IIED DENSITY STUDY
04 Cases of Housing in Karachi

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A. INTRODUCTION

1. Objectives

The objectives of the research as stipulated in the Terms of Reference (ToR) state that the current trend in Asian cities is to:

- Demolish low income informal settlements and place their residents in six to eight storey apartments. The reason given for this is that higher densities are achieved as a result of which cost of the housing unit is reduced. Also, land nearer to the city, which is costly, can be used for low income housing.
- New townships on the fringes for low income individual housing units are also being discouraged for the same reason.
- There is sufficient evidence in the form of reports and studies that show that low income groups are 1) unhappy with high rise solutions 2) usually sell their possession of high rise units and move elsewhere 3) the units are expensive to maintain and get degraded as the residents cannot or do not wish to pay their maintenance 4) residents cannot carry out any informal businesses in the apartments and 5) the apartments are expensive as compared to individual core units 6) As a result the residents become poorer and some of them destitute.

The objectives of this study are:

- To test the thesis that the same densities as prescribed by the Karachi Building Control Authority (KBCA) byelaws can be achieved by building houses on small plots as opposed to apartments without compromising on the overall social and physical environment.
- To see to what extent densities for new plots/ townships can be increased while at the same time fulfilling the needs of the residents
- The economic benefits or disadvantages of the results

2. Research Methodology

The research has been supervised by Architect Arif Hasan who is also the initiator of the project. He engaged the Urban Research and Design Cell (URDC)[1] at the Department of Architecture and Planning, NED University of Engineering and Technology (DAP-NED UET), Karachi as a partner in this research through case study documentation, analysis and design alternatives formulation. The URDC – Arif Hasan collaboration was formed with an intention to institutionalize the density research leading to the capacity building of the NED staff and students.

The research was divided in to two parts: one, the physical and the social surveys and two their analysis. The objective of the surveys was to develop an in depth understanding of the cases, and identification of physical and social trends. The research team members and students of the NED UET conducted the physical and social surveys under the guidance of URDC team at the department and helped in

[1] The Urban Research and Design Cell at the Department of Architecture and Planning, NED University of Engineering and Technology, Karachi is engaged in research on pertinent urban planning and design issues of Karachi. It aims to develop and advocate alternative planning paradigms which emerge as a result of its research work.

tabulating the data. Information was gathered through; mapping, interviews, questionnaire surveys and photographic documentation. Data gathered was converted in to tables and drawings which have been analyzed and tabulated as matrices by the URDC team. All analysis draws from primary research material. All photographs used in this report have been taken by Ms. Fareena Chanda and she has copyrights to them.

3. About the Cases

- Khuda ki Basti - 3 (KKB - 3) is a 10 year old suburban, incrementally developed lower to lower middle income settlement designed as per byelaws of the KBCA[2]. Based on the detailed interviews of 20 residents and documentation of four houses and observations on the use of space, a questionnaire was prepared to ascertain the preferences and opinion of 100 randomly selected households (which formed the 10% of the total case study population). A physical documentation of the area was simultaneously carried out. KKB-3 has 1237 housing units.

  KKB- 3 was chosen as a case study to understand to what extent densities for new plot townships can be increased without adversely affecting environmental conditions and the socio-economic requirements of the residents.

- Nawalane (NL) is one of the oldest settlements of Karachi and forms 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 of Karachi and forms the second case study. Based on detailed interviews with area residents and the councilors a physical and social documentation of the area similar to the one for KKB (which formed 10% of the case study population) was carried out for 75 randomly selected households and the results analyzed. Nawalane has 769 housing units.

  Nawalane was chosen as a case study to see whether the densities as prescribed by the Karachi Building Control Authority (KBCA) byelaws and zoning regulations can be achieved by building houses on small plots as opposed to apartments without adversely affecting environmental conditions and the socio-economic requirements of the residents.

- Paposh Nagar is a lower middle to middle income high density plot scheme near the city centre of Karachi and has developed incrementally over time. Based on detailed interviews with area residents and the councilors, a physical and social documentation similar to the one for KKB and NL of the area was carried out for 75 randomly selected households and results analyzed. Paposh Nagar has 714 housing units.

  Paposh Nagar was chosen to see how a planned low density settlement converts itself into medium rise high density area overtime and to understand the environmental and socio-economic repercussions of this change which can help in developing new approaches to planning and management of incremental growth.

[2] Karachi Building Control Authority (KBCA) is the agency responsible for forming and implementing the town byelaws for Karachi.

- Fahad Square is an apartment complex for a middle income group located near to the city centre. A separate questionnaire highlighting the issues and trends of high rise living for low income communities was prepared for the case and applied to 25 respondents. Fahad Square has 248 housing units.

  Fahad Square was chosen to see whether apartments ca be replaced by small houses without compromising on the density and at the same time fulfilling the security and image related requirements of the residents.

- Labor Square (which is 36 years old) was included as a comparison to Fahad Square (which is 10 years old) so as to understand how apartment complexes develop in physical and socio-economic terms over time and relate these changes to density related issues.

B. CASE STUDIES

Case No. 01: Khuda-ki-Basti

Location/ Context

Khuda ki Basti 3 is a suburban low income incremental housing scheme of Karachi. It is located in Taiser Town which is located in the northern end of Karachi at a distance of about 24 km from the city centre, 14 km from Haidery Commercial Area (North Nazimabad) and 10 km from Nagan Chowrangi, a prominent junction. The industrial zones of North Karachi lie within a range of 2-4 km. There are several under developed housing schemes in the vicinity of KKB-3 (refer map KKB-01 and KKB-02). It is 4th in a series of low income incremental schemes planned and executed by the NGO SAIBAN[3] in collaboration with the provincial government of Sindh.

Planning, Jurisdiction, the Laws

Khuda ki Basti-3 was planned as a low rise low density housing scheme according to the then byelaws and followed the land use percentages prescribed under the Malir Development Authority (MDA)[4] in whose jurisdiction the land was lying.

The land for the scheme was given by the government at subsidized rates to SAIBAN, which designed it with the help of a private planning firm and then executed it. SAIBAN is still present in the settlement and is responsible for the organization and development of social and physical infrastructure through community participation. SAIBAN also assists in the operation and maintenance of the settlement. The popular political and social domination of the Mohajir Quami Movement (MQM)[5] has resulted in dissolution of mohalla committees which were initially formed and coordinated by SAIBAN.

Planning Type: Concepts

Khuda ki Basti is spread over 40.8 acres (16.31 hectares) (refer map KKB-03). In KKB there are planned 47.4% residential plots, out of which 40.27% have remained purely residential while the remaining 7.14% have converted into residential cum

[3] SAIBAN, is the NGO responsible for the planning and execution of incremental housing schemes known as "Khuda ki Bastis" in Pakistan. It obtained this piece of land from the Malir Development Authority (MDA) for development of Khuda ki Basti-3. The format of development was kept the same as followed in the previously developed schemes at Gulshan-e-Shahbaz and Gharo in interior Sindh. A small site office of SAIBAN was constructed at the site where the field staff was posted to supervise the development of the settlement. A reception area was developed to examine the applying households for their need and willingness to reside in KKB-3. The scheme was planned to be developed in three phases. At present 2124 plots have been occupied out of a total 2870 developed plots. Information taken from the "Study of the socio-economic conditions, housing profile and construction modes on KKB -3 at Taiser town," Karachi, by Arif Hasan, Fazal Noor and Noman Ahmad, Nov 2003.

[4] Malir Development Authority (MDA) was an off shot of the Karachi Development Authority (KDA). After the devolution of the local bodies, KDA and its related bodies have been replaced by the City District government Karachi (CDGK) and follow the land use and zoning percentages devised by the Karachi Building Control Authority (KBCA)

5 MQM is the political party currently in power in 14 out of 18 towns of the Karachi District. It forms the ruling party of the CDGK.

commercial / industrial units due to a trend of self employment. About 1.85% purely commercial plots planned are not developed as yet, as these have been retained by SAIBAN for future speculation. 13.75% of the site is allocated for amenities including; schools, medical clinics, parks and religious buildings (refer map KKB-04 and KKB-05). An analysis of space utilization patterns reveals that the percentage of residential units in future KKBs could be higher taking some of the land allocated for amenities and parks, as the given 13.75% of the developed amenities are under or not utilized.

The density of the settlement is 203 people per acre (501 people per hectare) with 1237 units. 55.6% of the land is planned as built up plots, 35.6% as streets and roads and 7.24% as open spaces, such as parks, playgrounds and small open spaces in the streets. Together the circulation and open spaces form 42.84% of the developed land (refer matrix - 04). It seems probable keeping in view the low density and the under or non utilized open spaces and amenities that the percentage of built up plots could be higher and the circulation spaces could double for open space.

The streets have been planned both to accommodate circulation and outdoor activities. These are arranged as clusters around a central amenity. The longitudinal central circulation and amenity spine running through the site is planned in conjunction with the natural depression and also acts as a run off for rain water which drains along it (refer map KKB-07).

Each public open space is surrounded by a block of about 100 houses (refer map KKB-06). This forms a mohalla (neighborhood) system, in which representatives of these 100 houses have formed a mohalla committee for the maintenance and up gradation of their area, its municipal services and its public grounds according to the needs of the residents. The public and semi public zones are clearly defined in the plan. Such planning is envisioned to have a positive social and cultural impact on the area.

KKB has a very low population and built up density which given the high land values in Karachi and the non availability of properly planned and developed low income housing schemes (incorporating the technical and social support of an informed NGO) is a potential which is underutilized both by SAIBAN as well as the residents.

Area level large open spaces are under-utilized, as 85% of the residents have a preference for using the streets provided for circulation as open space, which according to them has the potential to accommodate daily social and economic activities. The small open spaces attached to the streets are therefore, more popular and have become small parks (refer table – 09).

The current space documentation and user feed back in KKB reflects that in future the street can be designed for the dual purpose of circulation and open spaces. The remaining land can be utilized to increase the number of residential and commercial plots and the consequent density in the area leading to an optimum usage of land.

The street as interface between private and public and its usage

Following the byelaws, the average street width at KKB is 24 feet (7.3 meters) and the houses are mostly 80 sq yards (67 square meters). The streets are used for parking of vehicles like; bikes, donkey carts, rickshaws & taxis or cars owned by the residents. Streets also serve as a semi private zone having children play area, sitting

out area, landscaping and animal cages and space for holding of marriages and funerals.

Due to the hot humid weather of Karachi, the 24 feet wide (7.3 meters) street with mostly ground or ground plus one structures on either sides offers little shade during the day. Due to the lack of shade, the street usage during the day as a semi-private / semi-public space remains limited. Despite this the people do not want narrow streets as being an upwardly mobile society; people wish to have broad streets for vehicular access as they may later own cars.

Open spaces and their use

The master plan of KKB 3 includes a hierarchy of public spaces with the common large public spaces and amenities placed in a central strip easily accessible by all mohallas. One open ground is developed as a plants nursery with a sewerage treatment plant while another as a cricket ground. The rest are in excess and are large, underutilized grounds hardly used or maintained by the people and mostly serve as garbage dumping areas.

From the above observations, it can be derived that due to low income peoples lifestyles and time affordability semi-private / semi-public spaces like streets have a better chance to be owned, used, kept and maintained than the larger public open areas. Therefore, the number of large, common public areas in a settlement should be kept limited and designated for special functions.

Infrastructure Conditions / Determinants

Infrastructure conditions at KKB are good with sewerage, water supply, gas and electricity lines in place. All infrastructures have been developed according to plan and include people's participation as per the Orangi Pilot Project's component sharing model[6]. The participation in development has given people a greater ownership of the area and they 'look after' the operation and maintenance of infrastructure developed by them.

Economic Support in Planning: Residential and commercial landuse distribution

While the housing scheme was planned according to MDA land use percentages and byelaws, however, an exception was made by SAIBAN that allowed residents to open small scale commercial outlets / workshops within their residences. This step was taken to support income generation as it a common practice in many low income areas. This is an important and successful step that should be adapted in the planning byelaws for low income areas to support their economic uplift. However, the scale and type of this commercial activity operative within a residential set up should be defined for environmental considerations.

The commonly found commercial activities at KKB include that of ice manufacturing, food catering, real estate agencies, private schools / tuition centers, clinics and small grocery stores.

[6] Orangi Pilot Project – Research and Training Institute (OPP-RTI) is an urban development and research NGO based in Karachi. For details on OPP-RTI, refer; http://www.oppinstitutions.org

Houses in KKB

All houses have a plot area of 80 sq. yards (67 sq. meters). The sizes of the plots are of 02 types: 24'x30' (7.3 m x 9.1 m) and 20'x36' (6.0 m x 10.9 m). The sizes of plots were intended by the planners/architects to optimize ventilation, thereby improving the internal environment. The greater depth of the plot enables the residents to modify the unit and use some part of the frontage for opening a shop or similar income generation space. Mixed results have been observed in its application. Residents have attempted to minimize on construction cost by using boundary walls as rooms walls. However ventilation benefits have been assured in such cases where the orientation of the plot is favorable and internal layout is done according to the proposed design (refer map KKB 9a and KKB 9b).

A sizable number of houses have un-plastered walls made of cement concrete blocks with roofs constructed of prefabricated cement concrete beams and tiles. Few houses have plastered walls. This factor indicates that initially the house occupants could only afford the minimum for their respective houses due to an overall low income and affordability status. Savings and loans constituted the main sources of housing finance in KKB (refer table - 07). However it must also be noted that once people have decided to live in KKB, households have continued to invest in their houses since it is a revered asset and one of the prime necessities of life (refer table – 07 and 08).

Despite the resource constraints faced by a sizable number of households the plinth is constructed as high as 2.0 feet (0.60 m) and is of cement concrete block masonry. The residents apparently develop these high plinths based on the popular consideration that after external development work, if the road level rises it can cause rain water to enter their homes (refer map KKB-07).

A sizable number of the houses have boundary walls. The reasons to construct boundary wall were several. Residents wished to procure a definite enclosure to define their dwelling. It also provided a basic measure of privacy. For this point, in a few cases, the boundary walls were raised to 6 feet (1.82 m) and more. In some cases, the internal room/enclosure was built using boundary wall as a common/sharing surface boundary. It also gave identity to an individual house.

In other words, boundary walls act as an elevation to the individual dwellings. The doors/gates installed in the boundary wall are normally of G.I. sheets and other metal sections. In cases where a shop or commercial space is provisioned, the boundary wall accommodates the opening of the shop.

Construction of rooms has several problems. Leakage in roofs, poor day light due to improper positioning of windows, absence of ventilators to let off the warm air and construction defects such as poor quality masonry can be commonly observed.

Kitchens are usually kept attached to the open courtyards as these generate heat, fumes and smell. Kerosene oil stoves or gas cylinders are used for cooking. Toilets are built either close to the front boundary wall or backyard. Toilets are built on a raised platform of varying dimensions. Almost all the toilets are squat type low cost structures.

Courtyards and the threshold space known commonly as “gallery” are probably the most utilized space. Womenfolk spent most part of the day in courtyards, busy in cooking and washing. In the absence of electricity, it is extensively used for sitting out, sleeping and playing. The courtyard also includes underground water tanks of the house. In cases where the courtyard is paved, its utility increases considerably.

Social Set-up

In KKB, the social set up mostly consists of extended families (including parents, grandparents and children) of mixed ethnicities. There is gender balance in the area with males at 52% and females at 48% (refer table - 01). 58% of males and 72% of females lie between the age brackets of 20 to 40 years (refer table - 02) indicating a large number of married or to be married population leading to an increase in the family size and an overall population and consequent density growth. This trend in a suburban low income housing setup like KKB means extensions in the existing houses as it is an affordable and desired social and physical solution and affordable.

The incremental and steady growth of KKB (refer table – 03) since its inception about a decade ago reflects that people are willing to go and live far away from the city centre if there is public transport availability and they can become owners of plots of land within the greater Karachi municipal limits. Given a situation in Karachi, where land prices are subject to market pressures and as such unregulated by the state, plot developments like KKB are a welcome relief to the low income communities and have the potential to be very successful models of housing.

The investment on construction of units and infrastructure is ongoing and people have developed a sense of belonging to the area. However, the real estate market is operational and selling and buying of houses is ongoing with the assistance of the resident NGO, SAIBAN. Because of SAIBAN’s supervision, there is little or no speculation on land and all plots are occupied by deserving families.

The average family size in KKB is 6.7 which is the average for the city of Karachi, which tend to be mostly nuclear setups (refer table-04). However, the trend in KKB is for extended family setups as 53% of families in KKB range between 5 to 8 family members which shows that majority of the families have a married son or elder relatives living with them (refer table-04). The incidence of a married son and his young family occupying a part of the house on each plot are higher as only 16% population is above 60 years of age, whereas number of men between 20 to 40 years of age is 58% (refer table-03). The average number of children per plot is 4.2, with about 1.7 having school going age (refer table-04).

This trend of accommodating up to 02 generations is possible in KKB as the 80 sq yards (67 sq meters) plots give the possibility of horizontal and vertical extensions. If not occupied by extended family the upper portions are often given on rent. The overall open spaces (including the parks and streets) can also accommodate the out spill activities of the resident population without creating any major issues of privacy and congestion.

Currently, 85% of the people use the space in front of their houses and the overall streets for economic activities and socializing. These activities include; storage, parking (of vehicles and carts), children play area, clothes washing/ drying and animal keeping (refer table-09). Street is preferred by almost all KKB residents as an immediate open space and its use is much higher compared to the 25% use of large

open spaces and 40% use of small open spaces in the area (refer table-09). The reason for this space use and preference is that people feel a sense of security and belonging to their respective streets where everyone is known to them, small children can be supervised collectively and it is within the purdah limits (acceptable communal space for women to come out into without being veiled).

The out spill of activities in the streets is bearable as the overall density at 501 people per hectare (refer table-11) is on the low side, However, with a trend of about 30% population (refer table-06) earning from their houses through rentals, shops or small industries and about 65% of the population (refer table-07) planning to have extensions in the houses to be able to do likewise, the density in the area would more than double in the next decade. This means that care has to taken in calculating optimum sizes and numbers of open space and street in the future KKB's so that with high densities in the area the communal spaces are neither under nor over utilized leading to degraded environmental conditions. Open spaces need to be paired with uses like; schools, health centers, sports centers, shopping and community centers as the residents desire these facilities and they play an important part in community development and a sense of belonging to the area (refer table-09 and 10).

The average of 1.8 members working per household with working women average at 0.5 per household (refer table-04) and 17% population working from home (refer table-05) reflects that, these households have an adult male and female and a young male or female family member working from home requiring space within the house and in the immediate space outside to do so.

90% of the male population is employed, out of which 40% are skilled laborers, 28% work as daily wage earners and 4% as government employees (refer table-05). 41% of the population works within KKB saving on transport costs and travel time, whereas, the other 41% works in adjoining areas (up to a distance of 05 to 10 kilometers) and 18% travel up to a distance of 15 to 20 kilometers for work (refer table-05). Initially, unavailability of transport was an issue in KKB, but with the passage of time and 100% day time availability of transport people are willing to commute long distances to work as long as they have ownership, social networks and safe environment for their families in the housing settlement.

The 59% of the population traveling for work is willing to bear the cost of transport which is usually up to 18% of the average income (refer table-06). The travel time ranges between ½ to 02 hours one way, yet they want to continue to live in KKB as they have ownership of plots. This is an asset which they would never be able to afford close to their places of work in the city.

The housing ownership and preferences given in table – 08 shows that 100% people are willing to live far from the centre if they have ownership of a house located in a settlement which provides good infrastructure, a good and safe environment and proximity to the family. 65% of the people prefer a 80 sq yards (67 sq meters) house in KKB far from the city compared to 16% who would move to a 48 sq yards (40.13 sq meters) house in the city and 13% who prefer a 02 room 81.6 sq yards (68.2 sq meters) apartment in the city (refer table–08).

The average per month income in KKB is about 8,000 Pakistani Rupees (about 98.7 $) which is at par with the rest of the low income areas (both inner city and suburban) of Karachi. It is an upwardly mobile society as only 15% of the population works on minimum wages (refer table-06). The expenditure per household tends to run 26%

above the shown income (refer table-06), which shows that, unaccounted supplementary incomes, savings, loans or credit are employed to make ends meet. House construction and maintenance is an important part of the household priorities and expenses as it is about 4% of the total expenses (refer table-06), which is the same amount spent on health and education. 100% houses are constructed with 96% population investing in them annually (refer table-07). 65% population has immediate financial plans for extensions in the houses with the remaining 35% aspiring to do the same as soon as they can raise the funds (refer table-07).

The trends discussed above show that low income people do not want to possess land for speculation, as is the trend in the middle and upper classes in Karachi, who own multiple plots in the city for investment and speculation. The low income people immediately invest in construction, regularly maintain the housing stock and develop it for economic and familial reasons. A house provides a low income household the possibility to have supplementary income in the form of a home run enterprise, saving on transport and capital costs. The close proximity ensures that the mother of the house can work as well as look after the family. The possibility to vertically extend ensures that at least two generations have housing security and the savings can be invested in the same house and settlement development leading to a consolidated community.

Statistical Analysis

Table 01

Gender Composition		
	Males	Females
	52%	48%

Table 02

Dominant Age Groups		
	Males	Females
Between 20 and 30 years	40%	24%
Between 30 and 40 years	18%	48%
Between 40 and 50 years	10%	10%
Between 50 and 60 years	22%	10%
60 and above years	10%	6%

Table 03

Occupancy Age		
	Males	Females
Between 10 to 08 years	32%	38%
Between 07 to 04 years	50%	33%
Between 04 years to now	18%	24%

Table 04

Family Size and Composition		
Average Household Size	6.7	
Range	02 - 16	
Mode	08	
02-04 members	25%	
05-08 members	53%	
09-16 members	22%	
Average number of households per plot	01	
Average number of children per household	4.2	
Range	0-14	
Mode	04	
Average number of schooling going children per household	1.7	
Average number of working members per household	1.8	
Average number of Working women per household	0.5	

Table 05

Occupations, Place of Work and Transport		
Skilled Labor (masons, electricians, drivers, carpenters, tailors)	40%	
Daily wage earners (factory workers, scrap vendors, hawkers)	28%	
Small business and Shop Owners	17%	
Government jobs (school teachers, clerks)	4%	
Population working within KKB	41%	
Population Working in adjoining Areas (up to a distance of 05-10 kilometers)	41%	
Average traveling time to workplace	½ to ¾ of an hour one way	
Population Working in the city centre and related areas (up to a distance of 15-20 kilometers)	18%	
Average Traveling Time to city	1 1/2 to 2.0 hours one way	
Day time Availability of Transport	100%	
Night time Availability of Transport	50%	

Table 06

Income and Expenditure		
Average Income per Household	8,000 PKR	
Range	2,000 to 11,000 and above PKR	
2,000 to 5000	15%	
5,000 to 8,000	33%	
8,000 to 11,000	21%	
Above 11,000	31%	

Minimum Wage Earners	15%	
Upwardly mobile	85%	
Percentage of population earning an additional income by having a shop in the house, renting a portion, tuitions, tailoring	30%	
Monthly expenditure of average income		
Food	75%	6,000 PKR
Transport	18%	1,500P KR
Water	8%	600 PKR
Electricity	7%	500 PKR
Health	4%	350 PKR
Education	4%	350 PKR
House maintenance	4%	350 PKR
others	6%	500 PKR
Total expenses	126%	10,050 PKR

Table 07

House Construction, Maintenance and Extensions		
Houses constructed	**100%**	
House Development and maintenance funds	4,200 per year	
Means of Maintenance		
Savings	46%	
credit	40%	
Selling Assets	10%	
Plans for future extensions	65%	
Aspirants for future extensions	35%	

Table 08

Housing Ownership and Preferences		
	Previous Residence	**KKB**
Location		
Within 5 to 10 kms of the city centre of Karachi	31%	-
Outskirts of Karachi, Up to 20 kms away from the city centre	58%	100%
Another city	11%	
Nature of tenure		
Owners	35%	95%
Rented	65%	05%
Advantages		
Ownership	35%	65%

Economical Plot (80 sq yd) Option	NA	85%
Availability of Amenities and Services	20%	50%
Proximity to city centre and work	15%	NA
Family proximity and networks	10%	52%
Safe and good environment	10%	92%
No response	10%	10%
Disadvantages		
Rented house	65%	05%
Unleased or illegal settlement	12%	NA
Small plot size	12%	NA
Unsafe and bad environment	21%	5%
Far from the city	NA	10%
Late Infrastructure Development	NA	30%
Water In availability	NA	14%
Preferences		
80 sqyds plot in KKB		65%
Average price		1,80,000 to 200,000 PKR
Average installment		650 PKR
60 sqyds IN KKB		0%
Average price		100,000 to 150,000 PKR
Average installment		500 PKR
48 sqyds in KKB		02%
Average price		90,000 to 100,000 PKR
Average installment		450 PKR
48 sqyds in City		16%
Average price		3,50,000 to 400,000 PKR
Average installment		1,300 PKR
02 room flat in the city		13%
Average price		3,50,000 to 400,000 PKR
Average installment		1,300 PKR
On rent in the city		02%

Table 09

Space Use and Preferences in the Settlement		
Threshold and Space in front of the house		
Children playing ,storage, parking (of vehicles and carts) , clothes washing/ drying, animal keeping	80%	
Street Used for;		

recreation, economic activities, socializing	85%	
Existing Large spaces Use		
yes	25%	
no	75%	
Existing small spaces Use		
yes	40%	
Children play Area		
Streets	40%	
parks	15%	
Home	10%	
Need for recreation spaces		
yes	38%	
no	62%	
Need for shopping spaces		
yes	75%	
no	25%	
Community centre necessary as a social space		
yes	50%	
no	50%	
Other importance of community centre like;		
Health related free facilities, immunization and awareness programmes and income generation programmes	98%	
Sense of belonging to KKB community	90%	
Reasons;		
Social support	75%	
Conflict Resolution	25%	
Preference for;		
Good social environment	40%	
Safe and healthy environment	28%	
A well planned, legal environment where jobs are also available	22%	
No response	10%	

Table 10

Role of schools and teachers opinions in KKB		
Given plot size for school appropriate		
yes	100%	
Does the school use of nearest open spaces in the area		
Yes, for children play area	75%	
No, as insecure	25%	
Do you agree that schools play a positive and important role in community development	100%	
Safe and Preferred walking distance to school	½ km	

Photographic Documentation

Picture 1: A panoramic view of Khuda ki Basti - III

Picture 2: The extents of Khuda ki Basti - III

Picture 3: Khuda ki basti – III; a low density, low rise housing scheme

Picture 4: Planning type ; sizes of plots (80sq. yards)

Picture 5: Street activity – children play area

Picture 6: Street activity – parking of vehicles belonging to the residents

Picture 7: Street activity – commercial activities and casual sitting

Picture 8: Street activity – lack of shade due to width of streets

Picture 9: Street activity – recreational activities

Picture 10: Street activity – residential area

Picture 11: Street activity – hawkers – a mode of income

Picture 12: Open spaces – ladies and children playground

Picture 13: Open spaces - area level playground

Picture 14: Open spaces – parda bagh (for families only)

Picture 15: Open spaces – sanitation and garbage dump in an open space

Picture 16: Open spaces – the central cricket playground

Picture 17: Saiban composting plant

Picture 18: Garbage collection

Picture 19: Water purification/filter plant

Picture 20: Local agricultural land

Picture 21: Small scale commercial outlets in residences

Picture 22: Commercial activity

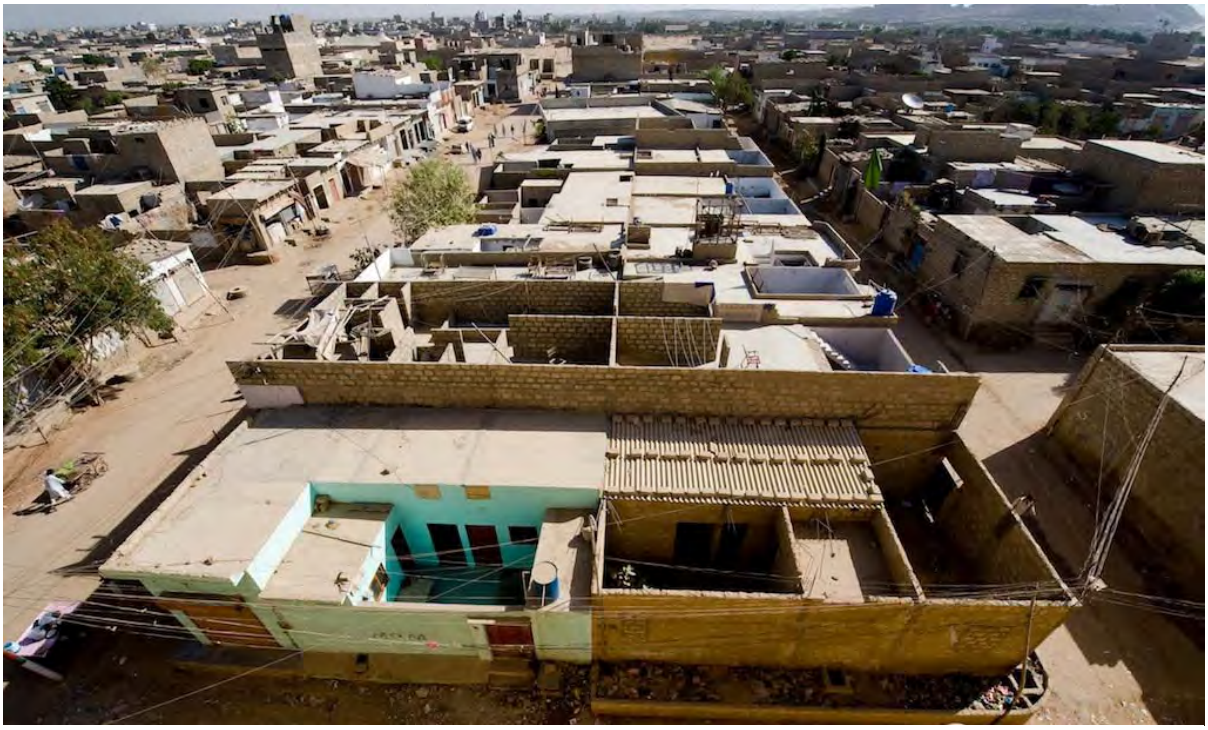
Picture 23: Commercial activity

Picture 24: Commercial activity

Picture 25: Women's participation in economic activities

Picture 26: Commercial activity

Picture 27: Houses in Kkb-III



Picture 28: House layouts and first floor extension

Picture 29: Builtup density

Picture 30: Different open/built arrangements

Picture 31: House layout - compound

Picture 32: House layout - bedroom

Picture 33: House layout – central courtyard

Picture 34: House layout – cos / skylight

Picture 35: House layout - entrance

Picture 36: House layout - courtyard

Picture 37: House layout - bedroom

Picture 38: House layout – living room

Picture 39: House layout - kitchen

Picture 40: House – street threshold

Picture 41: Use of space outside the house

Picture 42: Social setup – entertainment for men

Picture 43: Social setup – communal gathering spaces

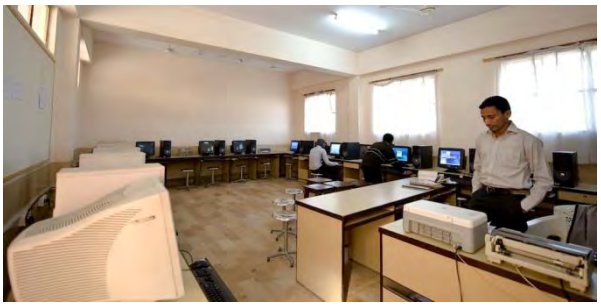
Picture 44: Local health, education and litracy clinic

Picture 45: Baqai medical complex

Picture 46: Baqai medical complex

Picture 47: School in Kkb-III

Picture 48: Classroom



Picture 49: Computer lab

Case No. 02: Nawalane, Lyari

Location / Context

Nawalane is situated in Lyari, one of the oldest settlements of Karachi dating back to over 250 years when the town first came into existence as a small commercial and trading centre.

Nawalane spreads over an area of about 20.9 acres (8.4 hectares) which comes under Union Council -11 in the Saddar town. [7] Towards the north is the Lyari Nadi (river), one of the two perennial rivers that run through the city ending at the delta in the sea. This *nadi* is now largely a sewer (nala) where the effluent of most of the city drains into the sea (refer map NL-01 and NL-02)

On the northwest of Nawalane is *Bakra Piri* (cattle market) in the southwest is KalaKot; Old Haji Camp on the east and Usmanabad on the north-east. Bounded on the immediate west of Nawalane, separated by the main 48 feet (15 meters) wide road called Mehrab Khan Essa Khan Road, is the New Kumharwara (a locality of the Kutchi *kumhars* – pottery makers originally from Katch). The settlement is connected to Hassan Ali Mir Mohammed Road at the east, Faqeer Mohammad Durra Khan Road at south-east and Ali-Buksh Jakhi Road in the north. Popular landmarks around it are Cheel Chowk, Timber Market, Katchi-Memon Grave-yard and Kumharwara.

There are other low income settlements surrounding it, namely:

- Usmanabad in south-east (opposite Faqeer Mohammad Durra Khan Road)
- Noorani Zikri Colony in the north (opposite Ali-Buksh Jakhi Road)
- Noor Mohammad Village in north-east
- Gabol Village on the west

Gabol Park and a primary government school along the Mehrab Khan Essa Khan Road across Nawalane are important landmarks (refer map NL-02).

As Karachi port developed in the early 18th century people came and settled in Lyari from various areas in Balochistan, Iran and Kutch. In 1886, Lyari was the largest of the 28 municipal districts of Karachi with a population of 24,000 of a total city population of 87,000, hence comprising of more than one-fourth of the city's population.[8]

The various ethnic groupings at Lyari brought with them their trade practices, ranging from; construction labor; transport, cattle, goat and camel traders; pottery makers; fishermen; boat makers; pastoral people and agriculture tribes.

The infrastructure in Lyari took longer to develop than in the rest of the city because the area was treated as an informal settlement or slum by the traders, as it was a locality for housing labor. Despite its large bulk of population, Lyari had no electoral

[7] In the year 2000 under the devolution plan Karachi was divided into 18 towns with each town having its own Nazim (Mayor) and Naib Nazim (Deputy Mayor) who work under the City Nazim (City Mayor). For administrative purposes each town was divided is into union councils.
[8] ibid

representation in the Municipal Council until the 1940s when Mehrab Khan Essa Khan became the first elected representative of Lyari in the Municipal Council. There were serious infrastructure issues in the area in particular that of sanitation and water supply leading to health problems.

After independence in 1947, due to more immediate problems because of a huge influx of migrants from India, the development of Lyari remained a non-priority. Several attempts have been made since to resettle the residents of Lyari to the suburbs of the city and transform the prime central city property of Lyari from a low income area, commonly perceived as a 'slum' (due to its negative political and social image) to a posh residential area close to the city's business center.

In the late 1950s, Ghulam Mohammad Nooruddin, an educated resident of Lyari, working in the Karachi Municipal Authority and later in the Karachi Development Authority, played an essential role in getting Lyari accepted as a settlement that required regularization and improvement.

Up till the 1960s, there were no basic civic facilities in Lyari. The people of Lyari felt alienated and deprived in the development schemes of the government. The Pakistan Peoples Party (PPP)[9] saw this as an opportunity and established a strong political hold in the area making promises for uplifting and upgradation. A resolution was passed in the Karachi Municipal Corporation (now defunct) in 1976 to give land ownership rights to the residents of Lyari by leasing out the residential plots for 99 years under the Katchi Abadi Improvement and Regularization Programme (KAIRP)[10]. Majority of Lyari residents obtained legal land entitlements. The PPP government gave land lease to the people to strengthen its political hold in the area.

According to unofficial estimates, the present population of Lyari is 1.6 million, spreading roughly over 74 square miles.[11]

Planning, Jurisdiction, the laws

Nawalane is a very high density residential neighborhood consisting of about 769 plots within an area of 20.9 acres (8.4 hectares) and a density of 1354 people per acre (3349 people per hectare) which is very high. It has commercial land use along two edges facing the Mehrab Khan Essa Khan and Faqeer Muhammad Durra Khan roads.

The entrance of Nawalane and Kumharwara is marked by a monument at the start of Mehrab Khan Essa Khan Road, popularly referred to as the Cheel Chowk (The eagle roundabout). It was built by KMC when the area was under its jurisdiction for up gradation and municipal works until the devolution of the local government in 2000.

[9] The Pakistan People's Party was a nationalist political party formed by Late Zulfiqar Ali Bhutto

[10] Katchi Abadi Improvement and Regulation Programme (KAIRP) for informal settlements was an important part of Karachi Master Plan of 1974-85. The 1970s was a period of socialist ideals and anti-capitalist politics. The rights of informal settlements dwellers were made an election issue in 1971, with the People's Party promising "*Roti, Kapra aur Makan" (Bread, Clothing, and Housing).* When it came to power it initiated the process of providing lease to informal settlement dwellers, and KAIRP was made a part of the KMP 1975-85. The main features of the plan were: upgrading of the informal settlements by providing urban services to the people of these settlements, granting a 99- year lease to the residents, and provision of plots or houses to the population affected by the up gradation process.

[11] SIDDIQUI, Sarah; KHATTRI, Rashid; 'Nawalane, Lyari' in: HASAN, Arif (ed) *Community Initiatives – Four Case Studies from Karachi*, City Press, Karachi, 1998.

The area rises up towards the northern end to a slightly higher topography (Refer Map NL-08b)

The name of the settlement was changed from *Gharibabad* to Newlane when the neighborhood was resettled by the British after it was burnt down in an accidental fire. It is now called Nawalane where *nawa* means new in the Balochi language. The change in the name from Gharibabad to Nawalane was recorded in 1973 in government documents.

At the time of regularization, the settlement was pre-dominantly low-rise, but due to the increase in the number of persons per household, there is a significant increase in the verticality of the settlement as well encroachment over the streets through projections.

The amenities found in the area include:

- Mosque: A large central mosque of around 1650 sq. yards (1410 sq. meters) and other smaller mosques which exist in the settlement at different corners of the block.

- Educational Institutions: A primary school block exists on the southern boundary of the block. It consists of three primary government schools. In addition there are a few informal *madrassas* (religious schools) and home-tuition centers within the settlement.

- There are no government health centers. However there are a few small scale private clinics.

Recreational Centers: There are no parks or green spaces in the area. There is an open sport cum playground in the immediate vicinity of Nawalane called Gabol Park. A gymnasium with a boxing ring and equipment for physical exercise established by the government stands next to Gabol Park. This complex is called the Lyari Sports Complex. These facilities are exclusively for men as the local culture does not allow women to take up such activities. A park by the name of Faiz Mohammad Park is found on the Union council map within Nawalane. Investigation revealed that this is currently subject to encroachment and is being used as a godown for the neighborhood market. There are various private clubs for football.

Planning Type: Concepts

Nawalane can be described as a high density settlement which is organic in nature with narrow winding streets. The plot sizes in the settlement vary from 80 square yards to 300 square yards (67.0 square meters to 252.8 square meters). The preferred plot size is 120 sq. yards (100 sq. meters). It has evolved to be so over time with few controls from the building control authorities. The lack of controls has been due to the strong political affiliations and collective will of the community in Nawalane. The community is a homogenous group of ethnic Baloch having a strong sense of belonging to the area.

It was observed during survey that the area of Nawalane could be distinctly divided into two parts; A and B. Part A, the southeastern half is of higher density than Part B, the northwestern half. Plot sizes in part A are smaller in size, owned by a poorer section of the community and consequently there is a higher built up density here

with an average of G+3 going up to G+5. In part B where plot sizes are bigger the average built up density is of G+1. These residents are also financially better off.

Part A was observed to be housing two different political factions who have major differences. This creates insecurity in the area (refer Map NL-04).

As a result in part A the social relations among families and neighbors were strained and people were found to be less open and communicative. They also felt financially and socially marginalized. In part B, on the other hand, people were visibly relaxed, more open and communicative. Parts of streets and cul-de-sacs were privatized with mutual consent amongst neighbors or extended families and hence having a common compound and open space. This is believed to also allow for better relations among the neighbors.

In part A on the contrary, people have accommodated their family extensions by going up on small plots with only the staircase being the common space. Similarly, infrastructure, especially sewerage seems better maintained in part B of Nawalane.

The street as interface between private and public and its usage

Nawalane consists of 24 streets of which only two are over 12 feet (3.6 m) wide and allow vehicular access. The rest are narrow and open for pedestrian only. The maximum observed street width is 15 feet (4.5 m) and the minimum street width is 2 feet 6 inches (0.76 m). The streets can be described as narrow and congested pathways with built up densities of average ground plus one (G+1) and going up to ground plus five (G+5) in some areas.

The streets are winding, narrow and congested pathways obstructing air circulation and natural light. Due to this, the residents have constructed skylights overhead or alongside bedrooms for capturing natural light and air. These congested spaces pose issues of physical and psychological well being, promiscuity and privacy.

The streets have dissolved semi-private spaces which become private compounds for extended families and neighbors in certain cases, developed through negotiation. Generally, a gender zoning was observed, as the streets are considered the domain of women and children while the peripheral areas are dominated by unemployed young men. This social control system also offers a ‘security’ to the area of Nawalane and reinforces its identity as a homogenous close knit neighborhood. On the down side, there are privacy issues as individuals and families are forced to interact even if they do not want to.

The narrow width of the street with high built up densities offers constant shade to the street space. Little platforms or *chabootras,* no more than 0.46 m wide at the house fronts become spaces for spill over activities which older women and children mostly use.

While narrow street spaces do offer interesting lively urban spaces which are climatically comfortable, there are many disadvantages to this. These can be listed as:

- Lack of accessibility in case of emergencies, like for an ambulance or a fire engine to enter in case of fire or any other accident. The area is hence highly vulnerable in case of emergency.

- In case of death, *janazas* or dead bodies can be taken only through certain routes causing discomfort & unease.
- Infrastructure maintenance, especially of sewerage lines and access to Karachi Electric Supply Corporation (KESC) vehicles is a major issue.

Open Spaces and Their Use

Open areas in the settlement are scarce. The narrow street spaces are the only open spaces in Nawalane. Only in rare cases, do compounds of a mosque open on to vacant plots to become additional open areas. There are no green areas in Nawalane. There are two grounds marked on the maps of the immediate context of the case study area, one of which has been illegally taken over for private godowns and storage purpose while the other exists as a playground for young boys only (Refer Map NL-05 and NL-06)

A large percentage of children less than 14 years (50.72 %) play within their houses as elders find it difficult to supervise them if they were to play on the streets. The residents feel that a compound where the elders could supervise while staying indoors might be a better housing setup for Nawalane.

As children over the age of 14 require lesser supervision therefore they go to play in nearby parks and grounds. 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 they are not allowed to interact in non-segregated areas. The women residents felt the need for community halls which could serve as enclosed and segregated interactive spaces and where they could learn different skills like stitching, embroidery and computers (refer table 09).

As there is a lack of proper wedding halls and community centers the weddings take place on the streets which creates inconvenience for the residents as streets are blocked off through setting up of tents for entertaining the guests.

Infrastructure Conditions / Determinants

The settlement is around 250 years old but was regularized in 1976. It existed as an informal settlement before that. It was after the regularization of the settlement that formal sewerage and water lines were laid and electric connections were provided. Currently sewerage is divided into two parts, one joined to Bakra-para Pumping station in the north and the second to Jamila Pumping Station in the south of the area (Refer Map NL-07)

The high density of the area is casting pressures on the existing infrastructure causing problems. There is a major sewerage problem in particular in part A of the settlement where the plot sizes are small and densities are very high. As the sewerage lines were laid after the construction of the settlement there are a number of manholes found inside the living spaces of houses. This is also attributed to the fact that the layout and growth of Nawalane is organic. Having the man holes inside the living spaces of houses not only creates foul smell in the houses but also leads to major maintenance issues.

Economic Support in Planning: Residential and commercial landuse distribution

Although the possibility is there only a small percentage of about 18.84% residents use the houses for earning any additional income. This is probably as spaces cannot be set aside for income generation as the requirement to accommodate a high number of residents is there (refer table 06). The working class setup in the area is another factor that does not lead to entrepreneurship thus the requirement for housing economic activities in the residences does not arise.

Condition of Houses

The houses are built back to back with streets on either ends. The houses share a common wall that sometimes also becomes the wall of the rooms inside. Most of the houses are designed around central courtyards that serve as spill over spaces for different activities (Refer Map NL-09a and NL-09b).

As it is an old settlement with very strong social ties almost all of the houses have developed incrementally accommodating many generations. The houses are constructed of reinforced cement with some of the houses being load bearing. 56.52 % of the houses have reinforced cement and concrete construction with most of the windows opening onto the internal courtyards. As the houses 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.

As it is a low lying area there are issues of drainage of rain water and heavy rains result in the flooding of low lying areas of Nawalane.

Social Set-up

Large families live together in Nawalane, and it is not uncommon to find 30 to 40 people living on an average plot size of 120 sq. yards (100 sq. meters) which may be multi storied. These houses put together offer interesting dynamics that contrast with areas such as KKB which due to the suburban nature are less dense, have plenty of public open spaces (built according to the town planning regulations) and many families are nuclear family set ups.

The population in Nawalane consists of 55.07% males and 44.93% females. 34.21 % of the males (highest percentage) are between the age of 20 and 29 years and the second highest percentage is 23.68 % of males 60 and above, where as 54.84 % (highest percentage) of the women are between the age of 20 & 29 years. This population proportion where a high percentage belongs to marriageable age indicates the requirement of incremental housing and expansion of the built structures to accommodate more people. A large percentage of males over the age of 60 years indicate the requirement for interactive spaces where older people can interact. (refer table 11 & 12). This would eventually lead to further incremental development and densification of the locality with more congestion and further burden on the existing infrastructure.

Majority of the population has been living in the locality since birth and has strong social ties with the area. The residents value the communal social setups and are

willing to face hardships and cramped and congested conditions as long as their social setups remain intact (refer table 13).

The average family size is 13.56 and there is an average of 2.72 families living on one plot. To accommodate the high population density of 1356 people per acre (3349 people per hectare) the vertical developments on plots are but natural. The large number of children (average 6.36) in each household requires open spaces for recreation and play activities but Nawalane does not offer such spaces (refer table 14)

Only 12 out of 69 respondents had working women in their households which meant that most of the women stay home for the larger part of the day and are involved in daily chores. Living in a congested area and spending most of the times at home they interact a lot with each other, which at times leads to unnecessary interference and fights.

Occupations, Place of Work and Transport

Only 27.82% of the people work within 2 kms of Nawalane, therefore maximum number of people do not have any time during the working day for any social, recreational or entertainment activities as commuting to far off places for work takes up most of their time

Most of the residents shops in nearby Kumharwara and Rinchor Lines area as most of the daily need items are easily available here at competitive prices.

Residents go to Hawksbay, Gadani, Aladdin Park once a year with family for recreational purposes. The average they spend per trip is around Rs. 1000 (US $ 12) (refer table 15).

Public transport is available easily during the day and till late in the night and the public buses only come till C*heel Chowk* which is a couple of minutes walk from the start of Nawalane. Rickshaws are available from C*heel Chowk* onwards if required by the elderly or school children.

Income and Expenditure

The settlement seems to be divided almost half and half between low income and middle income groups. This is evident in the physical set up of the area as well where the upper part has smaller houses and the lower part has bigger houses. It also means that only half of the population of the settlement on an average would have a better standard of living and would be indulging in recreational and entertainment activities that need to be paid for and are outside Nawalane.

Physical and Social Assets

As already mentioned Nawalane is largely residential with very few, small scale commercial outlets within it. Most of the residences with commercial enterprises lie on the periphery along the two main roads that form its boundary on the western end.

Environmental issues such as, congested living and social issues such as, drug addiction amongst youth were considered as the biggest problems of the area. Through the survey results it can be concluded that there is a requirement to engage

the youth in more constructive activities like sports and thus the provision of play fields and grounds can be considered as an important part of future design schemes. Introduction of these will also lead to the decongestion of the locality. 67 % respondents believed that the environment is not conducive to healthy living but conducive to educating children as they live near good educational facilities. The residents regard the schools as vital assets that help in educating and development of their children. 100 % of the respondents believed that the schools play a vital role in the community's development as they are a big influence on their children and consequently their lives. (refer table-11). The residents are divided half and half on the opinion about the environment being conducive to developing social relationships indicating a conflict between old values of communal living and new urban trend for nuclear and more private and independent living. 33.3 % answered that education facilities in the area should be developed further (refer table 17).

CBOs perform an important role in networking and development of the area. They help in arranging funerals, lobbying for basic services, admissions to schools, solving conflict with police. 94.20 % of the respondents answered that they have developed social relationships with the government officials who help in acquiring jobs, admissions of children to schools and solving problems with the police. 50.72% of the people have credit facilities available from local shopkeepers. 43.48 % have a savings committee (refer table 19)

Although congestion and lack of open spaces is pointed out as a problem, yet lack of ventilation is not considered an issue. 68.12 % of the residents answered that their houses are not hot in summers. 43.02 % believed that privacy is an issue as one could see into the neighbor's living spaces but the rest 56.98 % did not consider it a problem. The reason behind this could be that they do not know any better ways of living and have become used to this way of life since they have been living in these cramped conditions since birth.

However 31.88 % of the total respondents opted for a redesigned house in Nawalane which should accommodate all their family members and would be better planned and ventilated. Those wanting to stay in the locality want to because of community setups, ancestral property, central locality and easy accessibility. Those who want to shift to other areas in the city want to because of the problems of congestion, poor environment, gang wars and a better future for their children (refer table 19).

Construction, Maintenance and Extensions

This half and half divide in the current population is also evident in plans for further extensions and incremental development as 53.62 % of the residents plan further construction to accommodate their extended families within Nawalane (refer table 18) whereas the rest of the people want to try other options like shifting out of the locality.

On average the residents spent Rs. 5000 (US $ 61.7) on the maintenance of the houses annually. 63.77% of the respondents answered that they generated this amount through personal savings and 15.04 % answered that this amount was generated through selling of assets (refer table 18). What ever may be their means of generation of capital to invest in the maintenance of the houses, the fact that it is ancestral and owned property lead to interest of the residents in its maintenance and upkeep although the old unplanned houses are expensive and difficult to maintain.

Schools in the Locality

Four teachers were interviewed with regards to the schools present in the area. They believed that the open spaces in the schools were sufficient (67%) for the children to play and so was the built area. However, 50% children continue to play in the near by play ground and in class rooms. The teachers however, believed that the schools played a vital role in the community development through developing respect for hygiene, increasing literacy, building characters and making the children better citizens. As regards to the locality, they believed that the biggest problem was the development of bad social habits in the children with parents being unaware of them. In addition, poor literacy and unemployment leading to child labor were also pointed out as major problems. The teachers believed that the environment is not conducive to healthy living but is conducive to the development of strong social relationships and educating children in a collectively responsible environment (refer table 20).

Statistical Analysis

Table 11

Gender Composition		
	Males	Females
	55.07%	44.93%

Table 12

Dominant Age Groups		
	Males	Females
Between 20 and 30 years	34.21%	54.84%
Between 30 and 40 years	21.05%	22.58%
Between 40 and 50 years	7.89%	19.35%
Between 50 and 60 years	13.16%	0%
60 and above years	23.68%	3.23%

< 40 years	65.22 %
>40 years	34.78 %

Table 13

Occupancy Age		
	Males	Females
Less than 30 years	2.63%	38.71%
More than 30 years	97.37%	61.29%

Table 14

Family Size and Composition		
Average Household Size	13.56	
Range	04 - 58	
Mode	05	
04-08members	30%	
09-11 members	19%	
11-58 members	51%	
Average number of households per plot	2.72	
Average number of children per household	6.36	
Range	1-12	
Mode	04	
Average number of schooling going children per household	3.88	
Average number of working members per household	2.66	
Average number of Working women per household	0.2	

Table 15

Occupations, Place of Work and Transport		
Government (officers, clerks)	7%	Police, councilor, clerk
Skilled labor (Auto electrician, mechanic, painter, labor)	30%	laborers, rickshaw drivers, vendors, tailoring and embroidery, motor mechanics
Small business and Shop Owners	20%	Grocery store, chemist, hardware, estate agent
Private jobs	40%	Teacher, maid, security guard, bank, sales man, health workers, muezzin, compounder, chef,
Abroad	3%	
Population working within 2 kms	27.82%	from home, within Nawalane, Lyari, Kumharwara, Chakiwara and Rancor lines
Population Working in adjoining Areas (up to a distance of 05-10 kilometers)	20%	Garden, Saddar, Kharadar, KPT, Bohra Pir, City court, lea Market, and Jamshed Town, Site
Average traveling time to workplace	½ to ¾ of an hour one way	
Population Working in the city centre and related areas (up to a distance of 15-20 kilometers)	52.18%	Hub Chowki, Site, KMC, Sabzi Mandi, Hawksbay, Steel Mill, Sui gas, Light House, Khadda market,
Average Traveling Time to city	1 1/2 to 2.0 hours one way	
Day time Availability of Transport	100%	
Night time Availability of Transport	100 %	
Current Place for Shopping		
Within 2 kms	83%	Kumharwara, Rinchor Lines
More than 2 kms	17%	KDA, Saddar, Tariq Road,
Current Place for recreation		
Within 2 kms	3%	
More than 2 kms	97%	Hawksbay, Gadani, Aladin Park

Table 16

Income and Expenditure		
Average Income per Household	PKR 6500	
Range	2,000 to 11,000 and above PKR	
2,000 to 5000	20.29%	
5000 to 8000	15.94%	

8000 to 11000	11.59%	
Above 11,000	52.17%	
Minimum Wage Earners	36.23%	
Upwardly mobile	63.77%	
Percentage of population earning an additional income by having a shop in the house, renting a portion, tuitions, tailoring	18.84%	
Monthly expenditure of average income		
Food	55%	PKR. 3575
Education	22%	PKR. 1430
Transport	11%	PKR. 715
Electricity	8%	PKR. 520
Others (recreation, sewerage, solid waste)	3%	PKR. 195
House maintenance(minor repairs)	3%	PKR. 195
Health	4%	PKR. 269
	106%	**PKR. 6899**

Table 17

Housing Ownership and Preferences		
	Previous Residence	**Nawalane**
Within 5 to 10 kms of the city centre of Karachi	Only 04 of the residents previously lived in other residences, all four of whom are women who have changed residences because of getting married. Two of them previously lived in Nawalane only, one lived in a Goth near Landhi and one woman came from interior Sindh	100%
Outskirts of Karachi, Up to 20 kms away from the city centre		
Another city		
Nature of tenure		
Owners		94.20%
Rented		5.8%
Average area of plot		113 sq. yds
Average number of rooms		5.06
Advantages		
ownership		4.5%
Family proximity and networks		47.56 %
Proximity to city centre and work		37.8 %
Affordability		0 %
Safe and good environment		0 %
None		10.14 %
Disadvantages		

Poor Environment + lack of open space & privacy		23.6 %
On rent		0%
Location (away from transport routes+ expensive locality)		0%
Social issues		16.8%
Security issues		38.68%
None		21.74%
Poor infrastructure		0%
Good Ventilation		
Kitchen and washrooms		69.57%
Living and bedrooms		75.36%
Preferences		
80 sq. yds in KKB		2.9%
48 sq. yds in Baldia		8.7%
02 rooms flat in New Karachi		5.8%
120 sq. yds plot in Ittehad town		4.35%
Katchi Abadi on Hub river road		1.45%
Nawalane		66.66%
Others (Gulshan, Gulistan-e-Jauhar, Ghazi Town)		10.14%

Table 18

House Construction, Maintenance and Extensions		
Houses constructed	**100%**	
House Development and maintenance funds	5000 per year	
Means of Maintenance		
Savings	63.77 %	
credit	1.45 %	
Selling Assets	15.94 %	
No response	18.84%	
Plans for future extensions	53.62%	

Table 19

Space Use and Preferences in the complex		
Children play Area		
Under 14		
Streets	36.23 %	
Home	50.72 %	
Don't play	7.25 %	
No response	4.35 %	
Over 14		

Streets	14.49 %	
Nearby parks/ ground	59.42 %	
Home	17.39 %	
No response	8.7 %	
Need for recreation spaces		
yes	28%	
no	72%	
Community centre necessary as a social space		
yes	72%	
no	28%	
Usage of Streets for		
Weddings	46.58%	
Funeral prayers	5.59%	
Sense of belonging to community	100%	
Local shop gives goods on credit	50.72%	
Presence of a savings committee	43.48%	
Relatives in area	100%	
Preference for;		
Location	36.4 %	
Social Assets	31.4 %	
Additional Income	0 %	
Ownership	10.46 %	
Affordable locality	0 %	
None	21.74 %	

Table 20

Role of schools and teachers opinions in Nawalane		
Given plot size for school appropriate		
yes	67%	
Does the school use of nearest open spaces in the area		
Yes, for children play area	50%	
No, as insecure	17%	
Do you agree that schools play a positive and important role in community development	100%	
Safe and Preferred walking distance to school	½ km	

Photographic Documentation

Picture 1: Overview of the nawalane neighbourhood

Picture 2: High density residential neighbourhood

Picture 3: High density

Picture 4: Narrow streets and congestion

Picture 5: Organic planning, narrow winding streets and variety of plot sizes

Picture 6: Narrow, pedestrian only streets

Picture 7: Secondry street vs tertiary street

Picture 8: Poor condition of streets

Picture 10: Lack of sunlight and ventilation

Picture 11: Narrow streets; yet investment in well-built houses

Picture 12: Street activity – secondry street

Picture 13: Street activity – secondry street

Picture 14: Commercial activity mostly along main roads

Picture 15: Street activity – children playing

Picture 16: Street activity – platform act as spill-out spaces for residents

Picture 17: The only open plot in the area used as garbage dump site

Picture 18: Sanitation and solid waste disposal

Picture 19: Poor maintainence of infrastructure

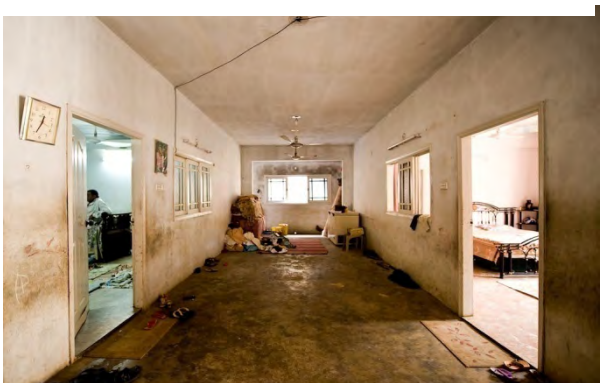
Picture 20: Only a small number of residences include commercials activities

Picture 21: Some commercial activity in the neighbourhood

Picture 22: Some commercial activity in the neighbourhood

Picture 23: House layout in nawaLane

Picture 24: House layout – living conditions



Picture 25: House layout – lounge

Picture 26: House layout – bedroom

Picture 27: House layout – kitchen

Picture 28: House layout – lack of privacy

Picture 29: House layout – rooftop activities

Picture 30: House layout – skylight

Picture 31: Nawalane community center compound

Picture 32: Nawalane community center communal room

Picture 33: Nawalane community center classroom

Picture 34: Nawalane community center classrooms (aerial view)

Case No. 03: Aurangabad, Paposh Nagar

Location / Context

Aurangabad, Paposh Nagar is situated in North Nazimabad. Paposh Nagar was named (*Pa* means *foot* ; *posh* means *to wear* ; *nagar* means *town'*) due to the community living there who were manufacturers of footwear and owners of leather workshops and boutiques in the 1950-1970s.

Toward the north of the Aurangabad Quarters is the famous Paposh Nagar graveyard, toward the east is the Abbasi Shaheed Hospital. It is bounded on the south by the Orangi Railway Station, and on the west runs the Orangi Nala (natural storm water drain). Across the Orangi Nala lies the SITE industrial area. After the construction of the Abbasi Shaheed Hospital (now serving as a city level hospital) in this vicinity the area started being identified with it. (Refer Map PN-01 and PN-02).

Planning, Jurisdiction, the Laws

Aurangabad Quarters was planned with the rest of Paposh Nagar during the time of Prime Minister Liaquat Ali Khan in 1954 for housing the migrants from India.

Stretching over an area of 15 acres (6.07 hectares) it houses 714 plots designed on a grid layout with streets on the front and back of houses. Population density of Paposh Nagar is 478 people per acre (1181 people per hectare) (refer matrix 04). Paposh Nagar was originally designed as ground floor core houses but has grown vertically over a period of time through incremental development. The location of Paposh Nagar provides easy access to public transport, hospitals, clinics, schools and commercial area (Refer Map PN-02 and 04).

Planning Type: Concepts

Aurangabad is a grid iron plan linking the various main existing roads around it. Plot sizes allotted at that time were 45 sq. yards (38.5 sq. meters). Later the secondary and tertiary roads were encroached upon to make plot sizes bigger. This has resulted in the remaining width of roads being; Tertiary roads: originally 12 ft-14 ft (3.6 - 4.2 meters), now 4 ft (1.21 meters). Secondary roads: originally 24 ft (7.3 meters), now 12 ft (3.6 meters) or one lane. Primary road remains the originally planned four lanes, two way roads of 48 ft (14.63 meters).

The resultant plot sizes after encroachment on roads have increased to about 66 sq. yards (55.73 sq. meters). The houses have an average size of 12’ x 50’ (3.6 m x 15.2 m). The built up heights vary from ground floor to G+3, maximum. The average house hold size is of 6.7 people with each house housing an average of 1.5 families (Refer Map PN-05 and PN-06).

Amenities in the area include schools, parks, playgrounds, MQM union offices and a hospital.

The street as interface between private and public and its usage

The 14 ft (4.2 meters) wide roads are used for small scale gatherings and functions. Weddings, however take place in wedding halls or playgrounds in the area. In the evenings, the children use the street as a play space and it is also used by the men of the area to hang around. The women are not found socializing on the streets.

The car ownership ratio is estimated to be 1:10 that is in every ten houses, there is one with a car. The cars are parked outside in available common open spaces or on streets wherever possible.

All the front gates of the houses open on the 3.6 meters wide road and these roads become essential connecting points in case of emergencies, the tight streets can cause delays.

Open Spaces and Their Use

Roof tops, courtyards and other such outdoor spaces within the houses are important for lighting, ventilation and relief purposes in the hot weather, especially with electric load shedding being common.

89.33 % of the women don't have any problem with regards to recreation and socializing spaces although the recreational opportunities are not sufficient. 89.33 % of the respondents believed that the locality requires properly designed recreation spaces that cater to all age groups.

Majority of the children play in parks, grounds or on the streets. 58.3 % of the children under the age of fourteen play in neighborhood playgrounds and parks where parents supervise them, where as 69% of the children over the age of 14 play on streets unsupervised. The street is also used for holding marriage ceremonies (refer table 39). Thus frequent usage and activity is observed in the area level park and it is well utilized.

Infrastructure Conditions / Determinants

Infrastructures including sewerage, water, and electricity and gas lines are all in place but there is shortage and lack of maintenance of water, electricity and gas lines (refer Map PN-07).

The reason for the bad condition of infrastructure condition can be attributed to the fact that, the infrastructure was not deigned to cater to the existing population and is over burdened.

Economic Support in Planning: Residential and commercial landuse distribution

Some houses at Aurangabad have small shoe manufacturing set ups, as the area is famous for this specially.

The residents would like to have more space in their houses to accommodate additional economic support facilities but the possibility does not exist in the current scenario as space cannot be spared for these activities.

Condition of Houses

The houses have streets on the front and back. The houses share a common wall with houses next door and stand as row houses. The boundary walls sometimes also become the wall of the rooms inside. Most of the houses are designed around spill over spaces for different activities (refer Map PN-9a and PN-9b).

As it is an old settlement with very strong social ties almost all of the houses have developed incrementally accommodating 2-3 generations and most people know each other. All the houses are reinforced cement concrete structures.

89.33% of the respondents believed that the houses are well ventilated. The survey shows that the houses are cold in summers and warm in winters (refer table 37). There are however, issues of security because of the adjacent unplanned settlements (refer Map PN-08). 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 living spaces of other houses which affects the privacy of the neighbors, however, the residents do not seem to mind it much. The unplanned extensions have also resulted in a decrease in the width of the roads.

Social Set-up

The majority of the people in this middle class neighborhood are Mohajirs (refugees) who migrated from India after the independence of Pakistan. The political party, MQM has a strong hold in the area. It is a homogenous community, which cooperates with each other and is able to resolve issues through political and social networks.

The social set up mostly consists of extended families. According to the socio-economic survey 26.32 % of the male respondents are between the age of 20 and 30 years who are in a marriageable age thus the requirement for extension of houses is high (refer table 32).

54.05 % of the female respondents are between the age of 20 and 30 years. 57.33 % of the total respondents are under the age of 40 years. With the majority of the population being in middle age and children not yet reaching a marriageable age it can be extrapolated that over the next ten to fifteen years there would be a great demand for further extensions of houses (refer table 32).

26.32% of the respondents are males above the age of 60, showing trends of extended family setups. The average occupancy age of the locality is 25 years with 40 % of the population residing in the area for the last 55 years and 37% of the population moved in to the locality over the last ten years (refer table 33). The remaining 23% people have moved in to the area in the last 2-3 decades. This trend shows that a large percentage of the locality is occupied by new communities. The older community gives the area a sense of belonging and history, whereas the new ones bring in new values and aspiration. There are bound to be conflicts, but due to the similar political, religion and ethnic networks these get resolved.

According to the socio-economic survey 68% of the population is upwardly mobile with people having an income of Rs.8000 (US $ 99) or above per month (refer table 36)

37.33 % of the families have one working male member and 26.67 % of the households have 02 working male members. 84 % of the households have no women working and only 13.33 % of the households have 01 woman working, meaning women are mostly home during the day and involved in daily chores (refer table 34). However, as women mobility is not encouraged they do not from an active part of the society.

94.67 % of the respondents show a strong sense of belonging to the community. 64 % of the respondents believed that the CBOs present in the area help in conflict resolution with police, assist in funerals, marriages, admission of school and lobby for basic services (refer table 29).

Occupations, Place of Work and Transport

Most of the population is employed in private jobs (40%) as teacher, maid, hospital staff, driver and laboratory in-charge. 31 % of the population is employed as skilled labor such as tailoring, embroidery and beautician.

Only 32% of the population works within 2 kms of Paposh and rest of the 68% of the people travel great distances everyday to get to and from work so they do not have enough time for social interaction on week days (refer table 35). This trend indicates that women as majority end-users should be more actively involved in area upkeep.

Most of the residents go to shopping centers that are within 2 kilometers for household shopping and go to water parks and beaches for recreation, once a year, with family and spend Rs. 1000 (US $ 12.3) per visit. These recreation facilities are on the outskirts of the city and serve as city level recreation areas (refer table 35).

Income and Expenditure

The average household income for Paposh Nagar is Rs. 8000 (US $ 99), with 35 % of the people earning above Rs. 11000 (US $ 135.8), meaning a smaller percentage of the people is of middle income earners and are upwardly mobile (refer table 36).

Only 6.67% of the respondents answered that they earned additional income through having a shop in the house, renting a portion of the house or having tuitions and tailoring activities within their houses.

Physical Assets

85.67 % of the people were previously living in residences within 02 kilometers of the city center, which includes those people who have been living here since the beginning of Paposh Nagar. 33.33 % of these houses were owned and 18.67 % were on rent. Thus with respect to the distances that needed to be traveled the residents were used to living near the city center. The reason that approximately 86.7 % of the residents chose to live in Paposh Nagar was the possibility of owning their houses near the city center. 93.33 % of the houses in Paposh Nagar are owned.

Most of the residents thought that poor infrastructure was the biggest disadvantage of the locality such as electricity, gas and water shortage and poor road networks.

46.67% of the respondents opted to continue living in Paposh Nagar rather than in a 80 sq. yards (67 sq. m) in KKB, 50 sq. yards (41.8 sq. m) in Baldia or a 02 rooms flat

in New Karachi as the proximity to the city center and strong social relationships in the area are considered the biggest advantage of the locality (refer table 37).

Construction, Maintenance and Extensions

Paposh Nagar is a fully developed locality and is completely occupied. It costs around Rs. 7574 (US $ 93.5) on average to maintain and or add to a house annually. This fund is generated through private savings (77.7%) or on credit (9%). Some residents also generate the fund through selling of private assets (1.3%) (refer table 38).

Schools in the Locality

Five teachers were interviewed with regards to the schools present in the area. They thought that the open spaces in the schools were insufficient for the children to play and 20% of the children ended up playing in the nearby open spaces, 40% of the children play in the classrooms and remaining 40 % of the children play in the school hall. It was believed that there was a requirement to add more class rooms as the present schools did not accommodate all the children.

The teachers (100%) believed that the schools did play a role in the community development. They believed that there was a desire amongst the residents to get their children educated (60%) and they cooperated with the teachers. As regards to the locality, the teachers thought that the biggest negative was the usage of bad language, illiteracy and unhygienic living conditions. The strong social networks were looked upon as a positive for the area that helped in creating an environment conducive to educating children (refer table 40).

Statistical Analysis

Table 31

Gender Composition		
	Males	Females
	50.67%	49.33%

Table 32

Dominant Age Groups		
	Males	Females
Between 20 and 30 years	26.32%	54.05%
Between 30 and 40 years	15.79%	18.92%
Between 40 and 50 years	18.42%	16.22%
Between 50 and 60 years	13.16%	10.81%
60 and above years	26.32%	0 %

< 40 years	57.33 %
>40 years	42.67 %

Table 33

Occupancy Age		
	Males	Females
Between 50 & 60 years	40%	29%
Between 40 & 50 years	11%	6%
Between 30 & 40 years	10%	8%
Between 20 & 30 years	8%	6%
Between 10 & 20 years	8%	14%
Less than 10 years	23%	37%

Table 34

Family Size and Composition		
Average Household Size	5.72	
Range	03 - 19	
Mode	07	
02-04members	17%	
05-08 members	49%	
09-19 members	34%	
Average number of households per plot	1.5	
Average number of children per household	3.36	
Range	0-12	
Mode	3	
Average number of schooling going children per household	2.14	
Average number of working members per household	2.04	
Average number of Working women per household	0.32	

Table 35

Occupations, Place of Work and Transport		
Government (officers, clerks)	10 %	Councilor, clerk, navy
Skilled labor	31%	Tailoring and embroidery, beautician
Small business and Shop Owners	19 %	Grocery store, chemist, hardware, estate agent
Private jobs	40%	Teacher, maid, hospital staff, driver, lab in charge
Population working within 2 kms	32%	Paposh Nagar, from home
Population Working in adjoining Areas (up to a distance of 05-10 kilometers)	48%	Civic center, Liaqatabad, Gol mal, Ghribabad, Sindhi Hotel
Average traveling time to workplace	½ to ¾ of an hour one way	
Population Working in the city centre and related areas (up to a distance of 15-20 kilometers)	20%	Site, Steel Mill, Saddar, Hyderi, Water Board. Orangi, Gurumandir, Ziauddin, Hub Chowki, Baqai, Clifton. Bahadurabad
Average Traveling Time to city	1 1/2 to 2.0 hours one way	
Day time Availability of Transport	100%	
Night time Availability of Transport	100 %	
Current Place for Shopping		
Within 2 kms	64%	Paposh
More than 2 kms	36%	Chandni chowk, Gol market
Current Place for recreation		
Within 2 kms	7%	
More than 2 kms	93%	Hawksbay, Sea View, Aladin Park

Table 36

Income and Expenditure		
Average Income per Household	PKR 8000	
Range	2,000 to 11,000 and above PKR	
2,000 to 5000	13.33%	
5000 to 8000	18.67%	
8000 to 11000	32.0 %	
Above 11,000	35.0 %	
Minimum Wage Earners	32.0 %	
Upwardly mobile	68.0 %	

Percentage of population earning an additional income by having a shop in the house, renting a portion, tuitions, tailoring	6.67 %	
Monthly expenditure of average income		
Food	50%	Rs.4000
Education	18%	Rs.1440
Transport	19%	Rs.1520
Electricity	9%	Rs.720
Others (recreation, sewerage, solid waste)	2%	Rs.160
House maintenance(minor repairs)	3%	Rs.240
Health	4%	Rs.320
	105%	**Rs.8400**

Table 37

Housing Ownership and Preferences		
	Previous Residence	**Paposh**
Within 5 to 10 kms of the city centre of Karachi	85.67 %	100%
Outskirts of Karachi, Up to 20 kms away from the city centre	13 %	
Another city	1.33%	
Nature of tenure		
Owners	33.33 %	93.33 %
Rented	18.67 %	6.67%
Average area of plot		51.28 m
Average number of rooms		3.1
Advantages		
Ownership		1.14 %
Family proximity and networks		2.29 %
Proximity to city centre and work		86.7 %
Affordability		0 %
Safe and good environment		5.75 %
None		3.44 %
Disadvantages		
Poor Environment		4.34 %
On rent		2.17%
Location (away from transport routes+ expensive locality)		0%
Social issues		2.17%

Security issues		2.17 %
None		4 %
Poor infrastructure		85.15 %
Good Ventilation		
Kitchen and washrooms		89.33 %
Living and bedrooms		65 %
Preferences		
Current House in Paposh		46.67 %
Redesigned House in Paposh		2 %
80 sq. yds in KKB		2 %
48 sq. yds in Baldia		0.5 %
02 rooms flat in New Karachi		2 %
Steel Town		2 %
N. Nazimabad		2 %

Table 38

House Construction, Maintenance and Extensions		
Houses constructed	**100%**	81.33 % of the houses have RCC construction
House Development and maintenance funds	7574 per year	
Means of Maintenance		
Savings	77.7 %	
credit	9.0 %	
Selling Assets	1.3 %	
No response	12.0 %	
Plans for future extensions	60 %	

Table 39

Space Use and Preferences in the complex		
Children play Area		
Under 14		
Streets	22.3 %	
Home	12 %	
Playgrounds/ Parks	58.3 %	
Don't play	3 %	
No response	4.35 %	
Over 14		
Compound	8.4 %	
Streets	69 %	
Nearby parks/ ground	1 %	
Home	1 %	
Don't Play	15.4 %	
No response	3.5 %	
Need for recreation spaces		

yes	89.33%	
no	6.67 %	
Community centre necessary as a social space		
yes	22.67%	
no	74.67%	
Usage of Streets for		
Weddings	89.33 %	
Others	10.67 %	
Sense of belonging to community	94.67 %	
Presence of CBO	64 %	
Role of CBO		
Assist in Funerals	31 %	
Assist in Marriages	10.2 %	
Lobby for basic services	9.7 %	
Admission of school	9.7 %	
Conflict resolution with police	25 %	
None	14.4%	

Table 40

Role of schools and teachers opinions in Fahad Square		
Given plot size for school appropriate		
yes	0%	
Does the school use of nearest open spaces in the area		
Yes, for children play area	40%	
No, as insecure	60%	
Do you agree that schools play a positive and important role in community development	100%	
Safe and Preferred walking distance to school	½ km	

Photographic Documentation

Picture 1: Paposh Nagar – a high density housing scheme

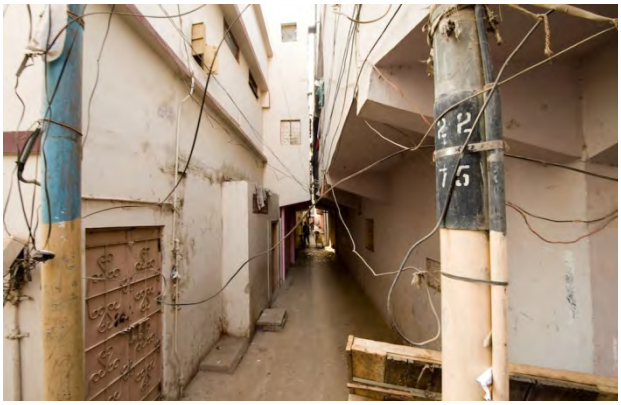
Picture 2: 45 sq. yard plots arranged in a grid-iron plan

Picture 3: Secondry and tertiary streets encroached to increase plot size

Picture 4: Average builtup height of a house is G+3

Picture 5: Primary street

Picture 6: Secondry street



Picture 7: Tertiary street

Picture 8: Narrow streets- lack of sunlight

Picture 9: Children playing on the streets

Picture 10: Street activity

Picture 11: Street activity – vegetable vendor

Picture 12: Street activity – children playing in small open spaces

Picture 14: Street activity – loading / unloading

Picture 13: Street activity – narrow streets

Picture 15: Street activity

Picture 16: Open space – parking area

Picture 17: Open space – roof top activity

Picture 18: Poor condition of sewerage pipes

Picture 19: Sanitation condition

Picture 20: Shop in a house

Picture 21: Beauty parlor in a house

Picture 22: Commercial lane

Picture 23: Row housing

Picture 24: Low height of ground floor

Picture 24: House layout

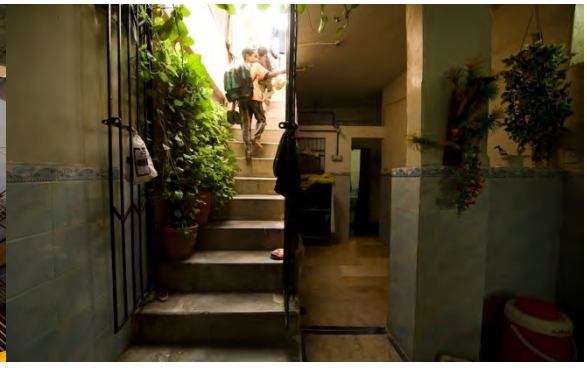
Picture 25: House layout – vertical expansion

Picture 26: House layout – living room

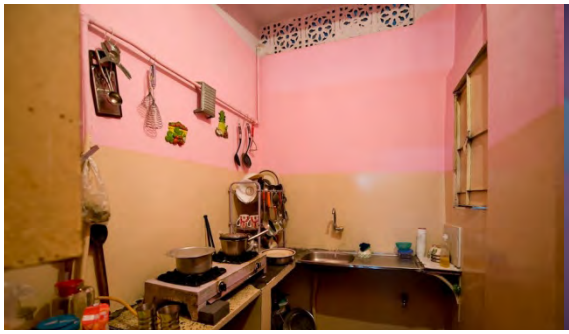
Picture 27: House layout – bed room

Picture 28: House layout – common room

Picture 29: House layout – rooftop acitivities



Picture 30: House layout – vertical connections



Picture 31: House layout – kitchen

Picture 32: House layout – washroom and kitchen

Picture 33: House layout – congested layout

Picture 34: House layout – storage space

Picture 35: Social setup – general life comes out to the street

Picture 36: Social setup – children playing

Picture 37: Social setup – water collection tank

Picture 38: Social setup – men interacting

Picture 39: Commercial zone

Picture 40: Commercial zone

Picture 41: Vendor

Picture 42: Commercial zone

Case No. 04: Fahad Apartments

Location / Context

Fahad Apartments are walk-up apartments built for middle to lower middle income group. They are situated in Gulzar-e-Hijri along Shahrah-e-Pakistan on a corner plot at a main road junction (Refer FS-01 and FS-02)

Gulzar-e-Hijri was to act as an absorber of the overspill from the over-populated and ever-growing city of Karachi. Consequently it was expected to generate decentralization of major fractions from the downtown core areas of the city. The 70,000 developed plots were to add to the housing stock and reduce the demand gap quite significantly. It was thought that eventually Gulzar-e-Hijri would assume the character of a Regional Metropolitan Service Centre.[12]

Gulzar-e-Hijri, scheme 33 was spread over 26,000 acres, where 110 cooperative societies were formed consisting of different groups and communities. It was started as part of the Open plot development scheme of the government. Land allotment was at subsidized rates and internal development was undertaken by built operation basis. The scheme was initially notified as KDA[13] scheme No. 33 in 1967 and the land for housing development was allotted to various co-operative housing societies. Layout plans for each sector were prepared by the KDA but no significant progress was made in this direction due to various issues regarding development work. Although Gulzar-e-Hijri was a very ambitious scheme with clearly defined objectives but it could not rise to the expectations of the planners because of the following problems:

1. Un-authorized occupation of land
2. Land belonging to existing Goths (rural land on the outskirts of the city)
3. Land disputes with the societies.
4. Existing un-authorized structures.
5. Stay orders from the courts on removal of encroachments.
6. Non-availability of funds.

The scheme was revived in 1980 and additional 12000 acres were added to its area. So far 150 Cooperative Housing Societies have been accommodated in the scheme.[14]

Planning, Jurisdiction, the Laws

Stretching over an area of 1.50 acres (0.60 hectares), Fahad Square houses 248 apartments and 56 shops in all. It has a built to open up ratio of 70.6% to 29.4% with ground floor built up area being 1.06 acres (0.42 hectares) and 5.3 acres (2.14 hectares) including all floors. The open area is 0.44 acres (0. 17 hectares).

[12] KDA, '*Gulzar-e-Hijri: New approach to city planning: A special report for the concept plan for the development of the Gulzar-e-Hijri Corridor*' KDA, Karachi

[13] Karachi Development Authority (KDA) was replaced by City District Government Karachi (CDGK) under the 2001 Devolution Plan of the Government

[14] KDA (1984) '*Gulzar-e-Hijri: An Overview: KDA Scheme 33*' KDA, Karachi

The vicinity of Fahad Square provides easy access to public transport, hospitals, clinics, schools and commercial area. Although the area started as a suburban locality, it now has good transport and public bus connections and has all public amenities in close proximity.

Planning Type: Concepts

Each apartment has 03 rooms having an area of 81.6 square yards (68.2 sq. meters) and all the apartments have the same layout (Refer Map FS-03). Four apartments are arranged around a common stair well on every floor. There are ten stair towers in the entire complex which is ground + four stories high. The average household size is 5.72 persons per apartment (population density = 942 people per acre or 2329 people per hectare) (refer table 24 and Maps FS-04a and FS-04b). The density is lower than that achieved for Nawalane through plot development.

The vertical circulation element and its role

The vertical circulation towers have sufficient open spaces and voids around them allowing good lighting and ventilation for the apartments. However, these circulation towers are hardly used for socializing. They provide direct access to the apartments as opposed to the street, and are a horizontal connecting element that acts as a physical as well as a social connection.

Open Spaces and Their Use

The common open space (compound) between the apartment blocks is used for parking, as a gathering space and a meeting point. A mosque and a union office were additions made in the complex by the residents in the compound. The compound acts as a gathering space for religious occasions and meetings of the apartment union also. The compound of the complex acts as a general hangout for 80% of the residents in the evening with parents chatting with each other about their daily routines and children playing cricket or cycling. Older children also use nearby grounds, parks and streets for playing (refer table 29 and Maps FS-04a and FS-04b).

72 % of the women don't have any problem with regards to recreation and socializing spaces and they believe that the compound fulfills their requirement for an interactive space.

The building union works towards the resolution of common issues of apartment dwellers, particularly infrastructure related. There is a strong sense of community and the residents are generally on good social terms with their neighbors.

The community hall which also serves as a marriage hall is under or non utilized. It is rarely used as a space for the gathering of the community such as parties or marriage ceremonies. 72% of the residents said they required a proper community center in the complex (refer table 29).

Infrastructure Conditions / Determinants

Although the transport, electricity and water infrastructure are in place there are leakages and sewerage problems within the complex as observed during surveys.

People get together to solve their own infrastructure problems on a need basis. A maintenance committee exists but is not able to resolve issues efficiently. There is a growing feeling amongst the residents that as the building union has come under the political control of the ruling party (MQM) it's working is being affected negatively. The union is unable to bring the residents on one platform to take collective decision which results in deterioration of the physical conditions in the complex and resultant environmental issues.

The water is supplied through water lines at specific times on an hourly basis. The residents have to rely on water tankers for back up support.

Gas connections have been acquired by the apartment dwellers independently due to which some of the apartments still lack gas connections.

Economic Support in Planning: Residential and commercial landuse distribution

The two sides of the apartment complex that face the main road have 56 shops lined on the ground floor. These include food outlets and real estate related offices in particular as there is a lot of new development happening in the vicinity.

Out of the 248 apartments only 03 have on going residential cum commercial activities such as tailoring, an informal montessori and a beauty parlor. Although most of the residents feel the economic crunch and would like to have an informal economic setup within their apartments, the lack of possibility of incremental development to accommodate the economic activity restrains them.

The current real estate value of each apartment is Pak Rs. 15 to 16 hundred thousand (US $ 18,518 to US $ 19,753) and the rental cost is Pak Rs. 4500 to Rs. 5000 (US $ 55 to US $ 62). Some of the apartments have been subdivided for rental purposes which show a requirement to earn additional income and a trend to opt for living in cramped conditions.

Social Set-up

At Fahad apartments, the social set up mostly consists of independent nuclear families. According to the socio-economic survey 60 % of the male respondents are between the ages of 20 and 29 years who have recently gotten married. Thus the 03 room apartment fulfills their current spatial requirements. They have not thought about the requirement for extra space once their children reach a marriageable age, as that would happen over the next 15 years and was not an issue of immediate concern (Refer Table 22).

60 % of the female respondents are between the age of 40 and 49 years meaning children are in school so they had more time to themselves thus there is a requirement for interactive spaces. Presently the compound of the apartment block is used as socializing space at a limited level (Refer Table 22).

The respondent's maximum age was 59 years showing a trend that there are no extended families and grandparents do not live in the same apartment. This could be one reason why most of the women do not have jobs and stay home because there is no family support to baby sit once the children are back from school.

The residents of Fahad Square belong to a mixed ethnicity and middle income group. According to the socio-economic survey 100% of the population is upwardly mobile with people having an income of Rs.8000 (US $ 99) or above per month (Refer Table 26).

40 % of the males have one working male member and 32 % of the households have 02 working male members. 84 % of the households have no women working and only 8 % of the households have 01 woman working. These figures show the trend that women are mostly home during the day and involved in daily chores (refer table 24). However, with the growing financial needs of the society, it is becoming inevitable that women also engage in economic activities. In the absence of the extended family setup, future plan of apartment complexes, blocks or neighborhoods would be required to accommodate child care centers.

Occupations, Place of Work and Transport

Most of the population is employed in private jobs (36%) such as bankers, accountants, cooks, college teachers, and drivers, in entertainment industry and in electronic factories (refer table 25).

Only 36% of the population works within 2kms of Fahad Square and rest of the 64% of the people travel great distances everyday to get to and from work. This routine does not leave enough time for social interaction on week days. The residents choose to continue to live in Fahad Square despite the inconvenience as they want to partake of the area facilities and bring up their children in the area they consider decent.

Most of the residents go to Samama shopping mall and KDA market for shopping which is within 2kms of Fahad Square. For recreation they go to Sea View and Hawksbay once a year, with family and spend Rs. 1119 (US $ 13.8) per visit. These places are on the outskirts of the city and serve as city level recreation places (refer table 25).

Income and Expenditure

The average household income for Fahad Square is Rs. 9500 (US $ 117), with 80 % of the people earning above Rs. 11000 (US $ 135) which shows that greater percentage of the people is of middle income earners (refer table 26).

Greatest expenses are on food (43.8%) education (24%) and transport (15.4%). As they are mostly middle income white collar people therefore the desire and culture to educate their children is strong. The reason for spending a big amount on transport is that 64 % work in places more than 2 kms from their area of residence (refer table 26).

Physical Assets

92 % of the people were previously living in residences more than 02 kilometers away from the city center and mostly in suburban settlements such as; Abul Hasan Isphahani Road, Gulberg, Gulistane-Jauhar, Liaqatabad, Nagin Chowrangi, Scheme 33, University Road, Water Pump and 60 % were on rent. Thus with respect to the distances that need to be traveled the residents are used to living in suburban

settlements but the major asset of living in Fahad Square is that the residents mostly own the apartments (68%) and are no longer paying rent (refer table 27) .

Most of the residents think that the previous locality was more expensive to live in although it had a better environment and location. The reason that approximately 90 % of the residents chose to live in Fahad Square was the cheap availability of apartments either on sale or on rent.

Most of the residents thought that security and affordability is the biggest asset of living in apartments as compared to a house. That is probably why they opted to continue to live here rather than in an 80 square yards (67 sq meters) 02 room house in New Karachi even if given the choice. The other problem of living in New Karachi that was highlighted was of distance. However 20% of the residents opted for a house in New Karachi as they would have the opportunity to earn additional income and they think it would be a better locality, better environment and they would have the opportunity to own a house and would have relatives nearby (refer table 27).

Construction, Maintenance and Extensions

Fahad Square has been fully constructed and is completely occupied. It costs around Rs. 7574 (US $ 94) on average to maintain an apartment annually. This fund is generated generally through private savings (46%) or by credit (44%). Some residents also generate the fund through selling of private assets (10%) (refer table 28)..

General issues that were pointed out with living in high rises were hygiene, security, privacy, inability to develop residences incrementally and high maintenance costs. Maximum residents believed that apartments are conducive to good social relationships, healthy living and good environment for raising children. Maximum residents are satisfied with the ventilation and light levels in their apartments (refer table 28).

Schools in the Locality

Four teachers were interviewed with regards to the schools present in the area. They thought that the open spaces in the schools were insufficient for the children to play and 75% of the children ended up playing in the nearby open spaces. The teachers however, believed that the schools played a vital role in the community development through increasing literacy, building characters and making the children better human beings. As regards to the locality, they believed that it was a passive locality with no real issues and the apartments provided for a secure area for living with environment being conducive to healthy living and strong social relationships (refer table 30).

Statistical Analysis

Table 21

Gender Composition		
	Males	Females
	80%	20%

Table 22

Dominant Age Groups		
	Males	Females
Between 20 and 30 years	60%	20%
Between 30 and 40 years	15%	20%
Between 40 and 50 years	15%	60%
Between 50 and 60 years	10%	0%
60 and above years	0%	0%

< 40 years	68 %
>40 years	32 %

Table 23

Occupancy Age		
	Males	Females
More than 05 years	40%	20%
Upto 05 years	40%	60%
Less than a year	20%	20%

Table 24

Family Size and Composition		
Average Household Size	5.72	
Range	03 - 10	
Mode	07	
02-04 members	36%	
05-08 members	56%	
09-16 members	08%	
Average number of households per apartment	01	
Average number of children per household	3.64	
Range	0-8	
Mode	05	
Average number of schooling going children per household	1.36	
Average number of working members per household	2.04	
Average number of Working women per household	0.32	

Table 25

Occupations, Place of Work and Transport		
Government (officers, clerks)	28%	PTCL, SSGC, Income tax, KMC, KANUPP, Naval Officer
Skilled labor (Auto electrician, mechanic, painter, labor)	16%	Auto electrician, mechanic, painter, laborer in sabzi mandi
Small business and Shop Owners	20%	Shopkeeper, estate agent, car dealer, garments
Private jobs	36%	Banker, accountant, cook, coca cola company, college teacher, Phillips, teacher, driver, TV channel, biscuit company
Population working within 2 kms	36%	
Population Working in adjoining Areas (up to a distance of 05-10 kilometers)	40%	Hasan Square, Kannup Head Office, North Nazimabad, Ayesha Manzil, Saddar, Sher shah, Water pump
Average traveling time to workplace	½ to ¾ of an hour one way	
Population Working in the city centre and related areas (up to a distance of 15-20 kilometers)	24%	Korangi, Orangi, Metroville, Schon circle, Jamshed road, Tariq road,
Average Traveling Time to city	1 1/2 to 2.0 hours one way	
Day time Availability of Transport	100%	
Night time Availability of Transport	100 %	
Current Place for Shopping		
Within 2 kms	48%	Samama, Itwar bazaar, Gulshan
More than 2 kms	52%	KDA, Saddar, Tariq Road, Hyderi, Water Pump
Current Place for recreation		
Within 2 kms	0%	
More than 2 kms	100%	Sea view and Hawksbay

Table 26

Income and Expenditure		
Average Income per Household	PKR 9500	
Range	8,000 to 11,000 and above PKR	
8,000 to 11000	20%	
Above 11,000	80%	
Minimum Wage Earners	0%	
Upwardly mobile	100%	

Percentage of population earning an additional income by having a shop in the house, renting a portion, tuitions, tailoring	0%	
Monthly expenditure of average income		
Food	43.8%	8500 PKR
Education	24%	4668 PKR
Transport	15.4%	2996 PKR
Electricity	10 %	1956 PKR
Others (recreation, sewerage, solid waste)	4.1%	600 PKR
House maintenance(minor repairs)	1.8%	164 PKR
Health	0.9%	175 PKR
	100%	11059 PKR

Table 27

Housing Ownership and Preferences		
	Previous Residence	**Fahad Square**
Within 5 to 10 kms of the city centre of Karachi	8%	
Outskirts of Karachi, Up to 20 kms away from the city centre	92%	100%
Another city	0%	
Nature of tenure		
Owners	36%	68%
Rented	60%	32%
Area of apartment		153.8 sq. meters
Number of rooms		2
Advantages		
ownership	12%	6%
Family proximity and networks	12%	12 %
Proximity to city centre and work	20%	24 %
Affordability	12%	22 %
Safe and good environment	36%	36 %
None	8%	0 %
Disadvantages		
Poor Environment + lack of open space & privacy	24%	20 %
On rent	8 %	0%
Location (away from transport routes+ expensive locality)	36 %	
Poor social relationship	12 %	12%

Security issues	4%	
None	16 %	12%
Poor infrastructure	0%	56%
Preferences		
153.8 sq.m apt in Fahad Sq.		80%
Average price		15,00,000 to 16,00,000 PKR
68.3 sq m in New Karachi		20%
Average price		400,000 to 11,00,000 PKR
Average installment		8000 PKR

Table 28

House Construction, Maintenance and Extensions		
Apartments constructed	**100%**	
House Development and maintenance funds	7574 per year(Almost all paid to the Union)	
Means of Maintenance		
Savings	46%	
credit	44%	
Selling Assets	10%	
Plans for future extensions	0%	
General Problems of living in High Rises		
Poor Ventilation	16 %	
Maintenance	36 %	
Congestion	4 %	
Privacy & Security	36 %	
None	8 %	

Table 29

Space Use and Preferences in the complex		
Number of respondents using the compound/ circulation spaces for social interaction		
Parking Area	46%	
Balcony	4%	
Corridor	2%	
Compound	48%	
Existing compound Use		
yes	80%	
no	20%	
Children play Area		
Under 14		

Compound	32%	
Nearby parks/ ground	4%	
Home	52%	
Streets	12%	
Over 14		
Compound	34%	
Nearby parks/ ground	4%	
Home	52%	
Streets	10%	
Need for recreation spaces		
yes	28%	
no	72%	
Community centre necessary as a social space		
yes	72%	
no	28%	
Usage of Shadi Hall		
Weddings	56%	
Other social gatherings	36%	
Taraveeh prayers	8%	
Sense of belonging to community	90%	
Reasons;		
Social support	40%	
Conflict Resolution	34%	
Admissions	14%	
Getting a job	12%	
Preference for;		
Location	52%	
Social Assets	4%	
Additional Income	4%	
Ownership	18%	
Affordable locality	6%	
Security	16%	

Table 30

Role of schools and teachers opinions in Fahad Square		
Given plot size for school appropriate		
yes	35%	
Does the school use of nearest open spaces in the area		
Yes, for children play area	75%	
No, as insecure	25%	
Do you agree that schools play a positive and important role in community development	100%	
Safe and Preferred walking distance to school	½ km	

Photographic Documentation

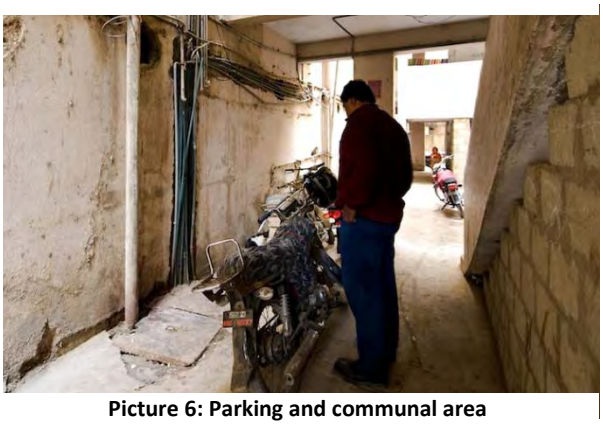
Picture 1: Fahad square building

Picture 2: Fahad square: 255 apartments, 56 shops

Picture 3: Four apartments are arranged around a common stair well on every floor

Picture 4: The vertical circulation tower act as a physical and social connector

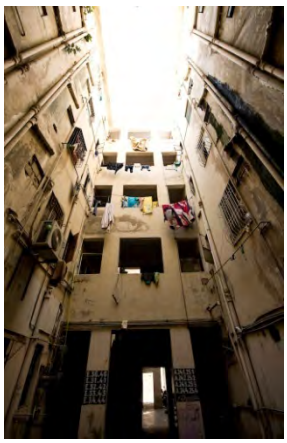
Picture 5: Parking and communal area



Picture 6: Parking and communal area

Picture 7: Open space used for parking and meeting point

Picture 8: Open space used by children for playing and hanging out



Picture9,10,11: Poor plumbing and sanitation conditions

Picture 12: Commercial strip on the outer boundary of the building

Picture 13: Commercial activity outside the building

Picture 14: Commercial activity outside the building

Picture 15: Commercial activity outside the building

Picture 16: Commercial activity outside the building

Picture 17: Commercial activity outside the building

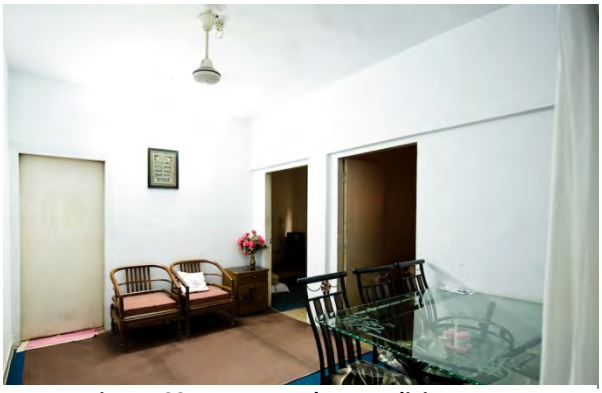
Picture 18: Socialization outside the complex

Picture 19: Socialization outside the complex

Picture 20: Main road nearby provides easy access to public transport system

Picture 21: Problem of hygene and sanitation

Picture 22: Problem of privacy and security



Picture 23: Apartment layout – living room

Picture 24: Apartment layout – family room

Picture 25: Apartment layout – bedroom

Picture 26: Apartment layout – drawing room

Picture 27: Apartment layout – kitchen

Picture 28: Apartment layout – entrance

Picture 29: Fahad square Mosque

Case 05: Labor Square [15]

Location/ Context

Labor Square is situated near the Metroville scheme in the Sindh Industrial & Trading Estate (SITE) Town.

SITE was established in November 1947. It was an autonomous body that had the authority to manage land and internal infrastructure. This large-scale industrial development containing manufacturing units for primary industries was located on the western fringe of the city and the idea was to develop the small-scale industries that existed before partition in the city. The demarcation of the land for industrial development resulted in the shifting of different types of industrial activities into SITE. As a result this area experienced fast scale development during the 1950s and 1960s. SITE houses 2,000 industrial units on 1800 hectares of land west of the Lyari River. The estate benefits from the proximity of the Port of Karachi and various roads linkages. SITE Town also houses various worker colonies to support the industrial estate having a population of nearly one million.

Initially SITE did not have any housing schemes for labor in close proximity of the industrial estate. There were some scattered squatter settlements around the vicinity where some labor lived. The labor colonies were later developed in Lyari, Landhi and Korangi. As these localities were far away labor found it difficult to commute and productivity was affected.

Therefore, during the 1970s plots were developed in SITE to create housing for labor and factory workers. Labor Square was one such settlement of walk up apartments for the low income.

Planning, Jurisdiction, the Laws

Labor Square is part of grid iron plan of the SITE Town with land between apartment blocks acting as spill out spaces and streets. The apartments are arranged linearly on the two sides of internal streets. The streets are around 24 ft (7.3 meters) wide and are lined by 28 blocks of apartments on both the sides. These blocks vary from ground plus two (G+2) to ground plus four (G+4) residential blocks with some ground levels designated to commercial outlets.

The design of Labor Square incorporates a Mosque, a park and a small commercial area that houses grocery, fruit, vegetables and meat shops. Although a lot of activity is seen in the commercial areas but the park wears the look of an abandoned ground firstly because it is situated away from the main residential blocks and secondly because it is surrounded by a boundary wall and enclosed by a gate that does not allow free access. The commercial outlets exist at the base of the residential blocks and serve as an interaction and socialization point also. If the park were also designed as an integrated element and not as an isolated land use it would have been a more utilized space.

[15] The information on Labor Square was obtained through on site observation and interviews with residents of Labor Square

The street as interface between private and public and its usage

As Labor Square is a low income settlement the ownership of vehicles is negligible. Only a small percentage of people own motor bikes that are parked on the streets cum compound in front of apartments. As a result the streets are utilized by residents as interaction spaces. Children are also seen playing on the streets while the elders socialize. The streets are shaded through out the day because they are lined by ground plus two to ground plus four apartments on both sides.

Even if the plan was made keeping in mind the fact that eventually the residents would own vehicles, still the width of roads and number of streets is far more than required. A cluster plan where vehicles are restricted to the periphery through a ring road would have worked better considering the social and economic structure of the residents.

Open Spaces and Their Use

The first impression of Labor Square is that of a middle density neighborhood with very wide streets (24 ft or 7.3 meters) which also act as spill out and open spaces.

The plan includes a park right at the main entrance but this park is more of a left over open space as there is no vegetation or shade available and is not utilized as it is isolated and enclosed. Based on this observation it can be concluded that smaller and semi-public spaces have a chance to be better owned, used, kept and maintained in a low income area than the larger public open areas. The number of larger, common public areas should be kept limited and designated for special functions.

Infrastructure Conditions / Determinants

The infrastructure conditions in general are poor and it is apparent that the residents do not have enough savings to pay for the upkeep of the apartments. The Sindh workers welfare board and government of Sindh are responsible for solid waste management but have failed to perform adequately.

Many garbage dumps are seen on the streets as there is no adequate system of garbage collection. The reliance is on government sweepers who don't collect garbage promptly.

Water supply is also inadequate and irregular. There is heavy reliance on water supply through donkey carts.

The drainage lines have severe maintenance issues also. There are leakage problems resulting in foul smell in the locality.

Condition of Apartments

Each apartment is a 03 room apartment having an area of 60 sq. yards (50.16 sq. m) and all the apartments have the same layout. Two apartments are arranged around a common stair well on every floor.

Each apartment houses extended families with the average household size being around 10.[16] The rooms are arranged around an entry foyer which is connected to the toilet and kitchen. The common staircase acts as a spill out space.

The internal walls are finished in plaster whereas the exterior has paint finish. The roof is constructed of pre cast concrete slabs. The paint is peeling off from a number of places because of the leakage in drainage pipes. The apartments also have ventilation issues as the compact space does not allow adequate through passage of air. Lack of through ventilation makes the apartment hot, dark and dingy. The balconies at the rear provide some private outdoor space for each apartment.

The Kitchen opens into the entry foyer and has no ventilation of its own which makes the apartments very hot. Only the ground floor apartments have windows opening on the streets which create privacy problems.

Although it is gated communities but there are no checks on people entering the area and anyone can walk in although close links with neighbors help in pointing strangers out.

Social Set-up

There are several ethnic groups including Urdu speakers, Punjabis, Balochis, Seraikis, Kashmiris, Pakhtuns, Sindhis, Memons, Bohras, Ismailis. Over 97% of the population is Muslim.

The social set up consists of extended families of mixed ethnicities. 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. The average family size as mentioned previously is ten out of which 04 approximately are children with 02 being school going children. Most of the households have 02 male members who are the bread earners of the family. The women stay home generally looking after children and being involved in daily house hold chores.

Most of the male members are occupied in nearby factories and offices thus they do not face any transportation issues and commuting does not take them much time. This leaves them with adequate time for socializing and interaction during evenings. Since most of the residents have been living in the square for the last 20 to 30 years a sense of belonging and familiarity is very strong although people are willing to relocate to a locality where incremental development is possible as poor infrastructure, scarcity of water and no possibility of incremental development leads to below standard and cramped living conditions.

Most of the children attend schools within 02 kms of the square where as older children go to colleges in all parts of the city. Residents visit beaches on the outskirts of the city once a year with family for recreational purposes.

The area does not however house any city level government owned medical facility. Only the presence of small private clinics is seen in the area adjoining Labor Square.

[16] As ascertained through the different interviews conducted on site

Photographic Documentation

Picture 1: Labor square buildings

Picture 2: Labor square – main entrance

Picture 3: Labor square – street layout

Picture 4: Labor square – building entrance

Picture 5: Central open space

Picture 6: Children playground

Picture 7: Undeveloped open space

Picture 8: Activity for males

Picture 9: Activity for youth

Picture 10: Labor square market

Picture 11: Small shops at corners

Picture 13: Hotel

Picture 14: Market shops

Picture 15: Small enterprise

Picture 16: Utility store

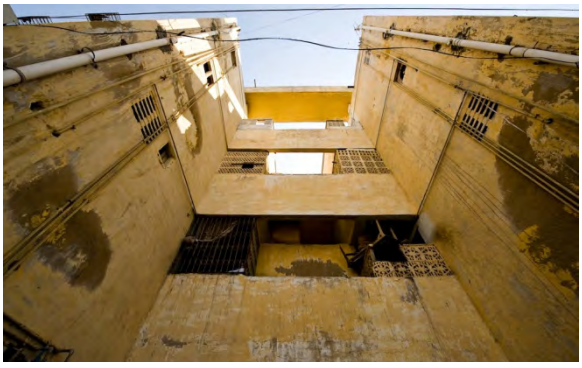
Picture 17: Abandoned covered market

Picture 18: Apartment layout

Picture 19: Apartment entrance

Picture 20: Apartment layout - bedroom

Picture 21: Apartment layout – living room



Picture 22: Building facade

Picture 23: Apartment layout – kitchen

Picture 24: Building layout

Picture 25: Sewerage condition

Picture 26: Garbage dump

Picture 27: School

Picture 28: Mosque

An Overview Identifying the Trends for Appropriate Housing

The Reality of Ownership, Affordability, and Location

All the 04 cases analyzed accommodate an upwardly mobile urban population. These range from the 10 year old slowly consolidating community of KKB which includes lower to lower middle income residents to the more consolidated lower middle to middle income communities of Fahad Square, Paposh Nagar and Nawalane. All these communities are working class people who have acquired education, skills and better social networks over time and have prospered as a result.

Majority of the families of KKB and Fahad Square have chosen to move from their previous rented residences to their respective locations for gaining affordable ownership of individually owned houses (plots and apartments). In the case of Nawalane, all of the residents belong to the same clan. They are living in shared inherited properties despite bad environmental conditions in the area as they do not want to shift to apartments and cannot afford individual houses in their area. However, with the current riots in the area a lot of residents have moved out of the Part B (of larger plots) of the area. This is probably because they could afford to do so and the social and political situation was becoming unbearable and a hindrance in daily life. Paposh Nagar is a mix of shared inherited and newly bought individually owned houses, in either case these are extended family setups wanting to live in plot developments near the city.

Despite the differences in the manner in which the houses have been secured and in the localities that they exist, one thing remains constant: that the people want to own a property, preferably a house which can be developed incrementally (mostly vertically) accommodating at least two generations and their economic and physical needs. People belonging to middle to lower middle class have a requirement of being able to earn additional income by having the possibility of being able to utilize part of their houses for income generation (as is evident through the surveys of all four cases). Even in Fahad Square there were cases where either part of the apartment was rented out or some sort of commercial activity (beauty parlor or tuition center) was taking place within the residential unit.

The importance that people attach to house ownership is reflected by the fact that, almost all residents plan to continue to develop their units and spend amounts ranging PKR 4,000 to 7,000 ($ 49 to $ 86) annually to maintain their properties (refer matrix 02). At present however, (according to the socio-economic surveys conducted) the residents of Fahad Square do not have major issues with residing in apartments, although they face the constraints of inability to expand their dwellings incrementally. This is because the majority of the population has young children who have not reached marriageable age thus the need for extra accommodation has not yet arrived.

To be able to access affordable 67 sq m plots at PKR 5,000 ($ 61) per sq meter in (KKB) compared to city centre prices of about PKR 10,000 ($123) per sq meter (Papaosh Nagar) (refer matrix 02) most lower to lower middle income people are willing to live far from the city, put up with long travel and sacrifice on social networks, if transport and related social and physical facilities and infrastructure develop steadily and in time (with the help of the government or an NGO). Once the

communities have developed this trust and invested in the area they continue to live in the area and consolidate it.

Those lower income people who choose to buy or rent a 68 sq meter apartment, despite it costing the same as a house in Paposh Nagar or Nawalane at about PKR 8,000 ($ 92) to 10,000 ($123) per sq meter (refer matrix 02) are usually white collar people who rely on jobs in the city and do not want to live far from their work place. In addition they do not aspire to live in old areas with run down facilities and infrastructure. In most cases apartment living is considered a secure choice by some in the volatile situation of Karachi and people opt for it.

Those residents, who are dissatisfied with their high rise choice, think so, because they cannot carry out any informal businesses, find the units expensive to maintain and degraded and cannot or do not wish to pay their maintenance. The eventual choice is then sometimes to sell their possession in high rise units and move elsewhere to individual plot units

The above mentioned situation reflects that there is an overwhelming demand for house rather than apartment ownership be it in or out of the city limits, as long as it is well connected and serviced and is affordable by the target group. There does not have to be one solution for all low income communities as there are different income categories and mindsets. The government can propose new suburban or upgraded inner city low income housing schemes which can offer an affordable (as per location) housing solution to the people. In the case of the fringe developments, they have to have well developed transport linkages to the city centre and adjoining areas for accessing jobs and services. Keeping in mind the demand for apartments as a safe and secure option, these settlements could offer a range of medium rise plot developments and apartment blocks with adequate open space and amenities. Whatever the design & density solutions may be, the requirement is for setting up appropriate planning and credit giving institutions who with the support of NGO setups like the SAIBAN can guide the whole process of planning, execution and operation and maintenance of housing schemes.

Covered Areas, Population Density and Investment

The land values per square meter and/or complete unit for Khuda ki Basti, Nawalane, Fahad Square and Paposh Nagar (refer matrix 02 and 05) are as follows:

- Khuda ki Basti : PKR 5,000 ($ 61) per sq. yard for an average 80 sq. yards (67 sq meter) house of G+1, having an overall covered area of 160 sq yards and a cost of PKR 800,000 ($ 9,876). This will be the ultimate market price. However, the current sale price varies between 350,000 and 650,000

- Nawalane : PKR 7,352 ($ 90) per sq. yard for an average 120 sq yards (100 sq. meters) house of G+2, having an overall covered area of 360 sq yards and a cost of PKR 2,646,720 ($ 32,675). These are the market rates for the old town that the developers are willing to pay for acquiring the property, demolishing it and constructing apartments. However, the sale price within he community varies between rs. 1,200,000 to rs. 1,500,000 ($15,000 to $18,750).

- Paposh Nagar : PKR 10,000 ($123) per sq. yard for an average 66.16 sq yards (55.73 sq. meters) house of G+2, having an overall covered area of 200

sq. yards and a cost of PKR 1,998,000 ($ 24,666). However, the current sale price varies between 1,800,000 to 2,100,000 ($22,500 to $26,250) depending upon the condition of the unit.

- Fahad Square; PKR. 9,752 ($ 120) per sq. yard for an average apartment having a covered area of about 81.6 sq yards (68 sq. meters) and a cost of PKR 795,763 ($ 9,824). However, the current sale price varies between 800,000 to 1,000,000 depending upon the conditions of the unit.

A comparison of the covered areas gained, possibility of expansion of a unit and the over all investments made highlights Fahad Apartments as the most expensive and constrained choice at PKR. 9,752 ($ 120) per sq. yard for an 81.6 sq yards (68.27 sq meters) apartment which is inflexible and non expandable.

This compared to an equivalent location near to the city centre (with access to jobs, schools and other developed facilities) such as Paposh Nagar at PKR 10,000 ($123) per sq. yard for an average house of G+2, having a covered area of about 200 sq. yards (twice as much space as in Fahad Square) immediately make it out to be a better investment and living option.

Nawalane offers an even better price at PKR 7,352 ($90) per sq. yard for an average house of G+2, having a covered area of about 360 sq. yards. But given the overall low environmental quality of the area (refer matrix 02) this option is not considered feasible for living by a lot of people who have not traditionally lived in the area. For Nawalane and other such inner city areas to become attractive for investment and living an over all inner city up gradation master plan needs to be made and implemented by the city government.

KKB at PKR 5,000 ($ 61) per sq. yard for an average house of G+1, having a covered area of about 160 sq yards emerges as a very good suburban choice for the low income. This rate is an economical one for a 67 sq meter suburban plot option in an otherwise expensive Karachi real estate market. Given the initial KKB Saiban provided subsidy with the possibility of incremental housing and vertical expansion accommodating at least 02 generations, low income communities find it an attractive option (refer matrix 02).The overall physical and social environments are safe and healthy which are looked upon as assets by the residents.

The population density for the four cases is as follows: 203 people per acre (501 people per hectare) for KKB, 1354 people per acre (3376 people per hectare) for Nawalane, 942 people per acre (2327 people per hectare) for Fahad Apartments and 478 people per acre (1181 people per hectare) for Paposh Nagar.

A comparison of the densities given above proves the point that the usual reason given in favor of high rise development that, it accommodates much higher densities is a myth. This myth is negated by the comparable population densities achieved in the very different built density of Nawalane (G+2 plots) and Fahad Square (G+6 apartments), where 3376 and 2327 people are accommodated per hectare respectively. The lower density of Paposh Nagar at 1181 people per hectare can be easily increased and planned for by adding more plots or floors in the area resulting in densities comparable to that of Fahad Square.

The above mentioned facts clearly negate the trend of demolition of low income informal settlements or evicting and settling their residents in six to eight storey

apartments near or outside the city. It is a unanimous view of all types of residents interviewed that plot developments come to the same price as an apartment and give more covered area and greater flexibility of development over time and are a preferred mode of investment and living. If old areas like Nawalane and Paposh Nagar can be upgraded and revamped or new settlements are planned near or outside the city along the lines of KKB, people are willing to pay for them.

On the other hand the population density of KKB at 508 people per hectare (designed under KBCA/MDA byelaws) is too low. Learning from Nawalane and Paposh Nagar, KKB densities can be considerably increased leading to increased affordability.

Built Open Ratio, Land use Requirements and Resultant Environment

The built open ratios of the four cases are as follows: Khuda Ki Basti = 60.31%: 39.69%, Nawalane = 75.28%: 24.72%, Paposh Nagar = 76%: 23% and Fahad Square = 70.6%: 29.3%

The over all physical and social environments of KKB are safe and healthy which are looked upon as assets by the residents. The houses are fairly well ventilated, with adequate light. The wide streets between plots provide adequate privacy and breathing space. 90% of the residents feel strong sense of belonging to the locality. 75% of the residents feel this affiliation because of the social support available to them through the NGO SAIBAN. The open spaces are however, underutilized in the current scenario and the streets need to be designed to serve both the function of circulation and as open spaces for the residents.

In Nawalane the situation is very different. Being as old settlement that has expanded incrementally over time the external spaces have been encroached upon, area conditions have worsened and the over all density has increased to an extent where the over all physical and social environment in no longer safe and healthy. Open areas in the settlement are scarce. The streets are winding into narrow and congested pathways obstructing air circulation and area exposed to natural light. Due to this, the residents have constructed skylights overhead or alongside bedrooms for capturing natural light and for air circulation.

The houses themselves with sometimes 03 shared walls with other houses have bad ventilation and light access and suffer privacy issues. 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.

In Fahad Square the common open space (compound) between the apartment blocks is used for parking, as a gathering space and a meeting point. A mosque and a union office were additions made in the complex on ground in the open space. Hence, the space acts as a gathering space for religious occasions and meetings of the apartment union.

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 not seem to bother the residents too much as they have access to the surrounding facilities like parks, playground and markets.

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

In Paposh Nagar 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 from 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 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 population density at 478 people per acre (1181 people per hectare) is adequate. If the area grows more vertically and the remaining open spaces are 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.

In the given physical conditions of the 04 cases it is clear that an open built ratio (ranging between KKB and PN), recognition of the street as an open space in the immediate neighborhood (mohalla extents), possibility of mixed land use, houses with the possibility of small scale commercialization and low income middle G+2 houses on plots are a desirable mode of development for planning.

The residents of all four cases attach great importance to possibility of provision of economic activities within the residential unit. Some types of commercial activity needs to be permitted in the localities in the residential spaces, but the type and scale of these activities needs to be controlled to safeguard the social and physical environment. It needs to be ensured that the commercial activity is a non polluting one and will not encourage the conversion of the land usage from residential to purely commercial.

Location of residential settlements next to workplaces is ideal. If the residents can find work within the locality they save on traveling costs, have more time to work towards the upkeep of the locality and more time for social and recreational activities. It also leads to greater usage of public areas within the locality and more conducive social environment. But since this cannot happen for all schemes, an efficient transport system connecting the two is desirable.

Issues of Security

The residents of the four cases attach great importance to the security conditions in their locality which is understandable in the context of Karachi, which has a multitude of political and social problems. The residents of KKB value the security that the isolated suburban settlement offers them as they are too far away to be directly hit by any riots within the city. The implications felt by them are that the transport gets disrupted and they may not be able to access the city, even in case of an emergency.

The residents of Nawalane however, are faced with the grave issues of gang wars in the area and are dwelling under constant tension and security threats. The insecure

conditions in Nawalane can be attributed to its location near the city centre, as any happening tends to affect them directly. Although the community in Nawalane is well organized it unfortunately does not have enough political patronage to get their issues resolved swiftly. On the underhand, Paposh Nagar due to its political affiliation with the ruling political party (MQM) in Karachi is able to access government support more readily. The dominance of MQM is also present in Fahad Square where they have set up a party office within the compound. The residents of Fahad Square attach great importance to secure environment that is achieved both because of the presence of the political party workers and it being a gated compound.

Institutional and Community Setups

The residents of each of the cases have some commonality which brings them together as a community. In the case of KKB the platform which brings them together is their income bracket and the fact that they contributed together for the development of the locality. In the case of Nawalane the residents are bonded through ethnicity and in the case of both Fahad Square and Paposh Nagar the strong political setup (that is the presence of MQM) brings the people together as a homogenous community.

Although strong bonding exists one way or the other amongst the residents they do face major operation and maintenance (O & M) issues in all the cases. This is because the formal institutional arrangements are weak everywhere, except in the case of KKB where a third party involvement of an NGO is present to look after the matters of operation and maintenance and the conditions are better.

Strong ethnic ties do not help in ensuring adequate O & M as is evident in the case of Nawalane. On the other hand strong political patronage ensures the security but does not ensure proper O & M as is evident in the cases of Fahad Square and Paposh Nagar where there are issues of proper rain water drainage, gas scarcity and leakage in drainage pipes which are neither addressed by the local unions neither by the local government representatives. This raises the importance of technical support & institutional arrangements in the form of professional groups or NGO's for supporting the planning, execution & O&M of all housing schemes in the city, irrespective of their political & social setups.

Cultural Setup and Usage of Spaces

The reason that residents have traditionally opted to continue to live in Nawalane despite issues of security is the strong ethnic ties with the community. Strong ethnic ties also alter the requirement levels for privacy as there are many houses in Nawalane where stair towers of one house look into the courtyards of neighbors but the residents don't seem to be bothered by it. However, the newer generation does not seem very comfortable with the set up and has started to move out in some cases.

In KKB and Fahad Square which are mixed ethnic groups there is clear demarcation between private, semi private, public and semi public spaces. Residents interact in semi public and public spaces and the residences are dealt as more of a private zone. In Nawalane and Paposh Nagar because of lack of adequate open spaces, close ethnic ties and the adhoc growth of the settlements these zones get blurred and the space of the public street, in some cases, spills into the privacy of the house.

Gender & Security: Perception of Women

Women and children make the majority of the end-users who spend the most time in any settlement. Their needs for space, security and mobility need to be catered for an efficient settlement.

Women's role in KKB is an active one with the support of SAIBAN. This has lead to their setting up various enterprises, participating in development and feeling secure and more at home in KKB, despite it being a heterogeneous community.

In Nawalane & Paposh Nagar, women mobility and interaction is limited due to the conservative nature of the community. Their absence in the economic and physical development and related decision making is evident in the bad upkeep of the area. The discouragement of women presence from public space and community is also present in Fahad Square.

D. CONCLUSIONS

A number of conclusions emerge from the four case studies on the basis of which these settlements can be redesigned to provide equal and/or higher densities than those prescribed by the KBCA and with better environmental and social conditions. These conclusions are given below.

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

- The respondents preferred a place that could grow incrementally to house some of their children after marriage since they were aware that finding separate accommodation for them was not an affordable option.

- The vast majority of respondents wanted the possibility of carrying out some income generating activity within their home. This was an important consideration.

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

- In building their homes initially, residents in the plot settlements had not considered the additions that they would incrementally make as their needs increased. As a result, the houses were badly planned and ventilated and the neighborhoods, in the case of Nawalane and Paposh Nagar, have problems of congestion and in certain areas of Nawalane there are also social problems. Planning in advance for the incremental growth of the house is a must.

- Apartment living forces a different lifestyle and culture on residents. It is perhaps because of this that the majority of families that have opted for it in Fahad Apartments are less poor than those who live in the other three settlements.

- The existence of a controlling authority and/or one that gives advise on development, helps the settlements to grow in an organised manner. Such an authority prevents encroachments on streets and public space and helps in the creation of education and health facilities. Saiban plays this role in KKB-3 but does not provide design advice on house construction. However, design and technical support for house construction is essential if an improved physical and social environment is to be created and sustained.

- Streets in low income plot settlements are planned for vehicular traffic but are not used as such. They can be integrated into parks and open spaces as a result of which space for residential areas can be considerably increased without adversely affecting access and safety.

- The site percentages allocated by the KBCA for different activities are rational and do produce a livable physical and social environment. However, for higher densities than proposed by the KBCA, a higher percentage has to be set aside for education and amenity purposes.

- In the case of plot townships of 15 acres (6.07 hectares) or more, core houses (which 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. Space for facilities and amenities are set aside as per KBCA regulations and are built upon by the government, the developer or by NGOs inducted into the planning process.

- Plots for apartment blocks and complexes are usually part of a larger KDA sector plan. The sector and its different neighborhoods have spaces allocated for social amenities such as commercial, educational, health and recreation. As such, the developer does not have to provide for these in the apartment complex plan. In addition, land is expensive in these locations and the developer would loose financially if he were to plan for incremental growth. This has been discussed with developers and estate agents and their proposals have been considered in the re-planning of Fahad Apartments which are discussed in Section 5.4 below.

- Orientation of roads, their widths and the ultimate heights of buildings and their relationship to each other are important to provide a climatically comfortable environment so that they can be used in the heat and humidity of a Karachi summer.

- In the re-planning exercise, it was not possible to achieve ultimate densities of higher than 3,500 persons per hectare without increasing the house heights to more than ground plus three floors or cutting back on spaces for amenities and social facilities. Increasing the heights make the houses uncomfortable and their living spaces on the floors below lacking in light and ventilation. Decreasing spaces for amenities and social facilities, adversely affects social and environmental conditions.

- The dimensions of the plots are important for developing rational and economic layouts. A geometrical relationship between width to depth is advisable. The narrower the width the cheaper are infrastructure and construction costs. Different options of plot sizes and house plans (which can grow incrementally) are given below:

    - 56.3 square yards (47 square meters); dimensions 13 feet x 39 feet (4.0 x 11.8 meters). Width to depth ratio 1:3;

    - 56.88 square yards (47.6 square meters); dimensions 16 feet x 32 feet (4.9 x 9.8 meters). Width to depth ratio 1:2;

    - 55.6 square yards (46.5 square meters); dimensions 20 feet x 25 feet (6.1 x 7.6 meters). Width to depth ratio 1:1.25

E. CONCEPTUAL REMODELING

Note
A set of assumptions have been developed around which the conceptual remodeling has been done.

- For Khuda Ki Basti, it is assumed that the residents will independently design their homes and additions to them remaining within the plotlines determined by the concerned NGO.
- For NawaLane and Paposh Nagar, it is assumed that the architectural design advice will be provided to the residents by an NGO.
- For Fahad Square, it is assumed that the houses will be designed and developed by a commercial developer.

In addition to the above,

- House plans in all the settlements have been developed around a central courtyard.
- Density of commercial area has not been added to the total density figures. If it is added it will inverse by 2 to 4 percent as shop and work shop owners tend to live with their families above their businesses.

For conceptual remodeling drawings, refer appendix 02

Khuda Ki Basti – 3

Khuda-ki-Basti has been remodeled to increase its density to more than the maximum prescribed by the KBCA regulations. According to KBCA regulations, the density at KKB should be 500 persons per acre (1,250 persons per hectare). The density achieved is 702 persons per acre (1,755 persons per hectare The manner in which density has been increased and land use changes have been made, with the results achieved, are explained below.

- The plot size has been decreased from 80 square yards (67 square meters) to 56 square yards (47 square meters). This has been done because the requirements of the KKB residents can be fulfilled on a smaller plot. The dimensions of the plot have been changed so as to make the plot 13 feet x 39 feet (3.96 x 11.8 meters). As a result, a larger number of plots can be accommodated. After remodeling the number of residential plots has increased from 1,237 to 1,910.

- Residential and residential-cum-commercial land use has been increased from 49 per cent to 55 per cent. This is in keeping with the maximum prescribed KBCA regulations.

- By combining road and open spaces, circulation areas have been reduced from 35.6 per cent to 23 per cent (KBCA minimum 22 per cent) and as a result commercial areas, parks, amenities and space for educational facilities have been increased from 1.9, 7.2, 2.9, 3.2 per cent to 5, 8, 4.5, 4.5 per cent respectively. This is a major improvement in the physical environment.

- The increase in the number of plots and the new dimensions also reduces the cost of the plot considerably. The Saiban cost of a plot was Rs 42,000 (US$ 525). After remodeling the cost comes down to Rs 24,600 (US$ 308). In addition, savings on infrastructure cost (water, sewage, road) per plot comes

to Rs 5,965 (US$ 74). This means a 44 per cent saving on infrastructure development. This remodeling makes KKB far more affordable.

NawaLane

Nawalane currently has a density of 1,354 persons per acre (3,376 persons per hectare). An attempt has been made to keep the same density. However, this has not been successful and as a result the density has been reduced to 1,262 persons per acre (3,157 persons per hectare). This is about 2.5 times higher than the KBCA prescribed densities. The remodeling exercise has improved the physical conditions and as a result many of the social problems faced by the residents (with regard to recreation, entertainment, education, public space, gender issues, privacy) have been taken care of. How this has been achieved is explained below.

- The average size of a plot in Nawalane is 125 square yards (100 square meters). It varies between 38 to 300 square yards (25 to 251 square meters). Currently, there are 769 plots. These have been replaced by 982 plots of 56.33 square yard (47 square meters) each.

- Currently, there are an average of 2.7 families (36.8 persons) living on each plot. Remodeling suggests two families or 27 persons on each plot. Housing plans developed for the settlement are ground plus three, with eight rooms.

- Land use allocations have also been changed. By remodeling residential use has been reduced from 60.5 to 55 per cent which is prescribed by the KBCA regulations. Commercial, parks, amenities and space for educational institutions have been increased from 0.02. 0.1, 1.8, 2.3 percent to 5, 8, 4.5, and 4.5 per cent respectively.

- The existing circulation area in Nawalane is 19.6 per cent. It consists of narrow congested lanes. It has been increased to 23 per cent and wherever possible roads and open spaces have been combined so as to give the settlement a feeling of openness.

- Amenities have been grouped together around large open spaces and the fact that they will be single storey (may be double) as compared to the ground plus three floor houses, will increase the feeling of openness at these nodes.

- Commercial areas have been developed on the periphery road. Each commercial plot is also 56 square yards (47 square meters) and may have 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.

Paposh Nagar

Paposh Nagar currently has a density of 478 persons per acre (1,181 persons per hectare). The average plot size is 81.6 square yards (67.8 square meters) and the average number of persons per plot is 10.5. By following the principles applied to the remodeling of Nawalane, the number of plots has been increased from 714 to 749 and at 13.4 persons per house the density has been increased to 694 persons per acre (1,735 persons per hectare).

The remodeling of Paposh Nagar creates a pleasant non-congested settlement. The residential area has been reduced from 60.5 per cent to the KBCA prescribed 55 per cent. The commercial area, parks, amenities, spaces for educational institutions have been increased from 4, 4, 2.85, 2.60 per cent to 5, 10, 4, and 4 per cent respectively. Road space has also been increased from 16.03 to 22 per cent. Sections through the site indicate that the ground plus four floor heights of the houses will not create a feeling of congestion.

Fahad Square

Plots for apartment complexes are built by developers with loan facilities. The developer maximizes his profits. As such, the concept of incrementally increasing the house was considered difficult to apply to a developer built scheme. Therefore, developers were contacted and discussions held with them and with estate agents. As a result, a number of interesting alternatives were proposed by them. Two of these alternatives have been developed and their proposals form part of the report. A brief description of both the options is given below.

Proposal – 1:

The developers feel that if larger areas alongside the main roads are given to them on the ground floor for commercial purposes, they would be willing to build double-storey row houses on them on lots of 56.88 square yards (47.6 square meters). The residents could then add to these houses incrementally with two more floors. They also propose that for areas not facing the main roads, single-storey units should be built and on them row houses should be constructed. The single-storey units in this case would not be able to “grow”. The results of this exercise are given below:

- Commercial units on ground floor : 42 numbers
- Residential units on ground floor (cannot grow) : 42 numbers
- Residential row houses built on top of ground Floor (can grow) : 84 units

All the commercial and residential units will have a foot print of 56.88 square yards (47.6 square meters). The total number of units works out to 168. At 6 persons per unit the population works out 1,008. For Fahad Apartment, this gives us a density of 672 persons per acre (1,660 persons per hectare). This is higher than the KBCA prescribed density for low income apartment blocks. If the double-storey row houses add a floor to their homes, the density will be considerably increased.

Proposal – 2:

Another developer proposed option consists of dividing the plot into lots of 36.75 square yards (30.75 square meters). As a result, 152 plots are developed leaving considerable space for social activities. Built-up area is 77 per cent of the site. The developer plans to construct row housing with each unit consisting of ground plus one and a half floors. The owners can add an additional one and a half floor later on.

The developer built accommodation of 152 units will have a density of 912 persons per acre (2,280 persons per hectare) at nine persons per unit, after the owners have added another floor. This is higher than the maximum density of 650 persons per

acre (1,625 persons per acre) permissible by KBCA regulations for apartment complexes.
The developer is happier with this model than with building apartments. He feels that he will get a better cliental (easier to deal with since they will be more affluent) and the cost of construction will be considerably reduced. Time period of construction will also decrease.

F. RECOMMENDATIONS

The studies carried out prove conclusively that through proper planning much higher densities than those prescribed by the KBCA for apartment blocks can be achieved by building small houses on plots of land. It is also conclusively proved that the accommodation in these houses can be incrementally increased provided proper design and technical advice is provided to the house owners. All this can be done without adversely affecting the physical and social environment as envisaged by the KBCA regulations.

This study is really an exploration into an understanding of the spatial dynamics of low income settlements and their relationship to social, economic and real estate development issues. Further work is required before one can reach conclusions that can apply universally. A few recommendations are given below.

- The high-density-incremental-growth-individual-house model is suitable for new settlements and townships. Additional work on the planning of individual units and land use, governance systems and financial requirements for the model need to be initiated.

- There are groups among the better-off poor who may prefer apartments. A better understanding of who they are and what they can afford is necessary.

- In incrementally growth, densities would require 20 years to achieve the targets they are planned for. A better understanding of the pros and cons of this reality needs to be investigated.

- Although the research deals with developer related concerns for the incremental housing model on apartment sites, it does not really offer a viable solution. Developer concerns need to be addressed.

- A study for the comparison of the Karachi situation and the KBCA regulations with other cities in Asia should be initiated.

- Study of further options and plot sizes to the ones that have been proposed should be carried out leading to the development of new zoning and density related regulations.

- The results of the study should be presented to the area communities and their feedback should be used for modifications if required.

From the data that has been gathered, academics should draw urban design and housing related lessons and turn them into teaching material.

G. APPENDICES

Appendix – 01

Matrices

Matrix 01: 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
	Low cost sanitation model based on the Orangi Pilot Project successfully executed	As it is a low lying area there are issues of adequate drainage	Drainage lines have severe maintenance issues	Adequate maintenance by the concerned government agencies	Drainage lines have severe maintenance issues

Electricity	Fair	Fair	Fair	Fair	Fair
	All the localities have formal electricity connections but they experience frequent power failures as is the case with the rest of the city				
Security of area	Good	Poor	Good	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 neighbors 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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Matrix 02: 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	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	FS at PKR. 9,752 ($12) per sq. yard for an average apartment having a covered area of about 81.6 sq yards	PN at the current rate of PKR 10,000 ($120) per sq. yards for a G+2 house of a covered area	The current residents who have mostly inherited the apartments or are sharing it with

	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. The over all 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.	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 encroached upon, area conditions have worsened and the over all density has increased to an extent where the over all 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	(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 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	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 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	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.

		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.	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	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	As it is an old settlement with very strong social ties almost all of the houses have developed incrementally accommodating 2-3	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	One time development

	house extensions are seen as yet. 65% of the residents plan to do further extensions	generations. 53.62% of the residents plan to do further extensions		families. 60%of the residents plan to do further extensions	
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	The respondents spent on average PKR 5000 ($ 61) annually for the maintenance of the houses. 63.77% of the respondents answered that	The respondents spent on average PKR 7574 ($ 93.5) annually for the maintenance of the apartments. 46% of the	The respondents spent on average PKR 7574 ($ 93.5) annually for the maintenance of the apartments. 77.7% of the	There were several drainage and sewerage leaks observed

	they maintain through personal savings	they maintain through personal savings	respondents answered that they maintain through personal savings	respondents answered that they maintain through personal savings	

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Matrix 03: 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 they are not allowed to interact in non segregated areas	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.

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

Advantages of location	Fair	Fair	Fair	Fair	Fair
	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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Matrix 04: Physical Conditions

	Khuda Ki Basti		(KKB)		Nawalane	(NL)		Paposh Nagar		(PN)			Fahad Sqare		(FS)		
Total Area	40.8	acres	16.51	hectares	20.9	acres	8.4	hectares	15	acres	6.07	hectares	1.50	acres	0.607	hectares	
	197472	sq.yds	165111	sq. meters	101214.24	sq.yds	84579	sq meters	72986	sq.yds	60702	sq. meters	7454	sq.yds	6070	sq. meters	
Total no. of plots	1237				769				714		l			248	l		
Average No of Families/ plot	01				2.72				1.5					01			
Average Family Size	6.7				13.56				6.7					5.7			
Average number of people per plot (average no of families per plot x average family size)	6.7				36.88				10.05					5.7			
Total Population (average no of people per plot x total no of residential plots)	8287				28360				7175					1414			
Population Density (total population / total area)	203	ppl per acres	501	ppl per hectare	1356	ppl per acre	3349	ppl per hectare	478	ppl per acre	1181	ppl per hectare		942	ppl per acre	2329	ppl per hectare
Total Built up Area-GROUND FLOOR	23.06	acres	9.33	hetares	15.4	acres	6.23	hectares	12.09	acres	4.89	hectares		1.06	acres	0.42	hectares
Total built up area ALL FLOORS	30.9	acres	7.37	hectares	35.87	acres	14.51	hectares	23.36	acres	9.45	hectare		5.3	acres	2.14	hectares
Total open area	17.74	acres	7.37	hectares	5.4	acres	2.18	hectares	2.91	acres	1.17	hectare		0.44	acres	0.18	hectares
No of plots/aptts. per acre	34.30	plots per acre	13.72	hectares	36.8	plots per acre	90.4	hectares	47.6	acre	117.6	hectare		202	apartment per	500 acre	Appts per hectare

	sq.meters	no.of plots	% of area as developed	% of total area as 'planned'	sq.meters	No of Plots	% of area as developed	sq.meters	No of Plots	% of area as developed				No of Aptts.	% of area		
LANDUSE																	
Schools		12	3.65%			2	2.32%		6	**2.32%**							
Amenities		9	2.86%			6	1.81%		5	1.81%							
Residential		921	40.27%			606	60.5%		578	60.5%				248			
Residential+ Commercial		145	7.14%			93	10.65%		127	6.66%				56	70.6%		
Commercial		14	1.85%			1	0.02%			4%							
Open spaces/ parks		12	7.24%			1	0.12%		1	4%							
Empty Plots			1.85%				5.1%			3.36%					0.0%		
BUILT / OPEN																	
Total built up area %			55.62%				75.68%			76.61%					70.66%		
Total open area%			44.68%				24.81%			23.39%					29.33%		
Total Area			100%				100%			100%					100%		

	area in sq. meters		% by area as developed		area in sq. meters		% by area as developed	area in sq. meters		% by area			area in sq. meters		% by area		
CIRCULATION																	
Total Circulation	10923.23745		**35.60%**		17591.70		**19.61%**	2089.14		**16.03%**			2525.11		**29%**		
1- Pedestrian*1	-		**19.1 %**				**9.75%**			**9.75%**					**02%**		
2- Vehicular*2	-		**16.5%**				**9.86%**			**6.28%**					**27%**		

*1: Pedestrian spaces include streets being used for pedestrians, cycles and motorcycles of width variation from 2'-6" (.75 meters) minimum to 8'-0" (2.42 meters). These are usually not wide enough for emergency vehicles like ambulances and fire engines.
*2: Vehicular spaces include those for public transport as well as those for cars and other motorized traffic. These are usually used by pedestrians as well simultaneously.

Builtup Density	**area in sq. meters**	**no.of plots**	**Built floor area as % of the total ground area**		**area in sq meters**	**no. of plots**	**% by area as developed**	**area in sq meters**	**no. of plots**	**% by area**			**area in sq meters**	**no.of apts.**	**% by area as developed**		
Total Case Study Area																	
Ground	108816.74		**40%**		15882.01		**16%**	6416.16		**7.93%**			785.00		**1%**		
Ground + 1	19432.20		**14%**		33672.78		**69%**	22014.78		**54.40%**			0.00		**0%**		
Ground + 2	6456.30		**7%**		23983.61		**74%**	74901.75		**73.63%**			438.07		**6%**		
Ground + 3			**0%**		45939.13		**19%**	3426.68		**16.94%**			0.00		**0%**		
Ground + 4			**0%**		1112.67		**5.69%**	0.00		**0.00%**			1841.31		**309%**		
Ground + 5			**0%**		412.00		**0.26%**	0.00		**0.00%**			0.00		**0%**		
Total	**134705.234**		**61%**		**12410.48**		**184%**			**152.84%**			**3064.38**		**316%**		
Length of sewer drain (rft)	**6363.64**					**20189**		**7409**					**9484**				
Length of water line (rft)	**6363.64**					**20189**		**7409**					**9484**				

Matrix 05: 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 – 02

Drawings