CONSERVATION STRATEGIES FOR HAMMAMS IN INDIA

MASTER OF ARCHITECTURE (CONSERVATION)

KANISHKA SHARMA
Sch. No. 2017MCO008

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
NEELBAD ROAD, BHAURI, BHOPAL – 462030

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CONSERVATION STRATEGIES FOR HAMMAMS IN INDIA

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By

KANISHKA SHARMA
Sch. No. 2017MCO008

Under the Guidance of
Ms. Shweta Vardia

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
NEELBAD ROAD, BHAURI, BHOPAL – 462030
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In the end, I appreciate efforts of my parents for their selfless support, sacrifice and continuous prayers throughout my life.

ABSTRACT

Hammam is a distinct building typology that was introduced during Indo-Islamic era and became a major socio-cultural institution. Their different locations in the city indicate that hammams were intended for the royals as well as for the citizens of the city and visitors. The hammams had spaces with different functions as bathing practices included several steps. The complex system of operating hot and cold baths mechanism was intelligently designed along with structure that could also adjust the temperature between outside and inside. Their layouts, ornamentation and decorative elements were important indicators of how traditions were made, maintained and passed on. This thesis intends to develop an understanding of hammams as an important institution in Indian cities. This thesis will also explore the form, geometry and spatial arrangements of hammams through case studies.

The hammam structures now lie in the neglect though under protection. A little awareness towards preservation of hammam structures can be created with stating parallel studies of working hammams elsewhere in India and across world. Further work is required to rehabilitate them in their context.

Keywords: Hammam, conservation, traditional, bathhouses

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1. INTRODUCTION

1.1 BACKGROUND

Historian Ibn khalun sees dynasty as cause and cities as effect relationship between the towns. The city was where knowledge between flowed. In 1206, Turks established themselves over north India when Qutbuddin-Aibak assumed power of Delhi. Islamic cities were formed across all over India from then onwards. Various types of institutions came up in Indian cities like *Itqas, khanqahs, hammam*[1] came up in India during Sultanate period.

The features of Islamic cities are; a) the main mosque surrounded by *suq* (economic) with hammam and madrasa. b) the citadel (*qasba*) of governor/sultan. c) *mohallas* (ethnic, social, economic) with gates. d) main street/s with sub streets for connecting. e) wall of the city with gates and f) exterior of city wall possessed 'weekly market and garden.

Mosque dominated religious beliefs propagated separation of public and private life was annexed with *hammams*. Their different locations in the city indicate that *hammams* were intended for the royals as well as for the citizens of the city and visitors. The *hammams* had spaces with different functions as bathing practices included several steps.

The complex system of operating hot and cold baths mechanism was intelligently designed along with structure that could also adjust the temperature between outside and inside. Their layouts, ornamentation and decorative elements were important indicators of how traditions were made, maintained and passed on. Cities with hammams therefore become the repositories of the country's civic sense.

[1] a health treatment in which you sit in a room full of steam and are then usually massaged and washed, or a building in which this treatment is available (Definition of "hammam" from the Cambridge Advanced Learner's Dictionary & Thesaurus © Cambridge University Press)

1.2 THE RATIONALE FOR THESIS SELECTION

Numerous *hammams* were built-in Indo-Islamic India. Most of them are presently in ruins. A couple of them operating and on the verge of extinction because of deficient use of *hammam*s in daily life. Social and urban changes have resulted in the decline of *hammam* structures especially the modern door to door pipe supply system. There is lack of detailed documentation of working system of *hammams*, for proper planning and development of these magnificent buildings scientific studies needs to be carried out. The *hammam* structures now lie in the neglect though under protection. A little awareness towards preservation of *hammam* structures can be created with stating parallel studies of working *hammams* elsewhere in India. Further work is required to rehabilitate them in their context.

1.3 RESEARCH GAP

Several scholarly work from 1942 to 2018 (refer table 1.1) mentions only few of the *hammams* across India. These mentions are mostly brief historical and architectural descriptions. No comprehensive list for *hammams* in Indian cities is available in India. *Hammams* are least studied building typologies considering their number is less than garden, tombs and mosques. There is need to study how development of historic *hammams* took place in India.

Research gap gives following of questions to form aim and objectives for the thesis.

Serial no.	Hammam location	Mitchell(2011)	Koch(1991)	Asher (1992)	Brown(1942)	Habib (2002)	Arora(2018)	R.Nath(1985)	Hamdani, A. H. (2017)	No. of mentions
1	Jehangiri Burhanpur	✓	✓			✓	✓			4
2	Redfort Delhi	✓	✓				✓			3
3	Redfort Agra	✓	✓				✓			3
4	Hakim hammam sikri	✓					✓	✓		3
5	Shahi hammam sikri	✓					✓	✓		3
6	Akhunum mullah kashmir	✓							✓	2
7	Jaunpur			✓						1
8	hammam at pari mahal complex						✓		✓	2
9	hammam at Mullah shah mosque								✓	1
10	hammam at Achbal bagh								✓	1
11	hammam at Ganderbal								✓	1
12	hammam at Shalimar bagh						✓		✓	2
13	hammam at Pathar Maszid								✓	1
14	hammam at dargah Hazartbal								✓	1
16	Hammam at bagh-e-Nilofer						✓			1
17	Aram bagh						✓			1
18	Matia mahal						✓			1
19	Gwalior fort						✓			1

Table 1.1: Mentions of hammams in several scholarly works on India (Author 2019)

- What does the term *hammam* mean across world? What are the features of hammam?
- What led to development of *hammams* developed in India? And where did these developments took place in India?
- What are the various typologies of *hammams* that developed in India? How are these typologies different in its setting and spatial arrangement?
- How is *hammam* as a structure and practice significant?
- How to retain the hammams structures to carry forward health, healing and leisure aspects of hammams?

This thesis will look for the answers of above raised questions.

1.4 AIM

The aim of this thesis is to prepare conservation strategies for hammams in India.

1.5 OBJECTIVES

- To understand the term *'hammam'* and features of *hammam* across world.
- To study and map the development of *hammams* in India.
- To identify various typologies of *hammams* in India.
- To establish the significance of the *hammam* structures and associated traditional knowledge practices.
- To prepare conservation strategies for *hammams* in India

Therefore, the matrix of research framework with aims, objectives, research questions and research methods that was adopted is as follows;

Table 1.2: matrix of research framework (Author 2019)

AIM	OBJECTIVES	QUESTIONS	METHOD
TO PREPARE CONSERVATION STRATEGIES FOR HAMMAMS IN INDIA.	TO UNDERSTAND THE TERM 'HAMMAM' AND FEATURES OF HAMMAM ACROSS WORLD	WHAT GOES THE TERM HAMMAM MEAN ACROSS WORLD? HOW DID HAMMAM DEVELOPED INTO AN INSTITUTION?	SECONDARY DATA (LITERATURE REVIEW)
	TO UNDERSTAND THE DEVELOPMENT OF HAMMAMS AND MAP THEIR DEVELOPMENT IN INDIA.	WHAT LED TO DEVELOPMENT OF HAMMAMS IN INDIA? AND WHERE DID THESE DEVELOPMENTS TOOK PLACE IN INDIA?	QUALITATIVE DATA FROM SECONDARY DATA AND ONLINE SURVEYS
	TO IDENTIFY VARIOUS TYPOLOGIES OF HAMMAM STRUCTURES IN INDIA.	WHAT ARE THE VARIOUS TYPOLOGIES OF HAMMAMS THAT DEVELOPED IN INDIA?	QUALITATIVE DATA FROM PRIMARY AND SECONDARY STUDIES
	TO ESTABLISH THE SIGNIFICANCE OF THE HAMMAM STRUCTURES IN INDIA.	HOW IS HAMMAM AS A STRUCTURES SIGNIFICANT INDIA?	QUALITATIVE DATA FROM PRIMARY AND SECONDARY STUDIES
	TO PREPARE CONSERVATION STRATEGIES HAMMAMS IN INDIA.	HOW TO RETAIN THE HAMMAMS STRUCTURE AND REVIVE THEM TO CARRY FORWARD HEALTH, HEALING AND LEISURE ASPECTS OF HAMMAMS?	QUALITATIVE DATA FROM PRIMARY AND SECONDARY STUDIES

MATRIX OF RESEARCH FRAMEWORK

1.6 Scope of Study

- This thesis would help in creating comprehensive understanding of functioning of *hammams* institution in Indian cities and associated traditional knowledge of constructing the built structure as well as practices that takes place inside the various spaces of *hammam.*
- To carry forward the leisure, healing and health aspects of *hammam* for the community at present.

1.7 Limitations

- The *hammams* in the city of Jaunpur, Burhanpur and Bhopal will be primary site for studies and understanding of other hammams will be based on literature reviews, secondary studies or previous studies the author have been involved to learn the development of hammams.
- The scientific study of construction materials and techniques is limited to secondary sources.

1.8 Expected Outcome

- To prepare a map of cities with locations of *hammams* in India.

- To derive conservation strategies for revival of *hammams* for community at present for it to act as catalyst for regeneration.

1.9 METHODOLOGY

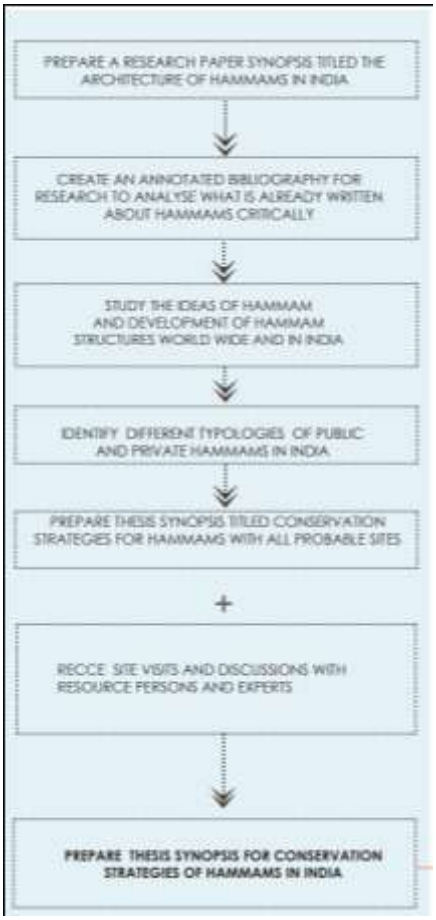


Figure 1 Research methodologies and thesis programming

The approach and methodology selected for developing the research activities to achieve the aims and objectives is described briefly below:

Initially, a descriptive research paper titled as *'architecture of hammams India' w*as prepared. Work started with collection of information into a annotated bibliography with help of background studies based on existing literature. During preparation of the research paper a critical analysis of the literature framework was done that helped in creating better understanding of the topic.

The process also led to defining the research questions which is the most important step during a research, which requires a full understanding to provide significant clues regarding the proper strategies being used.

Available studies led to recce site visit to selected case studies sites.

Literary sources and surveys work continues to fill in gaps with data collection, analysis, and evaluation drawing from the previous analysis of each case studies and comparative.

However, work on the literature review was continued and updated up until the end of the research. The analysis of the findings led to the formation of the conclusions and recommendations, which will be the last section of the research.

A flowchart describing the to and fro process of research activities to lead to expected outcome is as follows:

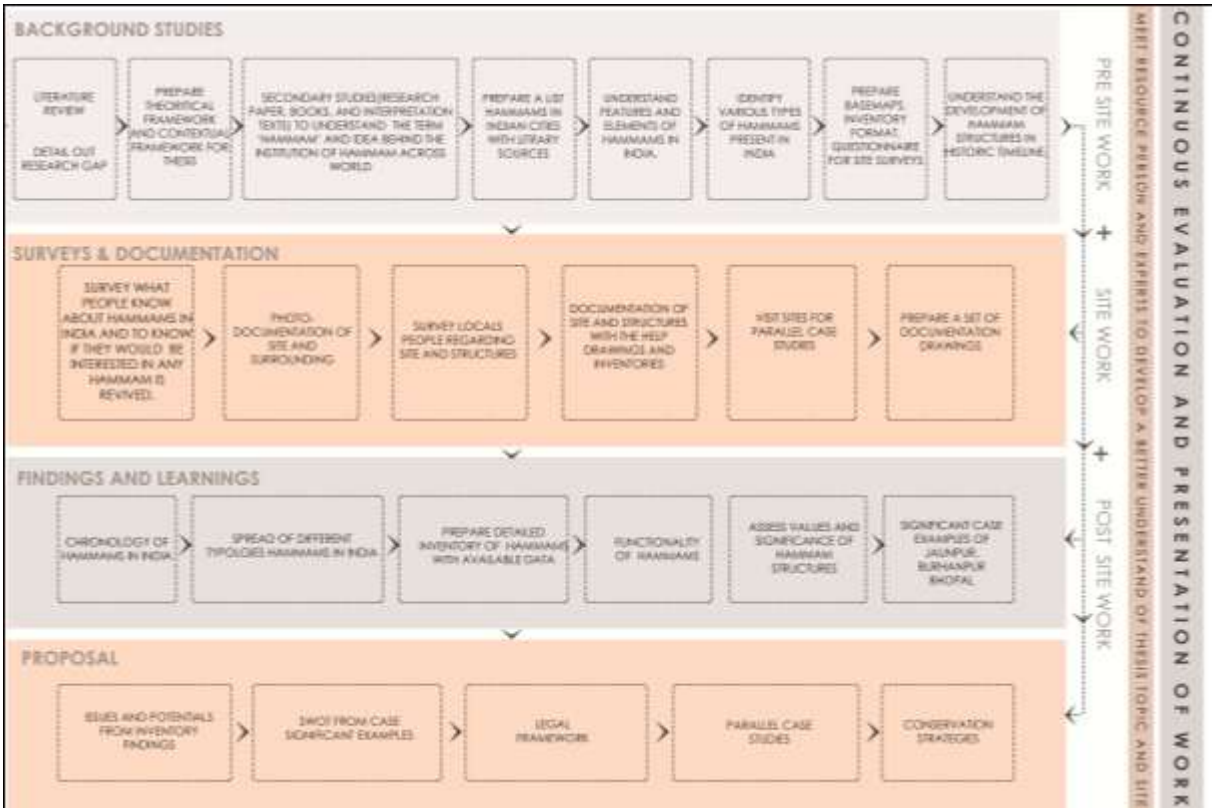


Figure 2 Methodology of thesis study

INPUTS AND REVIEWS

- Regular thesis studio sessions were conducted as a part of curriculum with faculties including Prof. Ajay Khare, Ar. Ramesh Bhole, Dr. Vishakha Kawathekar as the thesis coordinator and Ar. Shweta Vardia as thesis guide.
- September 2018: Discussion with conservation professional Sangeeta Bais ma'am suggested studying one hammam in detail for thesis.
- December 2018: Presented thesis synopsis titled conservation strategies for hammam of Burhanpur to *prof*. Rajat ray.
- 14th -16th January 2019: First thesis panel review was conducted in second year, conservation studio.
- 4th -5th February 2019: Second thesis review related to work done on-site.
- 25th -26th March 2019: Midterm review of thesis was presented to conservation professional Anurag Varma.
- 26th -27th April 2019: Prefinal thesis review was presented to Dr. Nisar khan and conservation professional Tapan Mittal Deshpande.

- 13th-14th May 2019: Final thesis presentation to Professor A.G.K. Menon sir and Anurag Varma sir

Figure 3 Thesis jury panel and presenters *Credits: Meenal Singh and Samhitha Polamuri*

RESOURCE PERSONS

- Dr N K Sinha. Superintending archaeologist, Sarnath Circle ASI
- Mr. Abdul Arif, Sarnath Circle ASI
- Munazzar Ali, C. A Delhi sub-circle
- A.K. Tripathy C.A. Jaunpur sub-circle
- S.B. Ota Visiting Faculty, SPA Bhopal
- Suresh Mishra and Nand Kishore Dewda, Burhanpur book author
- Ruchika Arora, Phd. in architecture with specialization on Mughal Architecture
- Tanvi Maheshwari, conservation architect
- Ramesh Bhole, Assistant professor, conservation department, SPA Bhopal
- Shivani Paliwal, Assistant professor, Landscape department, SPA Bhopal
- Sanmarga Mitra, Assistant Professor, SPA Bhopal

SITE VISITS

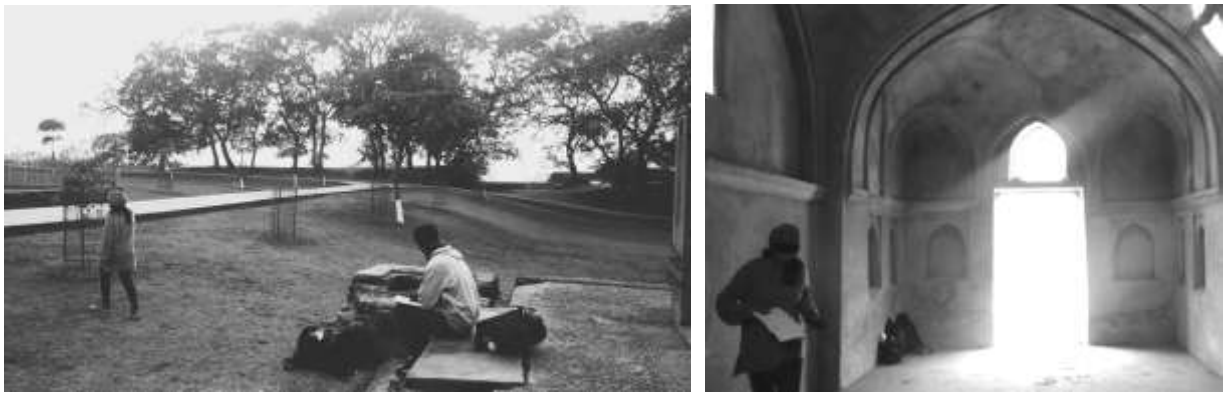


Figure 4 Work during site visits *credits: Pawan Sharma*

- 18th -22nd Dec 2018: Site visit Fatepur Sikri and Jaunpur
- 4th Jan 2019: Visit to Bhopal hammam
- 17th -22nd Jan 2019: Site visit for data collection and documentation to Jaunpur.
- 17th mar 2019: Site visit to Burhanpur for documentation

2. LITERATURE REVIEW

The story of architecture of hammam was covered in briefly research paper and research continued to fill in gaps in the literature.

To find out more about the developments of hammams in India, we looked-for to understand the background of India detail through different architectural time period in India.

India is fairly well define geographically with the Indian Ocean surrounds the country to the south, whilst the Himalayas to the north isolating it from the rest of Asia. Within this large area of landmass there are many regions, with climates, traditions environment and languages of its own, varying from the cold mountains of Kashmir to the tropical heat of the Deccan.[2]

India differs from other parts of the Islamic world, as it does not share the Roman and Sasanian traditions of the Middle East and North Africa; instead, it has its own complex history, which includes many different religions, cultures, and ethnicities (Petersen, 2002).

Muslim traditions in India display both the greatest complexity and independence. Its complexity is evidenced by the five traditions: Delhi sultanate, Bengal sultanate, Deccani sultanate, Gujarat sultanate, and Mughal. Satellites of Delhi sultanate were the kingdoms of Jaunpur and Malwa. Fergusson mentioned sub styles in Islamic India that comprised of, in the north, Ghaznavid(999-1151AD), Ghorid (1148-1215AD) and Jaunpur(1394-1479), and Malwa(1401-1530) (sub style of Delhi Sultanate). In the south, Bidar (1347-1609), Bijapur (1490-1660), and Golconda (1512-1627).

2.1 DELHI SULTANATE PERIOD (1190 – 1545 AD)

In the 13th century, the longest surviving Muslim empire was established by the Central Asian Turks in India, which was known as the Delhi Sultanate (Yarshater, 1991). During this period, a new technique of architecture-the architectural styles of

[2] Petersen, A. (2002). *Dictionary of Islamic architecture*: Routledge.

Persia, Arabia, and Central Asia was utilized. The engineering features of these buildings were the domes, arches, and minarets. The palaces, mosques, and tombs built by the rulers possessed these features, which were blended with the features of indigenous architecture, which resulted in a new synthesis of architecture. This occurred because the Turkish rulers of Delhi utilized the services of local Indian craftsmen, who were very skilful and had already constructed beautiful buildings. In the buildings that came up, we find the simplicity of the Islamic structure, as well as the detailed sculptures and designs they made using their own indigenous structures. A middle path was followed in all their designs in the architecture during this period [3]

2.2 BENGAL SULTANATE PERIOD (1339 – 1576 AD)

Between 13th – 16th centuries, Bengal was erected into a separate kingdom to the east of India, more or less independent from central control. Two capitals; Gaur and Malda, was adorned with many splendid edifices. This style is singularly picturesque, and displayed all of the features of a strongly-marked individuality of styles (Pereira, 1994).

2.3 DECCAN SULTANATE PERIOD (1347 – 1687 AD)

The first notable Indian style in the south was the Bahmani (Deccani sultanate) dynasty. First at Gulbarga (1347AD), and afterwards at Bidar (1426AD)(Fergusson, 1972a). The Deccani style was a peculiar harmonization between Hindustani and Mussulmani modes (Islam, 1970). The usage of vaults and domes are quite prominent. The difference of the architectural style were essentially enumerated from those mentioned above, and was marked by a grandeur of conception and boldness in construction, unrivalled by any edifices erected in India (Pereira, 1994).

2.4 GUJARAT SULTANATE PERIOD (1391 – 1583 AD)

The western Indian style adopted by the king of Gujarat during their period of independence (1396-1572 A.D.) was richer and more varied than that of Jaunpur,

[3] Pereira, J. (1994). *Islamic Sacred Architecture: A Stylistic History*: Books & books.

though hardly so original or marked by such individually, from the architecture of the Hindu and Jains (Pereira, 1994).

2.5 MUGHAL PERIOD (1526 – 1857 AD)

During this century, the Muslim world saw the rise of three great empires that constituted the most active, the most articulate, and the most closely-knit segment of the Muslim community. The Ottomans established themselves in Western Asia, and later penetrated Eastern Europe. At the same time, the Safavid Empire was established in Persia, while the Chaghtai Turks swooped into the sub-continent and founded the Mughal Empire (Ashe, 1881). The Mughal Empire was the last of the great Islamic Indian empires, and also was one of the largest centralized states known in pre-modern world history. By the late 16th century A.D., the Mughal Emperors held supreme political authority over a population numbering between 100 and 150 million, and lands covering most of the Indian Subcontinent (3.2 million square kilometers)[4]

The architecture of Indo Islamic era (1208-1857) focused on the grand works, palaces, mosques, gardens and mausoleums which were expressions of power. There have been significant studies done to understand their multiple facets in terms of physical and philosophical ideas as they are seen as the artifacts representing the cultures' aesthetics and beliefs.

Hammams which were integral part of the built fabrics largely been ignored. Their layout ornamentation and decorative elements were important indicators of how cultural traditions were made maintained and passed on. They were architecturally and socially significant. Their construction techniques demonstrate the complex system of operating hot and cold baths all over India.

[4] Richards, J. (1996). *The Mughal Empire* (Vol. 5): Cambridge University Press.

3. THEORETICAL FRAMEWORK

3.1 HAMMAM AND WORLD

Definitions:

1. A bathing establishment such as a Turkish bath. (as per Collins dictionary)

2. A health treatment in which you sit in a room full of steam and are then usually massaged and washed or a building in which this treatment is available. (As per Cambridge dictionary)

A place to bathe or where bath (gusl) is taken.

‘spreader of warmth' in arabic and ‘garmabeh' in the Persian which literally means ‘hot water', became synonymous with steam baths and bathing. As ebba koch explains, hammam could be anything from a single chamber to a group of interconnecting. Hammam is a place of bathing associated more widely with the Islamic world. Hammam is not just a specific type of building with a distinctive architectural features relying on the use of abundant amounts of water but also a critical site for hygiene.

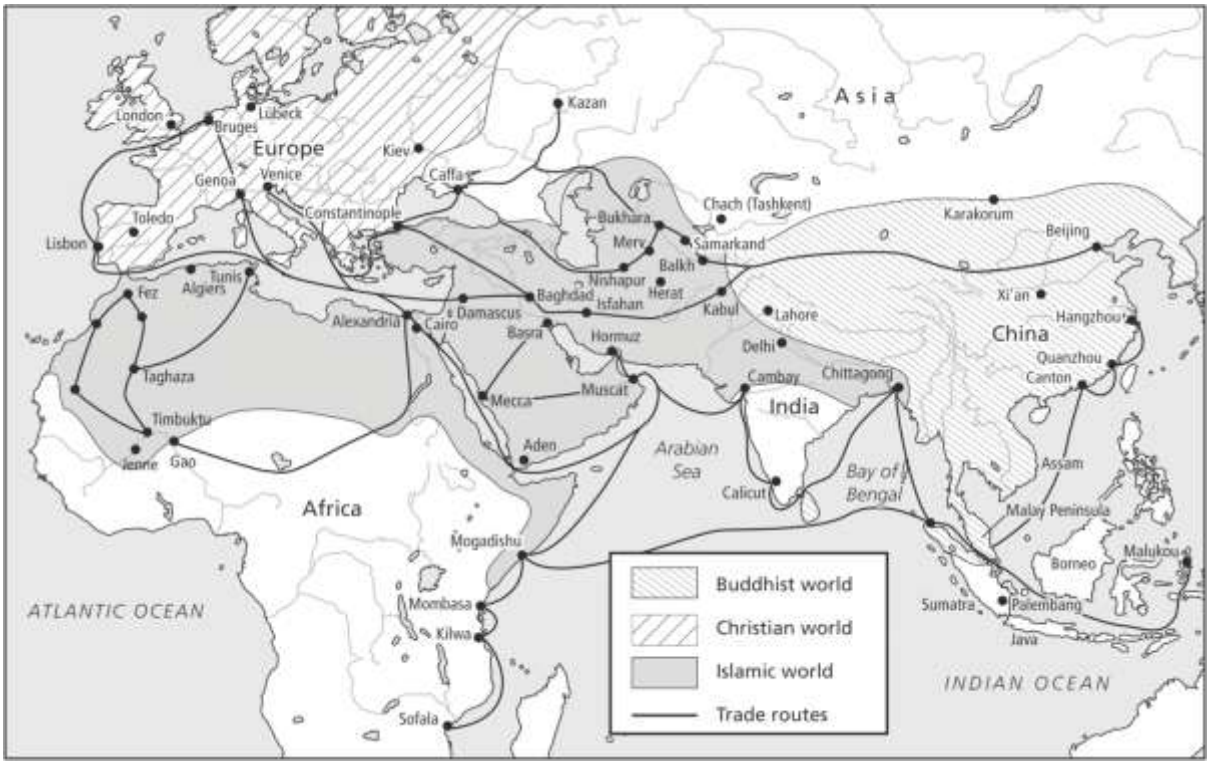


Figure 5 Map of trade routes of India with world during13th and 14th century

Source: Richard Smith

The spread of Islam and its ritual of purification and emphasis on hygiene and cleanliness led to the construction of hammams with modifications in roman bathing spaces.

Some prominent examples baths and important developments through timeline:

- Public bath can be traced back to second millennium B.C. in Mohenjo-Daro.
- 2000 B.C.E.-1200B.C.E: Mehr worshippers had ritual bath.
- Aegean, Greeks and Roman had baths structure in their cities.
- 3 RD CENTURY B.C.E Introduction baths from Greece to Italy
- 2ND CENTURY B.C.E.: Hypocaust which was invented in Stabean baths
- 80 B.C.E forum baths were built as public baths
- 1st C.E. Roman baths were built
  E.g. Pompeii(remains are still present)
  Villa diomed(private bath)
- Baths in the Roman Empire were provided water by the extensive aqueduct systems built by the Romans. Water supplies for public baths usually took priority over water for private use.
- Hot baths in the lavatrina- a room next to
  the kitchen.
- Later, when the custom of daily bathing in hot baths took hold,
  Romans began to build bathrooms (balnea) in their houses.
- 104 C.E. Tarjan bath was built in Rome.
- 217C.E. Carcalla bath were built
- 302 C.E. Diocletian bath were built
- Therefore we can say Roman baths are most famous of with both public and private characters extensively
- 7th century ritual bathing was daily activity for Zoroastrians
- 712-15 C.E. Qusayr-amra one of the first hammam in the Jordian desert.
  This exceptionally well-preserved desert castle was both a fortress with a garrison and a residence of the Umayyad caliphs built in the early 8th century, The most interesting features of this small pleasure palace are the reception hall and the hammam, both richly decorated with figurative murals that reflect the secular art of the time.
- 725-30 C.E. Hammam at Sarakh was built.

- Baths were considered foreign institution by muslims in the seventh and eight centuries. They referred them as hammam-al-rumi (hammam of roman).
- Hammams were amalgamation of the prototype of the Roman bath and Islamic traditions, thus creating a unique bathing culture in terms of its monumentality as well as an important social and religious space.
- It seems baths were bought to the Asia Minor by the Romans. Thence it spread to Syria, Iraq, and Persia with rise and spread of Islam. Arabs referred to them as hammamat-Rumiyya which does not means 'Roman baths' but Bath of Rum- Asia Minor(Byzantium, modern Turkey).
- Ummayyid Khalifs patronized them. Durings khalifs rule the bath architecture developed and became a popularly adopted feature of the public as well as private.It became usual for the hammam to be found adjoining the mosque complex.
- 10th century there is mentions of as many as 1500 working hammams in the city of Cairo.
- Among the various duties of Muhtasib (censor of Public Morals) one was to ensure cleanliness and good management of hammams.
- 13th century onwards hammam al-saffi operating in old city of Damascus.
- 1400 C.E. Baths in Alhambra at granada, spain were built

  Busra bath at turkey were built

  Kashan bath at Persia were built

- 14th century first hammams introduced in India during sultanate rule in India.
- 1501-1722 C.E. Numerous hammams were built since the Safavid dynasty.
- 1556 C.E. Ayasofya hammam was bulit in istanbul Hürrem Sultan, consort and legal wife of Ottoman Sultan Suleiman.
- Traditional Iranian public bathhouse in Kashan, Iran. It was constructed in the 16th century
- 1786 C.E. Hammam at Khist-i-kopruk Kholm, Balk province, Afghanistan was built during the reign of Mir wali.

Differences between the Hammams and the Roman Baths?

- In both open and closed areas of Roman Baths are larger than the Ottoman Hammams.
- The hot and cold pools that placed into the Roman Baths do not exist in Ottoman Hammams.
- One of the most obvious differences between the two-architectural visions is unlike the Roman Baths the outer walls of Ottoman Hammams are not fancy.
- The double baths doors which are the structure of the Ottoman Hammam are opening into the different streets. The purpose of this architectural application is to prevent women and men to see each other.
- Cause of this bathing habit with stagnant water of Roman culture and with flowing water of Turkish culture.

- Today Islamic hammams (or remains) are found from morocco to all the way down up to a small village of bo ai in china.
- Hammams began to lose their value with increasing westernization and the availability of running water in houses. Hammams suffered during the first half of the 20th century a marred reputation relating them to prostitution and low revenue and increasing cost of maintenance led to a deterioration in hygiene conditions and deterioration of the buildings themselves leading to the closure of many hammams.

From the timeline we understand following about hammam as an architectural space:

Architecturally, the hammam did not always form part of the actual mosque, and was usually found close by.

Architects did not give as much attention to the exteriors of the hammams as to those of the mosques. Many city hammams are not even detached buildings. Tucked away between houses, they are only recognizable by their entrance, similar to a present-day cinema. Detached hammams have no windows, their interiors being lit by means of glass' eyes inserted in the dome.

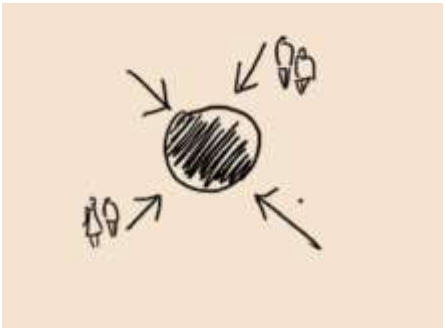
Two kinds of hammams developed:

1. The thermal bath (kaplica or ilica) they have a pool in the center of the last room.
2. The public bath.

The double baths were separated for women and men, and so allowed them to visit the baths at any time during the day. Single baths reserved three days a week for women only.

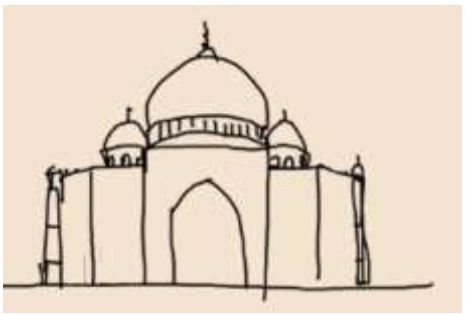
With residential complex

Symbol of development



Focal point for neighbourhood

in cities

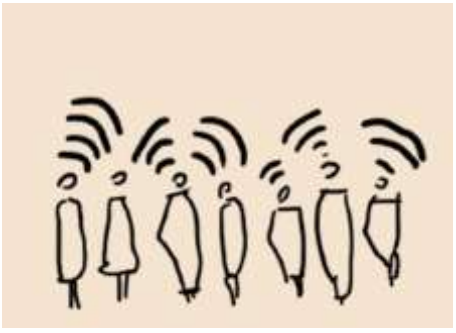


Proximity to religious structures like tomb or mosque

Found near market area as commercial institution.

Intergenerational space

User both males and females



Space for networking

for users

Figure 6 Indications for hammam as an architectural space

3.2 FEATURES OF A HAMMAM

Through important examples in timeline of hammams we will try and understand the following four features of a hammam structures

3.2.1 Setting of a hammam

Figure 7 Setting of Qsayr Amra hammam palace

Source: whc.unesco.org

The main monument building at Qusayr ‘Amra is the baths complex the transition between Late Antique and early Islamic art. The building is oriented northeast-southwest and is accessible from its northern side. The entrance leads into the main audience hall with a water basin in its northeast corner.

Figure 8 Exterior view of Qsayr Amra palace complex

Source: whc.unesco.org

To the east of the main audience hall a smaller door leads to the steam bath. The area is divided in three rooms of approximately 6 m^2 each: the changing room or apodyterium; the warm room or tepidarium; and the hot room or caldarium.

A system of animal-driven wheels, a saqiya, extracted the groundwater and ensured its availability to the baths complex and the surrounding agricultural or garden environments. North to the main monument building a saqiya includes a circular riding area for the animal, a 30 meter deep well, and a cistern for water storage.

The cistern is placed more than two meters from the ground, to ensure that water had enough pressure to flow through a complex set of channels and feed the bath complex.

3.2.2 Spatial arrangements of hammams

When entering the hammam, it's about the smooth movement from neutral/ cold rooms to hot rooms. The visitors are guided through a series of spaces, starting in a neutral and dry room followed by hot and wet rooms before returning back to beginning.

NEUTRAL ROOM

The visitor gets changed, hand over the clothes to the manager, choose a, masseuse, and after the rituals is over, changes back into the daily attire. The neutral room is a domed window less space, illuminated by wind catchers.

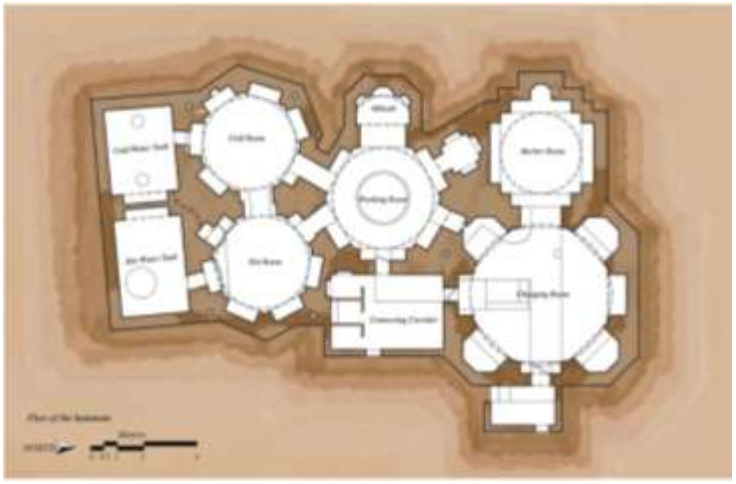
WARM ROOM

The warm room is a place for relaxations before and after visitor spends their 'hot time" it is where they get a massage, wash their hair, where they feel comfortable in a suitable temperature. In the middle of the warm space with a high temperature, a navel stone made of marble material .Washing can also be done on the navel stone which has a very high temperature and relax by sitting or lying down.

HOT ROOM

The hot room is a steam room, and incredibly hot and humid every visitor only stays here as long he or she is fine.
In addition to the unit called furnace which enables the heating of baths.

There could be more rooms for additional purpose depending upon how big a hammam. Water storage in hammams is designed to provide hot and cold water to the building. Furnace space is the unit that enables the building to be heated. The heat provided here is bought to the warm part. The rooms are constructed with high domes and vaults. Built with the local building materials with high thermal mass as well as renders and plasters that respond to the varying levels of heat and humidity. The process is similar to that of sauna, but is more related to ancient Greek and ancient Roman bathing practices



To understand the spatial arrangement of hammam in detail Khisht-i-Kopruk hammam in Afghanistan was studied in detail.

Figure 9 Plan of Khisht-i-Kopruk

Source: architectureindevelopment.org

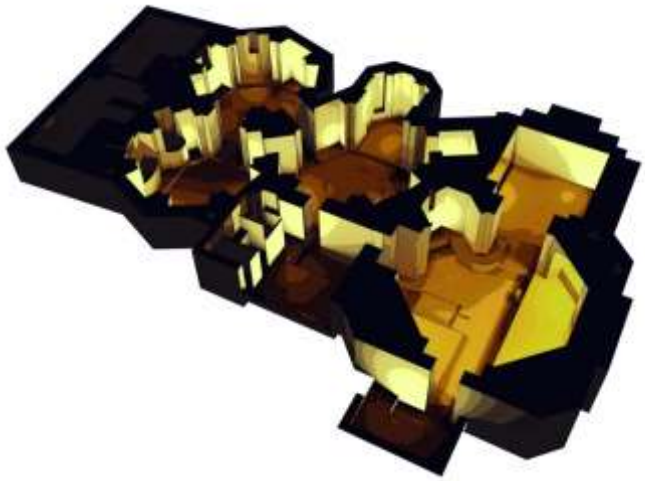


Figure 10 3D visualisation of Khisht-i-Kopruk Hammam

Source: architectureindevelopment.org

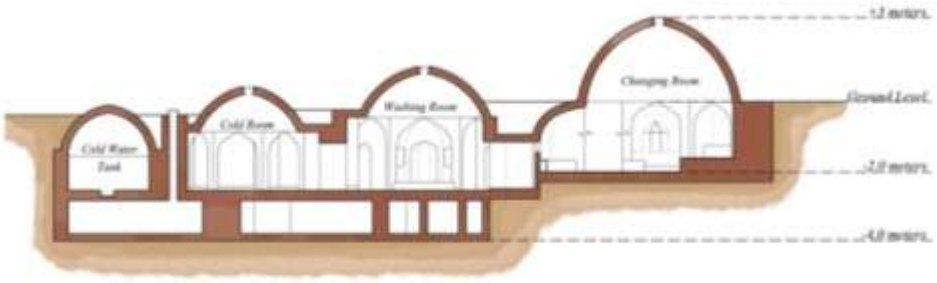


Figure 11 Longitudinal section through the hammam

Source: AFIR and Arch I platform

3.2.3 Heating system of a hammam

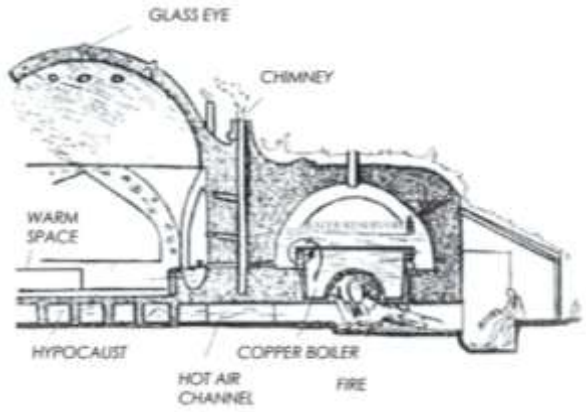


Figure 12 Heating system of hammam

Source: department of architecture Turkey

Boiler-room was at the rear of the building.

The intermediate and hot-rooms were heated by hot air which circulated under the floor's stone tiles.

The fireplace in the boiler-room was at a lower level than the floors of the other rooms.

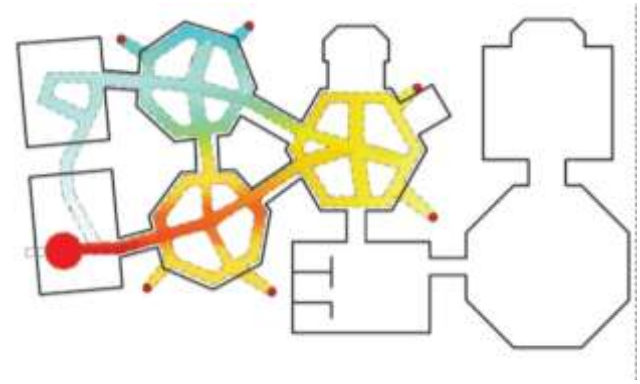


Figure 13 Underground heating system of khisht-i-kopruk

Source:architectureindevelopment.org

The Fire heated water in a huge kettle and steam was distributed to the other rooms by means of channels. The temperature of the hottest room fluctuated between 30° C and 40° C but in private cubicles next to the boiler room it can be hotter.

Hammam heating systems based on Roman baths. The system called "hypocaust", which provides heating in Roman baths, is known that it was seen at the end of the 2nd century BC or the beginning of the 1*st* century.

3.2.4 Construction system of a hammam

In hammams, stone and bricks are commonly used together as structural materials, built with stacking system.

Walls: carrying elements in the hammam structural system.

Walls have various openings and entrances, such as windows, doors, and niches.

The walls are very durable and very thick in terms of prevention of heat loss.

Mortars: used on the walls in the warm space are more durable than the mortars used in the cold space with the same concerns. Especially heavy stones and brick vaults made hammam stronger and an important part of the construction systems in hammam is the domes used as cloisters.

Half and sliced domes are part of the covering systems seen in the baths. The dome that covers the cold space is higher and wider than the domes in all other places. A small opening called a bright flashlight.

Arches were used on the openings and in the passage of the spaces.
In the domes that cover the lukewarm and warm spaces, there are also openings called ‘elephant eye’. The floor is covered with marble. The lime plaster used in these structures has been prepared to have sound absorption capacity in a certain way in order to provide acoustical properties that can be evaluated together with construction systems. The example below shows the construction system of various spaces in hammams.

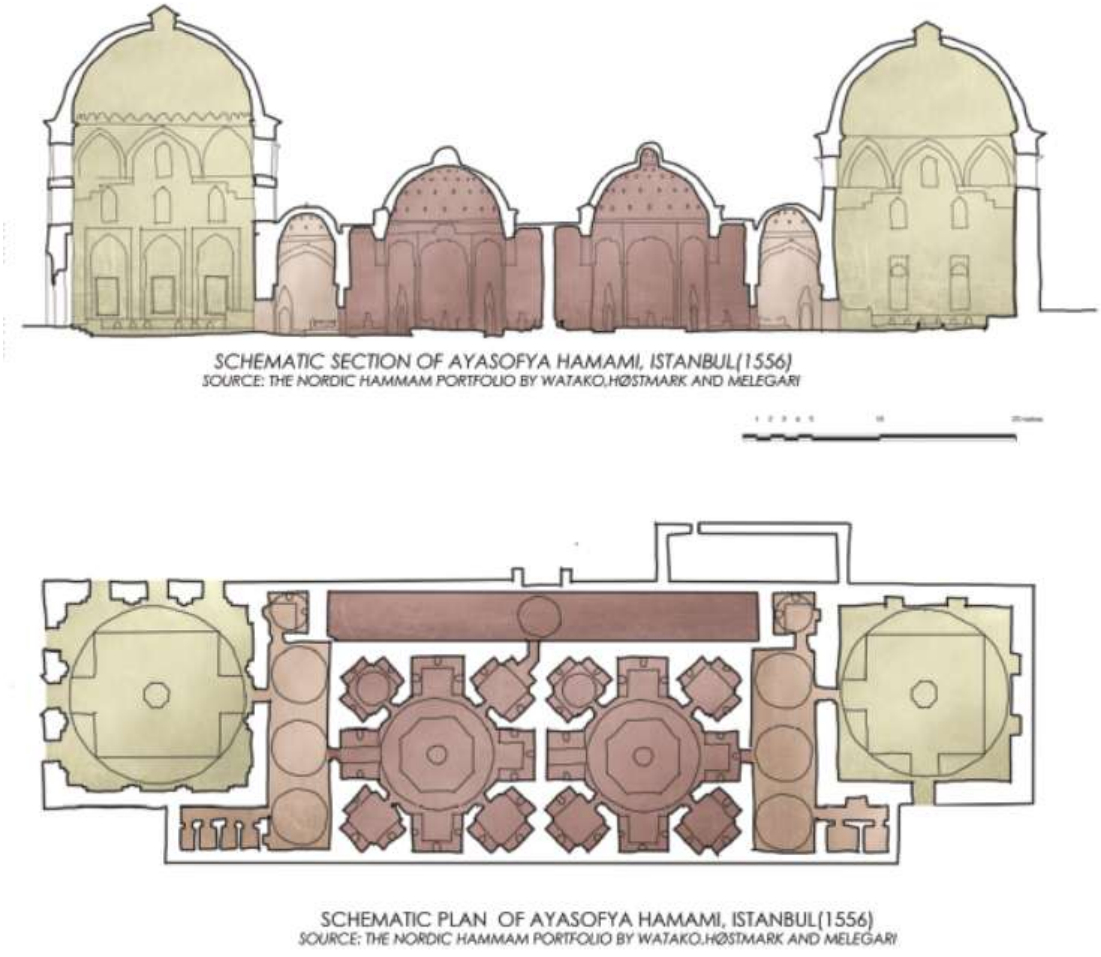


Figure 14 Schematic drawings of ayasofya hammam

Source: watako,Høstmark and Melegari

3.3 HAMMAM AND INDIA

Most parts of India are hot and dusty. Bathing becomes an important daily activity to remove the grime and dirt from the body. Therefore many ancient Indian texts often highlight the therapeutic and symbolic significance of Snanam.

Over the centuries the notion of Snanam has entered daily life, social gatherings and festivals of most Indian communities.

Rivers, kunds, ghats...are till date used for the same purpose. Hot springs of place like Bakreshwar (West Bengal), Manikaran (Himachal Pradesh), Yumthang (Sikkim), Saptparni cave (Bihar)… have been a place for the naturally detoxifying and relaxing.

Public baths in mohenjodaro were built during 3200 B.C.E.-2800 B.C.E.

The earliest example of a bath-like pond reached by steps is found at Uperkot caves in Junagadh of 4th century.

1206 -Qutubuddin Aibak declares himself sultan of India. This marks the start of sultanate rule in India.

Hammams were built in Delhi, Gulbarga and Bidar (Karnataka), Jaunpur (Uttarpradesh), Daulatabad(Maharashtra), Mandu(Madhya Pradesh) Champaner (Gujarat), Firozabad, Bijapur and Hisar(Haryana) by 14-15th century.

1321: Ghiyasuddin Tughlaq built first hammam in his palace in Tughlaqabad fort.

1376: Hammam was built by Ibrahim in the fort established by Firoz Shah Tughlaqs in Jaunpur

Muhammad bin tughlaq or Jauna second successor was expanding tughlaq region in India. Various sultanates formed as result of his expansion in India.

Figure 15 Image showing of ghiysasuddin palace hammam ruins

Figure 18 Hammam at firozabad built during 15th century. Source: Purvasha

Figure 16 Image exterior view of Jaunpur, shahi hammam

Source: Ken Sardonik

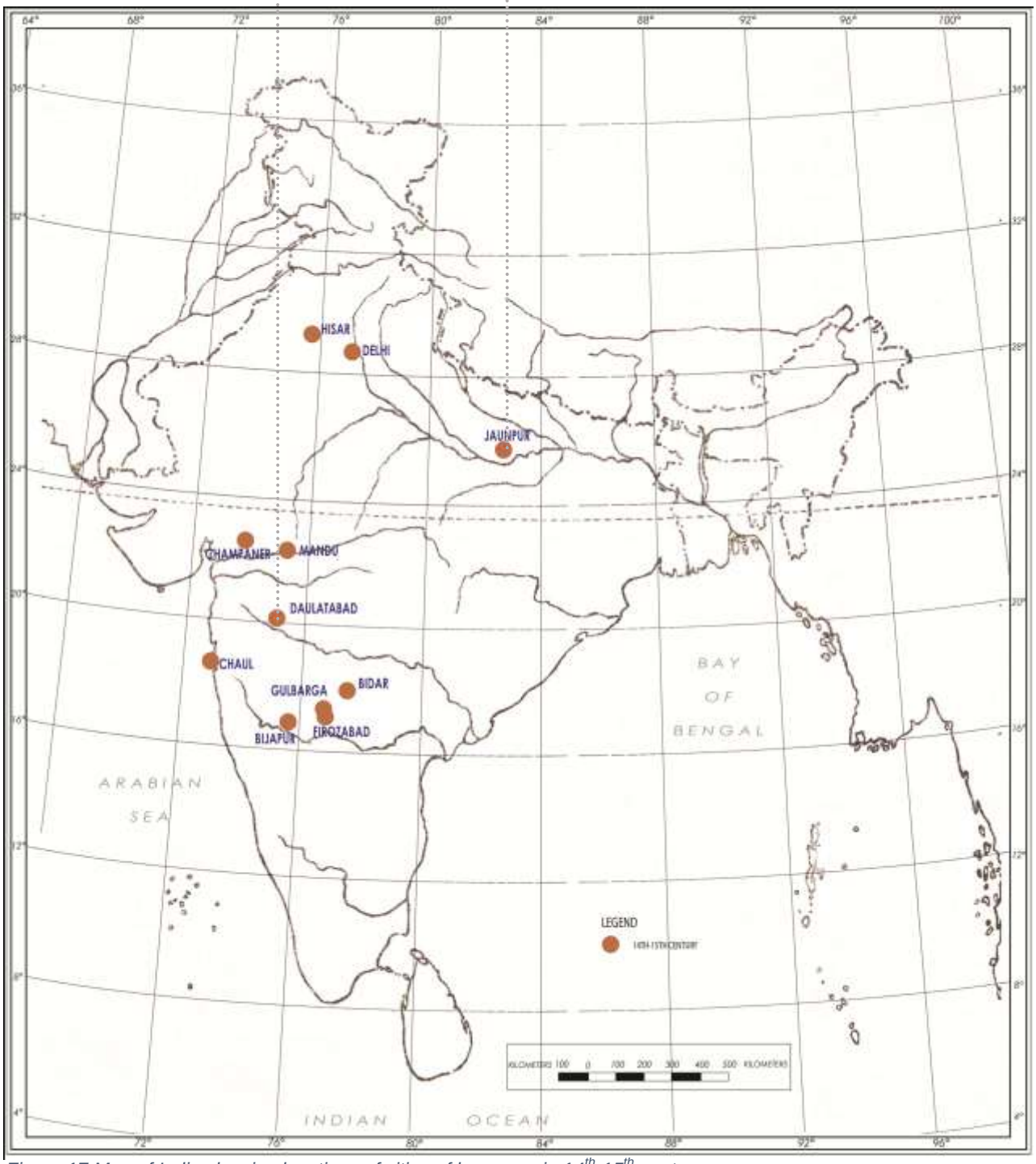


Figure 17 Map of India showing locations of cities of hammam in 14th-15th century.

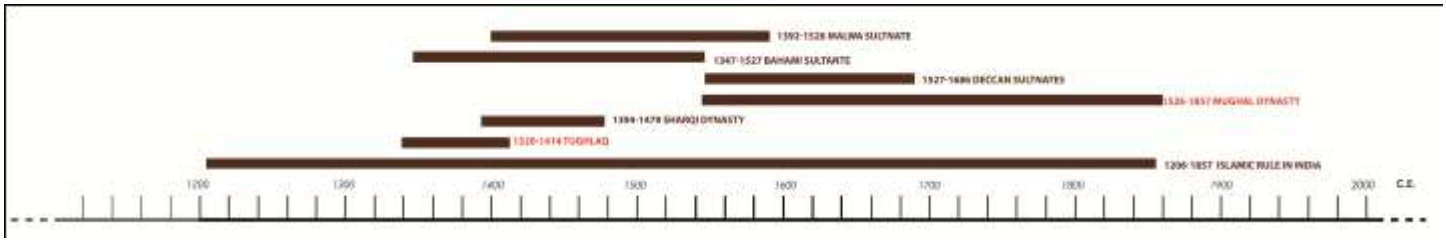


Figure 19Important timeline of Sultanate India

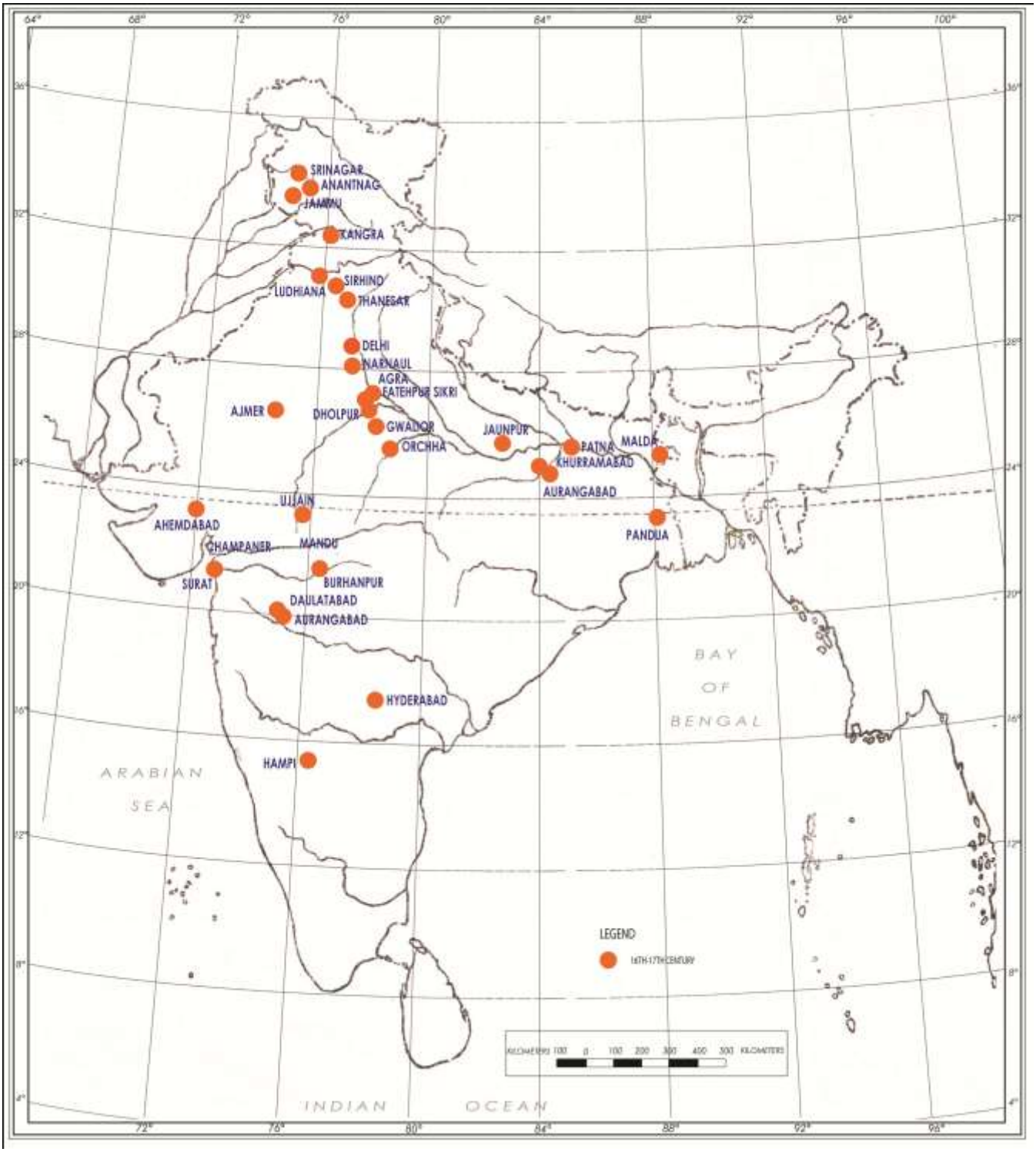


Figure 20 Map of India showing locations of cities of hammam in 16th-17th century

Mughals were ruling in north India, which experience months of heat and hot winds. Babur‘s realised that hammams as amenity was lacking in India.

We suffered from three things in Hindustan. One was heat, the other the biting wind and third dust. The hammam was a refuge from all three. Of course, a hammam has no dust or wind and in the hot weather it is so cool that one almost feels chill. One chamber of the hammam with warm-water reservoir was finished completely in stone and so First cold hammam was introduced by Babur in India. 1526: first Mughal hammam was built by Babur.

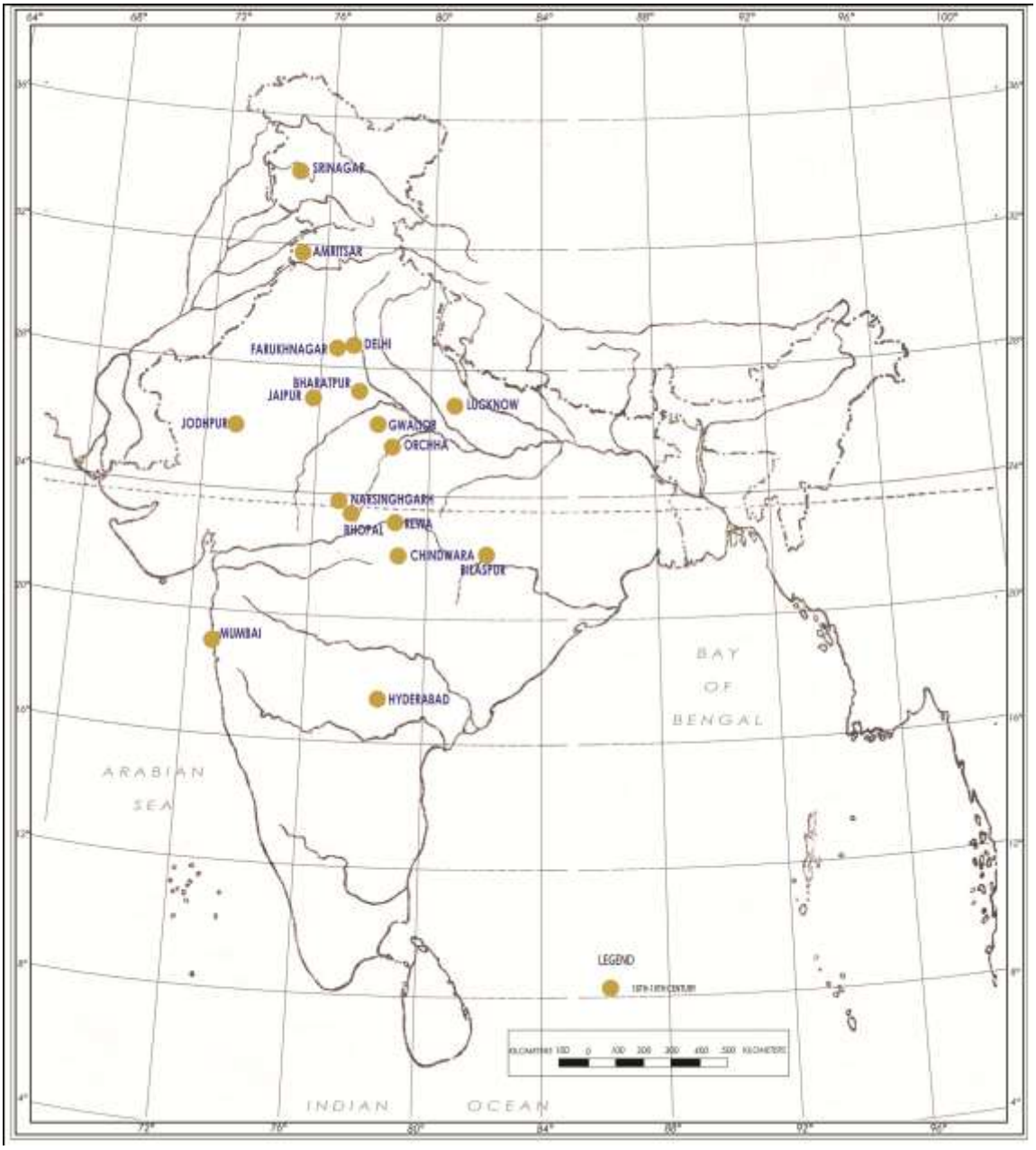


Figure 21 map of India showing locations of cities of hammam in 18th-19th century

During 16th and 17th century they were in proliferations period Later in 19th and 20th

they were established by Nawabs, Begums, Rajputs as part of their palace complexes. Hammams still retained three basic spaces -the interconnected rooms from the roman baths.

1857: the British authorities found the hygiene of the public structures less than desirable and installed pipe and pump systems led to decline of hammams.

3.4 Listing of Hammams in India

Identification of property is the first step to conserve heritage. Listing and mapping of hammam done to identify them across India.

For identification of following matrix was used. Refer annexure for complete list of hammams.

Methodology: comprehensive list of hammams in Indian cities was prepared with the help of various secondary sources and primary sources.

IDENTIFICATION OF PROPERTY					
S_NO	NAME OF THE COMPONENT PART	REGION(S)/DISTRICT(S)/ CITY(S)	COORDINATES	REFERENCE	SOURCE OF INFORMATION
1	SHAHI HAMMAM, REDFORT	DELHI	28°39'24.36"N 77°14'37.07"E	MURRAY, JOHN (1911). A HANDBOOK FOR TRAVELERS IN INDIA, BURMA, AND CEYLON [8TH ED.]. CALCUTTA: THACKER SPINK & CO. P. 198.	PRIMARY SURVEY
2	HAMMAM, NEAR ASAD BURJ, REDFORT	DELHI	28°39'24.36"N 77°14'37.07"E	ASI DELHI	PRIMARY SURVEY
3	SHAHI HAMMAM, SHAHI QULA	JAUNPUR	25°44'57.31"N 82°41'17.33"E	ASI SARNATH CIRCLE AND SHWETA SAHU (2014). THE THEORY OF MONUMENTAL CONSERVATION WITH REFERENCE TO JAUNPUR. CASIRJ, VOL. 5, NO 12, PP 186-[illegible]	PRIMARY SURVEY
4	HAMMAM, TUGHLAQA-BAD FORT	DELHI	28°30'46.43"N 77°15'40.72"E	ASI DELHI HTTPS://[illegible].WORDPRESS.COM/2012/04/[illegible]-THE-END-OF-THE-TUNNEL-TUGHLAQABAD-FORT-DELHI/	PRIMARY SURVEY
5	JEHANGIRI HAMMAM	BURHANPUR	21°18'39.23"N 76°14'0.17"E	KOCH, E. (1991). MUGHAL ARCHITECTURE: AN OUTLINE OF ITS HISTORY DEVELOPMENT. MUNICH: OXFORD UNIVERSITY PRESS.	PRIMARY SURVEY
6	SHAHI HAMMAM, SHAHI QULA	BURHANPUR	21°18'39.23"N 76°14'0.17"E	2017NICO	PRIMARY SURVEY
7	HAMMAM, BAGH-E-NILOFER	DHOLPUR	26°41'33.24"N 77°51'58.09"E	ARORA, K. (2018, APRIL). MUGHAL HAMMAMS FROM SAHAPEDIA: HTTPS://WWW.SAHAPEDIA.ORG/MUGHAL-HAMMAMS	RESEARCH PAPER
8	HAMMAM	CHAUL	18°29'10.99"N 73° 2'25.68"E	SOHONI, PUSHKAR (2014) THE VISUAL WORLD OF MUSLIM INDIA: THE ART, CULTURE AND SOCIETY OF THE DECCAN IN THE EARLY MODERN ERA	RESEARCH PAPER
9	HAMMAM-E-KADIMI	BHOPAL	23°14'56.93"N 77°23'41.08"E	2017NICO/ GANMAN, KARISHMA (02 JUNE 2016). "BHOPAL'S 380-YEAR-OLD HIDDEN HAMMAM". NATIONAL GEOGRAPHIC.	PRIMARY SURVEY
10	SHAHI HAMMAM, CHAMAN MAHAL	ISLAMNAGAR	23°21'28.42"N 77°25'3.99"E	2018NICO	PRIMARY SURVEY
11	HAMMAM QUTUB SHAHI TOMB	HYDERABAD	17°23'43.00"N 78°23'42.24"E	TELANGANA STATE ARCHAEOLOGY AND MUSEUMS DEPARTMENT/AKTC	AKTC BOOKLET
12	HAMMAMKHANA	SIRHIND	30°38'3.59"N 76°23'50.25"E	PARIHAR, SUBHASH. (2006). HISTORY AND ARCHITECTURAL REMAINS OF SIRHIND. ARYAN BOOKS INTERNATIONAL NEW DELHI	BOOK
13	SARDHKHANA	SIRHIND	30°38'2.40"N 76°23'45.63"E	PARIHAR, SUBHASH. (2006). HISTORY AND ARCHITECTURAL REMAINS OF SIRHIND. ARYAN BOOKS INTERNATIONAL NEW DELHI	BOOK
14	SHAHI HAMMAM	FATEHPUR SIKRI	27° 5'35.01"N 77°39'47.19"E	ARORA, K. (2018, APRIL). MUGHAL HAMMAMS FROM SAHAPEDIA: HTTPS://WWW.SAHAPEDIA.ORG/MUGHAL-HAMMAMS	PRIMARY SURVEY
15	HAKIMI HAMMAM	FATEHPUR SIKRI	27° 5'46.63"N 77°40'1.82"E	ASHER, CATHERINE. THE NEW CAMBRIDGE HISTORY OF INDIA: ARCHITECTURE OF MUGHAL INDIA. CAMBRIDGE: CAMBRIDGE UNIVERSITY PRESS, 1992.	PRIMARY SURVEY
16	HAMMAM, ARAM BAGH	AGRA	27°12'22.49"N 78° 2'20.55"E	ARORA, K. (2018, APRIL). MUGHAL HAMMAMS FROM SAHAPEDIA: HTTPS://WWW.SAHAPEDIA.ORG/MUGHAL-HAMMAMS	RESEARCH PAPER
17	HAMMAM, HUMAYUN TOMB	DELHI	28°35'41.28"N 77°15'2.33"E	TOM TURNER. GARDEN HISTORY: PHILOSOPHY AND DESIGN. TAYLOR & FRANCIS. P. 162. ISBN [illegible]	BOOK
18	HAMMAM, BHADRAFORT	AHEMDABAD	23° 1'27.52"N 72°34'52.52"E	ASI AHEMDABAD	PRIMARY SURVEY
19	HAMMAM, AMIR MANZIL	CHAMPANER	22°29'25.42"N 73°31'44.04"E	HTTPS://WWW.SAHAPEDIA.ORG/ EXCAVATIONS-CHAMPANER	WEBSITE ARTICLE
20	DARHAH, HAZRATBAL	SRINAGAR	33°47'21.18"N 75°14'40.07"E	HAMDANI, A. H. (2017). THE TRADITION OF MUGHAL HAMMAMS IN KASHMIR. JK KNOWLEDGE INITIATIVE, 1 (1), 103-110	JOURNAL ARTICLE
21	HAMMAM, RANI ROOPMATI PALACE	MANDU	22°18'36.73"N 75°24'34.90"E	HTTP://WWW.ASIBHOPAL.NIC.IN/MONUMENT/DHAR_MANDU_HAMMAM.HTML#	WEBSITE
22	HAMMAM	FIROZABAD	17°04'26.9"N 76°47'47.8"E	HTTPS://WWW.DECCANHERALD.COM/CONTENT/ [illegible]-FIROZABAD.HTML	ONLINE SURVEY
23	HAMMAM AT PARI MAHAL COMPLEX	SRINAGAR	34° 4' 59.88" N 74° 52' 59.88" E	HAMDANI, A. H. (2017). THE TRADITION OF MUGHAL HAMMAMS IN KASHMIR. JK KNOWLEDGE INITIATIVE, 1 (1), 103-110	JOURNAL ARTICLE
24	HAMMAM AT MULLAH SHAH MOSQUE	SRINAGAR	34° 6'12.83"N 74°49'2.48"E	HAMDANI, A. H. (2017). THE TRADITION OF MUGHAL HAMMAMS IN KASHMIR. JK KNOWLEDGE INITIATIVE, 1 (1), 103-110	JOURNAL ARTICLE IAR 74-75
25	HAMMAM AT ACHBAL BAGH	ANANTNAG	33°40'56.93"N 75°13'16.46"E	HAMDANI, A. H. (2017). THE TRADITION OF MUGHAL HAMMAMS IN KASHMIR. JK KNOWLEDGE INITIATIVE, 1 (1), 103-110	JOURNAL ARTICLE
26	HAMMAM AT GANDERBAL	KASHMIR	34°19'18.37"N 75° 0'41.63"E	HAMDANI, A. H. (2017). THE TRADITION OF MUGHAL HAMMAMS IN KASHMIR. JK KNOWLEDGE INITIATIVE, 1 (1), 103-110	JOURNAL ARTICLE
27	HAMMAM AT SHALIMAR BAGH	SRINAGAR	34° 8'56.77"N 74°52'20.54"E	HAMDANI, A. H. (2017). THE TRADITION OF MUGHAL HAMMAMS IN KASHMIR. JK KNOWLEDGE INITIATIVE, 1 (1), 103-110	JOURNAL ARTICLE
28	HAMMAM AT PATHAR MASJID	SRINAGAR	34° 5'30.79"N 74°48'20.95"E	HAMDANI, A. H. (2017). THE TRADITION OF MUGHAL HAMMAMS IN KASHMIR. JK KNOWLEDGE INITIATIVE, 1 (1), 103-110	JOURNAL ARTICLE
29	HAMMAM AT KHAN-QAH-I-MAULLA	SRINAGAR	34° 5'30.79"N 74°48'20.95"E	HAMDANI, A. H. (2017). THE TRADITION OF MUGHAL HAMMAMS IN KASHMIR. JK KNOWLEDGE INITIATIVE, 1 (1), 103-110	JOURNAL ARTICLE
30	HAMMAM AT LOHAGARH FORT	BHARATPUR	27°13'19.10"N 77°29'39.44"E	HTTP://UPTOURISM.GOV.IN/SITE/WRITEREADDATA/SITECONTENT/DRAFT-DOCUMENTS-TDAUTHORITY-AGRA-ON.PDF	DOCUMENT DRAFT

RESOURCES USED:

- Books, booklets, newspaper articles, journals, articles, research papers
- Discussion with experts
- Previous studies
- Primary surveys
- Architecture students
- History enthusiasts
- Online survey with 138 responses

Limitation:

The list is not an exhaustive list of hammams in India but a comprehensive list with all available resources

3.5 MAPPING OF HAMMAMS IN INDIA

Methodology: All findings were first updated on GIS software. Then to present the base map was prepared with help of political boundaries of present Indian states from survey of India map and for reference latitudes and longitudes were redrawn to accurately geo locate from GIS and Google Earth Pro software.

The Indian cities with presence of hammams and the number of occurrences of presence of hammams is highlighted with a number identified from the list of hammams prepared with the help of various secondary studies, primary and Google surveys.

Limitations: this mapping of hammams in India is not exhaustive but a comprehensive mapping of the previously prepared list of hammams.

Mapping of coordinates were done to the nearest built structure or area identified during research conducted.

Figure 22 Map of India with locations of cities with hammam

3.6 TYPES OF HAMMAM IN INDIA

Hammams acquired significant architectural and urban value inside cities in India. Hammams were established in different places depending on the area and requirements. Example there was public hammams, mortuary hammam, hammams with mosque or hammams in garden complexes. Hammams were found with caravanserai for resting stops on major travel routes.

Through national and International timeline we have gone through architectural history of hammams. David Watkin explains the aim of architectural history can be divided into three parts; practical, historical, and aesthetic aim[5].

Practical: Identification of the buildings in terms of its date of construction and completion.

Figure 23 Interior of Shahi hammam, Agra fort Source: George Mitchell

Historical: ascertain the reason the buildings were constructed based on interpretation of the religious, sociological, and cultural source.

Aesthetic: meaning of the buildings and their stylistic change throughout history.

Figure 24 Shahi hammam, Red fort Source: Author

Types of hammams based on its date of construction and completion in India. Therefore, hammams built in during some time period in India fall in this category. For example. Hammams built during Mughal period (1526-1857) in India fall in these category .Some examples of this category are;

Figure 25 Shahi hammam, Burhanpur Source: Author

a) Shahi Hammam at Agra fort

Next to sheesh mahal in Agra fort is a small hammam built by Akbar floor reveals underground heating system.

[5] Watkin, D. (1983). *The rise of architectural history.(paperback edition)*: The architectural press.

b) Hammam-e-lal quila

c) Burhanpur Janta hammam: Shahi hammam inside shahi fort burhanpur built in 1607 by Abdur Rahim Khan-e-Khanan

Types of building based on meaning of the buildings and their users through history; a hammam would be either public or private.

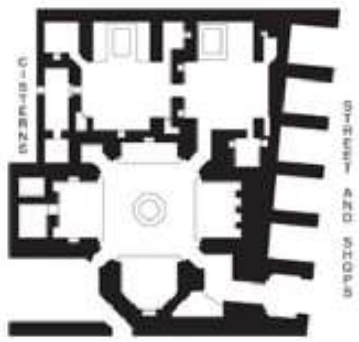


Figure 27 Plan of public hammam at Chaul

Source: Pushkar Sohoni

Figure 26 Interior view of hammam at Chaul

Source: Pushkar Sohoni

Figure 28 Interior view of public hammam of Mumbai

Source: Avijit Pathak

Some examples of public hammam

a) Public hammam at Chaul of 14th /15th century

b) Public hammam, Imamwada, Mumbai was in use till 2015

c) Hammam-e-Qadimi Bhopal operates every winters and used by both males and females at different timings during the day.

Types of hammams based on the reason the buildings were constructed based on interpretation of the religious, sociological, and cultural source.

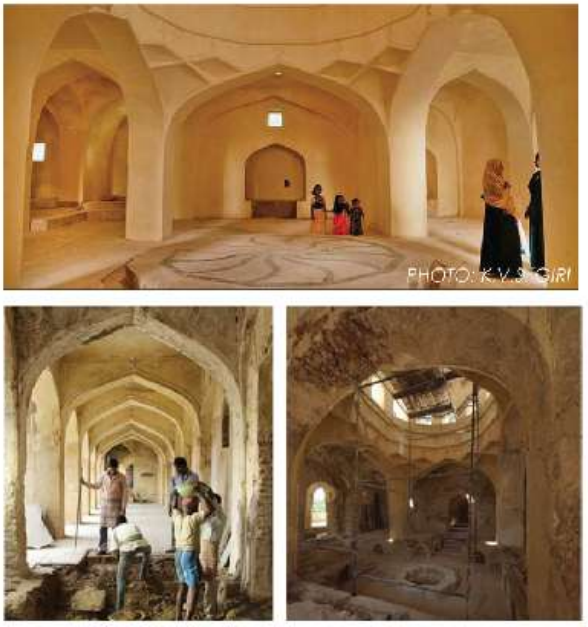


Figure 29 Conservation works inside Qutub Shahi hammam Source: Aga Khan Trust

For example Mortuary hammam falls under this category.

a) Qutub Shahi tomb Hammam, Hyderabad built in 1562 by Qutub Shahi dynasty falls in this category.

b) Another example of a mortuary hammam is the hammam in the complex of Humayun tomb built by empress Bega Begum in 1569-1570.

Figure 30 Hammam at Humayun Tomb

Source: Author

Types of hammams based on climate of India would be Hot hammams and cold hammams Mostly we know Hammams as hot hammams. During Mughals cold hammams were also introduced into India.

Some examples of Cold hammams are;

a) Cold Hammam designed by Babur in Bagh-e-nilofer, Dholpur Hammam was cool retreat has been confirmed by Babur. Hot baths were converted into cool retreat by Mughal architects. As Abu- fazl mentions the process of cooling with saltpeter which is saline earth as means of cooling water. This way we can explain the intricate water system of the hammam, tanks, fountains, series of mysterious pipes and purposefully designed architecture features. That can be maintained for war house in winter. Thus hammam could be warmed or cooled as desired.

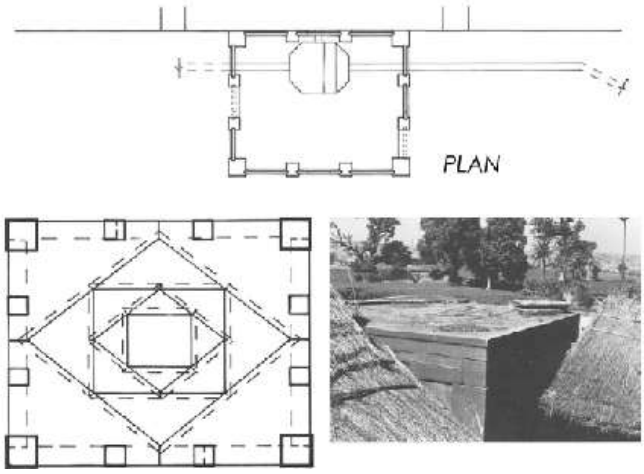


Figure 31 Cold Hammam of Dholpur with trabeated roof structure

Source: E.B. Moynihan

b) Another example of cold hammam is the Sardkhana at Aam Khas Bagh, Sirhindbuilt during Jahangir's reign.

Figure 32 View of SardKhana, Aam Khas Bagh

Source: Subhash Parihar

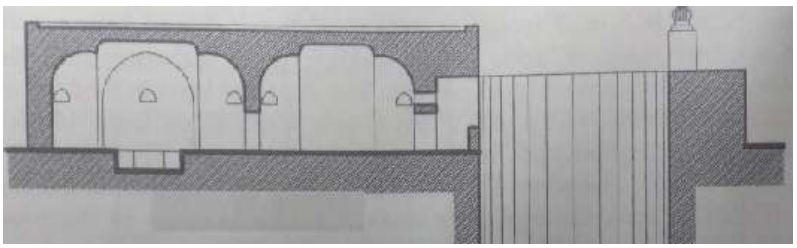


Figure 33 Section through Sard khana, Aam Khas Bagh

Source: Subhash Parihar

3.7 PUBLIC AND PRIVATE HAMMAMS

Locating hammams on map of India gave indications whether a hammam is public or private. Other typologies were difficult to find out without site surveys. Since surveys were limited to following understanding public hammam and private was developed;

3.7.1 Public hammams:

- Public are found surrounding mosques, caravanserai, khanqahs, markets which were open for public use.
- These hammams were found with caravanserai as resting stops on major travel routes.
- Going to public hammam was usually weekly activity for the users.
- Public hammams were larger in size to accommodate multiple users.
- Public hammams could be different structures all together for males and females or had different operational timings for each.

Some examples of Public hammams with setting for indication of type are given below:

1. Shahi hammam, Sikri with mosque
2. Janta hammam, Burhanpur with caravanserai
3. Hammam, Chaul with commercial complex
4. Hammam-e-Qadimi with residential complex
5. Hammam, Aam Khas bagh, Sirhind with public garden

3.7.2 Private hammams:

- The entry in private hammams was restricted and meant to be used by certain group of privileged people.
- These hammams primarily functioned as small areas attached to palaces and were not as significant.
- Under the Mughals vast establishment of private royal hammams were Hammams developed extensively towards the end of the medieval period.

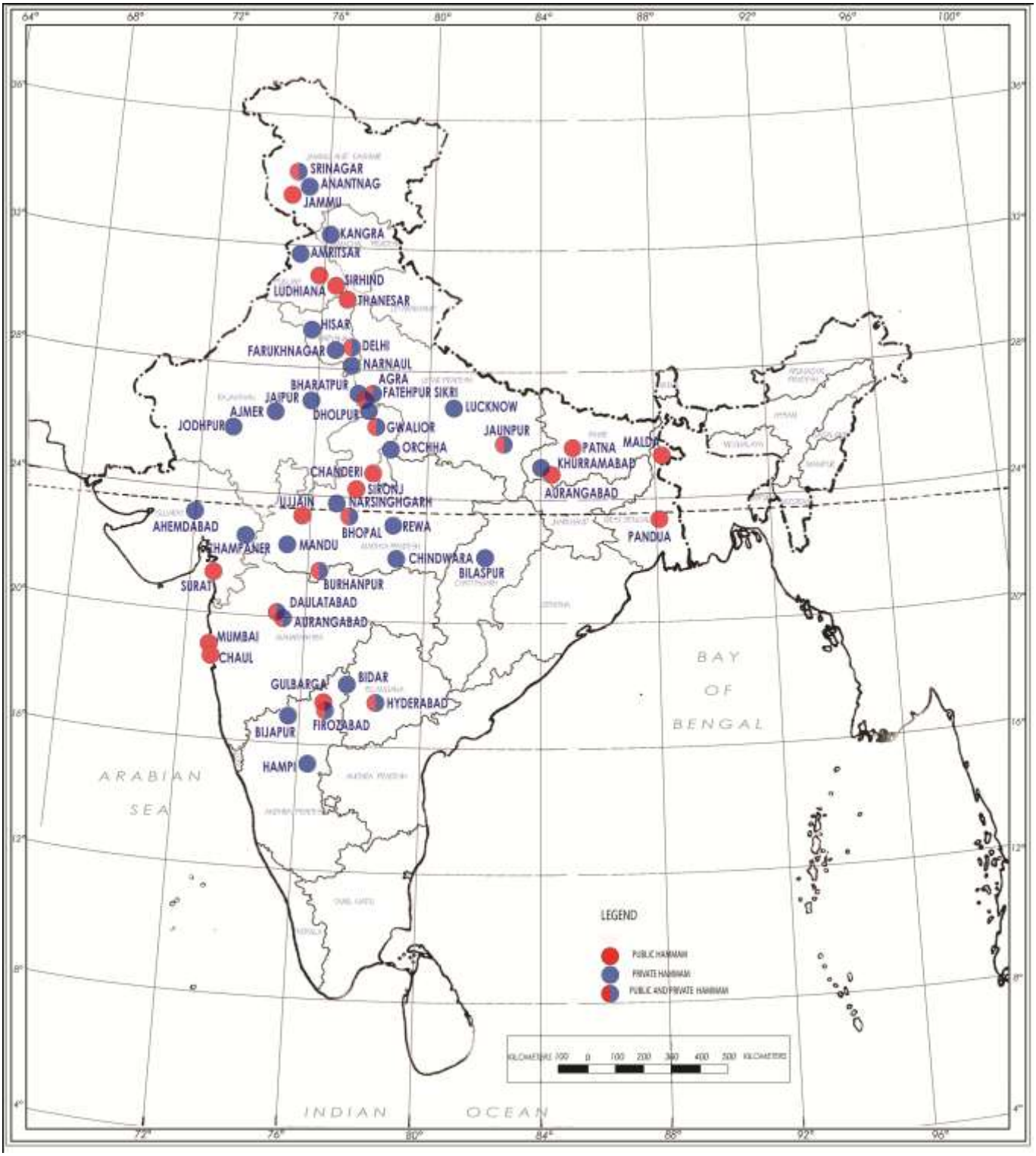


Figure 34 Mapping of public and private hammams

- The concept of hammams was taken to a new height in India with Mughal architectural pursuits, construction systems and rich traditions of ornamentation, established in different places depending on the area and requirements.

- Later during 19th- and 20th this influences can be seen in structures designed by nawabs and rajputs forts.
- Rich nobles also designed private hammams for their own use.

Some examples of Private hammams with setting for indication of type are given below:

1. Hammam, Bagh-e-Nilofer with royal garden
2. Shahi hammam, Jaunpur with royal palace
3. Shahi hammam, Qutub Shahi tombs with mortuary
4. Shahi Hammam, Agra Fort with royal palace

While mapping hammams on map of India we see that public hammams were majorly along trade routes while private hammams are located cities which were capitals of royals at for some time history.

3.8 ELEMENTS OF HAMMAM IN INDIA

Elements are necessary to identify a building as different entity from other historic structures. Many elements invented and originated in west were bought to India after the arrival of Islam. These elements were assimilated into all Islamic structures including hammams.

The common elements to identify a building as hammam in India can be classified into three categories namely; functional, structural, and ornamental from various examples that were studied. This helped in preparing the comprehensive list of hammams in India.

3.8.1 Functional elements:

Dome chamber: A chamber with dome to perform various functions of dressing, washing etc.

Square or polygonal is the most prevalent type of dome chamber later cruciform plans were also developed to cover larger area. The dome sits with more smaller or sliced domes on all four sides.

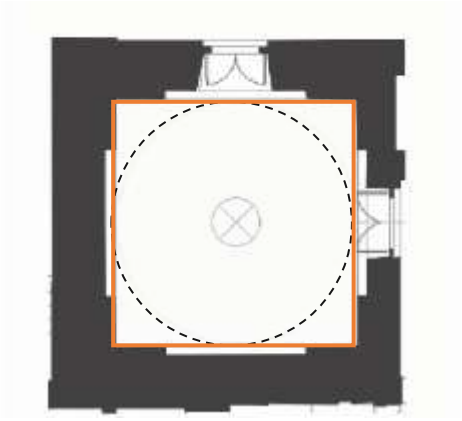


Figure 36 Square dome chamber, Shahi hammam, Islamnagar

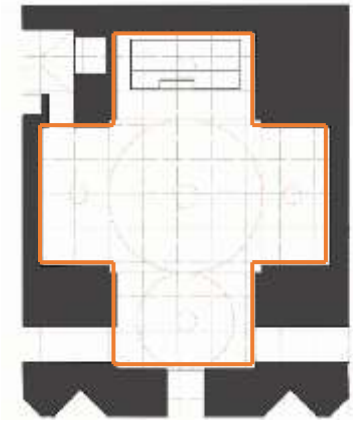


Figure 35 Cruciform dome chamber, Janta hammam, Burhanpur

Wind catcher: They were used for ventilation inside the entrance dome chamber. Wind catcher is usually located on the domed roof of chambers with height of 1.5 m.

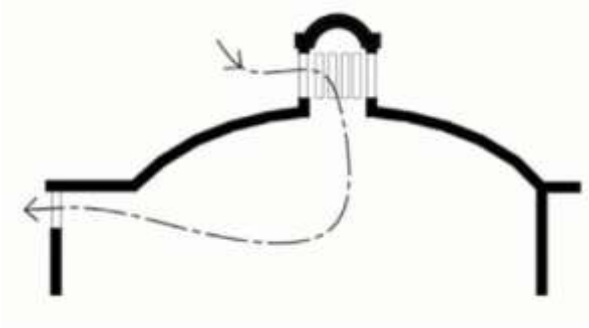


Figure 37 A sketch of wind catcher over a dome

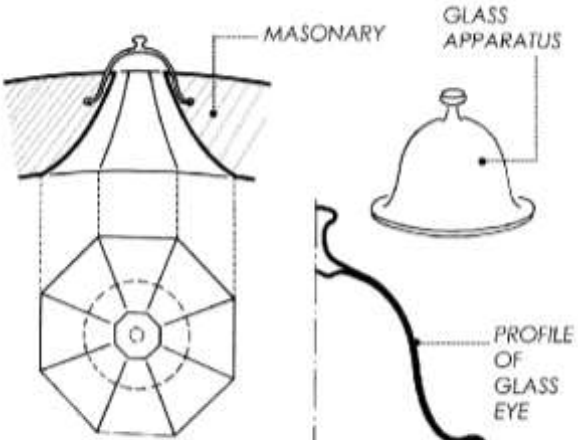


Figure 38 sketch scheme of glass eyes apparatus

Glass eyes: The domes used to have number of small skylight kind of glass apparatus embedded within masonry of domes as part of roof system to discourage vision inside but provide enough light inside the hammam structure.

Navel stone: A marble platform in the centre of washing area used by user to lie down and relax. Used by Hammamchi to massage the client against the stone.

Figure 39 Image showing pool, Janta hammam Burhanpur

Figure 40 Image showing Navel stone of Shahi hammam, Burhanpur

Pool: Initially pool was never a element of hammam. Hammams started to have pool private palaces as a luxury.

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Hypocaust: A under floor system of small brick piers with a furnace below the copper plate at the bottom of the water reservoir to heat water to be used in hammam's hot room.

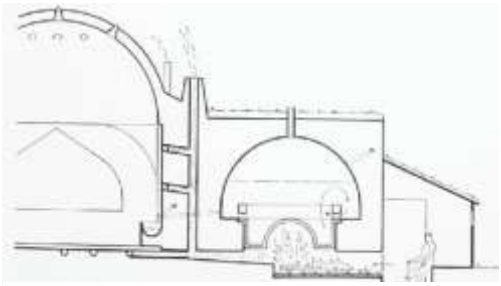


Figure 41 heating furnace of hammam

Source: Taschen

3.8.2 Structural elements:

Dome: A round vault forming the roof of a building or structure typically with a circular

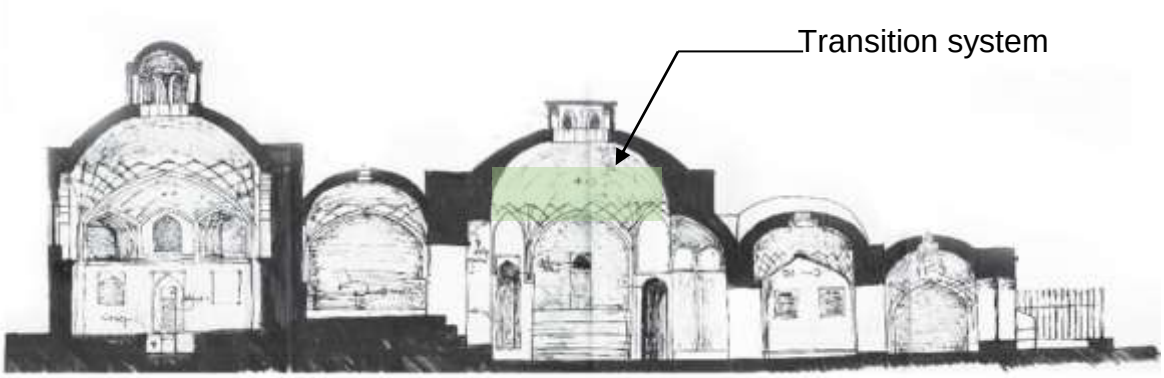


Figure 42 Image showing domes spanning over walls in section of hammam

base. Domes are spanning system over walls that the main carrying element with help of transition system.

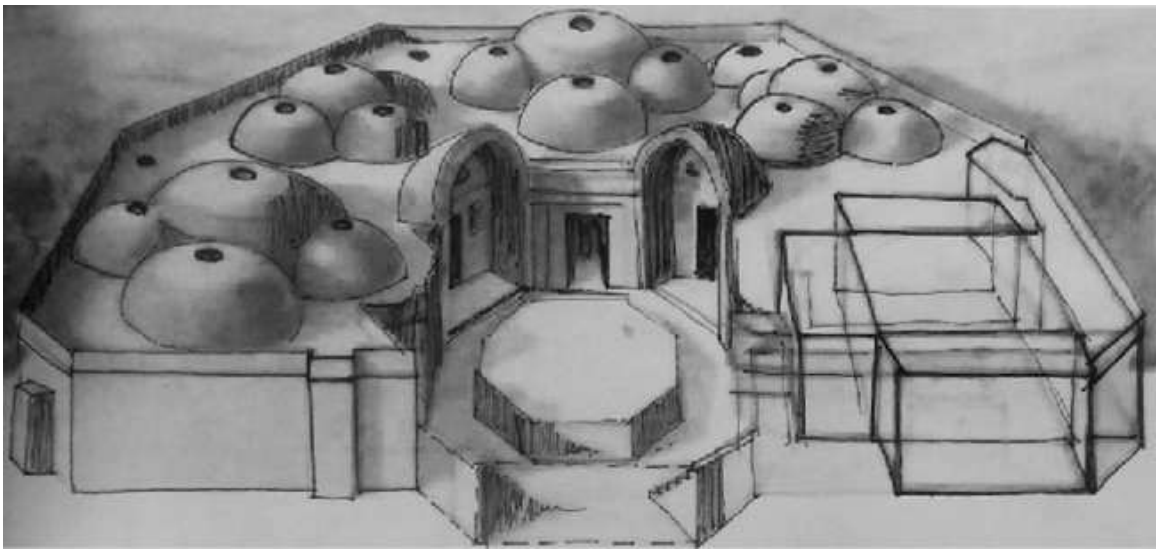


Figure 43 Image showing artistic representation of domes of Janta hammam

Source: Suresh Mishra

Figure 45 Image showing vault over a chamber of Hammam

Vaults: Another system of spanning chambers of hammams with series of arches.

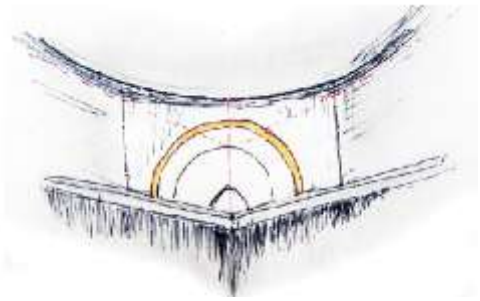


Figure 44 Sketch of a squinch

Squinch: A small arch located at the corner of a chamber to form octagonal from a square so that a dome can sit over the chamber

Intersecting arches: In transitional system, a curved surface is broken by a pattern of intersecting arch. Arch-net is preferred term.

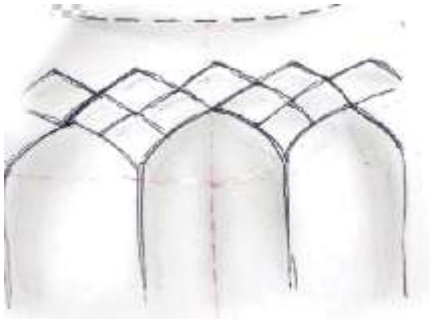


Figure 46 Sketch of Intersecting arches

3.8.3 Ornamental elements:

Arch Panel: The arch and panel system is decorative forms by one consistent system of articulation and the relationship between arch and panel and arch and arch

Empanelling - Arch is contained within a panel

Multiplication - when there is progressive increase forwards framed by arch

Intersection -arch cross arch

Enflaming - Arch is framed by arch. By repetition of the similar arcade pattern serves to unify surfaces and voids of the structure as well as to control; the decoration of the wall and other surfaces *Habib(2002)*

Figure 47 Ornamental surface of shahi hammam of Burhanpur

Maqaranas: Typically applied to the underside of domes, pendentives cornices, squinches, arches and vaults and is often seen in Islamic structures.

Origin of Maqaranas can be traced back to mid tenth century in N.E. Iran and North Africa.

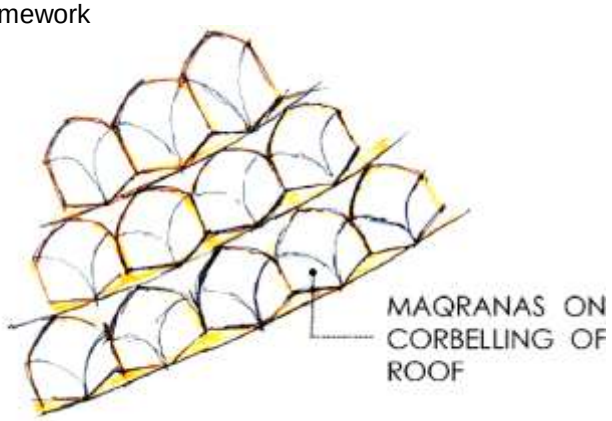


Figure 48 Sketch of maqaranas

Geometrical pattern: Many Islamic designs are built on squares and circles, typically repeated, overlapped and interlaced to form intricate and complex patterns. A recurring motif is the 8-pointed star, often seen in Islamic tilework; it is made of two squares, one rotated 45 degrees with respect to the other. The fourth basic shape is the polygon, including pentagons and octagons. All of these can be combined and reworked to form complicated patterns with a variety of symmetries including reflections and rotations. Such patterns can be seen as mathematical tessellations, which can extend indefinitely and thus suggest infinity.

Figure 49 Image geometrical pattern on Interior surface of hammam | source: Author

Chaddar: An ornamental or decorative element over which water flows and creates ripples. Chaddar is a way of evaporative cooling in historic structure. Chaddar flowing water solved the problem of running water feature in a hammam. This feature was usually seen in the entry room of hammam.

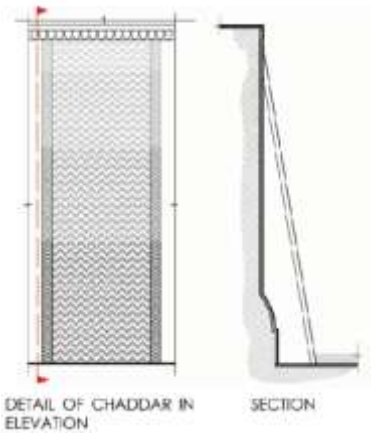


Figure 50 Image showing detail of chaddar| source: 2018mco

3.9 WORKING OF A HAMMAM

Working of a built structure is important to give better understanding of functions taking place inside building.

Methodology: To study the working of a hammam building, private hammam of chaman mahal, Islam nagar was taken as case study. The structure here is small and detail study could be done and two previous studies done by conservation department were available as resource. A schematic diagram was thus prepared as a artistic representation of working of the building.

History: Formerly a fortified city, Islamnagar was the capital of the Bhopal princely state for a brief period. Chaman mahal ("garden palace") is a sandstone structure built by Dost Mohammad Khan in 18th century.

Architecture:

Chaman Mahal is surrounded by gardens and fountains, and is ornamented with floral motifs. The architecture is a synthesis of the Malwa-Mughal architecture, with Bengali-influenced drooping eaves. The palace has a Mughal water garden and a hammam.

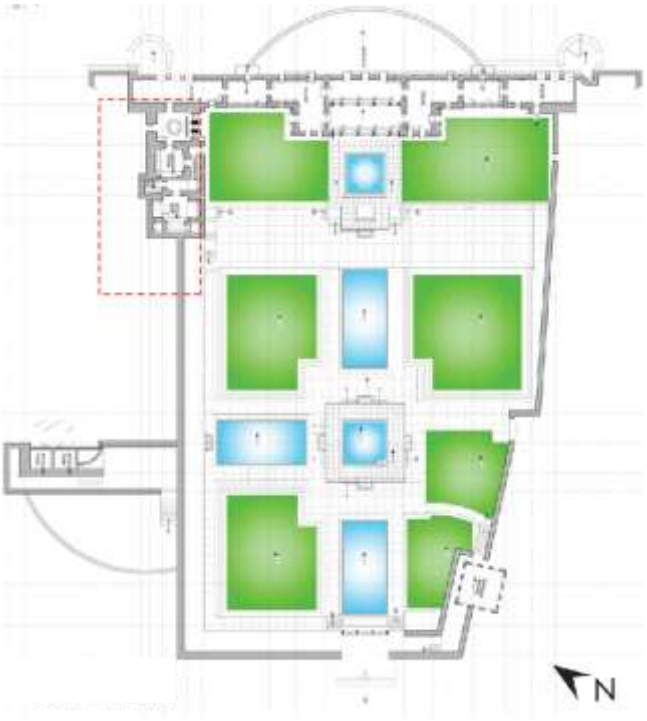


Figure 51 Key plan showing location hammam in Chaman Mahal, Islamnagar

Source: Shilpi Danna

Working: Hammam is in the northern side of the Chaman Mahal comprises of one dressing

room, a corridor for approach, hot water tank, water containers and w.c. with a provision manual scavenging. The entry room has welcome fountain then rakhtkhana a private facility Copper plate is heated by putting on fire in the thabakhana which heats water to used for bathing purpose. Corridor with service entry leads to gharamkhana with taas on three sides. Water heating tank and pool was fed water collection tank on roof .The hot water would transferred to a chamber in the fornt of periphery wall of hot water tank. Water supply for the water closet is done by a tank located just near it on the edge of hammam. The water flows from the tank to a small storage accessible from w.c

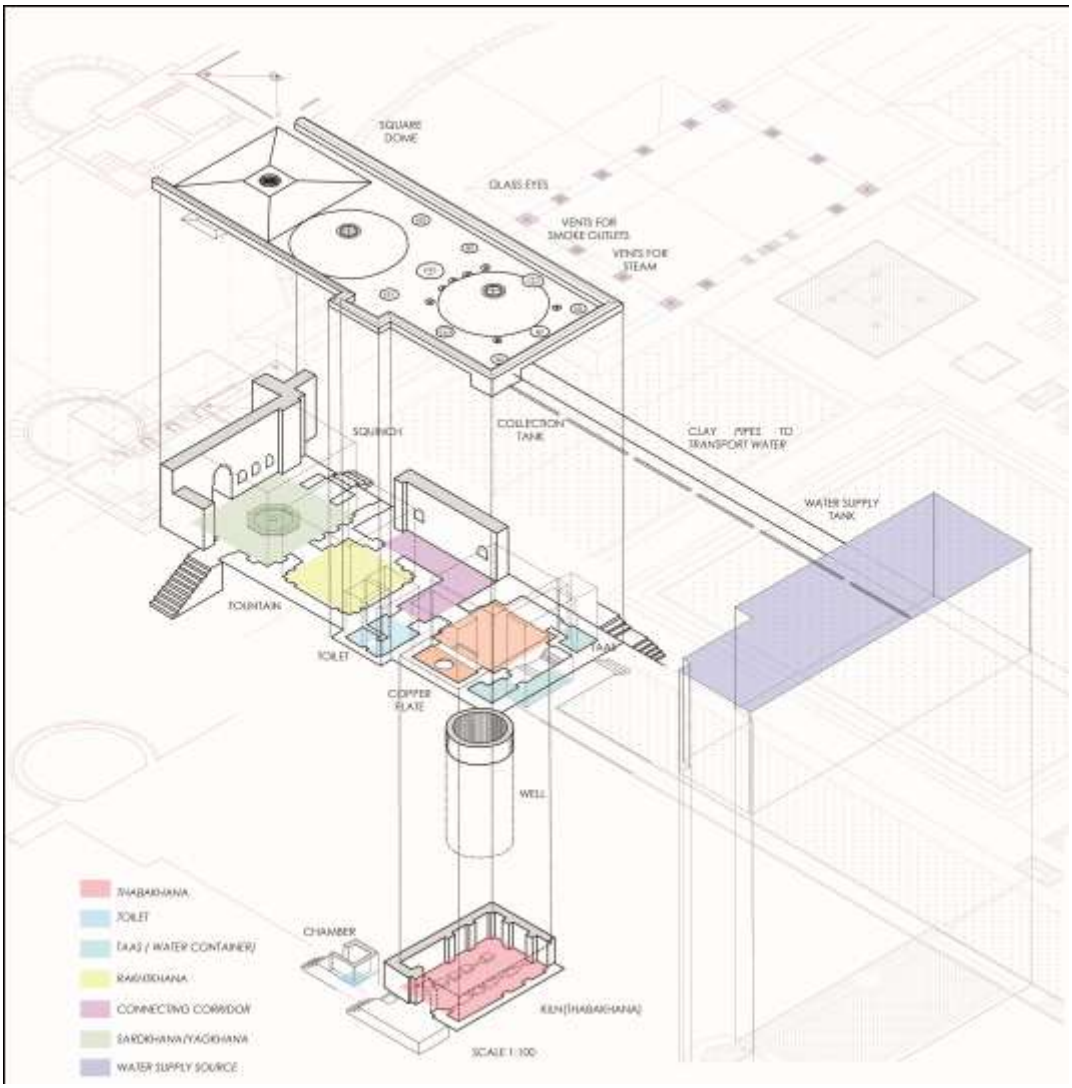


Figure 52 Schematic diagram of working of a hammam

Source: Author

4. CONTEXTUAL FRAMEWORK

No. of case studies were under taken to visit and survey hammams in detail.

The three significant case studies were identified:

4.1 SHARQI HAMMAM, SHAHI QUILA

This study was done in detail to understand architecture, form design and setting of a hammam originally.

Figure 53 Setting of Sharqi hammam Jaunpur inside Shahi Quila

Sources: Varanasi videos

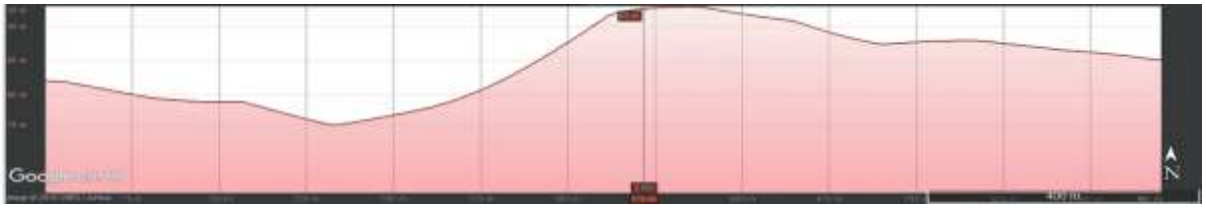


Figure 54 Topographic section highlighting location of of hammam (93m ASL)

Parameters for Site selection

- Building Type: hammams/bathhouses
- Type of Building: Royal hammam
- Time Period of Built Structures: Sharqi period
- Style of building: Turkish
- Geographical location: Uttar Pradesh

- Study area: Jaunpur
- Ownership: Jaunpur-sub circle, Sarnath Circle Archaeological survey of India.
- Justification of Site: One of Turkish hammam built in the Indian subcontinent by 14-15th century which still has complete built super structure and is under ASI protection.

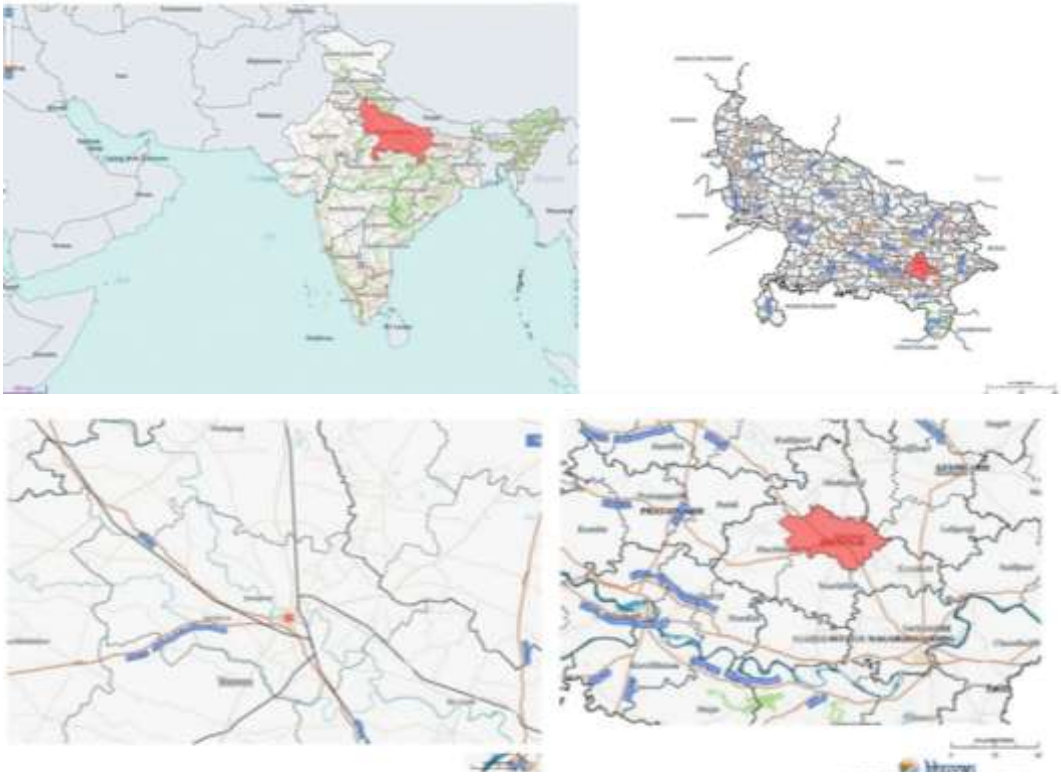


Figure 55 Location of Sharqi hammam, Shahi Quil, Jaunpur Uttarpradesh

Source: Bhuvan

Jaunpur is a town and a municipal board in Jaunpur district in the state of Uttar Pradesh. Jaunpur is placed to the northwest of the district of Varanasi. Shahi quila is located in the centre of historic city of Jaunpur.

CONNECTIVITY

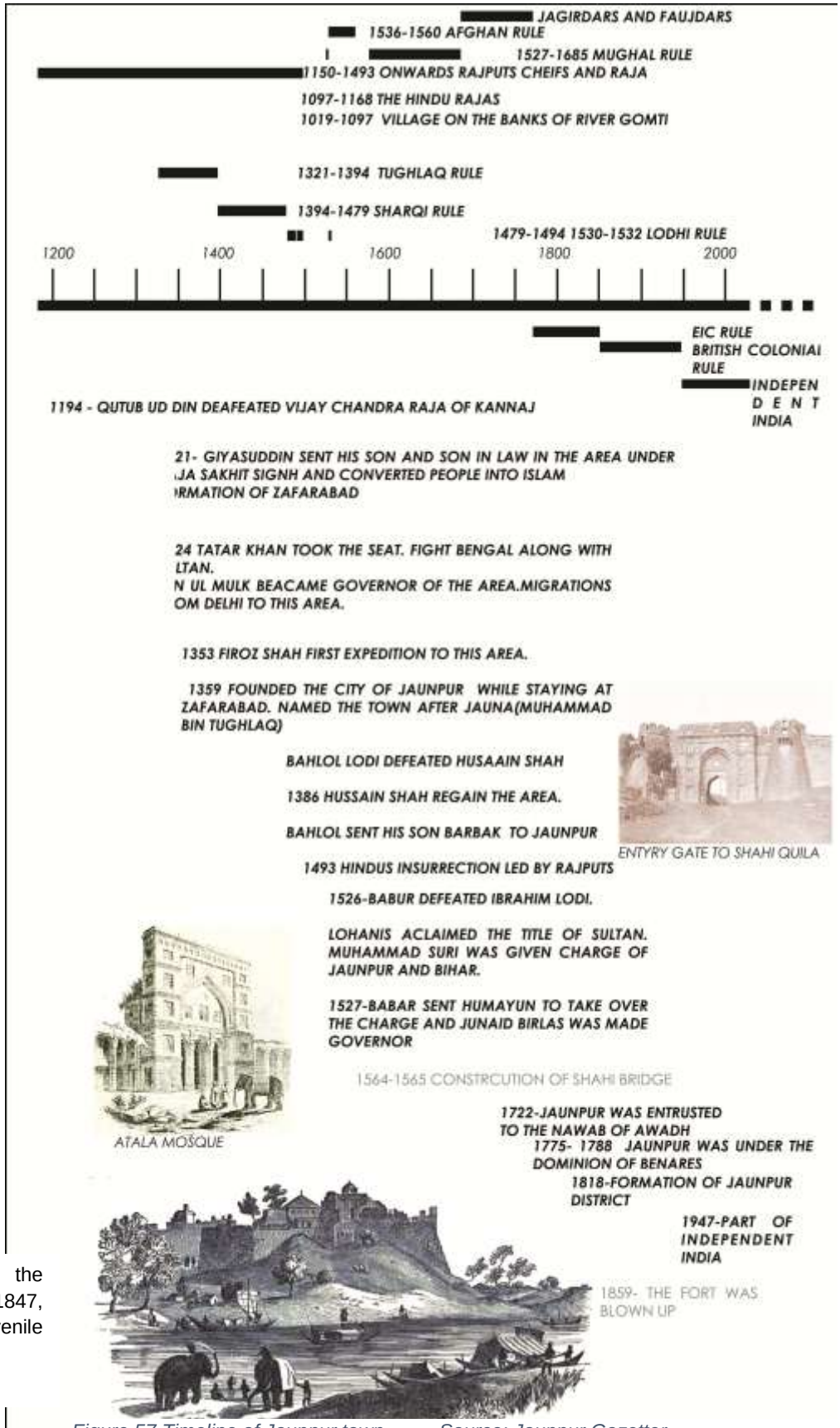
Rail-By Indian Railways, the Jaunpur district is well linked with all main cities of India. Jaunpur Junction (JNU), Jaunpur city Railways station (JOP), Shahganj Jaunpur (SHG), Janghai junction, Kerakat Railway station (KRS) are the four major railway stations.

Road- Jaunpur is the junction of Varanasi, Gorakhpur, Allahabad, Lucknow, and other cities. SH-36 and NH-56 are the Roadways connecting all major cities to Jaunpur.

The Shahi Fort Singh and Singh (2005) write about the Shahi Fort as, "*At the eastern end of the bridge, on the banks of the river Gomati stands the Jaunpur Fort. The fort was constructed in 1360 by Firoz shah Tughluq in the area known as Kerar Kot. Further additions and alterations continued during the reign of Sharqi and Mughal rulers. The fort of Jaunpur, although not a hill fort, was constructed on an artificial mound at a strategic location.*" The walls of this fort stand on about a 10 m high mound with a slope of about 35^0 to 40^0 covered by a variety of grasses, herbs, shrubs and trees. It was partly dismantled after the first war of independence. It contained till then the palace of forty pillars dating from Ibrahim's time. The only buildings now are the Turkish Bath or Hammam(during the Ibrahim's reign) and the mosque of Ibrahim naib Barbak built by Firoz Shah's brother in April 1376.

Figure 56 Image showing Shahi Quila Surrounding

In the surrounding of hammam there are many important historic buildings like Atala Mosque. To understand the context of Jaunpur better we Will go through the timeline of Jaunpur.



View at Juanpore, on the River Ganges (IV, June 1847, p.60)The Wesleyan juvenile offering, Volume 4

Figure 57 Timeline of Jaunpur town Source: Jaunpur Gazetter

LIST OF CENTRAL PROTECTED MONUMENTS UNDER THE JURISDICTION OF SUB CIRCLE, JAUNPUR

Archaeological Survey of India Sarnath Circle

1. Atala Masjid
2. Cemetery of seven kings of the Sharqui dynasty
3. Jaunpur Fort
4. Hammam or Turkish bath in the old fort
5. Jhanjhri Masjid
6. Juma Masjid
7. Khails Muklis or Char Ungli Masjid
8. Khanqah or Tombs of Sharqi kings of Jaunpur and the chamber for the royal mourners
9. Lal Masjid (Lal Darwaza)
10. Qalich Khan ka Maqbara
11. Ruaza of Shah Firoz
12. Stone group of a gigantic lion standing on a small elephant, lying on Akbar's bridge
13. Tomb of Nawab Ghazi Khan
14. Gateway of Hazrat Chirag-I-Hind's palace
15. Sheikh Burhan's Mosque
16. Walls of the old Kankar fort of Jaya Chandra

Figure 58 Image showing Atala mosque

To understand the topography, slopes, drainage pattern, watershed area of area various GIS maps were prepared as the hammam built structure is water dependent. The main source of water for Shahi Quila was perennial river Gomti .

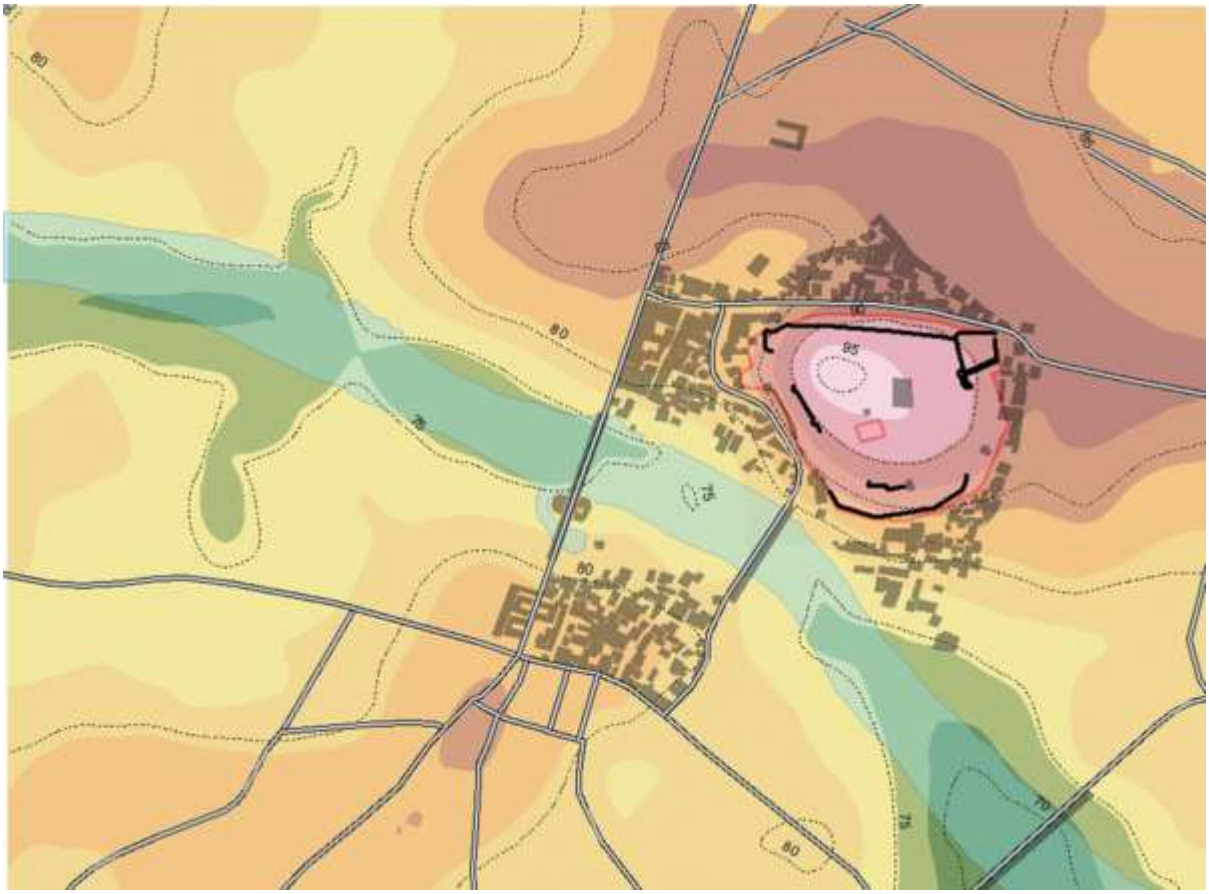


Figure 60Topography map of Shahi Quila and surrounding area

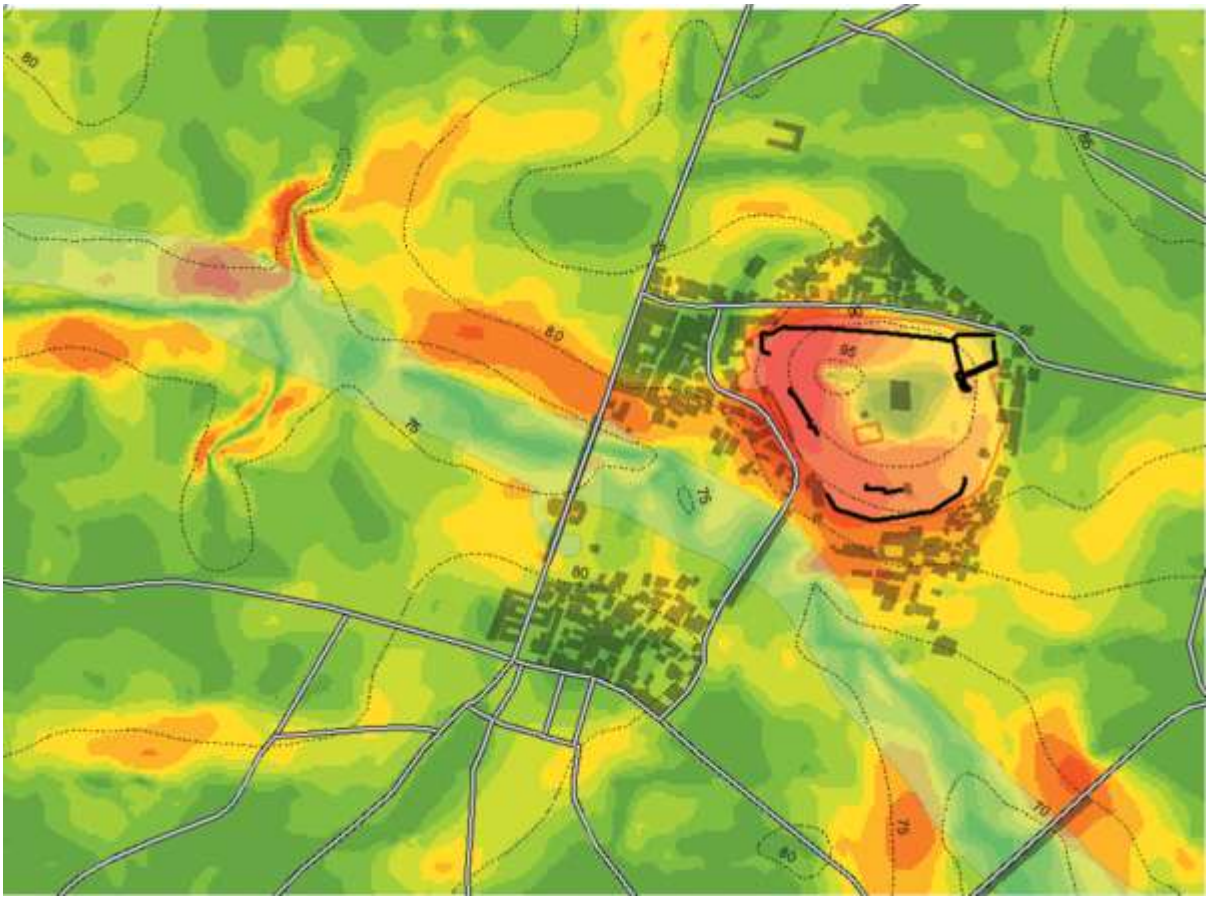


Figure 59 Slopes map of Shahi Quila and surrounding area

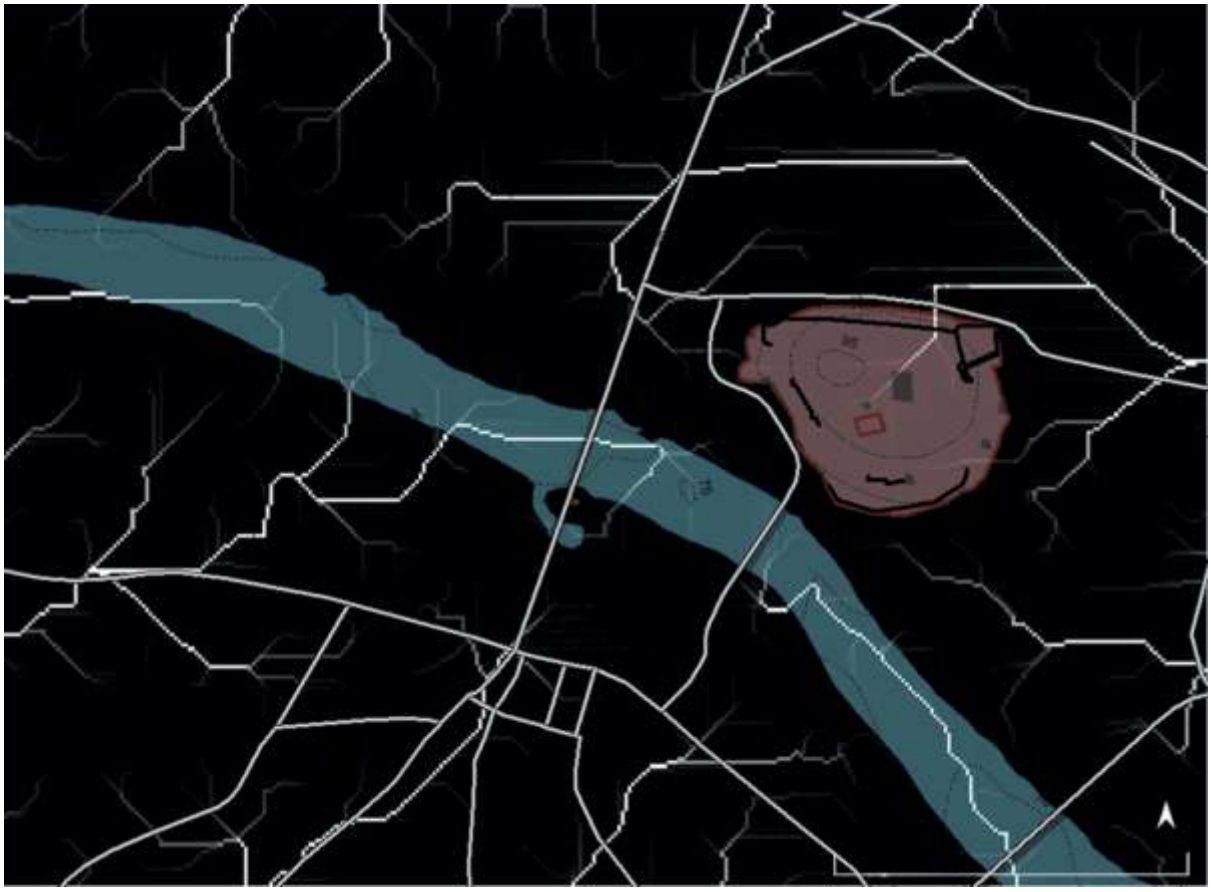


Figure 61 Drainage pattern of Shahi Quila and surrounding area

Inferences:

Historically Shahi Quila is the origin point of city.

The Shahi Quila is on the highest elevation on Jaunpur city.

The fort was established by Firoz Shah Tughlaq in 1359 and present city of Jaunpur was so formed.

Sharqi hammam was built on highest elevation along with the first mosque of city.

River is main source of water for city.

The mosque and hammam sits on the buildable area on with relatively less.

Water was bought to the quila with the wells and persian wheels mechanism

A large well was also source of water for the hammam

Water drains out towards the entrance of the Shahi Quila gate.

Detail documentation of Jaunpur hammam was done which led to curious questions that helped in formulating the study after site work.

Site work included:

Getting permission to work on site from ASI Sarnath office from the superintending archaeologist Dr. N.K. Sinha .

Visual observations of the site and site surroundings.

Discussion with the historian Mr. Arif

Survey of the staff managing and locals visiting the hammam. Locally known as *bhoolbholaiya*

Photo documentation of site chamber wise.

Measure drawing of free standing hammam structure of 14th century. Refer annexure for detail drawings.

Figure 62 Plan of Sharqi hammam, Jaunpur

4.2 JANTA HAMMAM, BURHANPUR

Parameters for Site selection

- Building Type: hammams/bathhouses
- Type of Building: Public hammam
- Time Period of Built Structures: Mughal period
- Style of building: Iranian/Turkish
- Geographical location: Madhya Pradesh
- Study area: Burhanpur
- Ownership: Burhanpur-sub circle, Bhopal Circle Archaeological survey of India.
- Justification of Site: Public hammam which is part of larger water system present in the city of Burhanpur.

In 1601, Mughals occupied Burhanpur on the northern fringe of Deccan. Abdur Rahim khan-i-khanan was the governor during the last years of Akbar and throughout the rule of Jahangir, lived in Burhanpur and was responsible for building the public hammam.

It has approx area of 900sq m.

4.3 HAMMAM-E-KADIMI, BHOPAL

Parameters for Site selection

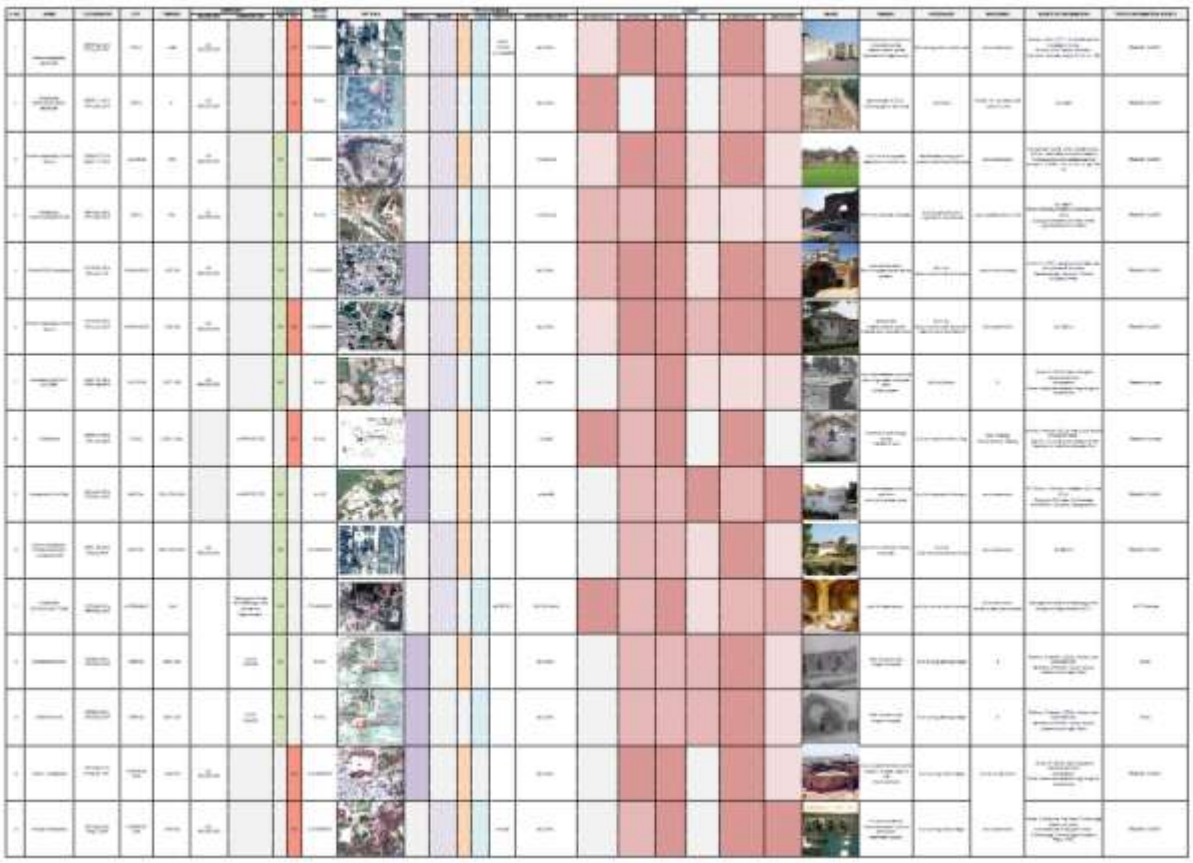
- Building Type: hammams/bathhouses
- Type of Building: Public hammam
- Time Period of Built Structures: Nawabs period
- Style of building: Turkish
- Geographical location: Madhya Pradesh
- Study area: Bhopal
- Ownership: Burhanpur-sub circle, Bhopal Circle Archaeological survey of India.
- Justification of Site: Only Public hammam which is still function.
- During Nawabs reign in Bhopal hammam –e-Kadimi for the use for public was established.

- A detail comparative was prepared of the three case examples sites with help of heading from Nomination Dossier and adding to the matrix the understanding from the study.

5. ANALYSIS

With all available data about hammams a matrix for 45 hammam structures was prepared.

Table 5.1 Table of analysis of hammams structures



The outcomes of the activities were:

- A number hammams in India are protected.
- Unprotected hammams are in ruins.
- Number of hammams is part of complexes
- Over time use of hammams have changed from their original function.
- Hammams of significant values are not accessible for visitation.
- The three most significant hammams were identified for preparing a detailed comparative study and detail out future actions based on their context.
- Public hammam are located in trading area of cities.
- The result of the values and significance

6. VALUES AND SIGNIFICANCE

6.1 VALUES

The values embodied in cultural heritage [6] are identified in order to assess significance, prioritize resources, and inform conservation decision-making. It is recognised that values may compete and change over time, and that heritage may have different meanings for different stakeholders.

Discussed in the 1964 Venice Charter, values and the question 'why conserve?' are the focus of the 1979 Burra Charter (last revised 1999). Cultural significance is said to be 'embodied' in the fabric, setting, use, associations, and meanings of a place, and includes aesthetic, historic, scientific, social and spiritual values for past, present and future generations. In order to preserve such values a 'cautious approach' of minimum intervention is advocated.

Significance assessment typically includes consideration of the rarity, representativeness, and communicative power of assets and their values. These are then managed in order to sustain and valorise that significance.[7] Engagement with the economic value of heritage may help promote its preservation.

6.1.1 Emotional values

Wonder:

- Working of *hammam s* heating and cooling system
- Construction of structure of *hammam* building
- Healing through *hammam*

[6] Ann Marie Sullivan, Cultural Heritage & New Media: A Future for the Past, 15 J. Marshall Rev. Intell. Prop. L. 604 (2016)

[7] "Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment" English Heritage.

- Folklore associated with *hammams*
- Construction of walls and clay pipes to channel water

Identity:

- Hammams are landmarks and iconic structure in various Indian cities like Fatehpur Sikri , Delhi, Hyderabad
- Domes and vaulted structure are identifiable features of Islamic city

Spiritual and symbolic

- *Hammam* are considered to purify soul
- They are symbol of developed neighbourhood

Continuity

- The *hammam* of Bhopal is presently in working condition
- *Hammams* in Kashmir are transferred with a house's
- Drawing room feature which seen all over Kashmir
- *Hammam* in Mumbai was functional till 2015

6.1.2 Cultural values

Historic values

- *Hammam* along with complex they are part of complex of repository of Tuglaq, Sultanate and Mughal period in India
- Hammam came to India during 14th century and saw proliferation period during Mughal period the elements of hammam like hypocaust in from the time of 2nd century
- The elements of hammam like hypocaust in bathhouses from 2nd century
- Nawabs, Rajputs and begums built hammams in their palaces as seen in Amer fort, Bharatpur, Bhopal during 18th -20th century.

ARCHAEOLOGICAL VALUES

- Hammams are still being excavated in various ruins of Islamic cities like Chamapaner, Chaul, Delhi
- The waterworks and system are possible of larger water system of cities established by Muslims.

Technological and scientific values

- The idea of construction of hammam is clear understanding of construction material and techniques
- Technique of spaning with domes and vaults
- The knowledge of topography as advantage for water system
- System of heating and cooling (with saltpetre).

Ecological values

- Use of herbal soaps, oils does not harm either building or environment
- Sustainable ways to heat the building with once the building is put on fire not put off till in use.

Architectural values

- First built during Tughlaq's reign in India.
- Representation of different architectural styles that came to India and developed and continuation (elements)

6.1.3 Use values

Functional

- Hammams forms part of complexes that World Heritage and National monuments
- Hammams are still in use.
- Only few hammams in India are open for visitors.

Economic

- As source income for a family of 24 members
- As ticket monuments resource for ASI
- Used guest house by ASI

Social

- Hammams are an important gathering place for males and females different times of day.
- Symbol of developed society.

6.2 STATEMENT OF SIGNIFICANCE

Historic significance:

The hammams and its setting is a repository of the architecture and system of planning of different periods and have immense historical significance. They showcase creative achievements of different period in the history of India.

Hammams elements in India were continuation of world architecture

Cold bath as a Typology developed by Babur in 1526

Technological and Scientific Significance:

Hammams in India construction technique and traditional knowledge emphasizes the exceptional understanding of material and techniques.

The system of cooling with help of saltpetre and heating with underground floor system is a sign of creative genius.

Cultural significance:

Hammams have remained in use from 14th century in India. Hammam have been used to purify and perform ablutions before entering a mosque

They were therefore source of income for mosque

Social gathering place for males and females

Associational significance:

Hammams in India are of great emotional values. The cities in India and give identity to cities like hammams of red fort in Delhi. Several historic hammams have perished but still live in memory of people of India

Archaeological significance:

Hammams surroundings are potential site for archaeological evidences for investigation

Ecological significance:

Hammam traditional hypocaust is significant as a sustainable heating system

The use of organic product makes the building practice eco-friendly

Architectural significance:

Hammams in India display high architectural significance as representation of architectural styles developing in India and their golden period.

7. LEGAL AND INSTITUTIONAL FRAMEWORK

Hammams in India are of great historical importance, requires a management system that addresses the challenges so posed, and is able to balance heritage protection and local development requirements as necessary. The heritage management that can be understood and developed at various levels as the ownership of hammams in India is with various institutions at various levels World heritage, Archaeological survey of India, State archaeology, municipalities, Waqf board, private ownership etc.

INTERNATIONAL OBLIGATIONS:

The Indian State Party is obligated to follow the directives of the World Heritage Convention 1972, the Operational Guidelines for its Implementation and the Nara Document on Authenticity for the site, as it is a signatory to the Convention. These international directives provide the principles and standards that have to be followed in the management of all World Heritage Sites including some complexes which hammams are part of.

The principal framework that is followed in our country is the Indian Constitutional and legal framework. The Operational Guidelines strongly recommends that every State Party should develop heritage management systems as per their own contextual and legal requirements. Such a national rooting shapes the proposed framework for heritage management and the ensuing operational system in a manner that is in harmony with other existing systems on ground.

The Constitution of India (COI) India is known as the world's largest democracy and a successful one at that, which cannot happen in the absence of a conscientiously worked out foundation. The Constitution of India (COI) provides exactly such a basis. It declares India to be a Sovereign, Socialist, Secular, Democratic for the country from which emanate all subsidiary frameworks, structures and systems, including legal, institutional and administrative, et al., that are required for the smooth functioning of the Indian democratic society, in a manner where every structure and system work in harmony with another. Therefore, it is obligatory that every aspect of heritage management be rooted in the principles of the COI that shall provide for its constitutional and legal validity.

The 73rd and 74th Amendments to the COI provide legitimacy and a constitutional framework for political decentralization and a system of governance at the grass roots levels, such that local bodies act as democratic units of local self-governance. Correspondingly, Parts IX and IXA, detail aspects relating to rural and urban local bodies respectively. And the 11th and 12th Schedules of the COI detail the powers, authority and responsibilities to be vested in these local bodies.

Therefore, there are three tiers of governance in the Indian set-up: national, state and local. Local bodies are sub-classified as urban and rural. As evident, the national government looks after affairs of national importance, state governments after matters of state importance, and local governments after matters of local importance All possible responsibilities are divided within these three tiers of governance.

ROLES, RESPONSIBILITIES, JURISDICTIONS AND MANDATES OF EACH LEVEL OF GOVERNANCE

The following provisions define the jurisdictions and mandates of each tier of governance that is necessary to define the different roles and responsibilities for the management of hammam sites.

A. The 7th Schedule of the COI defines the jurisdictions of the central and state governments towards law and policy development in various sectors. It mandates the exclusive areas of jurisdiction with the central government in List 1 – Union List; areas with the state government in List 2 – State List; and areas which are deemed the combined jurisdictions of the central and the state governments in List 3 Concurrent List.

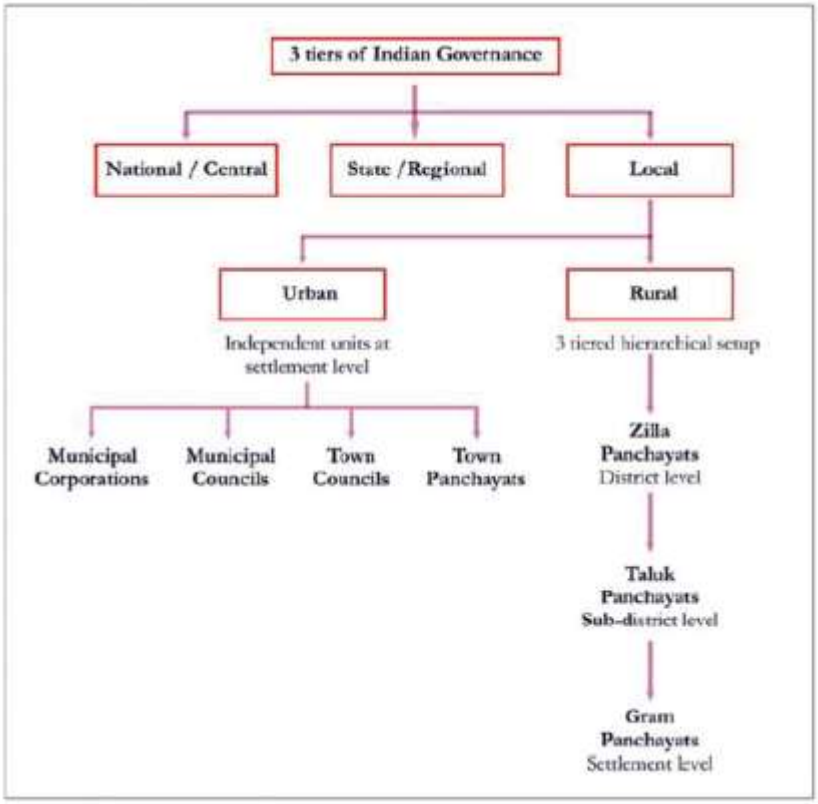


Figure 63 Teirs of Goveranance in India

Archaeological sites and remains are included in Union and Concurrent Lists, which means that the Centre is primarily responsible for all aspects related to such remains and may direct the states as required. Excavations and explorations at such sites, therefore, becomes a central subject, which mandates the ASI, an agency under the central government, to regulate all such activities on Indian soil. Monuments are included in Union and State Lists; therefore, both the central and the state

governments are equally mandated for protection and management of monuments within their respective care.
The other items in the aforementioned lists pertain to various development sectors to be addressed for responsible management of living heritage sites.
Items like railways, national highways, airways, all forms of communication (including telecommunication) and mining fall under the jurisdiction of the central government.
Items like local government, police, state highways and local roads, agriculture, water, public health, land, treasure troves, markets and fairs, inns, theatre and dramatic performances, taxes and rates of stamp duty are under the jurisdiction of the state government.
Items under the combined jurisdictions of centre and state are nomadic tribes, forests, wildlife, economic and social planning, education, religious and charitable institutions, electricity and acquisition of properties.

CENTRAL GOVERNMENT ACTS

Applicable to the whole of India with no prejudice.

A. The Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Rules, 1959 (AMASR Act, 1958): It relates to protection, preservation and all other aspects for ancient monuments and archaeological sites and remains that falls under Entry 67 in the Union List and Entry 40 in the Concurrent List of the 7th Schedule to the COI. The Act further mandates the Archaeological Survey of India (ASI) as the singular agency for protection of such monuments and archaeological sites all over the country.

B. Gazette Notification Regulating Prohibited and Regulated Areas, 1992: An administrative order under the aforementioned Act that lays down a singular regulation for the interface of the surroundings with protected archaeological heritage, where 100 metres around protected monuments is declared as ‘prohibited’ and further 200 metres as ‘regulated’ for the purposes of both mining operations and construction.

C. The Antiquities and Art Treasures Act, 1972: An act to regulate the export trade in antiquities and art treasures, to provide for the prevention of smuggling of, and fraudulent dealings in, antiquities; to provide for the compulsory acquisition of antiquities and art treasures for preservation in public places; and to provide for certain other matters connected therewith.

for eg:

STATE GOVERNMENT ACTS

A. The Madhya Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1961 (MPAHMASR Act, 1961): A state act on the lines of the central AMASR Act, 1958, it lays down guidelines for protection, maintenance and

management of such sites in the state that are not deemed to be of national importance but are of regional importance. The State Department of Archaeology and Museums, GOK is the mandated agency to protect and maintain such sites in the state of Karnataka.

B. The Madhya Pradesh Treasure Trove Act, 1962: An act to protect and regulate anything of value hidden in the soil or anything affixed thereto. This enables protection over movable items found during excavations.

8. STRATEGIES AND ACTIONS

Conservation best practices guides us that there are a number of basic prerequisites for safeguarding of heritage sites that are common to all types of heritage sites in all parts of the world.

- **Establish a knowledge base through investigation**
- **Safeguard authenticity and assure sustainability of the heritage**
- **Assess values and mitigate impacts threatening the heritage resource**
- **Ensure continuing life in the heritage resource**

CHALLENGES:

- There is lack of available documentation on hammams in India. The knowledge base of hammam as heritage with cultural and natural values needs to establish.
- Hammam structures in India are underutilised though originally designed as a public utility.
- Infrastructure and visitor facilities are lacking at hammams sites.
- A number of significant hammams which are protected are not accessible for visitation.
- Context in which hammams where made for public has changed over times though modern spas only a luxury with high affordance continue.
- Hammams are no more part of larger water system of the city.
- There is lack of awareness of benefits of traditional hammam rituals therefore practice of health, healing and leisure activity in hammams is in decline in India.
- Hammams structures in function are not functioning as per traditional use they were designed.
- Natural and Manmade threats are deteriorating hammams further.
- Ground work required to conserve hammams in India is a huge task.
- Many hammam sites are in ruins the sites need to be made safe for user.
- Access to hammams structure needs is not defined.

- Significant number of hammams is not protected.
- Lack of skilled professional to continue the practice of hammams and perform rituals.

ACTIONS TO MITIGATE CHALLENGES

- Hammams heritage repository of knowledge system that can be a system of educated sustainability of heritage structure so open hammams structures for visitation.
- Comprehensive list of hammams to be continued to assess values of hammams and add to knowledge base.
- Design guidelines for setting of hammams so that there is less impact on hammam as a heritage resource.
- Explore more ways for reusing and revival of hammam structures.
- Design a new module for hammams in India to promote to present that can be annexed to significant hammams
- Explore ways to incorporate idea of health awareness programme inside hammams in Indian cities by local governing bodies.
- Recent additions and alterations to be removed that are threat to values and significance hammams should be removed.
- Visitation needs to be promoted.
- Materials and condition assessment of hammams to conserve appropriately for any use.
- To maintain the crowd and hygienic conditions in the hammams surrpounding functioning by creating awareness among owner.
- Hammam sites needs to be made safe for visitation.
- Regular maintenance monitoring of Hammams of National and International importance.
- Site development to needs to done prevent encroachments to hammams.

GOAL: ***Reuse and revive hammams to retain for the future.***

Approach: There are numerous significant hammams in India in decline which has potential that can be identified, documented, protected, conserved, prevented and transmitted for retaining hammams in India for future by appropriate conservation strategies.

CASE STUDY: Conservation of the Shahi Hammam

Geneva: Aga Khan Historic Cities Programme, 2016.

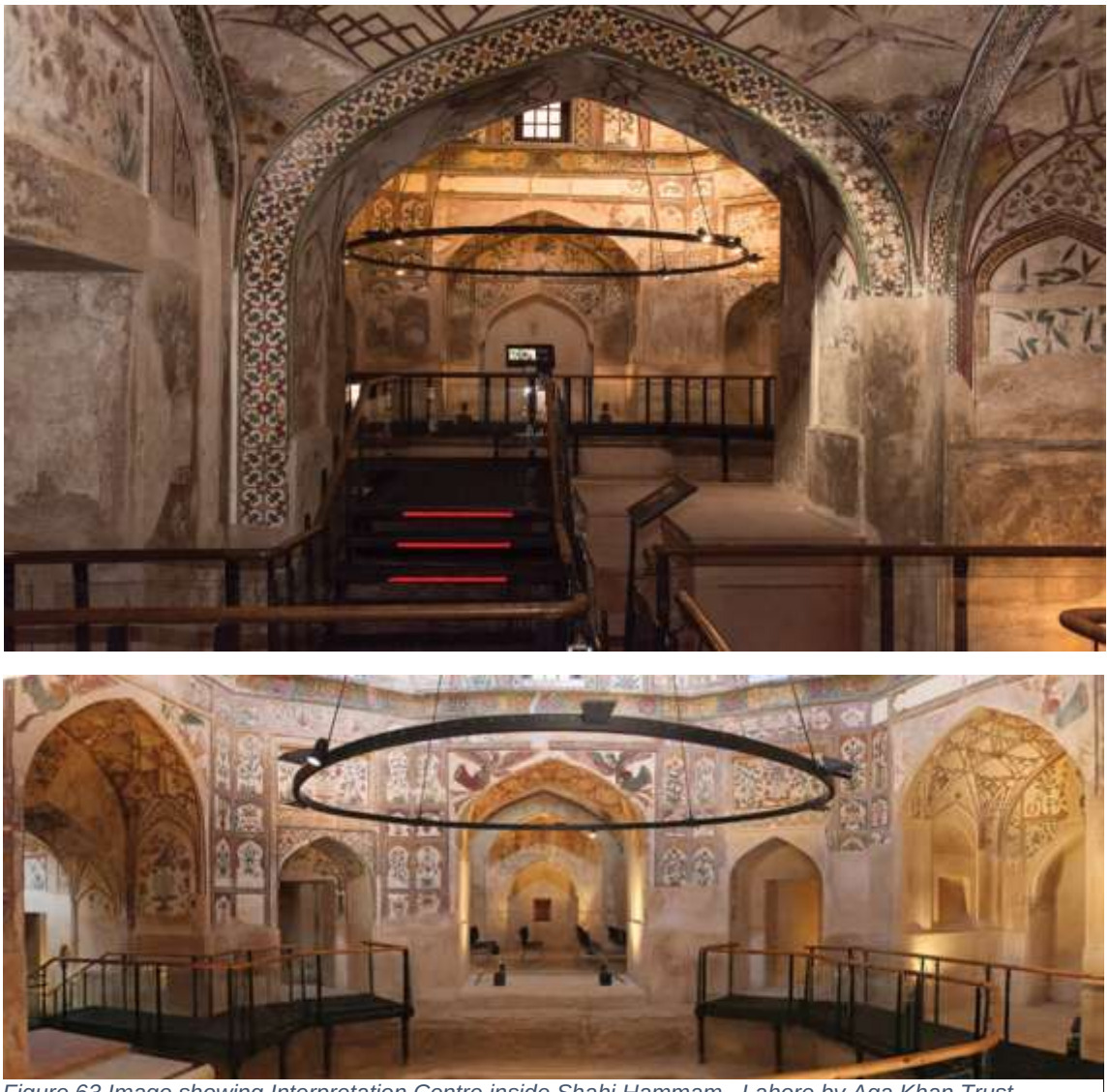


Figure 63 Image showing Interpretation Centre inside Shahi Hammam, Lahore by Aga Khan Trust

The Walled City of Lahore is famous for several historic monuments including the Lahore Fort - a World Heritage Site, the Badshahi and Wazir Khan Mosques. A

majority of these buildings and the mohallas in which they are situated form a unique heritage footprint. In July 2013, the Aga Khan Trust for Culture (AKTC) commenced the conservation of the Shahi Hammam, a 17th century Mughal period bathhouse with generous financial support from the Royal Norwegian Embassy.

STRATEGIES AND ACTIONS

Appropriate Use:

Hammams bears values and significance that are examples of Islamic culture from 14th century in Indian cities the use of the hammams sites is not as per their they were designed. Appropriate use will ensure that it remains authentic to its original configuration and setting, including the preservation of its natural ecosystem.

Legal and Institutional framework:

The legal and institutional framework will be conducive to the conservation and presentation of the site's values, authenticity and integrity and will ensure the enforcement of protection by-laws, the strategic and coordinated management of the sites of hammams and its field-based monitoring and supervision.

Conservation and Documentation:

Hammams in India will be conserved in its setting, form and material, respecting its authenticity and integrity, in order to maintain the Value of the entire sites, including the annex buildings and its physical and environmental contexts. Site conservation will particularly endeavour counteracting man-made and natural threats and will ensure the long-term sustainability and minimum impact of interventions, as per highest international standards. Accurate, periodic and accessible documentation will ensure transparency of interventions and their continuous revision in the light of new technical discoveries and acquisitions.

Maintenance and Monitoring:

Regular sites monitoring and maintenance will ensure that the values of the sites, its authenticity and its integrity remain intact and are properly conveyed to the local, tourist and scientific communities. Tourism flows will also be closely monitored to reduce their impact on the sites.

Visitation and Interpretation:

Hammams will be interpreted, presented and marketed to foster the thorough understanding of its cultural and natural values. Communication and tourism strategies will be designed to meet tourists' needs and expectations, and will endeavour to minimize visitation's impact on site conservation. ASI should ensures highest interpretation and visitation standards through the synergy of their specific expertise and competence

Research and Excavation:

Research on hammams in India will be promoted in order to reinforce and further enhance the values of the entire sites.

Further excavations will be programmed on the overall waterworks context to allow its interpretation and the relationship with other investigations will be undertaken as per the highest international standards and will ensure that their outcomes are accessible research community and the larger public. Accurate, periodic and accessible documentation of excavations will ensure transparency of interventions and their continuous revision in the light of new technical discoveries and acquisitions. Provisions will be made to ensure that explorations outcomes are accurately recorded.

Public awareness, education and community participation:

Hammams structures will represent an expression of Indian identity and culture, and its legacy will be recognized and protected by locals and nationals as part of a common heritage. Awareness will be spread among adults and the youth on its values and assets, and heritage-friendly behaviours will be channelled here to educate a whole new generation of Indians to the conservation and respect for their past and their environment.

Promoting

Funds will be ensured through fundraising activities to promote site conservation, investigation and presentation. Community-based activities aiming at tourism development be supported to enhance heritage-driven development in the area and to reinforce community participation into site conservation and presentation.

9. CONCLUSION

Water is an essential part of human life and it played a vital role through the history. It also shaped the social, economic and religious parts of life. As a result, all civilizations who lived in India built water structures in their periods like wells, fountains, pools, aqueducts, cisterns and public baths to serve their peoples.

Turks gave a great importance to the water architecture because of their nomadic traditions coming from the Central Asia and the necessity of the hygiene in Islam. Hence, Ottomans built many public baths (*hammams*) like Ancient Greeks, Romans and Byzantines before them. After the Ottoman rule, this tradition is continued to spread and came to India in 14th century spread to India as well but if we come to modern day, the *hammam* culture is unfortunately under threat together with the historical *hammam* buildings.

The India was a rich area about physical heritage values of this issue. There are buildings from a wide range between the Tughlaqs and the early years of the 19th century. Within this study, *hammams* from every period studied. Only two city *hammams* have an active use with their original function and the rest of them were abandoned. Added to this, some *hammams* of the area are also part of protected complexes.

It is seen that there are many factors to be solved in the survival of a historical building. Listing is an important step because it enables the official authorities to legally protect a heritage value. Otherwise, they are doomed to their fate. In this case, historical buildings needed to be revealed first and then designated as heritage values to be saved.

Secondly, archaeological researches could be improved to completely explore these buildings because during the preparation process of this study, overgrown vegetation and filled rooms with debris were main problems, so, this situation naturally affected the level of detail. Local municipalities can easily provide a basic but comprehensive cleaning to buildings with poor conditions.

Technical and financial obstacles are other problems in the conservation of the hammams but other than this type of buildings, the area also hosts a lot of other historical buildings like mosques, houses and, so, local workmanship could be improved by courses and practical education for a total restoration of the physical heritage values in the area.

Local municipalities, academic institutes and non-governmental organizations can play active roles in these developments but if we come to the financial part of this issue, it would be unrealistic to encumber all of these to the local sources. It is seen that most of the hammams in the area are owned by local municipalities but at the same time they all have poor conditions as well. This situation can be commented as the lack of technical and financial sources of the local administrations other than the priority levels of their “to do lists”.

Thus, the role of the central government over the Ministry of Culture and metropolitan municipalities is very critical to manage and support these because it is seen that the sponsorship of them has resulted with successful conservation projects in many cases.

The hammams of Sirhind for e.g. are not only the heritage values of a certain region, they have a national importance and these buildings could be added to a greater development plan with a national-scaled support.

Consciousness level of the community needed to be improved because there is a lack of scientific information about hammams, so, studies like this can be increased in quantity in order to inform people and prevent a top-down conservation approach.

Reversely, if the conservation of the heritage values has a minor importance for the authorities, this problem might also be solved by this when people start to demand the protection of the historical buildings more because they are buildings which emotionally and culturally connect people to where they live stronger. Hence, a bridge should be laid between the values and people, so, publications or media can provide this.

The role of the scientific or academic institutes is important in this matter of subject to shape the local policies and stimulate the public consciousness.

Existing touristic facilities which are derived from the heritage values of the public baths are good for domestic and international tourism but it is difficult to count them as an advantage in this issue because they are far so disconnected from the original details of the tradition with their architecture and cosmopolitan services but they market the hammams internationally by using the name.

Functionality is another issue to think about because designating abandoned historical buildings as cultural or social centres is a popular trend but it is thought that this conversion is not always the best choice or not the only opportunity to raise a forgotten building. Commercial options can be applied for sustainable and more profitable solutions as well and combining them with the local traditions might accelerate the authenticity.

In addition, the area has a rich archaeological potential in general, so, a museum function can be interesting too because hammams are valuable buildings worth to visit individually and attractive archaeological contents may add more value and promotion of them.

The buildings reflect the characteristics of their periods with their unique architectures and they needed to be conserved appropriately.

One of the main aims of this study was introducing the hammam culture and documenting the hammam buildings in the Jaunpur to the science world and the national readership. Furthermore, it is hoped that this study will affect the listing process of the unlisted hammams and help to the future restorations of them by providing scientific knowledge and conservation strategies.

Areas of further research.....

- Conditions and materials of building needs to be assessed.
- Technical survey for waterworks needs to done.
- Carrying capacity of buildings can be found.

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11. ANNEXURES

11.1 GLOSSARY

Garm khana: hot room of the hammam

Dehleez hammam: entrance of a hammam

Pakhsa: densified adobe walls built without framework

hammamchi or hammami: care taker of hammam

Salman-i-khana: barber room of the hammam

Sardkhana/yagkhana: cold room of a hammam

Taas: water container

Thabakhana: under floor heating system

Wataq-I-jaan shuey: washing room of the hammam

Saqiya; Persian wheel is a mechanical water lifting device, similar in function to a scoop wheel, which uses buckets, jars, or scoops fastened either directly to a vertical wheel

11.2 ONLINE SURVEY FORMAT AND SUMMARY

Survey for Hammams in India

* Required

1. **Name** *

2. **Age**
Mark only one oval.
- ◯ Less than 15 years
- ◯ 15 - 25 years
- ◯ 25 - 35 years
- ◯ 35 years and Above
- ◯ Other: _____

3. **Sex**
Mark only one oval.
- ◯ Male
- ◯ Female
- ◯ other
- ◯ Other: _____

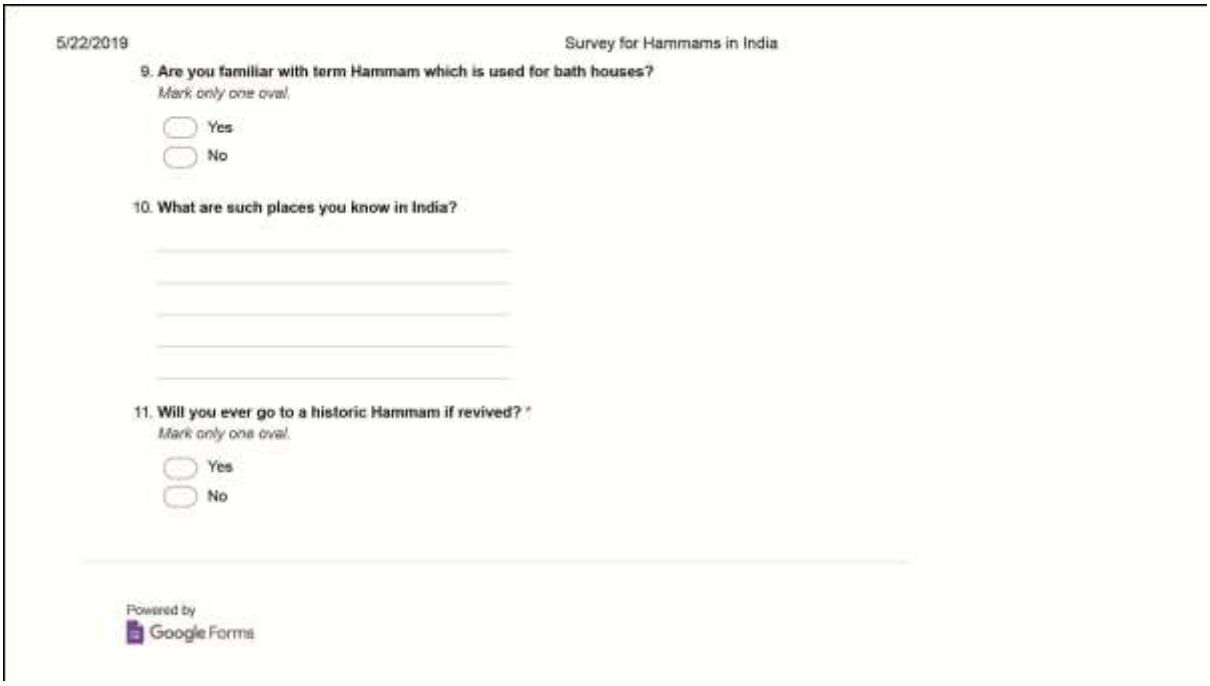
4. **Do you clean yourself often?**
Mark only one oval.
- ◯ yes
- ◯ no
- ◯ Other: _____

5. **How often you take bath ?**
Mark only one oval.
- ◯ Once Daily
- ◯ Twice Daily
- ◯ Less than 4 times a week
- ◯ More than 4 times a week
- ◯ Other: _____

6. **Have you ever been to public bathing space ?**
Mark only one oval.
- ◯ Yes
- ◯ No
- ◯ Maybe

7. **Have you ever heard of Historic steam bath in India ?**
Mark only one oval.
- ◯ Yes
- ◯ No
- ◯ Maybe

8. **Have you ever heard of Historic steam bath in India ? If "YES" where?**



5/22/2019 Survey for Hammams in India

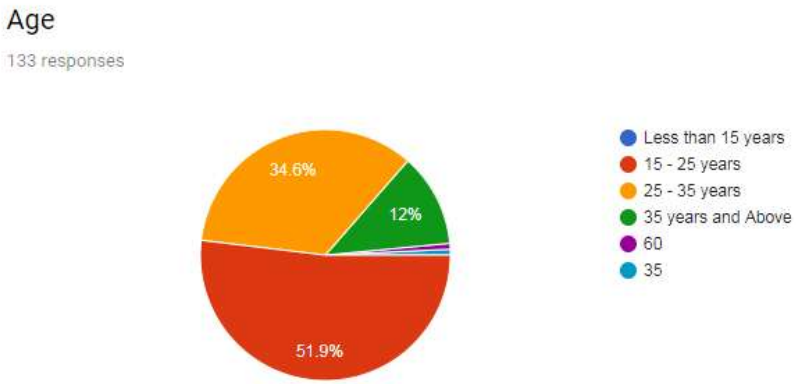
9. **Are you familiar with term Hammam which is used for bath houses?**
Mark only one oval.
- Yes
- No

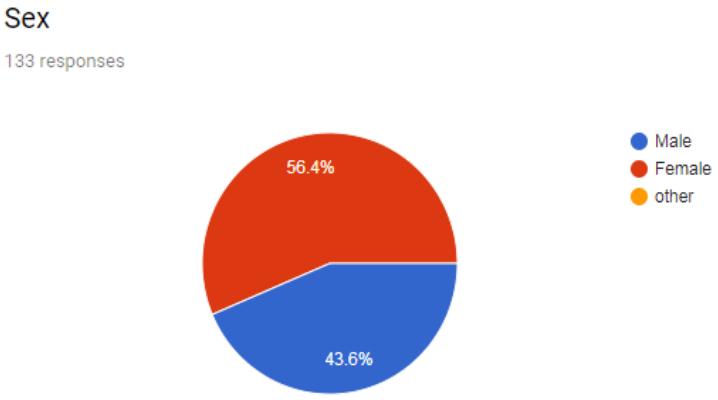
10. **What are such places you know in India?**

11. **Will you ever go to a historic Hammam if revived?** *
Mark only one oval.
- Yes
- No

Powered by Google Forms

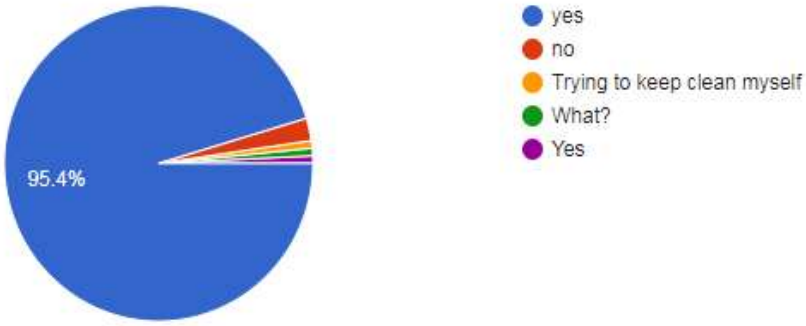
An online survey conducted to understand the users bathing pattern and to get know more about hammams. Survey received 133 responses mostly from architecture students and history enthusiasts. The following pie- charts below gives summary of the survey:





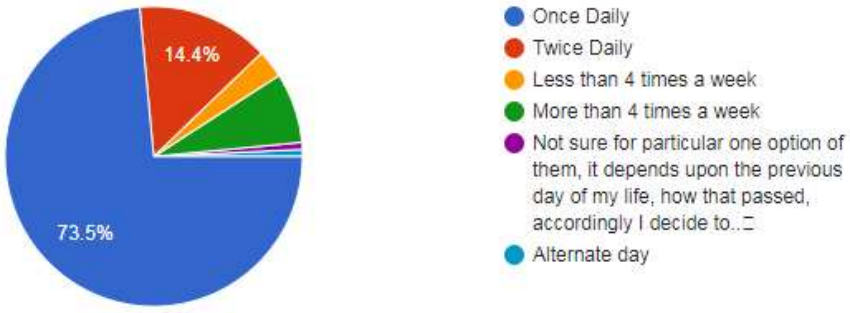
Do you clean yourself often?

130 responses



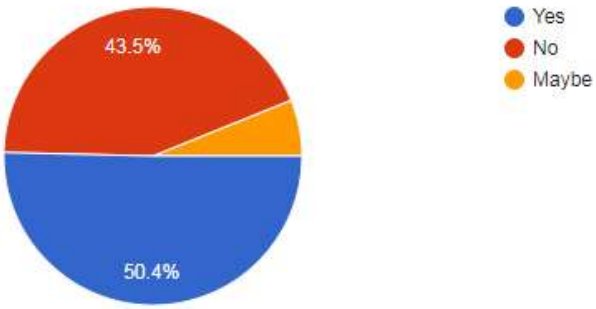
How often you take bath ?

132 responses



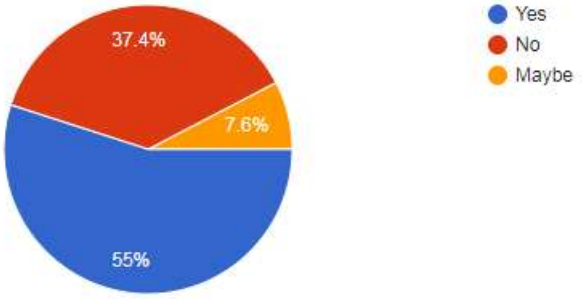
Have you ever been to public bathing space ?

131 responses



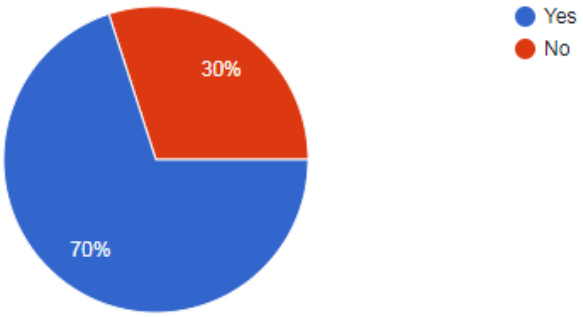
Have you ever heard of Historic steam bath in India ?

131 responses



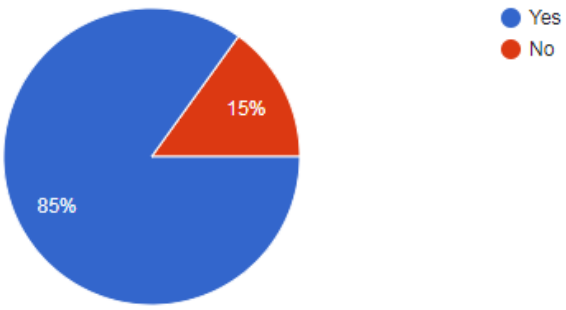
Are you familiar with term Hammam which is used for bath houses?

130 responses



Will you ever go to a historic Hammam if revived?

133 responses



11.3 BATHING AND RELIGION:

The Koran too, had something to say on bathing, its states that only running water is cleansing. Before entering the mosque, before prayer and reading of the Koran, a man must always bathe but only with the running water. Once washed a rite administered according to strict regulations prayer might begin. Because the mohammedan is obliged to observe the namaz (prayers) five times a day, he had to wash himself correspondingly often.

There are two methods of performing ghusls:

Irtimasi (by submerging the whole body) and tartibi (sequential)

The tartibi consisted of following five actions:

In the particular order, and accompanied by prayers, the sequence, if interrupted, had to be recommenced. Thorough washing could only be achieved in a hammam, since it was also necessary to observe the rule that no part of body should remain dry, because the hammam was thus so intimately connected with religion. The hammam achieved status in the eyes of religious.

11.4 RESEARCH PAPER

11.5 FINAL PRESENTATION SHEETS