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DETERMINANTS, EXPLANATION AND CORRELATES OF RESIDENTIAL CROWDING IN A PLANNED CITY A CASE STUDY OF CHANDIGARH

Anita*

ABSTRACT

Management of land and population comfort is essential for healthy living of mankind. Otherwise, crowding results. Crowding is a physical space problem inside and outside the houses or buildings, commercial as well as residential. Relevance of indoor physical Space remained more focus during Corona time period. Present paper is to search Explanations and co relates of residential crowding in a planned city Chandigarh. Sector wise density of houses and density of population has been used as measure to look at residential crowding. Vertical Expansion, Failure of principle of vertical expansion with floor space index, more proportion of scheduled caste population area, high density of houses, creation of unauthorised structures in the form of 'Jhuggies' by floating population leads to more density of population and resultantly more crowding. Even large sizes plots for high socio-economic groups are crowded as helpers and chowkidars add number of persons per house. It has been concluded that though some of the planning principals have failed but still it is successful on various principals of planning.

Keywords: *Crowding, Density of Population, Density of Houses.*

Introduction

Management of land and population comfort is essential for healthy living of mankind. Otherwise, crowding results. In the process of urbanisation throughout the world the growth of early cities had generally been governed by the availability of requisite researches and the then prevailing socio-economic organisations. The influx of the rural migrants leading to an overcrowding of the city. It was not a very strong factor for the growth of cities till the start of industrial revolution. However, this does not mean that the earliest cities were not crowded. Residential crowding has been an integral part of an urban system since the first cities came into being. The earliest example of urban residential crowding is recorded for the Greek cities, generally considered to be the first examples of planned cities. The accelerating growth of urban population has been accompanied by haphazard growth of cities leading to the emergence of such problems as overcrowding and creation of slums. An immediate victim of this overcrowding has been the quality of urban environment particularly in the large unplanned cities. It is usually accompanied by social ill health and disorder, characteristic feature of an overcrowded urban milieu throughout the world. The impact of crowding parameters (population, net and gross density, street crowding, indoor crowding) on corona virus.(Sudha Panda, 2021)

Study Area

Chandigarh is an Administrative City, having educational institutions of two states and one Union Territory, Capital of State of Panjab and Haryana. It has Union Territory Status as well. It is located in the Foot of Shiwalik Hills in the North Western part of India. It is one of the well-planned cities in India known for its carefully thought-out layout, urban planning and architecture, and is further subdivided into sectors which are efficiently connected by 6-lane roadways.(Kumar, 2022). Census of India, 2011 reveals its total population 105545 and density of population 9258 person per sq.km.(The Official Website of Chandigarh Administration, 2023)

Objective of the Study

- To search the causes and level of crowding.
- To assess the success of urban planning of Chandigarh City in terms of Crowding.

* Associate Professor of Geography, Government College for Girls, Sector-14, Gurugram, Haryana, India.

Methodology

Density of population is a commonly accepted measure for the understanding of concentration of population in a town or city and has been used for an understanding of the pattern of residential crowding. Floor Space Index has been used to see the relation between built up area and density of population in vertical expansion by observation survey method. Census of India 1981 used for calculation of density of population.

Discussion

There are several ways to identify the pattern of residential Crowding in any City or Towns. In the present paper an attempt has been made to explain the pattern of residential crowding in Chandigarh, in terms of the following explanations and correlates.

- The pattern of distribution of density of population.
- The pattern of distribution density of houses.

Pattern of Distribution of Density of Population

In Chandigarh, a positive correlation has been identified between areas of high density of population and high levels of residential crowding.

In other words, smaller the space available for a person to live in an area, higher will be the level of residential crowding as well as population concentration. The correspondence between these two is striking in sector numbers 19,27,30,20,21,23,22,37, and 35.

The higher density of population as well as residential crowding is associated with the following:

- Plots in the developed sectors, such as 27, 19, 20, 22, 23 were purchased at a time when land values were not high and, therefore, within the reach of the middle in group people. This also promoted a complete construction on the plots at an early date. Despite planning, within each house two and three Independence living sets for 2- 3 families were built at different floors in order to acquire a higher "exchange value". This is not true only for private housing but also for government housing too, where the house was allotted to more than one family the number of government houses available was less than the total requirement. This is true particularly in 19, 27 and 20.
- There are sectors in which density of population is not very high but the level of residential crowding has been identified as very high. for example, sectors 1-6 in Phase 1 and 3 and 39-46 in Phase II.
- The Phase 1 sectors (1-6) were planned for socially and economically high-income groups and in these sectors, size of the plots is very large. Despite this fact, high residential crowding and socially and economically high-income status generally do not go together. In these sectors in Chandigarh, the number of persons per house or the level of residential crowding is high. This is related to the numerous annexies constructed in these houses for the servants. Thus, the higher density sectors due to a spill over of population from the densely populated sectors.

Pattern of Distribution of Density of Houses

A comparison of the spatial patterns of density of houses and residential crowding suggests a close correspondence between the areas of high density of houses and areas of high levels of residential crowding. This correspondence is particularly strong in Sectors7, 19,20, 22 and 23. A few factors, such as 21, 24, 27 and 28, although placed in areas of lower density of houses, have only marginally lower values of density of houses. Although, all are completely planned, the built-up area in various sectors covers a different level of crowding; and have emerged at different rates. These differences in the extent of built-up area and the level of development in these sectors are related to number of factors. Many of these, while promoting the building activity in a sector, also promote residential crowding beyond a certain stage of development. Some of the prominent factors that have operated in Chandigarh are:

- The old established sectors, such as sector numbers 27, 28, 19,20 and 21, have high residential crowding because the land values at the time of sale of plots were quite low and, thus, promoted the full construction of the house plot. At a later stage, these fully constructed houses, attracted a large number of persons. Also, the sectors, in which size of the plot was small and larger portion was to be kept as built-up area, have been developed at a fast rate. These have emerged as areas of high residential crowding, e.g., Sector 20, is in every respect a sector of common man. It has the smallest size of houses in Phase 1, looking like Railway compartments. In this sector, there are only few houses with 10 Marla(10X100') or more than this (Sector 20 D).

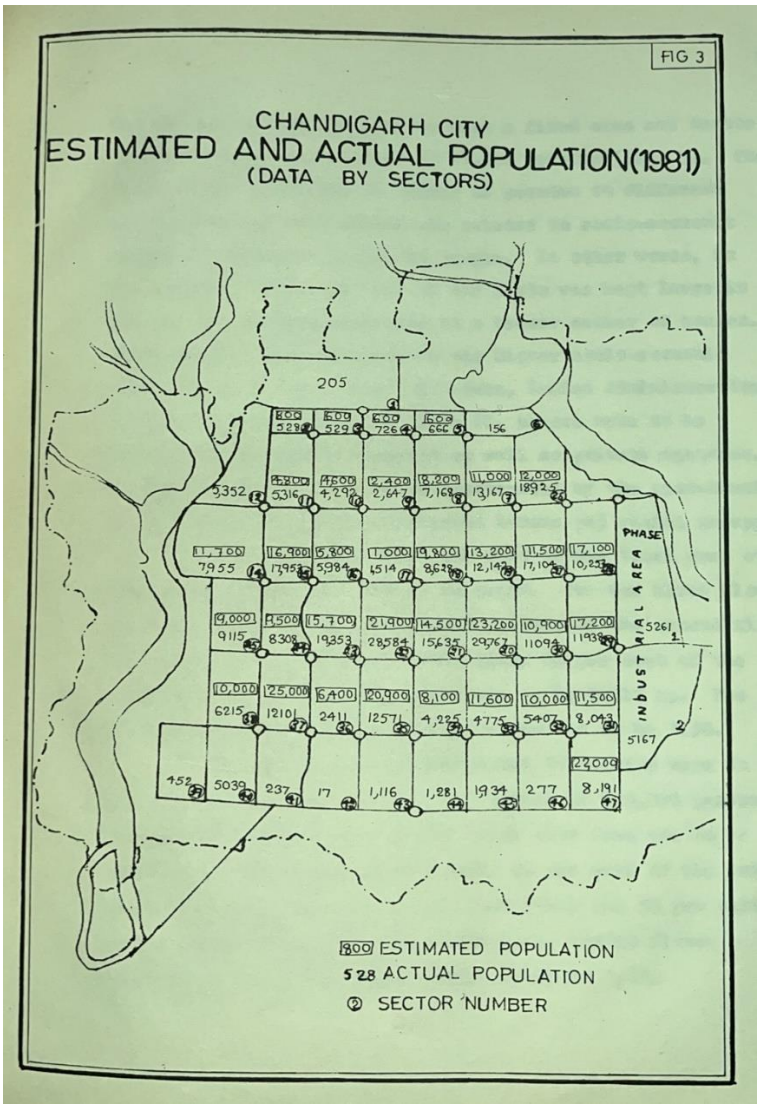
Most of the private houses in this sector are built in 7 and half Marla(82'X75') plots. Not only this, even government quarters are of lower type. This sector has one of the highest values of persons per house.

- Vertical expansion also contributed to a great extent in encouraging crowding, e.g., C and D parts of Sectors 20, 27, and 22 Shop cum Flats.

It is quite interesting to note that in a few sectors although the density of houses is quite low, the level of residential crowding is very high. These are the high-income group sectors 1-6, and the newly developed sectors of Phase II, i.e.,39,41,42 and 46.

This is related to:

- Houses of lower income group families are built as annexes in the larger houses. Sectors 1-6, meant for persons high social and economic status group, have houses built up over large sized plots, mostly as detached or semi- detached houses, thereby making density of houses low. But due to the annexes, structures constructed for the servants, also built up in that very plot, are contributing to a greater extent to the level of residential crowding by increasing the number of persons in each house.



Source of Map data-(India, 1981) Census of India

In comparison are sectors 17, 38, 37, 35, 31 and 40, which have low density of houses but high level of crowding. Amongst these, Sector 17 is the commercial and administrative centre comprising of large multi storeyed buildings. There is, thus, greater vertical expansion covering smaller area under construction leading to smaller density of houses. But in this sector considerable houseless population, like rickshaw pullers, Street hawkers, beggars, labour class workers, chowkidars of various administrative offices, lives thereby creating high level of residential crowding.

Other sectors located in Phase II, such as 38, 37, 35, 31,40 are newly developed sectors and hence only partially developed till now. In other words, in these sectors, a large proportion of the area has been planned to be constructed, but has not yet been fully constructed. Therefore, although all the house numbers planned to be constructed are included in the District Census Handbook But have not been constructed so far. Thus, pressure is on a few houses results in a very high residential crowding.

Pattern of Distribution of Scheduled Caste Population

It is one of the commonly used explanatory variables for explaining the pattern of density of population in towns. The scheduled caste population, as compared to other social and economic groups of population, is a socially and economically backward class and cannot afford large sized houses for living.

Therefore, generally residential crowding is observed in areas of their concentration. In other words, crowding is directly related to the proportion of scheduled caste population in an urban place.

In Chandigarh, in many blocks with high residential crowding, the concentration of scheduled caste population is also high. A positive co-relation(r=+0.58) has been identified between the level of residential crowding and the proportion of scheduled caste population living in a block. this value is significant at 6 levels of significance.

In Chandigarh, like other unplanned cities of India, scheduled caste population has been forced to move towards the peripheral areas. Some of the basic factors promoting this pattern are:

- In the Northern sectors in Chandigarh, meant for economically high-status people, a large proportion of scheduled caste population has been observed. Although, these sectors were not designed to contain the lower strata of the society, the necessity of functional dependence has resulted in the existence of these castes as appendages to the high social status groups and is the basic explanation for high levels of residential crowding in these sectors.
- In some sectors, high levels of crowding also correspond to a large proportion of scheduled caste population because of the location of Institutions and the employment offered by these. For example, in Sector 12, there is a high availability of lower menial jobs in the P.G.I., resulting in the concentration of the weaker sections of the society, particularly the scheduled caste persons.
- The southern part of Chandigarh comprises another area of high residential crowding corresponding to a high proportion of scheduled caste population.
- This part includes the Phase II sectors which are still developing. In these sectors, the control of administration is not very strong. A large number of unauthorised houses(huts) inhabiting labour class population have emerged.
- The Eastern peripheral sectors also have a high proportion of scheduled caste population employed in lower order jobs in the industries located in the industrial areas. However, unlike, other cities in India, the location of industries as well as concentration of a high proportion of Schedule Caste population is not accompanied by high level of residential crowding in these sectors.
- There is a general correspondence between areas of high proportion of scheduled caste population and areas of residential crowding in the blocks where low-income group housing (E.W.S.) has been provided. These are block numbers 398 and 400 in Sector 27; 439, 446 to 453 in Sector 29; 468, 460 and 473 to 475 in sector 30; 232 in Sector 21; 3 28 in sector 24; 496 and 497 in sector 32' 594 in Sector 45; and unauthorised housing, like jhuggies, in block numbers 363 to 385 in Sector 26.

In addition, specialised functional sectors also show a correspondence between high scheduled caste population and residential crowding, for instance, the scooter market is Sector 21.

However, this relationship is not true everywhere. For example, there are blocks with a high proportion of scheduled caste population but a low level of residential crowding. These are block numbers 60, sector 11; 71 Sector 12; 72 sector 14; 47 Sector 10; 13, 27, 28, 24 Sector 7; 357, 362 Sector 26; 165, 166 Sector 19; and 322 Sector 24.

These blocks are comprised of a large number of small sized houses, belonging to weaker sections of society barracks of Institutions, like a school, but not with hostels block number 71, 13, 166). Thus, although the proportion of scheduled caste population is high, the values for number of persons per house are low.

In comparison, there are blocks which have very high level of residential crowding but have either or very low proportion of scheduled caste population blocks. These are 59 Sector 11; 50 and 51 sector 10; 34 and 35 Sector 8; 19, 17, 9 and 12 Sector 7; 352 Sector 25; 80, 82, 85 and 84 Sector 14; 88, 89, 96, 91 and 102 Sector 15; 129 Sector 17; 147 Sector 18; 166 Sector 19; 392,412 and 406 Sector 27; 436, 420 Sector 28; 301, 319 and 320 Sector 23; 276, 277, 255 and 266 Sector 20; 478 sector 30; 568 Sector 39; 598 Sector 47. Most of these blocks have different types of Institutions, such as hostels, Dharmshalas, schools, shopping centres etc.

An Evaluation of Planning Proposals as a Means of Controlling Residential Density and Crowding

Chandigarh is a planned city. In this very specific zoning regulations have been applied to control the density of houses and population.

To implement zone in regulations, very elaborate framework of rules and regulations was provided in which a few basic principles have been applied in order to control residential crowding. Major among these is:

- The first basic principle of planning Chandigarh was to control crowding in the core area, i.e., Central Business District (Sector 17). However, in actual implementation it has failed and the situation in the City Centre appears like other unplanned cities of India all the in this case it may not be as bad as in other unplanned cities of India.
- The second principal of Chandigarh planning was to design houses for different social economic groups through different sizes of plots and houses. This has also failed. Through this proposal the lower income group and economically weaker sections were to be provided separate housing. The plan did not include any proposal for the bulk of the floating population that cities invariably attract. This class of population gets at different sides at particular times different planning stages. For instance, in the early stages of development of the city, labour colonies were located in the central part of the city (Bajwara in sector 22) as this class of population had to live close to their place of work.

However, after the completion of construction work in the interior sectors, they were forced towards peripheral areas where construction work was to start. This part of our society is not only employed in construction work but in other types of lower-level menial jobs too. Thus, with the completion of construction work some of them adopted other types of lower-level work. later on, when this population continued to live in Islam like areas, schemes for providing plots and cheap housing(tenements) for economically weaker section when implemented, the authorities faced a lot of difficulties in removing the unauthorised structures. wherever these tenements and slum like residential areas have continued to exist residential crowding has been high.

- To control vertical expansion, building by - laws were made. However, this measure has also not been successful in Chandigarh as construction of government housing is mostly flat type or box type (Triple Story). Thus, house more than the family in each house contributed to a large extent in the residential crowding.
- To provide lot of open space planners have imposed certain restrictions on the extent of built-up area in each plot. Thus, specified the portion of built up and Open Spaces at different floors of a house, i.e., floor space index (Table 1 and Table 2). This has also failed in Chandigarh as in this case, with the vertical expansion, space available for each person decreases the expected reduction in the number of persons does not take place.

Table 1: Chandigarh, Floor Space Index

Phase I

Total area of Plot in Yards	Built up area at		
	Ground Floor in Yards	First Floor in Yards	Second Floor in Yards
15 Marla 457.4	251.3	137.0	68.5
Living Space per person in %age	50.2	27.4	13.7
10 Marla 305.0	165.0	71.0	35.5
Living Space per person in %age	33.0	14.2	7.1
$7\frac{1}{2}$ Marla 228.7	125.6	68.5	34.2
Living Space per person in %age	25.1	13.7	6.8
5 Marla 152.5	82.5	35.5	17.7
Living Space per person in %age	16.5	7.1	3.5
EWS	-	-	-

Table 2: Chandigarh, Floor Space Index

Phase II

Total area of Plot in Yards	Built up area at		
	Ground Floor in Yards	First Floor in Yards	Second Floor in Yards
15 Marla 457.4	269.6	117.0	33.0
Living Space per person in %age	53.9	23.4	6.6
10 Marla 305.0	177.0	76.0	21.0
Living Space per person in %age	35.4	15.2	4.2
$7\frac{1}{2}$ Marla 228.7	134.8	58.5	16.5
Living Space per person in %age	26.9	11.7	3.3
5 Marla 152.5	88.5	38.0	10.5
Living Space per person in %age	17.7	7.6	2.1
EWS	-	-	-

- Through zoning, it was proposed to control the location of land uses. But in actual practice it has failed because certain sectors due to their locational advantages have attracted specialised functions leading to a high level of residential crowding.

A survey carried out by HUDCO, a central government corporation and the main financing agency for state housing boards, that a majority of the economically weaker section's housing financed by it so far, had gone to higher income households. The heavy demand for housing, the middle class makes it Virtually impossible to enforce and effective compartmentalisation between different income groups.

Thus, one of the major drawbacks in planning of Chandigarh was that no proposal was made in the planning of residences for floating population which is an integral part of every urban place of India. Consequently, unauthorised houses and jhuggies and other structures have appeared in many sectors.

For instance, commercial activity was dispersed in different sectors but some of the sectors, sectors such as 20, 27, 23, 21, 22, 19 develop interceptor markets. Institutional sectors, like Sector 12(P.G.I.), sector 14(University campus), and sector 11 and 10, where many of the colleges planned are located, created for residential purpose for in excess of what these sectors could provide. The result has been thatthese have become areas of very high residential crowding by accommodating larger number of persons for house.

The private house owners in such sectors try to acquire maximum exchange values through higher rents by renting out to a larger number of tenants. This has not been controlled through the planning proposals. Implicit in the Lee Corbusier's and CIAM's doctrine plan was a reliance on the use of rising land values as a means of financing urban development. Initially, residential land was sold at fixed prices based on development costs. However, as the problem inherent in the original short term financing policy became manifest, the auctioning of both residential and commercial land began to be used as a major means of raising finance for the cities development. The fundamental contradiction between relying

on, accepting and actually promoting a rise in land values, and the very objective of urban planning were never acknowledged by Lee Corbusier and his colleagues. They certainly have not been acknowledged by the Chandigarh administration. This has led to dire consequences for the majority of the city population in terms of acute overcrowding, a high cost of living and restrictions on the right to engage is certainly financially gainful occupations. Besides, these major principles which were taken into consideration have failed in actual but have failed in actual practice there are others which are totally lacking and indirectly lead to crowding.

Besides, failure of segregation of different social economic groups, principles of control on density of population has also failed by making 'Maximum Exchange' values from their tenants in case of private housing and allotting, use built for one household to more than one family.

Development of other satellite towns, like S.A.S. Nagar (Mohali) should have been restricted before the development of entire Chandigarh. However, Mohali has been developed before all the developed sectors from where, commuting to these factors has started, resulting in pressure on existing residential structures and hence, in these sectors crowding.

Conclusion

Vertical Expansion, Failure of principle of vertical expansion with floor space index, more proportion of scheduled caste population area, high density of houses, creation of unauthorised structures in the form of Jhuggies by floating population leads to more density of population and resultantly more crowding. Even large sizes plots for high socio-economic groups are crowded as helpers and chowkidars add number of persons per house. From the above discussion, it does not mean that Chandigarh planning has failed completely. It has been successful in industrial sectors. But this fact cannot be denied that architect of City Beautiful, planned by European planners in India, has failed in Indian land, especially in terms of residential crowding by laying out certain principles to avoid ill effects of crowding.

References

1. (2023, January). Retrieved from The Official Website of Chandigarh Administration: https://chandigarh.gov.in/know-chandigarh/general-information
2. India, G. o. (1981). *Census of India.* Government of India.
3. Kumar, A. (2022). Top 5 Well Planned Cities in India. Retrieved from https://www.squareyards.com/blog/top-well-planned-cities-in-india
4. Sudha Panda, S. R. (2021). Exploring urban dynamics of crowding with COVID-19 incidence A case study of Mumbai and Bengaluru city in India. *Journal of Urban Management, 10*(4), 345-356.