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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/13302
DOI URL: <http://dx.doi.org/10.21474/IJAR01/13302>



RESEARCH ARTICLE

ARCHITECTURE OF NEW MOSQUE- A DESIGN PROPOSAL OF MOSQUE IN CONTEMPORARY INDIA

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Manuscript Info

Manuscript History

Received: 20 June 2021
Final Accepted: 24 July 2021
Published: August 2021

Key words:-

Form, Mosques, Local Mosques,
Contemporary Mosque Architecture,
Postmodernism

Abstract

This study examines the parameters to analyze the form of local mosques in 21st century India. Since the advent of Mughals in India, mosque architecture has been immensely celebrated due to the fact that many inventions happened in building techniques and styles. Till today it has continued, though implicitly, and has been absorbed in the architecture of mosques which are mostly locally built. This is evident from their forms, especially, replicating those arches, minarets and domes. So, in this scenario, the question is what should be the form of local mosques in contemporary India when Islamic countries like Bangladesh, despite regarded as a developing country, is building creatively innovative and modern mosques? To respond to the question, local mosques built after the 1970s in India and Bangladesh are selected based upon their funding, year of construction, number of occupants, and built-up area. They are analyzed according to parameters of the form of mosques deduced from the literature study. According to results after analysis, it is found that there is a high grade of religious symbolism that is still prevalent in India unlike in Bangladesh. Besides, there is no participation of local people in mosque construction as well as in design with no interaction with the architects and clients who are involved in the process. The idea of Postmodernism and its features seems to have no role when local mosques in India are analyzed.

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Introduction:-

All the religions that exist around the world have religious symbols that contribute to their architecture. This has continued over the years in the same or different ways. Soon after modernism was introduced in architecture, there was a surge among architects, clients and people to accept the changes that it brought in terms of appearance. This had a different interpretation when the religion of Islam was considered. As we know, the mosque is one of the greatest and noteworthy visual illustrations of Muslim religious identity across the globe, but it is still following the same, old and conventional methods in its architecture without any significant development. Talking about India, because it is the area of consideration for this dissertation, the condition was far less improved. Since Postmodernism came to existence, people were not participating to elevate the status of Muslim identity and relying on architects for its building who lacked consciousness towards its design and construction. It is prevalent today where mostly locally commissioned mosques are built. Clients rely on architects and demand modern mosques

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without any clarity in their imaginations while architects simply replicate the traditional elements like dome, minarets, and arches in the mosque without any understanding of local construction techniques and aspirations of local people. This results in conventional and old looking forms of mosques which neither reflects local architecture nor modernity. It is a peculiar and eclectic style of architecture with onion domes and green color that maligns the true essence of form and its function. Hence, this paper focuses on finding out the form of mosques in 21st century India built by local communities. It will help an architect and layman to understand necessary parameters that are needed and must be followed to achieve a form that follows ideas of local people as well the architecture. It will help in motivating architects to create innovative and rational forms without alienating them from the built forms in the vicinity. The objective will be to understand the parameters required to analyze the form of mosques in India, based on which selected cases will be studied. After that, issues will be identified based on which design solutions will be recommended.

Significance

1. The findings will redound to the benefit in the arena of architecture by helping in proposing form of mosques in 21st century India.
2. The findings will also help to focus on variables that create opportunities for innovation and new ideas when designing mosques in India at present time.

Problem

1. Local mosques are being designed by replicating traditional elements like domes, minarets and arches.
2. No modern intervention and development are taking place i.e. easily identifiable and recognizable form of mosques are being produced.
3. There is lack of interaction among local people, architects and clients.

Need

1. To address the issues that prevail in defining the form of local mosques which are being built in 21st century India. Results will help in finding the parameters that will govern the form of mosques in contemporary India keeping the issues in consideration.
2. To change preconceived notion of mosque of being a symbol of Muslim faith, its function as a place for offering prayers and conventional methods of replication achieve their desired form.

Why Mosques?

- Only local mosques are being constructed in India with no recent developments while measures that are implemented are not being acknowledged.
- As a result, elements of mosques are only being replicated with implementation of conventional design features, thus producing an eclectic form.
- It helps to direct as a representation of Islam as well space for social gathering, teaching and learning.

Methodology: -

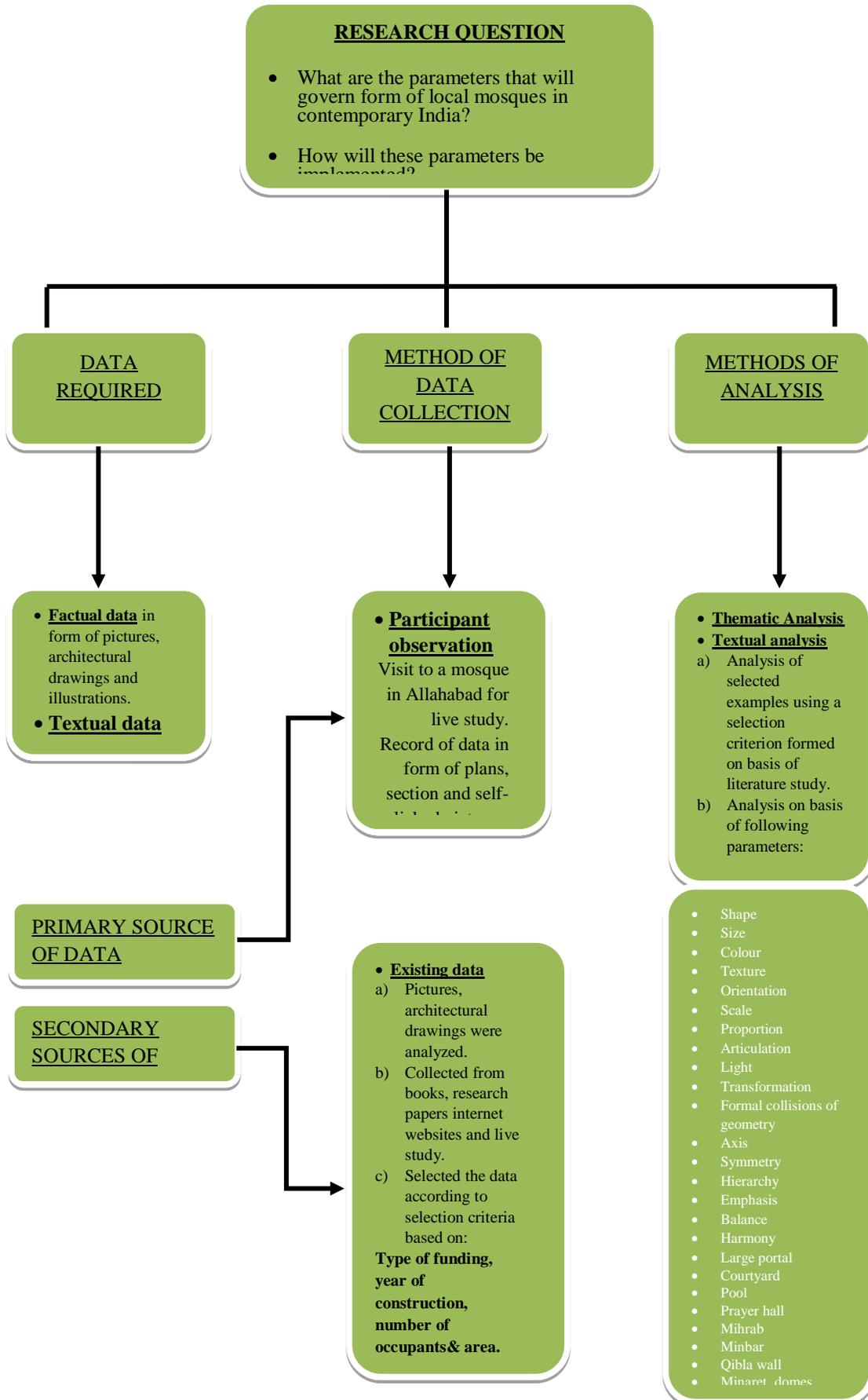
Form in Architecture

Form is a vital characteristic of any composition, in architecture. It not only affects the perception of an individual who sees it but also used to convey meanings with it. According to (Bacon, 1974) , he states:

“Architectural form is the point of contact between mass and space ... Architectural forms, textures, materials, modulation of light and shade, colour, all combine to inject a quality or spirit that articulates space.

The quality of the architecture will be determined by the skill of the designer in using and relating these elements, both in the interior spaces and in the spaces around buildings.”(Ching, 1943, p. 33)

Hence, form is a vast word which has number of meanings- (a)Form can denote an apparent appearance that may be recognized when an individual perceives it (b)It may also advocate to a condition in which about things act in order to be seen.



Parameters to analyse form in architecture

According to (Ching, 1943), form can be described as a term that has the ability to depict references to “internal structure and external outline” along with the attitude has ability to provide unity to the whole composition. Therefore, following points can be analyzed to study any form irrespective of its type or function.

Shape

Distinctive outline or “surface configuration” of a specific form is termed as shape. It is the primary aspect by which a form is categorized and identified by us.

Size

The “physical magnitudes of length, width, and depth” of any form is termed as its size. These dimensions govern proportions and scale, determined by its size comparative to other forms.

Color:

It is an experience of “visual perception” and light that is defined by an individual’s observation of “hue, saturation, and tonal value” seen on an object. It is also a property that “distinguishes a form” from its setting also affecting the “visual weight of a form.”

Texture

It is defined as the “tactile” and visual characteristic specified to any surface by virtue of its shape, size, proportions and organization. It also controls the degree of reflection or absorption of incident light by a surface, which is perceived by the one seeing it.

Position

It is defined as the location of form comparative to its setting or as “the visual field” within which it is seen.

Orientation

It is defined as the “direction of a form” concerning ground plane, another forms, or to the individual looking it.

Visual inertia

It is defined as a “degree of concentration and stability of a form.” It is dependent on geometry of form in addition to its orientation with reference to the ground plane, gravitational pull, and line of sight of individual seeing it.

Scale

It is always determined by its size comparative to supplementary forms in its context.

Proportion

Proportion discusses the relationship of one part to another part of a same composition.

Rhythm

Defined as reoccurrence or reappearance of architectural elements that establishes a rhythm.

Articulation

Articulation is defined as treatment of surfaces to define form. The differential treatment of edges, corners, windows and visual weight of a form contributes to articulation of form.

Light

Form is perceived liable on the light conditions in which it is viewed.

Transformation

Whatever forms are seen around are a result of transformation of primary solids that exist. The variations which are created by the management of one or more than one magnitude or by “the addition or subtraction of elements” that define its character can be termed as transformation.

Formal collisions of geometry

When two or more forms contradictory in geometry collide with each other's borders, the resultant will have some "visual dominance" reflecting those geometries. Hence this phenomenon is termed as formal collisions of geometry.

Axis

It is defined as an imaginary line defined by two points about which forms are organized in symmetrical or asymmetrical manner.

Symmetry

It is defined as a balanced allocation and organization of equivalent/ equal forms on either side of a separating plane or, line or about an axis or center. This line can be imaginary or physical.

Hierarchy

It is defined as an articulation of forms and spaces corresponding to another forms or spaces in an organization with respect to size, shape or position.

Balance

It provides visual stability to the form by placing elements constituting the form in balanced manner with respect to its colour, texture and shape.

Emphasis

It is created when one or more elements are used to convey virtual dominance or supremacy by colour, size, texture, shape etc.

Harmony

It is defined as a property of sameness or belonging of one element with another. It can be achieved by unity or variety. Unity in terms of colour even though variety is present due to shapes; unity in terms of shape but variety due to colours. In both ways, there is harmony among design elements.

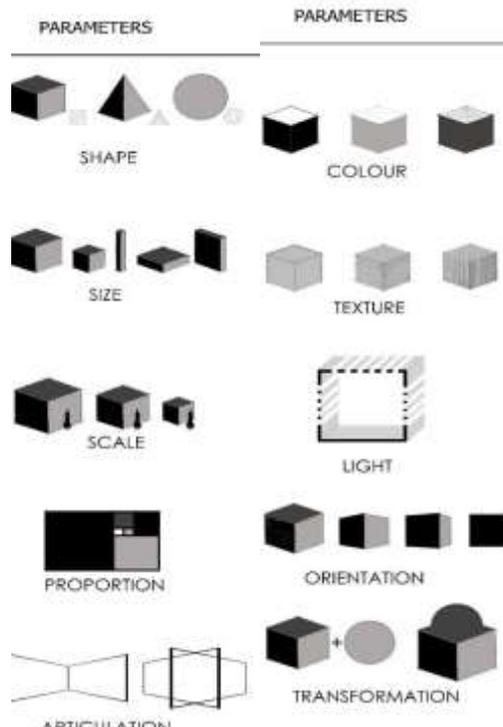


Figure 1:-Parameters to analyze form in architecture; Source: Author

Origin of mosques

Many historians and scholars believe that Islam originated in Middle eastern lands. In Qur'an and hadiths, there is no reference of how a mosque must be constructed or what should be its form. "There is no prescription for a mosque in the holy text in the Qur'an"- says Akel Ismail Kahera associate professor at the University School of Architecture in Texas(Dickinson, 2012). The only recommendation mentioned is how one must pray while facing towards Mecca. Mosques that we see today are a result of constant change that took place since it was first built due to climate, economy, power, materials and building technique, number of occupants, socio-cultural factors etc. Initially, Arabs were nomads in which everything that they owned had to be portable. At that time when Islam was gaining prevalence, only "a square area marked by a line-formed area for communal prayer." The prayer completed only by fulfilling basic requirement of facing the direction to Mecca. At the start, they were opposed to the idea of building because of their nomadic lifestyle. But as the time passed and Islam gained prominence, the followers increased and a need for a shelter arose among the people. The, then, Caliph was advised to openly practice their religion and, thus, he ordered the construction of a congregational space which began to be known as Mosque.(essays, 2018)

"A mosque or masjid (in Arabic) is a place where a Muslim prostrate and perform their obligatory prayer. The word masjid in Arabic comes from the verb 'sajada' which means to prostrate."(A Suratkon, 2019, p. 1)



Figure 2Figure 3



Figure 4:-Images showing definition of mosque in olden times using stones in order to define a square territory.
A square area marked by a line- formed area for communal prayer.

Evolution of mosques

Concept of a mosque

The definition of mosque is the simplest to understand like other vernacular structures in terms of their form. A congregational area which may or may not be open, used for social and religious gatherings where people collect to offer obligatory prayer after the caller calls prayer.

The mosque contains a demarcated space, which is roofed and 1/3rd of which is open to sky.Spatial organization of mosque depends upon proportion of open with respect to covered space. The open space is generally a courtyard called *sahn*, where the Prophet(pbuh) and his companions used to collect for prayers and social activities. The covered space is known as the prayer hall which is defined by qibla wall, minbar, mihrab and high ceiling. Most importantly, this z of prayer hall must always face the direction to Mecca.(essays, 2018)

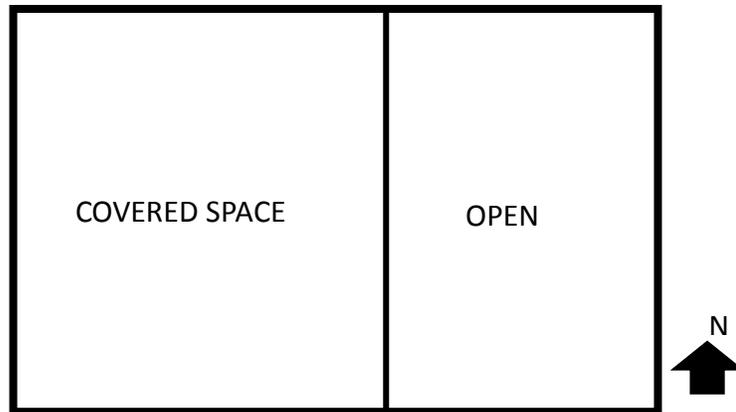


Figure 5:-Schematic diagram of spatial organization of typical mosque, Source: Author

Concept of Mosque

A congregational space came to be known as Mosque.

What was the change?

According to outlines established by Hasan Uddin Khan, five typologies of mosques have been developed in the Islamic ecosphere. (IMDAT AS University -of -Notre -Dame, 2006) From figure 6 it is clear that form of mosques changed around the world change in **climate, economy, power, function, area, number of occupants and materials.**

“Hypostyle hall with flat roof” or sometimes with one or more smaller domes as evident in Arabian and African examples and early Anatolian mosques.

Buildings having a “large central space, covered by a huge dome” laterally supported by weight of half-domes, which are most common in the Ottoman style, or “having pyramidal pitched roofs” as evident in examples from Indonesia.

The arrangement of an “iwan (vaulted hall)” placed on either side of a symmetrically divided enormous and centrally located rectangular courtyard as seen in Iran as well as in Central Asia.

The “triple-domed mosque with large courtyard” acting as a large public place for gathering and congregational prayer which is a typical feature of Mughal architecture in India.

The complex enclosed by walls, inside which pavilions are located in bounded spaces that are found in China.

Why was the change?

Despite common features, such as mihrabs and minarets, there is a history of diverse regional styles that accounted for regional differences in the colours, materials, and ornamentation of mosques. This varied from region to region depending upon: Scale of the building, number of occupants, area available, economy, power, need, climate. (essays, 2018)

Difference is seen because of

variety of secular functions at different locations; symbolic values; expression of identity by different communities.

Additions were done due to

Social, climatic, cultural, political, economic conditions that resulted in forms as seen in Figure 6.

Consistency was maintained only in

Orientation and the way an individual offers the Namaaz, spatial organization- a large prayer hall which is orientating towards Mecca. Function, spaces and requirements besides this were subjected to change. (Alamiri, 2017)

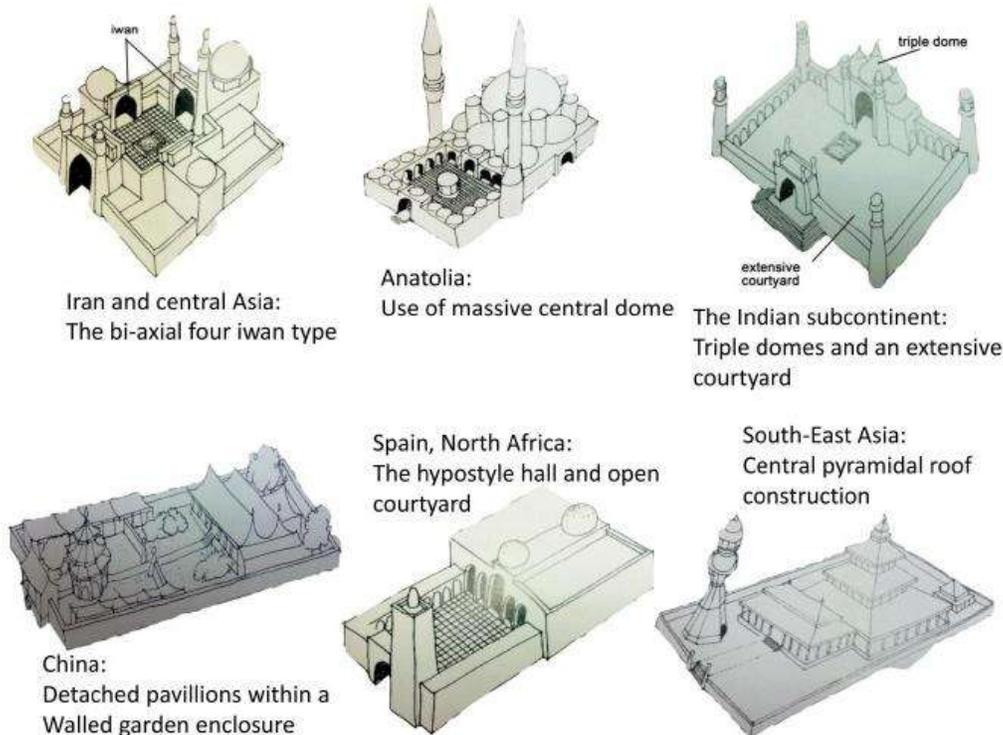


Figure 6:-Mosque typology around the world, Source:www.slideshare.net/shahrilkhairi/history-of-islamic-architecture

Parameters to analyse form of mosques

In addition to general parameters required to analyze any form, following are the elements of mosque architecture and furnishings.(Frishman & Khan, 1994) and (Renata Holod, 1997)

Portal

It is the entrance gateway to any mosque. It acts as an element to differentiate between a spiritual sanctuary and urban life. It is often celebrated by extravagant ornamentation and scale.

Courtyard

An open to sky space known as *sahn* which is surrounded by colonnades and arcades.

Pond/ ablution area

It is a feature which is most often seen in the middle of a courtyard in mosques. The purpose is to use it for ablutions (or *wudu*) before prayers and it can sometimes be purely decorative/ non-functional.

Prayer hall

It is a roofed hall to accommodate worshippers for congregation prayers. The size is completely governed by number of worshippers and climate. The space definition of a prayer hall is credited to columns (hypostyle hall), wall (qibla wall and minbar), roof (dome), windows (clerestory windows).

Qibla wall

The prayer hall should consist of a wall that must face Mecca i.e.to the west.

Mihrab

At mid-point of Qibla wall, a niche is created to indicate the direction of prayer for the worshipper. Its form is stimulated by Roman niche, from the time when people started ornamenting it.

Minbar

Also called as pulpit, is a raised platform at the right to mihrab, where the imam stands for khutba (oration).

Kursi

It is a low height podium on which Qur'an is kept while the person deployed, reads and recites verses from Quran.

Dikka

A wooden podium of single storey which is positioned in line with mihrab, reached by stairs which is attached to it.

Maqsura

It consisted of raised platform with protective screening during olden times.

Minaret

The tower used by muezzin to call for prayer besides its function to act as a landmark thus acting as focal point of area in which mosque is located.

Dome

It was invented much later to make the prayer hall look grand and feel more magnificent. It was added much later to endorse a comfortable environment for worshippers.

Arches

A building technique to create openings, often created to support long span systems. In Islamic architecture, arches hold a special place. They can be seen heavily ornamented as in mihrab, fenestrations and niches. Architecturally, they act as a scaling element.

It is important to note that not all the elements mentioned above contribute to form of mosques, for example, dikka, minbar, kursi, Maqsura. They have been considered only as a minor parameter as it contributes as an element of mosques. Similarly, parameters like, qibla wall, arches, dome, minaret, mihrab, courtyard, prayer hall, portal and ablution area are the major parameters that contribute to form of mosques. Hence, they are thoroughly analyzed.

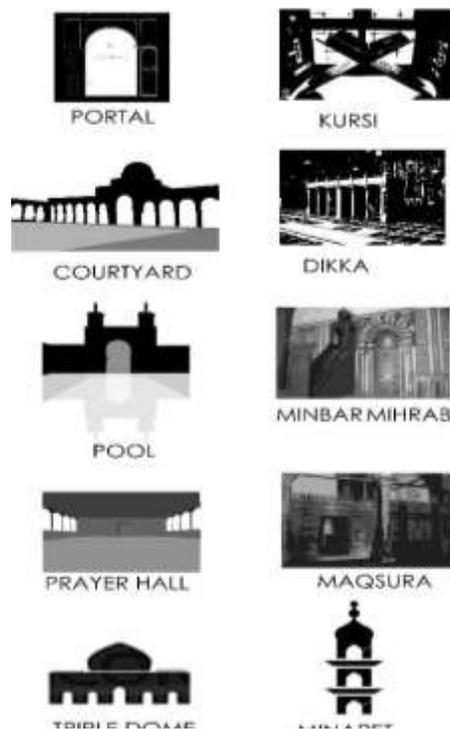


Figure 7:-Parameters to analyze form of mosques

Introduction of postmodernism in design of mosques around the world

Postmodernism style of architecture had a profound influence on a lot of young architects and wealthy clients. Since it was adopted much later than it started, history of destruction and war developed a surge to create new while still connecting to the history/ old. This helped in creating awareness among the stakeholders and renew their cultural identities. According to (Khan, 2008), countries arose with idea of creating new when world was experiencing war, distribution and everywhere identification played an important role. This helped in modernising but it was not rooted to history, hence, postmodernism evolved as a solution. The idea of Postmodernism was to create buildings that relate to context as well (but not something very usual) which might become cause of a bigger problem. It was easy to use familiar elements for creating similar forms of mosques which is very usual as it is in many mosques around the world (from Indonesia to North America). But architects, who were promoting postmodernism, relentlessly tried to convince that the expression is secondary, and qualitative identity is important. Henceforth architects tried to achieve balance between old and new rationally by taking references only to get inspiration and not to duplicate or recreate history.

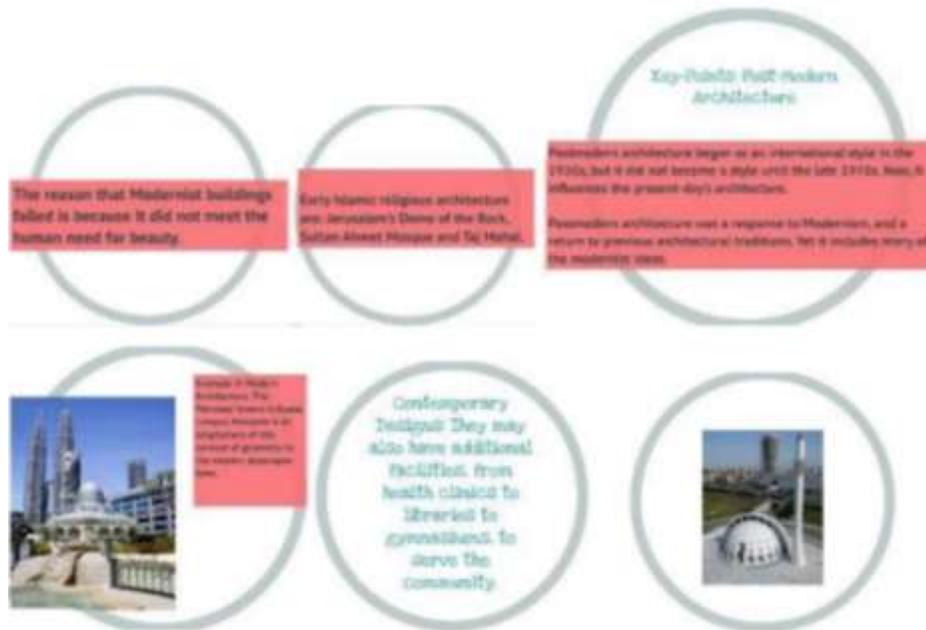


Figure 8:-Key points of postmodernism

How are mosques being designed in the world? From 1970s- present

When we examine the present scenario, certain things are quite alarming. According to (Fethi, 1985, pp. 52-63) the tradition and vernacular culture of building any built structure is dying. It is becoming nothing but merely an exception in today's construction when a structure complies with the norms of traditional and vernacular architecture. Earlier it was on interaction of builders and craftsmen and people but now it has become the product of "machine aesthetics" based on universal system of clients, architects and contractors.

Result:-

As a result, the forms of mosques that is being developed exhibit a different characteristic which does not look to be in coherence with the local architecture and lacks participation of people. Lack of consciousness in design of mosques has led to long-lasting consequences which needs immediate attention. Ihsan Fethi further, in his article

"The Mosque Today" mentions the following

1. The product is eclectic, or is easily identifiable (because of the form it achieves, elements used as symbols).
2. Or the result is either standardized, stereotyped building devoid of any "valid symbolism". Generally, developing a form which categorizes a style that is completely irrational or duplicate. (Fethi, 1985)
3. Lack of governance leading to carelessness in designing of mosques.
4. Due to lack of architectural guidance to municipality and contractors leading to hybrid mosques which are strongly eclectic in nature.

At present, forms of mosques are products of only certain ideas and methods that are conceived by specific people and they are products of the machine world accelerated by technology. Thus, enabling us to look into miscommunication that exists among local people and those who are responsible for building it.

Since late 19th century, mosque acts as a freestanding monument occupying a whole city block, primarily because of the fact that the urban fabric around which it is situated has started to westernise. Even though it may look like a mosque but on in-depth examined, it appears to be unusual as if alienated from the surrounding context. Truly stating, urbanisation has greatly affected its function as a spiritual and social centre as well as on its architecture. (Fethi, 1985)

Trends leading to forms at present

No matter how much the word has developed, religious symbolism seems to hold its stance and continue to have a place in some or the other ways. Elements like prayer hall, domes, minarets and arches seem to have undergone modern interventions while elements like courtyards, ablution area have been either reduced or neglected depending upon need and alternatives designed. As far as design principles are concerned, they are prominent as many architects are conscious enough to incorporate them in order to make a composition achieve visual balance. It has been analyzed by Hasan Uddin Khan that in present forms of mosques, certain characteristics are either missing or not worked upon. This can be seen in disappearance of outer wall and gateway. Besides that, demarcation from profane to sacred is lost because either courtyard is omitted or its size has shrunk over time. Minarets are being used not because of some architectural importance but only for the sake of using it and to depict religious symbolism. Dome without any valid symbolism and architectural importance even though some architects have tried to incorporate them with modern techniques for intake of light and air to create dramatic prayer halls as in Faisal Mosque, Pakistan; Yesil Vadi Mosque, Turkey; Baitur-rauf Mosque, Bangladesh, Shahporan Masjid in London. According to (Khan, 2008) Canadian- Pakistan architect Gulzar Haider speaks of mosque architecture without obvious and explicit traditional elements. But when people are taken into consideration they expect domes and minaret so that it can be perceived as a mosque. Hassan Uddin Khan continues to mention that people's perception has a primary role in the form of mosques. He quotes certain examples with reference to people of China and Indonesia regarding how they interpret the forms of mosques. He continues to mention that dome of a mosque built in 2000s in China is used as a sign of presence of Islam. It had no relation with interior of the mosque. The community is so conscious that dome and minaret is required such without which the definition and form of mosque will be incomplete.

By above discussion, the inference that can be drawn is that it is not always about a building but rather about people, region and place to which that buildings belongs.

How are mosques being designed in India? (From 1970s- present)

India was invaded by a Persian ruler, who belonged to a region where the monumentality of mosque was celebrated, in order to showcase their power. Similar ideology transferred in India when landmarks started to build. As the economy of the kingdoms strengthened, kings started offering mosques to the people. This means that people were given, they were not involved. Having stated that, climate also played a major role in mosque development in India.

According to (Renata Holod, 1997), the development of mosques has been categorised by the author under five heads named as: "personal patronage, the state as client, commission by local government bodies, mosques for public and commercial institutions, local community projects." This helps in vivid understanding of development of the forms of mosques in terms of scale and its funding. He further mentions that as far as India is concerned, local community projects are being undertaken in large numbers because people belonging to wealthy class are not taking steps to contribute in mosque development. This behaviour leads to not so intimidating scale, which is acceptable also, because monumental mosques can never bridge the gap of lack of association which exist among the people Muslim community. Besides, it also depends on power and stable economy. Further, it depends upon the architects as well i.e. on their ability to design. Here, people's consent is not addressed and design is based on architect's memory of a typical mosque while introducing his ideas. (Renata Holod, 1997, pp. 183-184)

Hence, this is a gap that exists forcing the development style in local community projects to be called Pan-Islamic architectural style which involves recognizable and universal features which are eclectic in nature that sometimes alienates such places of worship from their context.

How are mosques being designed in Muslim countries? (From 1970s- present)

Postmodernism started as a style against the idea of modernism, urging architects not to eliminate the use of conventional and traditional elements and contextual elements in design of the built form. Similar ideology was accepted in design of mosques worldwide to renew the expression when world was experiencing war and separation. According to (Rabbat, 2012, pp. 8-11), postmodernism in Muslim countries concretized articulation of ideology that saw ISLAM as an identity. Islamic countries till 1940s were dominant and had no influx of development. But after discoveries of oil in the Gulf region, there was a surge to modernise the country through architecture. In this case, the only option was mosque through which they were able to represent themselves as independent states. The Arabs already had deep religious and conservative outlook. This led to contemporary yet visually recognizable Islamic Architecture of mosques.

Hence, 1980s became the decade of identifiable Islamic Postmodern architecture in the Islamic world. **Inference-** Under constant control of Arab merchants and community, architects were still relying on traditional elements and religious symbols. International firms were coming up and they were dip into awe of Postmodernism and produced “loud and formalist composition.” The forms produced were modernised in terms of materials and construction techniques.



Figure 9:-Mosque in Qatar, 2010 **Figure 10:-**Chandgaon Mosque

How are mosques being designed in Muslim countries? (From 1970s- present)

According to Islam & Noble (2011), Hinduism and Buddhism were two great religions. Followers of these two religions developed their buildings based on religious aspirations. But after Muslim invasion different architectural approaches started to flourish because of invention in building construction and technology. An important factor that needs recognition is **People’s Participation in mosque building and construction**. After partition of Bengal, gave opportunities for new developments. Due to these two types of mosques are known to have been built in Bangladesh: a) **Mosques erected by people**, b) **Mosques erected by trained architects**.

Mosques erected by people have the following features: a) Community wise, b) Added their sense of building, c) Their needs were fulfilled irrespective of power, d) brought down the scale of mosques to human scale. Mosques erected by trained have the following characteristics: a) They are more inclined towards form and space, b) More concerned on scale of the structure.

Selection criteria for Bangladesh

The reason behind taking Bangladesh is that it has been greatly influenced by Postmodernism and has a history of people being actively involved in mosque building much before Postmodernism unlike other countries in Indian subcontinent. Mosques are generally of varying scales i.e. from intermediate to low scale. South East Asian countries have not been taken because they have a hot and humid ortropical climate throughout the year unlike in Bangladesh and India. Besides that, the contemporary mosque are mostly state funded and nationally funded projects leading to large scale mosques. According to scope of the dissertation, only local mosques will be studied since in India, most mosques are locally funded leading to low scale of mosques.

Recent developments in mosques of Bangladesh

James Steele and Ismail Serageldin in their book “*Architecture of Contemporary Mosque*” explains that the Mosque architecture of Bangladesh is not an impressive style or large-scale architecture as in North India, Iran, Iraq, Egypt,

Turkey, Syria etc. Even though it was, to some extent, sympathetic to its local climate, tradition and self-expression. What Bangladeshi people achieved, may not be a great style, but its construction principles were sound, appearances were original. The close relationship with the Bengali hut can hardly go unnoticed which was peculiarly suitable to the climate and the purpose for which it was intended. It is clear that technologically and culturally nobody can live in segregation. Without passionate respect and deep roots in one's own culture and the heritage of the people, it is not probably possible to sustain a creative life.

According to (M.Ahmed, 2006) Bangladesh, having the distinction of being the home to the highest density of Muslims per square kilometre in the world, has been known for its contribution to the world cultural heritage, especially, with regards to mosque architecture. Further, Michael Snyder explains in an article for New York Times, the perceptible and impalpable characteristics of contemporary mosques in Bangladesh. He mentions that prayer spaces are designed in order to be connected to climate and light comes in from all sides. People design their own mosques here in times wherever it is required. This is because many times it happens that funding is done in stages; therefore, it is not possible for it to be constructed in single slot of time. People often participate in designing, construction work helping masons with construction, materials and other site related works. When Eastern Bengal mosques i.e. present-day Bangladesh is considered, mosques there, were centre of civic life. With this he continues to mention that this change happened after the Sufi missionaries arrived in 13th century. Starting from 13th century till 16th century, Bengali Sultanate mosques in brick are left in Bangladesh as landmark and trendsetters in Bangladesh. When Mughal reign ended, the country was left with several structures built by them i.e. till the end of 18th century. But vernacular architecture of Bengal was credited to mangroves, shifting soil, thatched roof, storms, mud and bamboo, open sided- pavilions. All these elements succumbed to extreme climate of Bangladesh leaving only strong structures behind. As far as form of a mosque is concerned, they were rigid, with very less light in the interior, sometimes many pavilions were constructed, especially during Sufism. They used local materials with less monumental mosques. All these characteristics have been incorporated with no or slight modifications with same proportions and scale to design the contemporary mosques. However, this country seems to look like a modern invention. After tragic war of 1960s it came out as a new and developing country. This is due to increase in their economy coming from the textile industries. Bangladesh won independence in 1971. Michael explains that during that time, the country had a different but austere custom of mosque architecture that "relied on Turkish domes, beaked Mughal Arches and Arab minarets." This was easily named as a shorthand of Pan-Islamic. It remained consistent for long time but there was a problem. The issue that persisted is that it was never in concurrence with Bengali people itself. But robust, modernist tradition of building in Bangladesh started when architect Mazharul-Islam, who was trained in America, invited many Western architects including Louis I. Kahn. When these architects started to inspect, "traditional and nature-oriented forms," began to be found. This discovery stimulated these architects to get inspired by them and amalgamate these features with modern ideas to create postmodern structures. The result was that Brick as a material gained prominence while concrete was used to build simple and inexpensive structures.(Snyder, May 9, 2019)

Result:-

This country has plethora of ideas in terms of modernism and postmodernism for architects to imbibe. Since Bangladesh has been formed, the roots are in Modernism and Postmodernism which has been inculcated in local architects as well. Hence, whatever new ideas they have, it eventually gets mixed with modern concepts. As far as mosques are considered, spaces were religious at that time and modern movement of building was secular. This gap was filled with help of economy of the country which progressed because of textile industries. So, most mosques, that are being built are given as charity by wealthy merchants on private lands by public commissions as well as their money. According to (Snyder, May 9, 2019) when military government ruled the country from 1975-1991, most mosque projects were commissioned by those rulers so they were designed for political resolutions and used a discounted symbolic language thus laden with great deal of religious symbolism and religious extremism. Architecture of these mosques are now being raised around Modernist aesthetic but early mosques of this type were not built with secularist instinct. Nevertheless now, in last 20 years, patrons and architects that are hired have brought this secularism in religious sphere when world is trapped in irrational extremism. The results are the most inventive and aesthetically pleasing radical designs that surpass these irrelevant ideologies.

Prayer hall by Louis I. Kahn in Parliament Complex in Dhaka (1982)

According to (Snyder, May 9, 2019, pp. 1-3) the importance and impact of the architecture of Dhaka Assembly Hall by Louis. I. Kahn has also been emphasized. He mentions that when Louis I. Kahn started the design of Dhaka Assembly Hall in 1962, he made sure that a prayer hall must be included, which later became the most celebrated

design of a prayer hall across the globe. The author explains some of the characteristics of Dhaka Assembly prayer hall that resembles features of Postmodern architecture style. A lofty cube, with its corners inserted into huge hollow cylinders acting as columns, thus defining prayer hall. The prayer hall is actually a large study room with an area convertible to prayer hall, with sunlight entering the interior and creating dramatic experience. Eight high and huge circular windows twisted about its corners, the “continuations of their arcs spreading into the hollow columns” like flying buttresses. Direct sunlight enters in through hollow columns and spurs over concrete slab that were hand casted. Triangular squinches as used in construction of domes, angle up from the corners, just to give a glimpse as if dome is about to begin which does not really seem to happen. Instead of dome, Kahn used octagon, an approximation to dome and the most eternal representation of Islamic architecture, over the floor of assembly hall which is a “vaulted octagonal structure” rising 117 feet over a space dedicated to assembly employees. The assembly hall is majestic in contrast to which the mosque is contemplative. By this type of architecture, without any doubt, it would take years in Bangladesh to build such a religious space as inventive as it could be.



Figure 11:-Interior view of Prayer hall and qibla wall.

Figure 12:-Interior view of Prayer hall.

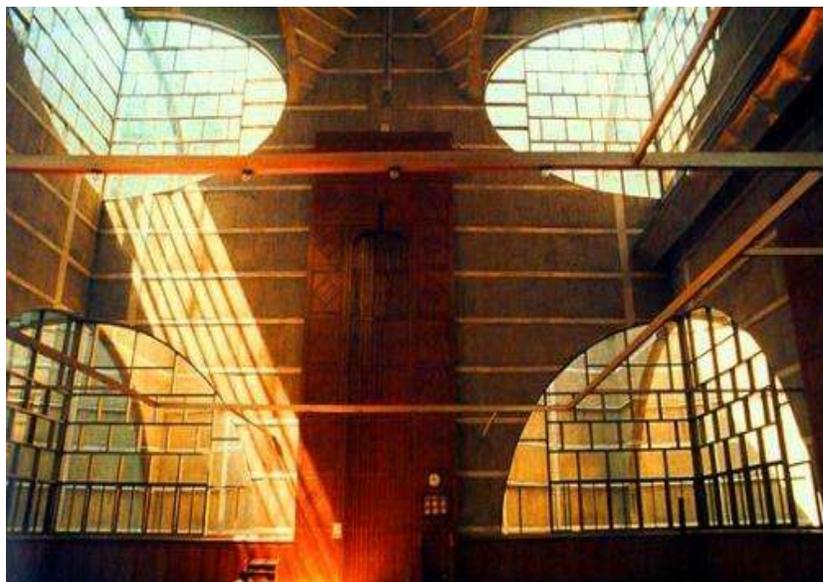


Figure 13:-Interior view of prayer hall in Dhaka Assembly hall designed by Louis I. Kahn,

Parameters of form of mosques built by local communities in contemporary India

- | | |
|-----------------------------------|---------------------------|
| 1. Shape | 1. Balance |
| 2. Size | 2. Harmony |
| 3. Colour | 3. Large portal |
| 4. Texture | 4. Courtyard |
| 5. Orientation | 5. Pool |
| 6. Scale | 6. Prayer hall |
| 7. Proportion | 7. Mihrab |
| 8. Articulation | 8. Minbar |
| 9. Light | 9. Qibla wall |
| 10. Transformation | 10. Minaret |
| 11. Formal collisions of geometry | 11. Dome (triple/ single) |
| 12. Axis | 12. Arches |
| 13. Symmetry | 13. Dikka |
| 14. Hierarchy | 14. Kursi |
| 15. Emphasis | 15. Maqsura |

These parameters will be used to analyze form of mosques of selected case studies and live study.

Inferences from literature study

1. Postmodernism has been an important concept in determining form of mosques around the world by discarding the practice of using traditional and conventional elements in form of mosques.
2. Mosques around the world are either standardized, or stereotyped building devoid of any “valid symbolism”. These mosques differ from each other by the **type of funding, area of land, number of occupants, year of construction, climate, and socio-cultural factors**.
3. However, climate and socio-cultural factors provides rather similar forms extending to wider regional borders whereas **type of funding, area of land, number of occupants, and year of construction** are the factors that will result in greater deviation in form of mosques.
4. Bangladesh has plethora of ideas in terms of modernism and postmodernism for architects to imbibe.
5. There is no participation of people in building and designing of mosques in India unlike Bangladesh.

Selection criteria for Case studies & Live study

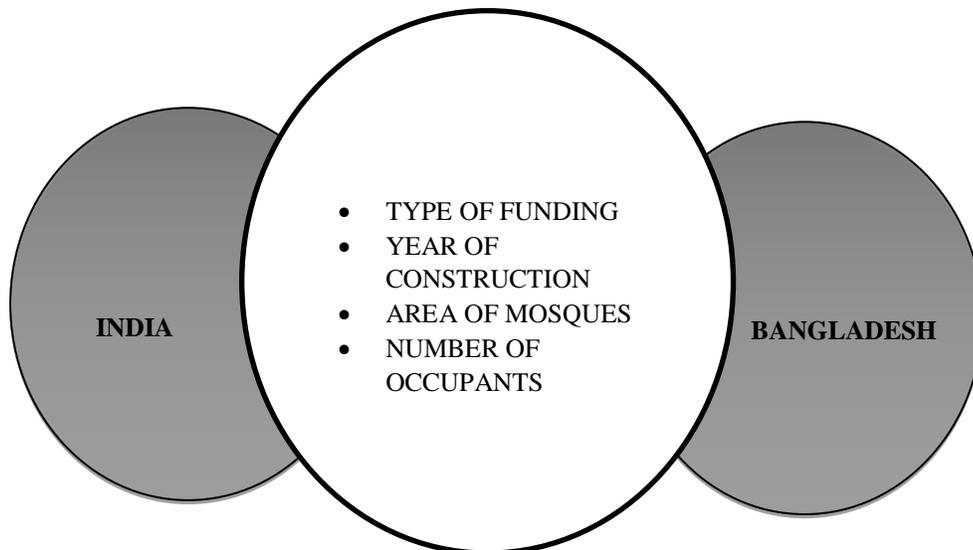


Figure 14:- Selection Criteria Of Case Studies And Live Studies.

Selection Criteria

Type of funding

As found, from the literature most mosques that are being constructed are locally funded mosques i.e. by the local people. Hence, in order to find the type of mosque which should be built in India, we need to study locally commissioned mosques.

Year of construction:

Since the research is limited to the time of postmodernism hence, mosques that are/were built in 1970s- present, have been studied.

Area of mosque

According to area, the form of mosques changes and most mosques that are being built, cater to comparatively smaller number of people, due to lack of space and lack of money. Hence only those mosques are studied whose area is ≤ 1000 square meters.

Number of occupants

The number of occupants or worshippers in today's scenario, are preferring to pray at home but this is not the case everywhere. Number only increases during Friday, congregational prayer. Hence only those mosques are studied where maximum people on Fridays are approximately ≤ 1500 worshippers.

Case Study: Baitur Rauf Mosque, Dhaka, Bangladesh

Country of origin: Bangladesh, City: Dhaka

Client: Sufia Khatun

Design: 2005-2006

Completed: 2012

Architect: Marina Tabassum

Primary Construction material: Bricks

The selection criteria of the mosque are on basis of following points:

Locally commissioned project

This mosque was a dream project of the architect's grandmother who donated land and funds for construction of this mosque. Later due to insufficient funds construction stopped, but local people started donating funds and it got constructed. The construction got completed in stages due to funding issues. As far as local people are concerned, they provided help to the architect in designing the mosque by checking the process and helping in execution work.

Year of construction

Since this mosque started in 2005 i.e. after postmodernism, hence this mosque is taken.

Area of mosque

The area of mosque is 750square meters because of land available.

Number of occupants

Normal days-450; Fridays: 800-900 men, and sometimes 10-12 women.

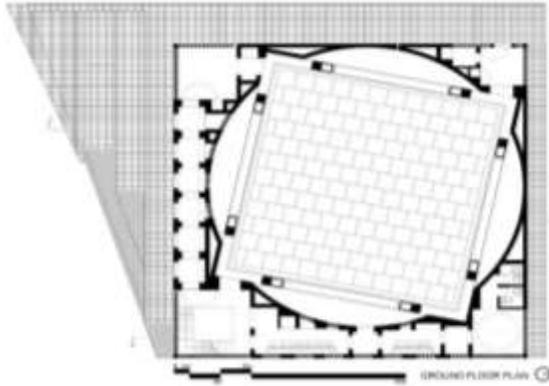


Figure 15:-Ground floor plan

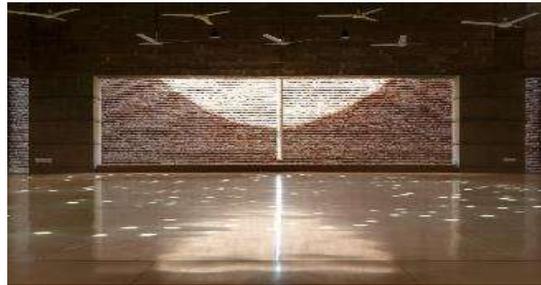


Figure 16:-Interior of prayer hall and qibla wall

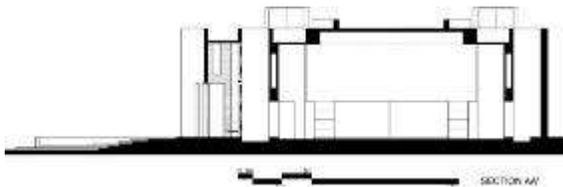


Figure 17:-Section facing qibla wall



Figure 18:-Interior of prayer hall

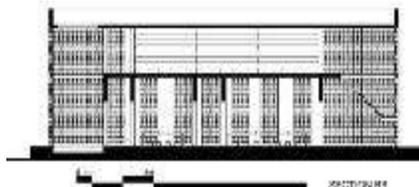


Figure 19:-Section facing ablution area in East



Figure 20:-View showing main entrance in south

Case Study: Chandgaon Mosque, Chittagong, Bangladesh

Country of origin: Bangladesh,

City: Chittagong

Client: Faisal. M. Khan

Design: 2005

Completed: 2007

Architect: Kashef Mehboob Chowdhary

Primary Construction material: Concrete

The selection criteria of the mosque are on basis of following points:

Locally commissioned project

This mosque was patronised by a wealthy merchant who wanted a modern mosque. Charity funds were started, hence there was sufficient money.

Year of construction

Since this mosque started in 2005 i.e. after postmodernism, hence this mosque is taken.

Area of mosque

The area of mosque is 1000 square metres because of land available.

Number of occupants

Normal days- 300; Fridays: 800-900 men, and sometimes 10-12 women.

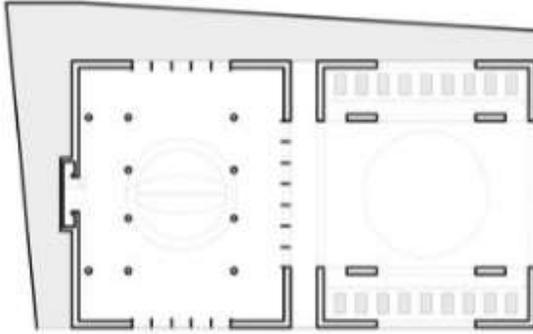


Figure 21 Ground floor plan Figure 22 East facing view of entrance

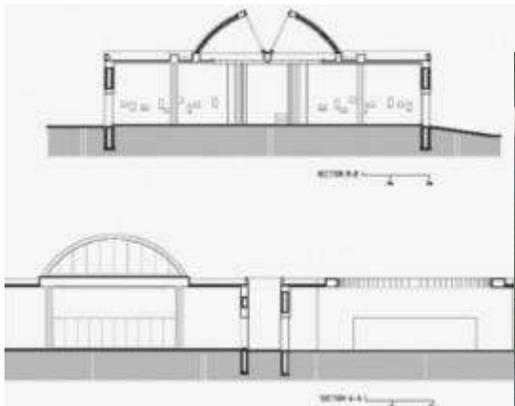


Figure 23 Sections Figure 24 Interior view of prayer hall and qibla wall



Figure 25 Interior view of prayer hall, Source:(Chandgaon mosque, n.d.)

Figure 26 View of courtyard with oculus, Source:(Chandgaon mosque, n.d.)

CASE STUDY: Mosque- E-Haji Abdur Rauf, Malegaon, India: -

Country of origin: India

City: Malegaon

Client: Haji- Abdur Rauf

Design: 2011

Completed: 2016

Architect: Arif Shah

Primary Construction material: Terracotta bricks

Locally commissioned project: This mosque was patronised by a wealthy businessman of this city. After his death, his sons escalated the project. The project is unique in its own city as this city is known as “city of mosques” with many mosques built from 20th century and onwards.

Year of construction: Since this mosque started in 2011 i.e. after postmodernism, hence this mosque is taken.

Area of mosque: The area of mosque is 900 square metres which was bought by the patron.

Number of occupants: Normal days- 450; Fridays: 1000 men, and no women, even though a mezzanine floor is dedicated to them.

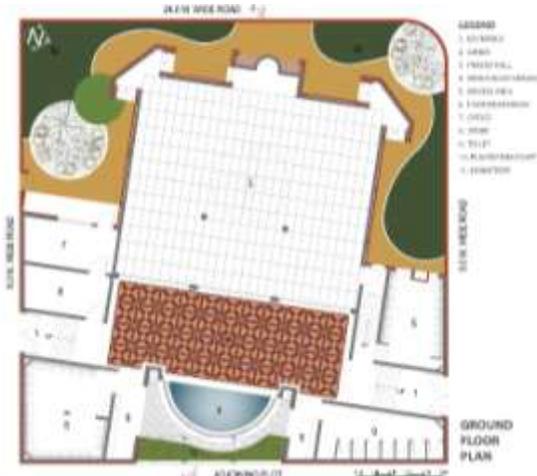


Figure 27 Ground floor plan, Source: (NBZ Malegaon mosque, n.d.)



Figure 28:- First floor plan, Source: (NBZ Malegaon mosque, n.d.).

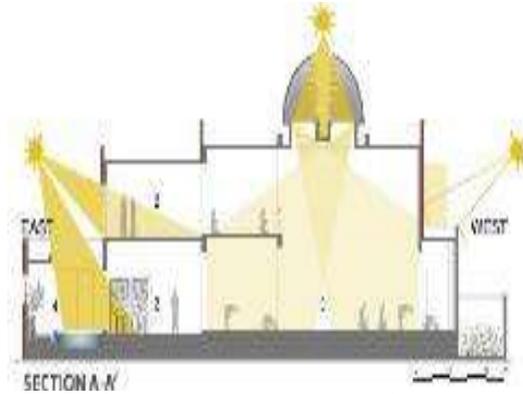


Figure 29:- Section AA' Source: (NBZ Malegaon mosque, n.d.)



Figure 30:- Interior view of first floor, Source: (NBZ Malegaon mosque, n.d.)



Figure 31:- View facing south and main road, Source: (NBZ Malegaon mosque, n.d.)



Figure 32:-Interior view of prayer hall, Source: (NBZ Malegaon mosque, n.d.)



Figure 33:- Entrance portal facing North, Source: Invalid source specified.



Figure 34:- Entrance corridor during classes, Source: (NBZ Malegaon mosque, n.d.).

LIVE STUDY: Abu-Bakr Mosque, Allahabad, India: -

Country of origin: India

City: Allahabad

Client: -

Design: 2000

Completed: 2002

Architect: -

Primary Construction material: Bricks & Concrete

Locally commissioned project:

According to local people, client was a rich contractor, who had bought this land to construct a mosque in order to make the area (which was undergoing development that time) to become a known spot for people of Muslim community and to mark a residential territory.

Year of construction:

Since this mosque started in 2000 i.e. after postmodernism, hence this mosque is taken.

Area of mosque:

The area of mosque is 900 square metres which was bought by the patron.

Number of occupants:

Normal days- 450; Fridays: 1500 men, and no women.



Figure 35:-View of Abu-Bakr Mosque, Allahabad; Source: Author



Figure 36:- Interior view showing Qibla wall, Abu- Bakr mosque, Allahabad; Source: Author

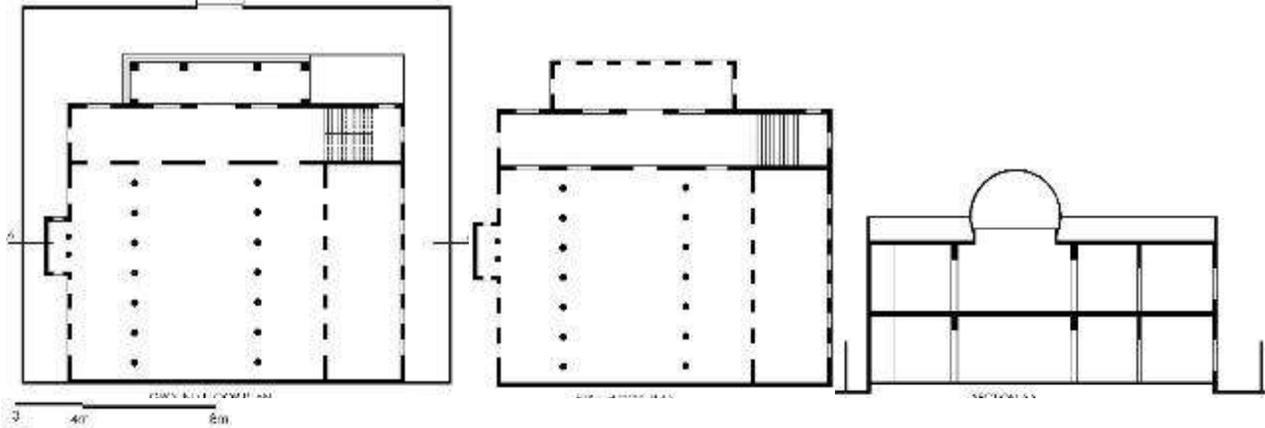


Figure 37:- Ground floor plan, Abu-Bakr Mosque, Source: Author Figure 38First floor plan, Abu-Bakr Mosque, Source: Author

Figure 39:- Section AA', Source: Author.



Figure 40:- Interior view of Prayer Hall; Source: Author



Figure 41:- Interior view of entrance corridor Source:Author.



Figure 42 Prayer hall facing east Source: Author



Figure 43:- View of hall during prayer; Source:www.google.com, n.d.

Analysis and Inferences:-

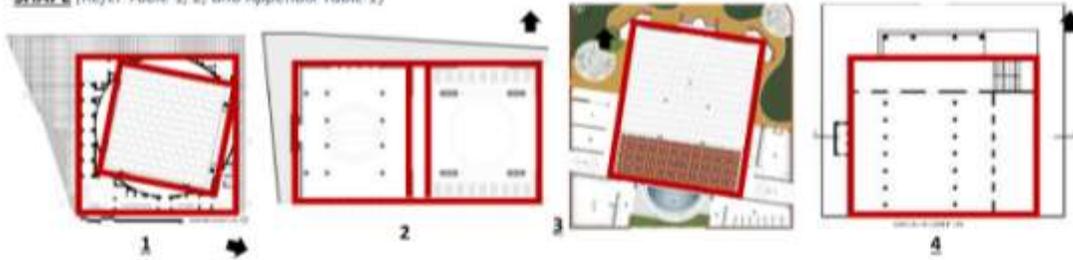
Table 1:- Analysis Table, Source: Author

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU-BAKR MASJID, ALAHABAD, INDIA
SHAPE	History (Prophet's mosque) Geometric simplicity is considered. Edges in shaded square look total. Triangle, inscribed circle for easy to learn. Context is considered.	History (Prophet's mosque in plain) Geometric simplicity is followed in modernism. Flat top and number of occupants considered.	History (Prophet's mosque in plain) Geometric simplicity is followed i.e. modernism. Flat top and number of occupants considered. Other of 40 circles, triangle and circle are used similar to those used for Louis Kahn in his Bangladesh mosque.	In this mosque, history of mosques is not prevalent when it comes to quality. Religious symbolism is prominent. Besides, due to use of circle with square and less privacy make it less modern.
COLOUR	One material is used. Workmanship is visible. Aging quality is good. Climate responsive.	To enhance geometric simplicity and modernism white colour has been used so that the structure stands out. Amongst other structures in the area, it also reflects sunlight, thus making the place feel cooler.	Practically durable and maintenance free. Climate responsive. Inspired in its original form is an ideology inspired from modernism & African vernacular architecture.	Available material and easy construction techniques followed. Colour is white to give minimal and modern look.
TEXTURE	To make it look as simple as possible like the structure around. Construction cost decreases. Stands out among other structures.	No ornamentation due to minimal design concept.	Texture due to exposed brickwork complements with modernism. Gives a vibrant character to the built form. Less or no ornamentation helps in perceiving it as a bold and simple form.	No ornamentation except just to fit glass in niches.
LIGHT	To protect from sunlight and comfortable spaces. To reduce energy consumption. Inspired by play of light and shadow by Louis Kahn. To create a peaceful and spiritual environment.	In order to reduce multiple windows on the facade, single large openings are created. This also provides with the function of the building, making it more public and minimal.	Lightly and bold form is the idea followed. Inspired by modernism. But some reference could also be traced from history of mosques in India when initially mosques used to be solid and light from exterior. Here indirect lighting is the only source available to achieve that effect in form of just or sunlight or used here.	Because of large number of occupants of 1000, it has ample of sunlight received by windows and ventilation. Ventilation gap of height of 3.4m with 400 mm height and window of total height 2.4m penetrates lot of daylight with just creating minimal disturbance.
ORIENTATION	Rotation is done so that glass wall perpendicular faces facade. How circle is oriented to that rotation factor is not considered.	Glass wall is important hence it is in west with main entrance on the east. Entrance is east.	Glass wall is important hence it is in west due to which proper habitat to be created. Entrance from north and south. Instead of putting it under some roof, architect created an abstract of extending volume extending away to the interior.	Glass wall is important hence it is in west with main entrance on the east. Entrance from north.
TRANSFORMATION	Context is taken to match with the surrounding structures. Simple forms are used to convey modernism. Absence of dome indicate use of ideology of Postmodernism.	Context is topped with a dome with a different fragment of wedge like opening for light. Could be present due to client's demand. Since built during early years of modernism based in Bangladesh, hence architect might have no other option other than presenting it in a different way.	Since built in important hence it is in west due to which proper habitat to be created. Entrance from north and south. Instead of putting it under some roof, architect created an abstract of extending volume extending away to the interior. But some dome perhaps and mosque. Hence, he treated every volume individually and formalized a composition. But it is modern intervention.	Height depending upon need and number of occupants. No proportion, except in the central space. 3 levels of spaces, some height of cuboid arranged & middle makes difference to just another opening. Importance. Concrete dome with a drum with windows tops removal. No specific arrangement is followed.

Table 2:- Inference Table, Source: Author

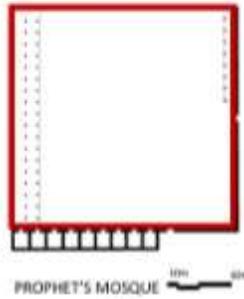
PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU-BAKR MASJID, ALAHABAD, INDIA
SHAPE	* Use of simple and easy geometry. Geometric simplicity.	* Use of simple and easy geometry. Geometric simplicity.	* Use of simple and easy geometry. Geometric simplicity.	* Use of simple and easy geometry. Geometric simplicity.
COLOUR	* Use of local material in its pure character so that context and building is easily perceivable. * Climate is also important. Material in pure form and colour to depict modernism.	* Use of modern material and colour to stand out among other buildings. * Climate is also important. Universal colour to depict minimalism.	* Use of local material in its pure character so that context and building is easily perceivable. * Proportion from African vernacular architecture.	* Use of modern material and colour to stand out among other buildings. Universal colour to depict a modern mosque.
TEXTURE	* Use of material in its pure character with no ornamentation. Minimalism.	* Use of no ornamentation. Minimalism in appearance.	* Use of material in its pure character with less ornamentation in form of just screens to create contrast. Minimalism.	* Use of less ornamentation with just pattern on outer facade. Minimalism in appearance.
LIGHT	* Use of natural light as an important element to create variation in spaces. * Climate responsive features are included. This resulted a different technique to incorporate natural light with less opening of facade. Minimal treatment of facade.	* Use of natural light as an important element to create variation in spaces. * Climate responsive feature are included. This resulted a different techniques to incorporate natural light with less opening of facade. Minimal treatment of facade.	* Use of natural light as an important element to create variation in spaces. * Climate responsive is restricted upto ingress of walls and use of material. This resulted a different technique to incorporate natural light with less opening of facade. Minimal treatment of facade.	* Use of natural light as an important element for mosque of such scale. Number of arched shaped opening on every side for light to enter. No proper use of dome in terms of light.
ORIENTATION	* Universal feature of function is constant and driving factor to arrange the spaces. In this conceived form is following function.	* Universal feature of function is constant and driving factor to arrange the spaces. In this conceived form is following function.	* Universal feature of function is constant and driving factor to arrange the spaces. In this conceived form is following function.	* Universal feature of function is constant and driving factor to arrange the spaces. In this conceived form is following function.
TRANSFORMATION	* Use of robust rigid form with clean lines with familiar identification, helping in merging with environment. Amalgamation of context and traditional mosque features.	* Use of robust, rigid form with clean lines and a dome with all to pervade light. Amalgamation of modern and traditional mosque features.	* Additive transformation with clean lines to minimize complexity. Function drives the form. * Traditional elements like minaret and dome treated with modernity in terms of material, openings and texture.	Composition as result of shapes chosen which are evolved to a decided height. No specific principle is seen. Only occupancy is considered.

SHAPE (Refer Table 1, 2, and Appendix Table 1)



1) Primary shapes like square and circle are used. Use of simple and easy geometry- Geometric simplicity. History (Prophet's mosque), Geometric simplicity is created, cylinder inserted for easy rotation and Context is considered.

2) Primary shapes like square, circle and rectangle are used. History (Prophet's mosque in plan), Geometric simplicity is followed i.e. minimalism, Plot size and number of occupants considered. Use of simple and easy geometry- Geometric simplicity.



3) Primary shapes like square, circle, triangle and rectangle are used. History (Prophet's mosque in plan), Geometric simplicity is followed i.e. minimalism, Plot size and number of occupants considered. Use of simple and easy geometry- Geometric simplicity.

4) Primary shapes like square, circle, and rectangle are used. History of mosques is not prevalent when it comes to quality, Religious symbolism is prominent. Use of simple and easy geometry- Geometric simplicity.

COLOUR & TEXTURE (Refer Table 1, 2, and Appendix Table 1)



Baltur Rauf Jame Mosque,
Dhaka,
Bangladesh

Texture is coarse and grainy due to exposed brickwork. Reddish orange colour, characteristics of terracotta bricks is visible.

Only available material, Workmanship available, Ageing quality is good and Climate responsive.

Material in pure form and colour to depict minimalism.



Chandgaon Mosque,
Chittagong,
Bangladesh

White colour is the overall colour widely used in the project. No other is used. Shades and tint of green is seen due to plants. Texture is smooth in appearance and rough when touched due to plaster.

Universal colour to depict minimalism, Use of no ornamentation- Minimalism in appearance.



Haji Abdur Rauf Mosque,
Malegaon,
India

Texture is coarse and grainy in appearance due to exposed brickwork.

Use of material in its pure character with less ornamentation in form of jaali screens to create contrast- Minimalism.



Abu Bakr Mosque,
Allahabad,
India

White colour is the overall colour widely used in the project. No other colour is used. Texture is smooth in appearance and rough when touched due to white painted walls.

Use of less ornamentation with jaali pattern on outer facade- Minimalism in appearance.

Figure 44:- Study of Shape, Colour and texture of Mosques, Source: Author.

LIGHT (Refer Table 1, 2, and Appendix Table 1)



Figure 46 Study of Light in mosques, Source: Author

Indirect light is used in form of jaali, light wells, perforations and skylight. Diffuses sunlight is also used. Daylight illumination comparatively less than 150lux.

Low, wide opening at a height of almost half the building height. circular and eye-like opening in ceilings with jaali. Qibla wall gets direct sunlight.

Indirect light has been used. Diffused light in form of jaali screens and skylight. Diffused light in prayer hall due to extended corners in north and south facade.

Direct light has been used. Diffused light in form of jaali windows. Daylight enters through arched shaped windows and horizontal jaali windows. Direct sunlight in courtyard.

ORIENTATION (Refer Table 1, 2, and Appendix Table 1)

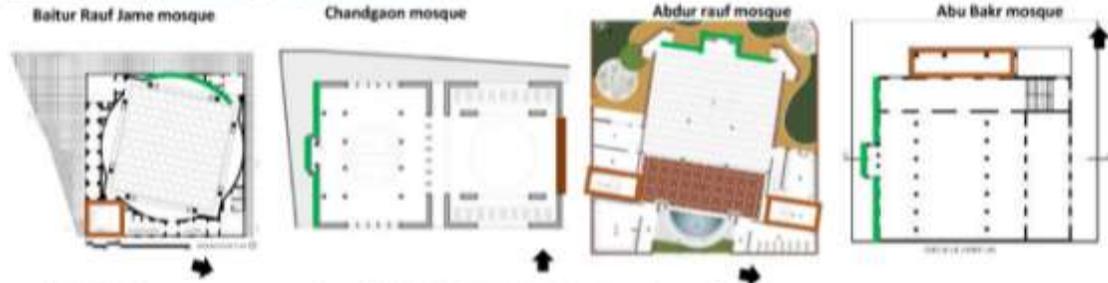


Figure 47 Study of Orientation of mosques, Source: Author

Site's western side was not perpendicular to cardinal west. Hence to accommodate rotated western wall, a cylinder was inserted to remove negative spaces.

Qibla wall is perpendicular to the cardinal west. Entrance faces the eastern side with side entrances from the north and south.

Western side of the site was not in the exact west. Hence, the qibla wall is rotated to perpendicularly face the west. Entrances faces north and south.

According to site conditions, western side faces perpendicular to cardinal west. Hence, qibla wall is designed in the same alignment. Entrances is on the northern side.

TRANSFORMATION (Refer Table 1, 2, and Appendix Table 1)



Additive and subtractive transformation has been used. The form is transformed such that its identity is not lost.

Additive transformation between a hemisphere and cuboid has been used. A hemispherical dome is added over the prayer hall. In perspective, it does not appear and identity of a cuboid is perfectly maintained.

Additive transformation between a hemisphere and cuboid has been used. The transformation looks complex as identity of whole composition in not unified.

Additive transformation between a hemisphere and cuboid has been used. Addition of three different cuboids together to form a larger cuboid is seen which is topped by a dome.

Figure 45:- Study of light, orientation, and transformation of Mosques, Source: Author

Table 3:- Analysis Table, Source: Author.

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU- BAKR MASJID,ALAHABAD, INDIA
 SIZE	Avoid restrictions due to plot size. Squares used because of plot size and shape. Height is kept 7 times human to get a non-imposing structure matching with the height of context buildings which is G+1 or G+2	Solid and bold geometry with distinct volume decreasing as the punctures increase in contrast with earlier mosques where less light is present. Such volume due to size and number of occupants.	Plot of land determined size of mosque, thus determining no. of occupants. Volume is in compliance with number of worshippers. This is also due to fact that client might have demanded to accentuate skyline with help of minaret of 12m similar to mosques around city.	Plot of land determined size of mosque, thus determining no. of occupants. Volume is in compliance with number of worshippers. This is also due to fact that client might have demanded to accentuate skyline with help of solid mass to increase its visual dominance in the area. The visual dominance is still the same since the form it was built because of its solid mass.
 SCALE	Most modern mosques built before this mosque were of relatively low height maximum reaching 8-9m only. Also, height of context buildings is also taken into consideration.	Most modern mosques built before this mosque were of relatively low height maximum reaching 8-9m only. Also, height of context buildings is also taken into consideration.	Maximum height achieved is of 12m in order to match with skyline around with number of mosques in vicinity.	Because of client and project cost it is one of the tallest in the local area because of its bold mass and hefty volumes.
 PROPORTION	Proportion is followed so that plan form is functional and aesthetically pleasing. In elevation, proportion has been used so that composition is visually aesthetic and matches with the proportion of context and most mosques that are being built around.	PLAN- proportion is visible when rectangle is divided into equal squares with openings of human reach level to increase the visual aesthetics. ELEVATION- it is also used in elevation with do. of dome equal to width of opening. These design principles are inspired from how architects used them in historical mosques.	PLAN- It is symmetrically divided along prayer hall with one side landscape and other side built up. Except the prayer hall ancillary space arrangement do not impose any visual appeal. ELEVATION- due to this composition does not appeal with many built edges to focus on.	Overall architectural proportion does not seem to create aesthetic effect in the composition. This might be due to lack of attention on architect part. The prayer hall somehow manages to be in proportion alongwith its treatment in the facade.
 ARTICULATION	Isolation is done so that subtle wall-facial void. In order to get it, a circle is inserted so that, it fits but many negative spaces are created. To reduce effect of negative spaces, functional spaces are kept either rectangular or square in shape.	Planes are to be joined in order to depict mosque as a pavilion as done earlier in old Bangladeshi mosques. They don't really meet rather arranged in such a way so as to define required shape.	Planes are following site lines along with lines creating in silencing prayer hall towards QIBLA. Prayer hall corners are played at 45 degree with an effort to create area for light to enter. Planes are articulated for inclusion of light similar to one of techniques used in Postmodern architecture of Louis I Kahn and other architects.	Planes are articulated in simple manner without any unique intervention, to create simple circulation with free space and less stairs. Outer facade is more porous for light to enter while inner facade is filled with operable windows.

Table 4:- Inference Table, Source: Author

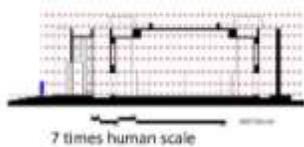
PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU- BAKR MASJID,ALAHABAD, INDIA
 SIZE	Foot print is considered and area of land available demanded square shape enclosed from all sides with openings from top. Height restrictions catered by single floor height. Climate is taken into primary consideration. Being perceived as people's mosque.	Area of land available demanded square shape enclosed from all sides with openings from top. Height restrictions catered by single floor height. Climate is taken into primary consideration. Being perceived as people's mosque.	Site is helping to accentuate the skyline by abstraction from post even though not much clear, in terms of cuboids that are used. Easily recognised as a local mosque but different in terms of appearance.	Site is helping to accentuate the skyline by abstraction from post even though not much clear, in terms of cuboids that are used. Easily recognised as a local mosque but different in terms of appearance.
 SCALE	Client's demand of serving it as charity was fulfilled by its intermediate scale with respect to human.	Achieved with help of minimalism and simple geometry with height matching with context. Local in nature.	Achieved with help of minimalism and simple geometry with height matching with context. Local in nature. By demand of area of land available.	Achieved with help of robust cuboids devoid of any ornamentation with respect to context.
 PROPORTION	Proportion is achieved by clear lines and height of mosque with respect to human. Repetition of planes and openings create proportionate plan and elevation.	Proportion is achieved by clear lines and height of mosque with respect to human. Using a cuboid and dividing into equal cubes with equal effect of proportionate openings with respect to human.	Proportion does not seem to be acting as an element contributing to its aesthetics. It is not contributing to the concept.	Proportion keeps in competing composition as whole with largest cuboid of prayer hall being in proportion in itself.
 ARTICULATION	Planes are acting as helping element for each other to conceive prayer hall as a pavilion. Openness and lightness as the idea is seen.	Planes are acting as helping element for each other to conceive prayer hall as a pavilion. Openness and lightness as the idea is seen.	Planes are helping in achieving a prayer hall with light being diffused through indirect openings. They are also helping to alert prayer hall.	Planes are generating corridors that affect area for occupants and affect amount of light entering the prayer hall.

SIZE (Refer Table 3, 4, and Appendix-I: Table 2)



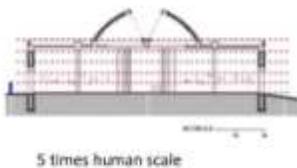
Baitur Rauf Jame mosque	Chandgaon mosque	Abdur rauf mosque	Abu Bakr mosque
According to plan, the size is same in proportion but with a different scale. Proportions of form is in harmony with other built form.	According to plan, the size is same in proportion but with a different scale. Proportions of form is in harmony with other built form.	According to plan, the size is more than other built forms. The proportions are also different because of the scale of the mosque.	Because of the scale of mosque, it is more hefty than other built forms. The scale and proportions do not match with other built forms.
Flood line is considered and area of land available demanded square shape enclosed from all sides with openings from top. Height restrictions catered by single floor height. Climate is taken into primary consideration.	Area of land available demanded square shape enclosed from all sides with openings from top. Height restrictions catered by single floor height. Climate is taken into primary consideration.	Size is helping to accentuate the skyline by abstraction from past even though not much clear, in terms of cuboids that are used. Easily recognised as a local mosque but different in terms of appearance.	Size is helping to accentuate the skyline by abstraction from past even though not much clear, in terms of cuboids that are used. Easily recognised as a local mosque but different in terms of appearance.

SCALE (Refer Table 3, 4, and Appendix-I: Table 2)



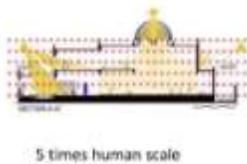
Most modern mosques built before this mosque were of relatively low height maximum reaching 8-9m only. Also, height of context buildings is also taken into consideration.

Client's demand of serving it as charity was fulfilled by its intermediate scale with respect to human.



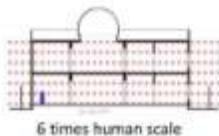
Most modern mosques built before this mosque were of relatively low height maximum reaching 8-9m only. Also, height of context buildings is also taken into consideration.

Achieved with help of minimalism and simple geometry with height matching with context. Local in nature. By demand of area of land available.



Maximum height achieved is of 12m in order to match with skyline around with number of mosques in vicinity.

Achieved with help of minimalism and simple geometry with height matching with context. Local in nature. By demand of area of land available.



Because of client and project cost it is one of the biggest in the local area because of its bold mass and hefty volumes.

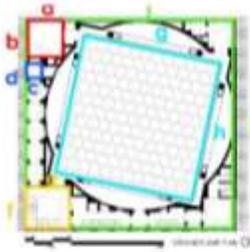
Achieved with help of robust cuboids devoid of any ornamentation with respect to context.



Figure 46:-Study of Size and Scale of Mosques, Source: Author

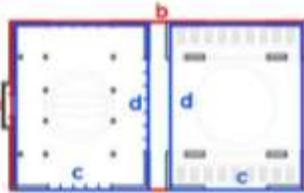
PROPORTION (Refer Table 3, 4, and Appendix-I: Table 2)

Plans



$a/b=c/d=e/f/g/h=1:1$

Proportion of 1:1 is followed which creates a visually balanced composition and a symmetrical composition.



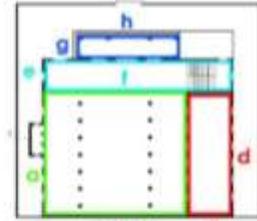
$a/b=c/d=1:2$

Proportion of 1:2 is followed which creates a visually balanced and symmetrical composition, thus helping in developing a proportionate form.



$a/b=2:3; c/d=1:3$

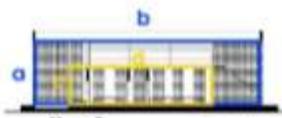
A perfect proportion is not elements however, site demanded an almost square space which led to somewhat, proportionate prayer hall unlike other ancillary spaces.



$a/b=5:8; c/d=2:5; e/f=3:20; g/h=2.5:8$

There is lack of visual balance and proportion despite using an approximately symmetrical composition.

Sections & Elevations



$a/b=c/d=1:3$

Proportion is followed so that plan form is functional and aesthetically pleasing. In Elevation, proportion has been used so that composition is visually aesthetic and matches with the proportion of context and most mosques that are being built around.

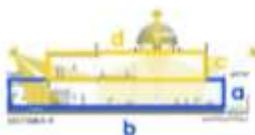
Proportion is achieved by clear lines and height of mosque with respect to humans. Repetition of planes and openings create proportionate plan and elevation.



$a/b=c/d=3:10$

ELEVATION & SECTION: Cuboid is adorned by hemispherical dome of early same diameter as width of main entrance.

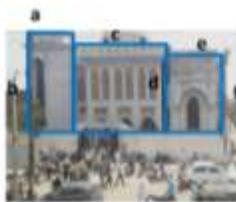
Proportion is achieved by clear lines and height of mosque with respect to humans. Using a cuboid and dividing into equal cubes with equal offset of proportionate openings with respect to humans.



$a/b=3:4; c/d=1:1$

ELEVATION: The overall composition looks complex and not in proportion with each other.

Proportion does not seem to be acting as an element contributing to its aesthetics. It is not contributing to the concept.



$a/b=4:7; c/d=1:1; e/f=3:7$

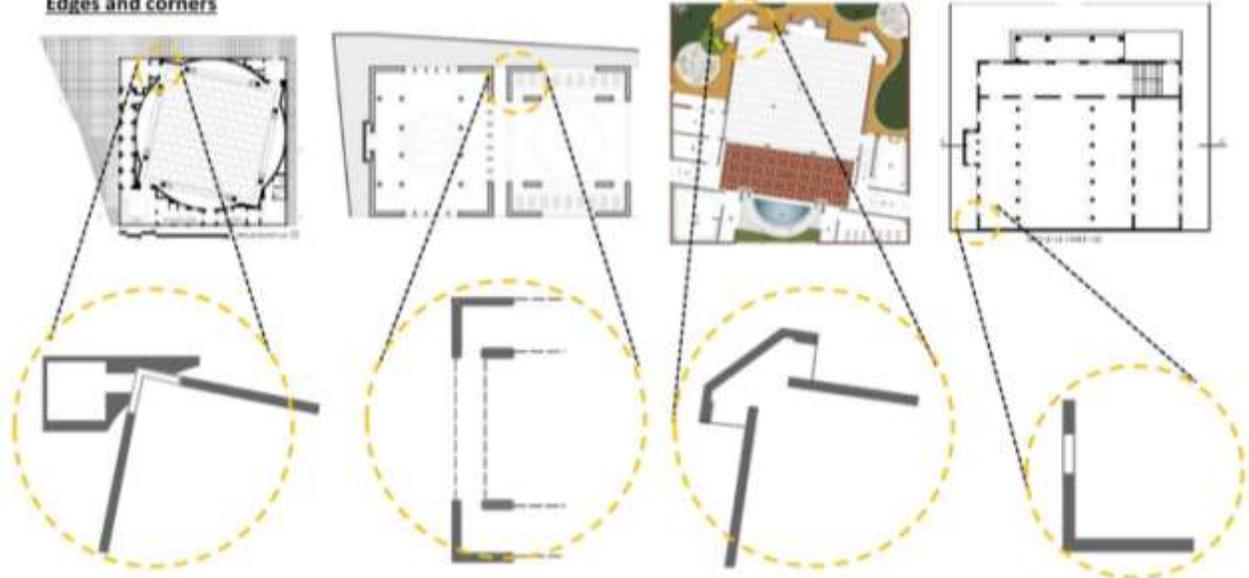
ELEVATION: The overall composition looks as if composed of three cuboids with middle as important with jaali and arches, rest are simple and different in dimension. All blocks have same height.

Proportion helps in completing composition as whole with largest cuboid of prayer hall being in proportion in itself.

Figure 47:- Study of Proportion in plan, sections and elevation of Mosques, Source: Author.

ARTICULATION (Refer Table 3, 4, and Appendix-I: Table 2)

Edges and corners



Corner is diluted for light to enter from lightwells created at the corners.

Edges are so perceived to create a pavilion like space. Instead of column, wall planes act as rectangular columns.

Corner is eliminated and offset by inclined plane to create a backdrop wall washed by sunlight.

Typical corner as done in simple rectilinear forms.

Rotation is done so that qibla wall faces west.

In order to get it, a circle is inserted so that, it fits but many negative spaces are created.

To reduce effect of negative spaces, functional spaces are kept either rectangular or square in shape.

Planes are so joined in order to depict mosque as a pavilion as done earlier in old Bangladesh mosques.

They don't really meet rather arranged in such a way so as to define required shape.

Planes are following site lines along with lines creating in orienting prayer hall towards Qibla. Corners are splayed at 45 degree with an offset to create area for light to enter.

Planes are articulated for intrusion of light similar to one of techniques used in Postmodern architecture of Louis I Kahn and other architects.

Planes are articulated in simple manner without any unique intervention, to create simple circulation with free space and less styles.

Outer façade is more porous for light to enter while inner facade is filled with openable windows.

DHAKA ASSEMBLY HALL designed by LOUIS I. KAHN

LOUIS I. KAHN used hollow cylindrical columns area a light regulating structural member with perforated

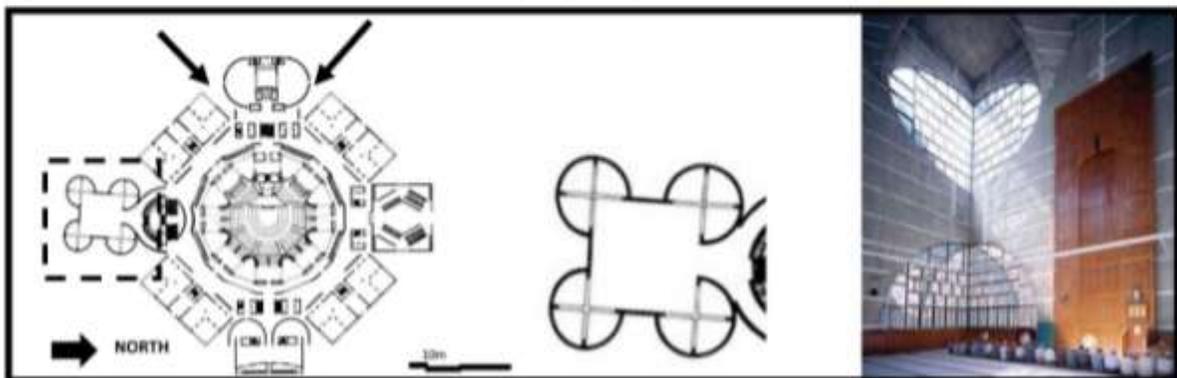


Figure 48:- Study of Articulation of Edges & Corners in Mosques, Source: Author.



Lightwells placed in corner, Baitur Rauf Jame Mosque

Planes are acting as helping element for each other to conceive prayer hall as a pavilion. Openness and lightness as the idea is seen.



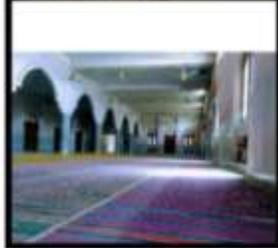
Corner edges are left unmet to create a pavilion like spaces

Planes are acting as helping element for each other to conceive prayer hall as a pavilion. Openness and lightness as the idea is seen.



Corner edges are left unmet to create a corner lightwell by wall washing with adjacent opening.

Planes are helping in achieving a prayer hall with light being diffused through indirect openings. They are also helping to orient prayer hall towards Mecca.



No such articulation has been done due to lack of consciousness of architect.

Planes are generating corridors that affect area for occupants and affect amount of light entering the prayer hall.

Surface Articulation



Visual weight is dominated by rigid surfaces and rough texture

Visual weight is dominated by rigid surfaces and smooth texture

Visual weight is dominated by rigid surfaces and rough texture

Visual weight is dominated by rigid surfaces and rough texture

Figure 49:- Study of Surface Articulation in Mosques, Source: Author.

Table 5:- Analysis Table, Source: Author.

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU-BAKR MASJID, ALAHABAD, INDIA
 PORTALS & ARCHES	No arches because of postmodernism ideology of creating new, mixed with history. Skilled labour not available. Secondary street has the main entrance with multiple openings to reduce congestion on the main road. Also it is directly visible from the approaching main road.	No pointed arches because of postmodernism ideology of creating new, mixed with history. Skilled labour not available. Construction cost increases. Portal is formed as a result of subtractive transformation.	No pointed arches because of postmodernism ideology of creating new amalgamated with old. Skilled labour not available. Construction cost increases. Portal is kept simple with half pointed arch pattern on the cast iron gate.	The idea of arches is followed because of lack of knowledge about the movement. Architect might not have been aware of postmodernism. Clients demand might have dominated. Religious symbolism is given importance than quality.
 COURTYARD	They are result of insertion of a circle in plan. Also helps in perceiving prayer hall as a pavilion with light and cross breeze.	Courtyard in square shape equal in area to that of prayer hall is present. Due to climate, courtyard is considered. Also retained because of association with Prophet's mosque conceiving with ideology of minimal and postmodern design.	Courtyard is not given importance and conceived as a source to bring air and light. Conceived as an area for ablution with semi circular pond. As a connecting element for service functions.	The effort such as courtyard which created space where people take their shoes off and sometimes parking. Other is helping it to breathe and generate ample daylight, even though proportion is not as same as the prayer hall.
 POND/ABLUTION AREA	Ablution area is on the east and closest to entrance for easy accessibility. Inset outside of 40cmers height clad in white tiles form seating. Change in colour and texture is due to change in function. Water pond is not present to distance from ablution elements. Heavy rains are experienced, hence areas become water ponds.	It is provided outside because in case of large number of worshippers it becomes chaotic. It is defined by a rough texture and grey colour of bare concrete. Minimalistic and simple in character.	Since history solution area and post modern not have any fixed shape or size, hence it is also designed as semi-circular area merged with water pond. Located at the direct end with easy visual connection and circulation. Seating are in alignment to make it seamless and simple.	Ablution area is of eastern end with no seating depicting the negligence of client and architect. But platform provided can hold upto 10 people at a time without congestion.
 PRAYER HALL	Prayer hall is designed as pavilion. Section like mosque designed in mosques have prayer hall designed as pavilions during Bangladesh. It helps in creating comfortable space for worshippers. Size is also a result of plot size.	Prayer hall is perceived as a pavilion same as it was treated earlier in history but with a different design. Square with a circular dome on top replicates the idea of solution style of prayer hall. Shape also depended on plot size and number of occupants. Similar to idea of prayer hall of Prophet's mosque but of smaller scale.	Prayer hall is mostly conceived as square in response to modern concept. It is divided into two levels first, creating an area of worship. An entrance towards it also created before entering prayer hall divided by door which acts as an extension of space in case of large number of worshippers and for children to learn. Architect has sensitivity towards community environment as evident in the site.	Since every mosque using columns, hence this also used columns. Use of arches is similar to one seen in churches. This is due to large area and use of framed structure. Octagonal base fluted columns creating contrast with colour of walls. Similar layout is followed on 1 st floor to accommodate large number of people.
 TRIPLE DOME/SINGLE DOME	Reflected obscure traditional elements, not of construction. Applied ideology of minimalism.	Hemispherical dome is retained but its treatment is different due to postmodernism ideology. Architect interpretation of the idea of mosque. Dimensions are such that it is not visible in perspective view.	Hemispherical dome is retained but it cut open like but for light to enter. Architect interpretation of the idea of mosque giving importance to religious symbolism. Dimensions are such that it is not visible in perspective view.	Direct religious symbolism given importance rather than innovation. Concrete dome because of easy availability. Client demand. Architect direct interpretation.

Table 6:- Inference Table, Source: Author.

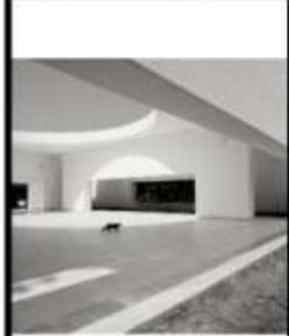
PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU-BAKR MASJID, ALAHABAD, INDIA
 PORTALS & ARCHES	Recognizable features are discarded. Approach to Postmodernism in Bangladesh mosques has affected architect's ideology. Familiarity with context is considered. Inspiration from Louis I Kahn mosque in Assembly building. Low, wide rectangular openings reflect idea of minimalism.	Recognizable features are discarded. Approach to Postmodernism in Bangladesh mosques has affected architect's ideology. Familiarity with context is considered. Inspiration from Louis I Kahn mosque in Assembly building. Low, wide rectangular openings reflect idea of minimalism.	Architect's interpretation of modern intervention resulted in no use of arches. Direct use of symbols has been discarded. Religious symbolism is not used.	Religious symbolism used to fool facade and openings. Architect's and client's interpretations lack idea of postmodernism.
 COURTYARD	Presence of sensitivity towards climate with use of courtyards for light and ventilation. Approach to its design depends on idea of postmodernism. Courtyards were designed as a result of prayer hall.	Presence of sensitivity towards climate with use of courtyards for light and ventilation. Approach to its design depends on idea of postmodernism. Courtyards were designed in amalgamation with prayer hall similar to Prophet's mosque in Medina.	Presence of sensitivity towards climate with use of courtyards for light and ventilation. Courtyards were designed as a result of prayer hall with whatever area left.	Presence of sensitivity towards climate with use of small courtyard for light and ventilation. Courtyards were designed as a result of prayer hall with whatever area left.
 POND/ABLUTION AREA	No distinct use of water for aesthetic indicators is temporaryness. Rainwater channels when filled make space appear to float. Smaller details can bring out change. Since a dedicated space for ablution is given, hence need is fulfilled.	No distinct use of water for aesthetic indicators is temporaryness. Since a dedicated space for ablution is given, hence need is fulfilled. Function is important rather than aesthetic and replication of tradition.	Due to lack of space, pond and ablution is combined to form a functional space. Ablution faces prayer hall but courtyard is treated as a less important space.	A small platform for ablution shows less space left for this function in order to occupy large number of worshippers in the prayer hall.
 PRAYER HALL	Design as a pavilion with perforated columns indicates its inspiration from mosques built during sultan in Bangladesh, hence inspiration from history. Minimalism helped in creating a simple yet meaningful space.	Design as a pavilion with circular columns indicates its inspiration from mosques built during sultan in Bangladesh, hence inspiration from history. Minimalism helped in creating a simple yet meaningful space.	Geometric simplicity used for designing the prayer hall in orientation towards Mecca. Primary shape used for direct and simple design for a functional space.	Simple representation of prayer hall used in earlier times in country. No intervention is made in terms of light, spatial arrangement of columns.
 TRIPLE DOME/SINGLE DOME	Religious symbolism is discarded. Approach to Postmodernism in Bangladesh mosques has affected architect's ideology. Familiarity with context is considered. Inspiration from Louis I Kahn mosque in Assembly building.	Presence of dome with such dimensions so as not to be visible with human perspective indicates its importance for light rather than religious symbolism. Interpretation of architect to achieve concept is important.	Presence of dome to be visible with human perspective indicates importance to look same but dominate style with modern idea. Interpretation of architect to achieve concept is important.	Direct religious symbolism is used in terms of dome with no proper dome and fruste.

PORTAL & ARCHES (Refer Table 5, 6, and Appendix-I: Table 3)



No arches have been used, Two entrances: One on south facade and other on west facade. In total 7 entrances are there with width of 920*3150mm.

Recognisable features are discarded.
 Approach to Postmodernism in Bangladesh mosques has affected architect's ideology.
 Familiarity with context is considered. Inspiration from Louis I Kahn mosque in Assembly building.
 Low, wide rectangular openings reflect idea of minimalism.



No arches have been used. Rectangular openings on the facade. Main entrance faces the courtyard in the east. In total 8 entrances are there measuring 25m*2.3m.

Recognisable features are discarded.
 Approach to Postmodernism in Bangladesh mosques has affected architect's ideology.
 Familiarity with context is considered.
 Inspiration from Louis I Kahn mosque in Assembly building.
 Low, wide rectangular openings reflect idea of minimalism.



No pointed arches because of postmodernism ideology of creating new amalgamated with old. Skilled labour not available. Construction cost increases. Portal is kept simple with half pointed arch pattern on the cast iron gate.

Architect's interpretation of modern intervention resulted in no use of arches.
 Direct use of symbols has been discarded- Religious symbolism is not used.

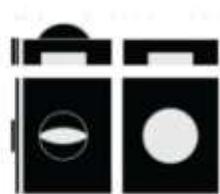


The idea of arches is followed because of lack of knowledge about the movement. Architect might not have been aware of postmodernism. Clients demand might have dominated. Religious symbolism is given importance than quality.

Religious symbolism used to treat facade and openings.
 Architect's and client's interpretations
 Lack of idea of postmodernism.



Rectangular openings in wall inspired by minimalist architecture



Rectangular and circular openings in wall and ceilings respectively. Inspired by minimalist architecture



Rectangular, triangular openings are used suggesting use of minimalism.



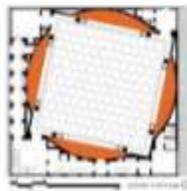
Pointed arches are used, similar to most mosques in India.

Figure 50:- Study of Portals & Arches in Mosques, Source: Author

COURTYARDS (Refer Table 5, 6, and Appendix-I: Table 3)



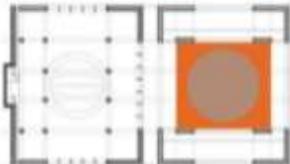
Courtyard ratio is calculated as x/y



Courtyard ratio- 1:0.3

Presence of sensitivity towards climate with use of courtyards for light and ventilation.

Approach to its design depends on idea of postmodernism. Courtyards were designed as a result of prayer hall.



Courtyard ratio- 2:1

Presence of sensitivity towards climate with use of courtyards for light and ventilation.

Approach to its design depends on idea of postmodernism. Courtyards were designed in amalgamation with prayer hall similar to Prophet's mosque in Medina.



Courtyard ratio- 1:0.6

Presence of sensitivity towards climate with use of courtyards for light and ventilation.

Courtyards were designed as a result of prayer hall with whatever area left.



Courtyard ratio- 1:6:1

Presence of sensitivity towards climate with use of small courtyard for light and ventilation.

Courtyards were designed as a result of prayer hall with whatever area left.

COURTYARD ratio in Bangladesh

Climate is warm and humid, characterised by high temperature (40 degree Celsius), with high humidity and high rainfall in monsoons.



Courtyards in Rural Bangladesh and in India, Source: www.uia2017seoul.org

Courtyards are not only used as a climatic responsive element but also as a forecourt for semi-public activities. Sizes vary according to need however, the ratio is generally 2:1 (x/y) as seen in rural houses.

COURTYARD ratio in India for warm & humid, and composite climate.



WARM & HUMID CLIMATE: Courtyards ratio is kept as 1:1 or in some case 1.5:1 in order to increase area for faster evaporative cooling.

COMPOSITE CLIMATE:

Courtyards ratio is kept as 1:2 or in some case 1:1.5 in order to increase area for winter sun and less summer sun. In addition to this, this ratio helps in ventilation during humid monsoons also.

Figure 51:- Study of Courtyards in Mosques, Source: Author.

POND/ ABLUTION AREA (Refer Table 5, 6, and Appendix-I; Table 3)**Baitur -Rauf Jame Mosque**

Ablution area is equipped with water but no pool is present.
Rainwater drainage channels are provided running around the prayer hall.

No distinct use of water for aesthetic indicates its temporariness.
Rainwater channels when filled make space appear to float.
Smaller details can bring out change.
Since a dedicated space for ablation is given, hence need is fulfilled.

**Chandgaon Mosque**

Ablution area is located in the forecourt and not in the masjid.

No distinct use of water for aesthetic indicates its temporariness. Since a dedicated space for ablation is given, hence need is fulfilled.
Function is important rather than aesthetic and repetition of tradition.

**Haji Abdur Rauf Mosque**

Ablution area is located in the courtyard on the east side with semi-circular water pool.
Circular seating is fixed along the circumference for people.
POOL radius measures 3m from wall of prayer hall.

Due to lack of space, pond and ablation is combined to form a functional space.
Ablution faces prayer hall but courtyard is treated as a less important space.

**Abu-Bakr Mosque**

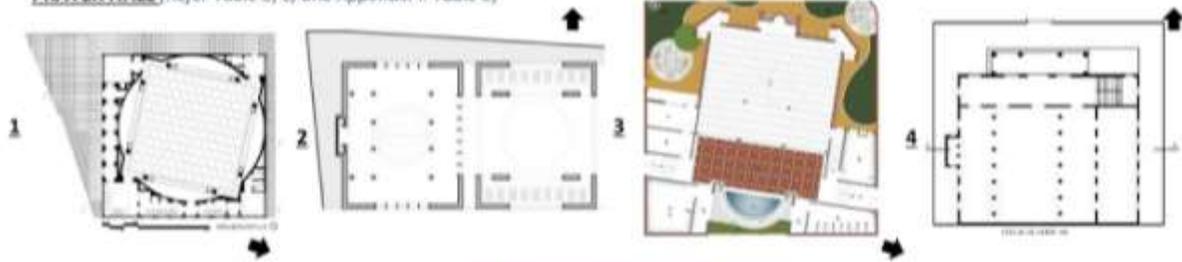
Ablution area is raised by 450mm on platform located along the northern side of boundary wall with marble flooring.

A small platform for ablation shows less space left for this function in order to occupy large number of worshippers in the prayer hall.

Ablution area is kept minimal and functional representing architects' consciousness to fulfil needs rather than using it as a symbol to replicate which was done in earlier mosques.

Figure 52:- Study of Ablution Area in Mosques, Source: Author.

PRAYER HALL (Refer Table 5, 6, and Appendix-I: Table 3)



1) Prayer hall is inspired from pavilions used in Sufi architecture of East Bengal. The amount of amount of light entering is also less as compared to rest three prayer halls.

2) Prayer hall is conceived as a pavilion and has a porous treatment of façade for maximum intake of light and air.



PROPHET'S MOSQUE

NTS

3) A column free prayer hall is created using trabeated framed structure. Mezzanine floor is supported by 4 columns that forms the aisle.

4) Prayer hall is divided into 3 aisles using columns inspired by halls built in Mughal Architecture. These columns take the support of the slab above.

Inspiration from pavilions of Bengali Sultanate Architecture in Bangladesh



Early sultanate mosque and tomb in east Bengal (WIKIPEDIA, n.d.)

Red fort halls built during Mughal period (WIKIPEDIA, n.d.)

Inspiration from hypostyle halls in Mughal Architecture in India



Source: Author



Multi-domed Sultanate era mosque (WIKIPEDIA, n.d.)

Hall in Diwan-i-Aam, Red fort Delhi (WIKIPEDIA, n.d.)



Source: Author



Naulakha pavilion (WIKIPEDIA, n.d.)

Mughal hypostyle pavilion (WIKIPEDIA, n.d.)



Figure 53:- Study of Prayer Hall in Mosques, Source: Author.

DOME (Refer Table 5, 6, and Appendix-1: Table 3)



Baitur -Rauf Jame Mosque

No dome is present as architect followed idea of minimalism with less importance to religious symbolism in her design.

Religious symbolism is discarded.
 Approach to Postmodernism in Bangladesh mosques has affected architect's ideology.
 Familiarity with context is considered.
 Inspiration from Louis I Kahn mosque in Assembly building.



Chandgaon Mosque

Dome is present but treated differently. Proportions are similar to domes used in earlier mosques in Bangladesh. It does not intimidate human scale and mosque.

Presence of dome with such dimensions so as not to be visible with human perspective indicate its importance for light rather than religious symbolism.
 Interpretation of architect to achieve concept is important.



Haji Abdur Rauf Mosque

Dome is present but treated differently. Proportions different from what were being used in local and conventional mosque and it does not dominate the composition.

Presence of dome to be visible with human perspective indicate importance to look same but dominate skyline with modern idea.
 Interpretation of architect to achieve concept is important.



Abu-Bakr Mosque

Onion shaped dome with a slight modification is present with similar treatment as domes in other local mosques shows lack of consciousness of architect as wells as client and people.

Direct religious symbolism is used in terms of dome with no proper aim and its use.

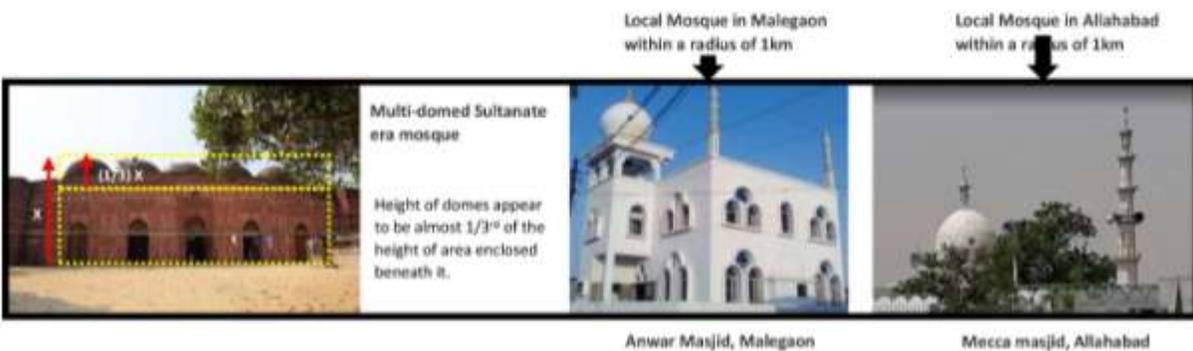
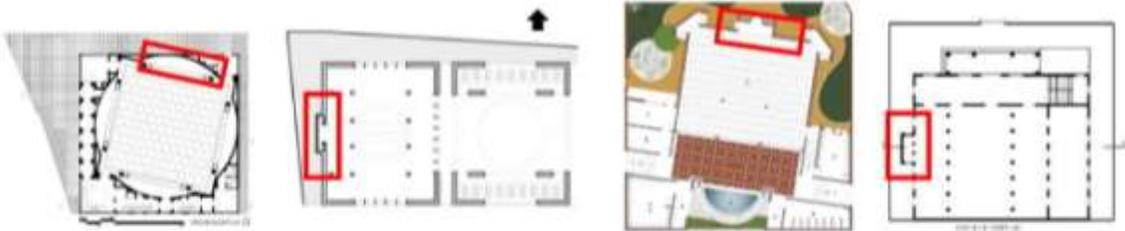


Figure 54:- Study of Dome in Mosques, Source: Author.

MIHRAB (Refer Table 7, 8, and Appendix-I: Table 4)



A vertical slit in curved wall allowing light to enter, forms the mihrab.

Niche protruding from qibla wall clad in dark granite in contrast to white, forms the mihrab.

A semi-circular niche with a grid and square pattern defines the mihrab.

A rectangular niche with light coming from adjacent windows and three arched columns, defines the mihrab.

Mihrab is treated as one of important element in mosque architecture. Concept of light and minimalism is used to treat it.

In order to define mihrab, change in texture and material is used.

It is slightly different from regular niches with a semi-circular arch which is seen in altar. Besides shape, texture can also be used in design of Mihrabs.

Mihrab is inspired by elements of history and tradition with no modern intervention in its appearance.

MINARET (Refer Table 7, 8, and Appendix-I: Table 4)



No minaret is present as architect followed idea of minimalism with less importance to religious symbolism.

No minaret is present as architect followed idea of minimalism with less importance to religious symbolism.

Used but the treatment is different from other minarets in area in order to accentuate the skyline.

Slender arched window on tubular cuboid over staircase gives an impression of a minaret.

Religious symbolism is discarded and function is focussed. Concept of postmodernism applied by the architect. Identity of mosque is familiar with context.

Religious symbolism is discarded and function is focussed. Concept of postmodernism applied by the architect. Identity of mosque is familiar with context.

Religious symbolism is preferred but with modern intervention of shape and material. Identity of mosque is tried to be kept familiar with context. Concept is achieved by using minaret to accentuate the skyline. Inspiration from African Vernacular architecture.

This cuboid occupies dog leg staircase which goes to the terrace, hence it appears like a minaret but not actually one. Architect has used this robust vertical cuboid and maintained its verticality by putting long windows.

Figure 55:- Study of Mihrab & Minaret in Mosques, Source: Author

Table 7:- Analysis Table, Source: Author

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU- BAKR MASJID,ALAHABAD, INDIA
 KURSI	It might not have been considered by the architect, it is more subjective rather than related to form of mosque.	It is not related to form hence, a variation is done by creating niches of size 300*300cm or 300*200 to keep the books.	It is not related to form of mosque, hence not given much importance. However, small wooden boxes are kept along qibla wall.	It is not related to form hence, a variation is done by creating niches on lower part of qibla wall for the books.
 DIKKA	Previously it was used for kings but now such symbols hold no importance, hence not present. Other local mosques do not follow the trend.	Since local mosques have not been focusing on dikka, this mosque has also not used it.	Since local mosques have not been focusing on dikka, this mosque has also not used it.	Since local mosques have not been focusing on dikka, this mosque has also not used it.
 MINBAR MIHRAB	The ideology inclined more on equity and simplicity. Also dependent on demand of imam. Treatment of qibla wall and mihrab design dependent on theme and concept of the architect. Mihrab is a necessary element of mosques to indicate orientation.	Minbar is simply defined, again following idea of minimalism. It is made out of some material to create seamless and indirect.	Minbar is defined by a richly carved wooden not intervened by a modern design. It is made due to imam demand, to create contrast of material, since wooden houses, but have also been used due to easy availability. Mihrab is present as it is an essential element but with a minimal design. A semi-circle with oblique square pattern in white is created. A contemporary essence in mihrab is present.	Minbar is eliminated in this mosque. Due to imam demand, provide i.e. a temporary platform is provided which may be used sometimes. Due to architect's interpretation, only a niche kept to define imam's position. Mihrab is defined by 3 arches or arcade different from the one used in windows to create contrast. Another feature is added by architect, is a blank wall as backdrop recessing out from qibla wall in order to enhance it.
 MAGSURA	Since local mosques do not follow the trend, hence this holds no importance to form of mosque.	Since local mosques do not follow the trend. Also it holds no importance to form of mosque.	Since local mosques do not follow the trend. Also it holds no importance to form of mosque.	Since local mosques do not follow the trend. Also it holds no importance to form of mosque.
 MINARET	This is due to ideology of the architect followed ideology of minimalism and modern concept of mosques. Many modern mosques built before it used a contemporary idea of not using minaret. No need for such construction until to call when loudspeakers could be installed anywhere.	Due to modern design concept and minimalism theory, minarets are not used.	Minaret has been conceived as tower only because of interpretation of postmodern ideology in order to delineate skyline as well as similar to local mosques. Shape used shows that he has tried to incorporate some elements of Bangladeshi mosque architecture but the curved minaret and vaulted roof shows inspiration from African Vernacular arch.	Minaret over staircase is present looking like minaret. Architect has tried to merge it using modern arrangement of volumes in a composition making it look like a minaret. This makes it look different than rest of mosques in area.

Table 8:- Inference Table, Source: Author.

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU- BAKR MASJID,ALAHABAD, INDIA
 KURSI	It is upto architect's and client's discretion to include it as it does not affect form of mosque.	It is upto architect's and client's discretion to include it as it does not affect form of mosque.	It is upto architect's and client's discretion to include it as it does not affect form of mosque.	It is upto architect's and client's discretion to include it as it does not affect form of mosque.
 DIKKA	It is not necessary that all traditional elements are followed. Those that full needs of contemporary users only those are considered. Needs of user group is important.	It is not necessary that all traditional elements are followed. Those that full needs of contemporary users only those are considered. Needs of user group is important.	It is not necessary that all traditional elements are followed. Those that full needs of contemporary users only those are considered. Needs of user group is important.	It is not necessary that all traditional elements are followed. Those that full needs of contemporary users only those are considered. Needs of user group is important.
 MINBAR MIHRAB	It is upto imam's discretion to add or eliminate it. It does not primarily affect form of mosque. Mihrab is treated as one of important element in mosque architecture. Concept of light and minimalism is used to treat it.	Minbar is merged with floor using some material to increase connection with mihrab. In order to define mihrab, change in texture and material is used.	It is used according to demand of imam and its availability. It is slightly different from regular niches with a semi circular arch which is seen in afar. Besides shape, texture can also be used in design of Mihrabs.	Temporary or permanent minbar is of imam's discretion. Moreover, it is not related to form of mosque. Mihrab is inspired by elements of history and tradition with no modern intervention in its appearance.
 MAGSURA	It is not necessary that all traditional elements are followed. Those that full needs of contemporary users only those are considered. Needs of user group is important.	It is not necessary that all traditional elements are followed. Those that full needs of contemporary users only those are considered. Needs of user group is important.	It is not necessary that all traditional elements are followed. Those that full needs of contemporary users only those are considered. Needs of user group is important.	It is not necessary that all traditional elements are followed. Those that full needs of contemporary users only those are considered. Needs of user group is important.
 MINARET	Religious symbolism is discarded and function is focused. Concept of postmodernism applied by the architect. Identity of mosque is familiar with context.	Religious symbolism is discarded and function is focused. Concept of postmodernism applied by the architect. Identity of mosque is familiar with context.	Religious symbolism is preferred but with modern intervention of shape and material. Identity of mosque is tied to be kept familiar with context. Concept is achieved by using minaret to accentuate the skyline. Inspiration from African Vernacular arch.	This cuboid occupies big leg staircase which goes to the terrace, hence it appears like a minaret but not actually one. Architect has used the robust vertical cuboid and maintained its vertically by putting long windows.

Table 9:- Observation Table, Source: Author.

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU- BAKR MASJID,ALAHABAD, INDIA
FORMAL COLISIONS OF GEOMETRY	Square is used to obtain cuboid, circle is inserted in inner square to make the solution easier.	Rectangle is divided into squares to accommodate spaces and extending same to achieved desired form.	Square is rotated to form circle and functions as a prayer hall.	Square is taken and divide into spaces using columns.
AXIS	Diagonal and bent axis is present	Straight axis is created	Bent axis is created from north and south entrances to reach prayer hall.	Bent axis is created from north and entrance to reach prayer hall.
SYMMETRY	Balance symmetry is present.	Rotated symmetry is present along the perpendicularity passing through rectangle and parallel to north.	Rotated symmetry is present along the perpendicularity to qibla wall and passing through mihrab.	Rotated symmetry is present along the perpendicularity to qibla wall and passing through mihrab.
HIERARCHY	Form is in hierarchy with contrast w.r.t its colour and size.	Hierarchy is achieved by colour and no ornamentation.	Hierarchy is achieved by colour and no ornamentation.	Hierarchy is achieved by size and no ornamentation.
BALANCE	Symmetrical balance is achieved by size and number of objects.	Symmetrical balance is achieved by size, colour and number of objects.	No use of balance as prominent design principle is seen.	No use of balance as prominent design principle is seen.
HARMONY	Harmony by variety is created, only by shape is achieved but variety due to colour.	Harmony by variety is created, only by shape is achieved but variety due to colour.	No use of harmony is prominently visible.	No use of harmony is prominently visible.
EMPHASIS	Present and is created by use of colour and texture.	Present and is created by use of colour and texture.	Present and is created by use of colour, texture and material.	Present and is created by use of colour, texture, dome and size.

Table 10:- Inference Table, Source: Author.

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU- BAKR MASJID,ALAHABAD, INDIA
FORMAL COLISIONS OF GEOMETRY	FUNCTIONAL AND SYMBOLIC REQUIREMENTS accentuates a form	FUNCTIONAL AND SYMBOLIC REQUIREMENTS accentuates a form.	FUNCTIONAL AND SYMBOLIC REQUIREMENTS accentuates a form.	FUNCTIONAL AND SYMBOLIC REQUIREMENTS accentuates a form.
AXIS	VISUAL CONNECTION can be enhanced with help of this principle.	VISUAL CONNECTION is easy in order to connect instantly enhanced with help of this principle.	VISUAL CONNECTION can be enhanced with help of this principle.	VISUAL CONNECTION can be enhanced with help of this principle.
SYMMETRY	Design principle which is important for religious spaces.	Design principle which is important for religious spaces.	Design principle which is important for religious spaces.	Design principle which is important for religious spaces.
HERARCHY	It is used to attain concept of mosque to stand out among other structures in vicinity.	It is used to attain concept of mosque to stand out among other structures in vicinity.	Architect wanted the mosque to stand out, hence it is achieved using this principle.	Architect wanted the mosque to stand out, hence it is achieved using this principle.
BALANCE	Visually balanced structure is designed using this principle.	Visually balanced structure is designed using this principle.	Lack of conscious design approach for composition to look balanced.	Lack of conscious design approach for composition to look balanced.
HARMONY	By material and selection of scale it is in harmony with other structures.	By material and selection of scale it is in harmony with other structures.	Lack of conscious design approach.	Lack of conscious design approach.
EMPHASIS	Emphasis is achieved by using brick which depicts minimalism	Emphasis is achieved by using white colour and perforations which depicts	Add to architect's concept to achieve visual emphasis by material to dominate skyline of city.	Add to architect's concept to achieve visual emphasis by dome and size to dominate skyline of city.

FORMAL COLLISIONS OF GEOMETRY (Refer Table 9 & 10)

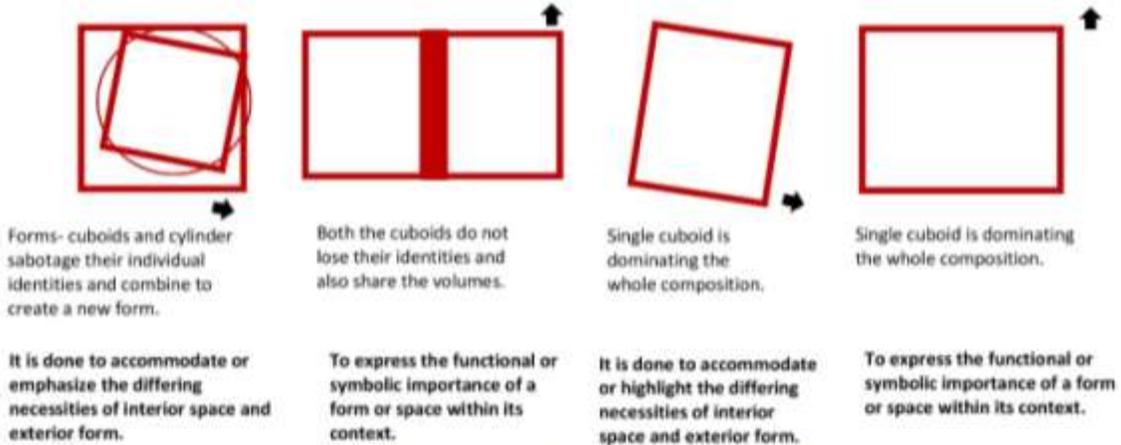
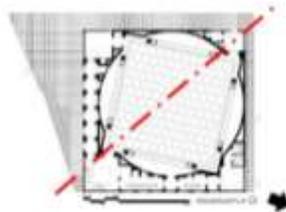


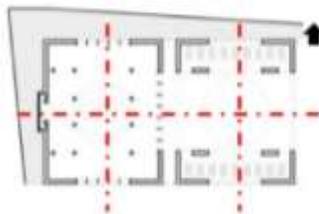
Figure 68 Study of formal collisions in Geometry, Source: Author

AXIS (Refer Table 13 & 14)



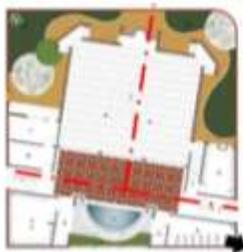
Baitur -Rauf Jame Mosque

Diagonal axis joining entrance and exit vestibules dividing the space in almost symmetrical manner.
Design principle is important for religious spaces.
VISUAL CONNECTION can be enhanced with help of this principle.



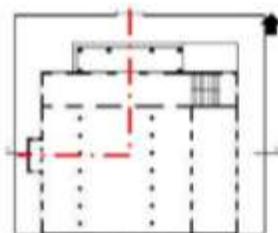
Chandgaon Mosque

Axis perpendicular to mihrab dividing the spaces in symmetrical manner.
Axis parallel to north dividing spaces into asymmetrical manner.
Design principle which is important for religious spaces.
VISUAL CONNECTION is easy in order to connect instantly enhanced with help of this principle.



Haji Abdur Rauf Mosque

Axis perpendicular to mihrab dividing the composition in somewhat symmetrical manner.
Bent axes defining the entrances.
VISUAL CONNECTION can be enhanced with help of this principle.

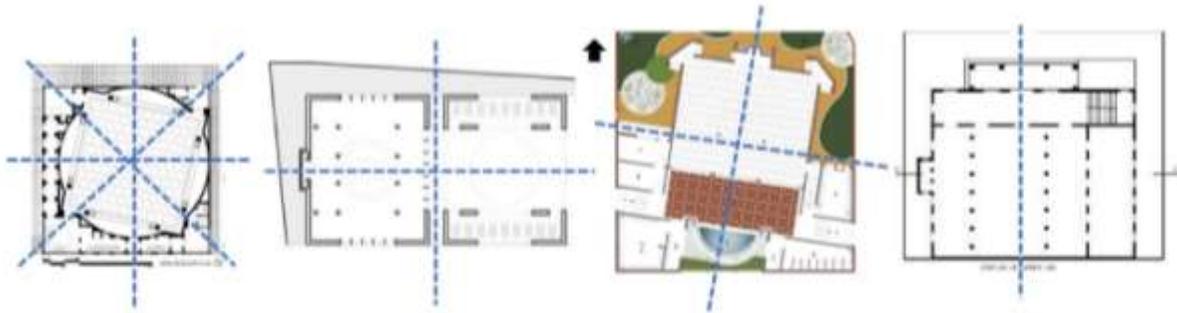


Abu-Bakr Mosque

Bent axis perpendicular to mihrab.
VISUAL CONNECTION can be enhanced with help of this principle.

Figure 56:- Study of Formal collisions of geometry and Axis in Mosques, Source: Author.

SYMMETRY (Refer Table 9 & 10)



Radial symmetry is present as a design principle, thus dividing spaces in equivalent areas.

Design principle which is important for religious spaces.

Bilateral symmetry is present, thus dividing spaces in equivalent areas.

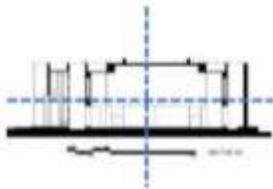
Design principle which is important for religious spaces.

Bilateral symmetry is present dividing spaces in equivalent manner.

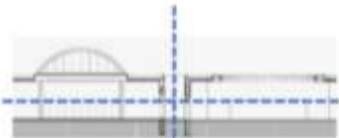
Design principle which is important for religious spaces.

Bilateral symmetry dividing spaces in equivalent manner.

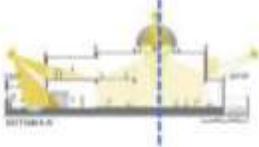
Design principle which is important for religious spaces.



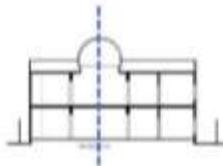
Radial symmetry is present as a design principle, thus dividing spaces in equivalent areas. Design principle is important for religious spaces.



Bilateral symmetry is present, thus dividing spaces in equivalent areas even though a dome is present. Design principle is important for religious spaces.



Bilateral symmetry is present up till the mezzanine area. Design principle is important for religious spaces.



Bilateral symmetry can be seen due to almost equivalent spaces on either side of axis. Design principle is important for religious spaces.

Figure 57:- Study of Symmetry in Mosques, Source: Author.

Conclusions and Recommendations:-

Result:-

The focus of this dissertation was to find what would be the parameters to determine form of mosques in India when we look at it in today's scenario. The independent variable that were studied are: **Large portal, Courtyard, Pool, Prayer hall, Mihrab, Minbar, Qibla wall, Minaret, Dome (triple/ single), Arches, Shape, Size, Colour, Texture, Orientation, Scale, Proportion, Articulation, Light, Transformation, Formal collisions of geometry, Axis, Symmetry, Hierarchy, Emphasis, Balance, Harmony**. The variables that govern the form of local mosques in 21st century India are required to be determined from this dissertation. Research that was undertaken comes under observational research. So, primarily based on observations, this dissertation aimed at finding the desired outcome.

Two mosques from Bangladesh were studied to understand how a country, whose architecture has its roots based on modernism and postmodernism, treat its mosque, which is an important symbol, that retains the identity of being an Islamic country. Similarly, two mosques from India were studied to understand how are local mosques being treated here. The study was based on the point mentioned above. On analysis of mosques and literature surveyed in Bangladesh and India, following points have been deduced:

Shape: Simple and bold geometries especially squares, rectangles and circles, have been used. Extruding them into robust forms have created compositions that respond to context- **Inspiration from Modernism and Postmodernism which has been indirectly imbibed in them by works of architect Louis I Kahn**. While in India as in case of Haji Abdur Rauf Mosque, architect has used squares, rectangles, triangles and circles to create abstraction and depict interpretation of postmodernism. Instead, in Abu-Bakr Mosque, architect has used cuboids only - **Inspiration from Modernism and Postmodernism but use of their ideologies superficially**.

Colour&Texture: In Baitur Rauf Mosque, material was used in its pure form. The architect has used exposed brickwork that mimics the structures in vicinity - **Ideology of Minimalism**. While use of brick or concrete in Indian local mosques is due to economical construction ethics, or to fulfil architects' aspiration to create a stand-alone feature. Thus, **using available material with no intervention to make systems durable and long-lasting**. Exceptionally, in Abdur-Rauf mosque- brick is used in pure form because the architect wanted the mosque to stand out among other mosques which were present in the vicinity. He may or may not have used the Minimalist technique.

Light: There was a primary application of natural light with variation in different spaces by designing bold and simple windows. Indirect lighting systems like light wells, screens and for direct lights, using large opening on ceilings or on walls were mostly used. This reduced openings on façade with less ornamentation thus making it bare and simple- **Ideology of Minimalism**. For example, in Baitur-Rauf Jame mosque architect has created prayer hall as a silent and dimly illuminated space inspired by the Bengali architecture of mosque in which less light is allowed to penetrate inside by use of fewer openings in façade.

Use of natural light for maximum light intake either by indirect or direct source of sunlight is seen in both mosques of India. This resulted in a maximum number of openings, very often repetitive - **Traditional method façade treatment for intake of light**. In Abdur Rauf mosque, indirect light infiltrated through angled corners, slits in dome, and jaali screens but a repetition of conventional elements was seen in Abu- Bakr mosque with monotonous use of arches throughout the façade.

Orientation: It is a primary factor that is taken care of in all four mosques that have been studied. In Baitur Rauf Jame Mosque and Chandgaon Mosque, Qibla wall is oriented towards west perpendicularly. Where the western edge of site did not coincide with Qibla wall, as in Baitur Rauf Mosque in Bangladesh, the square was rotated with help of cylinder to create a Qibla wall perpendicular to west. Similarly, in Malegaon Mosque, where the prayer hall was rotated so that Qibla wall was perpendicular to west. Hence **orientation of Qibla wall towards west is preferred**.

Transformation: In Bangladesh mosques, pure forms have been used with openings in such a way that their identity is not lost. For example, use of cuboid in Baitur-Rauf Jame mosque and Chandgaon Mosque. Thus, the composition was subtle and easily perceivable. Here- **Transformation retains identity of form**. While in India, additive transformation of cube or cuboid often times change the overall perception of form and it rather becomes complex. For example, transformation in Haji Abdur Rauf mosque is additive but abstract was complex and not

clear to perceive. Similarly, in Abu-Bakr Mosque where simpler transformation was seen, even though it is additive. Here- **Transformation does not retains identity of form.**

Size: It is another significant factor that govern the form of mosques and also the image that is perceived by the people. For instance, in Baitur-Rauf Jame Mosque and in Chandgaon Mosque, area, type of funding and context primarily governed their sizes- **Context played an important role.** Unlike in Bangladesh, importance was given to number of occupants besides funding and area while the context was neglected- **Context was considered but number of occupants governed majorly.**

Scale: The scale of Baitur Rauf Mosque and Chandgaon Mosque is intermediate i.e.7 and 5 times respectively due to limited funds, area of plot, and context. Their design was primarily influenced by religious needs which is reproduced in the scale. Similarly, the scale of Malegaon Mosque and Abu-Bakr Mosque is intermediate due to limited funds and area available. **Type of funding, need, context, and area govern the scale of the mosques. However, it is more dependent on context as it helps in determining how a form will be perceived by an individual.**

Proportion: Architects of Baitur Rauf Mosque and Chandgaon Mosque were **conscious enough to use proportion to achieve aesthetic quality and unity** in their designs. While architects of Malegaon Mosque and Abu-Bakr Mosque **did not take proportion in account to achieve aesthetic quality and unity in their designs.**

Articulation: It is found to be an important factor governing the form. Edges and surface articulation were applied in both the mosques of Bangladesh, to achieve a creative form. Internal edges and corners are articulated so that light could be penetrated, while exterior surfaces were left unadorned with no or less openings- **Influenced by Postmodern architecture.** Similar articulation of edges and corners could be seen in Haji Abdur Rauf Mosque, where the architect has used jaali screens, minimal horizontal bands on exterior façade and corners in interior were left unmet for light to penetrate. However, in Abu-Bakr Mosque, none of this was present-**Less influence by Postmodern architecture.**

Portal & Arches: This is an imperative factor that influences the image of mosques perceived by the people. No use of arches in any of the mosques of Bangladesh. Moreover, minimal rectangular openings were designed- **Inspiration from minimalism and postmodern architecture.** On the contrary, in Malegaon mosques arched gateways were designed while openings were kept rectangular and minimal. While in Abu-Bakr mosques, arches were used in abundance i.e. in exterior as well as in interior- **Design influenced by conventional elements.**

Courtyard: Architects and local people in Bangladesh have taken climate as a primary design consideration thus included courtyards and windows with double walls for protection from harsh climate specifically in case of Baitur Rauf Mosque - **Response to climate.** In contrast, architects do not seem to consciously incorporate climate-responsive features like courtyards even though they are present in the design as in Haji Abdur Rauf Mosque in Malegaon as well as in Abu-Bakr Mosque in Allahabad- **Lack of conscious response to climate.**

Pond/ Ablution area: Inclusion of an ablution area is mandatory with proper seating and water facility. Both in Baitur Rauf Jame Mosque and Chandgaon Mosque, a **proper area was defined** with seating and water facility. Although in the former it was located within the building while in the latter it was outside, accessibility should be easy. In Haji Abdur Rauf Mosque, ablution area was combined with pond with an easily accessible location while it was not maintained in Abu-Bakr Mosque-**Negligence towards functional requirements.**

Prayer hall: Concept of prayer hall in Baitur- Rauf Mosque as well as in Chandgaon Mosque has been derived from pavilions built in the 13th century that existed there- **Inspiration from History.** In contrast, concept of prayer hall in Haji Abdur Rauf Mosque and Abu-Bakr Mosque has been derived from the primitive hypostyle halls that existed in India- **Inspiration from History with no modern intervention.** For example, in Abu-Bakr mosque, the prayer space with a hypostyle hall is recreated more simply.

Mihrab: Although it does not chiefly influence form of mosques, but to define a prayer hall, it is an important factor. In Baitur- Rauf Mosque, a vertical slit was used to indicate Qibla wall while in Chandgaon mosque, difference in texture and colour of material defined the mihrab. Similarly, in Haji Abdur-Rauf Mosque, mihrab is

defined by a semi-circular niche with a textured surface, while in Abu-Bakr Mosque, it is defined by three columns forming an arcade. Hence-**design of mihrab is open-ended.**

Dome & Minaret: Domes, minarets and arches are not necessarily used without any function- **Religious Symbolism is discarded.** For example, in Chandgaon mosque, architect Kashef Chowdhury has used dome in such a way that it acts as a pocket to capture light and send it inside. Large oculus in courtyards cause the space to glitter during the day. While domes, minarets and arches in Abu-Bakr Mosque are necessarily used without any proper function. Dome used in Abdur Rauf mosque is intervened by slits to bring in light. Minaret is also used with openings in triangular and rectangular shapes with a curved top inspired by African vernacular Architecture- **Religious Symbolism is used blindly with different features to fulfill their design ideas.**

Formal collisions of geometry: In Baitur rauf Jame Mosque, the architect has used circle and square to create a pavilion, while in Chandgaon mosque, squares offset at a distance were used to create pathways and prayer hall area. There is a variety of how simplest geometries could be articulated to generate creative forms- **Cohesive and diverse use of geometries.** While in Haji Abdur Rauf Mosque and Abu-Bakr Mosque, no such articulation was found. Instead a square is simply transformed in to a framed cuboid- **Non-cohesive and similar use of geometries.**

Axis, Symmetry, and Hierarchy: In Baitur Rauf and Chandgaon Mosque, architects have strategically used these design principles to create an aesthetically pleasing and visually balanced forms.

They were helpful in organising spaces, enhancing visual weight and making distinguishable volumes that are easily perceived. In contrast to this, Malegaon mosque and Abu-Bakr mosque did not have visual weight or aesthetically pleasing compositions in terms of axis, symmetry and hierarchy, although in Malegaon mosque, the architect has used brick to create hierarchy. Similarly, in Abu-Bakr mosque, visual balance did not appear to play a crucial role.

Emphasis, Balance, and Harmony: These three design principles are clearly visible in form of material, colour, shape and organisation of spaces in Baitur- Rauf Mosque as well as in Chandgaon Mosque. Architects have used these principles to create visually balanced forms. In contrast to this, mosque in Malegaon and Allahabad have unconsciously used these to create the forms.

Participation of people: Baitur Rauf Mosque as well as Chandgaon Mosque in Bangladesh were locally commissioned which enabled people to interact with architects. The fund often times had local people as contributors, thus reducing overall scale and cost of construction as funds were limited- **People's Participation can be seen.** In India, both the projects were locally commissioned but people demand and aspirations were not catered by architects. There was **no participation of local people. Only wealthy clients can afford money for construction and people are not involved rather they do not take interest.**

Role of Religious extremism: Baitur Rauf Mosque and Chandgaon Mosque have been treated as secular and modernist spaces in Bangladesh, hence they have received wide appraisal for the quality of spaces within. **Religious extremism is discarded.** While mosque in Malegaon as well as in Allahabad is as religious today as it was before with no reforms in the quality of its spaces-**Religious extremism is not discarded while people's acceptance for new cannot be seen.**

In addition to this, minbar, Maqsura, kursi, and dikka do not play a significant role in the form of mosques. However, minbar is a mandatory requirement used as a furniture made out of various materials, and designs.

RESULTS FROM ANALYSIS	
MOSQUES IN BANGLADESH	MOSQUES IN INDIA
Inspiration from history	Inspiration from history with no modern intervention
Responding to site conditions	Responding to site conditions w.r.t materials only
Response to climate	No conscious response to climate
Inspiration from Modernism and Postmodernism	No inspiration from Modernism and Postmodernism
Pure geometry with no distinct modification	Transformations are complex visually
Minimalism	No Minimalism
Religious symbolism is discarded	Religious symbolism is retained.
People's Participation	No People's Participa-tion
Creative and secular spaces	No innovation in religious spaces
Low scale of mosques	Low scale of mosques
Conscious use of Design Principles	Lack of conscious in use of Design Principles
Interaction between architects and local people	Lack of interaction b/w architects & local people

Figure 58 Figure showing points of difference in forms of Mosques in India and Bangladesh; Source: Author
From analysis and results, following points can be concluded for the form of local mosques in India:

1. **Shape:** Mostly rectangles are taken into consideration. This is due to ease in planning and construction. However, this does not adhere some modernist approaches in which squares are being used to create spatially cohesive interior spaces.
2. **Colour:** Use of shades, tints, and tones of green is most common and is done to symbolize mosque in Medina. Besides this, white colour is often used to simplify visual perception of the form. However, this does not enhance the aesthetics rather make it more conventional and mundane.
3. **Texture:** Heavy to low ornamentation is seen in terms of floral patterns on walls and interiors which is outdated. This is due to replication of older mosques and mosques which are around. However, it adds to the construction cost and also the originality of form vanishes.
4. **Light:** This factor is extremely important and is required to be assessed as daylighting is not adequate in these places. Fenestrations have been provided but poorly designed and only for decoration. Most mosques rely on artificial lighting.
5. **Orientation:** Since it is a functional requirement, hence it is not modified in any way. Qibla wall faces west.

6. **Transformation**: The transformation is a typical use of cuboid or cube, topped with a hemispherical dome and slender minaret. It is a typical transformation with no visual weight and balance. This might happen because of insufficient knowledge on architect's part.
7. **Size**: In India it majorly, depends upon type of funding, area of the plot and number of occupants. However, context is not considered.
8. **Scale**: Mostly all forms of local mosques are of intermediate scale. However, it is not an issue. The problem arises when context is not taken into consideration, which changes the overall perception of form.
9. **Proportion**: Proportion as a design principle is not followed. For example, on analysis of two mosques, the ratio of each space was not equal. This is due to insufficient knowledge of architect. Thus, it results in visual imbalance of the form in elevation, section and plan.
10. **Articulation**: Typical edge articulation is prevalent while surface articulation is dominated by archetypal repetition of windows with less or no influence from Postmodern architecture.
11. **Portal & Arches**: Pointed arch is an element that is present in almost all the local mosques. It is in form of windows, gateways or simply façade treatment. Due to lack of tolerance for new and association with old with no modern intervention, the overall form becomes monotonous and mundane, besides increasing cost of construction also.
12. **Pond/ Ablution area**: No pond is provided but sometimes an ablution area is provided which is in a dilapidated condition located in corners. Even though a pond is provided, it is not enough to have a dual effect or function.
13. **Courtyard**: Either courtyard is omitted or used present with ratios of 1:0.6 or 1.6:1 (x/y). These ratios indicate that insufficient proportions of courtyards are being designed for any type of climate in India and are being omitted due to lack of space available. Hence, absence or shrinkage of courtyards in mosques leads to uncomfortable environment for the users.
14. **Prayer hall**: Architects take inspiration from history by using columns as used in hypostyle hall, however, there is lack of visual connectivity between levels. There is no progress in structural advancement or uniqueness. They are not well lit and properly ventilated.
15. **Dome (triple/ single)**: Mostly single onion shaped and bulbous concrete domes are used with no proper function. Height varies from 5-7m with diameter ranging from 8-10m. The widespread use of domes is due to adherence to religious symbolism and lack of tolerance among people to accept something new without a dome.
16. **Mihrab**: It is mostly defined by using different textures, colours, patterns or elements to a conventional niche, which is inspired by conventional mihrab designs, at the centre of Qibla wall.
17. **Minaret**: They are used only for accentuating the skyline with no function except for installing the loudspeakers. Height varies from 8-12m. The widespread use of minarets is due to adherence to religious symbolism and lack of tolerance among people to accept something new besides a minaret.
18. **Formal collisions of geometry**: Either a square or rectangle dominates the plan due to association with typical shapes because of ease in planning and construction. However, this leads to a mundane form that lack any diverse spatial organisation and modern approach.
19. **Axis, Symmetry, and Hierarchy**: These three ordering principles are crucial for a form to have visual weight. However, none of these seems to have an effect on form of local mosques, both internally and externally. Thus, there is no visual weight in the form of mosque. This might be due to lack of design consciousness from the architect's part of design consideration.

20. **Emphasis:** Emphasis on bulbous, concrete domes, used only for sake of symbolism, with no function and high minarets upto 12m with no importance except for accentuating the skylines, emphasizes the forms of local mosques and creates an obvious image for an individual.
21. **Balance and Harmony:** There is lack of visual balance and visual weight due to absence of balance and harmony created by colour, texture and size. Eventually, the form does not correspond to the context.
22. **Participation of people:** There is no role of people due to lack of interaction among architects, clients and local people. This creates a chain of duplicate forms with lack of uniqueness in the design.
23. **Role of Religious extremism:** It is widely prevalent in local mosques. Hence, people are accustomed to perceiving mosques with domes and minarets. Therefore, architects are unable to design forms without involving religious symbolism, thus, preventing them to attempt radically creative forms and spaces.

Design Recommendations:-

As far as design is considered, no one can comment on what the outcome would be as it depends on site, region, climate, soil conditions, design brief. Since the output in these cases cannot be derived but the approach that should be taken to achieve an architecturally creative and innovative design, can be stated. From the derived results, it is important that issues that are present in mosques which are built as a locally commissioned project, are acknowledged. below are qualitative recommendations based on the parameters analyzed:

1. Whenever such projects are undertaken, the client, architect, and local people must be involved and made to interact amongst themselves. Hence, this becomes a duty of the architect to understand the user group and the brief. It must be a democratic approach to the design of such mosques.
2. Architects get an advantage to examine antiquity of a place and also the history of architectural styles of mosques that resulted in different forms that ever existed in those regions. They get to know the vernacular language of forms of not only mosques but also other structures and learn about the local construction technique involved which would, if incorporated in their design innovatively, help local people to know about the past. People will be able to connect between ancient and contemporary. How a form is perceived depends on how architects interpret the vocabulary of forms of a mosque as a sacred space.
3. Local people and clients must be aware of what exactly they expect the mosque to look like. As it contributes to an image of that place, hence visual weight that a form should have to be perceived as an identity lies in the hands of both architect and local people, who must constantly guide the architect to achieve a desired form.
4. Locally available materials must be used to decrease construction costs. Their implementation must be in such a way as seen in examples of mosques in Bangladesh. This will not only help the form to be in a hierarchy with other structures in the vicinity but also make a sustainable mosque. Construction techniques might be modern along with structural systems while forms will be modern in their overall appearance as well. This leads to the idea of minimalism where architects have used materials in their pure characteristics to achieve visually appealing and modern buildings.
5. When minimalism is applied to spatial volumes then building forms completely change. Forms are reduced to either hybrid of old and new, or simpler forms that are easily perceived without any complexity. Simpler is the design, more easily it is perceived. Objects must be treated to create balance and harmony. Balance can be created by shapes that are bold and pure and also by using colours which balance rather than alienate mosques from its context.

Further, below are quantitative recommendations based on the parameters analyzed:

Shape:

- a) A **square or rectangular** shape is satisfactory. However **square can be used adequately** as it reduces wastage of spaces and accommodates the required areas easily as compared to circle, triangle or pentagon etc.
- b) This also depends on size of the plot but efforts must be made to use simple and bold geometry.



Figure 59:- Design recommendation for plan form of mosques; Source: Author

Colour & texture:

- According to results, bright colours should be avoided keeping the sanctity of space in mind as well as surrounding structures. Colour and texture are characteristics of the type of finish and material.
- It is advisable that locally available materials must be used and in their pure form that helps in reducing cost and also helps in response to climate.
- Ornamentation should not be used.**
- Red bricks, bricks made out of fly-ash can also be used as a substitute to normal bricks for construction. Perhaps concrete can prove beneficial if used in an alternative manner, for instance, in combination with other constituents like sawdust resulting in materials such as timber crete which requires cheap labor as well.**

Light:

- Importance must be given to the use of natural sources of light rather than artificial light.** This helps in cost reduction and achieve effective user experience.
- When minimalism is taken into consideration to design the form of mosques, fewer perforations will be used in the exterior. Hence daylight from a skylight, lightwells, jaali screens must be implemented.
- Considering the scale of the mosque, openings in the exterior must be decided accordingly. For a prayer room of 4-4.5m in height, lintel must be at 2.5m to 3m for the venturi effect to take place.
- Skylights, jaali screens, courtyards, and lightwells must be used to penetrate daylight in the interior.
- According to (holmes, 2014) minimum lux should be 150lux so that people can see each other properly with less use of artificial luminaries.

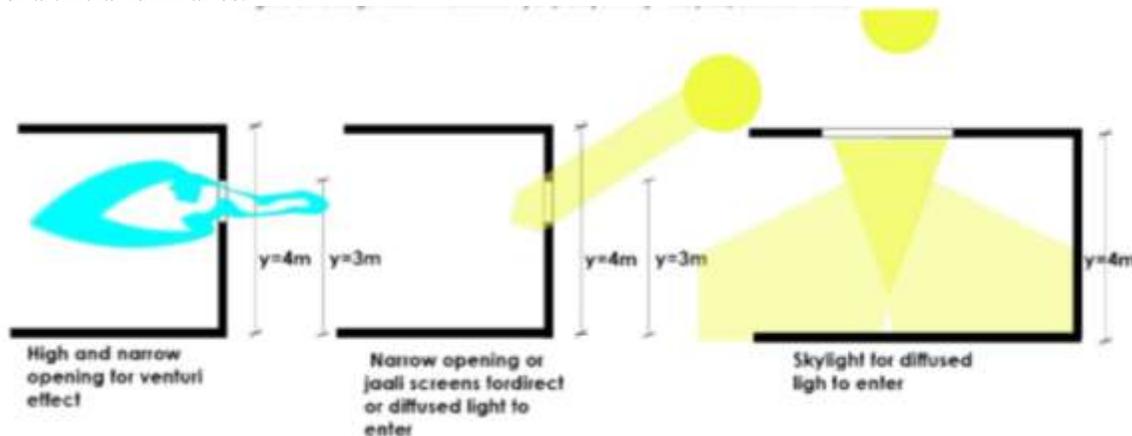


Figure 60 Design recommendation for fenestration; Source: Author

Orientation:

- No site is ideally a square or a rectangle with no perpendicular cardinal points. Orientation of Qibla wall to the west is important in mosques which cannot be changed, therefore while orienting the spaces, **one wall of prayer hall must face the west with entrances on any of the remaining three sides as per the design.**

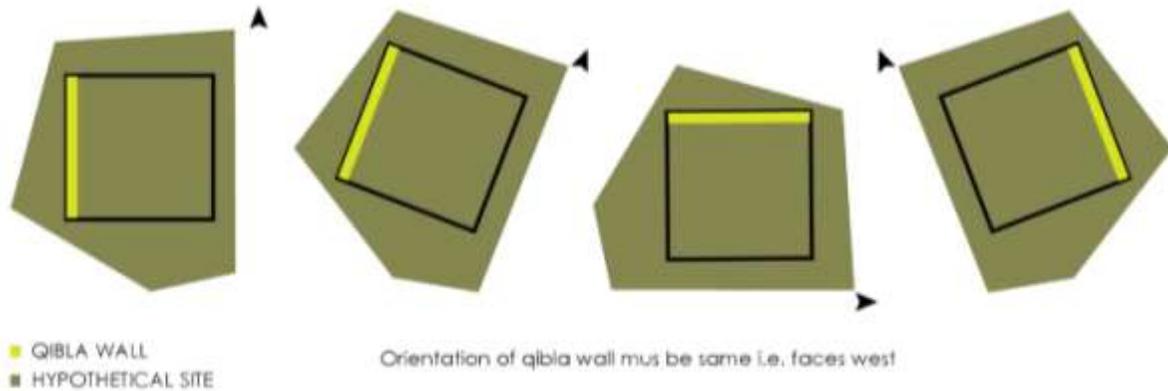


Figure 61 Design recommendation for orientation of mosques; Source: Author

Transformation: The transformation of geometries should not be such to make compositions look complex. Mostly subtractive and additive transformation will help form of mosques to retain their identity as dimensional transformation might lose identity, thus making an alienated form, unless consciously, sensibly, and radically implemented.

- Additive transformation and subtractive transformation must be implemented to such an extent that the identity of form used should not be lost.**
- Since minimalism teaches the use of pure forms without losing identity, hence additive and subtractive transformation will help in achieving that.

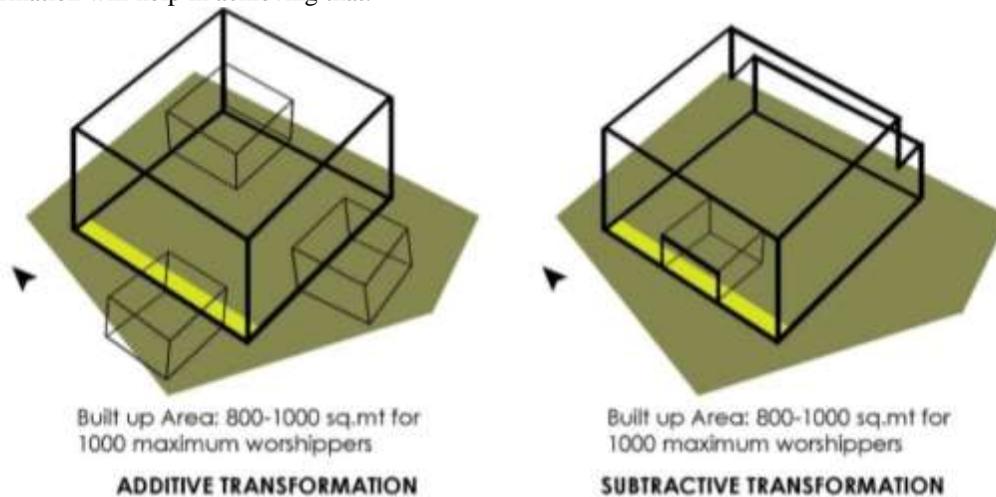


Figure 62 Design recommendation for transformation of mosques; Source: Author

Size:

- For a maximum of 1000 worshippers, total built-up area of 800-1000sq.mt can be designed.
- The maximum area will be occupied by prayer hall which shall be a square measuring 20m*20m.
- To accommodate this area, levels can be generated which can demarcate spaces, but the total height should be greater or equal to 8m.

Scale:

- The scale of mosques should not intimidate the human scale; hence it should be a maximum of 5-7 times the human scale.

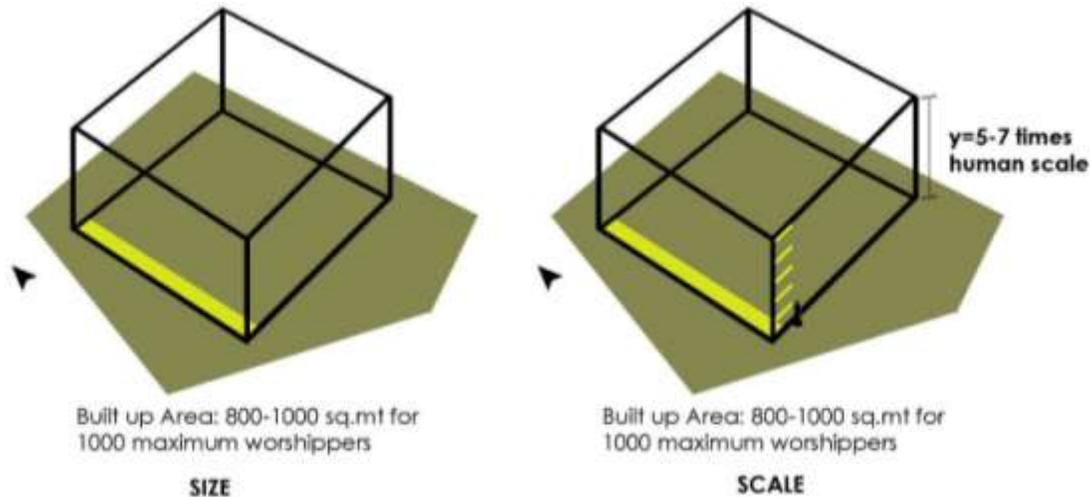


Figure 63 Design recommendation for size and scale of mosques; Source: Author

Proportion: Proportion as a design principle has a great deal in architecture. Many theories have been formulated to achieve proportion but the overall idea is to achieve visual balance and unity in forms. Especially in the case of mosques where traditional elements like traditional domes and conventional minarets have sometimes overruled this idea due to bad designs. But a mosque with such elements, designed proportionately with as many volumes as it can have (without diluting sanctity of mosque), an upright form can be achieved.

- From the analysis, it can be seen that proportion in local mosques in India unlike those in Bangladesh and historical Indian mosques.
- Recommended ratios are 1:1, 1:2 such that the ratio of all dimensions is equal.
- The objective is to have proportionate spaces, thus helping in achieving a proportionate composition.

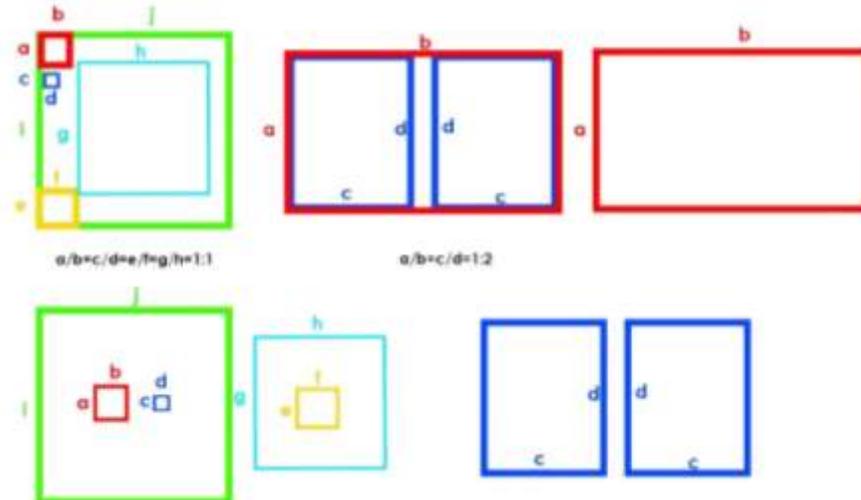


Figure 64 Design recommendation for proportion of mosques; Source: Author

Articulation:

- Surface articulation depends upon openings on the exterior and material/finish used.
- With very less or no ornamentation, less opening on the façade, the overall form appears rigid. Similarly, texture will depend on materials used and their type of finish.
- Edges and corners must be judiciously designed when indirect sources of daylight are concerned.

Portal & arches:

- Portal form the entrance to mosques.
- Unlike historical mosque, it need not be highly decorated or huge.
- It should be enough to fulfil the need of allowing 3-4 people to comfortably pass through it.
- It is advisable to decrease or discard the use of religious symbols such as arches in portals or windows.
- For a prayer room of 4-4.5m in height, lintel must be at 2.5m to 3m for the venturi effect to take place.

Courtyard: Climate is also one of the primary design considerations. In India, when we look back in history, many mosques had undergone tremendous changes in courtyards and their treatment of façade. This was majorly due to climatic conditions. In many mosques, for example those in Bengal, courtyards were introduced for ventilation and air penetration. Instead, mosques built in Gujarat, did not include a courtyard because of the hot and arid climate throughout the year. Climate determines whether there will be opening or light wells or wind towers or indirect light sources which ultimately affects forms of mosques.

- It is advisable to have a courtyard in a mosque as it not only serves as a transition from profane to sacred but also as a gathering space and acts as an extension when the number of worshippers increases.
- Besides that, it benefits in generating a comfortable environment by allowing sunlight, and air to enter.
- It helps in cross-ventilation. Courtyard ratio should be either 1:1, 1:1.5, or 1:2.

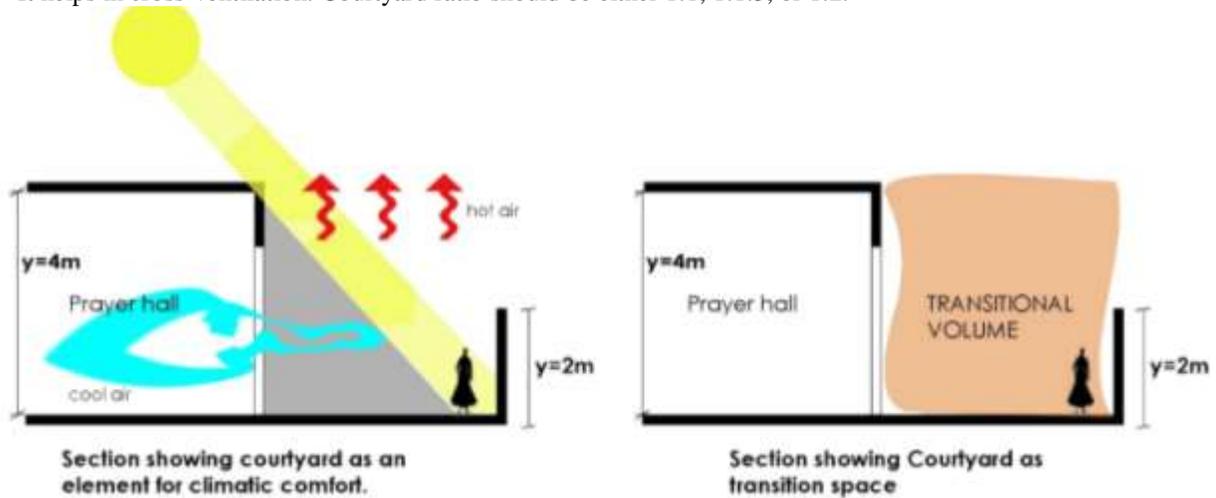


Figure 65 Design recommendation for courtyards in mosques; Source: Author

Pond/ ablution area:

- Ablution area need not be highly dominant and should have proper seating platform with water facility for people to perform ablution.
- It must be located before going inside a prayer hall. For regions where water ponds help in evaporative cooling to create comfortable environment, it is advisable to use them.

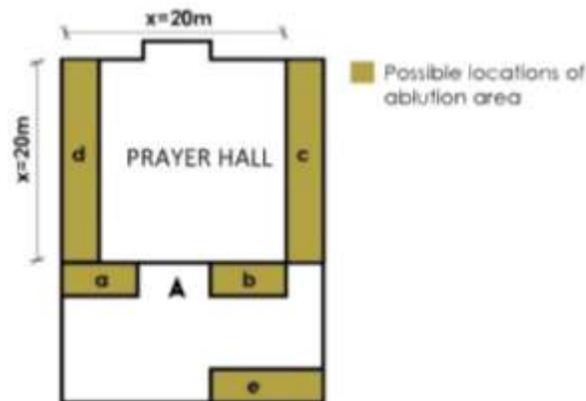


Figure 66 Design recommendation for possible location of ablution area in mosques; Source: Author

Prayer hall: When designing mosques in India, architects need to know that it is a secular country unlike Bangladesh which is an Islamic country. Despite this fact, Bangladeshi architects have created some of the most creatively and radically secular mosques. The credit goes to Louis I. Kahn, who by his design of prayer hall in Dhaka Assembly Hall, has created one of the finest of prayer halls in the world. Such an approach must be involved in India also where Muslim identity is important rather than religious symbolism.

- As mentioned earlier, it should be either a cuboid or cube which may be supported on columns, or arch or load-bearing structural system depending upon construction technique followed.

- For 1000 worshippers it is advisable to have a prayer hall measuring 20m*20m with a height of 8m for ventilation and providing comfortable interior space. This may be divided into ground floor and first floor or a single floor with a mezzanine for women.
- A column-free space is preferred for free circulation, visual clarity, and fewer obstructions in movement.
- Play of light and shadow should be incorporated for enhanced experience of users.

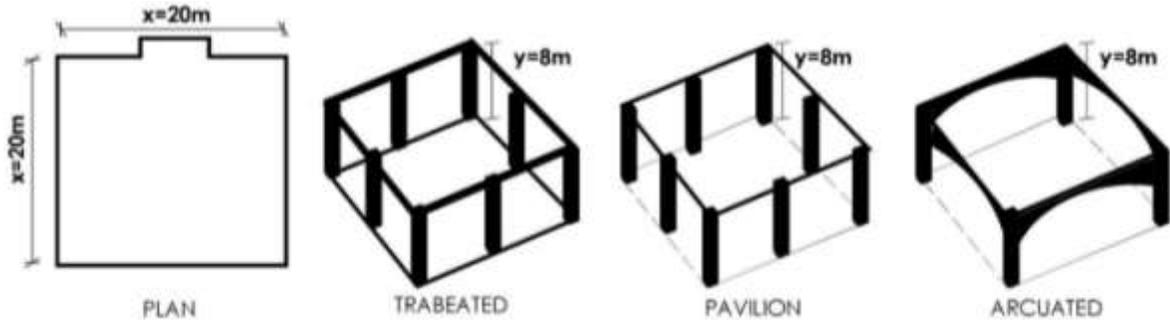


Figure 67 Design recommendation for prayer hall; Source: Author

Mihrab:

- Mihrab is an important element of a mosque even though it does not primarily affect the form of a mosque.
- Mihrab should be as simple as possible and can be defined with the help of texture, light, colour, material, or geometry.

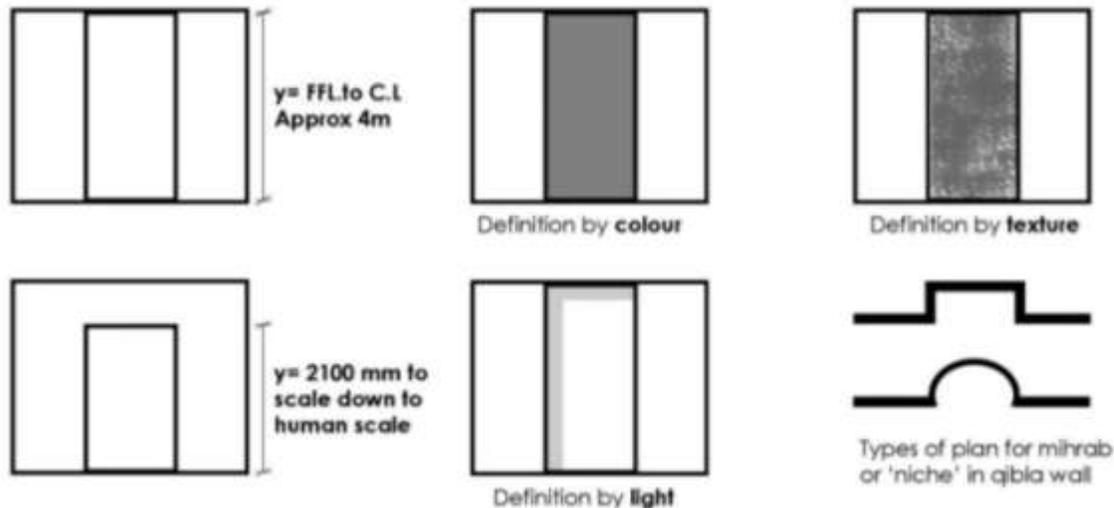


Figure 68 Design recommendation for Mihrab; Source: Author

Dome: Domes and minarets were invented earlier with unique construction techniques, hence lasted for a longer time period. Similarly, even if they are used today while defining forms of mosques, they should not overpower the form rather complement it. Here emphasis, as a design principle, comes into the picture, which element requires maximum visual weight to develop mosque identity for that region. Emphasis can be created by using bold geometries, using bright colour, change in its development style, for example traditional to minimalism, use of shadow, and natural light by creating perforations or opening in ceiling or walls.

- The use of religious symbolism like domes shall be reduced.
- This is because it increases the cost of construction and is not well designed as seen in today's scenario in form of small domes put over minarets in an eclectic manner.
- Using it as a religious symbol will only signify its existence unless used as a skylight, or for ventilation to serve any purpose.
- Even if they are used as an element, they should not dominate the whole composition, thereby keeping in essence with the contemporary architecture of mosque and its function.

Minaret:

- a) It is a religious symbol that has dominated forms of mosques for thousands of years.
- b) But now, its function has reduced to merely a symbol.
- c) Hence, it should not be used unless it has a function other than calling out for prayer.
- d) Height of the overall form must not be intimidating for other structures in vicinity.

Overall idea is to create such a form which do not emphasizes on traditional elements, and the idea of religious symbolism and extremism but on how it can contribute to the image of any city. In India, where secularism is deeply rooted, this architecture is not evident to have a clear identity although it is can be found throughout the entire country. Forms, thus, derived would be modernist and will not be called as Pan-Islamic shorthand or stereotyped for using familiar forms or replicating forms that are present. This will completely change the perception of sacred space for not only Muslims but people from other religions as well.

Conclusions:-

This dissertation aimed at finding the parameters that will govern the form of local mosques built by local communities in contemporary India and recommending what should be the form for such mosques. This is done by analyzing selected examples from India as well as Bangladesh based on parameters deduced from the literature study. The examples were selected, based on the type of funding, year of construction, number of worshippers, and built-up area. Mosques built after the 1970s were considered. The results show that there is a lack of modern approach and use of Postmodern style of architecture due to less/no contribution of local people and lack of interaction among architects as well as clients with regards to design and construction of mosques in India unlike in Bangladesh. Hence, recommendations include a low scale of mosques with less/no use of religious symbolism with elements inspired from history and intervened with a minimal and modern approach in coherence with site and climate, thus, condemning any kind of replication. Besides, the participation of local people is also a major aspect that has been recommended together with interaction of local people with architects as well as clients through questionnaires, interviews. This dissertation further contributes to giving an insight into what is the major concern concerning the development of local mosques in today's India as well as suggesting how the form of the local mosque in India should be, keeping the secularism of country in consideration.

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Appendix-i

Table 11:- Observation Table, Source: Author.

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU-BAKR MASJID, ALAHABAD, INDIA
 SHAPE	Primary shapes like squares and circles are used.	Primary shapes like square, circle and rectangle are used.	Primary shapes like square, circle, triangle and rectangle are used.	Primary shapes like square, circle, and rectangle are used.
 COLOUR	Reddish orange colour, characteristics of terracotta bricks is visible.	White colour is the overall colour widely used in the project. No other is used. Shades and bit of green is seen due to plants.	Red facing terracotta bricks have been used. Colour is dark orange and mix of red has with different tones. Off-white coloured jali patterns have been used.	White colour is the overall colour widely used in the project. No other colour is used.
 TEXTURE	Texture is coarse and grainy due to exposed brickwork.	Texture is smooth in appearance and rough when touched due to plaster.	Texture is coarse and grainy in appearance due to exposed brickwork.	Texture is smooth in appearance and rough when touched due to white painted wall.
 LIGHT	Indirect light is used in form of jali, light wells, perforations and skylight. Diffuse sunlight is also used. Daylight illumination comparatively less than 150lux. Qibla wall gets direct sunlight.	Low wide opening of a height of almost half the building height. Circular and eye-like opening in ceiling with jali.	Indirect light has been used. Diffused light in form of jali screens and from dome in the prayer hall. Diffused light in prayer hall due to extended corners in north and south facade. Horizontal jali windows. Punctures in masonry in triangular and rectangular shape. Direct sunlight in courtyard.	Direct light has been used. Diffused light in form of jali windows. Daylight enters through pitched shaped windows. Horizontal jali windows. Punctures in masonry in triangular and rectangular shape. Direct sunlight in courtyard.
 ORIENTATION	Qibla wall is rotated of angle of 13 degree from west i.e. faces north-west.	Qibla wall faces west perpendicularly.	Qibla wall faces west perpendicularly.	Qibla wall faces west.
 TRANSFORMATION	Regular cuboid is used which is paired with cylindrical volume.	Two volumes of equal cuboid paired together. The composition is topped by a slender minaret.	Sense of cuboids of different sizes paired to create a monolithic composition externally. The composition is topped by a slender minaret.	Composition of cuboids added together of different volumes topped with dome on the cuboid having prayer hall.

Table 11:- Observation Table, Source: Author

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU-BAKR MASJID, ALAHABAD, INDIA
 SIZE	Volume above plinth is 23m*23m*7.4m Smaller square is 14.75m*14.75m*10.4m Normal occupants: 450 On Fridays: 800-900 10-12 Women also sometimes come for prayer.	Volume is 40m*20m*(5.3+3.75)m Each square is 19*20*5.3m with cut dome rising 10 m from terrace Normal occupants: 280 On Fridays: 800-900 10-12 Women also sometimes come for prayer.	Out of 900 sq m plot area only, 800 sq metre is built, with maximum height of 7m excluding dome. Levels are divided into half the total height while ancillary functions of different volumes. Normal occupants: 450 On Fridays: 1000 worshippers. Meezanina is for women but they don't come very often.	Volume occupied 30*30*(8-4m) Levels are divided into two for praying area. Normal occupants: 280 On Fridays: 1800 worshippers. Flat floor is for large number of worshippers.
 SCALE	Relatively lower than most mosques. Approx 7 times the human scale.	Relatively lower than most mosques. Approx 3 times the human scale.	Relatively lower than most mosques. Approx 3 times the human scale.	Relatively larger than most ancient mosques. Approx. 6 times the human scale.
 PROPORTION	Plan form is in proportion with human scale from exterior as well as from interior anthropometrically. Simplify form as a whole look seamless and simple. Proportion of outer facade is not interesting.	PLAN- Two scales of equal dimensions with circular openings on ceilings at exact centre. Equal segments are divided in plans. ELEVATION & SECTION: Cuboid is dominated by hemispherical dome of exactly same dia as width of main entrance.	PLAN- Only the prayer hall and pool are in proportion with each other. rest are not in proportion. ELEVATION: The overall composition looks complex and not in proportion with each other.	PLAN- Linear corridors are created and prayer hall is extruded out from it. ELEVATION: the overall composition looks as if composed of three cuboids with masonry as important with jali and arches. rest are simple and different in dimension. All blocks have same height.
 ARTICULATION	Acc. to plan, a circle seems to be inscribed in a square of exactly 20m*20m Exterior planes are meeting at right angles while curved walls are defining a circle in the interior. Verticals are left to be open intentionally.	Planes meet at right angles. Rough "L" angles are created. Both squares do not coincide with each other. Instead both are placed at a distance.	Planes defining prayer hall meet at right angle but corners facing north and south are left unmet with planes at 45 degree spoiling the corners and creating openings. Rest of the edges are according to spaces left and the plot edges with no proper angle.	All planes are meeting at right angles. The edges are either straight or oblique with respect to plot shape which is not exact rectangular.

Table 12:- Observation Table, Source: Author

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU-BAKR MASJID, ALAHABAD, INDIA
 PORTAL & ARCHES	No arches have been used two entrances. One on south facade and other on west facade. In total 7 entrances are there with width of 4023(130mm).	No arches have been used. Rectangular openings on the facade. Main entrance faces the courtyard in the east. In total 8 entrances are there measuring 22m(2.2m)	Principally no arches have been used except in patterns of gates. Rectangular openings on the inside as well as outside. In total 8 openings are there to enter the mosque with entrances on north and south acting as main entrances. (max height is 3m)	Tudor arches are used in jami window with 8m height of 2300mm. Four centred arches are used for door ways.
 COURTYARD	4 walls created by rotation of smaller square create courtyard.	Circular void of diameter 11m is created in the entrance court.	Circular void of diameter 11m is created in the entrance court.	Instead of courtyard there is a fore-court at the entrance surrounded by high boundary walls of 3m
 POND/WATER AREA	Abution area is equipped with water but no pool is present. Rainwater drainage channels are provided running around the prayer hall.	Abution area is located in the forecourt and not in the masjid.	Abution area is located in the courtyard on the east side with semicircular water pool. Circular seatings are fixed along the circumference for people. FLOOR radius measures 3m from wall of prayer hall.	Abution area is raised by 450mm on platform located along the northern side of boundary wall with stairs leading to it.
 PRAYER HALL	Square prayer hall measuring 16.75*16.75*10.6m is present which is supported by outer square by light walls. Perceived as a pavilion supported on 8 peripheral RCC columns.	Prayer hall measures 13m*22m*1m. Consists of 10 circular columns placed equally in alignment with opening on north and south facade. RCC columns have been used.	Prayer hall measures 15m*15m in plan. Divided into two parts. Entrance hall measuring 12*7.5.3m main hall with mezzanine measuring 13*10.7m. Main prayer hall consists of 14 peripheral columns and 2 endo columns supporting mezzanine floor. The also acts as a defined path leading to the mihrab.	Prayer hall is preceded by an broad-est passage with depth of 3.0m and length equal to prayer hall. Prayer hall is on two floors: ground and first floor. Prayer hall consists of colonnaded aisle of depth of 3.5 m on either side with a rectangular area in the middle. Here pointed cusped arches have been used.
 TRIPLE DOME/SINGLE DOME	No dome is present.	Dome is present but in a different way. Diameter is 10m but is decorated in eye shape thus bringing in light through jami. Height is 2.95m from terrace floor.	Dome of diameter 4 m constructed from centre of prayer hall is present, supported on grid of beams with quadrilateral on top for light to enter. Height of dome from terrace level is 4m.	Single onion shaped dome is used of diameter of 4m and height of 3.5m located on terrace of prayer hall.

Table 13:- Observation Table, Source: Author.

PARAMETERS	BAITUR RAUF MOSQUE, DHAKA	CHANDGAON MOSQUE, CHITTAGONG	MOSQUE-E-HAJI-ABDUR RAUF, MALEGAON, INDIA	ABU-BAKR MASJID, ALAHABAD, INDIA
 KURSI	No Kursi is present for keeping the QURAN	No Kursi present except niches are created on wall wall to keep books. QURAN is kept on minbar itself.	Kursi is present for keeping the QURAN in form of specific low height wooden boxes kept along the length of abite wall.	Kursi is present for keeping the QURAN in form of low niches created in the abite wall.
 DIKKA	No dikka is present	No dikka is present	No dikka is present	No dikka is present
 MINBAR MIHRAB	No minbar is present. Imam stands in front of all worshippers, thus leading the prayer. Light is used to mark qibla wall identifies sunlight visible through large in wall of prayer hall. Mihrab is marked by vertical slit in the qibla wall.	Minbar in form of raised platform with three steps with rise of 150mm. Mihrab(mihrab) is created in wall wall extending to ceiling with width of 5m. White grey marble is used for finishing.	Minbar in form of raised platform accessible using two steps made of niche carved wood. Mihrab is semicircular projecting out from the main wall with feature created using oblique square pattern. Mihrab measures 3.5 in width and projects 2m out from the main wall.	No segregation of Imam with rest is present, except that worshippers stand behind him. No minbar is present. 3 colonnaded arches of height 2 meters represents mihrab with a blank wall of distance of 2m behind arches acting as back drop.
 MAQSURA	No maqsura is present.	No maqsura is present.	No maqsura is present.	No maqsura is present.
 MINARET	No minaret is present except the four corners of a greater height their outer wall gives an impression of minaret in a perspective view.	No minaret is present.	Minaret measuring 12m in height is present. It is ended with a semi hemispherical top with triangular and rectangular punctures around the minaret.	A cuboid of height 12m stands beside the prayer hall appears like a minaret with loudspeakers installed.