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Planning for high density in low-income settlements

Four case studies from Karachi

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Acronyms and abbreviations

KCBA, Karachi Building Control Authority
KDA, Karachi Development Authority
KKB-3, Khuda Ki Basti 3

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SUMMARY

In many large Asian cities, planners have begun to clear informal inner-city settlements and replace them with commercial and middle-class neighbourhoods, seeking to project an image of modernity and prosperity to foreign investors. Low-income residents of these settlements are often relocated to high-rise apartments on city peripheries.

Evidence suggests that households in low-income apartment blocks experience more social problems than their counterparts in informal settlements and have more difficulty buying homes or running home businesses. Thus, low-income communities may grow poorer when relocated to apartments.

Governments justify the construction of high-rise apartments on the grounds that it is the only way to achieve high densities while adhering to building bylaws. Here we show that, on the contrary, planned settlements of individual houses could meet — and in some cases considerably exceed — the density requirements for low-income apartments in Karachi, Pakistan, while improving the physical and social environment.

We conducted case studies of four low- to lower-middle-income housing sites in Karachi, including three settlements of small plots and one apartment complex. We then carried out a hypothetical redesign exercise to explore how high-density settlements could be constructed on these sites without compromising on living conditions.

- **Khuda Ki Basti 3** is a large recently developed suburban settlement and hence of comparatively low density, planned and managed by the NGO Saiban. We found that roadways and community spaces could be combined in order to increase the area available for parks, amenities, and commercial and educational facilities, and individual plots could be smaller if residents were allowed to build additional floors on each house. In the resulting high-density settlement, we estimate the price of a plot would fall by 41%.

- **Nawalane** is one of Karachi's oldest settlements, an ethnically uniform community situated in the dense inner city. Ad hoc development at the site has led to congestion, encroachment on public spaces, and poor lighting and ventilation. We found that the site's residential area could be scaled down and space for amenities increased, as directed by Karachi bylaws, while maintaining a density close to that of the present settlement and well over twice the prescribed maximum.

- **Paposh Nagar** is a government plot scheme dating from 1954 that originally lay on Karachi's fringe but is now located near the heart of the city. Initially well-planned and spacious, the settlement has densified and encroached on roads and public spaces — narrowing many streets to half their former size or less — as residents have built upward and outward to accommodate growing families. Careful management of such growth, we suggest, could create a dense but uncongested and pleasant settlement.

- **Fahad Square** is an apartment complex near the city centre. Most residents are young white-collar workers — only 3 of the 248 apartments are the sites of home businesses — but the upwardly mobile image of the 10-year-old complex is beginning to tarnish owing to poor maintenance. In a similar but 36 year older complex, Labour Square, the small apartments typically house multigenerational families of 10 to 15 people.

Although settlements of small plots can grow to high densities as residents expand their houses, apartment blocks are more lucrative for developers because there is more housing for sale immediately after construction (ie. more value is added per unit of land). We discussed this with developers and designed two small-plot settlements whose houses could grow incrementally, based on their proposals, which would represent profitable alternatives to apartments.

Planning for high density in low-income settlements

Four case studies from Karachi

1. Introduction

With the rise of globalisation, most major cities in Asia have begun seeking direct foreign investment to build their social, physical and economic infrastructures. To attract such investment, they are casting themselves as 'world-class cities', a version of urban prosperity and aspiration consisting of communication networks, investment friendly infrastructure, iconic architecture, international events and catering to tourism. This image has been aggressively promoted since the 1990s by international financial institutions, national and international corporate sectors and a number of UN agencies.

In these cities, globalisation and the pursuit of a world-class image have created an expanding industrial and agricultural corporate sector and an increasingly affluent middle class. Both these entities require land for their growth and consolidation. Often the ideal locations are occupied by existing inner-city informal settlements, many of which were marked for regularization and upgrading in the 1980s. Upgraded informal settlements are not in keeping with the image of the world-class city, however, so the settlements are being removed and their residents relocated in high-rise apartments, often on the peripheries of cities.[1]

Evidence suggests that that (i) low-income groups (with the exception of some white-collar workers and some of the better-off among the poor) are unhappy with high-rise housing because of social problems there; (ii) the units are expensive to maintain, service charges can be high (and unavoidable) and instalments for lease or ownership are usually unaffordable for the poor residents; (iii) residents cannot run informal businesses in the apartments, apart from service businesses such as tutoring or beauty parlours; and (iv) the residents become poorer and some of them grow destitute. As a result, the majority sell their possessions informally at throw-away prices, if they can, and move back as renters to informal settlements in city centres.[2]

Governments justify the construction of high-rise apartments on the grounds that it promotes the image of a modern city and that it is the only way to achieve high densities, while conforming to the building bylaws in most Asian cities. Image is a matter of perception and can be debated. By contrast, the density of low- and lower-middle-income settlements can be objectively ascertained.

Here we show that planners, NGOs and formal and informal developers in Karachi, Pakistan, could achieve — and in some cases considerably exceed — the densities prescribed in the bylaws of the Karachi Building Control Authority (KBCA) by building houses on small plots, as opposed to apartments, without compromising on concerns about the social and physical environment. We further examine the social and economic benefits from providing plots or houses rather than apartments.

2. Initial interviews and design of case studies

This study was initiated by Arif Hasan, working in association with IIED. First, interviews with residents of six randomly chosen low- and lower-middle-income settlements and apartment

[1] Hasan 2009b.
[2] Verschure 2006, UN's Advisory Group on Forced Evictions 2009.

complexes in Karachi were carried out at meetings within the settlements. Usually a crowd of six or seven persons gathered to give opinions about their experiences of living in the settlements or apartment complexes.

These interviews revealed that the majority of residents preferred 'homes' (by which they meant access to land) rather than apartments. Comments from residents of apartment complexes were critical of this living arrangement. One resident said, 'This is not a home — it is a coffin.' A female resident complained, 'There is no neighbourhood feeling. You cannot watch your children play without coming down yourself, and this is not always possible, so children misbehave and get involved in bad things.' Another complaint was that there is no privacy in apartment living, and as such, 'it promotes promiscuity in adolescents and this leads to conflicts between families'. Complaints regarding promiscuity and privacy were also made by residents of exceptionally high-density informally planned settlements consisting of individual houses. A senior apartment-complex resident said, 'A house has to grow with time. An apartment cannot grow, so either grandparents must go or the children must go. If neither can afford to go then you die of congestion and suffocation.' [3]

These views are not unanimous. One study of an apartment block, undertaken separately (see below), found that a majority of residents had no such concerns and were happy living there. Some residents said that the apartments provided security and that they were the only affordable option because the developers who sold the apartments offered loans. There was general agreement, however, that apartment complexes were badly maintained, that garbage was not collected and that there were serious plumbing-related problems. Residents also pointed out that it was difficult to carry out economic activity in the apartments and this denied them access to funds badly needed for survival.

The complaints of plot owners in low- and lower-middle-income settlements were different. In newer settlements, they were related to the bad state of infrastructure; in older settlements, they concerned congestion and lack of open space. Except in one settlement that was part of an inner-city regularised informal settlement, social issues did not surface, nor did the issue of being able to use the home as a place of economic activity.[4]

After the interviews and an exploratory study of a few houses, a larger local research and teaching team was brought in, coordinated by Asiya Sadiq and Suneela Ahmed of the Urban Research and Design Cell at the Department of Architecture and Planning, NED University of Engineering and Technology, Karachi. The goals of the study expanded to include feeding into the teaching of architecture and planning, and engaging with government agencies involved in land use planning.

On the basis of the initial interviews and site visits, as well as a review of secondary sources, we chose four sites for more detailed study. Questionnaires (Appendix 1) were administered to about 10 per cent of the households in each settlement, and the settlements were further documented as described below.

- **Khuda Ki Basti 3** (KKB-3) is a 10-year-old suburban, incrementally developed lower- to lower-middle-income settlement designed according to the bylaws of the KBCA, comprising 1,237 housing units. Twenty residents were interviewed in-depth, and a questionnaire was given to 100 households selected to represent different locations across the settlement. We physically documented four houses, using plans, sections and elevations to understand

[3] These interviews were carried out in August and September 2008 at Al Azam Square, Karimabad; Labour Square-1, Orangi Town; and Falaknuma Apartments, New Karachi.

[4] These interviews were carried out in August 2008 at Khuda Ki Basti 3, Nawalane, Lyari and Chashma Goth.

spatial relations, scale and the process of incremental growth. In addition, the settlement was physically documented. The results were analysed and tabulated.

KKB-3 was chosen as a case study of a comparatively new and low-density settlement. It served as a baseline for exploring the extent to which densities for new plot townships can be increased with regard to residents' preferences and maintaining the quality of environmental and socioeconomic conditions.

- **Nawalane**, comprising 769 housing units, is one of the oldest settlements of Karachi, part of the 250-year-old Lyari Town. It is an ethnically uniform, clan-based lower- to lower-middle-income settlement located in the dense inner city. Documentation and analysis, including detailed interviews with residents and municipal councillors as well as physical documentation of four houses, were similar to those for KKB-3. A questionnaire was given to 75 selected households spatially distributed across the apartment buildings and floors.

Nawalane was chosen as a case study to examine whether settlements of houses on small plots can reach the high densities that exist in this settlement (though they are in complete violation of KBCA bylaws and zoning regulations) without adversely affecting social and environmental conditions.

- **Paposh Nagar**, with 714 housing units, is a 55-year-old lower-middle- to middle-income government plot scheme near the city centre of Karachi, which has densified incrementally over time. As for Khuda Ki Basti 3 and Nawalane, we carried out physical documentation and detailed interviews with residents and municipal councillors. A questionnaire was given to 75 randomly selected households.

Paposh Nagar was chosen so that we could study the conversion over time of a planned low-density settlement into a medium-rise high-density area and understand the environmental and socioeconomic repercussions of this change. This could help in developing new approaches to planning and management of incremental growth.

- **Fahad Square** is a 10-year-old apartment complex with 248 housing units for low- and lower-middle-income residents, located near the city centre. A site-specific questionnaire highlighting issues and trends of high-rise living for low-income communities was given to 25 respondents. A physical survey was also carried out.

Fahad Square was chosen so that we could determine whether apartments can be replaced by small houses without compromising on density, while fulfilling the security and image requirements of the residents and meeting the profit requirements of commercial formal-sector developers.

An additional apartment complex, the 36-year-old Labour Square, was included as a comparison to Fahad Square to reveal how apartment complexes develop physically and socioeconomically over time and link these changes to density-related issues. For this purpose non-structured interviews were carried out at gatherings in three locations.

For the four main sites (not including Labour Square), we prepared matrices comparing environmental, housing and socioeconomic conditions (Appendix 2) and compiled maps and documentation including a satellite image of each site, site dimensions, land use, built-up densities, solid-void relationships, sewage and water lines, sections through sites and house plans (Appendix 4).

After analysing our findings from the case studies (Sections 3 and 4), we hypothetically redesigned the four sites to explore the possibilities for high-density housing on plot

settlements (Section 5). Finally, a matrix comparing the existing conditions with the new proposals was prepared (Appendix 3).

This research generated information related to a number of socioeconomic, sociopolitical, urban design, and physical planning and management issues. Only the results relevant to the planning of high-density low- and lower-middle-income settlements are described here.

3. Case study results

3.1 Khuda Ki Basti 3

Khuda Ki Basti 3 is located 25 kilometres from the city centre, spread over 40.8 acres (16.5 hectares). It is planned according to KBCA regulations for the planning of townships (see Box 1). Residential plots, 80 square yards (67 square metres) each, make up 49 per cent of the site; 1.9 per cent is allocated for commercial plots, 6.5 per cent for amenities (including schools), 7.2 per cent for open spaces and parks, and 35 per cent for streets and roads. The total number of plots is 1,237. The land was provided at subsidised rates to the NGO Saiban,[5] who had the settlement planned as a plot scheme and developed a process through which only low-income families could purchase a plot and they would be forced to live on it immediately. Repayment for the plot is in affordable instalments spread over seven years.

The settlement is designed as neighbourhoods, each having 100 houses around a small open community space, with space for one primary school for every two neighbourhoods. A central circulation and amenity spine containing parks and community buildings runs through the settlement. The maximum permissible density, as per KBCA regulations for the township, is 500 persons per acre (1,250 persons per hectare). For KKB-3 this works out to about 15 persons per residential unit. Currently the average number of persons per plot is 6.7 and the density is 203 persons per acre (555 persons per hectare). According to the Karachi bylaws, construction is limited to ground plus two floors. The settlement is completely occupied except for the commercial plots along the main road, but density is low since only 10 per cent of the houses are ground plus one floors and 6 per cent are ground plus two floors.

The findings of the physical and social survey were as follows (see maps in Appendices 4.1.1, 4.1.2 and 4.1.3):

- All the persons who were interviewed and/or answered questionnaires said they moved to KKB-3 because they wanted to own a home that they could build incrementally and because KKB-3 was affordable. The fact that it was far away from the city was not a major consideration, as transport was available. Thirteen per cent of the respondents would have preferred a 48yd^2 plot in the city centre and 16 per cent an apartment nearer to their place of work, but both groups said these options were unaffordable to them. Sixty-five per cent were renters before they came to KKB-3; at the time of the survey only 5 per cent were renters.

- Fifty-eight per cent of male and 72 per cent of female respondents were between the ages of 20 and 40. They were aware that they would need to provide homes for their children once the children grew older and married. They saw no affordable option but to build additional floors on their present properties, even if it violated the regulations.

[5] Saiban provides unserviced land to low-income families for affordable down payments and monthly instalments. They acquire infrastructure over time on the Orangi Pilot Project (OPP) model. Saiban provides support through other NGOs for education and health programmes and advice on infrastructure development.

- Thirty per cent of the respondents had businesses in their homes where they or other household members worked, and an additional 65 per cent were interested in using their premises for income-generation activities. As a result, 17 per cent of respondents worked from home, although 68 per cent were artisans or day-wage labourers. Meanwhile, none of the plots designated for commercial purposes have been occupied.

- The open spaces provided by planners are not utilised. Instead, the 24-foot-wide (7.3m) roads, meant for vehicular traffic, are used as community spaces. Eighty-five per cent of respondents felt that, in the absence of traffic, roads are secure for children and more suitable for social interaction than are the officially designated community areas, as the houses open out onto the roads. The spaces in the roads are used by children and adults for playing, washing and drying clothes, parking cycles and motorcycles, and social interaction and gossiping. Community gatherings, such as religious events and marriages, also take place on the streets. Even though the residential areas of Khuda Ki Basti 3 are fully inhabited, the street space is still not heavily utilised and appears empty. A tripling of population would seem to be required for its full utilisation. The larger planned open spaces, meanwhile, are unkempt — some of them have become garbage dumps — in spite of Saiban's attempts to turn them into parks.

- The average income reported by respondents in KKB-3 was Rs 8,000 (US$100) per month. On average, 4 per cent of this per month (Rs 350 or US$4.37) is spent on maintaining and expanding the house; 4 per cent is spent on children's education (this is low compared with other settlements because of cheap NGO-operated schools in the neighbourhood); and 18 per cent is spent on travelling, which takes up between 1 and 4 hours every day. The residents are willing to put up with this expense and with the long travel time because they wish to own a home and living far from their workplaces is the only way they can do so. As a result, only about 120 households out of 1,237 in KKB-3 have speculated by selling their properties,[6] although residents paid five times less for their properties than the current market price.[7]

- The wide streets lined with one- or two-storey houses do not provide shade for people to sit together in the summer heat. Higher houses and narrower streets, however, would.

- Even though residents wish to increase the size of their accommodation, they have not encroached on roads and public spaces. Furthermore, since the settlement is planned as neighbourhoods, it is not congested, and there appear to be no major social issues or conflicts. The presence of Saiban has protected public spaces from encroachment, as well as providing health clinics and two NGO-run schools, which greatly lower residents' expenditure on education compared with other settlements.

- The houses in KKB-3 are in the process of being expanded. Typically, where there is space on the ground floor, they build a room but leave a courtyard. Where there is no room on the ground floor, they add rooms on the first floor, and then on the second floor – still leaving a courtyard. Local block makers are providing concrete blocks and masons for the construction and the household members provide the unskilled labour. The rooms are small and often badly ventilated. Not enough thought was given to the prospect that rooms or floors would be added to the houses (for existing plans see Appendix 4.1.5).

[6] Akhtar Ali Khan, Project Director, Saiban, Karachi, personal communication.
[7] Plots were provided for a down payment of Rs 10,000 (US$125) and instalments of Rs 300 (US$3.75) per month for seven years. This works out to a total of Rs 42,000 (US$525). The current market price for a plot in the area is Rs 300,000 (US$3,750).

The following issues emerge from the KKB study:

- Circulation and community spaces can be combined so as to increase space for residential plots.

- The accommodation requirements of residents can be fulfilled in plots of 56yd^2 (47m^2) instead of the current 80yd^2 (67m^2), provided that residents are allowed to build houses of ground plus three floors. This would reduce the cost of the plot, infrastructure and construction.

- Respondents wanted at least two of their children, after marriage, and to be able to live in a semi-independent unit within their plot. To be semi-independent the new nuclear family must have a separate kitchen so that the mother-in-law and daughter-in-law do not have conflicts.

- Schoolteachers at the site felt not only that the areas allocated for the schools are appropriate, but that with the use of neighbourhood open spaces for playing the number of students can be increased by over 50 per cent. For higher-density settlements, however, the area allocated for education purposes should be appropriately increased.

3.2 Nawalane

Nawalane is situated in an area of Karachi known as Lyari Town, which is over 250 years old. It is an informal settlement that was regularised in 1976, spread over 20.9 acres (8.4 ha), with 769 plots and a density of 1,356 persons per acre (3,376 persons per hectare). Until 1976, most of the houses had one or two storeys. Today, the majority are ground plus two to ground plus four and even ground plus five floors, and they continue to rise vertically. Parks and playgrounds are almost nonexistent, though there are parks near Nawalane. The settlement consists of houses on plots of 38 to 300yd^2 (31 to 100m^2) and is served by 24 lanes. The maximum width of road (a paved area accessible to vehicular traffic) is 15ft (4.5m), and the minimum width of lane (a pedestrian pathway not accessible to vehicular traffic) is 2 feet 6 inches (0.76m; see maps in Appendices 4.2.1 and 4.2.2).

The settlement is ethnically homogenous. The ancestors of the 75 residents surveyed migrated from Balochistan. All the respondents were born in Nawalane except for four women who had come to the settlement as a result of marriage. The average family size of the respondents was 13.6, and an average of two families live on one plot. There are 6.4 children per nuclear family, so space is required for playgrounds. Among respondents, 34 per cent of males and 55 per cent of females were between the ages of 20 and 29. There will therefore be substantial growth in the population in the coming decade. Some 24 per cent of males were over 60 years old and needed a peaceful space for sitting, gossiping, and playing chess and board games. Only 19 per cent of the respondents use their homes for economic activity; the area is working class and does not have a tradition of entrepreneurship. The area is 71 per cent residential, 20 per cent streets and only 0.1 per cent parks and open spaces.

The findings of the physical and social survey were as follows:

- Nawalane can be divided spatially into two almost equal zones, which we termed A and B. The majority of houses in Zone A, in the southeast, are ground plus three to ground plus four floors. Zone A's density is around 4,480 persons per hectare, more than two and a half times the maximum government-prescribed density of 650 persons per acre (1,625 persons per hectare) for low-income apartment complexes (see Box 1). The physical and social conditions in this zone are degraded. The streets are congested, obstructing air circulation and natural light. Consequently, residents have constructed skylights in roofs or alongside bedrooms for capturing natural light and air. Interviewees expressed dissatisfaction with

these conditions, saying that they impinge on physical and psychological well-being, encourage promiscuity and limit privacy. Social relations are strained, and residents are less communicative than in Zone B. In many cases, 30 to 40 persons live on one plot. Families are expanding and as a result, new nuclear families are being formed. Most of Nawalane houses, especially in Zone-A, are already too congested to accommodate new rooms. At the same time, these new households do not wish to purchase or rent accommodation in informal settlements on the city fringe because of strong social and family ties within Nawalane and the tenure insecurity and distance from place of work associated with the informal settlements. Also, for many of the residents this option is unaffordable.

Box 1: KBCA density-related bylaws, 2006

Land allocation for new residential development

Land use	**Maximum % of total area**
Residential	55%
Commercial	5%
Amenities	
Roads/streets	22%
Parks	5%
Playgrounds	5%
Public usage, including religious buildings	5%
Educational	3%

Plot areas

- Residential plot: at least 80yd^2 (66.89m^2); no more than 600yd^2 (501.67m^2)
- Apartment site: at least 2420yd^2 (2023.4m^2)
- Commercial plot: at least 60yd^2 (50.42m^2)

Plot shapes

- Plot shapes should generally be rectangular.
- The ratio of frontage to depth of residential plots should be at least 1:1 and not more than 1:3.
- Residential or commercial plots should be at least 20ft (8m) wide.

Plot size	**Maximum density**	
	Persons per acre	**Persons per hectare**
80yd^2 (66.89m^2)	500	1250
>80yd^2 (66.89m^2); <120yd^2 (100m^2)	400	1000
>120yd^2 (100m^2); <240yd^2 (200.67m^2)	300	750
>240yd^2 (200.67m^2); <400yd^2 (334.45m^2)	200	500
>400yd^2 (334.45 m^2); <600yd^2 (501.67m^2)	150	375

Apartment type	**Maximum density**	
	Persons per acre	**Persons per hectare**
Low income	650	1625
Middle income	500	1250
High income	325	812.5

Source: Karachi Building and Town Planning Regulations, 2006

- Residents reported that when houses are crowded, as in Zone A of Nawalane, household fathers prefer to spend time elsewhere and mothers are happier when older children are away. As a result, older children have greater freedom, and adolescents may become part of

gangs or take to drugs.[8] (For maps showing density of Nawalane and its houses see Appendices 4.2.3 and 4.2.4).

- In Zone B, in the northwest, people are visibly relaxed, more open and more communicative. Parts of the streets and cul-de-sacs are privatised with the consent of neighbours and extended families, providing badly needed open space. Interviews also suggest that in Zone B the social relations between neighbours are more cordial than in Zone A, and adolescents, as a rule, are less aggressive. Houses are also larger and plot sizes bigger in Zone B, and most of the houses are ground plus one floor. Younger people have moved out to other areas and come back for religious festivals and family gatherings. The density in Zone B is about 2,600 persons per hectare, and the environment, in spite of ad-hoc planning and encroachments onto streets, does not give a feeling of congestion.

- Streets in Nawalane are used as public space. As most of them are inaccessible by motorised transport, they are secure. Respondents do not wish their younger children (below 10 to 14 years old) to play unsupervised; 51 per cent of respondents say that these children play within their homes. Children over 14 play in the neighbourhood parks. Streets in front of the houses are the domain of women and young children, whereas men and male youths dominate the periphery. Some 61 per cent of women face problems with regard to recreation and entertainment, and feel the need for community halls and vocational schools.

- Weddings and festivals also take place on the streets, and this creates considerable inconvenience for the residents, as access to their homes is often blocked off as a result.

- Judging from the respondents, average income per household is Rs 6,500 (US$81.25) per month. Average monthly investments in housing and maintenance is Rs 420 (5.25 US$) which is 7 per cent of income. A further 11 per cent of income is spent on transport and 22 per cent on the education of children. In our survey, 62 per cent said that the major disadvantages of living in Nawalane are related to lack of open space, privacy and security; 85 per cent felt that the major advantage is proximity to the city centre and places of work, and to family and ethnic networks.

- The narrow roads prevent access of ambulances and fire engines into the locality and pose problems for the maintenance of sewage and electricity supply lines.

- Some 67 per cent of respondents said that they would not like to leave Nawalane even if they were offered an affordable choice; 17 per cent would opt for a plot of land in other areas of Karachi, and 5.8 per cent for a two-room apartment on the city fringe; 10 per cent could not specify their choice.

- There are health and education facilities in the settlement. The health facilities, however, are in the informal private sector and as such are exploitative both in terms of costs and quality. Families spend a large amount on education, but that is because of the large average family size.

- Houses have been built in an ad-hoc manner and do not function well. The rooms are far too small, and as mentioned earlier, there are problems of overcrowding and lack of light and ventilation (for details of a neighbourhood see map in Appendix 4.2.5).

[8] Hasan 2009.

The following issues emerge from the Nawalane study:

- Densities over 3,500 persons per hectare create congestion that planners may find difficult to manage. Congestion and lack of space for social interaction is also responsible for discomfort in social relations.

- If circulation and community spaces can be combined, densities of up to 3,000 persons per hectare can be achieved without compromising on environmental conditions.

- Plots of 56.3yd^2 (47m^2) can accommodate three families provided permission is granted to build ground plus three floors and provided there is sufficient accessible open space in the form of a courtyard or in front of or adjacent to the house. The additional cost to the foundation of a two room ground floor house to build three more floors will be about 15 per cent which means Rs 48,000 (600 US$).

- For densities of between 2,000 and 3,000 persons per hectare, at least 4 per cent of the area (as opposed to the present 2.3) should be allocated for primary schools given the present demographic balance in Karachi. As the population ages, this can be used for colleges and other public services.

- Road width should be a minimum of 15ft (4.5m) so as to permit access by service and emergency vehicles.

- Women should be provided with space for recreation and related activities. Half of the area for amenities should be allocated for this function.

- The settlement would have been very different if there had been an organisation that could have provided the residents with design advice, managed the expansion of their homes and prevented encroachments.

3.3 Paposh Nagar

Aurangabad, a neighbourhood in Paposh Nagar, was created as a settlement scheme in 1954 for migrants from India. At that time it was on the fringe of Karachi, about 7km from the city centre. Today it is adjacent to Karachi's industrial area and to important health and education institutions. It was designed as 417 plots of 45yd^2 (38.5m^2) each. The houses consisting of two rooms, a kitchen and a bathroom, then had only one floor, but over time they have grown, and many are now ground-plus-one-floor to ground-plus-three-floor structures. Residents have also increased the sizes of their plots by encroaching on the roads. For example, the tertiary roads were planned as 12-14ft (3.6-4.2m) wide, but many are now only 4ft (1.2m) wide. Secondary roads were 24ft (7.3m) wide and are now 12ft (3.6m) wide. The primary road, however, has not been encroached upon and remains 48ft (14.6m) wide. As a result of these expansions, the average plot size is now 81.6yd^2 (68.2m^2). On average, household size is 6.7 persons and there are 1.5 households (10.1 persons) per house, yielding a density of 478 persons per acre (1,195 persons per hectare). The settlement contains private heath clinics, two mosques and six schools. There is a park southwest of the settlement that is used by the residents (see maps in Appendices 4.3.1, 4.3.2 and 4.3.3).

The findings of the physical and social survey were as follows:

- The 12ft- to 14ft-wide (3.6 to 4.2m) roads are used for small-scale gatherings and functions. Weddings, however, take place in wedding halls or playgrounds in the area. In the evenings, children play in the streets and men relax and socialize there. Women are not found socialising in the streets. We estimated that 1 in 10 households own cars, which are

parked wherever space is available. Most of the front gates of the houses open on the 12ft-wide (3.6m) roads.

- Rooftops and courtyards within the house are used extensively and provide light and ventilation. Of survey respondents, 89 per cent believed that the locality is in need of spaces designed for recreation that cater to all age groups. The survey suggests that 58 per cent of children under the age of 14 play in neighbourhood playgrounds and parks, where parents supervise them. Sixty-nine per cent of children over 14 play on the streets unsupervised.

- The majority of residents said they would like to have more space in their houses to accommodate additional economic support facilities. At present, such space is limited.

- Some 89 per cent of respondents said that their houses are well ventilated and they do not have any privacy-related problems. However, observations and documentation of the houses suggest that they are not well ventilated and there are privacy issues, especially where the upper floors of the houses project out onto the narrow streets below.

- Almost all families are extended families. Of our respondents, 36 per cent of males and 54 per cent of females were between the ages of 20 and 30. They claimed that they were the dominant group in the settlement. This will lead to an increase in population, requiring new homes, in the next decade. Males above the age of 60 comprised 26 per cent of the respondents. They also claimed that they were a sizeable group and said it is because of them that the extended families survive and function.

- Of the respondents, 47 per cent had resided in the area since before 1999 and 32 per cent moved there over the last 10 years. This suggests considerable mobility, which respondents attributed to the former owners of these houses becoming wealthier and moving to better locations because of entrepreneurial skills and/or improved education of children.

- The occupations of the residents are a mix of working-class and white-collar jobs. Residents are teachers, drivers, maids, paramedics, tailors and beauticians. Only 32 per cent of respondents worked within 2km of Paposh Nagar; the other 68 per cent travelled long distances to and from work and therefore did not have enough time for social interaction on weekdays.

- Some 85 per cent of respondents felt that the biggest problem they face in their settlement is related to poor infrastructure, especially plumbing in kitchens and bathrooms.

- Respondents said they spend 19 per cent of their monthly income on transport and 18 per cent on the education of their children. In addition, they spend on average Rs 7,574 (US$94.7) annually on home maintenance, improvements and additions.

- The spaces in Paposh Nagar homes are badly arranged and have problems with light and ventilation (for details see plans in Appendix 4.3.5).

The following issues emerge from the Paposh Nagar study:

- Paposh Nagar was initially a well-planned settlement with sufficient amenities. Because of population pressure and a lack of alternatives, however, the settlement densified and residents encroached on roads and public spaces, thus increasing plot sizes. This densification and growth could have been managed if there had been an institution to give design and technical guidance. With a ground-plus-three-floor option for the original 45yd^2 plots, families' accommodation requirements could have been fulfilled.

- Given the current density of the settlement, at least 4 per cent of the area should be utilised for amenities and another 4 per cent for education, rather than the present 2.6 and 2.9 per cent, respectively.

- If public and street space were combined, Paposh Nagar could be redesigned to accommodate higher densities without adverse effects on the physical and social environment.

- As for KKB and Nawalane, a 56.3yd^2 (47m^2) plot is adequate for the needs of the residents.

3.4 Fahad Square and Labour Square

Fahad Square differs from the other three case study sites, as it is not a settlement consisting of houses on individual plots but a developer-built apartment complex. Located in an urban-development project in suburban Karachi, and designed by the Karachi Development Authority (KDA) on 26,000 acres (65,000ha), the apartment complex is built on 1.5 acres (0.60ha) and consists of 248 apartments and 56 shops. Each apartment has three rooms and a covered area of 81.6yd^2 (68.2m^2). The original price was Rs 320,000 (US$ 4,000). The current price is about Rs 800,000 (10,000 US$). The entire complex is a walk-up affair of ground plus four floors. The average household size is 5.72 persons per apartment, yielding a density of 942 persons per acre (2,329 per hectare). This far exceeds the maximum density of 650 persons per acre (1,625 per hectare) allowed by KBCA regulations for low-income apartment complexes. Obviously, the developer of Fahad Square has violated the rules. (For layout see map in Appendix 4.4.3.)

The housing units in the apartments are also different from those in the other case studies. They have balconies, attached bathrooms with glazed tiles, and ‘American kitchens’. They project a different culture and way of life. This is imposed by the developer. Many of the residents would be living differently if they had built their own homes. The extent to which this has determined their lifestyles could be a subject of further study. (For an apartment plan see Appendix 4.4.4.)

The other major difference between Fahad Square and the other case study sites is that amenities and health and educational institutions in the neighbourhood are arranged according to a plan. The residents of Fahad Square have, however, added a mosque in the open space provided within the complex. Unlike Nawalane and Paposh Nagar, Fahad Square is not ethnically homogenous, as the apartments were offered for sale on the formal market, where, in addition to ethnicity, cost, location and the availability of loans determine who applies to acquire an apartment. The owners and renters have formed a union that maintains shared spaces and infrastructure. A small office for the union has been built in the open spaces provided by the developer. The complex has been occupied for the last 10 years.

The findings of the physical and social survey were as follows:
- Of the plot area, about 70 per cent has been built upon and the rest is open space, used for parking vehicles (mostly motorcycles), as a gathering and meeting point, and for religious occasions. Eighty per cent of the residents said they relax and socialize in this space in the evenings; parents chat and children cycle. Older children use the neighbourhood grounds and parks provided by the KDA. Seventy-two per cent of women said they have no problems with regard to recreation and socialising, and feel that the compound fulfils their requirements.

- Although transport, electricity and infrastructure are in place, residents complained of plumbing and sewerage problems. They also complained that the union fails to provide adequate services for maintenance of infrastructure. In addition, they said that the union is subservient to a Karachi ethnic political party and that this has adversely affected its functioning as well as relationships within the community. Although only 10 years old, Fahad Square is run down, and the open spaces could be better maintained.

- Of the 248 apartments, only three were the sites of commercial activities. These were a tailoring business, an informal Montessori school and a beauty parlour. Some apartments had been subdivided for rental purposes. Most of the surveyed residents felt the economic repercussions of inflation and recession and said they would like to have the possibility of setting up income-generation activities in their homes. Given space and social restrictions, however, this is not possible.

- Sixty per cent of male respondents were between the ages of 20 and 29 and had recently been married. Thus, the three-room apartment fulfilled their requirements. They said that the majority of the residents are young people with not more than two or three children and that there are almost no older people living in the apartments. That is why the average family size of the respondents is 5.7.

- The respondents had not considered the housing problems they will face once their children grow up and wish to get married. When asked, they said that they will not be able to raise funds for the purchase of an apartment or a plot of land. They seemed fatalistic, and some responded, 'God will provide.'

- Thirty-six per cent of surveyed residents were employed in private-sector jobs, including bank tellers, accountants, school and college teachers, workers in the entertainment industry and electronics factories, and cooks and drivers. Eighty per cent of the families said they earned more than Rs 11,000 (US$138) per month, as opposed to 52 per cent in Nawalane, 31 per cent in Khuda Ki Basti 3 and 35 per cent in Paposh Nagar. They reported spending 15 per cent of their monthly income on transport, 24 per cent on children's education and Rs 631 (US$8) on home maintenance. Home maintenance here means the monthly instalments they pay to the residents' union, unlike in the other studies, where it also includes improvements.

- Thirty-six per cent of the working population had jobs within 2km of Fahad Square, and the rest, 64 per cent, travelled long distances to and from work. Unlike in the other case study sites, where residents use local markets for shopping, residents of Fahad Square shop at the Samama Shopping Mall and KDA market, which are within 2km of the apartments.

- Sixty per cent of the respondents previously lived in rented accommodation and only 36 were owners. In Fahad Square 68 per cent are owners today and 32 per cent are renters. Most respondents claimed that their previous residence was nearer to their places of work but was more expensive for rent and shopping. Ninety per cent of the respondents chose to move to Fahad Square because cheap apartments were available for sale or for rent.

The following issues emerge from the Fahad Square study:

- KDA zoning regulations for plot townships do not apply to Fahad Square. Nonetheless, it would be interesting to see what densities could be achieved if Fahad Square was developed as a self-contained complex with all amenities and facilities, as per these regulations.

- In settlements with plots instead of apartments and with incremental additions to the first two floors, it is possible to achieve densities as high as those prescribed by KBCA rules.

Developers would make less profits from such settlements than from apartments, however, as catering to incremental growth means that initially there is less square footage of construction for sale.

- Apartments are suitable for white-collar workers and initially lend an upwardly mobile image to their owners. With time, however, congestion and poor maintenance destroy that image.

It is interesting to compare Fahad Square with Labour Square, which the provincial government built in 1974 next to the Sindh Industrial and Trading Estate, a major industrial area, as housing for factory workers. Labour Square consists of 28 blocks of three-room apartments. The blocks have ground plus two and ground plus four floors. Residents have, over time, become owners of their apartments by paying rental instalments. The important findings related to Labour Square are as follows.

- Unlike in Fahad Square, residents we interviewed estimated that there are 10 to 15 persons per apartment. When they moved there in 1974, many were young married couples with one or two children. Now the children have grown up, married and had children of their own. Because of cash constraints and a lack of affordable loans, they cannot purchase apartments or plots of land as additional accommodation for the children. Rentals and even land in *katchi abadis* — settlements created through the informal subdivision of state land — are unaffordable, apart from the outer fringe of the city, where there is no infrastructure.

- Maintenance of the apartment complexes is poor. There are problems related to sewage, scarcity of water and poor garbage collection. In addition, a number of informal businesses have cropped up in the open spaces, as it is not possible to operate businesses from within the apartments. This, it was claimed, adversely affects the social environment.

- Since this is a formally planned area, schools and colleges are available within 2km of the neighbourhood, and health facilities in the form of private clinics are also available.

4. Case study conclusions

Taken together, the four case studies yield a number of conclusions that could inform the planning of liveable high-density housing in low- to lower-middle-income areas.

- All respondents and interviewees in the four settlements wanted to own a place to live. The distance from their place of work influenced where they chose to live, but it was a secondary issue.

- The vast majority of respondents wanted the possibility of some income-generating activity within their home. This was an important consideration in their choice of where to live.

- Respondents preferred homes that could grow incrementally to house some of their married children, as finding separate accommodation was not an affordable option.

- When they first built their homes, residents in the plot settlements did not consider the additions that they would make incrementally as their needs increased. As a result, the houses are badly planned and ventilated; in Nawalane and Paposh Nagar, the neighbourhoods are congested, and in certain areas of Nawalane there are also social problems. Planning in advance for the incremental growth of houses is a must.

- The existence of a controlling authority or organisation that gives advice on development would help settlements to grow in an organised manner. A controlling authority or organisation can prevent encroachments on streets and public space, and help create education and health facilities; Saiban plays this role in KKB-3 but does not provide design advice on house construction. Design and technical support for house construction is essential, however, if an improved physical and social environment is to be created and sustained.

- Except for KKB-3, all the settlements had densities in excess of the KBCA requirements for apartment complexes.

- There is a limit to the density that can be reached without compromising on residents' needs. Houses higher than ground plus three floors are uncomfortable, and their living spaces on lower floors lack light and ventilation; decreasing spaces for amenities and social facilities adversely affects social and environmental conditions. In our replanning exercises (Section 5), we avoided increasing house heights above ground plus three floors or cutting back on amenities and social facilities, and we found that it was not possible to achieve ultimate densities higher than 3,500 persons per hectare. We have always kept a courtyard in the centre for providing light, air and an open family get together space.

- Apartment living imposes a different lifestyle and culture on residents. The majority of families in Fahad Square are less poor than those in the other three settlements, which may be the reason they have opted for this lifestyle.

- Streets in low-income plot settlements are planned for vehicular traffic but are not used by vehicles. They can be integrated into parks and open spaces, considerably increasing space for residential areas without adversely affecting access and safety.

- The portions of each site allocated by the KBCA for different activities are rational and do produce a liveable physical and social environment. For higher densities than proposed by the KBCA, however, a higher percentage has to be set aside for the purposes of education and amenities.

- In the case of plot townships of 15 acres (6.07 ha) or more, core houses that can be added to or plots of land on which people can build are normally provided. Such land is on the periphery of the city, and developers accept these conditions. Spaces for facilities and amenities are set aside as per KBCA regulations and are built upon by the government, by the developer or by NGOs inducted into the planning process.

- Plots for apartment blocks and complexes are usually part of a larger sector plan by the KDA. The sector and its different neighbourhoods have spaces allocated for social amenities such as commercial, educational, health and recreational activities. The developer therefore does not have to provide for these in the plan of the apartment complex. In addition, land is expensive in these locations, and developers would lose financially if they planned for incremental growth. We discussed this with developers and estate agents, and we considered their proposals in our replanning of Fahad Square (Section 5.4).

- The orientation and width of roads, the ultimate heights of buildings and the relationship of buildings to each other are important factors in efforts to provide a climatically comfortable environment in the heat and humidity of a Karachi summer.

- The dimensions of plots are important in developing rational and affordable layouts. A geometrical relationship between width and depth is advisable. The narrower the width, the cheaper are infrastructure and construction costs. A variety of options for plot sizes and

house plans that can grow incrementally are given in Appendix 5. Table 1 lists recommended plot dimensions.

Table 1: Recommended plot dimensions

Plot size (m^2)	Dimensions (m)	Width to depth ratio
47	4.0 x 11.8	1:3
47.6	4.9 x 9.8	1:2
46.5	6.1 x 7.6	1:1.25

5. Conceptual remodelling of the settlements

The above findings suggest that the settlements we studied could be redesigned to provide densities equal to or higher than those prescribed by the KBCA while improving environmental and social conditions. To demonstrate this, we created revised plans for each settlement.

This remodelling exercise also examined several more specific questions for each site: (i) whether KBCA-prescribed densities could be increased, and to what extent, while meeting the KBCA's land use requirements, including a residential area occupying not more than 55 per cent of the site as well as the required areas for social and recreational functions; (ii) the minimum size of plot that would fulfil the space requirements of a low- to lower-middle-income family in a ground-plus-two-floor house built around an open courtyard or space; (iii) the plot dimensions most suitable for reducing infrastructure costs and promoting better spatial relations within and between houses; and (iv) the effect that the redesigns would have on density-related and environmental issues in settlements.

The redesigned density figures given below for each settlement are for residential units only. The commercial areas will add an additional 2 to 4 per cent as shopkeepers and workshop owners tend to live with their families above their businesses.

5.1 Khuda Ki Basti 3

We remodelled Khuda Ki Basti 3 to increase its density to 702 persons per acre (1,732 per hectare), well above the maximum of 500 persons per acre (1,250 per hectare) prescribed by KBCA regulations. For details of density and land use see Appendix 3, and for a map of the new layout see Appendix 4.1.5**.** The changes and their results were as follows:

- The plot size was decreased from 80yd^2 (67m^2) to 56yd^2 (47m^2) because residents' requirements can be fulfilled on a smaller plot. We also changed plot dimensions to 13ft x 39ft (3.96m x 11.8m) to accommodate more plots. The number of plots increased from 1,237 to 1,910.

- Residential area was increased from 40 per cent to 55 per cent, in keeping with the maximum prescribed by KBCA regulations.

- By combining roads and open spaces, we reduced circulation areas from 36 per cent to 24 per cent of the settlement (KBCA minimum is 22 per cent). As a result, we were able to substantially improve the physical environment by increasing the spaces for commercial areas, parks, amenities and educational facilities from 1.9, 7.2, 2.9 and 3.2 per cent to 5, 8, 4 and 4.5 per cent, respectively.

- The increase in the number of plots and the new plot dimensions also reduce the cost of a plot considerably, making KKB far more affordable. The cost of a plot from Saiban was Rs

42,000 (US$525). After remodelling, the cost drops to Rs 24,600 (US$308). In addition, costs of infrastructure development (water, sewage and road) are reduced by Rs 5,965 (US$74) per plot, a 44 per cent savings.

5.2 Nawalane

Nawalane currently has a density of 1,356 persons per acre (3,390 persons per hectare). We were not able to keep the same density while providing a better physical and social environment; we therefore reduced the density to 1,262 persons per acre (3,157 persons per hectare), about 2 times higher than the KBCA-prescribed maximum density. The remodelling improved physical conditions may be successful in eliminating many of the social problems faced by residents with regard to recreation, entertainment, education, public space, gender issues and privacy. The changes and their results were as follows:

- Nawalane currently has 769 plots, averaging 125yd2 (100m2) and varying from 38 to 300yd2 (25 to 251m2). These were replaced by 982 plots of 56.33yd^2 (47m^2) each.

- Currently, there are an average of 2.7 families (36.8 persons) living on each plot. Remodelling placed two families, or 27 persons, on each plot. Housing plans for the remodelled settlement are ground plus three floors, with eight rooms (see Appendix 5).

- Residential space was reduced from 61 to 55 per cent of the settlement, as prescribed by the KBCA regulations, while spaces for commercial areas, parks, amenities and educational institutions were increased from 0.02. 0.1, 1.8 and 2.3 per cent to 5, 8, 4.5 and 4.5 per cent, respectively (for details see Appendix 3, and for a map of the new layout see Appendix 4.2.5).

- Nawalane's existing circulation area is 19.6 per cent of the settlement and consists of narrow, congested lanes. This was increased to 22 per cent, and wherever possible roads and open spaces were combined to give the settlement a feeling of openness.

- Amenities were grouped together around large open spaces. They were remodelled with one to two stories, in contrast to the ground-plus-three-floor houses, increasing the feeling of openness at these nodes.

- Commercial plots were added on the road at the periphery of the settlement, each one 56yd^2 (47m^2) with up to three floors of apartments above it.

- Sections through the site indicate that the ground-plus-four-floor heights of the houses will not create a feeling of congestion.

5.3 Paposh Nagar

The Paposh Nagar site is 15 acres (6.07 hectares). Currently it has a density of 478 persons per acre (1,195 per hectare). The average plot size is 81.6yd^2 (67.8m^2) and the average number of persons per plot is 10.5. By remodelling the settlement as described above for Nawalane, we increased the number of plots from 714 to 749 and the density to 13.4 persons per house and 661 persons per acre (1,653 per hectare). (For details see Appendix 3.)

The remodelling of Paposh Nagar created a pleasant, non-congested settlement. The residential area was reduced from 61 per cent to the KBCA-prescribed 55 per cent. The spaces for commercial areas, parks, amenities and educational institutions were increased

from 4, 4, 2.9 and 2.6 per cent to 5, 10, 4 and 4 per cent, respectively. Road space was also increased from 16 to 22 per cent (for details see map in Appendix 4.3.5). Sections through the site indicate that the ground-plus-four-floor heights of the houses do not cause a feeling of congestion.

5.4 Fahad Square

Apartment complexes are planned by developers with loan facilities, who aim to maximise profits. We therefore considered it difficult to apply the concept of incrementally expanding houses to a developer-built scheme. We held discussions with developers and estate agents in which they proposed a number of interesting alternatives. We modelled two of these alternative proposals, as described in Appendices 4.4.3 and 4.4.4 (Proposals 1 and 2, respectively). Briefly, the two options were as follows:

Proposal 1

The developers felt that if they were given the ground floors in larger areas alongside the main roads for commercial purposes, they would be willing to build double-storey row houses above them, on lots of 56.88yd^2 (47.6m^2). The residents could then expand these houses incrementally, adding two more floors. The developers also proposed that in areas not facing the main roads, single-storey units with the same footprint should be built and row houses constructed above them. The single-storey units would not be able to grow, though the row houses above would. The results of this redesign would be as follows:

- Forty-two ground-floor commercial units
- Forty-two ground-floor residential units (cannot grow)
- Eighty-four residential row houses built above ground floor (can grow)

At 6 persons per unit in 168 units, the population would be 1,008. Given the area of Fahad Square, this yields a density of 672 persons per acre (1,680 per hectare), higher than the KBCA-prescribed maximum density for low-income apartment blocks. If residents of the double-storey row houses added a floor to their homes and allowed for the expansion in their household sizes accordingly, the density would be considerably increased (for layout see map in Appendix 4.4.4).

Proposal 2

Another developer-proposed option consists of dividing each plot into lots of 36.75yd^2 (30.75m^2). In an area the size of Fahad Square, 152 lots would be developed, leaving considerable space for social activities. Built-up area would be 77 per cent of the site. The developer would construct row housing, with each unit consisting of ground plus one and a half floors. The owners could add an additional one and a half floors later on (for layout see map in Appendix 4.4.5).

At 6 persons per unit, the developer-built accommodation of 152 units would have a density of 608 persons per acre (1,520 per hectare), lower than the maximum density of 650 persons per acre (1625 persons per hectare) permitted by KBCA regulations for apartment complexes. If the additional floors were built, the density, by a modest estimate, would increase to 9 persons per unit and 912 persons per acre (2,280 per hectare).

The developer who made the proposal preferred this model to building apartments. He felt that it would attract a more affluent clientele and construction would be faster and considerably cheaper.

6. Recommendations

Our research shows conclusively that through deliberate planning much higher densities than those prescribed by the KBCA for apartment blocks can be achieved by building small houses on plots of land. We have also demonstrated that accommodations in these houses can be incrementally expanded, provided that owners receive design and technical advice. All this can be done without adversely affecting the physical and social environment as envisaged by the KBCA regulations.

This study explores the spatial dynamics of low-income settlements and their relationship to social, economic and real estate development issues. Reaching conclusions that apply universally will require further work, but the following recommendations based on our findings should guide planning and research elsewhere.

- The model of high-density, incrementally growing individual houses is suitable for new settlements and townships. Additional work is needed on the planning of individual units, land use, governance systems and financial requirements for the model.

- There are groups among the better-off poor who may prefer apartments. Planners need a better understanding of who they are and what they can afford.

- With incremental growth, it would be expected to take 20 years for settlements to reach their planned densities (faster consolidation is possible if appropriate means for densification are made available). The pros and cons of such lengthy development should be investigated.

- Although our research deals with developers' concerns about applying the incremental housing model to apartment sites, it probably does not offer a commercially viable solution. Financial and commercial concerns still need to be addressed.

- A study comparing Karachi and the KBCA regulations with other cities and regulations in Asia should be initiated.

- Study of further options and plot sizes in addition to those proposed here should be carried out, leading to the development of new zoning and density regulations.

- The results described here should be presented to the communities at the four study sites, and their feedback should be used for modifications if required.

- Academics should draw lessons on housing and urban design from these data and incorporate them into teaching material.

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LIST OF APPENDICES

Appendix 4 and 5 are only available online.

More information can also be obtained from www.urbandensity.org

Appendix 1: Questionnaires

Interviews for Khuda Ki Basti (KKB) Study

Questionnaire: 100 Interviews

1. Family Information

- Name of respondent
- Plot / Street No.
- Living since when
- Number of family members

  - Husband / wife
  - Children number / of ages
  - Grand children number with ages
  - Others
  - Number of children going to school
  - Working members 1 Total 2 women
  - What work do they do 1 2 3
  - Where do they work 1 2 3

- Income

  - Total income
  - Income spent on transport

- Previous residence

  - Location
  - Status at the location (rented, other)
  - Advantages at the location 1 2 3
  - Disadvantages 1 2 3

2. Preferences

- If you had a choice what would you chose

  - 80 square yards in KKB for Rs Monthly instalment Rs
  - 60 square yards in KKB for Rs Monthly instalment Rs
  - 48 square yards in KKB for Rs Monthly instalment Rs
  - 48 square yards near the city for Rs Monthly instalment Rs
  - 2 room flat in 5 floor building at Karimabad at Rs Monthly instalment Rs

- Give two reasons for your choice
- Do you require space to do economic activity in your house? Yes No

  - If Yes, what sort of activity? 1 2 3

- Do you do any economic activity in the house? Yes No

3. Use of Space

- How many rooms do you have in the house
- How many do you need

- Do you or your family use the large open spaces Yes No
  In the settlement
- Do you use the smaller open spaces Yes No

- If the cost of your plot could be reduced to Rs would you be happy without these spaces Yes No
- Where do the children play
- Do you do shopping away from the shops in the street Yes No

  - If yes, where?
  - For what?

- Do you go out of the settlement for recreation Yes No

  - If yes, where do you go?
  - How often do you go?
  - Do you go as a family?
  - How much do you spend on one visit?

4. Opinion Regarding the Settlement

- What is right about the settlement 1 2 3
- What is wrong about the settlement 1 2 3

5. Interview of School Principals / Teachers (2 primary, 2 secondary)

- Is this plot space allocated enough Yes No
  If No, why not? 1 2 3
- Do you use the small open spaces near the school Yes No
  If Yes, why is it necessary? 1 2 3
  If No, why not? 1 2 3

6. Use of Community Centre

- Have you ever been to the community centre Yes No

  - If Yes, how many times?
  - What for?

- Do women go to the community centre? Yes No

  - If No, why not? 1 2 3

- What is the community centre used for?
  (From community centre staff) 1 2 3

  - How often?

Interviews for Nawalane Study

Questionnaire: 50 Interviews

1. Family Information

- Name of respondent
- Plot / Street No.
- Living since when
- Number of family members

  - Husband / wife
  - Children number / of ages
  - Grand children number with ages
  - Others
  - Number of children going to school
  - Working members 1 Total 2 women
  - What work do they do 1 2 3
  - Where do they work 1 2 3

- Income

  - Total income
  - Income spent on transport

- Previous residence

  - Location
  - Status at the location (rented, other)
  - Advantages at the location 1 2 3
  - Disadvantages 1 2 3

2. Preferences

- If you had a choice what would you chose

  - Living here:
  - A 80 square yards in KKB for Rs Monthly instalment Rs
  - A 48 square yards in Baldia for Rs Monthly instalment Rs
  - A 2 room flat in New Karachi at Rs Monthly instalment Rs
  - A 120 square yards plot in Ittehad Town Monthly instalment Rs
  - Katchi abadi on Hub River Road Monthly instalment Rs

- Give two reasons for your choice
- Do you require space to do economic activity in your house? Yes No

  - If Yes, what sort of activity? 1 2 3

- Do you do any economic activity in the house? Yes No

3. Use of Space / Recreation

- Where do the younger (under 14) play 1 2 3
- Where do the older boys play 1 2 3
- Are there any problems for women and girls regarding games / recreation, meetings? Yes No
- If yes, what are they 1 2 3
- How can they be solved 1 2 3

- Where do you do your household shopping 1 2 3
- Do you go out of the settlement for recreation Yes No

  - If yes, where do go?
  - How often do you go?
  - Do you go as a family?
  - How much do you spend on one visit?

4. Opinion Regarding the Settlement

- What is right about the settlement 1 2 3
- What is wrong about the settlement 1 2 3

5. Interview of Nearest School

- Is the open space in the school sufficient? Yes No

  If no, how much space do you need?

- Is the space inside sufficient? Yes No

  If no, how much more do you need?

6. Use of Community Centre

- Is there a community centre in Nawalane Yes No

  - If yes, do you use it? Yes No
  - If yes, for what purpose? 1 2 3
  - Do women use it? Yes No
  - If no then why not? 1 2 3
    And do they need a separate centre? Yes No

Questionnaire: 25 Families

1. Family Information

- Name of respondent
- Plot / Street No.
- Living since when
- Number of family members

  - Husband / wife
  - Children number / of ages
  - Grand children number with ages
  - Others
  - Number of children going to school
  - Working members 1 Total 2 women
  - What work do they do 1 2 3
  - Where do they work 1 2 3

- Income

  - Total income
  - Income spent on transport

- Previous residence

  - Location
  - Status at the location (rented, other
  - Advantages at the location 1 2 3
  - Disadvantages 1 2 3

2. Preference

- Living here
- 2 rooms/bath/kitchen on 48 square yards for Rs in New Karachi
- 2 rooms/bath/kitchen on 80 square yards for Rs in New Karachi
- Reasons for your choice 1 2 3

3. Opinion Regarding the Settlement

- What is right about the settlement 1 2 3
- What is wrong about the settlement 1 2 3

Appendix 2: Comparison of environmental, housing and socio-economic conditions for the four sites

Environmental Conditions

Case Study	Khuda Ki Basti (KKB)	Nawalane (NL)	Fahad Square (FS)	Paposh Nagar (PN)	Labor Square (LS)
Settlement layout	Orthogonal Grid Iron plan with a house cluster layout around central amenities	Grid Iron plan based on the site topography with back to back houses	Part of the Grid Iron plan of Gulzar-e-Hijri. Compound type apartment block	Grid Iron plan with streets on the front and back of houses	Part of Grid Iron plan of the SITE Town with spaces between apartment blocks acting as spill out spaces and streets
Built area	55.62 %	75.68 %	70.66 %	75.40 %	Not Available
Open area (voids which are either open spaces or un constructed plots)	44.68 %	24.32 %	29.43 %	24.56 %	Not Available
Noise Level Control (traffic and general noise)	Good	Fair	Fair	Fair	Fair
	As the settlement is located on the outskirts of the city there is no noise pollution	The road facing houses complain of noise pollution generated by traffic and surrounding commercial activities	The road facing apartments have noise pollution problem due to traffic	The road facing houses have noise pollution problem due to traffic	The road facing apartments have noise pollution problem due to heavy industrial area traffic

Air and Ventilation	Good	Poor	Fair	Fair	Fair
	Good air quality due to its location outside the city	High level of carbon monoxide due to area pollution. Poor ventilation because of narrow, congested streets	The road facing apartments complain of carbon monoxide pollution but the apartments opening onto the central compound have access to clean, fresh air	The road facing houses complain of carbon monoxide pollution due to area pollution	The road facing apartments complain of carbon monoxide pollution due to area pollution
Solid waste disposal	Fair	Fair	Good	Fair	Poor
	No garbage dump seen on the streets. Some garbage dumped in open plots. Strong concept of recycling introduced by SAIBAN and a general low level of consumerism leads to less garbage production.	No garbage dump seen on the streets. Some garbage dumped in open plots. Garbage collected through sweepers who take it to collection points. The main problem lies at the collection points because of city level municipal inefficiency to collect garbage on time.	The union of the apartments is responsible for ensuring adequate solid waste disposal. There are certain garbage collection points and overall disposal is adequate	No garbage dump seen on the streets. Some garbage dumped in open plots. Garbage collected through sweepers who take it to collection points. The main problem lies at the collection points because of city level inefficiency to collect garbage on time.	Many garbage dumps seen on the streets. No adequate system of garbage collection. The reliance is on government sweepers who do not collect garbage promptly.

Drainage during rain	Fair	Poor	Fair	Fair	Fair
		The natural slope of the terrain does help the drainage of rain water but the low lying areas become collection points as is the case in the rest of Lyari (The town in which NL is located)			
Water supply	Poor	Poor	Poor	Fair	Poor
	Water supply is inadequate and irregular	Being a low lying area there are issues of water supply	Water is mostly obtained through water tankers for which money is collected by the union from each apartment	Adequate supply by the concerned government agencies	Water supply is inadequate and irregular
Sanitation	Good	Poor	Fair	Good	Poor

Electricity	Fair	Fair	Fair	Fair	Fair
	The suburban settlement provides adequate security	There are issues of gang wars	The gated community ensures good security	Adequate security due to the political patronage of MQM that the area enjoys .	Although it is a gated community but there are no checks on people entering the area and anyone can walk in but close links with neighbours help in pointing strangers out.
Parking for cars	N/A	Poor	Good	Fair	Fair
	Residents do not mostly own cars. The primary and secondary streets are wide enough to accommodate cars	The primary streets are wide enough to accommodate cars. Cars cannot enter secondary streets.	The compound accommodates all parking requirements.	Some of the residents own car, they are mostly parked on the streets.	The ownership of vehicles is minimal. Few of the residents own motor bikes that are parked on the streets cum compound in front of apartments
Traffic condition	N/A	Poor	N/A	Fair	N/A
	Not applicable as the car ownership and visits are low	Traffic volumes are high during peak hours on the main roads.	Not applicable as it is a gated compound with adequate parking facility	The primary roads get congested during peak hours but the secondary streets are OK	Not applicable as it is a gated area and secondly very few people own vehicles

Landscaping and vegetation	Poor	Poor	Poor	Poor	Poor
	Few scattered tree plantations	Tree plantations on the main roads, the narrow streets have no space for plantations. Some potted plants kept by residents	Individual apartments have some plants, no plantations on community level	Very few trees	No trees or plantations seen at all
Area Parks	Good	Poor	Fair	Fair	Fair
	3.52 % of the total area is designated for area parks. Some of the area parks have been developed and are in use by the residents	No space for any area parks	No space for any area parks. The cemented compound serves as the play and socializing area. Nearby parks are utilized for different purposes	1.67 % of the total area is utilized as area level park	One park was seen within the boundary wall of the apartment blocks but it was not being utilized and was a ground rather than a park
Dominant land use and consequent street condition	Residential streets are mostly used for recreation and economic and social activities like children playing, parking of carts and socializing	Commercial Use is on the main road and Residential on secondary lanes. The lanes are too narrow for any playing activity to take place	Residential in apartments and playing and socializing in the compound.	Residential streets are mostly used for recreation and economic and social activities like children playing, parking of cars and socializing	Streets in front of the apartments are mostly used as interaction and recreation areas

Note

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- Results of KKB, NL, FS and PN are based on detailed surveys, observations and interviews. The case of LS is based on observations only.

Housing conditions

Case Study	Khuda Ki Basti (KKB)	Nawalane (NL)	Fahad Square (FS)	Paposh Nagar (PN)	Labor Square (LS)
Average Plot/Apartment size	80 sq. yards (67 sq. meters)	120 sq. yards (100 sq. meters)	81.6 sq. yards (68.2 sq. meters)	66.6 sq. yards (55.7 sq. meters)	61.2 sq. yards (51.2 sq. meters)
Layout of Houses/ Apartments	One to two room layout of **single household around a private** internal courtyard which is connected to the toilet, kitchen and the staircase. The first floor usually has one to two rooms and roof terrace. (refer house plans KKB)	Two to three room layout of **multiple households around a shared** internal courtyard which is connected to the toilet, kitchen and the staircase. The same maybe repeated on the upper floors. (refer house plans NL)	One or two room layout of **single household around a lounge/living area** which is connected to the toilet and kitchen. The common staircase and shared courtyard/open space are outside. (refer apartment plans FS)	Two to three room layout of **multiple households around a shared** internal courtyard which is connected to the toilet, kitchen and the staircase. The same maybe repeated on the upper floors. (refer house plans NL)	Two rooms layout of **double household around an entry foyer** which is connected to the toilet and kitchen. The common staircase and shared street act as spill out spaces.
Average household size	6.7	13.56	5.72	6.7	10
	Mostly Nuclear families	Mostly Extended families	Mostly Nuclear families	Mostly Extended families	Mostly Extended families
Average number of families per plot	01	2.7	01	1.5	02
Average number of rooms	03	5.0	03	04	02
Average built up floors	G+1	G+2	G+6	G+2	G+3

Land value per square yard	PKR 5,000 ($ 61) per sq. yard for a typical house of G+1, having a total covered area (all floors) of 160 sq yards (133.78 sq meters)	PKR 7,352 ($ 90) per sq. yard for a typical house of G+2, having a total covered area (all floor) of about 360 sq yards (301.0 sq meters)	PKR. 9,752 ($ 120) per sq. yard for an typical apartment having a total covered area of 81.6 sq. yards (68.2 sq meters)	PKR 10,000 ($ 123) per sq. yard for a typical house of G+2, having a covered area of about 200 sq yards (167.2 sq meters)	Not Available
Livability conditions of the locality	**Fair to Good**	**Poor to Fair**	**Fair to Good**	**Fair to Good**	**Poor to Fair**
	KKB plots were given at a subsidized rate of PKR 370 ($4.5) per sq yard. Over time an average family has invested about PKR 200,000 ($2469) per plot and the current market rate has reached to about PKR 5,000 ($61) per sq. yard. This rate is still an economical one for a 80 sq yards suburban plot option in an otherwise expensive Karachi real estate market. Given the initial KKB subsidy with the possibility of incremental housing and vertical expansion accommodating at least 02 generations, low income communities find it an attractive option.	NL at the current rate of PKR 7,352 ($90) per sq yard for a G+2 house provides a rather expensive option for new low income communities who are unable to pay so much upfront. The current residents who have mostly inherited the houses or are sharing it with family find it an attractive option as they have invested incrementally and are now owners of at an average 120 sq yards (100 sq meters) city centre plot with a possibility of commercialization and further vertical expansion accommodating their future generations. However, over time the external spaces have been	FS at PKR. 9,752 ($12) per sq. yard for an average apartment having a covered area of about 81.6 sq yards (68.2 sq meters) provides an economical housing option for lower middle income nuclear families who want to live near the city centre, availing the facilities and nearness to work that the location provides. However, there is no possibility of incremental housing development and horizontal and vertical expansion accommodating any future generations. The external spaces provided are shared by all residents and are generally not very well kept. This does	PN at the current rate of PKR 10,000 ($120) per sq. yards for a G+2 house of a covered area of about 66.6 sq yards (55.7 sq meters) provides a rather expensive option for low income communities who are unable to pay so much upfront. The current residents who have mostly inherited the houses or are sharing it with family find it an attractive option as they have invested incrementally and are now owners of an average 66.6 sq yards city centre plot with a possibility of commercialization and	The current residents who have mostly inherited the apartments or are sharing it with family do not find it an attractive option as their family sizes have grown and there is no possibility of incremental expansion of the apartments and they cannot afford to buy new property to accommodate their extended families. There are also issues of adequate drainage, solid waste collection, water supply and ventilation.

	The overall physical and social environments are safe and healthy which are looked upon as assets by the residents. The houses themselves with open walls on 02 sides are fairly well ventilated, with adequate light. The wide streets between plots provide adequate privacy and breathing space.	encroached upon, area conditions have worsened and the overall density has increased to an extent where the overall physical and social environment in no longer safe and healthy. Old area ties, family and clan networks, city centre nearness (aspects which are looked upon as assets by the residents) still keeps the residents in the area. Otherwise, the locality and the houses are congested with no open spaces and major security issues such as gang wars. The houses themselves with sometimes 03 shared walls with other houses have bad ventilation and light access and suffer privacy issues.	not seem to bother the residents too much as they have access to the surrounding facilities like parks, playground and markets. Old area ties, family and clan networks are not deemed very important by the residents as compared to city centre nearness. The feel that in an urban life and nuclear family set ups apartments offer safe and economical living. They feel that their next generations will follow suit and deal with the restraint of extensions of the dwelling units by moving into another flat. The apartments are fairly well ventilated and have access to light. Privacy is not an issue as there is ample space between two blocks of flats	further vertical expansion accommodating their future generations. Nearness to the city centre, ownership of a family house, old area ties, family and clan networks (aspects which are looked upon as assets by the residents) keeps the younger generations in the area. The locality has also over time become lower middle to middle income with mostly professionals and businessmen living here. The houses have been extended both horizontally and vertically encroaching on the back and front streets. This has overall congested the area leaving narrow streets and almost no open spaces. The decrease in the street widths has lead to the blocking of air and light and privacy issues.	

				However, due to the average built up density not exceeding above G + 2 at the moment, the overall density is bearable. If the area grows more vertically and the remaining open spaces have been encroached upon, the area conditions would worsen to an extent where the over all physical and social environment will no longer be safe or healthy.	
Availability of open spaces	Good	Poor	Fair	Poor	Good
Use of Roof	Good	Fair	Poor	Good	Poor
Use of Compound/ Courtyards	Good	Fair	Fair	Good	Streets act as interactive space. There are no formally designed courtyard or compound
Use of Street	Good	Fair	Poor	Fair	
Use of Near by Ground	Fair	Fair	Fair	Fair	Poor

Overall Building Material	Block masonry and Reinforced Cement Concrete	Mix of load bearing and Reinforced Cement Concrete structures	Block masonry and Reinforced Cement Concrete	Block masonry and Reinforced Cement Concrete	Block masonry and Reinforced Cement Concrete
Roofing	Batten tiled sheets	Reinforced Cement Concrete	Reinforced Cement Concrete	Reinforced Cement Concrete	Reinforced Cement Concrete
Flooring	Concrete finish	Tile finish	Porcelain tiles	Tile finish	Concrete finish
Façade treatment	Mostly un plastered	Paint finish	Paint finish	Paint finish	Paint finish
Boundary walls	The boundary walls are raised to 8 feet and more. In some cases, the internal room/enclosure are built using boundary wall as a common/sharing surface boundary wall.	Party walls between adjacent houses. No compulsory open spaces around built units	Compound wall enclosing the entire apartment complex	The boundary walls are raised to 8 feet and more. In some cases, the internal room/enclosure are built using boundary wall as a common/sharing surface boundary wall.	Compound wall enclosing the entire apartment complex

Indicator of Incremental Growth	Yes	Yes	No	Yes	No
	The possibility of incremental growth exists on individual plots but as the settlement is young and the need hasn't arose therefore not many house extensions are seen as yet. 65% of the residents plan to do further extensions	As it is an old settlement with very strong social ties almost all of the houses have developed incrementally accommodating 2-3 generations. 53.62% of the residents plan to do further extensions	One time development, both by the builder and the individual owner.	The settlement has grown incrementally vertically as the plot sizes are small and the need is there to accommodate growing families. 60%of the residents plan to do further extensions	One time development
Ventilation of houses/ apartment	Fair	Fair	Fair	Fair	Poor
	Ventilation benefit has been accrued in such cases where the orientation of the plot is favorable and internal layout is done accordingly to the proposed design	69.57 % of the respondents believed that kitchens and washrooms are well ventilated and 75.36 % of the respondents thought that bedrooms and lounge are well ventilated	16 % of the respondents believed that the apartments had poor ventilation	Originally planned with front and back streets, the ventilation must have been good, however, with encroachments and resultant narrow streets the ventilation is poor now. In the cases where an internal courtyard still exists , the condition is better	No through ventilation makes the apartment hot, dark and dingy

Privacy	Good	Fair	Fair	Fair	Fair
	As the settlement is a low density area with only ground plus one structure therefore there are no major issues of privacy invasion.	As the residences do not have any compulsory open spaces around them and are constructed in an ad hoc manner, some of the staircases look into the courtyards and terraces of other houses	36 % of the respondents believed that the apartments had privacy issues	The unplanned house extensions have lead to breach of privacy as one neighbor can look into the adjacent houses. But the residents don't seem to be bothered by it and manage through putting curtains or blinds.	Only the ground floor apartments have windows opening on the streets which create privacy problems
House development and maintenance	Good	Fair	Fair	Fair	Poor
	The respondents spent on average PKR 4200 ($ 52) annually for the maintenance of the houses. 46 % of the respondents answered that they maintain through personal savings	The respondents spent on average PKR 5000 ($ 61) annually for the maintenance of the houses. 63.77% of the respondents answered that they maintain through personal savings	The respondents spent on average PKR 7574 ($ 93.5) annually for the maintenance of the apartments. 46% of the respondents answered that they maintain through personal savings	The respondents spent on average PKR 7574 ($ 93.5) annually for the maintenance of the apartments. 77.7% of the respondents answered that they maintain through personal savings	There were several drainage and sewerage leaks observed

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Social conditions

Case Study	Khuda Ki Basti (KKB)	Nawalane (NL)	Fahad Square (FS)	Paposh Nagar (PN)	Labor Square (LS)
Average household size	6.7	13.56	5.72	6.7	10
	Extended families	Extended families	Nuclear families	Extended families	Extended families
Average number of children	4.2	6.36	3.64	3.36	4
Average number of school going children	1.7	3.88	1.36	2.0	Not Available
Average number of working members per household	1.8	2.66	2.04	2.04	2
	The average number of working men is 1.3	The average number of working men is 2.46	The average number of working men is 1.72	The average number of working men is 1.72	Mostly men are the bread earners
Average number of Working women per household	0.5	0.2	0.32	0.32	Nit Available
Dominant Age groups	20 to 40 years	20 to 30 years	20 to 30 years	20 to 30 years	30-40 years
	40 % of males between 20 and 30 years and 48 % of females between 30 and 40 years	34.21 % of males and 54.84 % of females between 20 and 30 years	60 % of males between 20 and 30 years and 60 % of females between 40 and 50 years	26..32% of the males and 54.05 % of the females are between the age of 20 to 30 years	

Occupancy Age	5 years	Since birth	6.5 years	25 years	35 years
	50 % of the population has been residing from 04-07 yrs	100 % of the population has been residing since birth	50 % of the population has been residing for 05 to 08 years	40 % of the population residing in the area for the last 50 years and 60% of the population residing for less than 50 years with large percentage (37%) of the population moving in to the locality over the last ten years	
Occupations	40 % skilled labor	40 % private jobs	36 % private jobs	40 % private jobs	Mostly laborers and factory workers
Place of work	Within 0-10 kms	15-20 kms	5-10 kms	5-10 kms	Within 0-10 kms
	41 % works within KKB and another 41 % works in adjoining areas up to a distance of 5-10 kms	52.18 % population working up to a distance of 15-20 kilometers	40 % up to a distance of 05-10 kilometers	40 % of the population working in adjoining Areas	Most of the population is working in the surrounding factories
Place of shopping	23.96% within 2 kms	83 % within 2 kms	52 % more than 2 kms	64 % within 2 kms	Most of the residents shop from nearby weekly markets
Place of recreation	100 % more than 2 kms	97 % more than 2 kms	100 % more than 2 kms	93 % more than 2 kms	100 % more than 2 kms
Day time Availability of Transport	100 %	100 %	100 %	100%	100%
Night time Availability of Transport	50 %	100 %	100 %	100 %	100 %

Average Income per Household	PKR. 8000 ($99)	PKR. 6500 ($ 98)	PKR. 9500 ($ 80)	PKR 8000 ($98)	Not ascertained
Monthly expenditure	PKR. 10,050 ($124)	Not ascertained	PKR. 11,059 ($ 136.5)	Not ascertained	Not ascertained
Nature of tenure	95 % ownership	94.20 % ownership	68 % ownership	93.33% ownership	95 % ownership
Usage of open space/ compound	Fair	Not applicable	Good	Fair	Good
	The bigger open spaces are under utilized (only 25% of the residents use it) or not utilized except in the evenings for playing football.	Streets are narrow and mainly used for pedestrian circulation. There are no designed open spaces for interaction of residents.	80% of the residents use the central compound for either socializing or as play area	Streets and nearby parks are used for socializing and as play area	Streets are used for socializing and as play area
Play area for children	Fair	Poor	Good	Fair	Good
	Children normally play on the streets and in the open areas on the neighborhood scale.	50.72% of the children under 14 play in their houses and 59.42% of the residents over 14 play in nearby parks and ground.	The compound serves as the main play area for the children and socializing space for the elders.	40 % of the children play on the streets and 55 % play in the nearby area level park	As there are hardly any vehicles on the streets therefore they are a safe play area for children
Women's socializing area	Fair	Poor	Fair	Fair	Good
	Women use the threshold and space in front of the houses for recreation, economic activities and socializing.	60.87 % of the women face problems with regards to recreation and entertainment spaces because there are no separate entertainment/ recreation areas for them and	The compound serves as the main socializing space for the women.	89.33 % of the women do not have any problems with regards to non availability of recreation spaces	The streets are the main socializing space for the women.

		they are not allowed to interact in non segregated areas			
Community center	Fair	Fair	Fair	Poor	Poor
	The residents were divided equally on the presence of community centre necessary as a social space.	100 % believe that the schools play a vital role in the community developments: in making better human beings 56.52 % answered that there is no community center in the area.	72% of the residents believed that there is requirement for a community center	74.67%of the residents believed that there is no requirement for a community center	There is no provision for any community center
Sense of belonging to the community	Fair	Good	Fair	Good	Fair
	90% of the residents feel strong sense of belonging to the locality. 75% feel this affiliation because of the social support available to them through the NGO SAIBAN.	100 % of the residents have a strong sense of belonging because 97.37% of the residents have been living in the area since childhood and have developed strong social ties	90 % of the residents feel a strong sense of belonging because a high percentage of ownership of the apartments, sense of security because of the gated compound and social ties that have developed over time	94.67% answered they have a strong sense of belonging to the community	People are willing to relocate to a locality where incremental development is possible
Role of CBO/ NGO	Good	Good	Fair	Fair	Poor
	The NGO SAIBAN has a very strong presence and helps through health related free facilities, immunization , awareness and income generation programmes.	CBOs in the area help in funerals, lobbying for basic services, admissions in schools, solving conflict with police. One such NGO is Anjuman-e-Naujuwanan-Nawalane	As it is a Muhajir Quami Movement (MQM) dominated area therefore the political party has set up its office in the compound and works towards resolution of the problems of the residents.	CBOs in the area help in funerals, lobbying for basic services, admissions in schools, solving conflict with police.	No CBO or NGO exists in the area

	Fair	Fair	Fair	Fair	Fair
Advantages of location	Ownership (65%) , economical plot option (85%) and safe and good environment (92%) were pointed out as the biggest advantages	47.56 % of the respondents thought of family proximity and social networks \ as the biggest advantage and 37.8 % though of proximity to city centre and work as the biggest advantage	36 % answered safe and good environment	Proximity to city centre and work was pointed put as the biggest advantage of the area (86.67%)	Nearness to workplace
Disadvantages of location	Late infrastructure development (30%) was pointed out as the biggest disadvantage	38.68 % pointed out security issues as the biggest disadvantage and 21.74 % said there were no disadvantages of the location	56 % answered poor infrastructure: non availability of water, electricity, leaking drainage pipes	Poor infrastructure conditions was pointed out as the biggest disadvantage of the area (85.15 %)	Poor infrastructure, scarcity of water and no possibility of incremental development leading to cramped living conditions.

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Appendix 3: Physical comparisons with new proposal

	Khuda Ki Basti		Nawalane		Paposh Nagar		Fahad Square	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed Option-2
Total Area	40.8 acres (16.32 hectares)		20.9 acres (8.4 hectares)		15 acres (6.07 hectares)		1.50 acres (0.607 hectares)	
Total no. of plots	1237	1910	769	982	714	749	248	152
Average Family Size	6.7 persons	6.7 persons	13.56 persons	13.56 persons	6.7 persons	6.7 persons	5.7 persons	9 persons
Number of families per plot	01	02	2.72	02	1.5	02	01	02
Average number of people per plot	6.7 persons	15 persons	36.8 persons	27.0 persons	10.05 persons	13.4 persons	5.7 persons	9 persons
Total Population (Residential)	8287 persons	28650 persons	28299 people	27000 persons	7175 persons	10037 persons	1414 persons	1368 persons
Population Density (total population / total area)	203 ppl per acre 501 ppl per hectare	702 ppl per acre 1755 ppl per hectare	1354 ppl per acre 3376 ppl per hectare	1262 ppl per acre 3157 ppl per hectare	478 ppl per acre 1181 ppl per hectare	661 ppl per acre 1653 ppl per hectare	942 ppl per acre 2327 ppl per hectare	912 ppl per acre 2280 ppl per hectare

Average residential plot size	**80 sq. yards (67 sq. meters)**	**56 sq. yards (47.0 sq. meters)**	**120 sq. yards (100 sq. meters)**	**56 sq. yards (47.0 sq. meters)**	**81.6 sq. yards (68.2 sq. meters)**	**56 sq. yards (47.0 sq. meters)**	**66.6 sq. yards (55.7 sq. meters)**	**36.75 sq. yards (30.75 sq. meters)**
Average Market Price of One Built Unit	**PKR 400,000 USD 6,250**	**PKR 650,000 USD 8,125**	**PKR 1,200,000 USD 15,000**	**PKR 1,500,000 USD 18,750**	**PKR 1,800,000 USD 22,500**	**PKR 2,100,000 USD 26,250**	**PKR 800,000 USD 10,000**	**PKR 1,000,000 USD 12,500**
LANDUSE (%)								
Residential	**40.27**	**55**	**60.5**	**55**	**60.5**	**58**	**70.6**	**77**
Residential cum Commercial	**7.14**	**0**	**10.65**	**0**	**6.66**	**0**	**0**	**0**
Commercial	**1.85**	**5**	**0.02**	**5**	**4**	**4**	**0**	**0**
Parks (area level, neighborhood parks))	**7.24**	**8**	**0.12**	**8**	**4**	**8**	**0**	**5.35**
Amenities	**2.86**	**4.5**	**1.81**	**4.5**	**2.85**	**4**	**0**	**0**
Educational	**3.19**	**4.5**	**2.32**	**4.5**	**2.60**	**4**	**0**	**0**
Empty Plots	**1.85**	**0**	**4.98**	**0**	**3.36**	**0**	**0**	
Total Circulation (Roads & Streets)	**35.60**	**23.0**	**19.6**	**23**	**16.03**	**22**	**29.4**	**17.65**

OPEN / BUILT								
Total Built up Area	**60.31 %**	**68.5 %**	**75.28%**	**68 %**	**76.61 %**	**70 %**	**70.6 %**	**77 %**
Total Open Area	**39.69 %**	**31.5%**	**24.72%**	**32 %**	**23.39%**	**30 %**	**29.4%**	**23 %**
Total Road Length (In Rft.)/rm	**14000ft/ 4267.2m**	**12600ft/ 3840.48m**	**15120ft/ 4608.57m**	**11278ft/ 3437.53m**	**12000ft// 36576m**	**7985ft/ 2433.82m**	**2747ft/ 837.28m**	**-**
Total Sewerage Line Length (Iu Rft.)/rm	**16,200ft/ 4937.76m**	**13600ft/ 4145.28m**	**17000ft/ 5181.6m**	**12,400ft/ 3779.52m**	**13,400ft/ 5913.12m**	**8950ft/ 2727.96m**	**3075ft/ 937.26m**	**-**
Total Water Lines Length (Iu Rft.)/rm	**15800ft/ 4815.84m**	**13000ft/ 3962.4m**	**16800ft/ 5120.64m**	**12000ft/ 36576m**	**13200ft/ 4023.36m**	**8620ft/ 2627.376m**	**2900ft/ 883.92m**	**-**
Cost of Roads Per Rft.	**6790**	**3575**	**11790**	**6766**	**10100**	**6166**	**7491**	**-**
Cost of Sewerage and water supply Per plot (Rs) Rft	**6500ft/ 1981.2m**	**3750ft/ 1143m**	**10988ft/ 3349.14m**	**7320ft/ 2231.13m**	**9313ft/ 2838.6m**	**6783ft/ 2067.45m**	**6789ft/ 2069.28m**	**-**
Cost of roads per plot (Rs)	**6790**	**3575**	**11790**	**6766**	**10100**	**6166**	**7491**	**-**
Savings per plot roads sewerage and water(Rs)		**3215 2750**		**5024 3668**		**3934 2530**		**-**
TOTAL	**13290**	**5965**	**22778**	**8692**	**19413**	**6464**	**14280**	**-**

Appendix 4: Maps and photographs

4.1 Khuda Ki Basti 3

4.1.1 Satellite image
(http://www.iied.org/pubs/pdfs/G02678.pdf)
4.1.2 Existing land use
(http://www.iied.org/pubs/pdfs/G02679.pdf)
4.1.3, 4.1.4 Existing housing types
(http://www.iied.org/pubs/pdfs/G02680.pdf)
4.1.5 Conceptual remodelling
(http://www.iied.org/pubs/pdfs/G02681.pdf)
4.1.6, 4.1.7, and 4.1.8: Conceptual 3D-Modeling
(http://www.iied.org/pubs/pdfs/G02682.pdf)
4.1.9 Pictures
(http://www.iied.org/pubs/pdfs/G02683.pdf)

4.2 Nawalane

4.2.1 Satellite image
(http://www.iied.org/pubs/pdfs/G02684.pdf)
4.2.2 Existing land use
(http://www.iied.org/pubs/pdfs/G02685.pdf)
4.2.3 Existing built-up density
(http://www.iied.org/pubs/pdfs/G02686.pdf)
4.2.4 Existing housing types
(http://www.iied.org/pubs/pdfs/G02687.pdf)
4.2.5 Conceptual remodelling
(http://www.iied.org/pubs/pdfs/G02688.pdf)
4.2.6 & 4.2.7 Conceptual 3D-Modeling
(http://www.iied.org/pubs/pdfs/G02689.pdf)
4.2.8 Pictures
(http://www.iied.org/pubs/pdfs/G02690.pdf)

4.3 Paposh Nagar

4.3.1 Satellite image
(http://www.iied.org/pubs/pdfs/G02691.pdf)
4.3.2 Existing land use
(http://www.iied.org/pubs/pdfs/G02692.pdf)
4.3.3 Existing housing types
(http://www.iied.org/pubs/pdfs/G02693.pdf)
4.3.4 Conceptual remodelling
(http://www.iied.org/pubs/pdfs/G02694.pdf)
4.3.5, & 4.3.6 Conceptual 3D-Modeling
(http://www.iied.org/pubs/pdfs/G02695.pdf)
4.3.7 Pictures
(http://www.iied.org/pubs/pdfs/G02696.pdf)

4.4 Fahad Square

4.4.1 Satellite image
(http://www.iied.org/pubs/pdfs/G02710.pdf)
4.4.2 Existing layout plan
(http://www.iied.org/pubs/pdfs/G02711.pdf)
4.4.3 Plan of apartment
(http://www.iied.org/pubs/pdfs/G02712.pdf)
4.4.4 Proposal 1
(http://www.iied.org/pubs/pdfs/G02713.pdf)

Appendix 5: Proposed housing plans
(http://www.iied.org/pubs/pdfs/G02704.pdf)

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