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Developmental and Ecological Implications of Housing in Ludhiana City

Abstract

Housing as an activity is intimately linked to the broader socio-cultural, economic and political environment within which it operates. These processes dictate not only the spatial spread and pattern of housing but its nature, density and ethno-regional composition as well. In addition, the process of housing is influenced by and has implications for the physical environment. The city of Ludhiana which came into being, around the end of the fifteenth century and has seen periods of socio-political turmoil as well as unprecedented economic growth exhibits a housescape that has been responsive to these processes. It emerges that different sections of the population have responded differently to these impulses and this has implications for the nature of socio-cultural patterns that exist at present. These also function as markers for future trends in housing for the city.

Keywords: Developmental implications, ecological implications, housing types, housing dynamics, housing patterns.

Introduction

The present paper seeks to view housing within a broader context and establishes the nature of its interaction with the physical, social, political and economic components of the environment. The implications of various processes that occur in the environment for housing have been analysed. These have been analysed under two sections: developmental (those flowing from the development of the city and impacting upon the development of housing) and ecological (those related to and emanating from the physical environment of housing). The objective of the paper is to view the dialectics of development processes, the state of the environment and the evolution of housing types and patterns. The analysis has been carried out for the city of Ludhiana.

Developmental Implications

Developmental implications have been arrived at by relating the housing evolution of Ludhiana City to the development of the city in general. Development impulses that stimulate and direct housing development could be politico-administrative (relating to the political situation, administrative status of the city and the institutions built for the provision of housing), economic (dealing with the economic vitality and nature of economic activities carried on in the city) and demographic (relating to demographic expression of political, social and economic situations mainly migrations at the inter and intra city levels).

Chart 1.1 lists in chronological order, significant events that provided a stimulus to the development of the city and their simultaneous impact on the housing scenario. The housing story of Ludhiana arranges itself in six distinct episodes related to six indelible events in the history of the city namely – its establishment as a fort town in 1481; its annexation by the British in 1849; the partition of the country in 1947; the Green Revolution in the mid sixties; the socio-political turmoil in 1980s; and the liberalization of the economic regime in India and the world over in the 1990s.

Ludhiana comes into being: Established by the Lodhis, in 1481 as a fort on the banks of the River Satluj, Ludhiana lay *en route* to Delhi, for invaders from Central Asia. Frequent onslaughts by invading armies restricted population growth and the number of civilians residing in the vicinity of the fort remained static. These dwelt in sporadic settlement pockets scattered around the fort. The residential layout remained amorphous.

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Colonial Impact: The situation changed in 1809. Under a treaty conducted between the British and the Sikhs, Satluj was agreed upon as the boundary between the Sikh kingdom in the north and the British Empire in the south. The fort was developed as a cantonment to house British forces. The first residential localities beyond the fort were developed during this phase. The residence of the British political Agent, stationed in the city, was built to the south of the fort. The residences of the representatives of the cis-Satluj states were located close by. Quarters for the Afghan royal family, ousted from Kabul, were also built in this area.

A period of political stability, it provided impetus to commercial activity. Chaura Bazaar a commercial area came up to the east of the fort. Residences of the traders were also built along with. Kashmiri weavers invited by Sir C. Wade laid the foundation of the hosiery industry. These settled in Purana Bazaar a locality lying between the fort and Chaura Bazaar. To this day, the locality continues to be the hub of small-scale hosiery industry in the city. During the 1830s the American Presbyterian Mission was established in Ludhiana. Besides a hospital and a school a residential locality also came up to the south east of the fort, slightly removed from yet accessible to the native population. In 1849, the British annexed Punjab. The local civil administration became functional in the town in 1853-54. An increase in the number of the administrative staff, necessitated residential arrangements. The Civil Lines came up to the south of the existing built up area.

The Indian Sepoy Mutiny of 1857 saw the native population rise against the administration. Retribution was extracted and houses scattered around the fort were demolished. The native population redistributed itself, with the higher castes settling in Chhowni Mohalla and the lower castes forming a slum locality – Karabara, on the banks of the *Buddha Nala*.

The laying of the railway line in 1870 effectively separated the organically developed native localities from the planned British inhabited Civil Lines. The last three decades of the XIX century saw the economic base of the city strengthen. The city became the major supplier of woolen products and hosiery goods to the British army. By the close of the XIX century the city had an industrial cum residential area (Purana Bazaar), commercial cum residential area (Chaura Bazaar), a native mohalla (Chhowni Mohalla), a planned locality (Civil Lines) and a slum (Karabara). A century down the line, this typology of residential areas still persists.

The onset of the XX century saw the expansion of Civil Lines with the rich native population residing over here alongside the ruling class. World War I necessitated an increase in hosiery production. German looms replaced the cottage weaving industry and Miller Gunj, the first industrial area of the city came up. Built on the native side of the railway line, Miller Gunj stimulated the growth of the first two industrial slums – Islam ganj and Maqbool pura.

Thus it was that the Colonial period laid the blue print for the future spatial arrangement of housing and other land uses in the city. The slums to the south east in proximity to industry, or on low lying area along the *Buddha Nala*, the planned locality towards the south west on higher ground, away from pollution and the evolved localities with mixed land use at the core of the city.

Partition of India: The partition of the country into India and Pakistan in 1947 witnessed an exodus of the city's Muslim population and an influx of Hindu and Sikh population from West Punjab. This created the first major housing problem in the city. While some of the refugees were rehabilitated in houses vacated by the Muslim population, others were provided houses in Model Town, a locality developed especially to rehabilitate refugees. Still others just camped wherever they found space. These camps later took the form of slum localities that exist even today (Saini, 1992). Model Town became a predominantly Sikh inhabited locality. The hangover of the post partition communal riots had left a spatial imprint.

The Improvement Trust was established in 1958, with the objective of initiating planned residential development in the city. In line with the location of Civil Lines, the new localities were located in the south west of the city. However these were located at a considerable distance from the populated part of the city. This factor was to prolong the peopling of these localities.

Around this time Ludhiana was covered under a special industrial development programme. Industrial Area 'A' and 'B' and Industrial Estate were developed along the G.T. Road in the southeast of the city, essentially an extension of the colonial Miller Ganj. A healthy industrial growth attracted labour. These settled in slums that sprang up in the vicinity of the Industrial Area, particularly along the railway lines leading to Delhi and Dhuri.

The implementation of the post-partition land reforms led to a ceiling on ownership of agricultural land and instigated agriculturists in the vicinity of the city to parcel and sell off excess agricultural land in the garb of residential plots. Located beyond municipal limits this land was un-serviced and cheaply priced. It is no wonder that slum like conditions prevailed in such unauthorised localities. A number of the informally developed localities in the northern part of the city, close to Karabara (the first slum of the city), were thus formed. The newly constructed Bypass in this area was an additional stimulant for the development of slums (Saini 1992, p. 30).

The supply of developed and opportunely situated land in post-independence Ludhiana was meagre. On the other hand, the booming economy and the influx of migrants stimulated the demand for housing. The physical expansion of residential areas took place albeit in the informal sector.

Green Revolution: The Punjab Agricultural University was established as a precursor to the Green Revolution in 1961. The extensive green area was to function as the lungs of the city. Located in the direction opposite to that of industrial area, it served

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as a magnet for the siting of high class planned residential development in the west (Tagore Nagar, Kitchlew Nagar) and south west (Sarabha Nagar, Gurdev Nagar, BRS Nagar).

A rise in the prosperity levels consequent upon the Green Revolution also had implications for housing in Ludhiana City. The prosperous among the rural population, built houses in the city. The Naxalite movement, active in the smaller towns and villages of the state, encouraged people to migrate to Ludhiana. Ludhiana became a Municipal Corporation in 1976. City limits were extended and a number of informally developed localities became a part of the city (Nand Puri, Baba Deep Singh Nagar, Indira Colony, Janta Colony). On the other hand, being granted the status of a municipal corporation also increased the access to finances for infrastructure, notably water supply and sewerage. A large number of localities were so provided with amenities under UBSP and IDA assisted programmes.

The development of planned Urban Estates was initiated at Dugri in the south of the city and Jamalpur in the east. Improvement Trust expanded existing localities and initiated the development of new ones, (Rajguru Nagar, Sukhdev Nagar and B.R.S. Nagar) all in the vicinity of the University. Flatted development was also initiated in the densely populated parts of the city (Civil Lines and Pakhowal Road).

This was thus a phase of physical expansion of the housescape, fostered by a booming economy and policy/ administrative initiative. This period saw the city institutions for housing at their most active. The largest number of planned residential localities was initiated during this period.

Terrorism: Following the anti-Sikh riots of 1984, Ludhiana received a deluge of Sikh migrants from different parts of the country. The onset of terrorism during the 1980s resulted in a slump in economic growth. However, being a relatively peaceful part of Punjab, Ludhiana remained an attractive destination for Hindu migrants from other parts of the state and Sikh migrants from surrounding villages both seeking security. While Sikhs settled in peripheral localities of the city, Hindus sought the more densely populated parts of the city. Localities having flatted development particularly were considered more secure than those having independent houses. The former attracted Hindu households. Many of these were rehabilitated in the newly developed Urban Estate at Dugri. The economically better off among these sought rented accommodation before establishing a permanent base. Rented accommodation was procured primarily in Sikh dominated localities like Gurdev Nagar, Model Town, Model Town Extension, Sarabha Nagar and Urban Estate Dugri.

The peopling of flats and rise in the number of tenant households led to a rise in population densities in residential localities. Another marked development in terms of housing, during this phase was a pronounced trend towards residential segregation on religious basis. Real estate prices

remained low and refugees from other states were the prime investors in housing.

Liberalisation: The new Economic Policy adopted by the country during the 1990s was associated with two major events that in turn influenced housing patterns in the city of Ludhiana. The first was the disintegration and economic collapse of the USSR – the major export destination of Ludhiana's hosiery products; the second the formation of Punjab Urban Planning & Development Authority a regulatory agency for urban development in the state.

The first resulted in a major setback to the hosiery industry in Ludhiana. Simultaneously, the liberal economic policy brought in its wake a rise in commercial activity in the city. There was a shift from manufacturing to trading in Ludhiana. A visible spatial manifestation of this trend was the change in land use from residential to commercial. The above is especially true of the Civil Lines area and all other major arteries of the high class residential segment of the city including the Mall, College Road, Cemetery Road, Rani Jhansi Road, Pakhowal Road and Ferozepur Road.

The formation of PUDA facilitated the entry of private players in the arena of housing development. This increased the volume of developed land available for housing. Physical expansion of the City's housescape was a natural corollary. New privately developed residential localities came up in proximity to existing high-class residential areas in the west and southwest of the city. This indicates the direction of future housing expansion of the city.

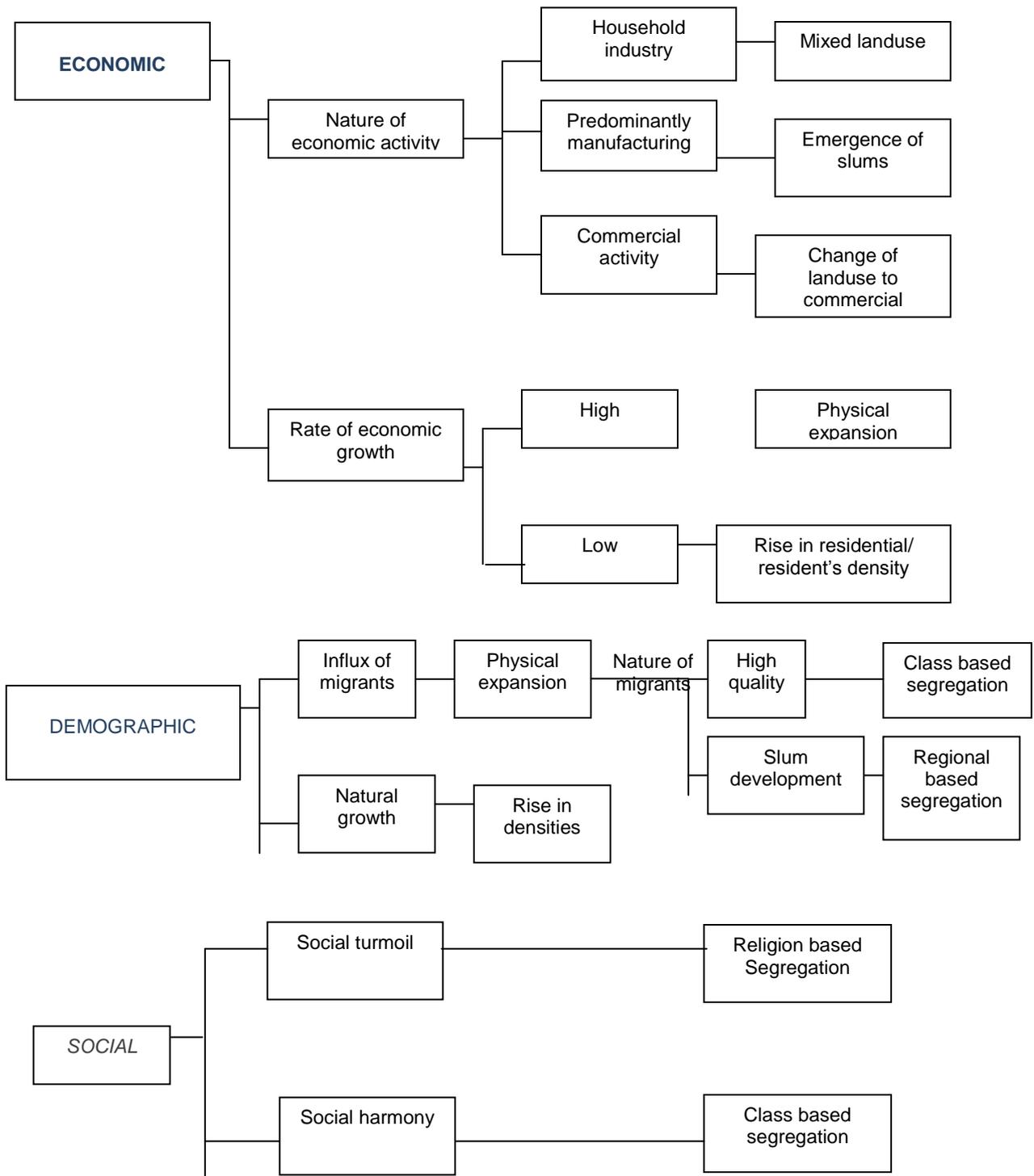
Chart 1.1
Ludhiana City: Development of Housing in Space - Time Context

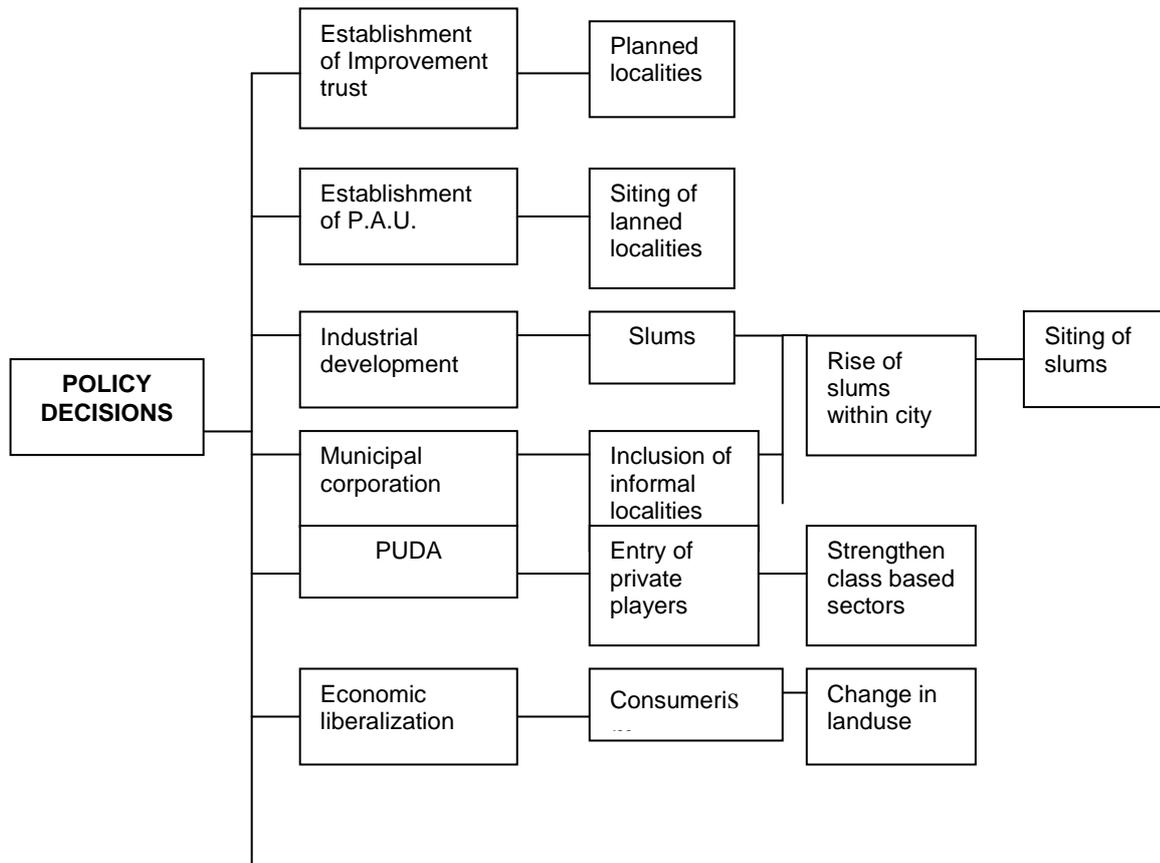
Year / Period	Events associated with city's				Implication for housing
	Political scenario	Administrative arrangements	Economic growth	Demographic profile	
Pre-Colonial 1481 1481-1809	Faced various foreign incursions	Fort established on banks of River Satluj		Population size remained static	Settlements scattered around the fort
Colonial 1809 1816	Treaty between British and Sikhs : Satluj becomes border between two territories Representative of cis-Satluj states stationed here Exiled Afghan royals seek refuge	British political agent stationed at Ludhiana Development of cantonment	Development of Chaura Bazaar		Amorphous character of residential localities in Purana Bazaar and Chaura Bazaar Development of residential localities to the south of fort to accommodate these
1823-1838			The beginning of hosiery industry	Kashmiri migrants settled here Establishment of American Presbyterian Mission	Locality comes up between fort & Chaura Bazaar (beginning of Old City) Hospital and residential locality to the east of fort
1849-55	Punjab annexed by British empire	Local civil administrative set up created		Increase in number of administrative staff	Civil lines comes into being
1857	Indian Sepoy Mutiny. Local participate	Settlements around fort destroyed			Development of Chhowni Mohalla and a slum -Karabara
1867		Municipal Committee set up		40000 population of city	Development of residential areas in and around Chaura Bazaar
1870		Connected with Railway			Railway lines divides indigenous old city and British Civil Lines
1870-1910			Development in trade and commerce		
1911-1919	World War I commences		Introduction of German looms Miller Ganj developed		Britishers and Rich locals reside in Civil Lines
1930		Civil Lines included within city limits			Industrial development leads to growth of slums. Expansion of Civil Lines
1933		Electrification	Industry diversifies		Islam Ganj & Mushtaq Ganj come up as slums

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1944		Districts town planning office set up			
Post -Partition 1947	Partition of India			Influx of refugees and out flow of Muslims	Refugee colonies come up Model Town & slums emerge
1949		Class I Status for Municipality			
1956-61			City covered under Special Industrial development programme Industrial Area A, B & Industrial Estate	Industrial labour comes in	Slums come up close to Industrial area
1959		Improvement Trust set up			Planned localities to follow
Post Green Revolution 1961	Naxalite movement in villages and small towns of Punjab	Punjab Agricultural University set up		Rapid population growth	Institutional housing built in PAU
1962		Bye-Pass on GT road constructed		Immigration to Ludhiana city from surrounding areas	Slums come up along bye-pass
1976		Municipal Corporation status, city limits extended	Healthy rate of growth and expansion	Immigration to Ludhiana city from surrounding areas	Number of slums come within Municipal limits, Improvement Trust develops localities: Sarabha Nagar Tagore Nagar, Model Gram
1980	Terrorism gains ground			Immigration to Ludhiana city from villages nearby	Residential segregation along religious lines. Hindus move towards flats in heart of city. Sikhs from villages move to city, settle on periphery
1984	Anti-Sikh Riots in different parts of the country			Massive immigration to Ludhiana	Migrants settle in Sikh dominated localities: Model Town and Extn. Urban Estate Dugri, Sarabha Nagar, Gurdev Nagar
Post - Liberalisation 1990	USSR disintegrates		Blow to hosiery industry		
1995	Establishment of Punjab Urban Planning Development Authority	Shift from manufacturing to trade		Residential mobility Hindus move outward from core areas. Sikhs moves towards periphery	Commercialisation of residential areas: Civil Lines / The Mall / Pakhowal Road / Ferozepur Road

Chart 1.2
Economic, Social and Planning Dynamics of Housing in Ludhiana City





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On the other hand, the northern and southeastern parts of the city continued to attract informal unplanned development. A healthy industrial growth and a surge in labour immigration propelled this, especially once peace returned to Punjab. During this period housing was seen as an investment capable of providing returns. Households owning land in proximity to the industrial area constructed single room tenements that were rented out to industrial labour. In most cases inhabitants of a single tenement had a common place of origin. Residential segregation along regional lines became manifest.

To sum up, the socio-economic, politico-administrative and demographic processes carried implications for housing development in the manner of defining trends in the growth of housing, the siting of different kinds of localities and the social structure of these (Chart 1.2). The economic boom resulting from industrialisation and the Green Revolution provided an impetus to the physical expansion of housing as also to the proliferation of slums. The siting of Industrial Area and Punjab Agricultural University determined the siting of slums (in proximity to the former) and planned localities (close to the latter) in opposite directions from each other. The influx of migrants in the face of socio political turmoil, led to a rise in housing densities on the one hand, and segregation on religious basis on the other. The prevalence of social harmony saw localities being structured on class basis, a trend likely to be strengthened by the entry of private players in housing development. The influx of migrant industrial labour from other states was associated with segregation on regional basis.

Spatial expressions of housing thus produced, in turn have implications for the city system. Segregation on religious lines remains a threat to social harmony within the city. The separation of work areas from high-class residential areas is accompanied by problems of traffic management. The emergence of ethnically homogenous localities, has led to a visible 'ghettoisation' of the city. More worrisome, however, is the rise of crimes like sodomy and rape in localities that have skewed sex ratios resulting from male selective immigration. Finally it is expected that future development of planned and unauthorised housing localities will follow established trends. This is likely to result in a polarization of housing conditions among different segments of the city. The situation is accompanied by implications of an ecological nature, discussed in the following part of the paper.

Ecological Implications

The ecological and environmental dimensions of housing are fairly evident. In fact the house itself forms the most immediate environment for the dweller. Further, housing draws sustenance from the environment – building materials to give it form, air water and fuel to make it functional. In the process the former impacts upon the latter. The ensuing relationship has implications of an ecological nature.

Ecological implications related to housing have been derived from an analysis of the human imprint on the physical environment in terms of the latter's quality and what it implies for housing in the city. The quality of environment has been interpreted in terms of the quality of water and air. Its impact has been seen in the incidence of disease especially the types related to the quality of the environment.

All of the above has been viewed from the perspective of the nature of housing within the city. The idea is to understand the extent to which housing damages the environment or suffers due to a damaged environment. A related query deals with the nature of interface that exists between slums and poor environmental conditions. Are slums, manifestations of poor environment? Are these responsible for damaged environment or do they instead suffer as a consequence of one?

Ground Water Quality: Blessed with ample sub-surface water reservoirs, the city has based its water supply on sub-surface sources. A report on the ground water quality of the city was prepared by the Punjab Pollution Control Board (PPCB) in 1991. The quality of various pollutants (bacteriological and inorganic) present in the water was ascertained and measured against guideline values and permissible limits set by W.H.O. and Bureau of Indian Standards (B.I.S.) respectively.

Water samples were collected from over 150 points spread over the city. Almost two-thirds of these were located in areas having considerable residential development. For the purpose of this analysis, data sourced from PPCB has been corroborated with more recent research findings on the ground water quality (Arora, 2000) of the city. The perusal of available data resulted in some pertinent observations.

First, the groundwater of localities in the vicinity of *Buddha Nala* and Industrial Area is most polluted. This fact is easily explained the *Buddha Nala* is the recipient of the city's untreated domestic sewage, for which there is no satisfactory arrangement of treatment and final disposal (PPCB). Further, along the *Nala* the strata mainly consists of sand which being highly permeable, the waste directly percolates into the ground water reservoir, and pollutes it. The Industrial Area is home to a number of small and medium enterprises consisting of foundries, dyeing units and electroplating units. A number of these, discharge untreated effluents into low-lying area or simply in the open in the form of stagnant sludge. This gradually permeates the underlying water reservoir, in the process, polluting water in the vicinity. Second, localities suffering from ground water pollution are mainly unauthorised localities a few of which have been even been designated as slums, including Janta Nagar, Dashmesh Nagar, Kundanpuri, Salem Tabri and Shivpuri. The only two authorised localities to have polluted ground water are Urban Estate, Dugri and Model Town both located close to the Industrial Area.

Third, the source of polluted water in a majority of the cases is the hand pump. In the absence of piped water supply the unauthorised

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localities accounting for about 25 per cent of the population depends on hand pumps. Piped water supply emanates from tube wells that source water from far greater depths and are relatively unpolluted. It emerges that the two main nuclei from where ground water pollution in the city disseminates are the *Buddha Nala* and Industrial Area. Untreated domestic sewage and industrial effluents are the major causes of ground water pollution. Polluted water is the lot of the resident dwelling in unauthorised localities. These suffer on two counts: one an unfortunate location (close to sources of pollution) and two the slipshod functioning of the urban local body (visible in a lack of piped water supply and sewage treatment facilities).

Ambient Air Quality: Ambient air quality is most commonly measured in terms of the presence of SO₂, NO₂ and suspended particulate matter (SPM). Data collected by Central Pollution Control Board (CPCB) over a period of six years (1988-94) showed that among the cities comprising the sample, Ludhiana emerged as the most polluted city north of Delhi (Agarwal *et al.*, 1999).

The high levels of air pollution are accounted for by high amounts of vehicular and industrial pollution. A total of 0.45 million vehicles are registered in Ludhiana in addition to the 4000 buses and trucks that ply through the city daily. Ludhiana is said to have the highest density of vehicles in the country after Calcutta (*ibid*) and as much as 60 per cent of the air pollution is accounted for by vehicles on the road. A large number of industries are located in the city and a substantial number of these occur in residential areas of high population density. The poor ambient air quality in most residential areas therefore comes as no surprise.

Within the city, in the year 1997 the concentration of SPM in industrial pockets touched 800 µg/cum while that in residential areas rested at 300 µg/cum, far in excess of the safe limit of 360 µg/cum and 140 µg/cum respectively. According to a study conducted by PPCB in 2001, pollution levels in commercial cum residential areas were 1.5 times and those in industrial areas twice that of the background levels. After factoring in the effect of meteorological influences like wind direction, wind velocity and atmospheric stability, it emerged that the part of the city suffering most from air pollution lay in the east and south east directions and comprised primarily unauthorised localities.

The southwestern part of the city, on the other hand, where most of the planned authorised residential development took place is free of air pollution. For one, this part of the city is devoid of industrial establishment; and for another most of the unauthorised residential development, stimulated by the industrial boom, came up in the vicinity of the industrial area (the source area of air pollution). Moreover in the absence of decentralization of work areas vehicular traffic is concentrated in certain areas including the old city and the adjoining industrial estate and focal point. An inefficient public transport system increased the use of private transport leading

to a larger number of vehicles on the roads on any given day.

Meanwhile, a search for a cleaner environment has spurred households to move from the polluted old city to the cleaner planned localities (Kahlon, 1998). However the choice of shifting to a cleaner environment is available only to a fortunate few: those with high affordability levels. A majority of the residents staying in unauthorised localities are forced by high land prices and transportation costs to stay in the vicinity of the highly polluted industrial area. These 'children of a lesser God' are discriminated against even by nature, for the prevailing wind direction ensures that the area characterized by unauthorised residential development is also marked by a heavily polluted atmosphere.

Incidence of Disease: Long before slums came to be regarded as eyesores on the urban landscape, these were acknowledged as breeding grounds of a variety of diseases. The fear that such diseases may be communicated to people dwelling in high class residential areas, instigated the initial efforts at eradication or improvement of slums (Burns & Grebler, 1977).

More than a hundred years later health continues to be an important social indicator and the occurrence of disease a pertinent commentary on the state of the city's physical environment. Ludhiana is no exception. The impaired environment of unauthorised localities, obvious from both water and air pollution, ensures that unauthorised localities, housing 0.6 – 0.7 million people, are hot beds of a variety of diseases.

An estimated number of 1117 and 1099 persons suffered premature death due to ambient SPM during the years 1991-92 and 1995 respectively (Kumar '97). The number of people that fell sick due to this reason was much higher at 571619 in 1991-92 and 562155 in 1995. The estimated monetary losses on this account were pegged at Rs. 100.7 crores and Rs. 102.7 crores respectively (*ibid*).

A study conducted at the local Christian Medical College and Hospital found a high incidence of tuberculosis, chronic bronchitis and other respiratory problems among industrial workers. Almost 80 per cent of the industrial labour is estimated to be suffering from lung diseases (Agarwal *et al.*, 1999) unauthorised localities in the vicinity of the Industrial Area and the Buddha Nallah are home to these labourers.

Despite the Municipal Corporation claiming cent per cent coverage of piped water supply, a not so small segment of the population still depends on hand pumps. This is especially true of localities along the *Buddha Nala* where the water table is all of 3-4m deep. Residents in these localities are not aware of what pollution is but they complain of falling prey to mysterious diseases (Agarwal *et al.*, 1999). Diseases related to water pollution include gastrointestinal disorders, stomach disorders, anaemia, neurological dysfunction, renal impairment, hypertension, dermatitis and cancers of the digestive tract and skin.

Table 1.1 shows the incidence of diseases related to water supply (Gastroenteritis and Cholera) and poor sanitation (malaria and dengue) by nature of locality in the city of Ludhiana. The message is clear. The informally developed unauthorised part of the city is more prone to disease than the planned, publicly developed part of the city.

Table 1.1
Ludhiana City: Occurrence of Disease by Nature of Locality, 2001

Nature of locality	Dengue	Malaria	Gastroent eritis	Cholera
Old City	6.5	7.7	9.0	16.1
Organically Evolved	7.0	-	3.0	4.3
Developed by State agencies	18.0	19.3	2.0	2.3
Developed by Govt. Department / Institutions	6.5	-	-	-
Unauthorised	62.0	73.0	86.0	77.3
All Localities	100.0	100.0	100.0	100.0

Source: Compiled from data available with Chief Medical Officer, Ludhiana

The predominance of hand pumps and the high level of ground water pollution easily explain the high occurrence of water borne diseases in unauthorised localities. This may also be attributed to a lack of civic amenities in these localities. Open drains and non-existent sewerage system are tantamount to stagnant water in low-lying areas. This is likely to promote the occurrence of malaria.

The 'Old City' emerged as another disease prone locality of the city. Here the dense build of the physical structures makes preventive measures like spraying insecticide difficult. Sanitation is a major problem both in the Old City and the 400 odd unauthorised localities mostly inhabited by migrant industrial labour (Agarwal *et al.*, 1999).

While the occurrence of water borne diseases remains limited to unauthorised development, malaria has found victims in the planned segment of the city as well. One-fifth of the malaria afflicted patients reside in publicly developed localities of the city. This is because mosquitoes, the carriers of malaria do not remain restricted to their breeding grounds; rather they have a much wider area of influence.

To conclude, the housing scenario in Ludhiana city bears a deep imprint of a variety of developmental impulses that it was subjected to over a period of time. Patterns dictated by chance or random occurrences during the colonial rule were perpetuated in times that followed. Subsequent economic, administrative, social and political happenings at the city / regional / global level like extension of municipal boundaries, rise of terrorism, success of Green revolution and liberalization of economy, all impacted upon the spatial patterns of housing produced. The booming economy on the one hand improved standard of living and on the other led to the proliferation of slums. Social turmoil led to residential segregation. Rise in commercial activity led

to a rise in real estate values of core areas and stimulated residential mobility towards the periphery. The city today is rapidly losing its residential space to commercial activity. Planned residential development and unauthorised development are proceeding in opposite directions leading to the spatial polarisation of housing quality. This polarisation manifests itself in the quality of environment within the city. Historical, economic and natural forces have joined hands to ensure that the deterioration of the environment wrought by uncontrolled and unregulated industrial growth spells doom for the residents of slums and other unauthorised localities. Slum dwellers emerge as the sufferers of a debilitated environment rather than its perpetrators.

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