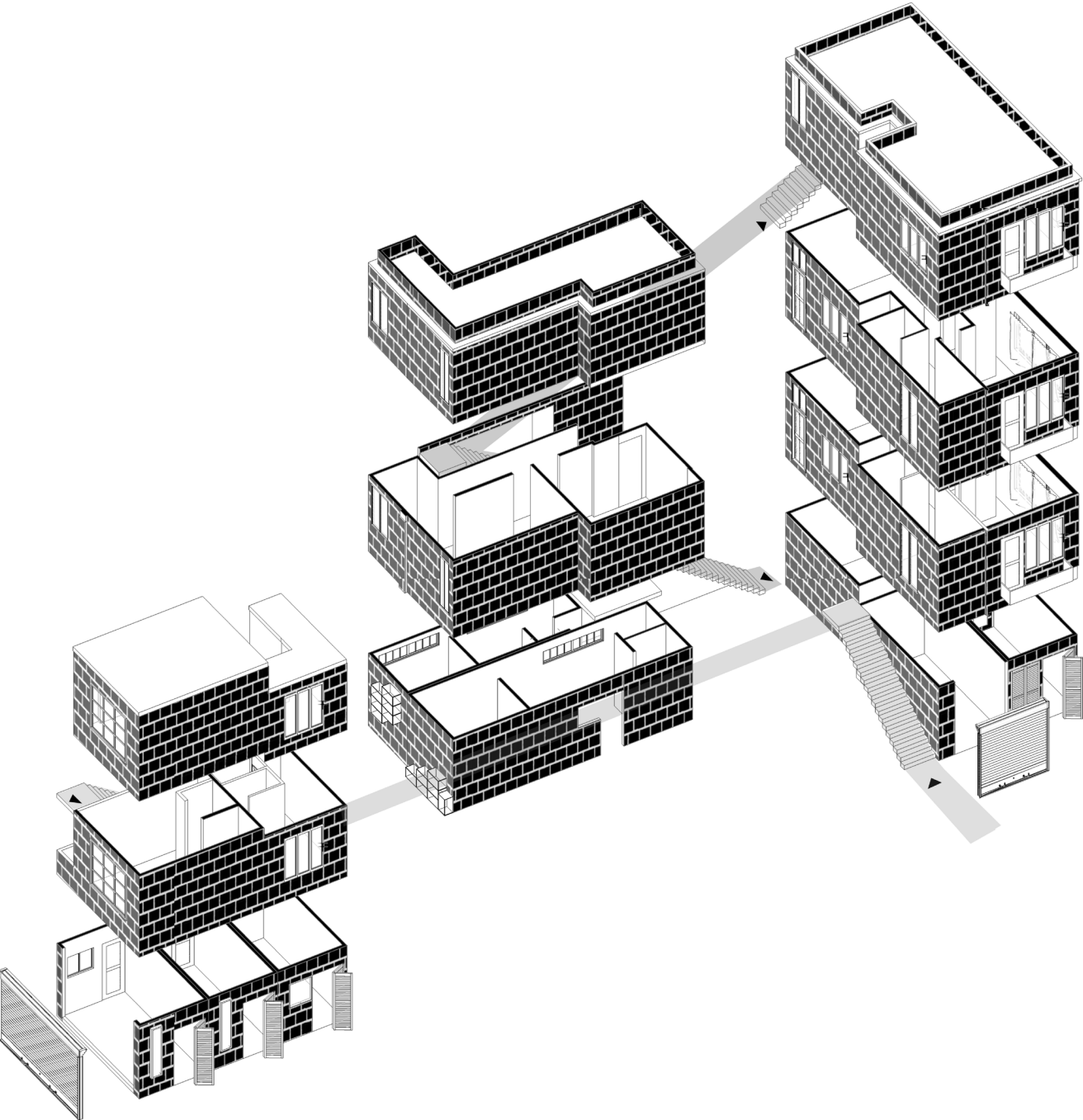


Figure 47. Volumetric division and circulation scheme of the stair house, Illustrations by Author

### Circulation and spatial hierarchy

Since the families living in these units are necessarily not related by a familial association, the social exchange is observed to be very different than the havelis. On the contrary to the central courtyard entrance in the Dojnara house, there are two entrances to this building. The first entrance is from in between the shops which takes you to first level onto a shared lobby of two households. From this shared space, the next staircase takes to the floor above. The other entrance is through a staircase adjacent to the storage space. This vertically progresses to first level and then splits into two connecting four units together. The construction and maintainance of the entire spine is collectively borne by all the households within the precinct.

The only shared spaces here are lobbies created as margins to the circulation spine. People use them for extending the domestic space and in almost all instances a lobby is shared between two or more units. Thus, the extension of space has a programmatic function which engages all the sharing parties bringing least confrontation. During the site visits, drying clothers as well as shared eating spaces were observed as dominant programs.

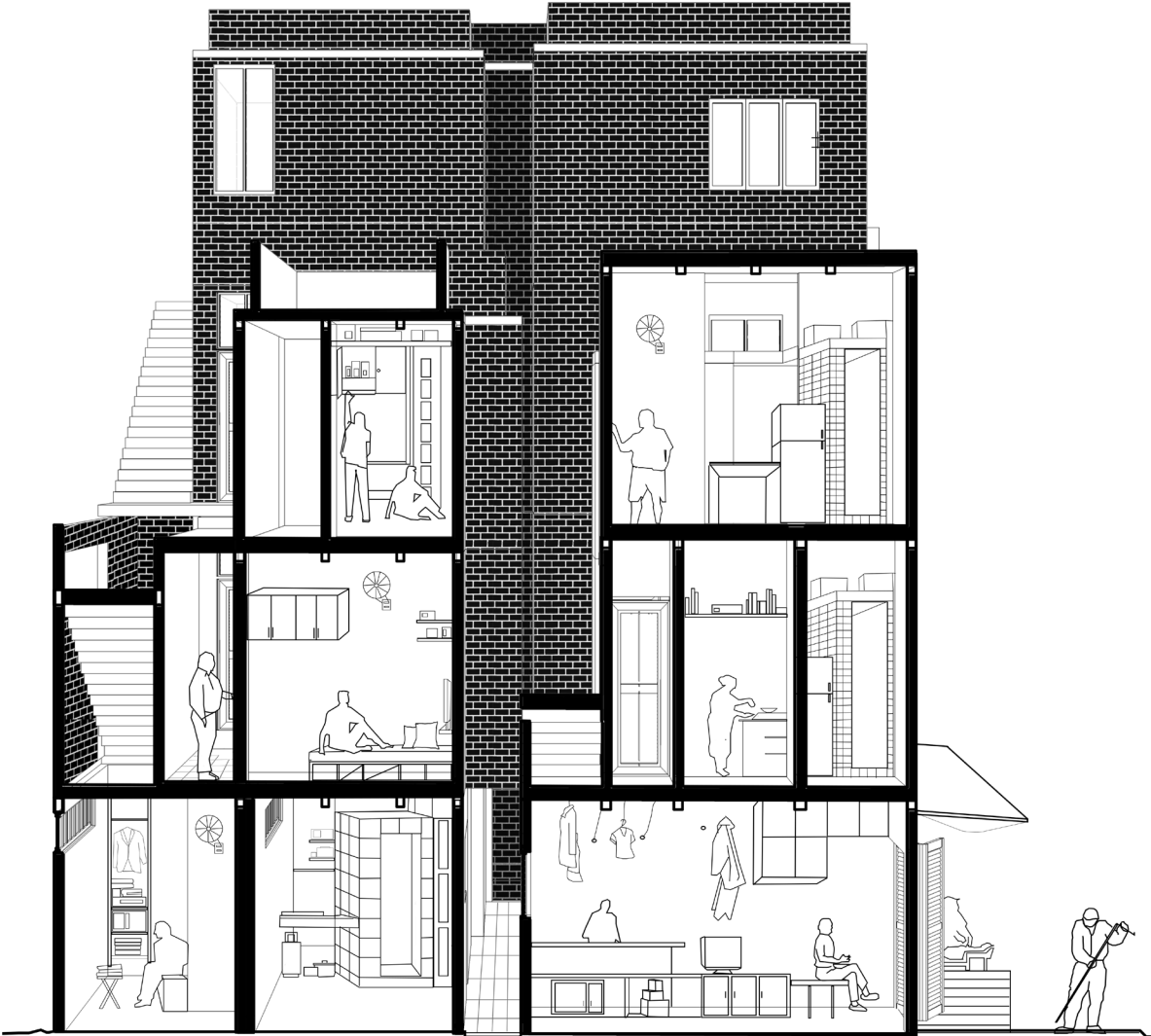


Figure 48. Activity Map of the stair house, illustrations by Author

## Envelope and Activity

The usage of exposed bricks in Chirag Delhi is socially considered as synonymous to contemporary dwellings and hence the stair house also has an exposed brick facade as illustrated. The houses or living units are added onto a central circulation spine, one finds that the houses have a much more extroverted - street based social exchange. The shops on the ground floor, effectively mark these are mixed use dwellings. The users have quite clearly demarcated and separated the private from the public spaces. The efficiency of this scheme comes from the appropriation where people are able to give space to activities as per their own requirements. In the analysis of the stair house, the evenly spread and mostly square rooms were observed.

The activity map shows that people are sensitive to having toilets and bathing areas within the units, no matter how small the unit it. The variety of kitchen layouts are also an interesting accomplishment. The house layout is flexible to be shared between one family or individual members sharing the accommodation. The activity section also shows the evenly gridded structural system which is effectively helping span units. The narrow circulation space as observed is open to sky and helps in an augmented scheme of natural ventilation and daylight sharing. However, since the units are too close, the acoustics of the complex is an issue. The noise from the kitchens and children spread quickly within the units.

# BREAKING THE LAAL DORA

## *Reflections and Way forward*

When the colonial powers started mapping the landscape of India, an unfamiliar context they could only map the legible. Through gazetteers, maps and drawings they semantically reduced the Indian landscape to something simple and ordered. However, informal settlements in Delhi, actively resisted this change and survived both in numbers and form. Post-Independence, the governmental agencies made several attempts to organise the settlements and on being not able to successfully do it, marked them into red boundaries called 'laal Doras' or Red threads. The zones inside the red threads were exempted of government policies of ordering and have now been relegated to slums. Just because these settlements do not fit the brief of an order in our disciplinary perception, does not mean they are not ordered. This paper argues that these settlements are ordered, ordered by complexity.

The study of Chirag Delhi unsurfaced various organisational patterns from the seemingly chaotic terrain. These patterns were completely missed or dismissed in the earlier readings of the landscape and probably is the biggest reason why informality does not receives its due engagement. In a self-organised system of dwelling, caste system, a traditional method of social classification, was found as the neighbourhood organising force in Chirag Delhi. The racial or caste-based agglomerations were further streamlined by the patterns of natural drainage. It was identified that not only was the traditional structure of Chirag carefully ordered as per the preferred lifestyle of various social groups, it also was made efficient and sustainable when it came to water management. The ability to adapt to preferred lifestyles harmoniously in a settlement seems as a precarious proposition and demanded further theoretical research for an overriding force.

To observe and make sense of the observations, the viewing lens had to be changed and in this case, it was provided by Ostrom's common property regime. She states that in an environment, where the user groups cannot afford to harvest resources individually, they mobilise in communities to share resources for a common gain. Taking this as the benchmark, Chirag Delhi was drawn and redrawn. This process unsurfaced a network of small public spaces based on the resource points such as ground water and fertile soil shared between the communities. It was also mapped that the communities have over the years of socio-spatial restructuring developed loops and connections of these resource points, resulting in a loop of squares, that in turn redistributes the grain of the settlement. Hence, where the caste system which possibly clustered the inhabitants to form homogeneous clusters was neutralised by resource pooling, rendering the clusters with much-needed heterogeneity and diversity.

Correa in his narrative on the urbanisation of India argues that in a hot climate zone like India, acknowledging space as the ultimate resource is crucial. He further states that by stacking and piling poor in non-resonating cells, popular design approaches have missed this fundamental requisite.<sup>29</sup> Studying Chirag Delhi brought out the merits of self-organisation and the ability of these settlements to use space as a tool to become adaptive and assimilative to social and economical conditions. Additionally, It was observed that social network is key in constructing neighbourhoods and communities. The migrants feel secure while placing next to someone known and hence, the communities are observed growing along familial,

religious or economic affiliations. Such idiosyncrasies in the non-designed environment add value to the settlement shaping the user interactions.

The patterned self-organisation was analysed to percolate down into the spatial structure of neighbourhoods in Chirag Delhi. The neighbourhoods have a formulaic spatial sequence where the neighbourhood can be accessed through a single entry with a clearly defined gateway or entrance. This entrance opens to a shared open space through which the dwellings could be accessed. This shared space was either a traditional courtyard or a circulation amenity such as staircases. This classification became the foundation of dwelling types. The traditional courtyard dwellings are categorised as the Haveli types, whereas dwellings around a circulation space were termed as Hujuras. Further on, the Haveli types were synthesised as subtractive dwelling forms as the design approach entailed subtracting of courtyards and living clusters. Also, the Hujuras were observed as additive dwelling types as they were designed by adding on to the common circulation spaces.

The internal courtyards are analysed as the most significant component of the former type, deeply derived from and effecting the social exchange of the inhabitants. The more public extensions of the domestic space were classified as definer type courtyards, whereas more private and secluded extensions of the domestic space were categorised as the articulator type. The courtyards which were interconnecting two domestic spaces or marking the entrance to a domestic space were categorised as the transitional type of courtyards. The wide range of scales and sizes of the courtyards bring out the significance of this architectural component suggesting an active integration of the same in the design proposals for the poor. Not only do the courtyards are effective in daylight and ventilation processes, they also quite successfully augment the domestic space especially in the case of accommodating the urban poor.

The study of Hujuras brought to the discourse, various ways and schemes where circulation spaces can be used to bring about an effective incrementality. The study highlights that in the environments that poor self-organise, a careful attention is laid on the bathing and kitchen areas. These programs are prioritised over the sleeping areas and are organised within the dwelling. This suggests the high regard for privacy, personal hygiene and dignity are crucial considerations to the poor. The study of Hujuras also brought out the merits of a low-rise dense dwelling model. The Hujuras of Chirag Delhi are affordable, easy to construct and maintain dwelling forms. It entails great variety and are highly flexible to iteration.

The paper concludes that the dwellings in a non-designed environment are formulated by social forces especially economics, religion and defence. The physical forces would also play a role, however, only over a radically changing terrain. The interplay of physical forces in isolation and along with social forces can be a point of future exploration.

Despite of clear intentions, most design attempts have been unable to gauge the 'ordered complexity in the self-organised and user-generated dwelling types, which this paper argues should have been at the core of design processes. Partly by being always outside the system and partly rejecting the intelligence in nature, designers have not been able to effectively use the learnings into formalization processes. The paper attempts to make a case for these forces and spontaneous orders which are not always positive but are arguably genius.





## END NOTES

1. Correa, Charles. *A place in the shade: the new landscape & other essays*. Penguin Books India, 2010, 15-19.
2. Masterplan of Delhi, Projection Report 2021.
3. Human Resource Development Report, 2015.
4. Sam, Sullivan. "The Yamuna River Project: Najafgarh Drain." *Issuu*. December 23, 2016. Accessed December 07, 2017. [https://issuu.com/yamunariverproject/docs/16fa\\_yrp\\_najafgarh\\_drain\\_final\\_revi\\_1182a2d52e5a7d](https://issuu.com/yamunariverproject/docs/16fa_yrp_najafgarh_drain_final_revi_1182a2d52e5a7d).
5. Julia, King. "Dear Delhi." *Incremental Cities*. May 07, 2014. Accessed November 16, 2017. <https://incrementalcities.wordpress.com/2014/05/07/dear-delhi/>.
6. Correa, Charles. *A place in the shade: the new landscape & other essays*. Penguin Books India, 2010, 23-42.
7. Arundhati, M., and Arundhati Maiti. "Urban Villages: A comparison b."
8. CHATTOPADHAY, Subrata, Priyanka DEY, and Joel MICHAEL. "DYNAMICS AND GROWTH DICHOTOMY OF URBAN VILLAGES: CASE STUDY DELHI." *International Journal for Housing Science & Its Applications* 38, no. 2 (2014).
9. *Economic Survey of India, 2016*
10. Mehra, Ajay K. "Urban villages of Delhi." *Urbanization and Governance in India*. Manohar, New Delhi (2005): 279-310.
11. Chakrabarti, Poulomi. "Inclusion or Exclusion? Emerging Effects of Middle-Class Citizen Participation on Delhi's Urban Poor." *IDS Bulletin* 38, no. 6 (2007): 96-104.
12. Mitchell, Maurice. *Learning from delhi: Dispersed initiatives in changing urban landscapes*. Ashgate Publishing, Ltd., 2010.
13. World Monuments Fund, Indian National trust for Art and cultural heritage (INTACH) 2008, Vol. Chirag Delhi
14. Indian National trust for Art and cultural heritage (INTACH) 2008, Vol. Chirag Delhi
15. MASTERPLAN 1961, Delhi Urban Art Commission 2008
16. Delhi Urban Art Commission 2008
17. Delhi Urban Art Commission 2008
18. "Chirag Dilli & Khirki." World Monuments Fund. Accessed January 24, 2018. <https://www.wmf.org/publication/chirag-dilli-khirki>.
19. "Chirag Dilli & Khirki." World Monuments Fund. Accessed January 24, 2018. <https://www.wmf.org/publication/chirag-dilli-khirki>.
20. Delhi Urban Art Commission 2008
21. Roy, Ananya, and Nezar AlSayyad, eds. *Urban informality: Transnational perspectives from the middle East, latin America, and south Asia*. Lexington Books, 2004.
22. Miller, John H., and Scott E. Page. *Complex adaptive systems: an introduction to computational models of social life: an introduction to computational models of social life*. Princeton university press, 2009.
23. Whyte, William H. *The last landscape*. University of Pennsylvania Press, 2012.
24. Aggarwal, Bhavika. "By the people, Complexity in commonplace." *Seminars in Architecture* 2012 2012 (2012): 07-18. Accessed October 02, 2017.
25. Aggarwal, Bhavika. "By the people, Complexity in commonplace." *Seminars in Architecture* 2012 2012 (2012): 07-18. Accessed October 02, 2017.

26. Aggarwal, Bhavika. "By the people, Complexity in commonplace." *Seminars in Architecture* 2012 2012 (2012): 07-18. Accessed October 02, 2017.
27. Ostrom, Elinor, Roy Gardner, and James Walker. *Rules, games, and common-pool resources*. University of Michigan Press, 1994.
28. Aggarwal, Bhavika. "By the people, Complexity in commonplace." *Seminars in Architecture* 2012 2012 (2012): 07-18. Accessed October 02, 2017.
29. Correa, Charles. *A place in the shade: the new landscape & other essays*. Penguin Books India, 2010,15-19.

## Works Cited

- Correa, Charles. *A place in the shade: the new landscape & other essays*. Penguin Books India, 2010, 15-19.
- Chalana, Manish, and Susmita Rishi. "Making Sense of the Order in the Disorder in Delhi's Kathputli Colony." *Messy Urbanism: Understanding the "Other" Cities of Asia* (2016): 155.
- Appadurai, Arjun. "Deep democracy: urban governmentality and the horizon of politics." *Environment and urbanization* 13, no. 2 (2001): 23-43.
- King, Julia, and Renu Khosla. "Unthinking Sanitation for the Urban Poor." *Public Interest Design Practice Guidebook: SEED Methodology, Case Studies, and Critical Issues* (2015): 137.
- "[RE]Search [DIA] Logues : Housing by." *Recentering Delhi Housing Catalogue Housing* (November 10, 2016): 10 . Accessed October 22, 2017. [https://issuu.com/yamunariverproject/docs/15fa\\_\\_researchdialogues-housing](https://issuu.com/yamunariverproject/docs/15fa__researchdialogues-housing)
- Roy, Ananya. "Why India cannot plan its cities: Informality, insurgence and the idiom of urbanization." *Planning theory* 8, no. 1 (2009): 76-87.
- Qazi, Nuzhat Q., L. Adrian Bruijnzeel, Shive Prakash Rai, and Chandra P. Ghimire. "Impact of forest degradation on streamflow regime and runoff response to rainfall in the Garhwal Himalaya, Northwest India." *Hydrological Sciences Journal* 62, no. 7 (2017): 1114-1130.
- Government of India. "Rajiv Awas Yojana: Guidelines for Slum-Free City Planning." Ministry of Housing & Urban Poverty Alleviation, August 4, 2010. [http://www.citiesalliance.org/sites/citiesalliance.org/files/CA\\_Images/RAY\\_Guidelines\\_city-wideSlum-freePlanning.pdf](http://www.citiesalliance.org/sites/citiesalliance.org/files/CA_Images/RAY_Guidelines_city-wideSlum-freePlanning.pdf).
- Walczak, Gillian. "No Strings Attached: Reimagining the Redevelopment of Delhi's Kathputli Colony." PhD diss., Carleton University Ottawa, 2017.
- Walczak, Gillian. "No Strings Attached: Reimagining the Redevelopment of Delhi's Kathputli Colony." PhD diss., Carleton University Ottawa, 2017.
- Rapoport, Amos. "House form and culture." (1969).
- Roy, Ananya, and Nezar AlSayyad, eds. *Urban informality: Transnational perspectives from the middle East, latin America, and south Asia*. Lexington Books, 2004.
- Miller, John H., and Scott E. Page. "Complex adaptive systems." *An Introduction to Computational Models of Social Life*, Princeton, NJ (2007).
- Whyte, William Hollingsworth. *The social life of small urban spaces*. 1980.
- Aggarwal, Bhavika. "By the people, Complexity in commonplace." *Seminars in Architecture* 2012 2012 (2012): 07-18. Accessed October 02, 2017.

Ostrom, Elinor, Roy Gardner, and James Walker. Rules, games, and common-pool resources. University of Michigan Press, 1994.

"Master Plan for Delhi with the Perspective for the Year 2021," n.d. <http://www.rgplan.org/delhi/MASTER%20PLAN%20FOR%20DELHI%202021.pdf>.

"Master Plan for Delhi - 2021." Delhi Development Authority, New Delhi, May 2010. <http://dda.org.in/ddanew/pdf/Planning/reprint%20mpd2021.pdf>.

"Rajiv Awas Yojana (RAY): Module 1." Ministry of Housing and Urban Poverty Alleviation. Accessed December 19, 2016. <http://mhupa.gov.in/writereaddata/RAYModule.pdf>.

Badshah, Akhtar. "Interventions into old residential quarters: the case of Shahjahanabad." PhD diss., Massachusetts Institute of Technology, 1983.

Mathur, Anuradha, and Dilip da Cunha. "In Depth: Inscribing the Indian Landscape." *Architectural Design* 77, no. 6 (2007): 70-77.

Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

Habraken, N. (1998). *Structure of the Ordinary*. Cambridge, Massachusetts, London: The MIT Press.

Fonseca, R. (1969). *The Walled City of Old Delhi*. Landscape. Gleick, J. (1987). *Chaos: Making a New Science*. New York: Penguin Group (USA) Inc.

