

#AICTEinternship



Ministry of Education
Government of India



Ministry of Housing
and Urban Affairs
Government of India



MISSION AMRIT SAROVAR JAL DHAROHAR SANRAKSHAN

PUSA INSTITUTE OF TECHNOLOGY

TEAM NAME:- WATER CHANNEL AT OLD LODI BRIDGE (ATHPULA)

GEO-LOCATION:- [HTTPS://MAPS.GOOGLE.COM/?CID=2553871303996860632&ENTRY=GPS](https://maps.google.com/?cid=2553871303996860632&entry=GPS)

LOCATION:- ATHPULA BRIDGE, LODI GARDEN, SUBRAMANIAM BHARTI MARG, LODHI GARDENS, LODHI ESTATE, NEW DELHI, DELHI 110003, INDIA

COORDINATES:- 28.5965° N, 77.2228° E

GUIDED BY:- MR. TUSHAR DEV

ACKNOWLEDGEMENT

- IN SUCCESSFULLY COMPLETING THIS PROJECT, MANY PEOPLE HAVE HELPED US. WE WOULD LIKE TO THANK ALL THOSE WHO ARE RELATED TO THIS PROJECT.
- PRIMARILY, WE WOULD THANK GOD FOR BEING ABLE TO COMPLETE THIS PROJECT WITH SUCCESS.
- THEN WE WILL THANK TO **GOI** SPECIALLY **AICTE** WHO HAS PROVIDED US AN OPPORTUNITY TO PERFORM THIS PROJECT.
- THEN WE WILL THANK TO MY PRINCIPAL (**O.P. PANDEY**) AND (**MR. TUSHAR DEV**) TEACHER, UNDER WHOSE GUIDANCE WE LEARNED A LOT ABOUT THIS PROJECT. HIS SUGGESTIONS AND DIRECTIONS HAVE HELPED US IN THE COMPLETION OF THIS PROJECT.
- FINALLY, WE WOULD LIKE TO THANK OUR PARENTS AND FRIENDS WHO HAVE HELPED ME WITH THEIR VALUABLE SUGGESTIONS AND GUIDANCE AND HAVE BEEN VERY HELPFUL IN VARIOUS STAGES OF PROJECT COMPLETION.
- WITH MUTUAL SUPPORT AND COORDINATION WE HAVE TRIED TO DO SO. ACCEPT OUR APPOLOGY IF ANY MISTAKE(S) FOUND IN DURING WHOLE REPORT.

ANNEXURES

TOPIC NAME

A. INTRODUCTION

B. URBAN PLANNINGS

1. LOCATION OF WATER BODY
2. SIZE OF WATER BODY
3. EXTENT AND WATER HOLDING CAPACITY
4. INLET AND OUTLET
5. LOCATION

C. ARCHITECTURE

1. HISTORICAL CONTEXT AND GEOGRAPHICAL SETTING
2. SIGNIFICANCE (CULTURAL, HISTORICAL, RELIGIOUS)

D. URBAN DESIGN

1. SPATIO-TEMPORAL ANALYSES
2. FIELD VISIT
3. INTEGRATION IN THE URBAN FABRIC
4. ECOLOGICAL CONSERVATION AND REJUVENATION
5. CONSERVATION/PLANNING OF CATCHMENT

INTRODUCTION

- MISSION AMRIT SAROVAR INITIATIVE HAS BEEN LAUNCHED BY THE MINISTRY OF HOUSING AND URBAN AFFAIRS (MOHUA).
- MOHUA HAS IDENTIFIED 300+ CULTURALLY AND HISTORICALLY SIGNIFICANT WATER BODIES ACROSS THE COUNTRY IN WHICH LODHI BRIDGE (ATHPULA), BUILT OVER LAKE.
- WERE BUILT IN INDO-ISLAMIC ARCHITECTURAL STYLES.
- IS LOCATED IN LODHI GARDEN. ITS COORDINATES ARE AS FOLLOWS:- 28.5931° N, 77.2197° E
- THE MONUMENT WAS CONSTRUCTED DURING THE REIGN OF **SIKANDER LODI**, THE SON OF BAHLOL LODI, WHO RULED FOR TWENTY-EIGHT YEARS FROM AD 1489-1517
- ITS HISTORIC STRUCTURE, BEAUTY AND PANORAMIC VIEW IS SUFFICIENT TO ATTRACT TOURISTS TO VISIT.

ABOUT LODHI GARDEN

- LODI GARDEN, LOCATED ON LODI ROAD BETWEEN SAFDURJUNG'S TOMB AND KHAN MARKET IN SOUTH DELHI, COVERS AN AREA OF 90 ACRES AND IS DOTTED WITH BEAUTIFUL MONUMENTS AND TOMBS, BELONGING TO THE SAYYID, LODI AND MUGHAL DYNASTIES.
- IT WAS KNOWN AS *BAAG E JUDAI* OR *VIDAAI BAAG* (GARDEN OF SEPARATION OR GARDEN OF FINAL FAREWELL).
- IT IS SPRAWLING GREEN PARK IS LOCATED IN THE HEART OF DELHI.
- IT HOUSES THE MAUSOLEUMS OF TWO DELHI SULTANATE RULERS NAMELY MOHAMMED SHAH AND SIKANDER LODHI ALONG WITH OTHER STRUCTURES.
- THE ARCHITECTURAL HERITAGE OF AROUND 500 YEARS AND THE SERENE GREEN SETTING MAKE IT A PRIME ATTRACTION IN DELHI.

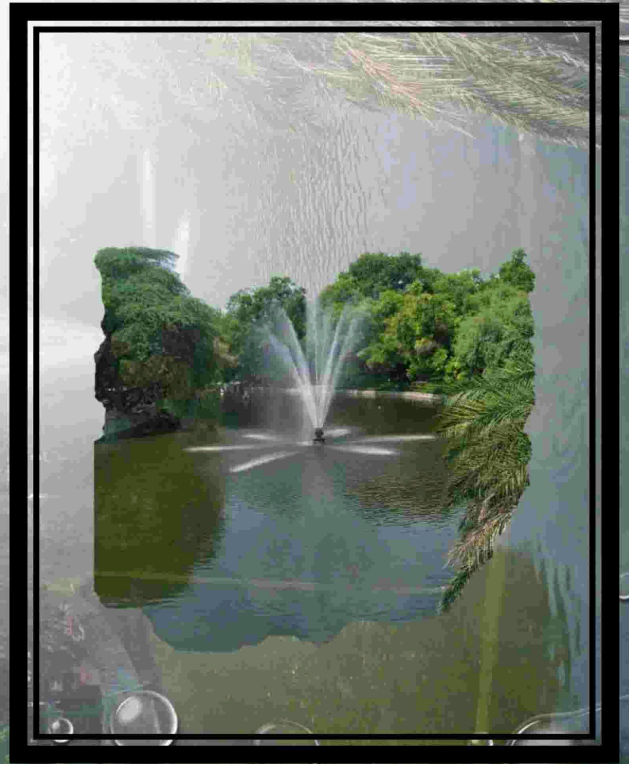


HISTORICAL ASPECTS

- **LODI GARDENS TRACES ITS HISTORY BACK TO 1444 WHEN THE TOMB OF MOHAMMED SHAH, A SAYYID DYNASTY RULER OF THE DELHI SULTANATE, WAS ERECTED HERE BY HIS SON AND THE LAST RULER OF THE DYNASTY, ALA-UD-DIN ALAM SHAH.**
- **ANOTHER SIGNIFICANT TOMB LOCATED IN THE AREA IS THAT OF SIKANDER LODI FROM THE LODI DYNASTY, WHICH WAS BUILT IN 1517 BY HIS SON IBRAHIM LODI.**
- **WHEN EMPEROR AKBAR OCCUPIED THE THRONE OF DELHI, HE MADE USE OF THE LODHI GARDENS AREA AS AN OBSERVATORY AND STORED RECORDS IN A LIBRARY BUILT FOR THIS PURPOSE.**
- **LADY WILLINGDON, THE WIFE OF MARQUESS OF WILLINGDON (THE THEN GOVERNOR GENERAL OF INDIA) LANDSCAPED THE AREA AND TURNED IT INTO AN ATTRACTIVE GARDEN. THE GARDEN WAS OFFICIALLY INAUGURATED IN 1936 AND WAS GIVEN THE NAME LADY WILLINGDON PARK TO HONOR HER EFFORTS.**
- **WHEN THE COUNTRY GAINED INDEPENDENCE IN 1947, IT WAS RENAMED AS LODHI GARDENS.**

GEOLOGICAL ASPECTS

- It constitute of many substructure which makes its geologically important.
- Architectural places to visit in L.G.:-
 - Tomb of Sikander Lodi
 - Sheesh Gumbad
 - Athpula Bridge
 - Lodi Lake
 - Swan and Duck House
 - Fountain
 - Gateway
 - Mosque



WHY IT IS SO IMPORTANT TODAY?


- **ONE OF THE TOP HISTORICAL PLACES IN DELHI.**
- **ITS GARDEN ACT AS PICNIC SPOT.**
- **THERE ARE MANY A REASONS PRESENT WHICH MAKES IT WORTH IMPORTANCE MORE DELIGHTLY.**
- **ITS PANAROMIC VIEW MAKES ANYONE ADMIRED.**
- **ITS HISTORICAL ASPECTS MAKES IT WORTH.**
- **THE PARK CONTAINS NUMEROUS OF ENDANGERED TREES AND SHRUBS.**
- **ITS UNIQUE CIVIL ENGINEERING IS ROLE MODEL NOWADAYS.**
- **RRM (REGULAR RUBBLE MASONARY) TECHNIQUE IS USED FOR MAINTAINING ITS AESTHETIC APPEARANCE.**

INFORMATION BULLETEIN:-

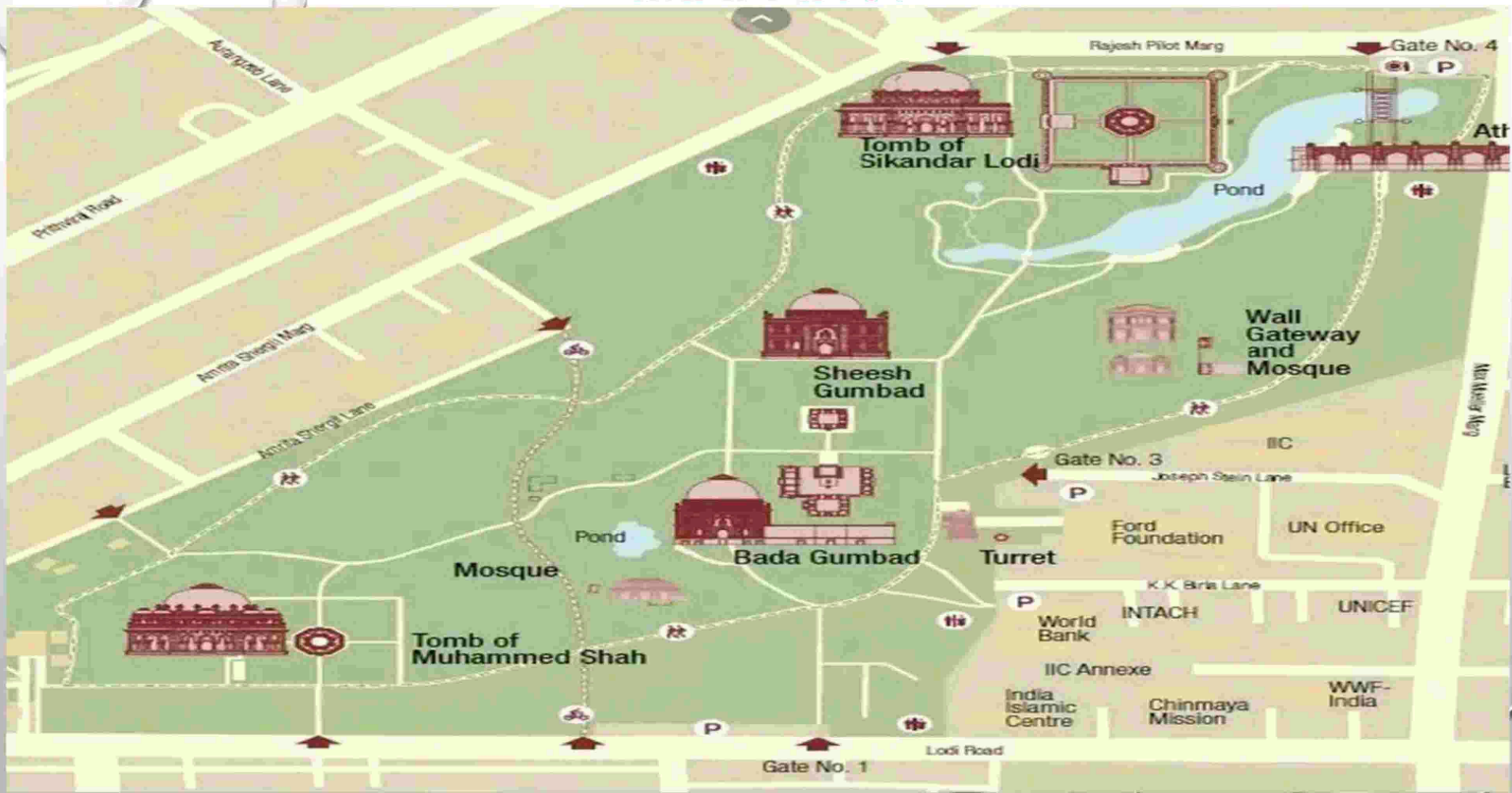
LOCATION	LODHI ESTATE, NEW DELHI
TYPE	CITY PARK
FORMERLY KNOWN AS	LADY WILLINGDON PARK
ORIGINS	1444
AREA	90 ACRES
TIMINGS	05:00 AM to 08:00 PM (APRIL TO SEPTEMBER) 06:00 AM TO 08:00 PM (OCTOBER TO MARCH)
ENTRY FEE	NIL/FREE
NEAREST METRO STATION	JORBAGH METRO STATION AND LOK KALYAN MARG METRO STATION



URBAN PLANNINGS

- **URBAN PLANNING, ALSO KNOWN AS REGIONAL PLANNING, TOWN PLANNING, CITY PLANNING, OR RURAL PLANNING, IS A TECHNICAL AND POLITICAL PROCESS THAT IS FOCUSED ON THE DEVELOPMENT AND DESIGN OF LAND USE AND THE BUILT ENVIRONMENT, INCLUDING AIR, WATER, AND THE INFRASTRUCTURE PASSING INTO AND OUT OF URBAN AREAS, SUCH AS TRANSPORTATION, COMMUNICATIONS, AND DISTRIBUTION NETWORKS AND THEIR ACCESSIBILITY.**
- 

-:MAPPING:-



:-MAPPING:-

DELHI HILLS, FORESTS AND A RIVER

In a fast growing city, the place of nature is very challenging. On one hand, it faces the core demands, based on which the city develops further on the other hand, it faces various challenges in the form of urban development. The research in this report aims to explore the role of nature in making the city more livable. On the way, the relationship of nature with culture and life and maps ecologically significant areas. Delhi's natural and historical relationship of nature with culture and life and maps ecologically significant areas. Delhi's natural and historical relationship of nature with culture and life and maps ecologically significant areas.

JOURNEY SO FAR
The last 100 years have seen the changing relationship of different cultures with nature over time. In a fast growing metropolis, it is helpful to know the natural context and analyze the opportunities for the conservation of nature.

MAPPING NATURE
The map lets us identify significant areas, both natural and man-made. Forests, trees, parks, lakes and water bodies in the city. The historic character of the city surfaces through in the many water bodies and heritage buildings.

This is a project on the history of Delhi. We would appreciate your feedback and suggestions. We would be happy to receive your suggestions. We would be happy to receive your suggestions.

THE REGION

Spans of Aravalli Range in Delhi is the oldest fold mountain in India - and the Yamuna - a tributary of river Ganga - are two major features which frame the triangular-shaped region. While there was a scattering of settlements in the region, the urban settlements of Delhi developed, more profusely, around the Aravalli Range in the south of the Yamuna.

A part of the Aravalli Range in the south and north of Delhi is the Yamuna river. The Yamuna river is a part of the Aravalli Range in the south and north of Delhi. The Yamuna river is a part of the Aravalli Range in the south and north of Delhi.

CHANGING COURSE OF RIVER YAMUNA
The Yamuna river has changed its course over time. The Yamuna river has changed its course over time. The Yamuna river has changed its course over time.

DELHI'S WATER MANAGEMENT SYSTEM

The Delhi water management system is a complex one. It involves the Yamuna river, the Aravalli Range, and the city's water supply system. The Delhi water management system is a complex one. It involves the Yamuna river, the Aravalli Range, and the city's water supply system.

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DELHI'S WATER SUPPLY

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JOURNEY SO FAR

1 NESTLED IN THE HILLS

Securely nestled in the hills, most of the earlier settlements - Lal Kot, Dahi-Indraprastha (Old Delhi), Siri, Jahangirpuri and Tughlakabad - were in the south.

The Ridge had forests, gardens, orchards and public grounds. Level areas were used for agriculture. The ridge of the Aravalli Range was used for agriculture. The ridge of the Aravalli Range was used for agriculture.

2 ON RIVERFRONT

The eastern bank of the Yamuna river played a significant role in the development of Delhi. The eastern bank of the Yamuna river played a significant role in the development of Delhi.

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3 CHANGING ROLES OF NATURE

The role of the Ridge forest in the 19th century was ecological protection and recreational. The role of the Ridge forest in the 19th century was ecological protection and recreational.

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4 NATURE IN A GROWING METROPOLIS

After India's independence in 1947, Delhi became a fast growing city. The role of nature in a growing metropolis is a complex one. The role of nature in a growing metropolis is a complex one.

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5 NATURE IN A GROWING METROPOLIS

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-:NEARBY PLACES:-

- **SAFDARJUNG TOMB (WEST TO L.G.) APPROX. 500MTRS.**
- **PURANA QILA 2.6KM**
- **NATIONAL HANDICRAFTS AND HANDLOOMS MUESUEM (2.8KM)**
- **RASHTRAPATI BHAWAN (3.1KM)**
- **INDIA GATE (3.8KM)**
- **HUMAYAUN'S TOMB (3.1KM)**
- **NATIONAL ZOOLOGICAL PARK (3.2KM)**
- **LODI ERA TOMB (EAST TO L.G.) (APPROX. 15000MTRS.)**
- **LODHI ERA BAOLI (WEST TO L.G.)**
- **HAUZ KHAS KILA (SOUTH)**

Lodhi Era Tomb
4.2 ★★★★★ (23)

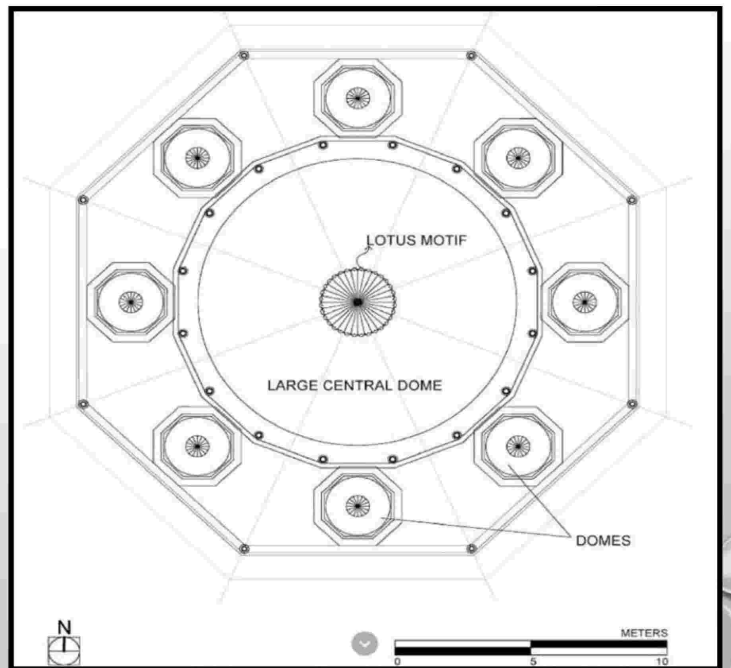
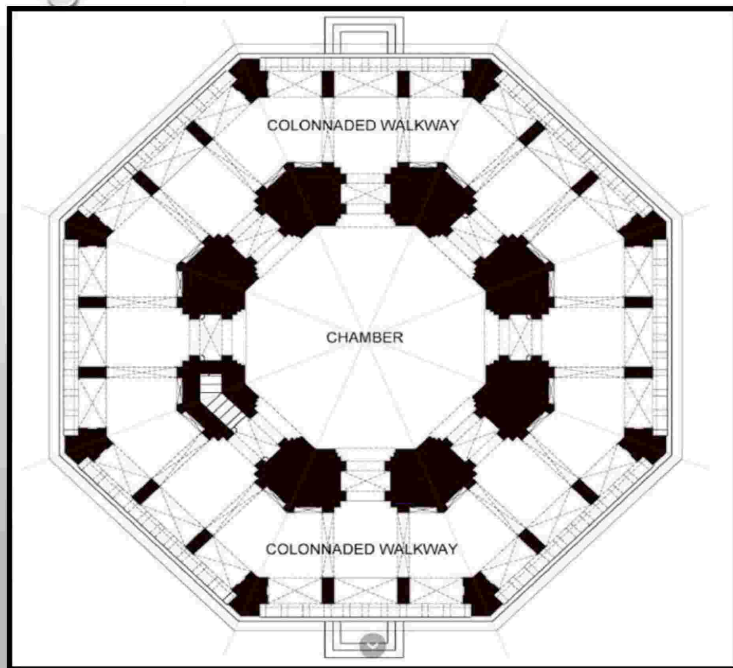


TOMB OF MUHAMMED SHAH SAYYID

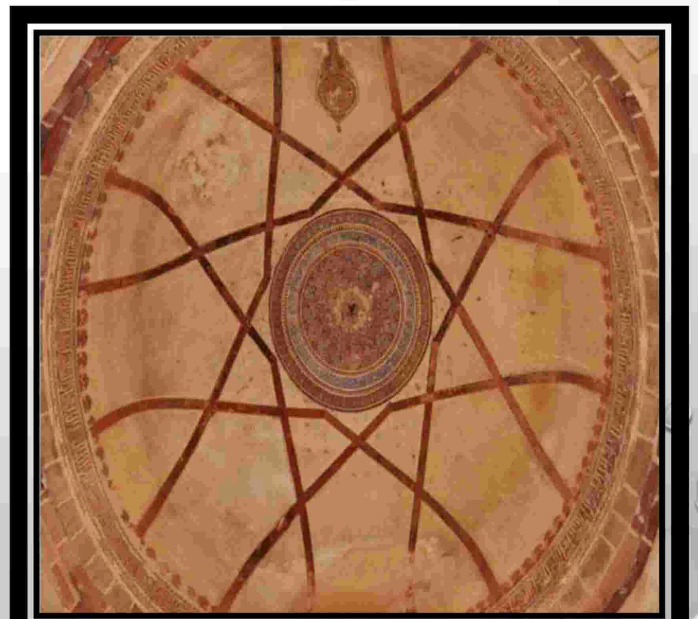
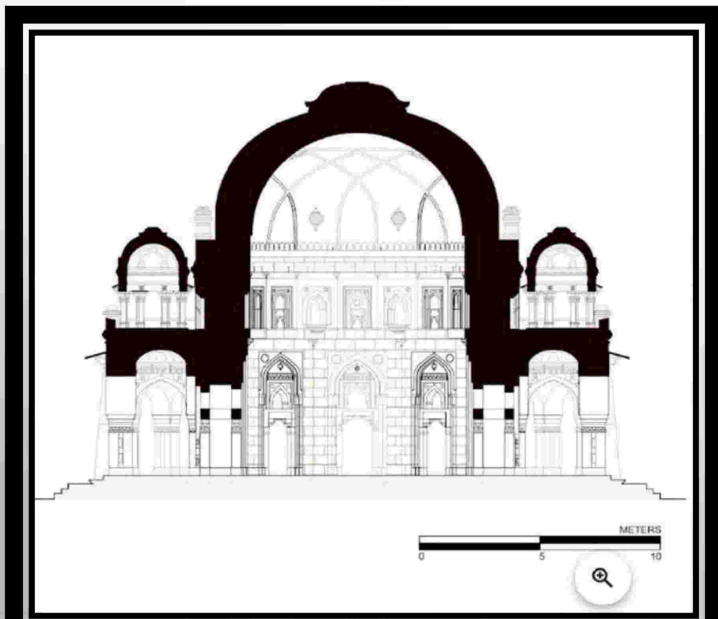
- **MUHAMMED SHAH BELONGED TO THE RELATIVELY SHORT LIVED SAYYID DYNASTY WHICH LASTED FROM 1414-1451.**
- **ONE OF THE FEW ARCHITECTURAL REMAINS OF THIS PERIOD IS THE TOMB OF THE THIRD SAYYID RULER, WHO RULED FROM 1435-1445.**
- **IT HAS SOME DISTINCTIVE FEATURES OF ITS TIME – AN OCTAGONAL PLAN, CORNER BUTTRESSES, DECORATIVE PLASTER FINISH, CORBELLED DOORWAYS AND CHHATRIS ON THE ROOF.**
- **THE GRAVES INSIDE ARE THOSE OF MUHAMMED SHAH AND PROBABLY OTHER MEMBERS OF HIS FAMILY.**



FRAMEWORK

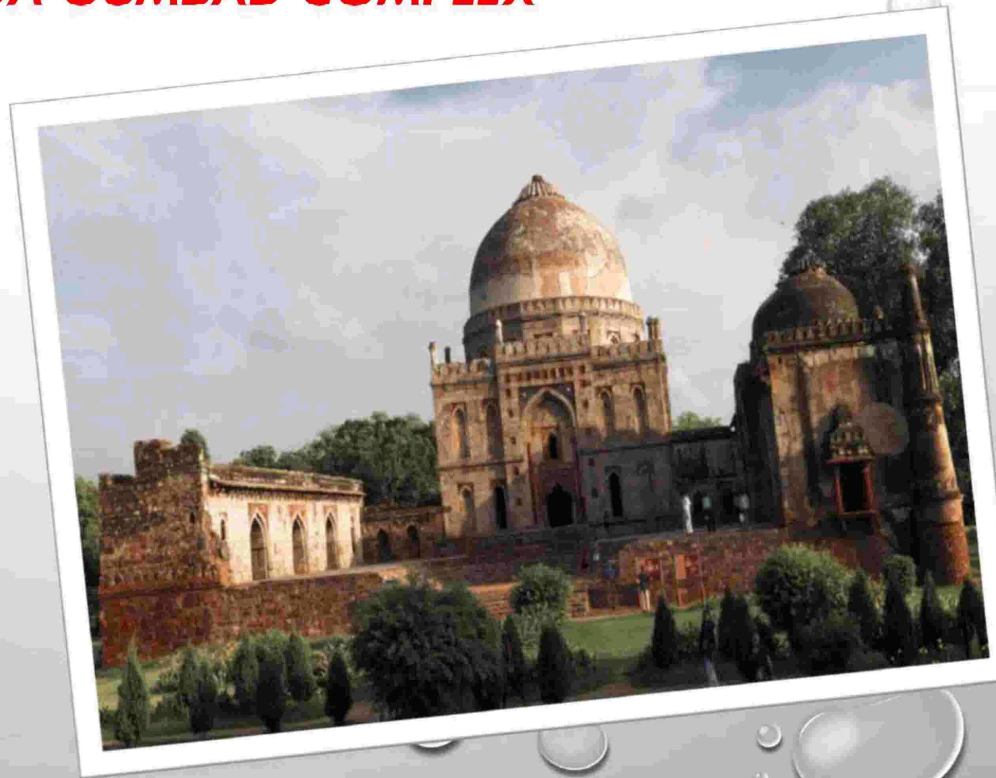


**TOMB OF MUHAMMED SHAH SAYYID, LODI GARDEN, IN THE REIGN
OF ALAUDDIN ALAM SHAH., FROM THE COLLECTION OF:
INDIAN NATIONAL TRUST FOR ART AND CULTURAL HERITAGE
(INTACH), DELHI CHAPTER**



BADA GUMBAD COMPLEX

- **THE BADA GUMBAD COMPLEX IS LOCATED IN THE CENTRAL PORTION OF THE LODI GARDEN AND INCLUDES THE BADA GUMBAD, A MOSQUE AND AN ARCHED PAVILION KNOWN AS THE MEHMAN KHANA. THE AREA WAS DEVELOPED AS THE 'LADY WILLINGDON PARK' IN 1931, AS PART OF THE CITY OF NEW DELHI.**

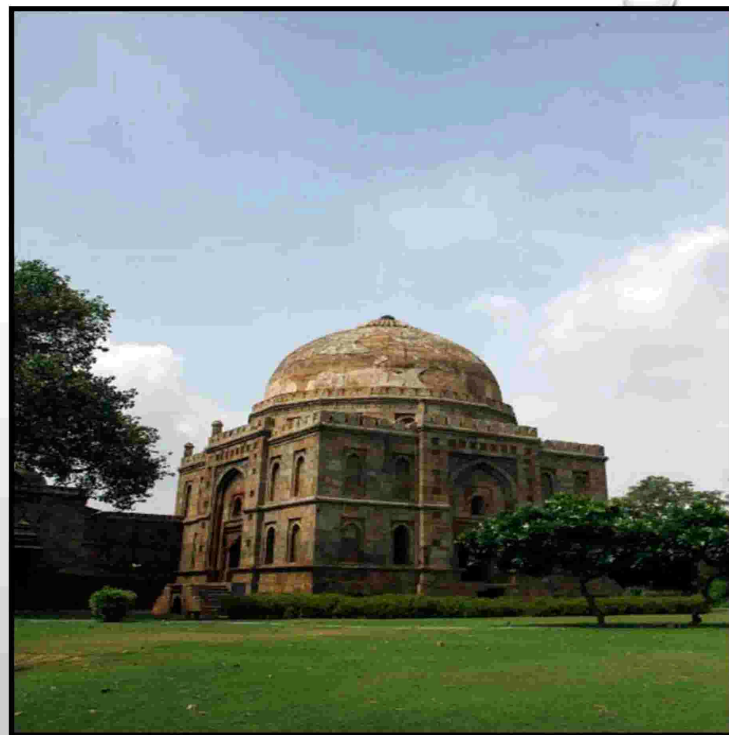


BADA GUMBAD

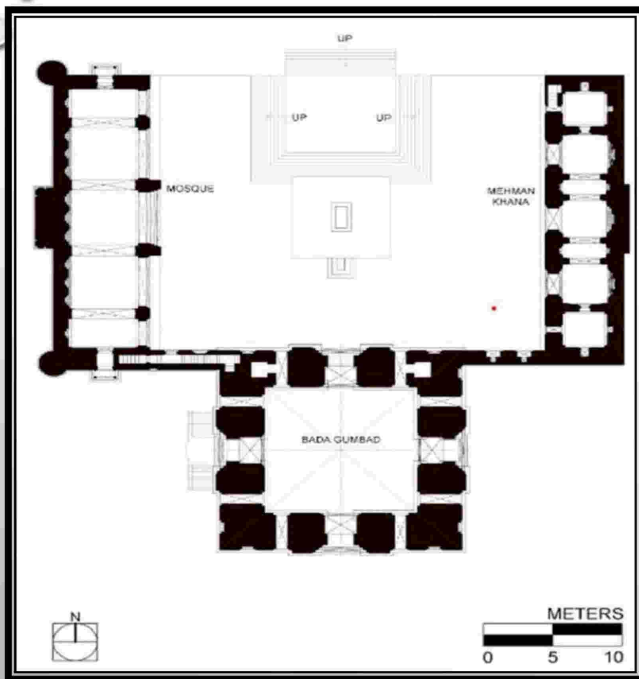
- **'BADA GUMBAD' LITERALLY MEANS THE BUILDING WITH A BIG (BADA) DOME (GUMBAD). ITS ENTRANCE IS ACCENTUATED BY A FLIGHT OF STEPS RISING UP TO A HEIGHT OF APPROXIMATELY 4 M FROM THE GROUND. TOWERING UP TO APPROXIMATELY 27 M AND MEASURING 19 M X 19 M, THIS STRUCTURE IS ONE OF THE BIGGEST AND THE FINEST EXAMPLES OF THE LODI-PERIOD MONUMENTS IN DELHI.**

THE STRUCTURE SHARES ITS PLINTH WITH A MOSQUE AND A MEHMAN KHANA (GUEST HOUSE), OFTEN ALSO REFERRED TO AS THE ARCHED PAVILION.

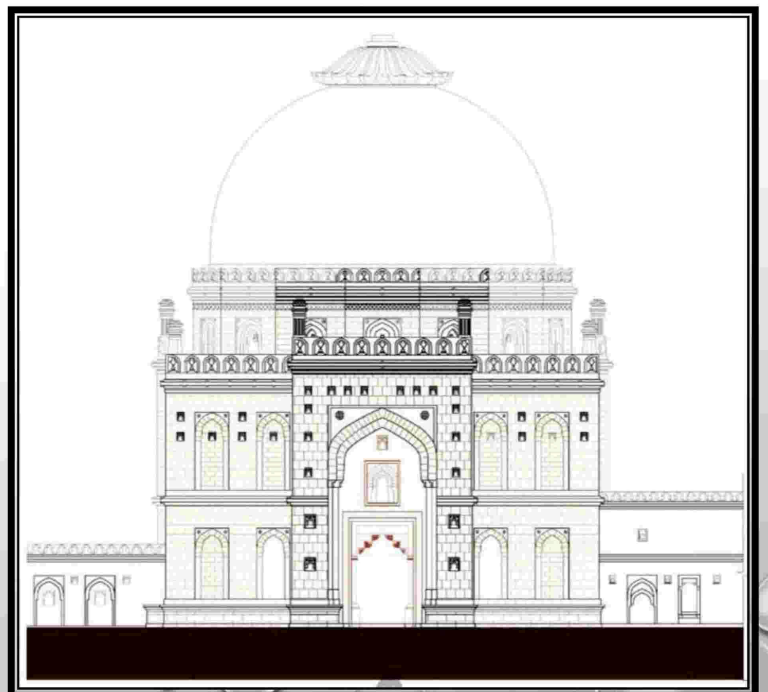
ALL FOUR SIDES OF THE STRUCTURE ARE OPEN AND IT DIFFERS IN THIS RESPECT FROM OTHER MONUMENTS AT THE LODI GARDEN IN THAT THE MIHRAB (THE ARCH ON THE WESTERN WALL WHICH INDICATES THE DIRECTION OF PRAYER) IS ABSENT.



2-D DESIGN OF BADA GUMBAD



PLAN



FRONT

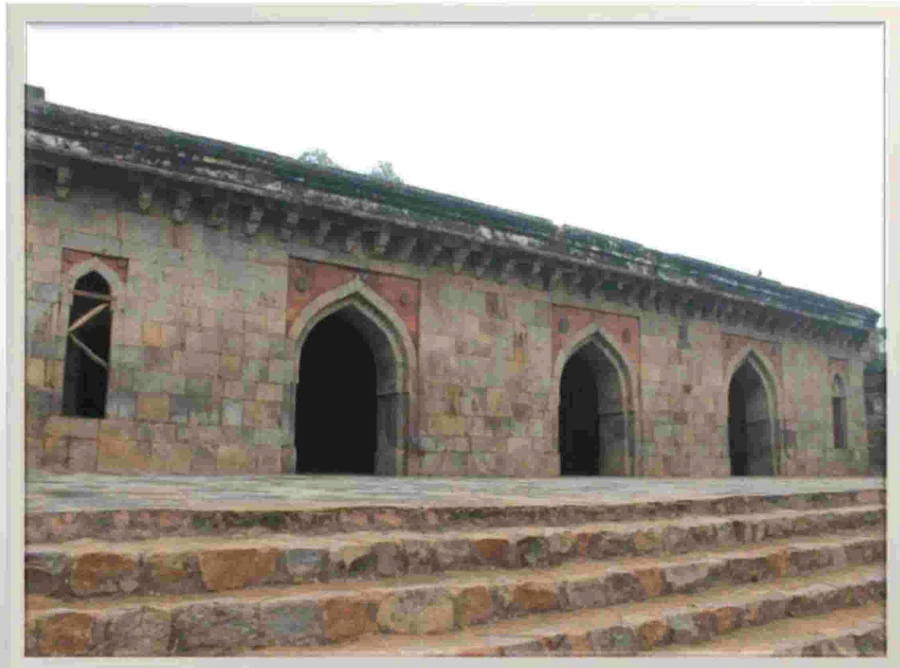
MOSQUE

- **THIS MOSQUE, BUILT AT THE SAME TIME AS THE ADJOINING BADA GUMBAD, IS A FINE EXAMPLE OF THE DECORATIVE TECHNIQUE OF INCISED AND PAINTED LIMESTONE PLASTER USED IN THE LODI PERIOD.**
- **OTHER DISTINCTIVE ELEMENTS ARE THE JHAROKHAS AND CORNER TURRETS REMINISCENT OF THE QUTUB MINAR.**
- **AN INSCRIPTION OVER THE SOUTHERN MIHRAB (THE ARCH ON THE WESTERN WALL WHICH INDICATES THE DIRECTION OF PRAYER) DATES IT TO 1494.**
- **IN THE COURTYARD IN FRONT OF THE MOSQUE IS A MOUND OF RUBBLE WHICH WAS PROBABLY A GRAVE PLATFORM.**
- **THE FIVE-BAY MOSQUE MEASURES 25M BY 64M. THE THREE CENTRAL BAYS ARE ROOFED WITH SQUAT DOMES WHILE THE TWO END BAYS HAVE VAULTED ROOFS.**



MEHMAN KHANA

- FACING THE MOSQUE IS AN ARCHED PAVILION THAT WAS USED AS A GUEST HOUSE OR 'MEHMAN KHANA'.
- THE BUILDING HAS ARCHED COMPARTMENTS AND IS SIMILAR IN SCALE TO THE MOSQUE, MINUS THE DOMES AND THE ORNAMENTATION.
- THE FRONT FACADE HAS THREE LARGE ARCHED OPENINGS BETWEEN THE TWO SMALLER ONES ON THE EXTREME LEFT AND RIGHT.
- RED SANDSTONE HAS BEEN USED IN THE SPANDRELS OF THE ARCHES.

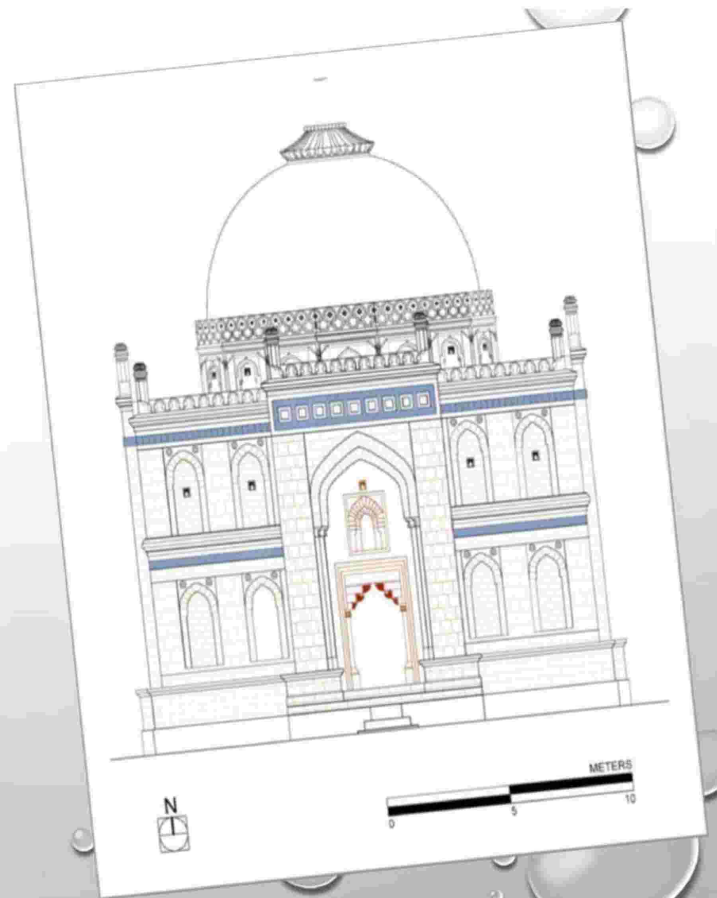


SHEESH GUMBAD

- **THE SHEESH GUMBAD (OR 'GLASS DOME', CALLED SO BECAUSE THE DOME AND PARTS OF THE FACADE WERE ONCE COVERED WITH COLOURED GLAZED TILES), FACES THE BADA GUMBAD.**
- **HOME TO SEVERAL UNIDENTIFIED GRAVES, IT HAS BEEN CLAIMED TO BE THE TOMB OF THE FIRST LODI EMPEROR BAHLOL, WHO DIED IN 1489.**



- **THE SHEESH GUMBAD HAS A SQUARE LAYOUT LIKE THE OTHER LODI TOMBS. IT MEASURES 17M ON ALL SIDES, WITH A HIDDEN STAIRCASE ALONG ITS WESTERN WALL THAT LEADS TO THE TERRACE ABOVE.**
- **ITS WESTERN WALL CONTAINS A MIHRAB, AND THE OTHER THREE SIDES HAVE THREE OPENINGS EACH - A CENTRAL DOORWAY FLANKED BY TWO ARCHED OPENINGS TO ADMIT LIGHT AND AIR.**
- **THE CENTRAL TOMB CHAMBER MEASURES 10M ON ALL SIDES AND HAS SEVERAL GRAVES.**



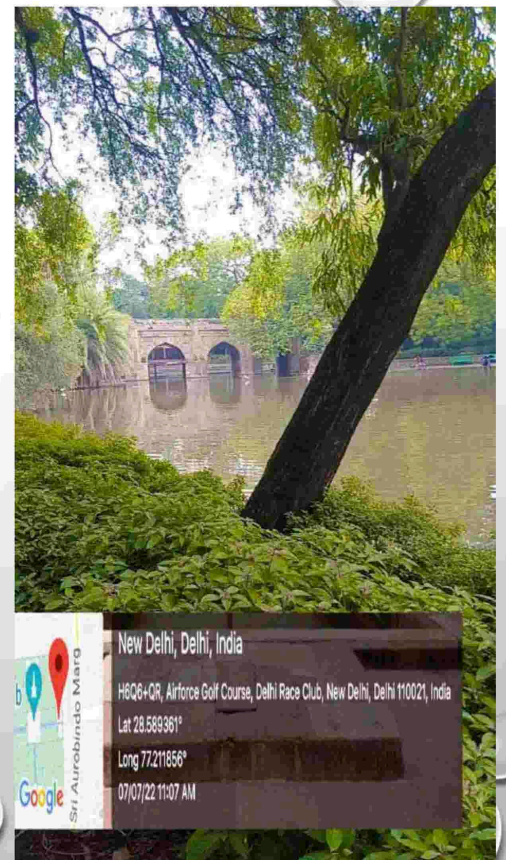


THE LAKE

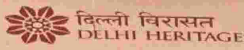
- **THE GARDEN BELONGS TO THE BRITISH ERA AND THE LAKE HAS BEEN ONE OF THE MAJOR ATTRACTIONS AMONG THE VISITORS.**
- **IT IS SPREAD OVER 6,172 SQ METRE AREA.**
- **IS 1-4 MTRS DEEP.**
- **CONTAINS 50 LAKH LITRES OF WATER.**
- **SEEING THE LAKE'S POPULARITY, THE CIVIC AGENCY REGULARLY CARRIES OUT BEAUTIFICATION DRIVE AROUND IT.**
- **THE LATEST PROJECT AIMS AT TOTAL REJUVENATION OF THE LAKE.**
- **EARLIER CONSTITUENT OF YAMUNA RIVER.**
- **BEFORE 1936, WAS USED AS IRRIGATION CHANNEL BY VILLAGERS.**

ATHPULA

- Athpula aka The eight-pier bridge.
- This eight-pier bridge ('Ath' meaning 'eight') was built during Akbar's reign by Nawab Bahadur, to span a tributary of the Yamuna that probably met up with the Barahpula canal further south.
- The stream must have dried up at some point and part of it has now been replaced by a man-made reservoir.
- This beautifully curving bridge built diagonally across the stream was originally known as 'Khairpur ka Pul' after the village of Khairpur in which it was located.



ATHPULA

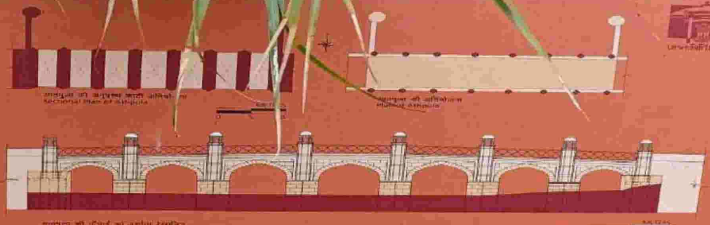


अठपुला

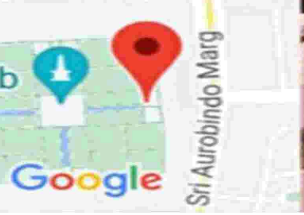
मुगल बादशाह अकबर के शासनकाल के दौरान निर्मित यह मेहराबी पुल एक नाले पर बनाया गया था, जो इस इलाके से होता हुआ संभवतः दक्षिण की ओर बारापुला नाले में मिलता था, जो आगे यमुना नदी में गिरता था। अठपुला नाम 'आठ' शब्द से पड़ा है जो आठ स्तंभों से संबंध रखता है जिनके ऊपर पुल की सात मेहराबें निर्मित हैं। यह पुल कुछ तिरछा बना है और इसका मोड़ बेहद आकर्षक है। यह स्पष्ट नहीं है कि कौन सी सड़क इस पुल के ऊपर से गुज़रती थी, लेकिन इसके पास बना मुगल बगीचा यह दर्शाता है कि यह कोई महत्वपूर्ण विश्राम स्थल रहा होगा।

Athpula

Built during the reign of the Mughal Emperor Akbar, this bridge was constructed to span a stream which went through this area and probably joined the Barahpula nala further south which fed into the River Yamuna. The name Athpula is derived from *ath* (eight) which refers to the eight piers that support the seven arches of the bridge. The bridge is placed diagonally across the stream bed and has a beautiful curving shape. It is not clear which road went over this bridge, but the presence of a Mughal garden nearby suggests that this was an important resting place.



- 1. अठपुला
- 2. अठपुला का नाला
- 3. अठपुला का नाला
- 4. अठपुला का नाला
- 5. अठपुला का नाला
- 6. अठपुला का नाला
- 7. अठपुला का नाला
- 8. अठपुला का नाला



New Delhi, Delhi, India
H6Q6+QR, Airforce Golf Course, Delhi Race Club, New Delhi, Delhi 110021, India
Lat 28.589361°
Long 77.211856°
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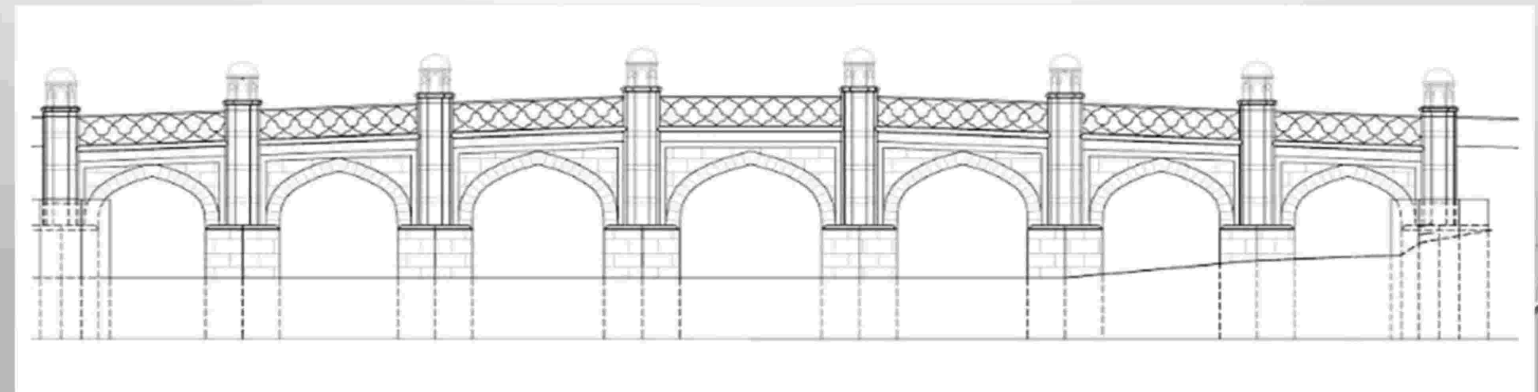
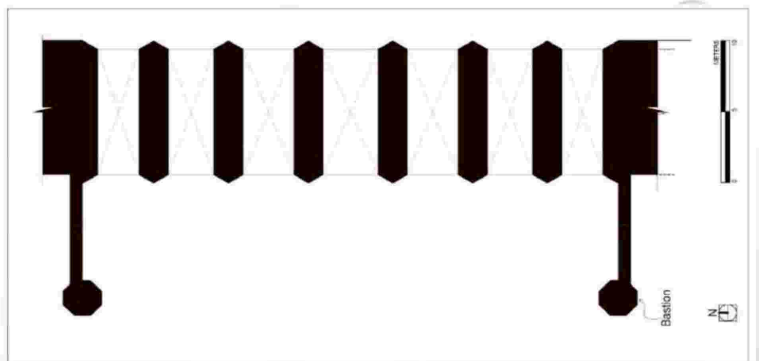
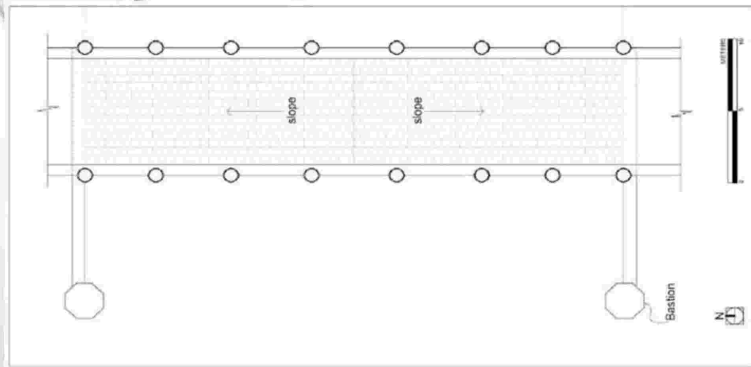
ATHPULA

- **THIS BRIDGE WAS BUILT DURING THE REIGN OF THE MUGHAL EMPEROR AKBAR BY A NOBLE MAN IN THE COURT KNOWN AS NAWAB BAHADUR.**
- **IT IS ONE OF FEW THE SURVIVING STRUCTURES BUILT DURING AKBAR'S REIGN IN DELHI.**
- **THE BRIDGE ONCE SPANNED A TRIBUTARY OF THE RIVER YAMUNA, PROBABLY JOINED THE BARAHAPULA NULLAH FURTHER SOUTH WHICH FED INTO THE RIVER YAMUNA.**
- **ATHPULA COMES FROM THE WORD 'ATH' MEANING 8, IT IS AN 8 PIERS BRIDGE WITH 8 ARCHES, OUT OF WHICH TODAY 4 ARCHES ARE VISIBLE.**
- **THE SPAN OF THESE ARCHES DECREASES FROM THE CENTRE TO THE BANK OF THE STREAMLET.**

ATHPULA

- **THE TOP OF THE BRIDGE IS PAVED WITH LOCAL GREY STONE.**
- **THE BRIDGE WAS REPAIRED 1ST TIME IN 1913-1914.**
- **IT IS NOT CLEAR WHICH ROAD WENT OVER THIS BRIDGE, BUT THE PRESENCE OF A MUGHAL ROSE GARDEN NEARBY SUGGESTS THAT THIS WAS AN IMPORTANT RESTING PLACE.**
- **TODAY THE STREAM OR THE WATER BODY OVER WHICH IT RUNS HAS BEAUTIFUL FOUNTAINS AND IS A HOME TO GEESE AND DUCKS.**

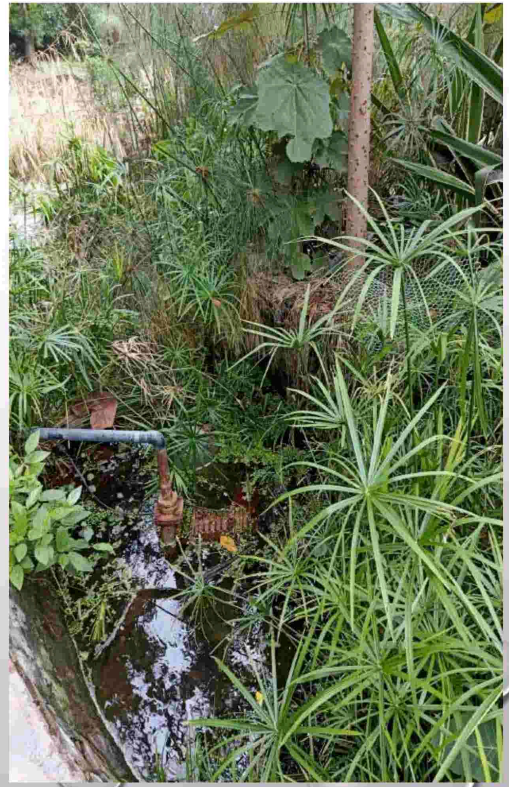
FRAMEWORK OF ATHPULA BRIDGE



LAKE DERIVED FROM RIVER YAMUNA

- **AS PER THE ARCHAEOLOGICAL SURVEY OF INDIA, THE LAKE BELOW ATHPULA WAS CONNECTED THROUGH THE RIVER YAMUNA.**
- **DAY PER DAY, THE YAMUNA RIVER SHRINKS DUE TO WHICH THE LAKE RESULTS INTO POND, BUT THERE IS STILL SOME AID THAT WATER LEVEL INCREASES AND IT IS SOMEHOW STILL CONNECTED TO RIVR YAMUNA.**
- **EXACT WATER SOURCE AS PER NDMC, THERE ARE SEVERAL GROUNDED EARTH MOTORS AND ALSO THERE IS RAIN WATER HARVESTING SYSTEM AVAILABLE WHICH RESULTS IN WATER ALL OVER THE YEAR.**
- **THE LAKE PRESENT THERE HAS AQUATIC LIFE, IT MEANS THE WATER IS FRESH.**

-:PICTURES RELATED TO LAKE AND RECHAERGE:-



OUR GROUP MEMBERS







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and Urban Affairs**
Government of India

MISSION AMRIT SAROVAR – JAL DHAROHAR SANRAKSHAN INTERNSHIP

INSTITUTE NAME : PUSA INSTITUTE OF TECHNOLOGY

WATER BODY NAME : Water Channel at Old Lodi Bridge (Athpula)

INO NAME : Tushar Dev

PERIOD OF REPORT : 08.07.2022 – 14.07.2022

LOCATION : ATHPULA BRIDGE, LODI GARDEN, SUBRAMANIAM BHARTI MARG,
LODHI, GARDENS, LODHI ESTATE, NEW DELHI, DELHI 110003, INDIA

COORDINATES : 28.5965° N, 77.2228° E



Targets Set For The Week

- TO UNDERSTAND THE PAST WATER REJUVENATION PROJECTS BEING UNDERTAKEN FOR THE WATER BODY
- TO CONDUCT WATER PARAMETERS TESTS
- COLLECTION OF MONTH WISE RAINFALL DATA OF AREAS NEAR THE WATER BODY AND COLLECTION OF EVAPORATION DATA OF THE SITE
- TO CALCULATE THE AREA AND PARAMETER OF THE WATER BODY
- TO FIND OUT THE LIMITATIONS OF WATER BODY TO SERVE AS A RECREATION SPOT
- TO GEO-TAG THE START AND END POINTS OF THE WATER BODY AND TO GEO-TAG ALL IMPORTANT MONUMENTS NEAR THE WATER BODY



OUTCOMES AND OBSERVATIONS

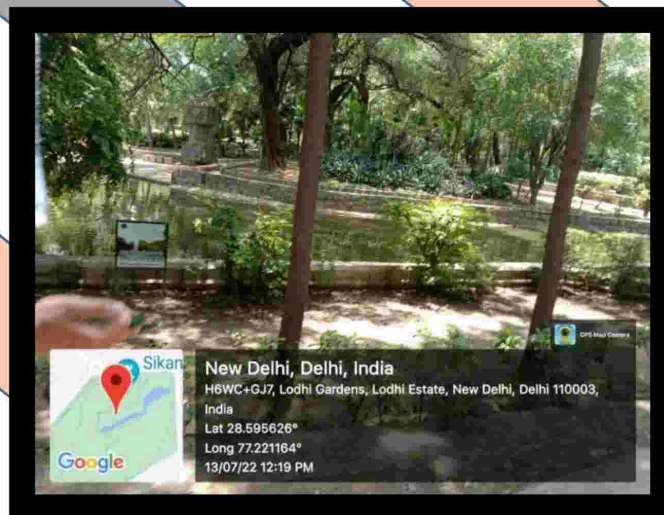
- UNDERSTOOD ABOUT THE PAST WATER REJUVENATION PROJECTS WHICH WERE UNDERTAKEN FOR THE WATER BODY
- TO CONDUCTED WATER TDS AND pH TESTS
- COLLECTED OF MONTH WISE RAINFALL DATA OF AREAS NEAR THE WATER BODY AND COLLECTION OF EVAPORATION DATA OF THE SITE
- TO FIGURED OUT SOME OF THE LIMITATIONS OF WATER BODY TO SERVE AS A RECREATION SPOT AND DISSCUSSED THE WAYS TO OVERCOME THEM
- CALCULATED THE AREA AND PARAMETER OF THE WATER BODY
- TO GEO-TAGGED THE START AND END POINTS OF THE WATER BODY TO GEO-TAG THE START AND END POINTS OF THE WATER BODY AND TO GEO-TAG ALL IMPORTANT MONUMENTS NEAR THE WATER BODY

THESE ABOVE MENTIONED POINTS ARE FURTHER DISCUSSED IN DETAIL IN THE NEXT PAGES



INFORMATION ABOUT PAST REJUVENATION PROJECT

- DUMPED PURIFIED WATER BACK ON THE OTHER SIDE
- AIMED AT RECYCLING OF WATER, DE-SILTING OF THE LAKE AND MAKING COMPOST OUT OF THE SLUDGE; AND BIO-REMEDIATION OF THE LAKE WATER USING NATURAL MICROBIAL OR ENZYMES.

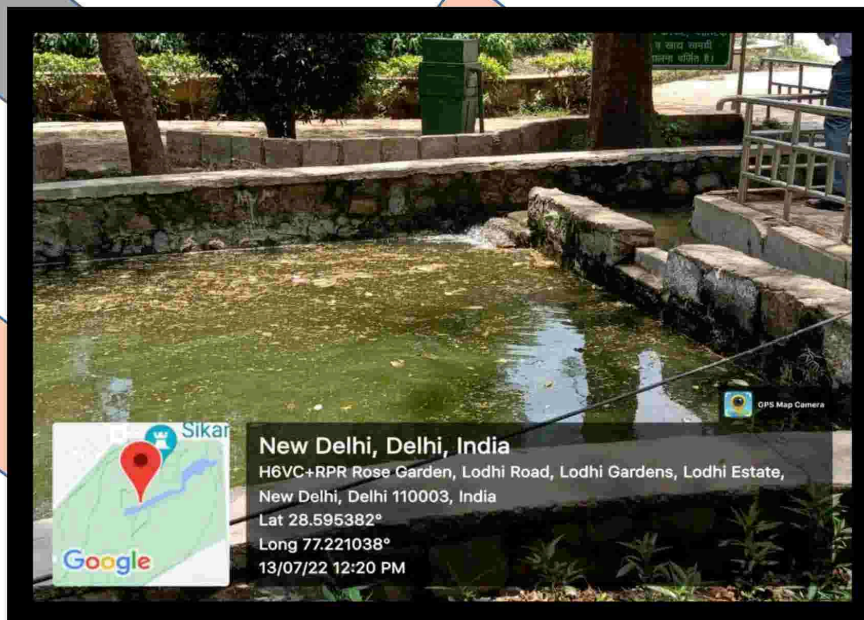


- PRIOR TO THE INSTALLATION OF THE RECYCLING PLANT, NDMC WAS USING BOREWELLS TO FILL FRESH WATER IN THE LAKE AT INTERVALS, WHILE THE UNTREATED OLD WATER WAS USED FOR HORTICULTURE PURPOSES, SUCH AS WATERING PLANTS. BUT THE PROCESS WAS DIFFICULT AND TIME-CONSUMING.



INFORMATION ABOUT PAST REJUVENATION PROJECT

- AFTER THE INSTALLATION OF THE TREATMENT PLANT, THERE IS NO NEED TO EMPTY THE WATER FROM THE LAKE AFTER FREQUENT INTERVALS AS ITS QUALITY GETS IMPROVED AND AUTOMATICALLY ADDED



- A BOAT WAS ALSO ENGAGED FOR COLLECTING SLUDGE USING A PUMP FROM THE MIDDLE OF THE LAKE, WHILE STAFF HAVE BEEN DEPLOYED FOR COLLECTION OF SOIL AND TRASH FROM THE BANKS OF THE WATER BODY
- A PERMANENT WOODEN DUCK HOUSE WAS ALSO CONSTRUCTED DURING THIS PROJECT

SOURCE NDMC OFFICIALS

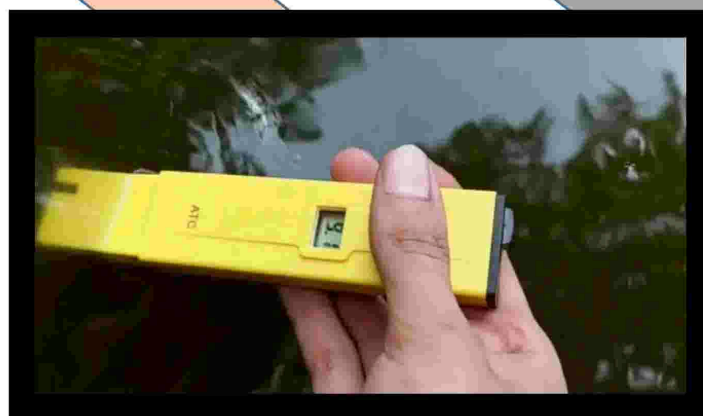


WATER PARAMETERS TESTS

- pH AND TDS WAS TESTED OF THE WATER BODY WHICH CAME OUT TO BE



TDS = 515 mg/l



pH = 9.1 (WATER IS ALKALINE DUE TO PRESENCE OF EXCESSIVE ALGUE)



WATER PARAMETERS TESTS

ACCORDING TO IS-10500 :

Table 1 Organoleptic and Physical Parameters
(Foreword and Clause 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, <i>Max</i>	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, <i>Max</i>	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, <i>Max</i>	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

The acceptable limits for

pH= 6.5-8.5

TDS= 500 mg/l

- **THE WATER OF WATER BODY FAILS IN BOTH THE PARAMETERS**
- **TO OVERCOME HIGH pH EXCESSIVE ALGUE SHOULD BE REMOVED AND WATER SHOULD BE NEUTRALIZED**
- **TO OVERCOME HIGH TDS THE WATER SHOLUD BE FILTERED**



COLLECTION OF MONTH WISE RAINFALL DATA

ACCORDING TO MoES :

- THE OBSERVED RAINFALL VARIABILITY AND CHANGES OVER DELHI STATE ARE GIVEN AS FOLLOWS :

DISTRICT	JUNE		JULY		AUGUST		SEPTEMBER		MONSOON		ANNUAL	
	MEAN	CV	MEAN	CV	MEAN	CV	MEAN	CV	MEAN	CV	MEAN	CV
NEW DELHI	78.2	71.4	182.2	75.2	216.1	53.1	133.3	65.3	609.8	32.7	732.2	32.1
CENTRAL DELHI	79.6	72.7	167.4	68.8	207.0	64.2	129.7	76.1	583.6	55.8	712.1	51.9
NORTH DELHI	62.5	74.1	191.9	62.8	190.5	52.9	128.9	83.9	573.8	43.8	682.9	52.0
NORTH WEST DELHI	67.6	71.1	174.9	83.9	182.0	69.4	117.8	87.3	542.2	55.8	621.6	51.5
SOUTH DELHI	74.2	55.7	181.4	72.1	182.3	66.8	80.1	77.1	518.0	52.6	624.6	50.4
SOUTH WEST DELHI	69.8	65.7	186.0	55.1	181.1	51.7	108.9	73.7	545.7	37.0	664.5	39.8
WEST DELHI	68.7	91.9	183.1	61.8	185.9	58.2	126.8	80.4	564.5	39.5	680.3	51.5
EAST DELHI	43.2	83.9	101.8	56.2	162.0	66.3	112.3	99.0	419.2	48.4	503.6	35.4
NORTH EAST DELHI	47.6	71.0	144.4	56.5	108.6	55.3	138.1	104.4	438.6	55.7	495.3	50.9

(ALL ABOVE MEASUREMENTS ARE IN MM)

THE LODHI GARDENS (THE PLACE WHERE THE WATER BODY IS LOCATED) FALLS UNDER SOUTH DELHI REGION

COLLECTION OF MONTH WISE EVAPOURATION DATA

ACCORDING TO IMD :

- THE SPATIAL AND TEMPORAL TRENDS OVER INDIA ARE GIVEN AS FOLLOWS:

Evaporation (Exp) and rainfall (Rf) trends in mm/year for annual, winter, summer, monsoon and post-monsoon for 1971 to 2000
(Trends significant at 95% level are shown in bold)

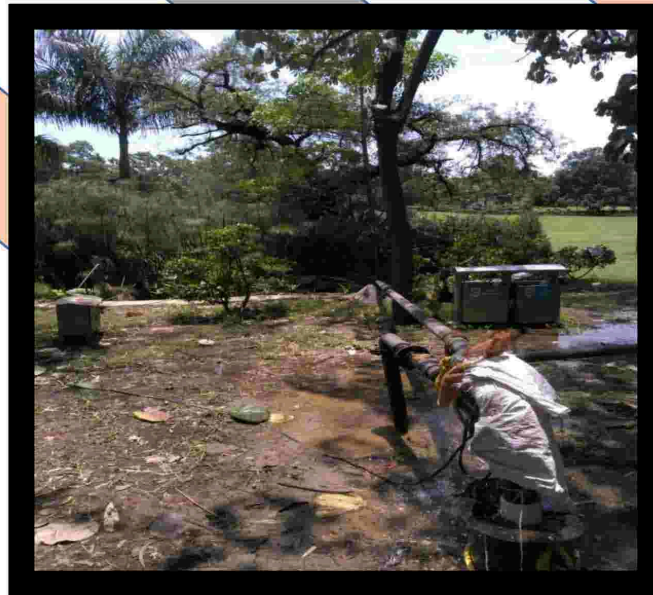
Station Name	Annual		Winter		Summer		Monsoon		Post monsoon	
	Exp	Rf	Exp	Rf	Exp	Rf	Exp	Rf	Exp	Rf
Srinagar	1.04	-1.75	-0.09	-1.45	0.26	1.72	0.62	-1.44	0.36	-0.08
Amritsar	-1.42	0.81	-0.10	0.87	-0.17	-0.33	-0.92	0.49	-0.08	-0.04
Chandigarh	-8.91	1.47	-0.40	0.36	-2.35	-1.06	-4.00	2.83	-1.78	-0.34
Dehradun	-9.94	-0.72	-0.93	0.98	-3.99	1.31	-3.94	-2.43	-0.79	-0.26
Hissar	-16.46	1.73	-1.77	-0.36	-6.36	-0.77	-5.47	1.80	-2.44	1.27
Karnal	-22.32	4.55	-3.03	1.95	-10.06	-0.20	-6.95	2.71	-1.92	0.35
Pantnagar	-1.84	-0.52	-0.34	1.54	-1.59	1.25	1.36	-3.63	-0.86	0.58
Bikaner	8.16	-4.51	1.71	0.28	1.74	-2.56	5.56	-3.19	0.13	0.97
New Delhi	-42.54	-4.41	-5.78	1.68	-17.03	-0.39	-12.60	-5.02	-6.64	-0.56
Agrs	-3.73	4.35	-0.97	-0.60	-1.95	0.24	0.39	4.59	-0.82	0.20
Dibrugarh	13.05	5.02	7.30	-0.83	0.16	3.48	1.28	3.99	4.44	-1.36
Jodhpur	-21.66	-2.64	-3.54	0.50	-6.74	-0.45	-7.47	-2.60	-3.07	-0.08
Johner	-9.47	-8.80	-1.34	-0.16	-3.84	-0.57	-2.00	-8.26	-1.81	0.24
Lucknow	-7.33	-10.10	-1.36	0.84	-2.52	-0.49	-2.00	-9.44	-1.09	-0.72
Nagarkata	-13.68	22.37	-1.97	0.96	-5.15	4.46	-4.74	22.55	-1.43	-5.47
Guwahati	10.68	2.69	3.85	0.24	0.72	1.74	3.15	0.72	3.34	0.10
Tockalati	-2.02	-22.72	0.35	-0.05	-1.33	-6.71	-0.84	-13.85	0.0	-1.95
Kota	-11.80	-5.82	-0.70	0.73	-5.06	0.74	-4.23	-5.08	-1.32	-2.11
Madhapura	-11.49	-11.26	-1.93	-0.03	-4.30	-4.25	-3.73	-1.77	-1.06	-5.10
Dness	-23.83	-1.67	-1.39	-0.05	-9.82	-0.11	-8.51	-1.95	-3.29	0.47
Guna	-13.59	-2.86	-2.88	-0.12	-5.55	0.12	-1.94	-2.29	-2.72	-0.49
Sikhar	-3.89	-4.92	-0.87	0.79	-1.70	-3.25	-1.09	-2.05	0.15	-0.20
Imphal	-8.79	0.30	-0.23	1.59	-2.57	1.45	-4.43	0.60	-1.12	-3.24
Bhuj	-1.95	1.51	-0.66	0.07	-2.43	1.29	0.74	-1.10	0.59	1.26
Ahmadabad	-33.61	0.33	-3.77	-0.11	-14.35	-0.09	-9.54	1.03	-4.88	-0.46
Jabalpur	-15.47	-3.17	1.38	0.08	-11.16	0.46	-5.89	-2.44	0.92	-1.06
Ranchi	-19.60	2.22	-2.62	-0.13	-7.57	-0.93	-6.32	3.88	-2.22	-0.44
Agartala	-9.49	-4.77	-1.22	-0.40	-5.45	-1.06	-2.30	-3.27	0.08	0.16
Lamnagar	-34.94	-4.58	-3.32	-0.02	-14.97	0.11	-9.93	-2.82	-5.32	-1.85
Rajkot	-10.99	-6.62	-2.47	0.16	-2.16	-0.17	-2.02	-1.91	-3.12	-4.68
Indore	-10.33	0.10	-1.29	0.32	-3.76	0.38	-2.63	0.43	-2.15	-0.97
Pendra	-1.07	-1.31	0.43	0.92	-0.33	-0.72	-0.25	-2.31	-0.51	0.96
Kolkata	-10.67	7.07	-1.05	-0.95	-3.38	-0.30	-4.04	4.20	-1.86	4.30
Jaigan	-17.51	2.18	-2.99	0.0	-4.61	1.57	-6.93	0.42	-1.95	0.22
Nagpur	-24.27	-1.46	-2.85	-0.14	-12.22	1.11	-6.12	-1.86	-2.55	-0.35
Cuttack	-7.51	-8.64	-0.98	-1.62	-1.06	3.59	-3.45	-11.01	-1.45	0.48
Parbhani	-20.42	7.54	-0.97	0.97	-8.37	0.72	-10.23	4.75	0.09	1.20
Jagdalpur	-5.51	-5.63	-0.55	0.66	-3.90	1.97	-0.70	-7.68	-0.05	-0.52
Mumbai	-20.07	5.84	-4.13	0.51	-6.60	1.26	-5.22	3.13	-3.53	0.90
Pune	-20.09	4.35	-2.86	0.55	-7.75	-1.00	-5.62	2.80	-3.08	2.04
Rangundam	-22.30	5.98	-2.77	0.99	-9.54	-0.53	-7.10	8.34	-2.34	-2.74
Anakapalle	-4.29	10.33	0.32	0.49	-2.57	0.66	-1.36	8.27	-0.15	0.95
Solapur	-4.23	2.91	0.20	0.30	-3.23	0.79	0.64	2.32	-0.77	-0.44
Hyderabad	-37.00	3.77	-6.78	0.13	-11.87	-0.44	-12.09	3.27	-5.43	0.86
Rajshamshy	-19.65	2.52	-4.83	0.70	-8.81	0.89	-5.62	5.06	-1.86	-4.29
Kolhapur	-17.95	-2.79	-2.39	0.54	-4.98	-1.86	-7.01	-0.11	-3.09	-1.29
Panjin	-8.14	11.90	-1.59	0.43	-3.42	2.58	-1.22	8.45	-1.08	0.49
Bellary	-23.01	2.31	-3.52	0.78	-6.93	-0.87	-8.15	2.28	-3.30	0.25
Anantpur	-17.81	3.36	-3.18	0.76	-7.05	-0.23	-4.19	5.82	-2.58	-2.91
Chennai	-8.27	-2.51	-0.15	3.78	-3.49	2.32	-3.55	-4.46	-0.37	-2.15
Mangalore	-6.51	1.62	-2.49	0.36	-3.80	0.89	-0.66	-3.26	0.77	3.70
Hassur	-3.33	-3.27	0.22	-0.04	-0.76	-2.42	-1.40	-0.38	-0.09	-0.55
Bangalore	6.22	8.05	1.89	0.29	-1.94	1.16	3.60	4.43	3.06	2.31
Aduthurai	-13.71	8.37	-0.94	8.44	-3.86	-0.95	-7.43	-0.17	-0.85	2.88
Pattambi	-19.19	-1.98	-3.04	0.11	-5.60	-2.75	-6.05	2.87	-3.51	-1.90
Kottayam	-10.89	7.28	-1.01	-0.66	-1.78	-3.62	-5.46	8.28	-1.79	3.68
Kovilpatti	-36.22	-4.19	-8.02	-0.37	-8.71	-1.15	-14.13	-0.71	-4.61	-1.28
Thiruvananthapuram	-5.32	-1.09	-1.43	-0.18	-0.94	-3.81	-1.49	0.32	-0.53	2.94

(ALL ABOVE MEASUREMENTS ARE IN MM)



COLLECTION OF MONTH WISE EVAPOURATION DATA

- ACCORDING TO THIS DATA THERE IS DECREASE OF 12-13MM OF WATER LEVEL IN MONSOON SEASON (JULY –AUGUST MONTHS)
- FROM WHICH WE CAN CONCLUDE THAT WATER BODY CANNOT BE FULLY RECHARGED ONLY BY RAINFALL WATER.
- THIS INFORMATION WAS ALSO CONFIRMED BY THE WATER BODY TREATMENT OFFICIALS THAT “APART FROM RAINFALL THE WATER BODY IS RECHARGED WITH GROUND WATER BECAUSE THE RAINFALL WATER IS NOT ENOUGH TO FULLY RECHARGE THE WATER BODY.



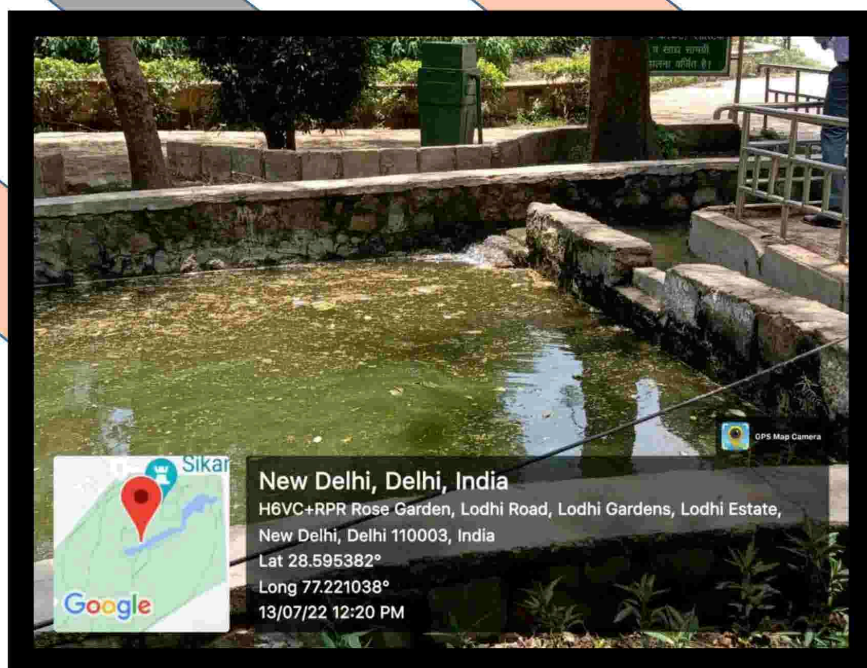
(RECHARGING OF WATER BODY WITH THE HELP OF GROUND WATER)



LIMITATIONS OF WATER BODY TO SERVE AS A RECREATION SPOT

THESE ARE THE LIMITATIONS FOUND OUT BY OUR TEAM IN THE WATER BODY/NEAR THE THE WATER BODY FOR SERVING AS A RECREATION SPOT :

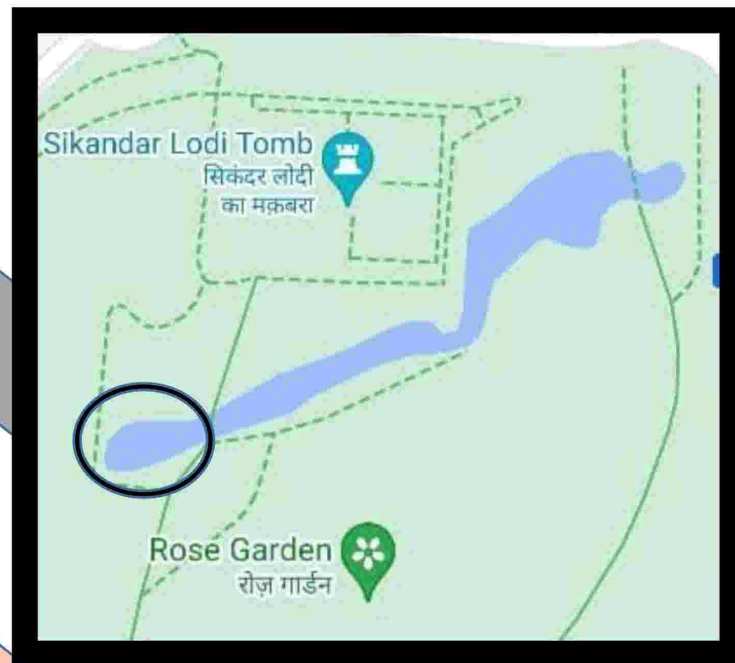
1. SANITATION: THE WATER BODY AND AREAS NEAR THE WATER BODY NEED REGULAR AND PROPER SANITATION FOR ELIMINATION OF ODUR AND MAINTAINANCE OF ESTHETIC APPEARANCE OF WATER BODY



2. OVERGROWN WEEDS : THERE ARE OVERGROWN WEEDS ON THE STARTING POINT OF THE WATER BODY IN A LARGE AREA WHICH IS CAUSING STAGNATION OF WATER, THIS STAGNATION OF WATER IS CAUSING THE ODUR AND BREEDING OF MOSQUITOS WHICH CAN CAUSE VARIOUS DEASEASES .



LIMITATIONS OF WATER BODY TO SERVE AS A RECREATION SPOT



THE ENCIRCLED AREA OF COORDINATES 28.5952262, 77.2207704 IN THE ABOVE GIVEN PICTURE IS COVERED WITH VERY LARGE WEEDS COVERING A LARGE PROPORTION OF THE WATER BODY , AS THE WATER BODY GETS RECHARGED BY BOREWELL FROM THE SAME END ONLY IT MAKES DIFFICULT FOR THE OFFICIALS TO RECHARGE THE WATER BODY.



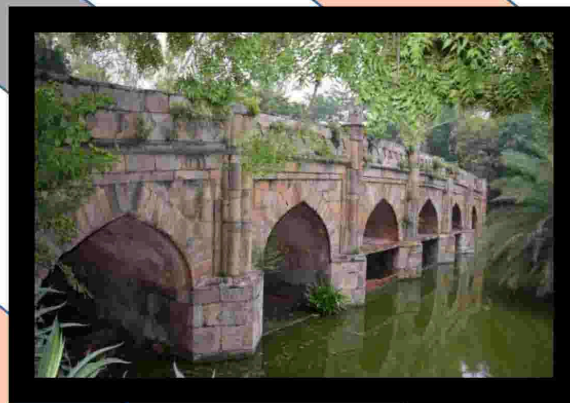
PHOTO OF THE AREA OF
WATERBODY WITH WEEDS



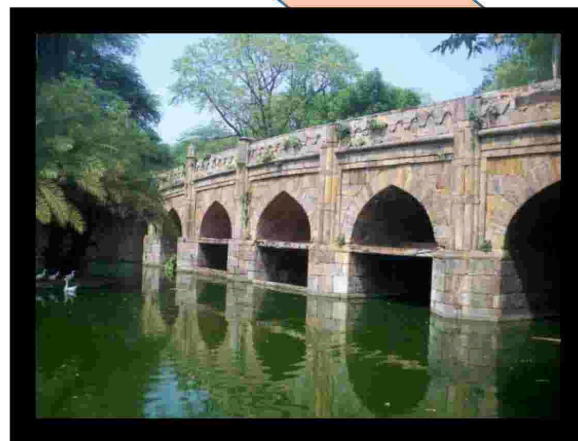
LIMITATIONS OF WATER BODY TO SERVE AS A RECREATION SPOT

3. STRUCTURAL DEFECTS IN THE ATHPULA BRIDGE : THE STRUCTURAL DEFECTS OF THE ATHPULA BRIDGE ARE GIVEN AS FOLLOWS :-

- i. ON THE BRIDGE WEEDS WERE GROWING ALL ALONG THE BRIDGE BETWEEN THE CRACKS AND JOINTS OF THE BRIDGE , WHICH CAN BE VERY HAZARDOUS FOR THE BRIDGE.

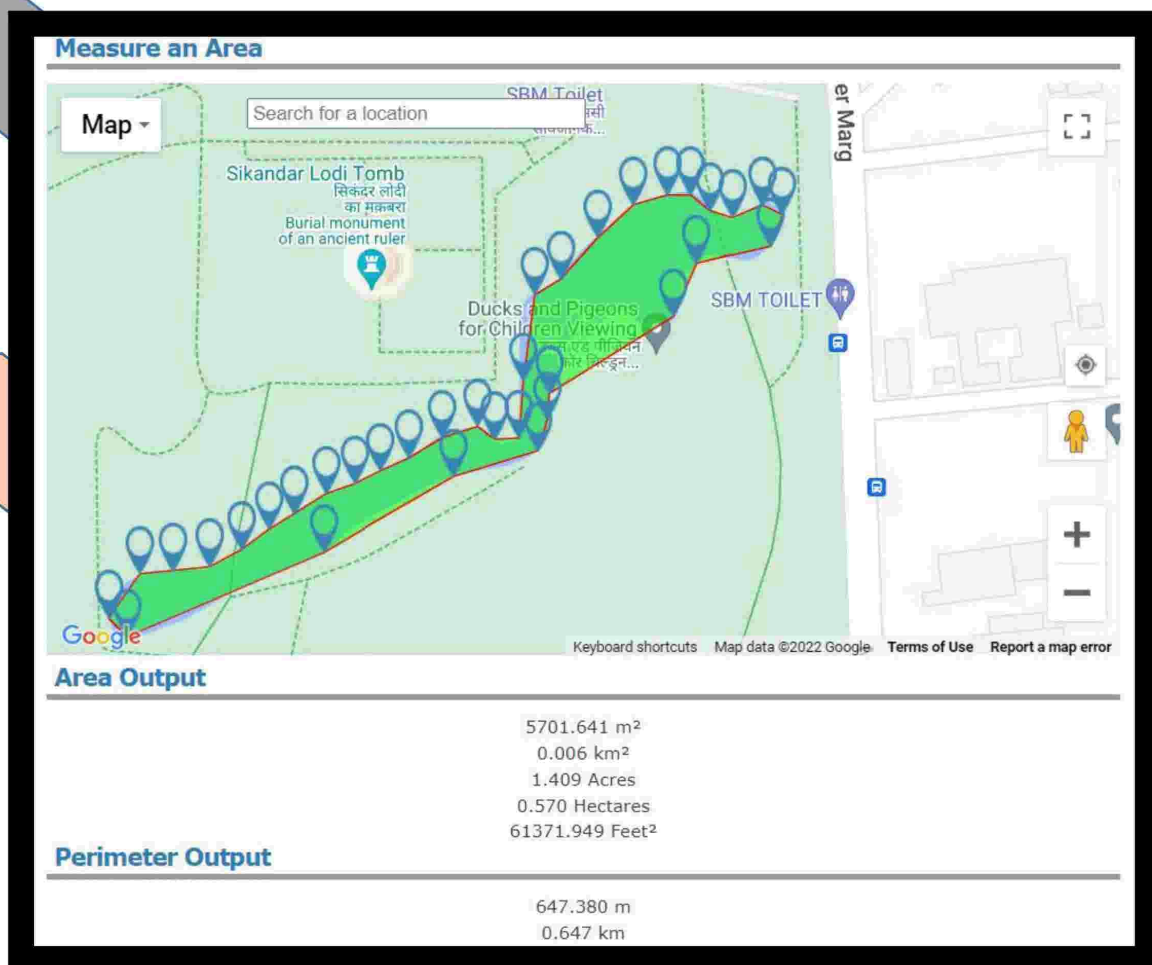


- ii. THE PLASTER OF THE BRIDGE IS CRACKING, EFFLORESCENCE ON PLASTERED SURFACE, FLAKING, PEELING AND POPPING IS OCCURRING ALL OVER THE BRIDGE. THE INTERDOSE OF 2ND AND 3RD ARCH IS FULLY EXPOSED DUE TO POPPING OF PLASTER.





TO CALCULATE THE AREA AND PARAMETER OF THE WATER BODY



AREA = 5701.641 m²

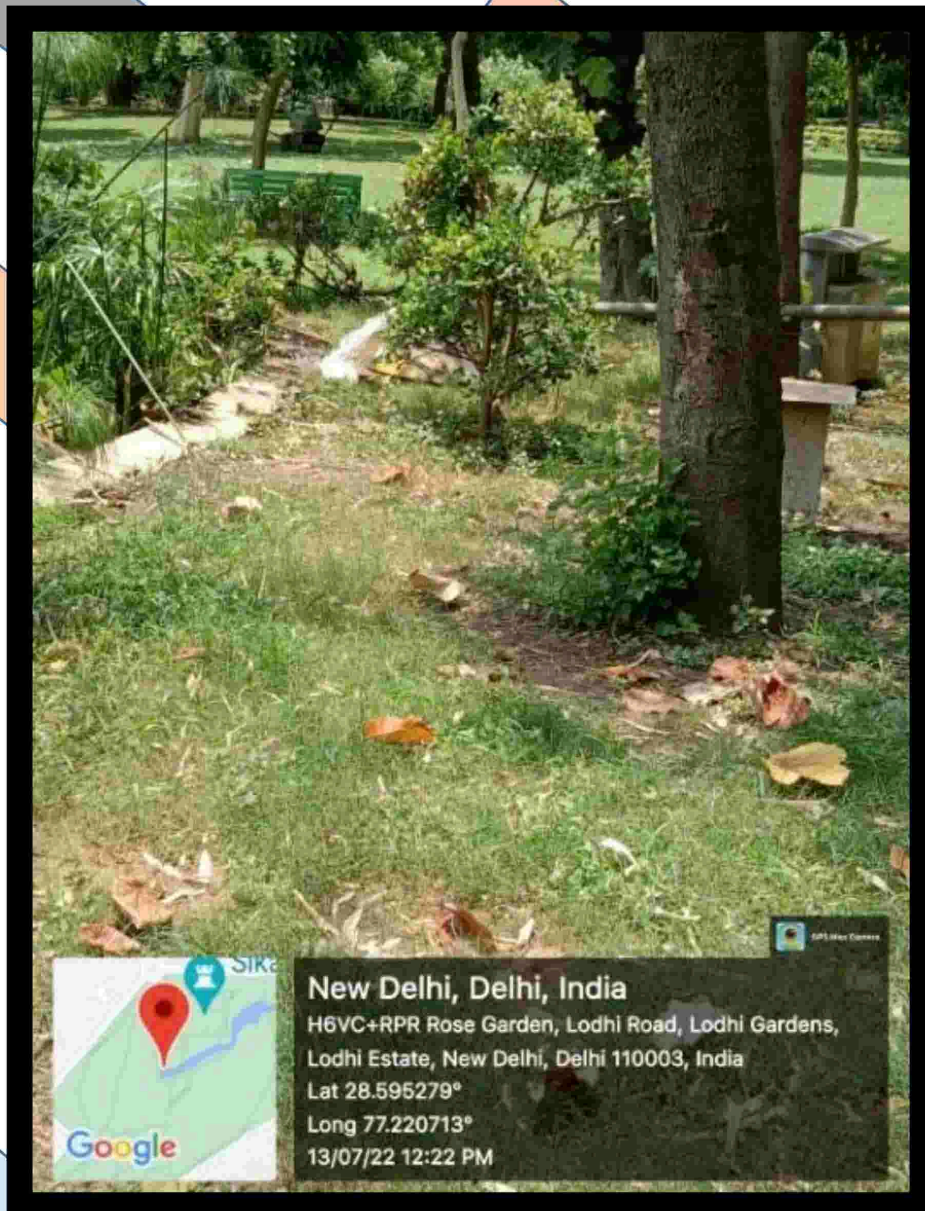
PARAMETER = 647.380 m

SOURCE : GOOGLE MAPS AND SERVICES



GEO-TAGGING OF THE START AND END POINTS OF THE WATER BODY

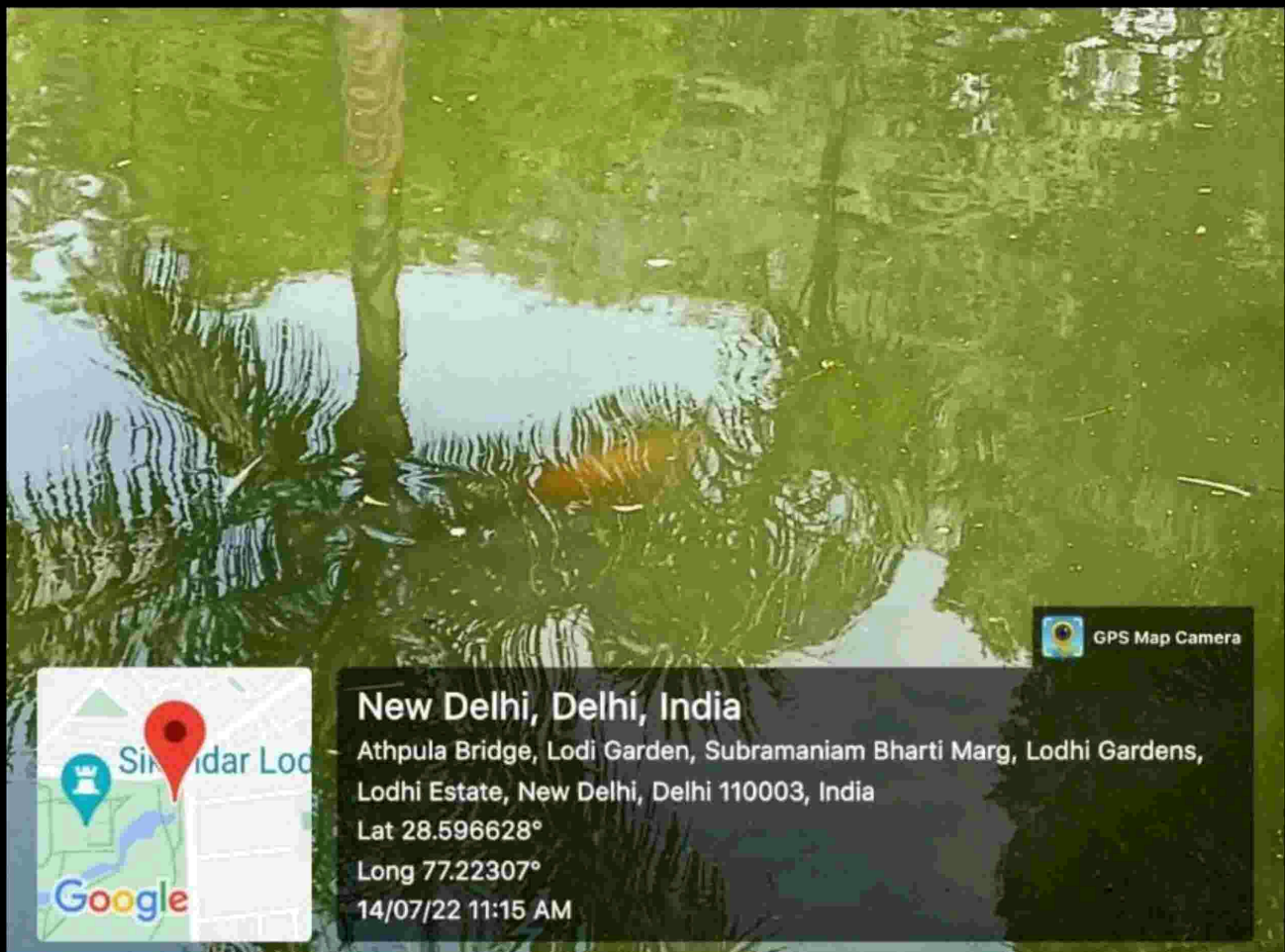
STARTING POINT OF THE WATER BODY





GEO-TAGGING OF THE START AND END POINTS OF THE WATER BODY

ENDING POINT OF THE WATER BODY





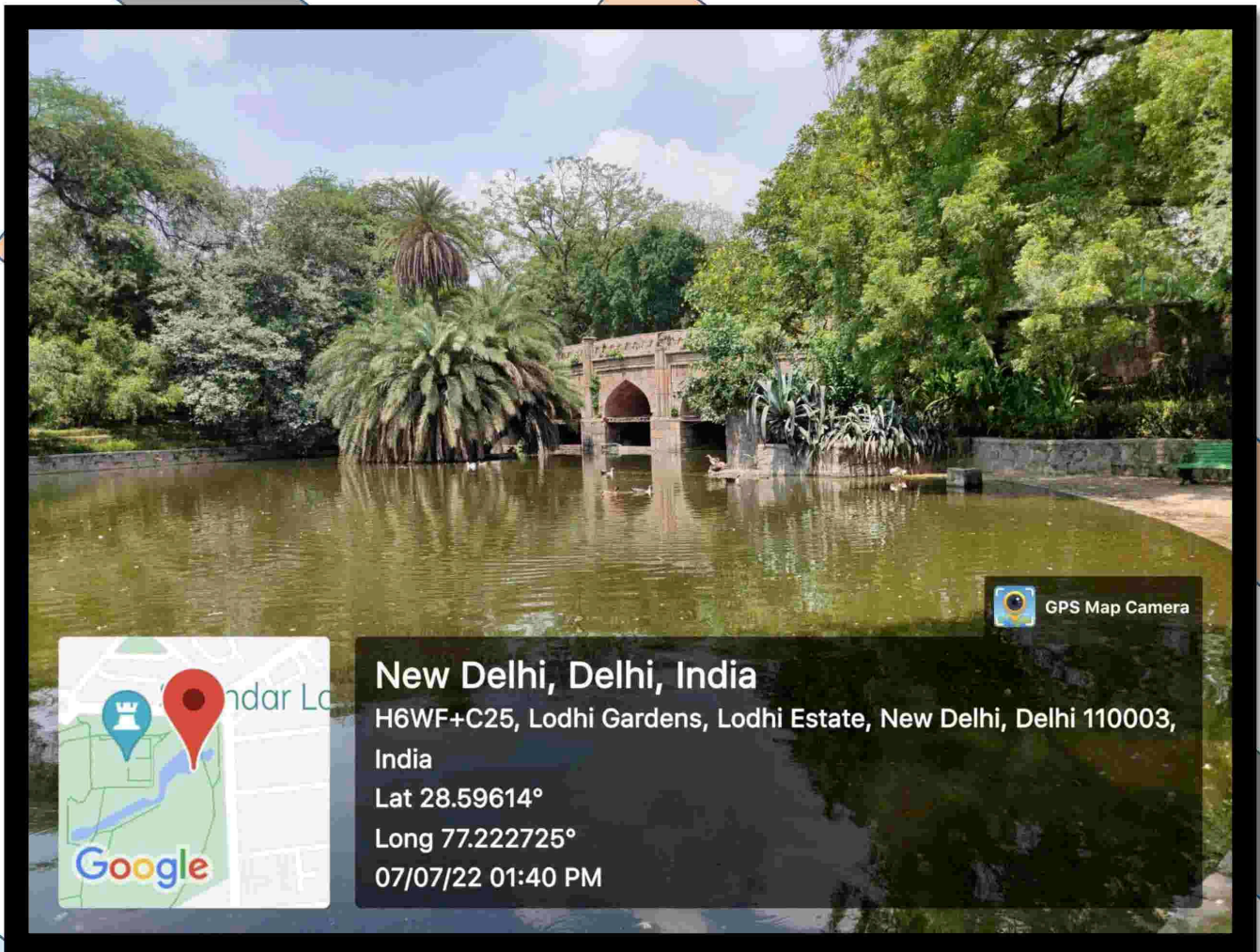
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GEO-TAGGING OF THE IMPORTANT MONUMENTS NEAR THE WATER BODY

ATHPULA BRIDGE



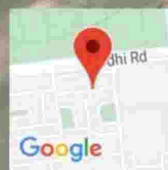


GEO-TAGGING OF THE IMPORTANT MONUMENTS NEAR THE WATER BODY

OLD WATER CANAL IN LODHI GARDEN



New Delhi, Delhi, India
H6RC+43F, Lodhi Gardens, Lodhi Estate, New Delhi,
Delhi 110003, India
Lat 28.59113°
Long 77.219538°
14/07/22 11:35 AM



New Delhi, Delhi, India
231, Jor Bagh, New Delhi, Delhi 110003, India
Lat 28.589302°
Long 77.219139°
14/07/22 11:34 AM

PROBABLY THIS WATER CANAL WAS USED TO CARRY WATER FROM THE WATER BODY TO SOME TRIBUTARY OF YAMUNA WHICH USED TO FLOW NEAR SRI AUROBINDO MARG AND ULTIMATELY JOINED TO THE YAMMUNA RIVER

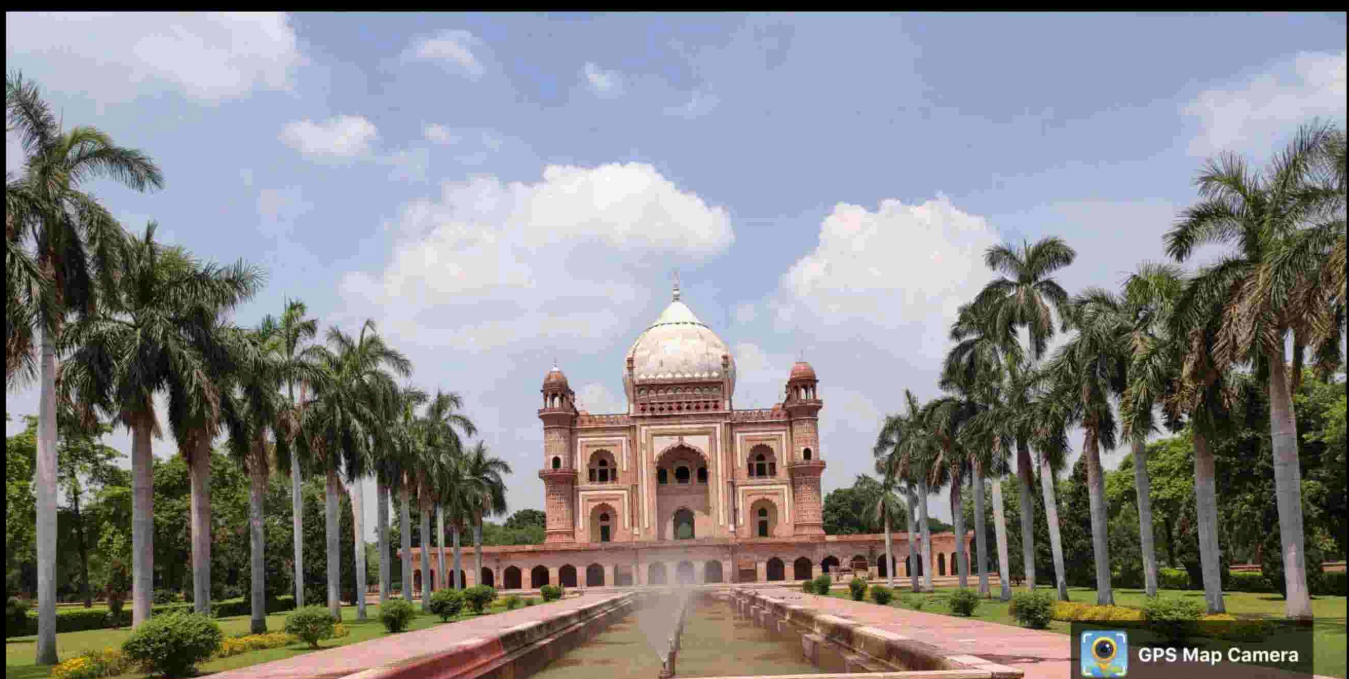


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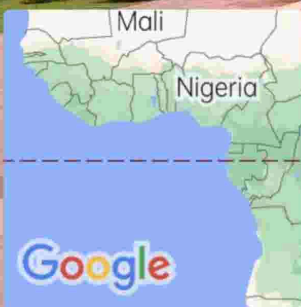


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GEO-TAGGING OF THE IMPORTANT MONUMENTS NEAR THE WATER BODY



GPS Map Camera



New Delhi, Delhi, India

Sri Aurobindo Marg, Airforce Golf Course, Jor Bagh, New Delhi,
Delhi 110003, India

Lat 28.589321°

Long 77.212519°

07/07/22 11:06 AM

SARDARJANG TOMB



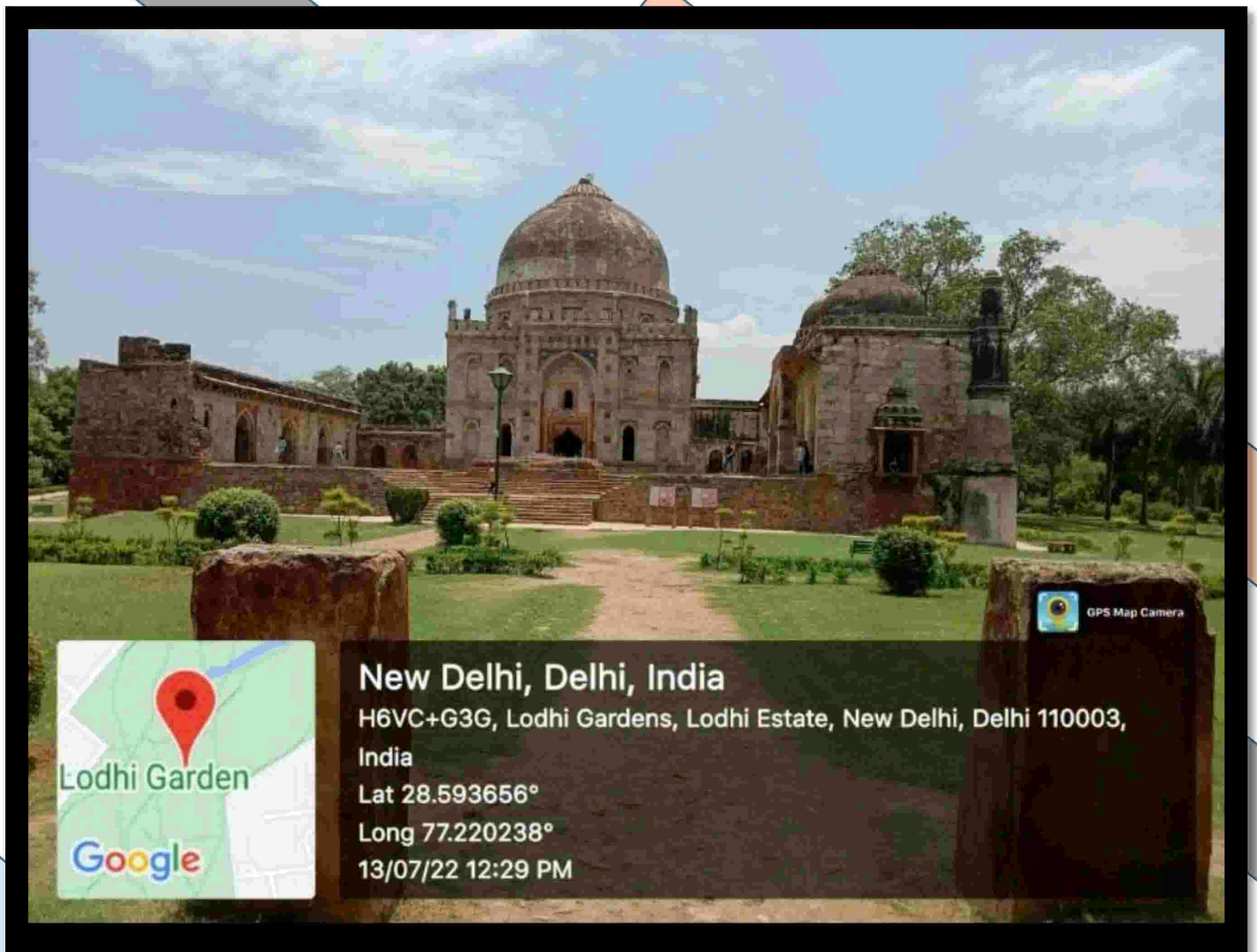
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GEO-TAGGING OF THE IMPORTANTS MONUMENTS NEAR THE WATER BODY

BADA GUMBAD



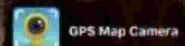
New Delhi, Delhi, India

H6VC+G3G, Lodhi Gardens, Lodhi Estate, New Delhi, Delhi 110003,
India

Lat 28.593656°

Long 77.220238°

13/07/22 12:29 PM





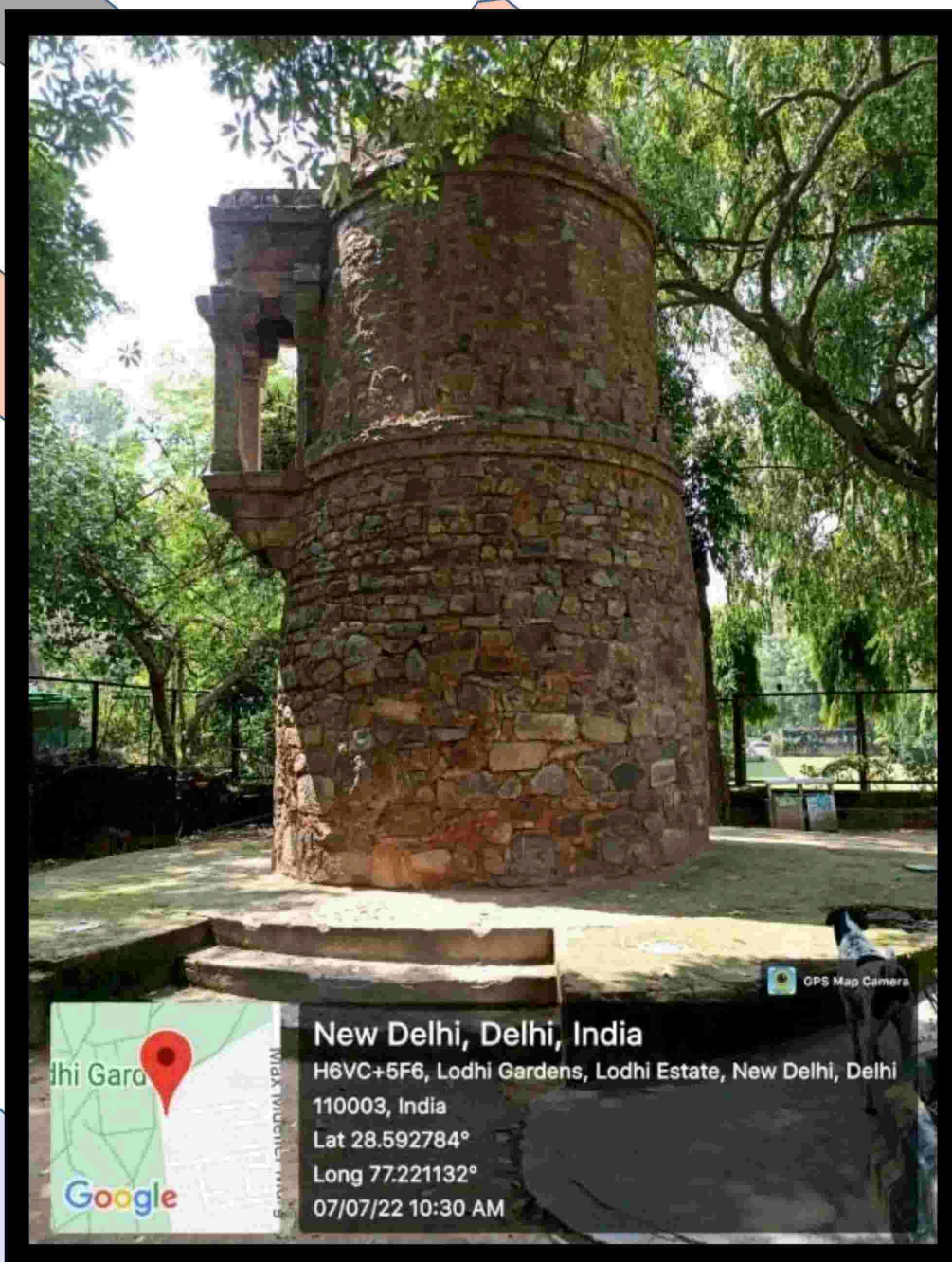
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GEO-TAGGING OF THE IMPORTANTS MONUMENTS NEAR THE WATER BODY

TURRENT





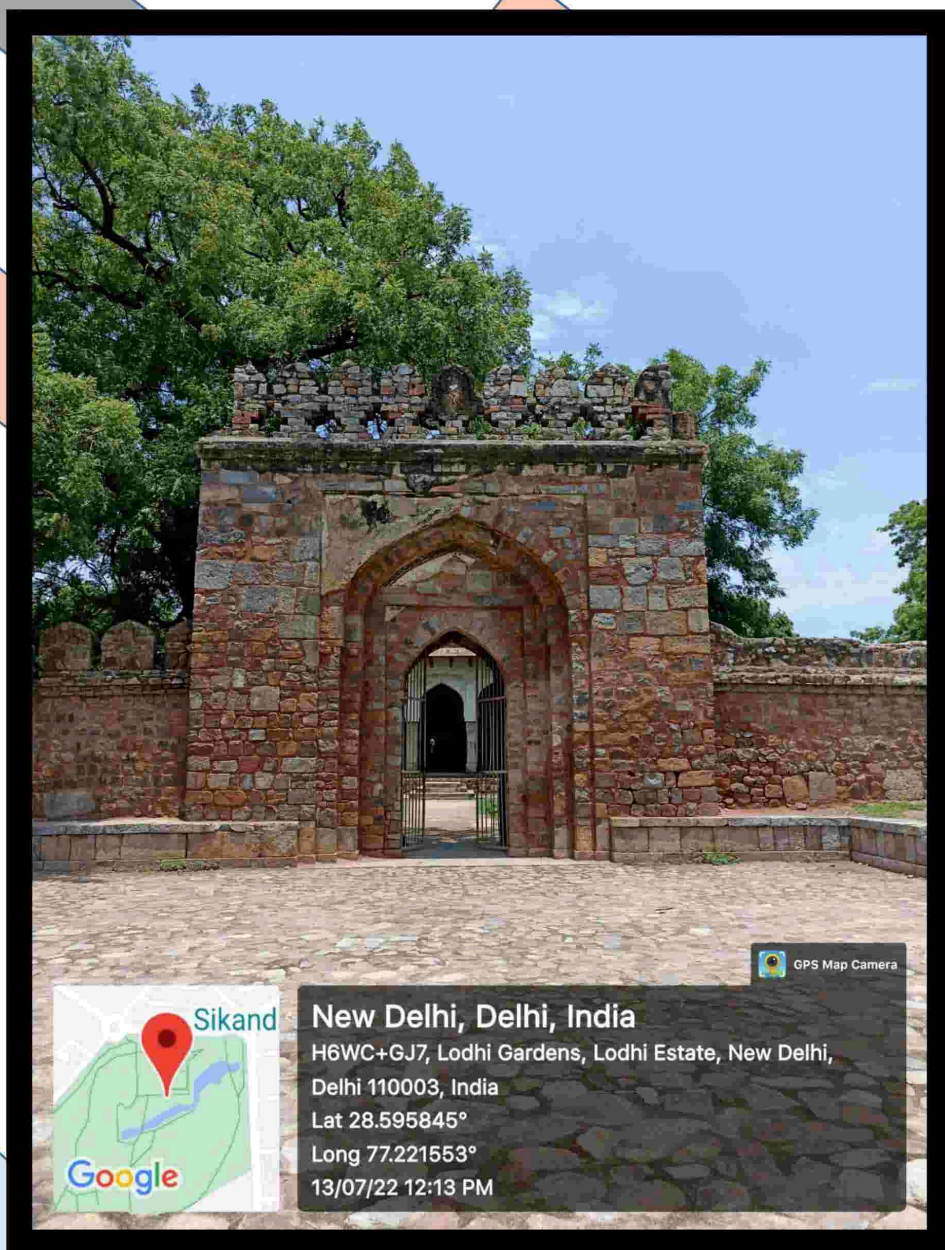
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GEO-TAGGING OF THE IMPORTANT MONUMENTS NEAR THE WATER BODY

TOMB OF SIKANDER LODI





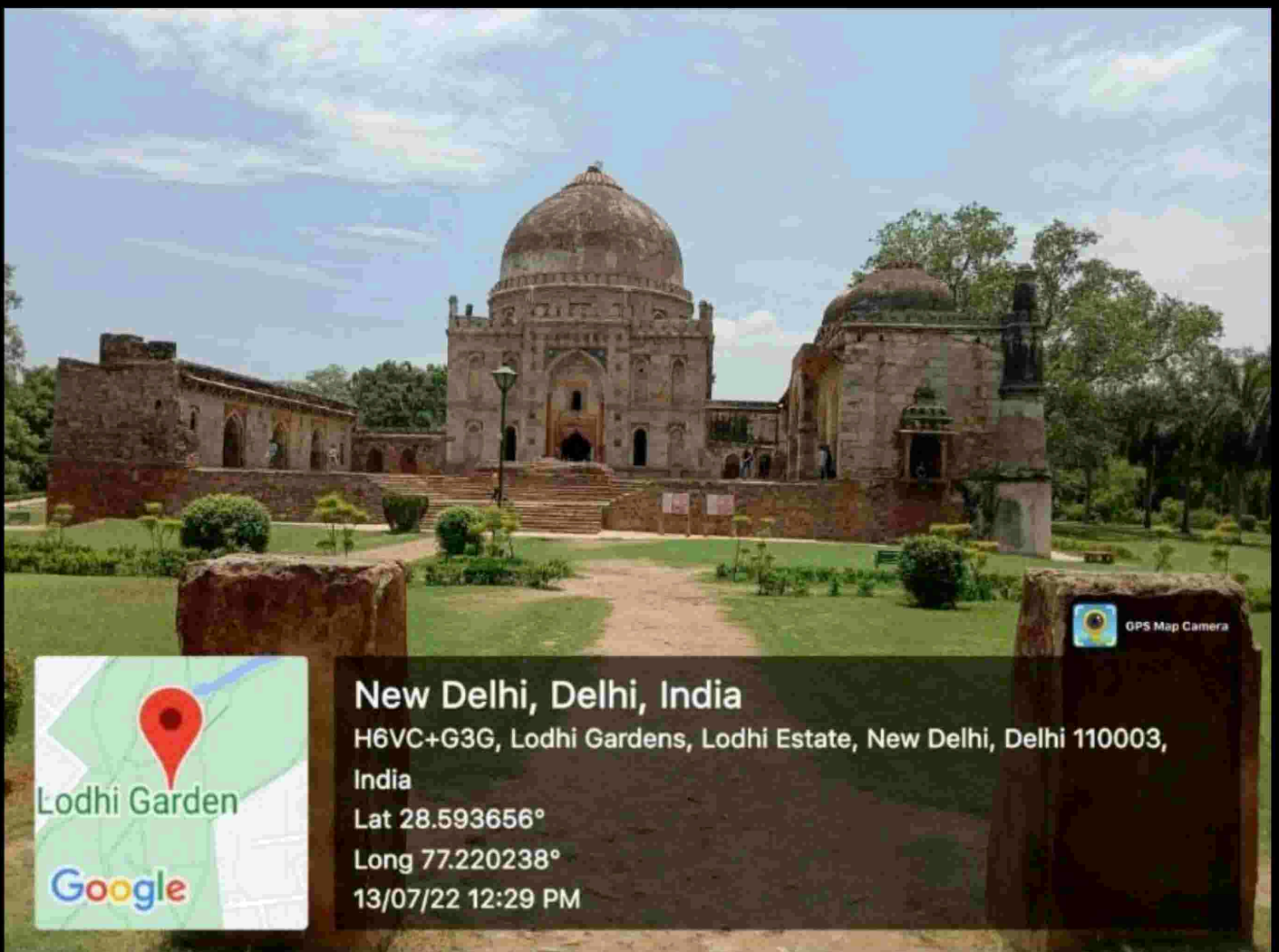
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GEO-TAGGING OF THE IMPORTANTS MONUMENTS NEAR THE WATER BODY

SHEESH GUMBAD



New Delhi, Delhi, India

H6VC+G3G, Lodhi Gardens, Lodhi Estate, New Delhi, Delhi 110003,
India

Lat 28.593656°

Long 77.220238°

13/07/22 12:29 PM





Targets Set For the Next Week

- AUTOCAD MAPPING OF WATER BODY AND SURROUNDING AREAS
- WATER QUALITY PARAMETER BOD AND DO
- TO INVESTIGATE THE PURPOSE OF WATER BODY
- TO DETERMINE THE CURRENT WATER TREATMENT PROCESSES
DONE BY NDMC
- TO DETERMINE THE MODES OF RECHARGE AND RE-CIRCULATION
OF WATER OF THE WATER BODY
- TO DETERMINE THE CHEMICAL TREATMENT DONE ON THE WATER
OF THE WATER BODY



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GROUP PHOTO OF THE TEAM MEMBERS





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MISSION AMRIT SAROVAR – JAL DHAROHAR SANRAKSHAN INTERNSHIP

Institute Name: PUSA INSTITUTE OF TECHNOLOGY

Water Body Name: Water Channel at Old Lodi Bridge (Athpula)

INO Name: Tushar Dev

Period of Report: 18/07/2022– 22/07/2022



Targets Set for the Week -3

- 1. AUTOCAD MAPPING OF WATER BODY AND SURROUNDING AREAS**
- 2. TO MEET THE ULB (NDMC) OFFICIALS AND CONCERNED REJUVENATION AGENCIES TO KNOW ABOUT THE CURRENT EFFORTS BEING UNDERTAKEN FOR WATER BODY REJUVENATION**
- 3. TO INVESTIGATE THE PURPOSE OF WATER BODY**
- 4. TO DETERMINE THE MODES OF RECHARGE AND RE-CIRCULATION OF WATER OF THE WATER BODY**
- 5. TO DETERMINE THE CHEMICAL TREATMENT DONE/Required ON THE WATER BODY**



OUTCOMES AND OBSERVATIONS

- **COMPLETED THE AUTOCAD MAPPING OF THE WATER CHANNEL AND SURROUNDINGS IN 2D.**
- **WE MET THE NDMC OFFICIAL MR. PRANAV TIWARI (JUNIOR ENGINEER) NDMC AND DISCUSSED ABOUT THE ONGOING REJUVENATION WORKS FOR THE CHANNEL AND THE UPCOMING ONES.**
- **WE INVESTIGATED ABOUT THE MAJOR PURPOSE OF WATER BODY BY THE CARETAKERS WORKING THEIR AND TALKED TO THEM.**
- **WATER WAS MAJORLY STAYING THERE AND PRONE TO STAGNATION BUT STILL WE TRIED TO FIND OUT THE MODEE OF RE CIRCULATION AND RECHARGE.**
- **ENZYMATIC TREATMENTS MAJORLY DONE AS CHEMICAL TREATMENTS.**



AUTOCAD MAPPING OF THE WATER CHANNEL AND SURROUDING





PURPOSE OF WATER

BODY

AS WE HAVE DISCUSSED AND INVESTIGATED YET THE WATER BODY IS MAJORLY USED FOR FOLLOWING PURPOSES.

1. THE WATER BODY IS USED FOR PLANTATION MAINLY AND TO PROVIDE PROPER REQUIRED MOISTURE TO THE PLANTS.
2. IT PROVIDE A PROPER WHOLE SOME HABITAT TO THE AQUATIC LIFE AS THE OXYGEN IS IN REFERRED QUANTITY.
3. AS A DUCK HOUSE SITUATED NEAR IT PROVIDE WATER NEEDS TO THEM LIKE FOR DRINKING AND BATHING ETC.







DISCUSSION WITH THE NDMC OFFICIAL.

- ON 19/07/2022 WE MET JUNIOR ENGINEER (NDMC) MR. PRANAV TRIPATHI AT KHAN MARKET.**
- HE TOLD US ABOUT THE REJUVENATION AND FILTRATION PROCESSES GOING ON.**
- HE HAVE A BROAD VIEW ABOUT THE TOTAL PROCESS OF FILTRATION**
- HE SAID THAT SEDIMENTATION IS DONE ITSELF IN CHANNEL.**





- **AERATION IS DONE BY THE HELP OF  FOUNTAINS.**
- **HE HAD ALSO INFORMED US ABOUT THAT ENZYMATIC/BIOREMEDIATION WORK BEING UNDERTAKEN BY THE AGENCY AND WATER TREATMENT PLANT OF 15KL CAPACITY BEING USED TO FILTER THE WATER. **



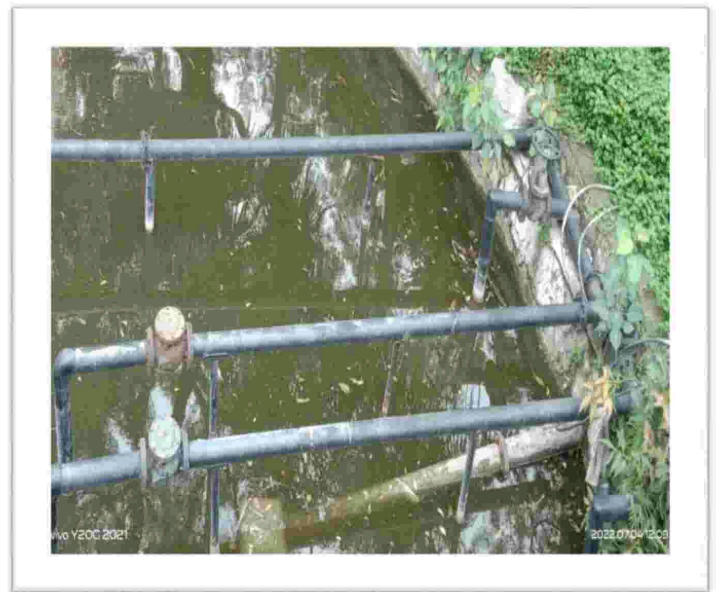


MODES OF RE- CIRCULATION **AND RECHARGE :-**

- IF WE TALK ABOUT THE CIRCULATION WE MUST TALK ABOUT THE STAGNATION.
- STAGNATION IS MAJORLY THERE IN THE WATER BODY   AS THE UNWANTED WEEDS ARE NOT ALLOWING THE WATER TO FLOW
- FOUNTAINS ARE MAIN SOURCE OF CIRCULATION OF WATER.
- THE MODES OF RECHARGE IS PURELY NATURAL i.e. RAINWATER.
- LATERAL RAIN WATER HARVESTING SHAFTS ARE BUILT AT THE END AND THE BEGINNING OF THE WATER BODY WITH STONE FILTER FOR



ADEQUATE FILTERING AND RAINWATER PERCULATING IN GROUND WATER THAT ULTIMATELY JOIN THE CHANNEL.





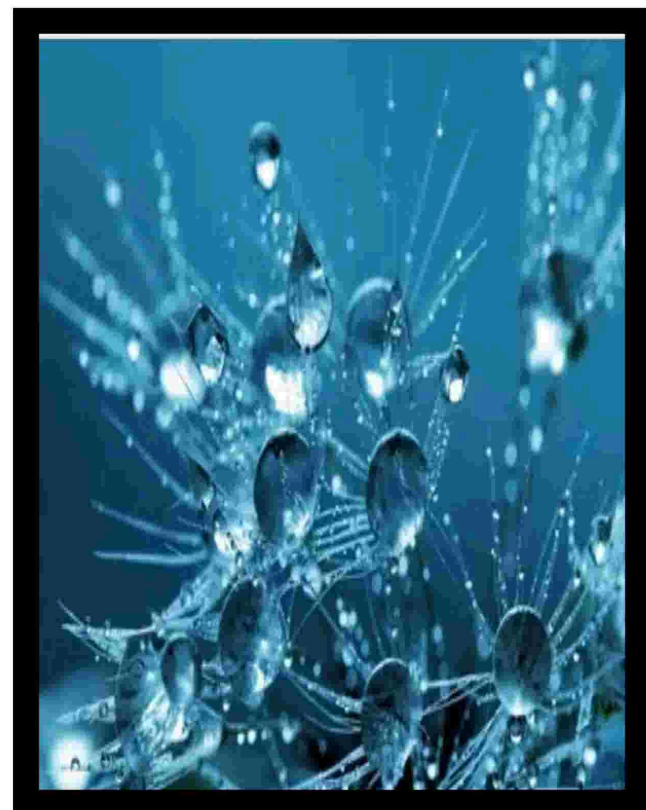
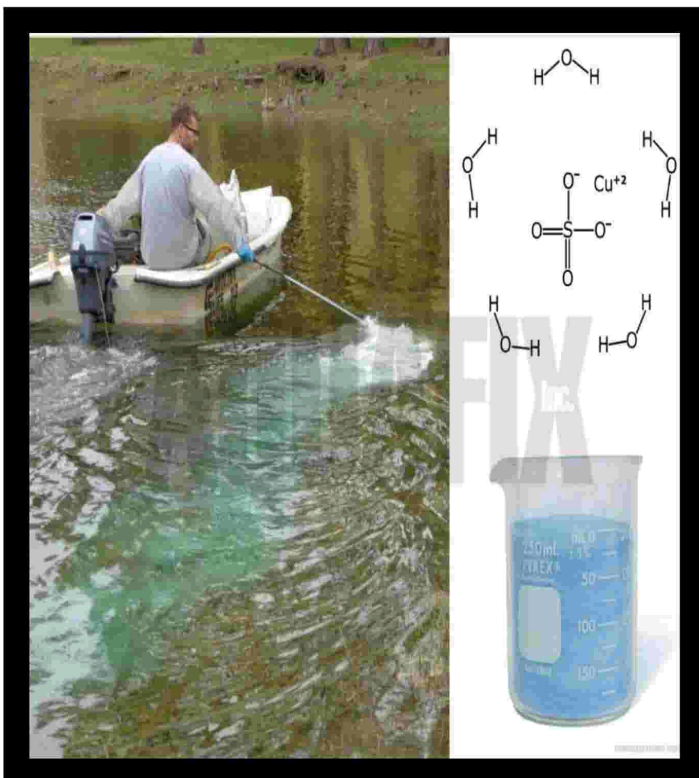
CHEMICAL TREATMENT DONE
/CAN BE DONE ON THE WATER
BODY

- ENZYMATIC TREATMENT IS BEING UNDERTAKEN TO REDUCE THE BOD without affecting the ecosystem.
- WE RECOMMEND THAT CuSO_4 TREATMENT CAN BE DONE TO REDUCE THE PRESENCE OF ALGAE WHICH CAN REDUCE THE ODOUR



AND CAN BECOME A MORE BETTER PLACE FOR THE TOURISTS.

- CHLORINATION CAN ALSO BE DONE.





MEDICINAL GARDEN

NEAR WATER BODY

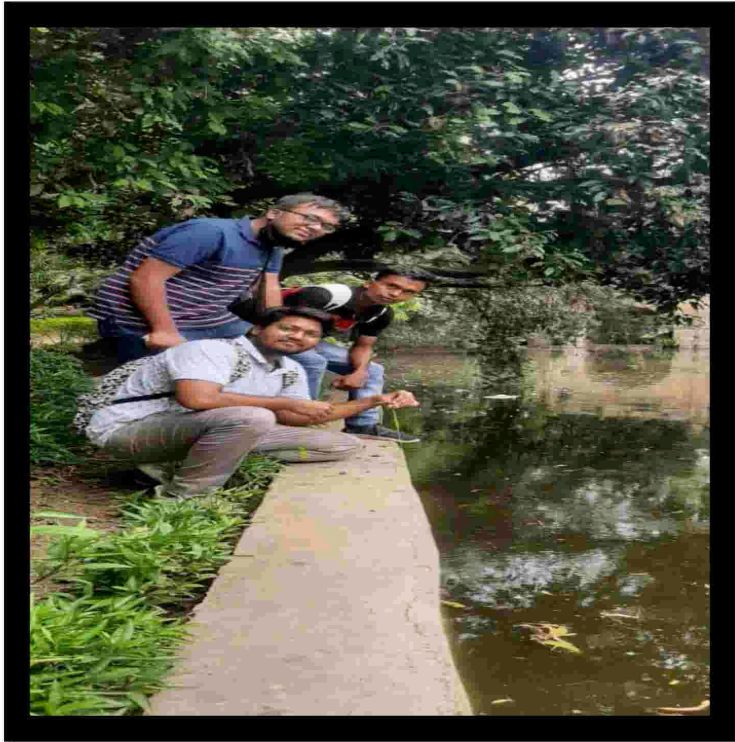
- A MEDICINAL GARDEN IS ALSO SETTED UP IN SOME AQUURED LAND NEAR THE WATER BODY AT LODHI GARDEN
- IT CONSIST OF PLANTS LIKE TULSI, EUCALPTUS, ALOE VERA, AND MANY MORE.
- IT'S A VERY BEAUTIFUL THING TO EXPLORE AND A VERY GOOD TOURIST ATTRACTION ALSO.



THIS WEEK'S WATER LEVEL

VARIATION DATA

<u>DAY</u>	<u>WATER LEVEL</u>
MONDAY :-	2.14 FEET
TUESDAY:-	2.16 FEET
WEDNESDAY:-	2 FEET
THURSDAY:-	2.10 FEET
FRIDAY :-	2.12 FEET



WE TAKING MEASUREMENTS




TARGETS SET FOR NEXT WEEK

(WEEK -4)

- **CONDUCT THE WATER PARAMETER TESTS OF BOD , DO AND TURBIDITY AND SUGGEST TREATMENTS WHICH CAN BE DONE IN CASE PERMISSIBLE PARAMETERS EXCEEDED**
- **BRAINSTORMING □ AND GROUP DISCUSSION TO COME UP WITH A VIABLE IDEA OF POSTER MAKING.**
- **TO MAKE A RECOMMENDATION REPORT FOR SPECIFIC TREATMENT TO MAKE WATERBODY A BETTER RECREATION SPOT . RECOMMENDATION WILL BE FOR THE WATER BODY AND ALSO FOR IT'S SURROUNDING STRUCTRE AND A PUBLIC OPINION IS ALSO TAKEN FOR THE SAME.**



- **PLOT A TIME V/S WATER LEVEL VARIATION GRAPH TO FIND OUT THE WATER LEVEL VARIATION OF THE WATER BODY.** 
- **SUGGEST ANY CHANGES OR UPSCALING OF THE CAPACITY OF THE TREATMENT PLANT BEING USED BY NDMC.**



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OUR GROUP MEMBERS



MISSION AMRIT SAROVAR – JAL DHAROHAR SANRAKSHAN INTERNSHIP

Institute Name: PUSA INSTITUTE OF TECHNOLOGY

Water Body Name: Water Channel at Old Lodi Bridge (Athpula)

INO Name: Tushar Dev

Period of Report: (25.07.2022) – (30.07.2022)



Targets Set for the Week

- TO MEASURE THE WATER HOLDING CAPACITY OF THE WATER CHANNEL.
- TO DETERMINE THE WATER PARAMETERS BY PERFORMING DIFFERENT KINDS OF TEST.
- TO PLOT THE SEASONAL VARIATION AS WELL AS DAY VARIATION GRAPH OF THE WATER CHANNEL .
- TO GIVE THE SUGGESTION OF UPSCALING THE CAPACITY OF TREATMENT PLANT TO NDMC.
- TO TAKE THE PUBLIC OPINION ON THE DIFFERENT ASPECTS OF LODI GARDEN .
- TO DISCUSS ABOUT TE RE-IMAGING OF WATER CHANNEL.

Outcomes and Observations

- WE FOUND THE TOTAL HOLDING CAPACITY OF THE WATER CHANNEL OF LODI GARDEN THAT IS APPROXIMATELY 42 LAKH LITRES .
- THE DIFFERENT KINDS OF TEST THAT WERE PERFORMED IN THE COLLEGE BY OUR GROUP MEMBERS IN THE PRESENCE OF OUR INO OFFICER IN THE LAB ARE AS FOLLOWS ;-[BOD TEST, pH LEVEL TEST, TDS TEST , DO TEST].THESE ALL TESTS WERE PERFORMED WITH THE SAMPLE THAT HAS BEEN TAKEN FROM THE SITE.
- THERE ARE ALSO SOME QUANTITY CONTROL TEST THAT WERE PERFORMED BY NDMC,SOME TESTS ARE FOLLOWS;-[BOD TEST, COD TEST, TSS TEST, TDS TEST, pH VALUE, NITRATE CONTENT, SULPHATE CONTENT]. THESE TESTS WERE ALSO PERFORMED USING THE SAMPLE FROM THE SITE .
- WE FOUND THE WATER LEVEL [DEPTH] VARIATION IN THE WATER CHANNEL IN DIFFERENT SEASONS AS FOLLOWS ;-

SEASONS	OBSERVATIONS [IN FEET]
SUMMER	0.5-1
RAINY	4-5
WINTER	2-3

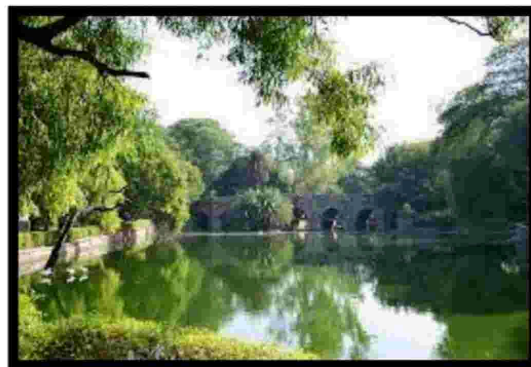
DAY	OBSERVATIONS [IN FEET]
MONDAY	2.5
TUESDAY	2.4
WEDNESDAY	2.6
THURSDAY	2.8
FRIDAY	2.1
SATURDAY	2.3

SOURCE;-NDMC

■ WE HAVE TAKEN THE PUBLIC OPINION ON VARIOUS ASPECTS FROM THE LOCALS AS WELL AS THE VISITORS WHICH INCLUDE INDIANS AND FOREIGNERS .ALL THE QUESTIONS THAT HAS BEEN ASKED DURING THE INTERACTION WITH THE VISITORS ARE MENTIONED IN THE FOLLOWING PAGE OF THIS REPORT

■ RE-IMAGING OF WATER CHANNEL ARE;

- 1.)DEPTH SHOULD BE INCREASED FOR THE PURPOSE OF BOATING FACILITY
- 2.)IT SHOULD BE CLEANED ON THE REGULAR BASIS SO THAT NO FOUL SMELL COMES FROM THE WATER BODY



THE ABOVE OBSERVATIONS IS FURTHER EXPLAINED IN DETAILED IN THE UPCOMING PAGES

QUANTITY OF WATER CHANNEL

THE CAPACITY OF WATER CHANNEL IS APPROXIMATELY 42 LAKHS LITRES.

AREA = 5701.641 m²

INITIAL DEPTH = 3ft.

FINAL DEPTH = 5ft.

Notes

Initial depth = 3ft
final depth = 5ft
Area given = 5701.641 m²

∴ We know that 1ft = 0.305m

∴ Initial depth = 3 × 0.305m
= 0.915m

also,
- final depth = 5 × 0.305
= 1.525m

Now,
Since only height is variable
let's integrate to find the
volume of water channel

$$V = \int_i^f 5701.641 h \, dh$$
$$V = 5701.641 \int_{0.915}^{1.525} h \, dh$$
$$V = 5701.641 \left[\frac{h^2}{2} \right]_{0.915}^{1.525}$$

Notes

$$V = \frac{5701.641}{2} [(1.525)^2 - (0.915)^2]$$
$$V = \frac{5701.641}{2} [1.488]$$
$$V = \frac{8484.041}{2}$$
$$V = 4242.02 \, m^3$$

∴ We know that 1m³ = 1000L

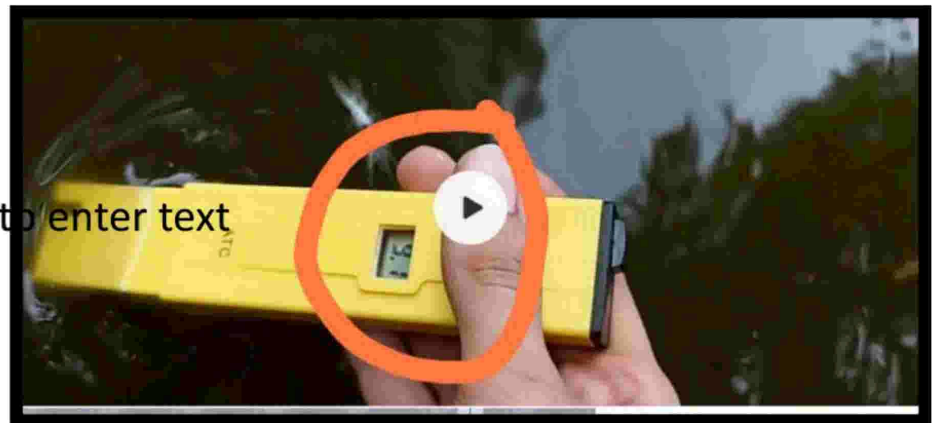
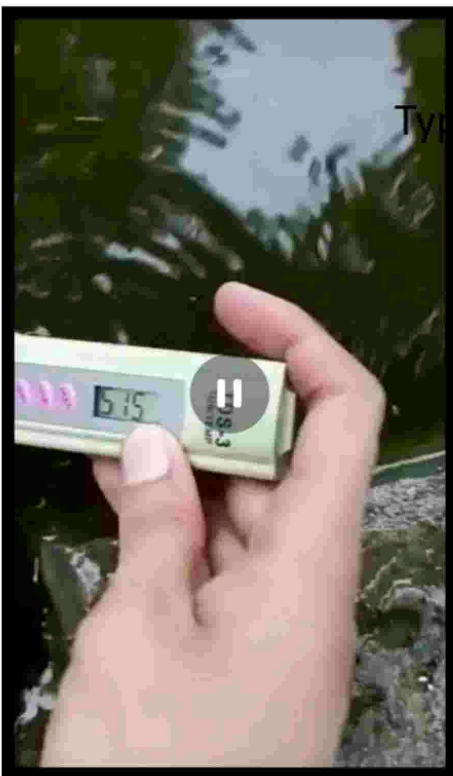
∴ The vol^m of water in the
channel is about 42 lakh litres

Source;-NDMC DATA

CALCULATED BY OUR GROUP
MEMBERS.

TEST PERFORMED IN OUR COLLEGE

PAREMETERS	LIMIT	UNIT	OBSERVATIONS
BOD	30	Mg/l	29-31
pH	6.5-9.0	Mg/l	9.1
TDS	500-2000	Mg/l	515
Do	6.5-8	Mg/l	7-7.5



SOURCE
OUR TEAM MEMBER



TEST PERFORMED BY NDMC

SOURCE

DELHI JAL BOARD

QUALITY CONTROLLED LABORATORY

REF NO;-D.E.B/DTQX/W.D/2020/PAID-38-39

DELHI JAL BOARD
GOVT. OF N.C.T. OF DELHI
QUALITY CONTROL LABORATORY
W.W.WAZIRABAD, DELHI-110054

Ref No. D.E.B/DTQX/W.D./2020/PAID-38-39 Dated: 21.07.2020

Analysis report of water Sample received from Office of the Assistant Engineer-V(R-II)
NDMC: Golf Link Service Centre: N.Delhi
Sampling Point : Lodi Garden

Ref No-252/D/AE-V(R-11) Dated: 14.07.2020
Challan no.80 Dated: 15.07.2020

S. No.	PARAMETERS	Limit	UNIT	A	B
1	DATE OF SAMPLE Received	--	--	17.07.20	17.07.20
2	B.O.D	30	Mg/l	23.8	8.90
3	C.O.D	250	Mg/l	120	34
4	T.S.S.	600	Mg/l	70.6	10.0
5	T.D.S	500/2000	Mg/l	928	127
6	pH Value	6.5-9.0	--	7.9	7.3
7	Nitrate	45	Mg/l	2.93	1.48
8	Sulphate	200-400	Mg/l	98.2	60.4
9	E.Coli	--	--	-ve	-ve

S/CH/2020/2177
A/CHEMIST

CH/2020/2177
CHEMIST

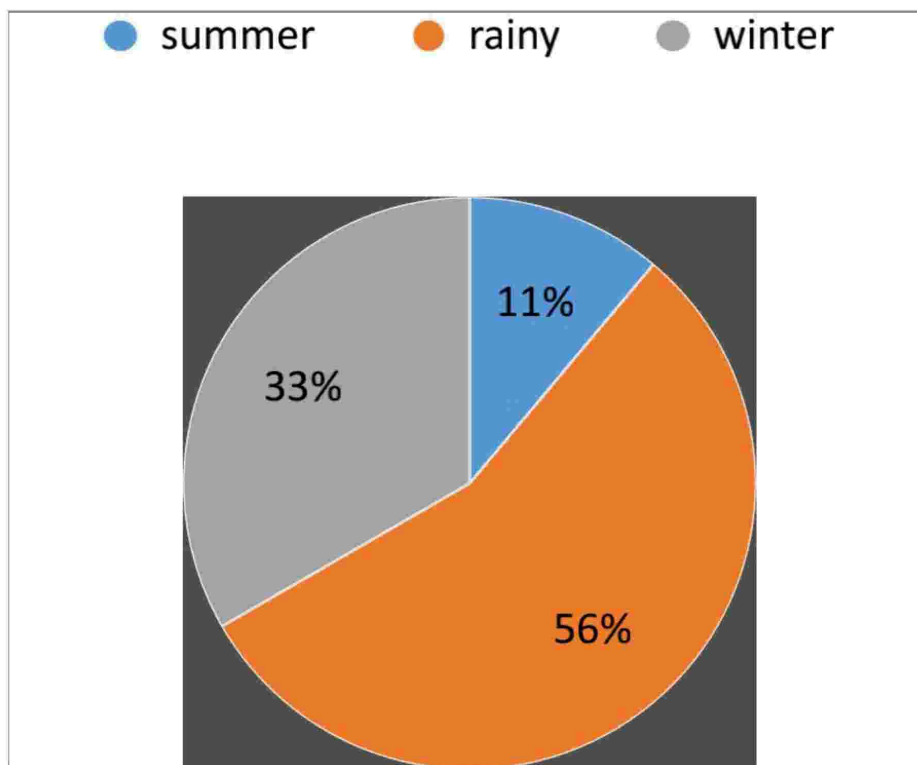
A.C.W.A
Asstt. Chief Water Analyst
D.E.B. Govt. of N.C.T. of Delhi
Wazirabad, Wazirabad

SOURCE;-NDMC

WATER LEVEL VARIATION IN THE WATER CHANNEL

SEASONAL VARIATION

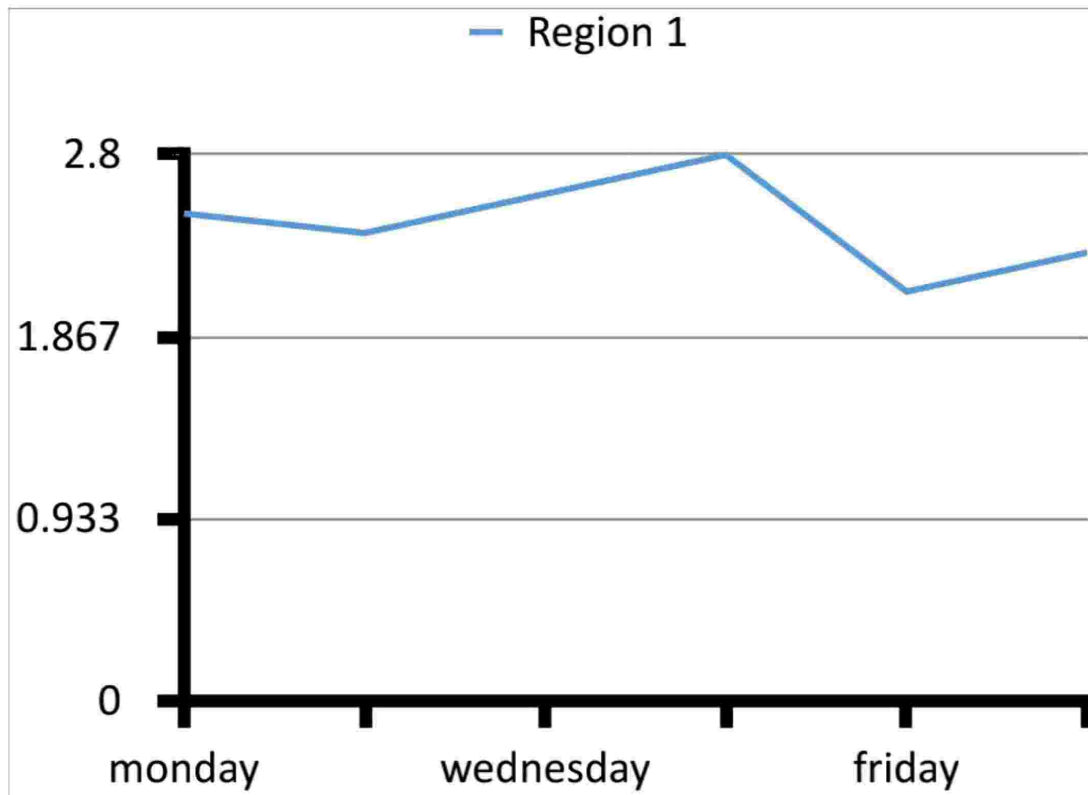
SEASONS	OBSERVATIONS [IN FEET]
SUMMER	0.5-1
RAINY	4-5
WINTER	2-3



SOURCE;-NDMC

DAYWISE VARIATION

DAY	OBSERVATIONS [IN FEET]
MONDAY	2.5
TUESDAY	2.4
WEDNESDAY	2.6
THURSDAY	2.8
FRIDAY	2.1
SATURDAY	2.3



SOURCE;-
OUR TEAM MEMBERS

AMRIT PUBLIC OPINION

THE QUESTIONS THAT WERE ASKED BY OUR TEAM MEMBERS TO THE PUBLIC ARE FOLLOWS:-

Q1.) WILL YOU VISIT THE PLACE AGAIN ?

Q2.) HOW WILL YOU MANAGE THE AREA AS AN INCHARGE ?

Q3.) WHAT IMPROVEMENTS WILL YOU UNDERTAKE HERE OR WHAT IMPROVEMENTS WOULD YOU LIKE TO SEE IN AND AROUND THE WATER BODY OR IN THE LODI GARDEN?

Q4.) WHAT IS THE PURPOSE OF VISITING THE PLACE?

Q5.) HOW MUST DO YOU KNOW ABOUT THE WATER BODY AND ABOUT LODI GARDEN AND ITS MONUMENTS?

Q6.) WILL YOU BE INTERESTED IN A LIGHT AND SOUND SHOW IN THE LODI GARDEN WHICH WILL HIGHLIGHT THE IMPORTANCE OF THESE MONUMENTS AND THE WATER BODY IN AN INTERACTIVE MANNER?

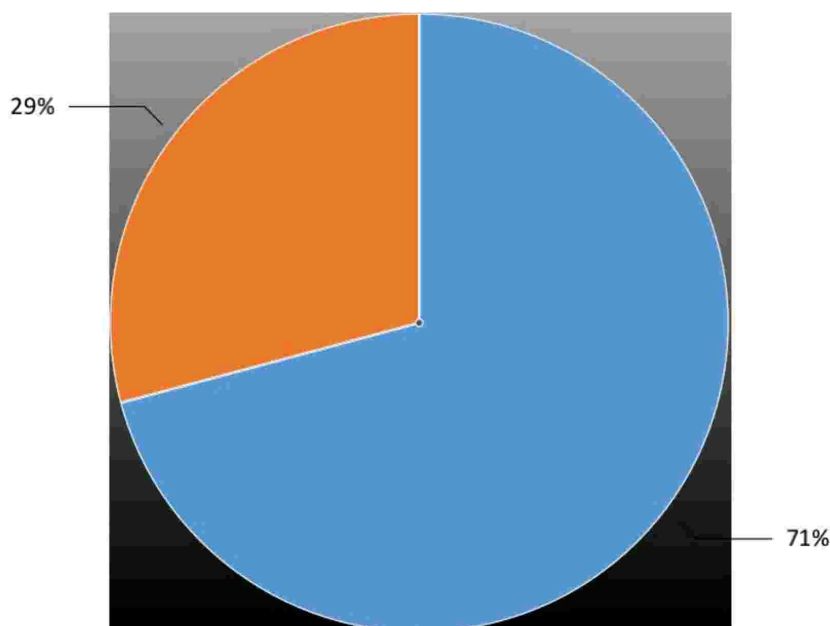
Q7.) DO YOU THINK THERE IS A NEED FOR A CANTEEN / FOOD COURT LIKE SYSTEM ANYWHERE AROUND THE WATER BODY WHERE PEOPLE CAN MEETUP AND HANGOUT AFTER THEIR VISITING THE WATER BODY?

WILL YOU VISIT THE PLACE AGAIN

WE HAVE TAKEN THE PUBLIC OPINION ON THIS TOPIC FROM ALMOST 100 VISITORS AND WE GET TO KNOW THE ANSWERS IN ONE WORD THAT IS. YES/NO.

● YES

● NO





TAKING PUBLIC OPINION

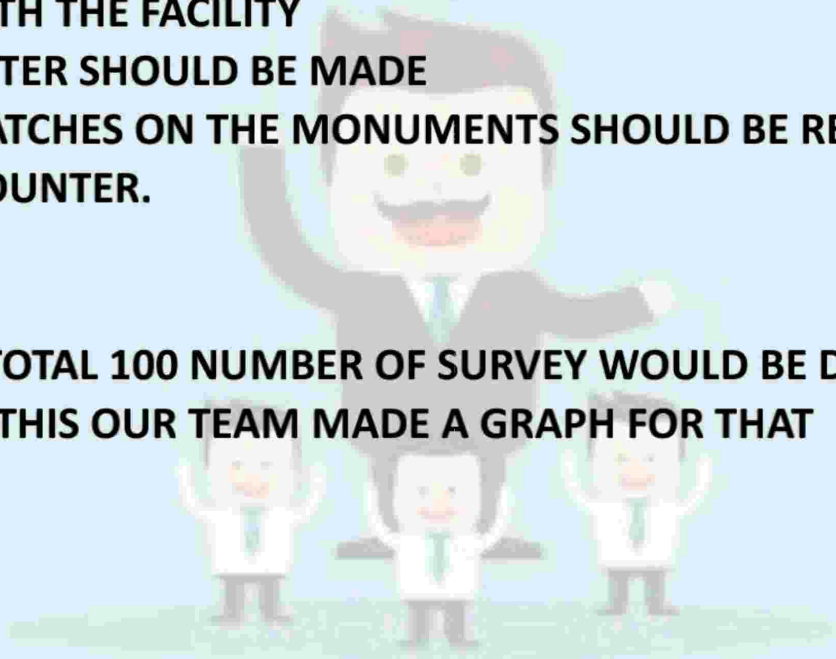


HOW WILL YOU MANAGE THE AREA AS AN INCHARGE ?

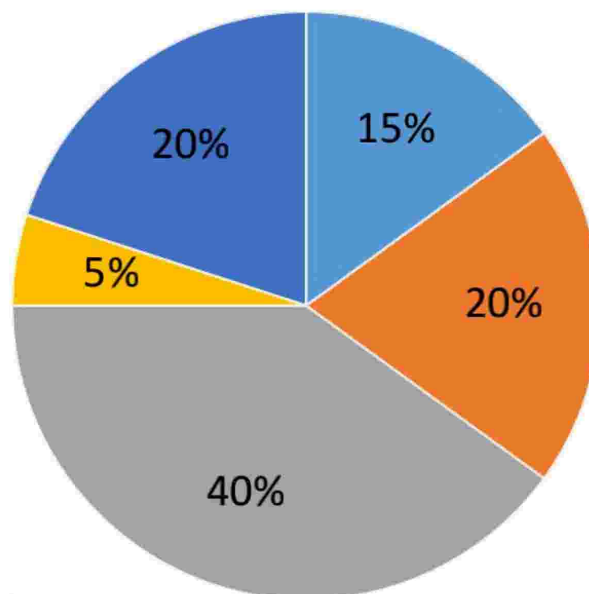
DIFFERENT THOUGHT MADE BY DIFFERENT PEOPLE .

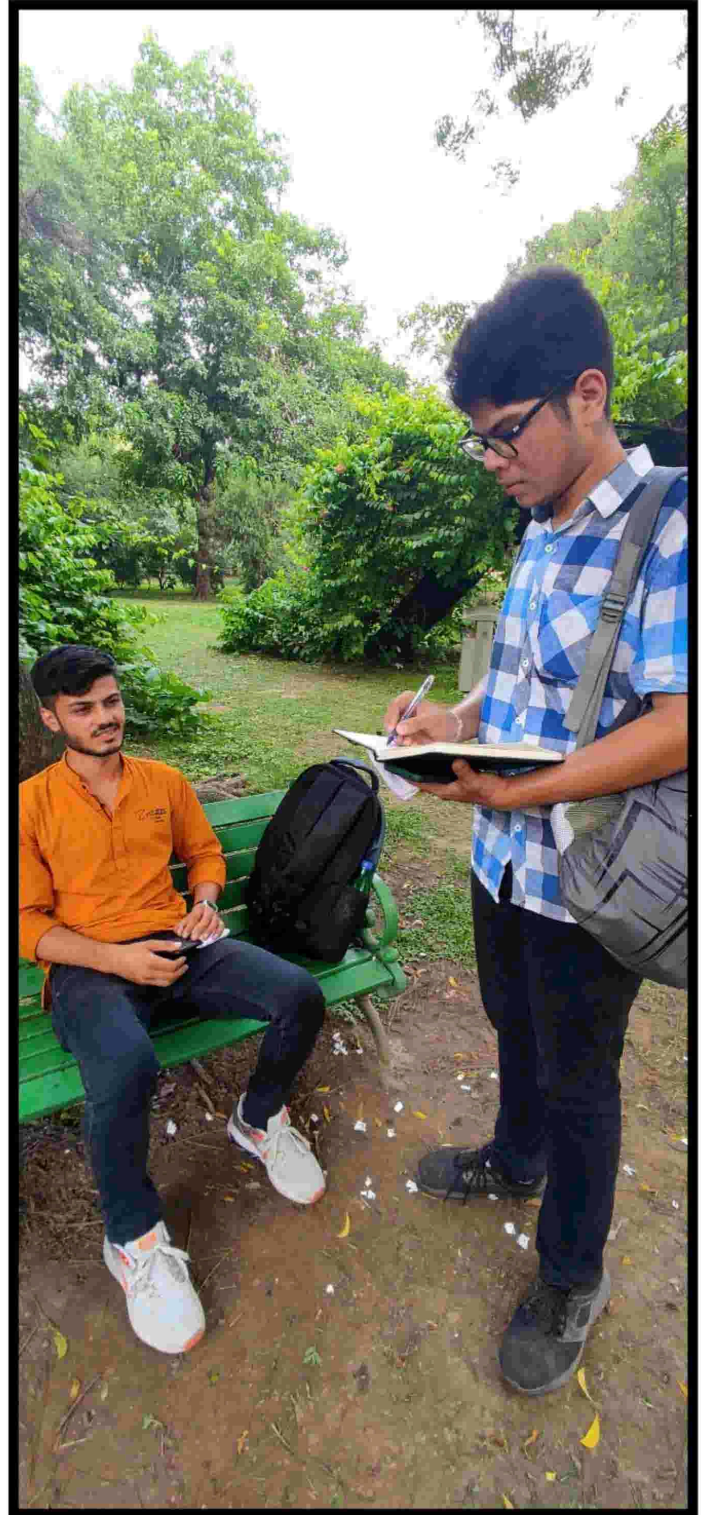
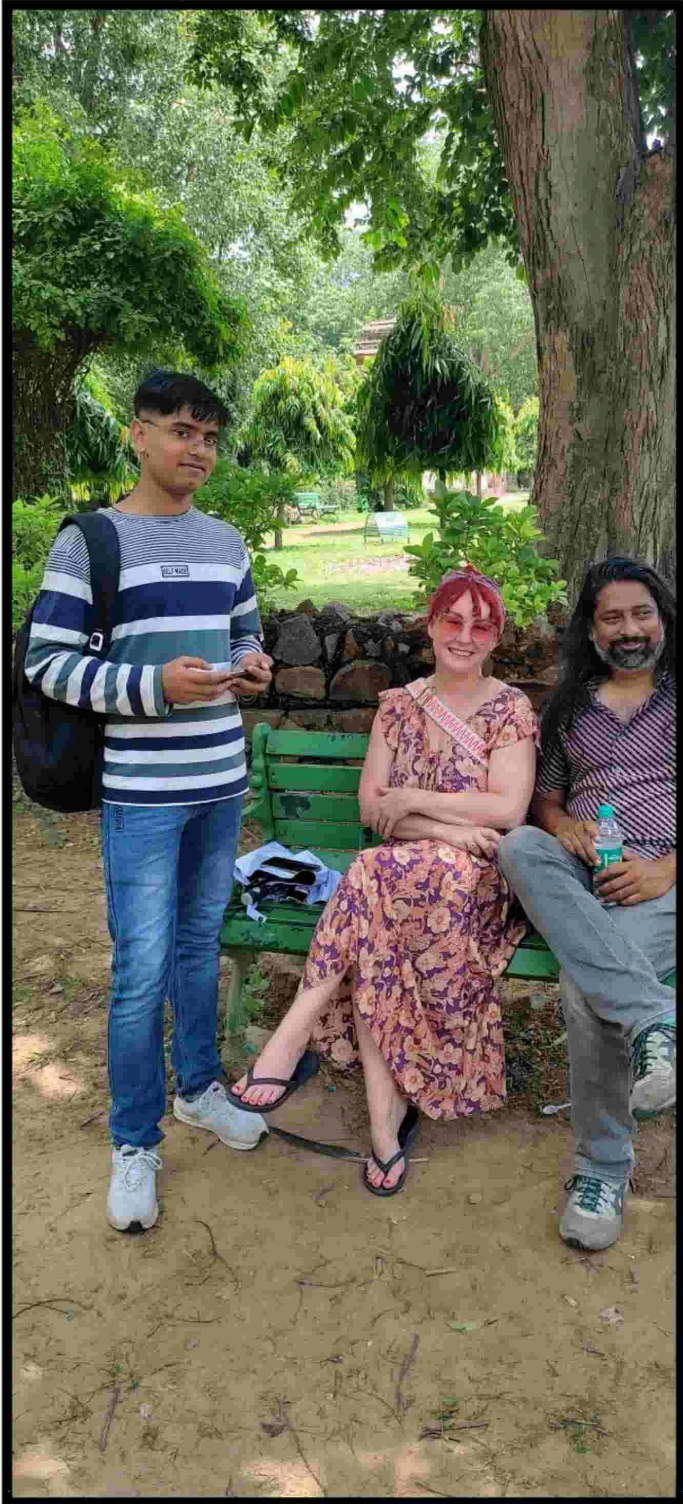
- 1) MAINTANCE WORK SHOULD BE PROPERLY DONE
- 2) SATISFIED WITH THE FACILITY
- 3) TICKET COUNTER SHOULD BE MADE
- 4) GRIFFTY SCRATCHES ON THE MONUMENTS SHOULD BE REMOVED
- 5) NO TICKET COUNTER.

THERE IS A TOTAL 100 NUMBER OF SURVEY WOULD BE DONE
OUT OF THIS OUR TEAM MADE A GRAPH FOR THAT



- MAINTANCE WORK
- REMOVE GRIFFTY
- SATISFIED
- NO TICKET
- YES TICKET





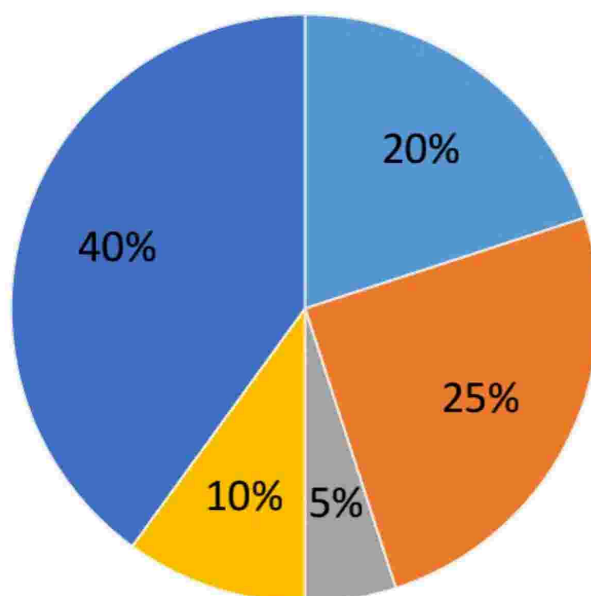
WHAT IMPROVEMENTS WILL YOU UNDERTAKE HERE OR WHAT IMPROVEMENTS WOULD YOU LIKE TO SEE IN AND AROUND THE WATER BODY OR IN THE LODI GARDEN?

ACCORDING TO PUBLIC THERE IS A LOT OF IMPROVEMENT SHOULD BE DONE IN LODI GARDEN .

- 1) RENEWAL OF MONUMENTS
- 2) IMPROVE PARKING FACILITY AT ALL GATES
- 3) ENHANCED THE SECURITY OF GARDEN
- 4) PROVIDE THE VIP AREA
- 5) WATER SHOULD BE CLEANED PROPERLY

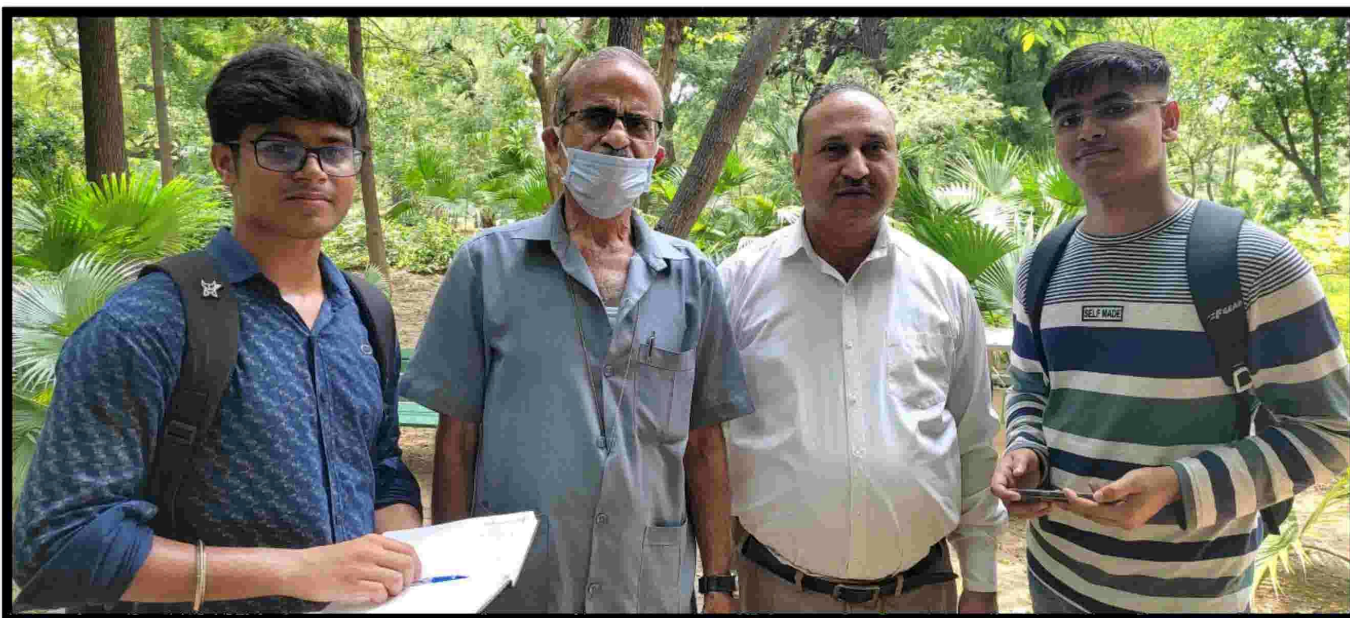
TOTAL 100 NO. OF SURVEYED DONE BY OUR TEAM MEMBER

● RENEWAL OF MONUMENTS ● PARKING ● SECURITY ● VIP AREA
● WATER CLEAN





**A LOT OF ANSWER IS GIVEN BY
RESPECTED VISITOR**



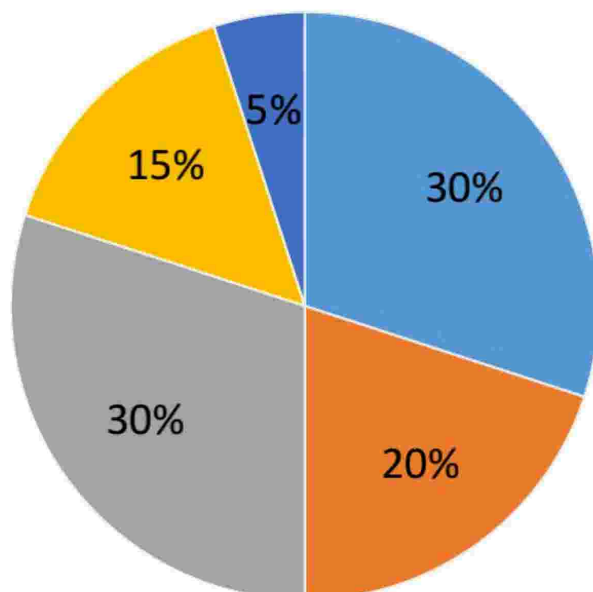
WHAT IS THE PURPOSE OF VISITING THE PLACE?

THERE ARE VARIOUS OF PURPOSE THAT WAS GIVEN BY AMRIT PUBLIC TO THEIR VISIT

- 1) TO SEE GREENARY AREA
- 2) TO MEET WITH THEIR FRIENDS
- 3) SOME PRIVATE TALK
- 4) TO WALK ON THE 90 ACRES PARK

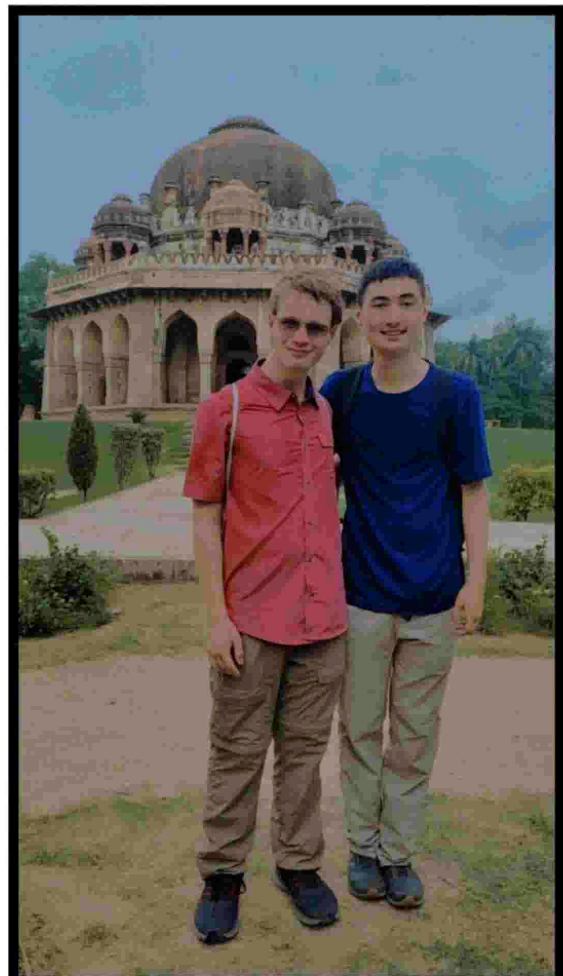
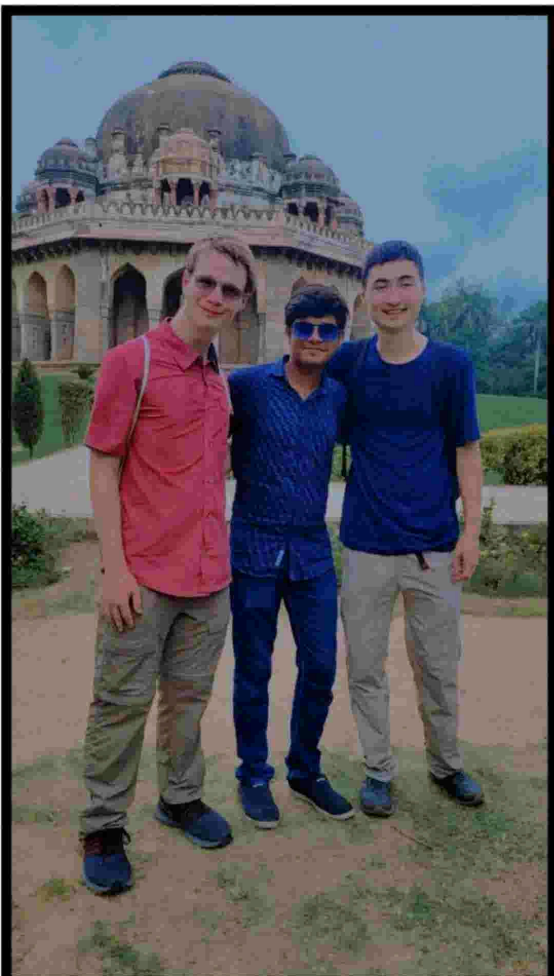
TOTAL 100 NO. OF SURVEYED DONE BY OUR TEAM MEMBER

● GREENARY AREA ● MEETING ● PRIVATE TALK ● WALKING
● FLIM SHOOTING





THESE TWO FRIENDS ARE FROM TEXAS (USA) WHO HELPED US A LOT



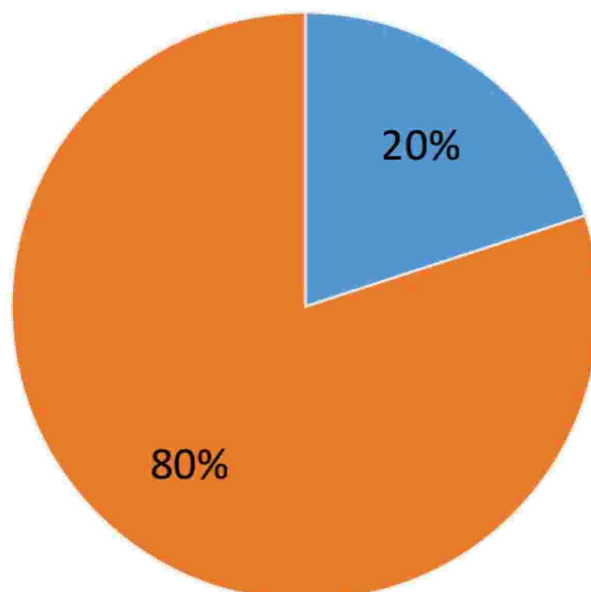
HOW MUST DO YOU KNOW ABOUT THE WATER BODY AND ABOUT LODI GARDEN AND ITS MONUMENTS?

ACCORDING TO SURVEYED THAT WE WERE DONE ON LODI GARDEN MANY PEOPLE DIDNOT KNEW ABOUT THIS HISTORICAL SPATIO

THERE IS A TOTAL 100 NUMBER OF SURVEY WOULD BE DONE OUT OF THIS OUR TEAM MADE A GRAPH FOR THAT

● YES

● NO





OUR TEAM SUGGEST:-

GOVERNMENT SHOULD MAKE A SHORT FILM ON THE HISTORICAL SPATIO OF THE LODI GARDEN TO AWARE ABOUT THIS GARDEN



WILL YOU BE INTERESTED IN A LIGHT AND SOUND SHOW IN THE LODI GARDEN WHICH WILL HIGHLIGHT THE IMPORTANCE OF THESE MONUMENTS AND THE WATER BODY IN AN INTERACTIVE MANNER?

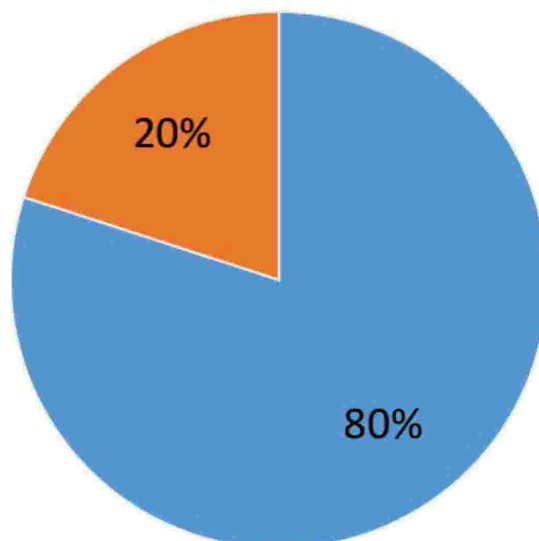
FOR INSTALLING THE LIGHT SHOW AND SOUND SYSTEM IN AND AROUND LODI GARDEN, AFTER THE SURVEYED THAT OUR TEAM, IS COMING IN THE CONCLUSION THAT VISITOR WHO SAYS

- 1) YES = 80 %**
- 2) NO = 20%**

THERE IS A TOTAL 100 NUMBER OF SURVEY WOULD BE DONE OUT OF THIS OUR TEAM MADE A GRAPH FOR THAT

● YES

● NO





DO YOU THINK THERE IS A NEED FOR A CANTEEN / FOOD COURT LIKE SYSTEM ANYWHERE AROUND THE WATER BODY WHERE PEOPLE CAN MEETUP AND HANGOUT AFTER THEIR VISITING THE WATER BODY?

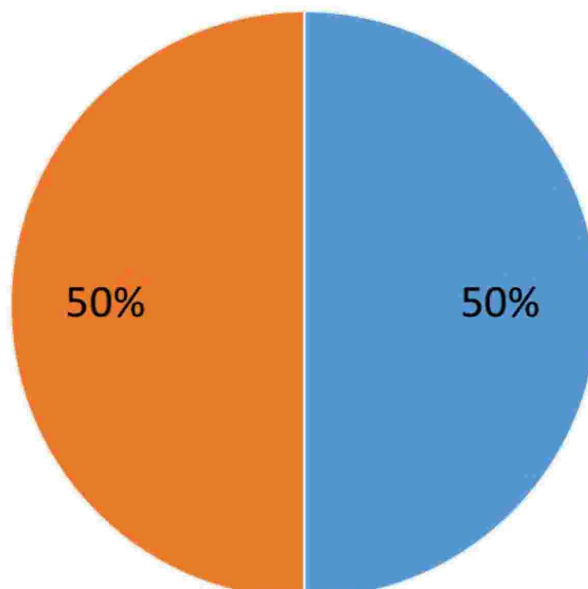
How to be Creative While Setting up An Eco Friendly Restaurant

WE HAVE TAKEN THE INTERVIEW OF ALMOST 100 TOURISTS IN THIS REGARDS BUT WE GET VERY MIXED OPINIONS FROM THEM , WE CAN SAY THAT THERE ARE 50-50 RESPONSE ABOUT OPENING THE FOOD COURT .

THERE IS A TOTAL 100 NUMBER OF SURVEY WOULD BE DONE OUT OF THIS OUR TEAM MADE A GRAPH FOR THAT

● NO

● YES





Activities Scheduled for the Coming Week

- THIS IS OUR FINAL WEEK REPORT.
 - WE WILL MAKE POSTER IN UPCOMING WEEKS
 - WE WILL ALSO MAKE SHORT FILM ON THE TOPIC OF LODI GARDEN TO AWARE THE PUBLIC ABOUT ITS HISTORY AS WELL AS ITS PRESENT SITUATION.
-
- **THANKU VERY MUCH AMRIT SAROVAR SCHEME TO ENCOURAGE US FOR INCREASING THE VISUALISING POWER AND GIVEN A GOLDEN OPPORTUNITY TO WORK ON THE GREAT REJUVENATION PROGRAMME OF ATHPULA LAKE.**

Group Photo of the Team at Water Body





THE BEST CREATER NEXT TO GOD ARE.....

CIVIL ENGINEER.....

THANKU VERY MUCH!!