

## A Geographical Analysis of Housing Conditions in NCT of Delhi

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**Abstract :** Housing is one of the three basic needs of human life and an important indicator of social well-being. The simplest and the most traditional definition of housing is 'shelter'. For most of the individuals, it means a home, a permanent 'base' where a greater part of one's life is spent. According to Census, 2011 indicators of housing condition in NCT of Delhi are Number of Households with condition of census house as good (65.8%), Material of roof (Concrete 63.7%), Material of wall (brunt brick 86%), Material of floor (cement (64.7%), Number of dwelling rooms, Household size and Ownership Status (68.2%). This paper makes an attempt to analysis an intra city comparison of housing conditions of NCT of Delhi. For this purpose, the census data at ward level has been collected from the Table HH-14: House listing & housing census, 2011. Statistical techniques such as Composite index, Z score and Standard Deviation have been used for analysis of this data. The results show a lot of differences in the levels of housing conditions. Municipal wards exist in middle north and middle south of the NCT of Delhi i.e. 260,105, Cantt.0003, 51, 61, Cantt.0004, 73, 63, 237, 137, 225, 127, 256, 246, 252, 146, 258, 182, 21 and 7 have better housing conditions. The middle and south eastern wards of the NCT of Delhi i.e. 80, Cantt.0008, 224, Cantt.0002 have lack of housing conditions.

**Key Words:** Housing Conditions, Census House, Dwelling Rooms, Household Size, NCT of Delhi.

### 1.1 Introduction:

The simplest and most traditional definition of housing is "shelter." Every human being requires shelter and a roof over his head. For most of the individuals, it means a home, a permanent 'base' where a greater part of one's life is spent. It is a great force that moulds the mind, character, attitude, and behaviors of people. The location of housing determines the social and economic development of the citizens. Some studies have argued that the housing industry plays a crucial role in the political, economic, and social order.

Housing is one of the three basic needs of human beings, but it is still beyond the reach of the disadvantaged section of society. Housing conditions, availability of drinking water, sanitation facilities, etc. might contribute to the health improvement of the people and determine the quality of life of the society (Nayyar, 1997). Housing conditions determine the residential environment, which in turn is determined by the number of rooms in a house, open space, and material of building used in house construction. These facilities directly affect the socioeconomic status and prestige of a household (Nadia, 2012).

Houselessness is a major problem across the world in both rural and urban areas due to poverty, unemployment, low income, costly land and building materials. Good housing conditions are also important for people's health and affect childhood development. Housing costs make up a large share of the household budget and constitute the main component of household wealth. Everyone has the right to adequate housing, which means more than just four walls and a roof over their heads. Finally, housing is important to satisfy other essential needs, such as having a family. All these elements make a "house" a "home" and are essentially valuable to people (Streimikiene, 2015). Present paper has made an attempt to find the spatial pattern of housing conditions at municipal ward level in NCT of Delhi in 2011.

### 2.1 Study Area

Delhi, the capital city of India has 9 districts as North, North West, North East, South, New Delhi, Central, West, South West and East. There are three ULBs i.e. Municipal Corporation of Delhi, New Delhi Municipal Council and Delhi Cantonment Board (DB). There are total 272 wards of MCD, 9 wards of NDMC and 8 wards of Cantonment board in the NCT of Delhi.

Delhi, Mumbai and Kolkata have recorded a significant decline in the population growth rate during the period 2001-2011. However, Delhi's urban population growth is fastest at 26.8 per cent, with Mumbai and Kolkata being way behind, at 12 per cent and 6.9 per cent, respectively.

### 3.1 Data

Data relating to housing conditions have been taken from Table HH-14: House listing & housing census, 2011. Spatial data like topographical maps have been taken from survey of India. Topographical maps bearing numbers H43W13, H43W14, H43X1, H43X2, H43X3, H43X5, H43X6 and H43X7 have been used for spatial information. The municipal wards boundary map has been taken from Directorate of Census Operations, New Delhi and ORGI- Data Dissemination Unit (DDU) New Delhi. Administrative Atlas of NCT of Delhi (2011) and District Census Handbook, Series-08, Part XII-A have been taken from ORGI- Data Dissemination Unit (DDU) New Delhi.

### 3.2 Methodology

Census of India provides information relating to housing conditions at ward level. In this study the municipal ward has been taken as a unit of analysis for comparison. Ward map has been scanned, geo-referenced and digitized in Arc GIS software. In this study, a set of seven indicators have been taken for the spatial analyses of housing conditions at wards level in NCT of Delhi (Table: 1)

List of indicators used for determining housing conditions are given in Table-I:-

**Table: 1. Indicators and Variables of Housing Conditions**

Sr. no.	Indicators of Housing Conditions	Categories
1	Number of households with condition of census house as	Total (good)
2	Material of roof	Concrete
3	Material of wall	Burnt brick
4	Material of floor	Cement
5	Number of dwelling rooms	4+
6	Household size	5
7	Ownership status	Owned

In order to get spatial variations in the levels of development of housing conditions as good, material of roof, material of floor, material of wall, household size, number of dwelling rooms and ownership status, Z-score and composite index techniques have been used there.

$$\text{Formula of Z score} = Z = \frac{x - \mu}{\sigma}$$

**Z** = Standard score  
**x** = Observed value  
**μ** = Mean  
**σ** = Standard Deviation

A composite index has been made to know the differences in the level of development of housing conditions in NCT of Delhi. The higher value of composite index indicates higher development of housing conditions and lower value shows low development. Levels of development have been categorized into five categories i.e. very low, low, medium, high and very high. ARC GIS software has been used to show the spatial pattern of availability of housing conditions at the municipal ward level in NCT of Delhi through maps.

#### **4.1 Result and Discussions**

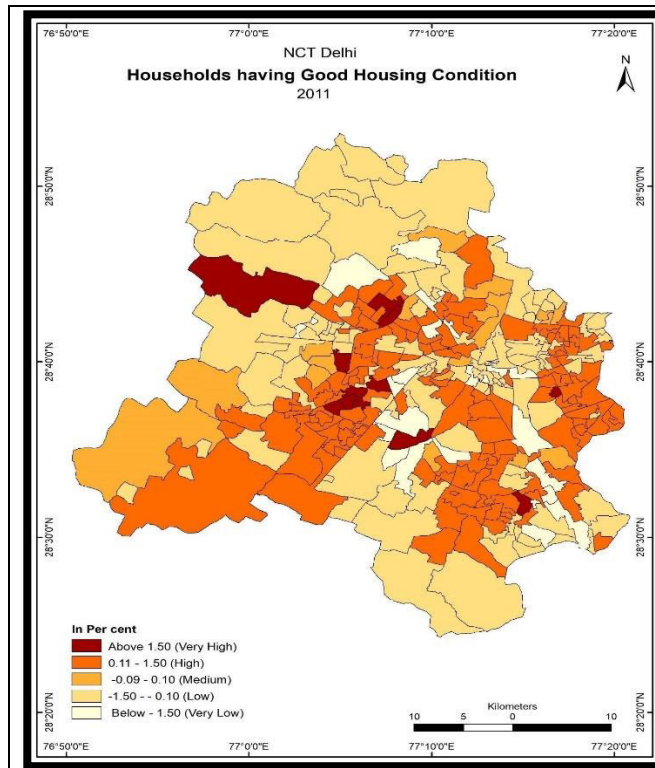
##### **4.2 Number of Households with Good Condition of Census House**

It is a very important indicator of the housing condition. There are more households in the good category than in the livable and dilapidated categories. So, in this study, only the total (good) category has been taken. The good housing conditions have been classified into five categories.

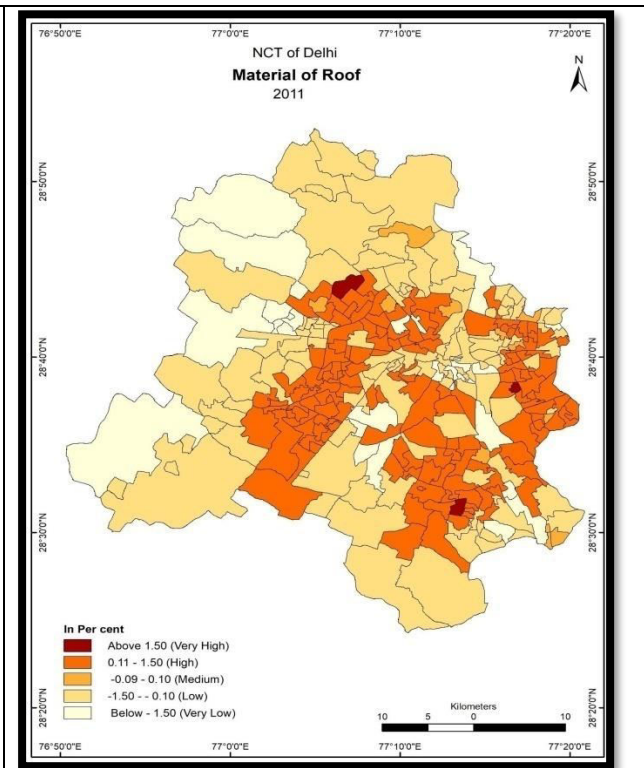
The category of very high level of good housing condition is represented by households in 11 wards. These are Cantt. ward no. 0003, and 0029, 0041, 0050, and 0051 wards of north west, 0105, 0109, 0114, 0117 and 0222 wards of west district, 0190 ward of south district. Ward No. 0029 of North West district has the highest z-score value- 3.52 which shows that this ward has the best housing conditions. The category of high level of housing condition is represented by households in 135 wards. Most of these wards exist in the middle, eastern and south western parts of the NCT of Delhi. Middle northern and middle southern wards of the NCT of Delhi have low level of good housing condition. Very low level of housing conditions among the households are seen in 24 wards, most of them from middle parts of the city. Ward no Cantonment - 02 of south-west district has lowest Z-score value (-3.45). These wards exist in the middle southern and middle northern parts in the NCT of Delhi (Map 1.1).

##### **4.3 Material of Roof**

The local climate is a significant factor in selecting roofing materials. Different materials have varying degrees of resistance to heat, cold, UV radiation, and moisture. In the material of roof concrete category has been used there. Central wards and middle eastern wards of the city are more developed than north and western wards of the NCT of Delhi. The category of very high level of material of roof is represented by 0021 ward of north-west district, 0105 ward of west district, 0184 ward of south district and 0222 ward of east district in NCT Delhi. These wards exist in the middle north and middle eastern parts in the NCT of Delhi.



Map 1.1

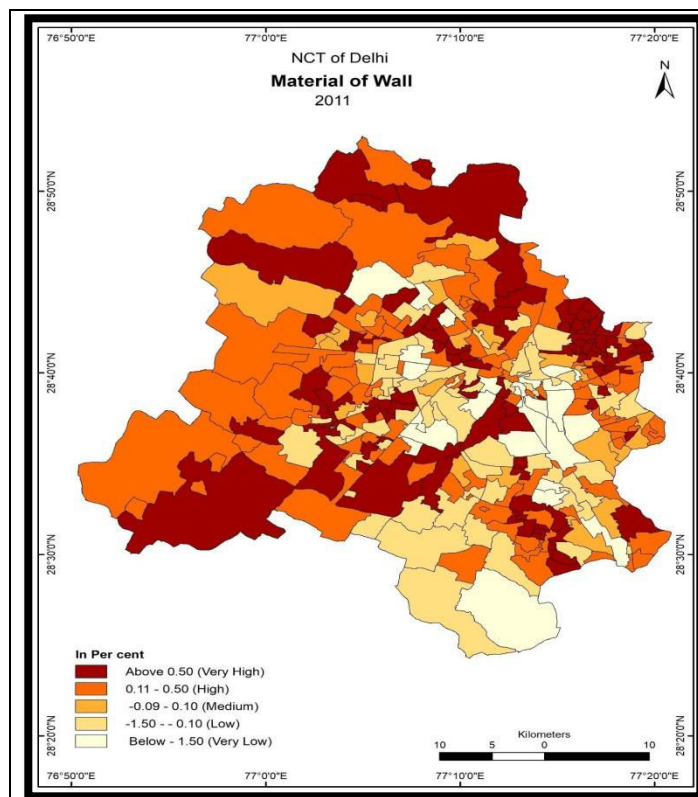


Map 1.2

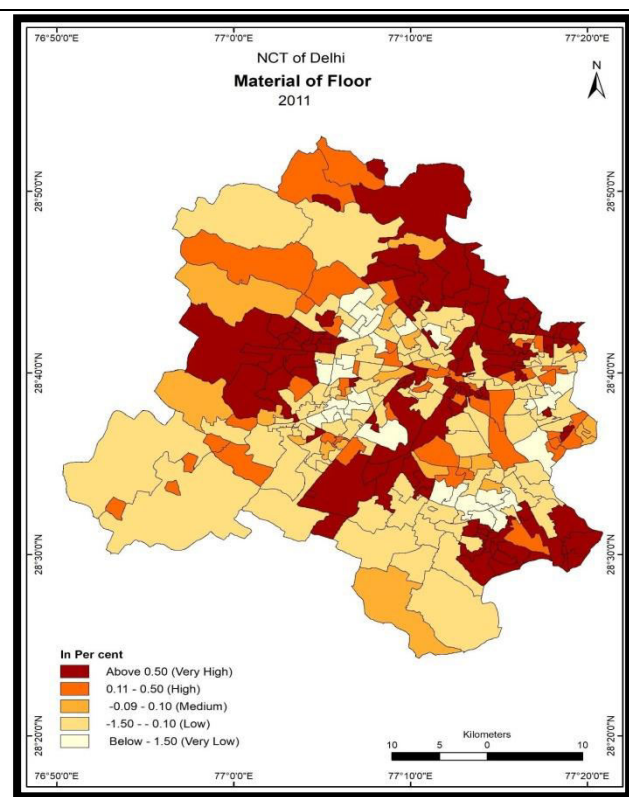
The category of high level of material of roof is represented by households in 144 wards. Most of these wards exist in the eastern and middle southern part in the NCT of Delhi. Some wards are also found in the western part of the city. Medium level wards are located in the middle north and eastern part of the NCT of Delhi. Low level of material of roof among the households are seen in 102 wards which are found in most congested parts of old city. Mostly wards exist in the northern and southern part in the NCT of Delhi. Some wards are also found in the western and middle part of the city. Cantt.0004 ward has very lowest z-score value -2.50 in the NCT of Delhi (Map 1.2).

#### 4.4 Material of Wall

The availability of certain materials in a specific region can affect the choice. Some materials may be readily accessible, while others may need to be imported, potentially increasing costs (Allison, 2004). Material of wall is also a good indicator of housing condition. The category of very high level of material of wall is represented by households in 87 wards. These wards occur in the northern, middle western and eastern part in the NCT of Delhi. The wards of high level are found in the northern, western, middle and eastern parts in the NCT of Delhi. Medium level of material of wall is found in 26 wards in NCT of Delhi.



Map 1.3



Map 1.4

Low level of material of wall among the households is reported in 64 wards which form the most congested parts of old city. Ward Cantt. 0002 of south west district has the lowest (-6.30) z-score value (Map 1.3).

#### 4.5 Material of Floor

It is also a good indicator of housing condition in any area. The environmental impact of flooring materials is becoming increasingly important. Sustainable and eco-friendly options, such as bamboo, reclaimed wood, cork, or recycled materials, are favored by environmentally conscious consumers. North eastern and southeastern wards are in very high category and middle western and south western wards are in low and medium category. Some Wards in the central part are in very low category. The category of high level of material of floor is represented by households in 49 wards, some of them form parts of old city and most belong to new parts. These wards exist in the north eastern, middle and south eastern parts in the NCT of Delhi (Map 1.4).

The category of high level of material of floor is represented by households in 96 wards, some of them form parts of old city and most belong to new parts. Very low level of

material of floor among the households are seen in 49 wards, most of them form outer parts of the city (Map 1.4).

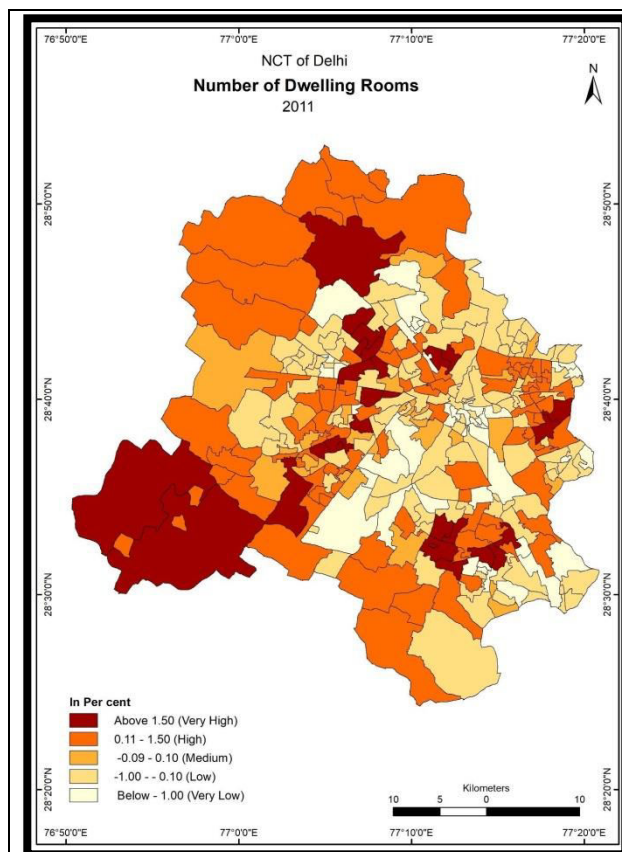
#### **4.6 Number of Dwelling Rooms**

The number of dwellings refers to the total count of housing units or residential and household size, on the other hand, it refers to the number of people living within a single dwelling or housing unit. It indicates the composition of a household in terms of the number of individuals residing together in a shared living space related to each other (Ledent, 2022). Number of dwelling rooms also shows the housing condition. According to census of India (2011), there are seven categories of dwelling rooms i.e. No exclusive room, One room, Two rooms, Three rooms, Four rooms, Five rooms, Six rooms and above.

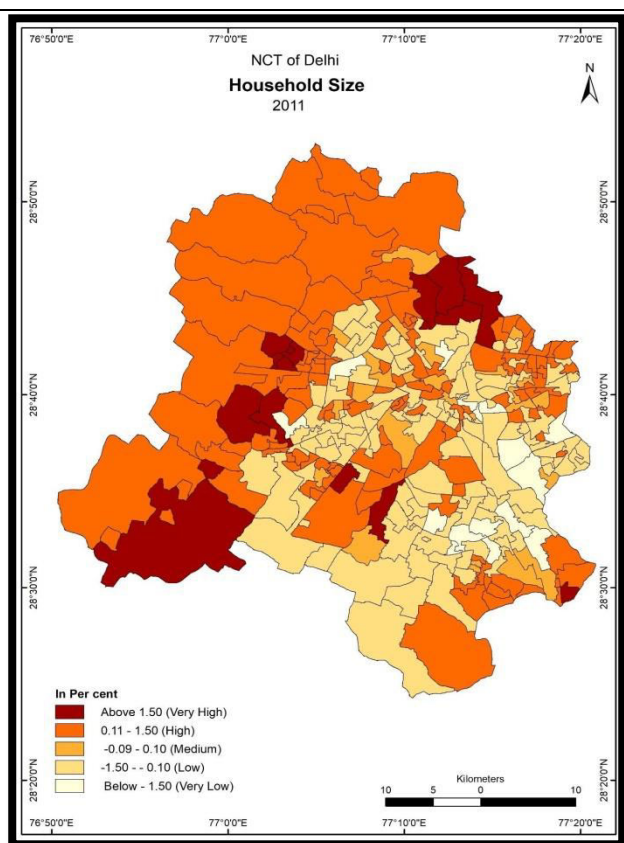
In this study more than four rooms category has been taken. North and western wards and some eastern wards of the NCT of Delhi are in very high category. Middle wards in NCT of Delhi are categorized in very low and low category. The category of very high level of number of dwelling rooms is represented by households in 26 wards, some of them from parts of old city but most of these wards belong to new parts of the city. These wards exist in the middle north, middle west and south eastern part in the NCT of Delhi. The category of high level of number of dwelling rooms is represented by households in 87 wards. These wards found in the north, middle and south western parts in the NCT of Delhi. Medium level of number of dwelling rooms and development is seen in 25 wards. These wards exist in the middle and middle western parts in the NCT of Delhi. Low level of number of dwelling rooms among the households is seen in 110 wards which form the most congested parts of old city. Very low level of number of dwelling rooms among the households are seen in 41 wards, most of them form outer parts of the city. These wards exist in the middle north and middle eastern parts in the NCT of Delhi.

#### **4.7 Household Size**

Household size is a negative indicator of housing condition. Highest number of household size shows the low development and lowest number of household size shows the highest development in household development. There are 1, 2, 3, 4, 5, 6 and above 6 categories of household size.



Map 1.5



Map 1.6

The wards of north and western parts of the NCT of Delhi have been categorized in the very high and high category. Middle eastern and southern wards of the NCT of Delhi have been categorized in low and medium category. The category of very high level of household size is represented by households in 15 wards. Mostly wards exist in the north eastern and western parts in the NCT of Delhi.

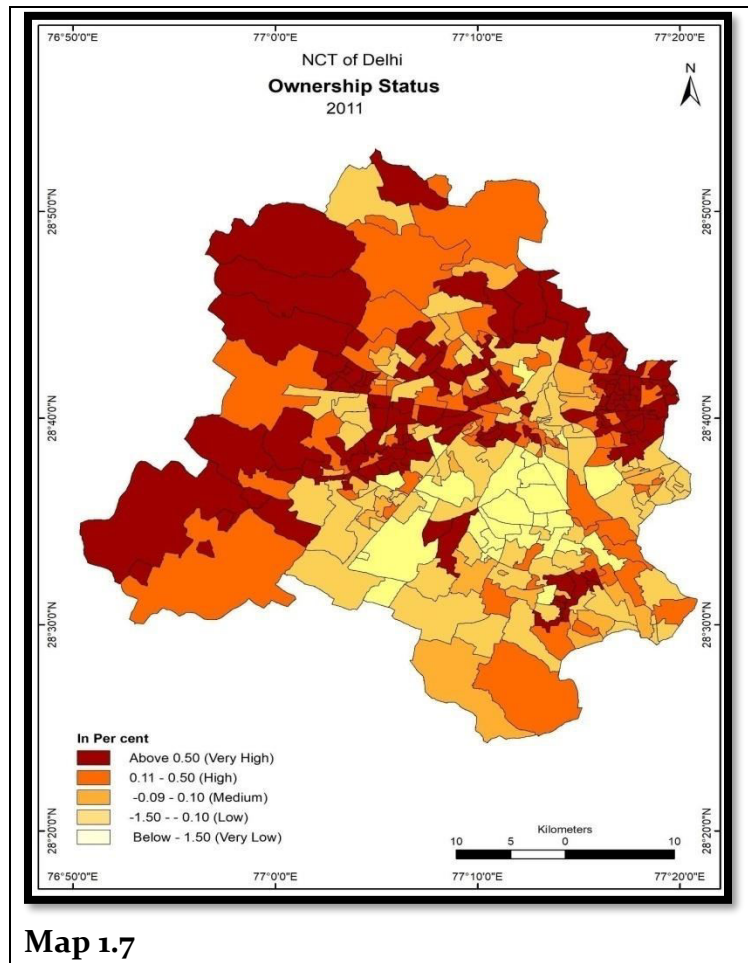
#### 4.8 Ownership Status

There are three categories of the ownership status as owned, rented and any other. In these categories owned category has been taken in present study. This can occur if households' ownership is associated with higher income levels, greater educational opportunities, and access to resources that promote literacy and cognitive development. Additionally, households' owners may prioritize education and literacy for themselves and their families (Danes & Morris, 1986).

The category of very high level of ownership status is represented by households in 105 wards. These wards are found in the western and middle northern parts in the NCT of Delhi. The category of high level of ownership status is represented by households in 63 wards. These wards exist in the north, west and south eastern parts in the NCT of Delhi.

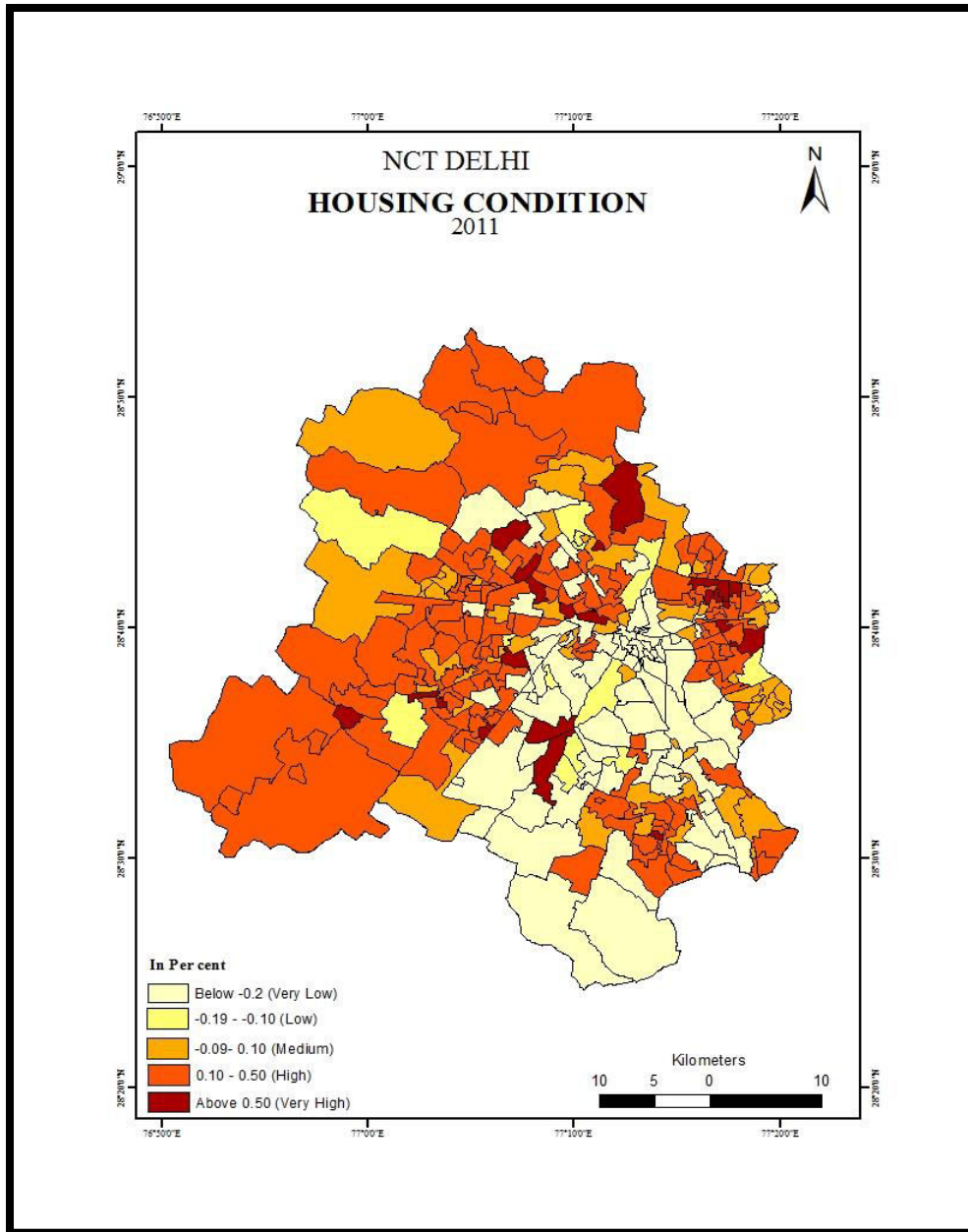


Medium level of ownership status and development is seen in 26 wards. These wards exist in the middle and eastern part in the NCT of Delhi. Low level of ownership status among the households is seen in 69 wards which are found in the middle and southern parts in the NCT of Delhi. Very low level of ownership status among the households is seen in 26 wards, most of them form outer parts of the city. Most of these wards are found in the middle part in the NCT of Delhi.



### Spatial Variations in Housing Conditions in NCT of Delhi

A composite index has been made to know the spatial variations in housing conditions in NCT of Delhi. The higher value of composite index indicates higher development of housing conditions and lower value shows low development. Levels of development have been categorized into five categories i.e. very low, low, medium, high and very high.



**Map 1.8**

Wards existing in middle north and middle south of the NCT of Delhi i.e.260, 105, Cantt.0003, 51, 61, Cantt.0004, 73, 63, 237, 137, 225, 127, 256, 246, 252, 146, 258, 182, 21 and 7 have better housing conditions because it covers a large areas of planned area as cantonment wards, well connected with infrastructural and transport facilities like Delhi metro line. The middle and south eastern wards of the NCT of Delhi i.e. 80, Cantt.0008, 224, Cantt.0002 have lack of housing facilities because these are the unplanned area and old region of NCT of Delhi .So these wards need improvement in the housing development (Map1.8). Physical features also influence the housing conditions in NCT of Delhi. Plain area lies in north west, west and south west and east region which is more

developed in housing conditions while ridge and hilly region lies in central and southern parts.

### 6.1 Conclusion

This paper shows the ward wise differences in the housing conditions in the NCT of Delhi. Variables of housing conditions i.e. number of households with condition of census house as good, material of roof (concrete), material of wall (brunt brick), material of floor (cement), number of dwelling rooms, household size and ownership status have been used to find out the spatial differences in the NCT of Delhi. Wards existing in middle north and middle south of the NCT of Delhi i.e. 260,105, Cantt.0003, 51, 61 and Cantt.0004 have better housing conditions because it covers a large areas of planned area, while wards 80, Cantt.0008, 224 and Cantt.0002 have lack of housing facilities because these are the unplanned area and old region of NCT of Delhi hence these wards need improvement in the housing development.

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