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SIGNIFICANCEOF OPEN SPACES IN COMBATING CLIMATE CHANGE

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ABSTRACT

The climate change figures are alarming us daily. Although open spaces help in regulating climate change, but they are vulnerable to climate change itself just like any other land use. In the city of Delhi, the spatial distribution of open spaces is marked by a high degree of variation. The status of open spaces in Delhi needs to be improved with stringent planning. With the changing climate impact, these open spaces become breathing spaces for its inhabitants. Open spaces have many functions such as habitat protection, stress reliever, recreational andalongside aesthetic value is added to the built environment. This study analyses the availability of open spaces in the districts of Delhi and recommends the positive impact of open spaces in reducing the impact of climate change. This study is important in the present scenario of ever-increasing population, migration, urbanization, privatization of urban open space. Spatial arrangement and magnitude of urban open spaces, both are important in the current scenario. Right proportion of green open spaces with built up areas may provide an authentic as well as sustainable solution for reducing the impact of climate change in urban areas.

KEY WORDS:OPEN SPACES, CLIMATE CHANGE, BREATHING SPACES, HABITAT PROTECTION, AESTHETIC VALUE

INTRODUCTION:

Open spaces have always been a concern for the cities that are exploding with high rising population. The functionality of open spaces is very significant in the backdrop of changing climate. According to RameGowda, 1974, there is a standard of 1.5 hectares of total open space per 1000 population as a minimum requirement. This standard has been used for open space availability analysis in this research study. This paper shall understand the open space planning and also find the importance of open spaces in reducing the impact of the changing climate, along with the distribution and types of open space.

The study area is the national capital of India, New Delhi. The cities can be made breathable and better only through its open space system. The availability and qualityof open space makesthe city recognizable and memorable. A sustainable city provides adequate access to open space, which included parks, playgrounds and recreation facilities to its residents. Numerous studies have also shown that parks and street trees lead to escalation in the property values. The nature of urban open space is much diversified. The city level open space is very important as it's a

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lifeline of the city. Lots of efforts have gone into the making of Development plans. The inefficient provision of open space reflects inadequacy of urban planning policies.

The concept of "open space" in urban areas now is not only limited to urban parks and preserves. Public spaces such as streets, schoolyards, outdoor sports complexes, cemeteries and public squares are all important open space (Hall and Ward, 1998). Baines (1999) writes on the short term or temporary open space such as waste lots, gap sites awaiting redevelopment but not currently managed. According to Thompson (2002), these areas are unspecified areas and these purpose specific open spaces are as much necessary as decorative parks. Chiesura (2004) suggests considering the variability in open space, these fulfill the demands of all the sections of the population. Venkatasubramanian (1991) defines open space as, "undeveloped or predominantly undeveloped land in an urban area which has a value for park and recreation purposes, conservation of land for historic and scenic purposes". Tankel (1966) writes, "open space includes not only land and water in and around urban areas which is not covered by buildings but the space and light above as well".

The conscious provision of open space is an important part of the modern town planning. Open spaces provide green areasas breathing spaces to the residents of apartments and in places of congested colonies; it helps in recreation for people of all age groups, it enhances the natural landscape around the public buildings and monuments. It is generally observed that people living in congested areas are more likely to visit the community open spaces. The distribution of open space has always been influenced by the city development. The land use change and the lifestyle of the community perhaps leads to modifications in extent and magnitude of open space.

The 2021 Master Plan includes an analysis of the "population holding capacity" of Delhi. It assumes an average density of 250 persons per hectare (100 persons per acre), redevelopment of already developed areas to enable higher density, especially along Metro corridors, as well as augmentation of infrastructure and increasing the transportation network capacity.

These calculations show that the holding capacity is 15,300,000, significantly less than the forecasted population. So, additional land must be acquired to accommodate the increased population. Future analysis predicts that Delhi will continue to face significant challenges as the population grows. Delhi will soon be 'a global metropolis and a world class city', it is essential for the city to make availableaccommodation and living for all its residents**.**so that people get good quality of life and are not forced to migrate to better areas that are less polluted with greener open spaces, where they breathe fresh air and have a place to relax. It is estimated that Delhi could be the world's most populous city by 2028 with 37.2 million people. The increase in urbanization of the world population is inescapable and irreversible. City population is expected to account for roughly half the world's population in the 21st century. Thus, urban planning becomes essential and fundamental for future developmental policies. Over the years, Master Plan remains to be the only planning instrument which stood test of time despite criticism, severe limitations and slow pace of implementation.

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OBJECTIVES:

1. To analyze the distribution of open spaces in the districts of Delhi
2. To understand the positive impacts of open space for combating climate change.

RESEARCH METHODOLOGY

In the study undertaken, open space includes all green spaces used for the recreational needs and environmental support of the population like parks, playgrounds, within the spatial limits of the Delhi Urban Area. The study excludes water bodies, graveyards, vacant lands, railways, road pavements. So, here the open spacemainly has the recreational functions as well as leisure time needs of the urban population.

The tools used for advanced environmental management are remote sensing technique and GIS. The data derived from the documents generally deals with descriptive features of open space in Delhi. GIS platform in the present study means the use of the software Arc View 3.2 A to study the information generated from satellite imageries/ maps. Analytical tools such as map overlays have helped in studying the spatial association of attributes such as density of built environment and open space, availability of open space in the wards of core, intermediary and peripheral zones of the city.

Table 1: Urbanizationtrend in Delhi

Census Year	Population	Urban population	Urban (percent)	Decennial Growth (percent)
1901	405819	214115	52.76	-
1911	413851	237944	57.50	11.13
1921	488452	304420	62.32	27.94
1931	636246	447442	70.33	46.98
1941	917939	695686	75.79	55.48
1951	1744072	1437134	82.40	106.58
1961	2658612	2359408	88.75	64.17
1971	4065698	3647023	89.68	54.57
1981	6220406	5768200	92.73	58.16
1991	9420644	8471625	89.93	46.87
2001	13782976	12819761	93.01	51.33
2011	16,753,235	16,333,916	97.49	26.56

Source: Economic Survey of Delhi 2010-11

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ANALYSIS OF OPEN SPACE IN DELHI

For analysis of open space, three zones were demarcated i.e. core, intermediary and periphery as shown in figure1. Table 2 shows the total open area in core, intermediary and peripheral zones. The core and the intermediary zones are mostly urban areas. The rapid pace of urbanization is indicated from the Table 1 that 97.50 of Delhi's population live in urban areas & the remaining 2.5% live in rural areas. Over the years, the number of villages in rural areas have decreased considerably confirming the increase in urban population & the urban areas.

Planning standards for open space in cities vary according to the measure of local conditions. According to RameGowda (1974), there is a standard of 1.5 hectares of total open space per 1000 population as a minimum requirement. We have also used the same standard for this study.

Table 2: Open Area in the Zones of Delhi, 2011

Zones	Area (Hectares)	Open Area (Hectares)	Population	Open Area per 1000 Population	Density of Population
Core zone	20207	2620	3981841	0.65	197.05
Intermediary zone	34502	6126	5537706	1.11	160.50
Peripheral zone	91553	10198	4330960	2.35	47.30

Source: Calculated from maps

Table 2 shows the data of open area and total area, open area per thousand population and the density of population in the three zones respectively.In the core zone, the open area per 1000 population comes to 0.65 hectares, in intermediary zone the value is 1.1 hectare, and in the peripheral zone the value is 2.35 hectare. This table shows the relationship between open area per thousand population and density of population. The density of population is decreasing from core to peripheral zone.As we move from the core to the periphery, the open space value is increasing but still the population in the core and the intermediary zones do not have open space availability as per the standard mark of 1.5 hectare because of higher density.Reason being that core and intermediary zones have higher density of population due to better infrastructure, employment opportunities, and development.The open space per thousand population is the most satisfying in the peripheral zone.The planned areas of the city seem to have relatively larger proportion of open space available as compared to the unplanned areas.

DISCUSSION AND ANALYSIS:

The imperativefact to take into consideration is that the open space must be available in right proportion to all the people. It must be given due importance. People living in the peripheral zone probably are happy and satisfied with the open space and that space will also help in environmental sustainability. This paper analyzes the right provision of open space. Presently the society is concerned for climate change and need of the hour is

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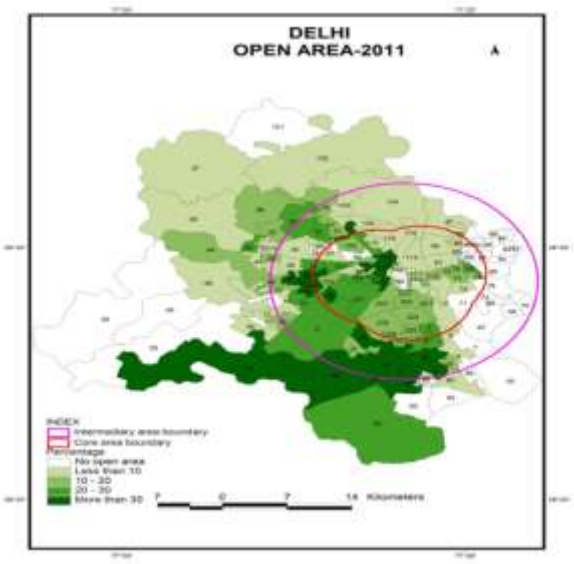
that we must promote the green spaces. This is essential and practical policies are needed for saving our open spaces and places that are denselypopulated need planning for some improvisations as required. Conservation goals can be achieved keeping in mind the following points:

- ✓ To provide better access of open space to the society
- ✓ To protect diversity of plant and animal species for protection of sustainable ecosystems
- ✓ To protect water quality, including surface and underground drinking water supplies, needed to sustain human life
- ✓ To promote institutional and community open spaces
- ✓ To improve quality of life and overall health of people, especially those with limited current access to open space.
- ✓ To preserve Delhi's historical buildings and surrounding parks and open area
- ✓ Vertical growth must be done wherever necessary. It is not a solution for all places as it puts immense pressure on resource and infrastructure.

Figure 1: Demarcation of core, intermediary and peripheral zones in Delhi



Source: Land Use Maps of Delhi by DDA

Figure 2: Open area per thousand population in Delhi, 2011

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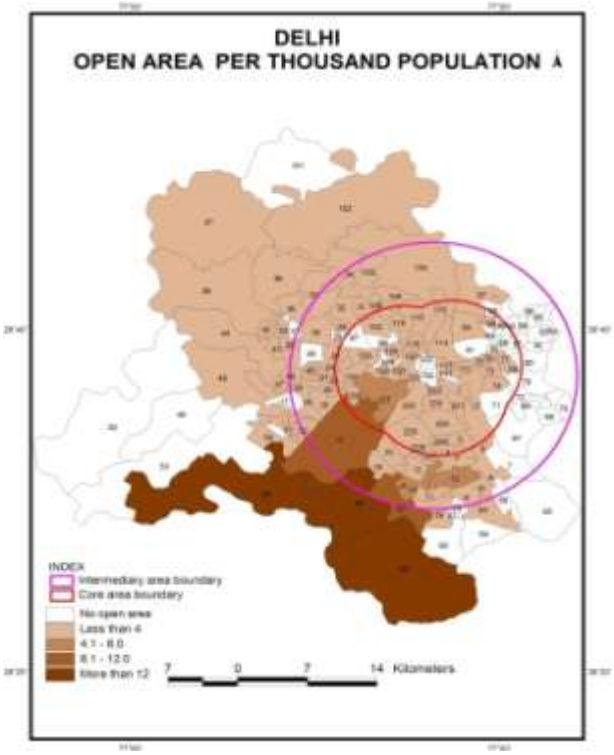

Source: Land Use Maps of Delhi by DDA

If we protect the open spaces, we also protect the natural resources in them and help people as well as communities to become more resilient to climate change. At present climate change is a global issue and it is affecting one and all. We are already witnessing the increase in annual temperatures. The urban heat island effect is increasing the heat-related impacts of climate change in urban areas, making increased temperatures and extreme hot weather events more severe, and more complicated.In a densely populated city, the urban heat island effect occurs when the temperatureis as much as 2 degrees higher compared to the suburban or rural areas. This is definitely because of less open spaces that are covered by concrete that has higher heat capacity to hold in comparison to open spaces.

If the green cover is increased in urban areas, then it shall help to reduce the urban heat island effect. The built surfaces shall be shaded by green cover. This will absorb heat and water vapour will be released through vegetation (evapotranspiration). So, if we plant as many trees as possible be it between buildings, schools, houses, apartments and colonies, then we may be able to save ourselves from the urban heat island effect. Keeping it cool is important for saving earth from climatechange impact.

Conservation and expansion of open green spaces in and around cities could be an effective mitigation strategy to counter the effects of urban heat islands. This shall help in increasing the open spaces as well as conserving them. This analysis helps us in understating the distribution of open spaces and the positive impact for combating climate change.

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SUMMING UP

The cities can be made better only through its open space system. The quality of open space creates an imageability of the city. A sustainable city provides adequate access to open space, which included parks, playgrounds and recreation facilities to its residents. Numerous studies have also shown that parks and street trees lead to increase in the property values. The nature of urban open space is much diversified. The city level open space is very important as that is the lifeline of the city. The provision of open space reflects inadequacy of urban planning policies. The district wise analysis shows the true status of open space that needs to be improved with proper planning.Developmental plans must be made with an in-depth analysis of the present status. The need of the hour is a partnership between government, community groups, nonprofit organizations, and private land owners to develop an Open Space Conservation Plan for Delhi.

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Figure 2: Open area per thousand population in Delhi, 2011

List of tables

Table 1: Urbanization trend in Delhi

Table 2: Open Area in the Zones of Delhi, 2011

References:

Baines, C. (1999) "Background on urban open space", Proceeding of the Scottish Urban Open Conference, Scottish Natural Heritage /Dundee, City Council, Dundee.

Census of India and DDA Sub-Group (MPD-2021)

Cheisura A. (2004) The Role of Urban Parks for the Sustainable City, Landscape and Urban Planning 68: 12-138.

Delhi Statistical handbook, 1992, 1994, 2002, 2004, 2006, and 2011 Directorate of Economics and Statistics, Government of National Capital Territory of Delhi.

Economic Survey of Delhi (2010-11) Planning Department, Government of NCT of Delhi.

Ramachandran H., (1991) "Greening of a Metropolis", Annals of Nagi, Vol. No. 1 June 1991, 9-27

Ramachandran R., (2001) Urbanisation and Urban Systems in India, Oxford University Press, New Delhi

Tankel, S.B. (1966), The Importance of Open Space in Urban Pattern, Cities and Space: The Future Use of Urban Land, John Hopkins Press, Baltimore, 57-71.

Thompson, C.W., (2002) Urban Open Space in the 21st Century, Landscape and Urban Planning 60(2): 59-72.

Venkatasubramanian, S., (1991), "Open Space in Delhi: An Analysis of Park User Characteristics", M.A. Field Survey Report Department of Geography, Delhi School of Economics, University of Delhi, Delhi.

Yadav, C. S. (1979), Land use in Big Cities: A Study of Delhi, Inter India Publications, Delhi, 272p.

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