

# Role of GIS in Utility Project For Spatial Distribution of Landmarks

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**Abstract:** GIS (Geographical Information System) is a computer based integrated database management system that stores a large volume of spatial data along with its attribute or non-spatial data which are captured, stored, retrieved, processed and analyzed to provide answers to queries of a geographical nature as and when required. Role of GIS technology in utility projects integrates common database operations such as query and statistical analysis with the unique visualization and the geographic analysis benefits offered by maps. These abilities distinguish GIS from other information systems and make it valuable to a wide range of public and private enterprises for explaining events, predicting outcomes and planning strategies. Urban planning is one of the main applications of GIS. Urban planners use GIS both as a spatial database and as an analysis and modeling tool. The applications of GIS vary according to the different stages, levels, sectors, and functions of urban planning. With the increase in user friendliness and functions of GIS software and the marked decrease in the prices of GIS hardware, GIS is an operational and affordable information system for planning. It is increasingly becoming an important component of planning support systems. Recent advances in the integration of GIS with planning models, visualization, and the Internet will make GIS more useful to urban planning.

**Index Terms** - Remote Sensing (RS), Geographical Information Systems (GIS), Global Positioning System (GPS), Spatial Analysis

## I. INTRODUCTION

Role of GIS technology in utility projects integrates common database operations such as query and statistical analysis with the unique visualization and the geographic analysis benefits offered by maps. These abilities distinguish GIS from other information systems and make it valuable to a wide range of public and private enterprises for explaining events, predicting outcomes and planning strategies. Urban planning is one of the main applications of GIS. Urban planners use GIS both as a spatial database and as an analysis and modeling tool. The applications of GIS vary according to the different stages, levels, sectors, and functions of urban planning. With the increase in user friendliness and functions of GIS software and the marked decrease in the prices of GIS hardware, GIS is an operational and affordable information system for planning. It is increasingly becoming an important component of planning support systems. Recent advances in the integration of GIS with planning models, visualization, and the Internet will make GIS more useful to urban planning. Landmark is a geographic feature. Anything which is easily recognizable is called a landmark. Landmark is used to designate places that might be of interest to tourists. Landmarks are often buildings such as hotels, museums, monument, heritage building and natural points of interest

that have a special historic interest and value as part of development. Webster dictionary describes landmark as “Any prominent feature of the landscape, as a tree or building, serving to identify a particular locality.” Landmarks may be divided into two categories – (a) Natural Landmarks – Physical features such as valleys, waterfalls, mountains are called Natural Landmarks. The second category of Landmarks is Man – Made Landmarks. (b) Man – Made Landmarks – These are features like buildings, bridges, monument and public squares

## II. Objective

The objectives of the study are as follows:-

- To study the spatial distribution of Landmarks in Chandigarh city with the help of GIS.
- To create a Database of Landmarks in Chandigarh city.
- Mapping of above said attribute in the GIS environment.

## III. Data Base

### A. DATA SOURCES:

Various types of data sources have been used in this report. The sources of data have been used as per the requirement of the objectives of the study. The sources of data collected can be put under the following two categories:-

#### (a) PRIMARY SOURCES:

The primary data was collected from the field survey during May -2015 through observation. Field survey was undertaken to collect information on attribute regarding the location, purpose, area, year of construction, aim of construction and dimension of Landmarks (size, shape, and direction).

#### (b) SECONDARY SOURCES:

The secondary sources encompass town plan, topographic map, guide maps of Chandigarh, CITCO, Atlas on the location of the landmarks information about the location and year of construction. The maps of some Landmarks are taken from Town Planning Offices in Sector 9 (D) and Chief Architecture Sector 9 (D).

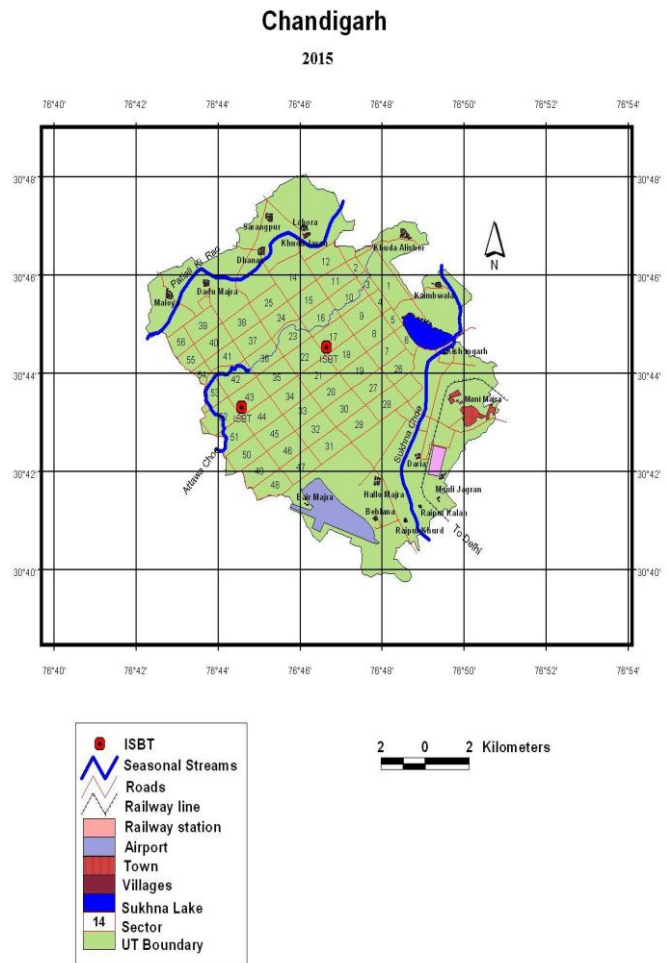
### B. MATERIALS AND METHODS:

The study of Landmarks in the Planned City of Chandigarh using conventional sources of data such as topographical sheets, guide maps, field survey as well as Remote Sensing and GIS. Efforts will also be made to put this Database into GIS format as a decision supporting tool

so that various trend answers to queries could be derived conveniently quickly and precisely. Situated to requirement of theme under study different methodology and techniques have been used. The technologies of Remote Sensing, GIS and Google earth ,(GPS) have been applied in this study. The entire work has been done by using GIS and Remote Sensing software Arc map 9.3.1 version. The interpretation was aided by ground truth and local knowledge. Base map of Chandigarh was georeferenced using (Ground Control Points) on Google Earth. Digitization was done in Arc Map 9.3.1 version software.

**IV. Study Area:**

Chandigarh, the dream city of India's first Prime Minister, Sh. Jawahar Lal Nehru, was planned by the famous French architect Le Corbusier. Picturesquely located at the foothills of Shivaliks, it is known as one of the best experiments in urban planning and modern architecture in the twentieth century in India. Chandigarh derives its name from the temple of "Chandi Mandir" located in the vicinity of the site selected for the city. The deity 'Chandi', the goddess of power and a fort of 'garh' laying beyond the temple gave the city its name "Chandigarh-The City Beautiful". The city has a pre-historic past. The gently sloping plains on which modern Chandigarh exists, was in the ancient past, a wide lake ringed by a marsh. The fossil remains found at the site indicate a large variety of aquatic and amphibian life, which was supported by that environment. About 8000 years ago the area was also known to be a home to the Harappans. It is joint capital of two states Haryana and Punjab.



Source: Department of Urban Planning Chandigarh Administration.

**V. SPATIAL DISTRIBUTION OF LAND MARKS WITH THE HELP OF GIS:**

In the spatial distribution of landmarks the role of GIS is very important in utility projects. There are 18 landmarks in Chandigarh City as per data of Town Planning Office, Chandigarh which will be described in this report. These are located in Sector 1, 3, 10, 14, 16, 17, 23, 36, 42, 43. Important Landmarks are Sukhna Lake, The Rock Garden, The Open Hand Monument, Leisure Valley, Zakir Rose Garden, The High Court, Legislative Assembly (Vidhan Sabha), The Secretariat, Gandhi Bhavan, Student Centre, Mountview Hotel, Taj Hotel, Government Museum and Art Gallery, City museum, Museum of Science / Evolution of Life, International Dolls Museum, The City Centre and Judicial Academy.

**VI. DISTRIBUTION OF LAND MARKS:**

**A.SUKHNA LAKE:**

Sukhna Lake is a rainfed lake created in 1958 by damming the Sukhna Choe, a seasonal stream coming down from the Shivalik Hills. Roughly kidney shaped, Sukhna Lake is located at 30 degree 44 minute North latitude and 76 degree 48 minute East longitude and elevation 380 meter with its concavity facing the Shivalik Hills. It is an artificial lake at the foothills of the Shivalik range and it's about 3 sq. km.

This lake is situated in Sector 1. This lake is 1.52 Kilometer long and 1.49 km. wide. The creation of the lake was one of the greatest gifts from Le- Corbusier. The city planners were deeply attached to the lake. So much so that Pierre Jeanneret's ashes were immersed in the lake in 1970 as per his wishes by his niece. The Lake become host in November for many exotic migratory birds like the Siberian duck, Storks, Canes, teals, pintails, brahiminy, spot bills, bar headed geese, cormorants, coots.

#### B. THE OPEN HAND MONUMENT:

The Open Hand Monument is located at 30 degree 45 minute North latitude and 76 degree 48 minute East longitude and elevation 363 meter. It is one of the finest and a significant monument of the city. It is located in amidst of the popular Capitol Complex houses three magnificent edifices namely the Secretariat, the High Court and the Legislative Assembly. It was constructed by Le Corbusier. The Open Hand is the symbol of peace and reconciliation.

#### C. THE HIGH COURT:

The High Court is a classic work of modern architecture. Its building is L-Shaped with the long facade facing the Capitol Plaza. The law interpreting monument was the first building in the Capitol Complex during 1951 – 57 and was completed in 1962. The Punjab and Haryana High Court has also been playing an active role in protecting and enforcing the rights of the people. The High Court is a temple of justice and a symbol of faith of people of the region.

#### D. THE LEGISLATIVE ASSEMBLY:

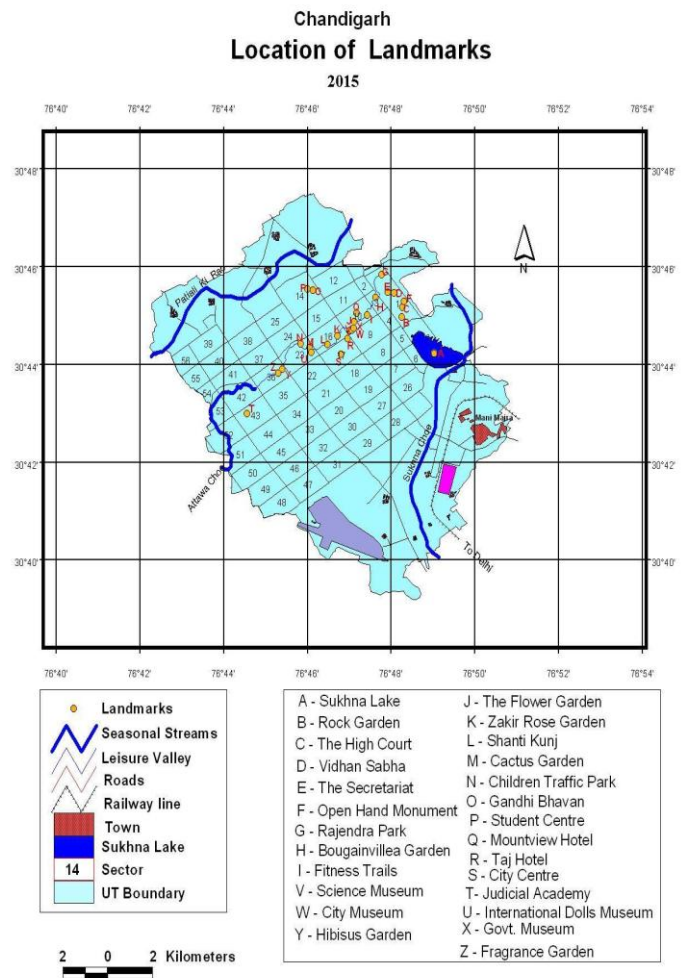
The Assembly building was completed in 1962 and conceived as a horizontal rectilinear structure square in plan with a monumental portico facing the main plaza. The two legislative chambers conceived as free standing, curvilinear forms enclosed within a rectilinear shell, carrying on one side the entrance portico and on the opposite side of band of offices. Similarly, the smaller Council Chamber (Haryana Assembly) conceived in a rectilinear frame is crowned by a pyramidal roof, provided with a north light.

#### E. THE SECRETARIAT:

The secretariat building is the headquarters of both Punjab and Haryana and the largest building in the Capitol Complex. The structure resembles the shape of an eight-storied concrete slab. The Secretariat is the longest and the tallest of all the structures in the Capital Complex. It was constructed during 1953-59. It was designed by Le-Corbusier.

#### F. GANDHI BHAVAN:

The Gandhi Bhavan is a lotus shaped building and located in Sector 14 in Panjab University. The Department of Gandhian Studies came into existence in 1965. Initially a one year certificate course in Gandhian Philosophy was started. In 1972, the certificate course was converted into a post-graduate diploma course in Gandhian Philosophy.



#### G. STUDENT CENTRE:

Student Centre is known as Stu-C. It is one of favorite eating joint inside Panjab University campus and also one of the most happening places for the youth of entire Chandigarh city. The office of the Panjab University students' council is located in the student centre, sector 14. The student centre is the hub of students' activities – academic, cultural, social and political, besides being a favorite eating and hanging out zone for students.

#### H. ZAKIR ROSE GARDEN:

Zakir Rose Garden was named after India's Former President Dr. Zakir Hussain. The garden was established in 1967 under the guidance of Chandigarh's first Chief Commissioner, late Dr. M. S. Randhawa. The Garden is located in Sector 16(B). This is the largest rose garden in Asia and is spread over an area of 27 acres and has more than 17000 plants representing some 1600 varieties of roses.

#### I. GOVERNMENT MUSEUM AND ART GALLERY:

The Government Museum and Art Gallery is located in Sector 10-C near the Zakir Rose Garden. It was designed by Le Corbusier and inaugurated on 1968. The museum is known for its collection of Gandhara sculptures, Pahari and Sikh miniature paintings and contemporary Indian paintings

and sculptures. Its visiting time is 10:00 a.m. to 4:30 p.m. It opens all days except on Monday and gazetted holidays.

#### **J. NATURAL HISTORY MUSEUM OR SCIENCE MUSEUM:**

The Natural History Museum traces the evolution of life with special focus on the 'Dinosaurs of India' and 'Evolution of Man'. The museum also has sections on 'Nature in Art', Cycloram.

#### **K. THE ROCK GARDEN:**

The Rock Garden is located at 30 degree 45 minute North latitude and 76 degree 48 minute East longitude and elevation 355 meter. It is situated between the Capitol Complex and Sukhna Lake in Sector 1. The popular sculpture Rock Garden covers an area of about 64 acres. It was constructed by Nek Chand using varieties of multi colored stones. It was first open for public viewing in the year 1976.

#### **L. INTERNATIONAL DOLLS MUSEUM:**

International Dolls Museum in Chandigarh is one of the best museums of our country. It is located in Bal Bhavan in Sector 23. It has interesting collection of dolls and puppets from the world covering the variant art of more than 25 countries. The Museum was established in the year 1985 by Chandigarh administration in collaboration with the Rotary Club of Chandigarh.

#### **M. THE CITY MUSEUM:**

The Chandigarh Architecture Museum was one of the greatest urban experiments of the 20<sup>th</sup> Century. It is one of the several activities pursued by the UT Administration during the fiftieth anniversary of India's independence. The city Museum was opened in December, 1997 and located in Sector 10 C.

#### **N. MOUNTVIEW HOTEL:**

Mount View Hotel is one of the best luxury 5 star hotels in Chandigarh. It is centrally located in Sector 10 of the administrative city of Chandigarh. It is well connected with all the major tourist and commercial centers of the city, and easily accessible from the airport and railway station. It is located amidst lush green lawns and majestic trees. It sprawls over seven acres of landscaped environs.

#### **O. TAJ HOTEL:**

Taj Hotel is the city's finest property and is well suited to both business and leisure travelers to Chandigarh. It is located in Sector 17-A, Block 9, the city's prime business and shopping area. Taj Hotel has 152 rooms equipped with the latest technology, ergonomic furniture and contemporary amenities.

#### **P. THE CITY CENTRE, SECTOR 17:**

The City Centre is the heart of the city and one of the most enjoyable places. Four pedestrians' concourses meeting at a

Central Chowk (intersection). The Sector 17 of Chandigarh is a pedestrian paradise dotted with fountains, sculptures and groves of trees. There are many government and private offices also big showrooms and excellent departmental stores cater to the needs of shoppers.

#### **Q. LEISURE VALLEY:**

Leisure Valley is also an important Landmark in Chandigarh City which is spread in Sector 1, 3, 10, 16, 23, 36, 42. Le Corbusier saw the bed of a seasonal rivulet used as a stream water drain and sculpted it into a linear park, now over 8 kms long, about 400 meters broad at its widest point oriented north east to south west. Sections of the Leisure Valley are known by separate names as:-Rajendra Park, Bougainvillea Garden, Fitness trails and the Flower Garden, Zakir Rose Garden, Shanti Kunj, Children Traffic Park, Hibiscus Garden, and Fragrance Garden.

#### **R. CHANDIGARH JUDICIAL ACADEMY:**

The academy is situated near the ISBT, Sector 43. It has been constructed by engineering department of the administration at a cost of Rs 63 crore. It covers an area of 8.5 acre in time of 22 months. Judicial Academy is under the High Court. The Academy is under training institute to train the employees of High Court under their judiciary.

#### **CONCLUSION :**

Most of the landmarks find a tendency to concentrate in northern and central parts of the city. Out of the total 18 landmarks covered in the study, most of the landmarks like the Open Hand Monument, Sukhna Lake, Rock Garden, the High Court, Vidhan Sabha, the Secretariat, Zakir Rose Garden, Gandhi Bhavan, Student Centre, Taj Hotel, Mountview Hotel, Government Museum and Art Gallery, City Museum, Museum of Science / Evolution of Life, International Dolls Museum, the City Centre and Judicial Academy of historical significance. Leisure Valley landmark is a natural site. The buildings of Capitol Complex (The High Court, Legislative Assembly, and the Secretariat) are heritage buildings. These landmarks are along Uttar Marg, Jan Marg, Vigyan Path and Madhya Marg roads.

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### **Internet**

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