A COMPARATIVE STUDY OF DOMES OF CONTEMPORARY JAMIA MOSQUES AND MUGHUL HISTORICAL MOSQUES OF LAHORE

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A Jamia mosque has been a major landmark in any Muslim settlement since ages and one of the most important institutions of the Muslim world. A dome, with its typical shape, has been a significant architectural element of a mosque from early times. However scientific, technological and industrial developments gave birth to new structural forms and shapes. Thus there are numerous new possibilities for the shape and form in place of a typical dome. It is being observed that the contemporary features and styles of domes of Lahore are different from the historic mosques of the Mughul era in terms of form, construction methodology, structure support system, materials and interior finishes. Thus objective of the current paper is to compare the architectural features and styles of domes in the Mughul historical mosques with those of the contemporary mosques built in newly established housing colonies in the same city. The objective is focus on evaluation of the changes in stylistic features of the new domes and also on the identification of factors responsible for new developments and contemporary trends in the domes of Lahore. In order to assess, a comparative analysis with the domes of Mughul historical mosques and domes of contemporary mosques from different locations of Lahore is done. The results are derived that some elements are used continuously in domes of Lahore throughout the history, but changes in trends are also observed. The conclusions are drawn and recommendations are formulated for future development. The study concluded that the architectural features and styles of domes constructed in contemporary mosques are different due to the change in materials, technological development and also due to lack of traditional skilled labor and time. The recommendations are given

to ensure that the architectural features and styles of contemporary domes should be in continuation of traditional Mughul architectural features and styles through appropriate transformation. There should be a properly developed statutory body of experts being responsible for constitution of some sound legislations and guideline for a systematic development of contemporary mosques.

Key Words: *Dome, Mosque, Mughul, Historic, Contemporary, Form, Style, Mughul*

INTRODUCTION

Statement of the Problem

Significant new forms have been introduced in architectural features and styles of domes in the contemporary mosque architecture of Lahore. These changes were required to be studied and analyzed.

Significance of Research

The objective of the research is to focus on the study of architectural features and styles of domes in the Mughul historical mosque architecture and to evaluate the changes in the stylistic features of the domes in the contemporary mosques of Lahore.

Research Methodology:

The methodology to conduct the research comprised on:

i. Literature study of historical mosques with respect to the stylistic and architectural features of domes were studied. For this evolution of domes, types and forms of earliest domes, parts of domes and historical context of domes were studied. Literature regarding Mughul historical mosques with respect to the stylistic and architectural features of domes of Lahore were studied. For this purpose three famous historical mosques named Maryam Zamani mosque, Wazir Khan Mosque and Badshahi Masjid were selected and studied.

ii. Documentation and literature regarding contemporary mosques with respect to the stylistic and architectural features of domes of Lahore were studied, the time period is from beginning of 21st century and the features of domes were documented and studied in detail. The study method included photographic surveys of the mosques as

well.

iii. Finally a comparative analysis of collected materials on domes of the Mughul historical and contemporary mosques were carried out. The conclusions were drawn with identification of the significant changes found through comparative analysis.

ANALYSIS AND DISCUSSION

THE DOME

Origin and Evolution

In mosque architecture, dome had been considered as one of the most important architectural element throughout the Muslim world. In Islamic architecture, dome had started from Umayyad period in Jerusalem in 691 A.D. The Dome of the Rock being the earliest known structure, which designed for circumambulation was not a mosque. It was commonly known that the advent of dome was subject to Byzantine architecture, especially San Vitale at Ravenna. Because of its inspirational symbolism and continuous use of dome in Islamic architecture by different architects and its distinct form from region to region led to the development of dome and its importance in Islamic architecture[1].

The Arab Muslims conquered various lands and converted the local religious buildings into mosques. As a result of this transformation it emerged as an amalgamation of mosques architecture. From the Dome of the Rock this feature was taken over by the Jami‘ Mosque of Damascus. Apart from mosques, the domes were also erected in grand palaces, different schools and public baths and other buildings. Semicircular domes were one of oldest and most common domes in the world[2]. The Mughul rulers of the South Asian subcontinent, particularly, added bulbous dome having Persian origin. The primitive domes were created as seen in Qairawan (670-675), Umayyad mosque in Damascus (705-707) and Cordoba (756-796). Specifically in Ottoman period the size and number of domes were increased significantly which covered the entire area as seen in the Suleymania mosque[3].

Typology

Different types of domes were found: Figure-1.1 (i, ii, iii, iv, v, vi, vii, vii)

Fig. 1
Beehive Dome
Source:
https://en.wikipedia.org/wiki/Beehive_tomb

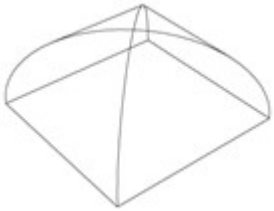

Fig. 2
Cloister Vault
Source:
https://en.wikipedia.org/wiki/Cloister_vault

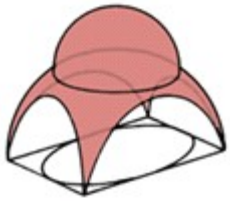

Fig. 3
Compound Dome
Source:
https://kids.kiddle.co/Dome

Fig. 4
Crossed - Arch Dome
Source:
https://commons.wikimedia.org/wiki/File:Cordoba_Mosque_02.jpg

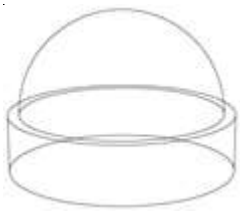

Fig. 5
Hemispherical Dome
Source:
https://en.wikipedia.org/wiki/Dome

Fig. 6
Onion Dome
Source:
http://photoeverywhere.co.uk/britain/brighton/slides/pavilion_roof3510.htm

Fig. 7
Oval Dome
Source:
https://en.wikipedia.org/wiki/Dome

Fig. 8
Umbrella Dome
Source:
http://www.santacroceopera.it/en/ArchitetturaEArte_Glossario.aspx#cupola

Figure-1.1(i, ii, iii, iv, v, vi, vii, viii): Different shapes of domes

Historical Context of the Dome

Following domes were found in civilizations developed during historical developments at by various nations: Figure-1.2 (i, ii, iii, iv, v, vi, vii, vii).

Fig. 1
Persian Domes
Source:
https://commons.wikimedia.org/wiki/File:Sheikh_Lotfollah_Mosque,_Isfahan_03.jpg

Fig. 2
Chinese Domes
Source:
https://en.wikipedia.org/wiki/Lei_Cheng_Uk_Han_Tomb_Museum

Fig. 3
Roman and Byzantine Domes
Source:
https://en.wikipedia.org/wiki/Dome#/media/File:Giovanni_Paolo_Panini_-_Interior_of_the_Pantheon,_Rome_-_Google_Art_Project.jpg

Fig. 4
Arabic and Western European Domes
Source:
https://en.wikipedia.org/wiki/Dome#/media/File:Dome_of_the_Rock_Temple_Mount.jpg

Fig. 5
Russian Domes
Source:
https://en.wikipedia.org/wiki/Dome#/media/File:Onion_domes_of_Cathedral_of_the_Annunciation.JPG

Fig. 6
Ottomon Domes
Source:
https://en.wikipedia.org/wiki/Dome#/media/File:Selimiye_Mosque,_Dome.jpg

Fig. 7
Italian Renaissance Domes
Source:
https://en.wikipedia.org/wiki/Dome#/media/File:Santa_Maria_del_Fiore.jpg

Fig. 8
South Asian Domes
Source:
https://en.wikipedia.org/wiki/Dome#/media/File:Taj_Mahal_2012.jpg

Figure-1.2 (i, ii, iii, iv, v, vi, vii, viii): Forms of historical domes

DOMES OF HISTORICAL MOSQUES OF LAHORE CONSTRUCTED DURING THE MUGHUL PERIOD

Imperial Mughals utilized and maintained a combination of the features and characteristics of Central Asian, Persian and local Hindu and Buddhist architecture. The synthesis so created was attractive and unique having its own distinct personality, ornate and handsome decoration with faience, faience mosaics, terracotta, red sand stone, marble and variety of other stones. Following significant historic mosques in Lahore constructed during the Mughul period were studied[4].

Maryam Zamani Mosque
(The Eld and Configuration of Dome)

The mosque also called Masjid Begum Shahi, was built at the command of Emperor Jahangir for his mother Maryam Zamani, its date of development was additionally affirmed as A.H. 1023, comparing to 1613 A.D[5]. The mosque came to be utilized by Ranjit Singh as an explosive industrial facility, which explains its having come to be known as Barud-Khana Wali Masjid. The mosque alongside shops and houses appended to it was restored to the Muslim community in 1850[6].

Its three massive domes, the central one being larger, and the heavy arches were found typical representation of the Pathan architectural style. On the other side, its gateways, the balconies and the flanking rooms were more close to the Mughul style. It, therefore, could be said that it portrays an amalgamation of Pathan and Mughul architecture thus hinting at a transitional phase[7]. Built in bare brick using lime as mortar,

the building carries five double-domes, the central one being supported by a 2.75m high neck. The double dome of the mosque was found to contain two shells, the inner shell contains stucco and both the shells were connected by wooden reinforcement[8]. Figure-2.1(i, ii)

Fig. 1
Domes of Maryam Zamani Mosque
Source:
http://cometopakistan.com/mosque-of-mariyam-zamani-begum/

Fig. 2
Domes of Maryam Zamani Mosque
Source:
https://www.wikiwand.com/en/Begum_Shahi_Mosque

Figure 2.1 (i, ii): Domes of Maryam Zamani Mosque

WAZIR KHAN MOSQUE
(The Eld and Configuration of Dome)

Among the architectural monuments of Lahore the Wazir Khan mosque has a very significant position. It had been found as one of the best specimens of Mughul architecture that retained unified features of Indo-Persian architecture. It was always an interesting landmark that mirrors the soul and ability of the Mughul developers as well as of the anonymous artisans, contributed their expertise in tile making, framework or wall painting to make the mosque not only a spiritual but also an appealing monument.[9].

Western side of the Wazir Khan Mosque courtyard comprised a rectangular chamber which was the prayer chamber or sanctuary of the mosque. The five chambers of the sanctuary were surmounted by five squat domes and the five arches facing courtyard, form the facade of the sanctuary. The central dome was larger than the rest. Its height was found 17.60 m including its finial with a diameter of 7.90m and the side ones were 14.30 m high and their diameters measured 5.75 m2, all double shelled. All the five chambers of the sanctuary were exactly alike except the central one which was larger and more elaborate in adornments than the other four[10]. Figure-2.2(i, ii)

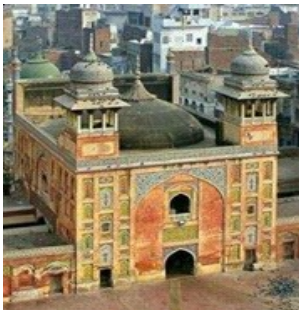

Fig. 1
Domes of Wazir Khan Mosque
Source:
https://www.pakistanpoint.com/en/story/341506/wazir-khan-mosquean-architectural-relic.html

Fig. 2
Domes of Wazir Khan Mosque
Source:
https://commons.wikimedia.org/wiki/File:Domes_of_Wazir Khan_Mosque.JPG_

Figure 2.2(i, ii): Domes of Wazir Khan Mosque

BADSHAHI MOSQUE
(The Eld and Configuration of Dome)

Badshahi mosque at Lahore, which was also sometimes called Alamgiri Masjid, was built during the period of Emperor Aurangzeb Alamgir in the year 1673-74 A.D. The mosque was restored to its original design after comprehensive conservation work conducted from 1939 to 1960 at a cost of 4.8 million Rupees. The main entrance was still on the east, which was approached by a flight of 22 steps rising from three sides and ended on the red sandstone platform[11].

It was found that the most conspicuous features of the mosque were its three crowning bulbous domes on the top of the rear chamber of the prayer hall. The central dome was larger and much higher than the other two to the right and left. The domes were attractively and systematically erected on a squinch system which was covered with marble layers, and they had shinning pinnacles clearly seen from a great distance[12]. They had very beautiful golden finials on their tops which also could be seen from a great distance shining in the Sun. In reality, the domes were composed of inner and outer shells of masonry with distinct spaces or voids of 30' x 322' and 394' x 431' respectively, between the domes. They were known as double domes. The reason for this structural procedure became necessary because of the inclination to raise the height of the dome and afford an easy swelling in shape, so that the domes would present a loftier and more majestic appearance[13]. This innovation of the double dome had also helped acoustics by controlling and transmitting the sound of the sermon rising from the Mihrab (niche)

beneath the central dome in such a way as to avoid an echo. But undoubtedly the crowning glory of the elevation of the prayer chamber of this mosque lied in the bulbous shape and volume of these domes which, supported by lofty drums of 21 ft. and 32 ft. respectively[14]. Figure-2.3(i, ii)

Fig. 1
Domes of Badshahi Mosque
Source:
https://www.pbase.com/bmcmorrow/image/140585422

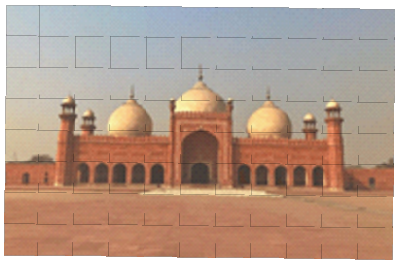

Fig. 2
Domes of Badshahi Mosque
Source:
https://www.blizinhotels.com/articles/badshahi-mosque-the-symbol-of-mughal-grandeur

Figure 2.3(i, ii): Domes of Badshahi Mosque

DOMES OF CONTEMPORARY MOSQUES OF LAHORE – BUILT IN LAST SIXTEEN YEARS

Many housing societies have emerged in Lahore in the past 30 years e.g. Defense Housing Authority (DHA), WAPDA Town, Valencia Town, Bahria Town, Sukh Chen Society, Lake City, Eden Developers Society etc. were considered as well established societies. It was observed that the city of Lahore had expanded towards South East and South West. Domes of newly constructed mosques were mostly benchmarks of the housing societies found everywhere, but the features and styles of domes were found quite different from the Mughul historic domes of mosques of Lahore in terms of form, material, structure support system, construction techniques and interior finishes. Significant changes had occurred in the architectural features and styles of domes in the contemporary mosques of Lahore. It is necessary to point out the difference between a real arch or dome or false arches and domes. Real arches and domes are constructed to distribute the weight from above, while false arches and domes are built by RCC the shapes having only a decorative value.

CRITERIA OF SELECTION OF CASESTUDIES

For the purpose of research, case studies were chosen from different

areas of Lahore which have been developed during the last sixteen years. The logical reasoning of the selection of Jamia mosques is from the last sixteen years, precisely after 2001, there was huge development in the construction industry and a lot of public/private housing schemes were developed on different scales. This mushroom growth of housing societies, particularly in the said years, generate multiple discussion in several areas, from which the author took the dome as a component of mosque to research. The selected mosques included the Jamia mosques from various societies having number of worshipers five times a day. These mosques were grand in size and were properly designed by different architects. These mosques were constructed with the latest construction technology and served as the benchmark of the societies. The selected mosques were analyzed and described in detail.

GRAND JAMIA MOSQUE BAHRIA TOWN– LAHORE

In 21st century the Grand Jamia Mosque in Bahria Town, Lahore was considered as one of the best examples. The mosque maintained the true essence of Islamic spirit blending with modern elements. Its creativeness was motivated by vernacular construction traditions also using Indo-Islamic spirit of development. The mosque was designed by the renowned architect, Nayyar Ali Dada, and was inaugurated on Eid-al-Adha on 6 October 2014. It could accommodate 70,000 worshipers having 25,000 indoor worshippers 'capacity. The exterior of the mosque consists of 4 million and 2.5 inch thick handmade Multani tiles made by the professional *craftsmen*[15]. *Figure-3.1*(i, ii)

Fig. 1
View of The Dome of Bahria Town Grand mosque

Fig. 2
View of The Dome of Bahria Town Grand mosque

Figure 3.1(1,2): Views of The Dome of Bahria Town Grand mosque
Source: Authors

DOME OF BAHRIA TOWN GRAND MOSQUE:

The dome of Bahria town, which had been placed above the roof top with 80 feet height, in the center like a majestic crown which has been surrounded by 20 smaller domes of the same form. The central dome was the crown jewel, the outstanding piece of workmanship. The dome was 40 ft. in height having a diameter of 50 ft. which gave the feeling of granduer.

The interior of the dome is fully decorated with Muqarnas designs, in a fiber glass material having a wood finish to retain its grandeur. The lighting system is installed all around its back and there is proper gate for maintenance at the back of the dome. Figure 3.2 (1,2)

Fig. 1
Interior view of The Dome of Bahria Town Grand mosque

Fig. 2
Interior view of The Dome of Bahria Town Grand mosque

Figure 3.2(1,2): Interior view of The Dome of Bahria Town Grand mosque
Source: Authors

BAHRIA TOWN SECTOR "F"MOSQUE – LAHORE

Grand Jamia mosque Sector "F" located in Bahria Town, Lahore, designed by Bahria Town Design wing was inaugurated on Eid-al-Fitr in July 2016. It could accommodate 1000 worshipers indoors, while the courtyard could also accommodate 300 worshipers. The mosque was four feet above the road level having the rooftop elevation to 65 feet and the Grand Dome was placed at the center like an impressive crown. The courtyard was designed with hydraulic umbrellas which would act as a shading device against the sun and rain. The structure comprised of one minaret, 90 feet tall and a grand beautiful dome, which covered the whole prayer hall. In the courtyard, there was very precious inlay work on China Verona marble which gave a lofty look for the entrances. Figure 3.4(1, 2)

Fig. 1
View of Bahria Town Sector "F" Mosque

Fig. 2
View of Bahria Town Sector "F" Mosque

Figure 3.4(1, 2): Views of Bahria Town Sector "F" Mosque
Source: Authors

DOME OF BAHRIA TOWN SECTOR "F" MOSQUE:

The mosque is comprised of beautiful grand dome having magnificent piece of craftsmanship. It was 45 feet high from the ground level and covered 52'x 52'feet Prayer Hall having a radius of 24feet. The interior of the dome was fully decorated with Muqarnas design patterns, in a plywood material cladding having a wood finish to retain its grandeur. Qur'ānic verses were inscribed all around the interior of the dome. Figure-3.5 (1, 2)

Fig. 1
Interior View of Bahria Town Sector "F" Mosque

Fig. 2
Interior View of Bahria Town Sector "F" Mosque

Figure 3.5(1,2): Interior Views of Bahria Town Sector "F" Mosque
Source: Authors

D.H.A. PHASE–V MOSQUE–LAHORE

The Jamia mosque D.H.A. located in D.H.A. Phase-V, Lahore was designed by D.H.A. Design Wing and can accommodate 1000 worshipers indoor and outdoor collectively. The base of the entire structure was elevated 4 feet above the ground / road level having 7 steps and ramp access also, with the rooftop rising to 43 feet and the prayer hall had a grand dome placed in the center with a pinnacle. There was no use of calligraphy and the facade had graffito finish with the use of tiles. The mosque was designed in a Turkish style with large number of half domes placed at the corners and a pointed minaret standing alone towards the west side. Figure-3.7(1, 2)

Fig. 1
View of Grand Mosque At Phase-V DHA Lahore

Fig. 2
View of Grand Mosque At Phase-V DHA Lahore

Figure 3.7(1, 2): Views of Grand Mosque At Phase-V DHA Lahore
Source: Authors

DOMES OF D.H.A. PHASE–V MOSQUE:

The mosque comprised of beautiful grand dome in the center which covered the whole praying area. It was 43 feet high from the ground level and covering Prayer Hall of 50'x 50'feet, having a diameter of 28 feet with a chrome pinnacle at the top. There were a lot of half domes, designed as found in historic Turkish mosques, at the corners of the mosque supporting the structure as well. The interior of the dome was fully painted with white emulsion having a hanging chandelier which is illuminated after dark. Figure-3.8 (1, 2)

Fig. 1
Interior View of D.H.A.
Phase – V mosque

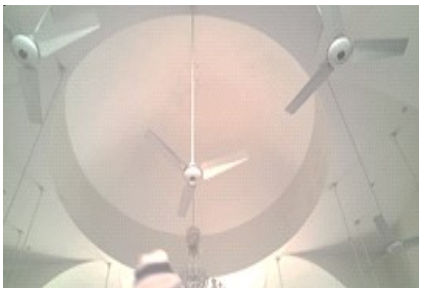

Fig. 2
Interior View of D.H.A.
Phase – V mosque

Figure 3.8(1,2): Interior View of D.H.A. Phase – V mosque
Source: Authors

SUKH CHEN MOSQUE – LAHORE

The mosque of Sukh Chen, the central Jamia mosque of the Sukh Chen Society, was inspired by the famous Blue Mosque of Istanbul, Turkey. The mosque has a combination of grey and white facade having two minarets with conical top with the blending of pointed arches and domes. The interior was richly decorated with painted floral patterns and calligraphy by Turkish calligraphers. There was a beautiful arcade running outside in the open courtyard having small domes. Figure-3.9 (1, 2)

Fig. 1
View of The Sukh Chen Mosque

Fig. 2
View of The Sukh Chen Mosque

Figure 3.9 (1,2): Views of The Sukh Chen Mosque
Source: Authors

DOME OF SUKH CHEN MOSQUE

The mosque comprised of beautiful grand central dome 15 feet in

diameter having 24 windows all around with colorful stained glass finish having pinnacle at the top. The mosque had four small full domes 10 feet in diameter with 10 windows covered with stained glass finish. As it was a replica of the Blue Mosque, four out of total eight half domes were of equal size, one had seven widows and other half domes had five windows each with stained glass. All the domes both full and half covered the whole praying area of the mosque. The interior of the dome was richly decorated with painted floral patterns and calligraphy with blue color in Turkish style. Figure- 3.10 (1,2)

Fig. 1
Interior view of the Sukh Chen Mosque

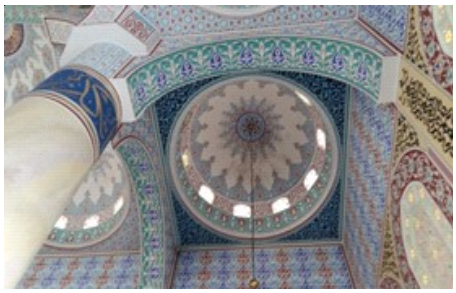

Fig. 2
Interior view of the Sukh Chen Mosque

Figure 3.10(1,2): Interior Views of the Sukh Chen Mosque
Source: Authors

ASSESMENT AND COMPARISON OF DOMES OF MOSQUES OF LAHORE - PAKISTAN

In order to assess the significant changes in the architectural features and styles of domes in contemporary mosques of Lahore, a comparative analysis with the domes of historic mosques was considered. For this purpose, domes of historical mosques and domes of contemporary mosques from different locations of Lahore were compared. The results were derived that some elements were used continuously in domes of Lahore throughout the history, whereas the change in trends was also observed. Following considerations were considered appropriate for the purpose of comparison. Table 4.1

1. Form
2. Materials
3. Construction technique
4. Structural Support Systems
5. Interior Finishes

4.1: Table Showing Comparative Analysis of Domes of Mughul Historical Mosques with the Domes of Contemporary Mosques

Table 4.1: Comparative Analysis of Domes of Mughul Historical Mosques with the Domes of Contemporary Mosques

Consideration	Mughul Historical Mosque	Contemporary Mosque
Form	• Square to Circular Shape • Bulbous Shape • Double Dome	• Having no specific common shape
Materials	• Limited number of materials (stone, dress brick etc.)· • Cut dressed small brick • Lime mortar • Lime plaster • Timber and bamboo scaffolding	• Large number of materials· • Reinforced Cement Concrete • Fiber Glass • Cement Plaster • Brick • Iron Scaffolding
Construction Techniques	• Traditional Methods/ techniques • No Prefabrication • On site construction • Working was physically and manually done • Small brick domes were made with concentric rings • Intersecting of arches made large domes	• Very vast construction methodology and variety of techniques • Concept of prefabrication • Pouring of cement after proper wrought iron framework • Heavy machines are used
Structure Support Systems ·	• Quarter Domes • Half Domes • Muqarnas • Ring Beam to get Hoop reinforcement in Double Domes · ·	• Reinforce Cement Concrete • Other elements are designed for aesthetics

Interior Finishes	• Highly decorated interiors • Proper Inlay • Properly Designed Frescos • Quranic verses in Arabic Calligraphy • Designed Muqarnas · • Designed Circumference of dome interior for proper acoustics • Variety of interior finishes like: *Khishti Kunda Kari, Kashi Kari,* Filigree work, *Mina Kari, Tarseem Bandi, Pucca Qali, Munabbat Kari, Taza Kari, Ahan Kari, Aina Kari, Khanda, Ghalib Kari, Khatati,* Pietra Dura and Timurid Peshtatq ·	• Normally decorated interior finishes • Interior decorated with pasted fiber glass designed molded sheet • Simple distempers and paint finishes are used • Active means like speakers and other sound systems are used • Wood work, painted patterns, ceramic tiles are also used.

5 CONCLUSIONS AND RECOMMENDATIONS

The study of contemporary trends of domes in mosque architecture of Lahore revealed that the domes of the contemporary mosques are quite different from the historic mosques of Lahore. There is huge change found in architectural features and styles of the beautiful elements of mosque architecture. There are a lot of factors behind all these changes in terms of features and styles in mosque architecture. Therefore some conclusions have been derived from the research to analyze the direction of the contemporary domes of Lahore and some recommendations, as described in the following section, are made for future development of contemporary trends of domes and minarets.

CONCLUSIONS

The study revealed that the historical domes had grand forms, every building reflected the wealth and power of the empire with attractive structures erected with marble and inlay works. Thus they generated very important role in monumentality in terms of size and visibility. The historic mosques of Lahore had been mostly built by the grand emperors of the time. They could manage huge labor, ample time and tremendous

amount of wealth to build magnificent mosques. But in contemporary times small *Mohallah* (neighborhood) mosques are built on low budget or through the *Chanda* (fund collection) collection and they take many years to complete. In case of housing societies with great affordability, the developers finance the *Jami*ʿ and sector mosques, and their aims are to construct an aesthetically pleasing structure in the minimum possible time to attract investors. Different influencing criteria such as political, economic, time and issues of skilled labor are involved, which created such gap and confusion in the revival of features and styles of domes in contemporary mosque architecture of Lahore.

· The historical mosques of Lahore had very limited number of materials such as lime mortar, stone, marble, cut dressed small brick, clay etc. But now after massive industrialization most materials are produced with Reinforced Cement Concrete as the major material, from which constructor got the larger span area and greater height in very less time. The production of fiber glass, different classification of wood, different classifications of steel and other new materials play a very important role in changing trends. As the materials are changed, the product detail and finishes are also changed which result in changing styles and features. It is concluded that the changed materials in construction techniques resulted in changing styles and features of contemporary domes of mosque architecture of Lahore.

· In terms of constructions methodology, in older times of historic mosques of Lahore, the construction methodology was rather limited and normally on the site constructions with manual labor had taken place. So everything was fabricated on the site with huge labor work. Now in the 21st century huge building machines are available and large number of offsite construction could be done easily with the help of prefabrication. New methodologies with new materials can easily be handled. Thus changing techniques in construction methodology resulted in changing styles and features of contemporary domes of Lahore.

· In historic mosques of Lahore, different types of structure support systems were used for supporting the domes. Different types of crossed arches over which domes were placed and different techniques of hoop reinforcement (mostly for double domes) were used for supporting the domes and specially quarter domes, half-domes, Muqarnas were used for supporting the structure. Nowadays simple load bearing structures or trabeated structure systems are available which support the dome respectively. Only R.C.C. structures are frequently used to cover large spans and get the complete structural support into the mosques.

In historic mosques domes of Lahore, classical interior finishes with different types of frescos and inlay work were used widely. Now in modern times, no such work has been done because firstly no skilled labor is available nowadays for this kind of work, secondly mostly people nowadays lack such kind of tastes and the most important factor is that these works needed a lot of time and a slow process is not feasible for the contractor to construct and even for the developer. Different kind of vegetable colors are now produced by which interior finishes are to be finished. So the changing trends with different criteria tended to make the radical changes in the stylistic features of contemporary style of domes.

RECOMMENDATIONS

Following recommendations were made of from the comparative studies of domes of mosques of Lahore.

- Continuity through transformation: The present contemporary architectural features and styles of mosques should not be alien structures rather they should be in continuity of historic features. In other words, it must be ensured that the contemporary architectural features and styles of mosques be in continuation of traditional Mughul architectural features and styles of mosque architecture through appropriate transformation.
- Availability of authentic literature: There must be the authentic literature and developed archive based on the study of Mughul traditional features and styles as well as contemporary features and styles of domes and minarets of mosque architecture of Lahore. More of such studies be undertaken for strengthening the valuable literature.
- The R.C.C. is the major building material now a days and one could easily mold any form with its use. It must be, however, considered important that the forms of contemporary domes should be in line with proportion and scale with respect to the overall architectural scheme of the building and its surroundings. It would ensure the continuity of design and underlying geometry of the Mughul historic structures.
- New materials should be used in continuation of traditional Mughul domes such as those of grand Jamia mosque in which architect used brick, Rosewood, *Khatatti* and enameled tiles etc. and gradually tried to transform a traditional style into contemporary one without affecting the monumentality of a mosque.
- With regard to interior finishes, with development of new industrial

materials, one could not stop their use because contemporary materials are easier to manufacture and can also be readily used. Different kind of vegetable colors, wallpapers, enamel colors, stone tiles etc. are found available in the market, but all the interior finishes with new materials should not be falsified i.e. *Kashikari, Tazakari,* glazed lime plaster, decorative arts, *Khatati, Ahankari* and other inlay work, frescos etc. should be respected in true manner when developing with new materials.

- Establishment of a Statutory Body: There must be a statutory body under the Federal or Provincial Government which must be functioning towards regularizing under the act and should make some sound legislation for the development of contemporary mosques. Such a body would be a centralized department at Provincial or Federal level whose enactment should be autonomous. This body should be made responsible for the contemporary mosques being designed by the architects, engineers and developers. Their responsibility should be to check and wet the drawings of the mosques by reviewing its forms, architectural features and styles. They should also check the form of contemporary mosques which should have strong concept of geometrical interpolation in planning like the traditional mosque of the Mughul era. There must be geometrical analysis of the forms being designed by the architects and it must be ensured that the form was regular and well-proportioned. All the selections and rejections of the drawings should be from this department. The hierarchy of this department could develop by engaging senior architects of the country having deep insights into the traditional architectural styles of Pakistan including field practicing architects, structural engineers, material specialist, qualified contractors, institutional professors, conservationist, archaeologist and art historians.
- Revival of the Skilled Labor: There must be the revival of skilled labor. The renowned families (*Ustad Gharanay*) which were expert in the construction of traditional stylistic features like the *Khishti Kunda Kari, Kashi Kari, Mina Kari, Binat Kari, Pucca Qali, Khatati* etc. should be called upon by the proposed department which shall engage them for such art work in the future. This will be an attempt to restore the skilled labor and their professional traditional techniques that had been lost due to the practice of contemporary trends in mosque architecture. This attempt would be bi-fold i.e. it would not only be the revival of the stylistic features of the traditional mosques in the contemporary trends but also the revival of traditional skilled labor and professional techniques. Once such type of skilled labor would be in the market, there would be an account of new job opportunities for the

skilled labor that would not only serve at national level but also at international level like in recent conservation and restoration work of Wazir Khan Hammam done by AKCSP, in which fresco art techniques and all inlay works were done by Sri Lankan experts conservationists and historians.

· Centralization of *Chanda* (Fund) Collection: The funding and *chanda* collection for the construction of the mosque must also be under the centralized department. The collection boxes of *chanda* scheme must be installed and collected by the centralized department and must work under some act, like Auqaf Department administers the fund in most of the mosques of Lahore like Wazir Khan, Sonehri Masjid, Data Darbar Masjid etc.

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