

Historical Development of Bagh-e Dasht in Herat, Afghanistan: A Comprehensive Field Survey of Physical and Social Aspects

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Abstract—Bagh-e Dasht area is situated in the northern part of Herat, an old city in western Afghanistan located on the Silk Road which has received a strong influence from Persian culture. Initially, the Bagh-e Dasht area was developed for gardens and palaces near Joy-e Injil canal during the Timurid Empire in the 15th century. It is assumed Bagh-e Dasht became a settlement in the 16th century during the Safavid Empire. The oldest area is the southern part around the canal bank which is characterized by Dalans, sun-dried brick arcades above which houses are often constructed. Traditional houses in this area are built with domical vault roofs constructed with sun-dried bricks. Bagh-e Dasht is one of the best-preserved settlements of traditional houses in Herat. This study examines the transformation of the Bagh-e Dasht area with a focus on Dalans, where traditional houses with domical vault roofs have been well-preserved until today. The aim of the study is to examine the extent of physical changes to the area as well as changes to houses and the community. This research paper contains original results which have previously not been published in architectural history. The roof types of houses in the area are investigated through examining high resolution satellite images. The boundary of each building and space is determined by both a field survey and aerial photographs of the study area. A comprehensive field survey was then conducted to examine each space and building in the area. In addition, a questionnaire was distributed to the residents of the Dalan houses and interviews were conducted with the Wakil (Chief) of the area, a local historian, residents and traditional builders. The study finds that the oldest part of Bagh-e Dasht area, the south, contains both Dalans and domical vault roof houses. The next oldest part, which is the north, only has domical vault roof houses. The rest of the area only has houses with modernized flat roofs. This observation provides an insight into the process of historical development in the Bagh-e Dasht area.

Keywords—Afghanistan, Bagh-e Dasht, Dalan, Domical vault, Herat, over path house, traditional house.

I. INTRODUCTION

HERAT is a historic city in western Afghanistan located on the Silk Road. It was once one of the main areas of Great Khorasan, where Persian culture had a strong cultural and architectural influence.

Bagh-e Dasht, often known as Bagh-e Tasht, is the area

situated in the northern part of Herat city (Fig. 1). In comparison to other areas of the city, Bagh-e Dasht has the most well-preserved traditional landscape. According to our surveys conducted in 2018, the main architectural feature of traditional houses in Bagh-e Dasht is Dalans, sun-dried brick arcades located in residential areas. Another architectural feature of Bagh-e Dasht is the houses constructed above Dalans.

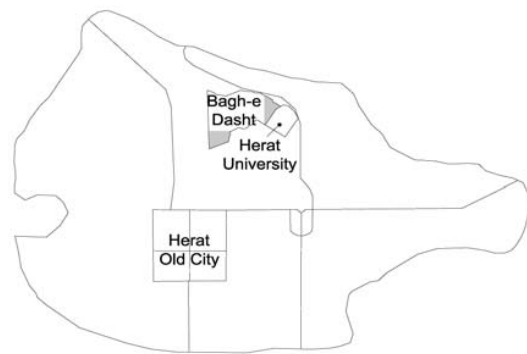


Fig. 1 Location of Bagh-e Dasht in Herat, Afghanistan (Drawing by K. Kawish 2018)

The existing literature on Dalan is very limited. Geist [1] describes the architectural and social history of the arcade as well as its typology. Rudofsky [2] includes images showing arcades in Bern, Aibar, Portugal, Monpazier, Spain and the old Moravian town of Telc. It also shows covered streets in Spain, Italy and the Libyan Desert. Goldfinger [3] describes the construction of a network of bridges, ramparts, and alleyways designed to defend the town against invaders who might have penetrated the perimeter walls. Najimi shows Dalans in Herat Old City [4]. Kawish et al. [5] study traditional houses with domical vault roofs in Herat city in detail as well as their distribution in Iran and Afghanistan in 2018 [6]. The Herat Garden letter [7] gives only a very brief historical background of the Bagh-e Dasht area. However, the Bagh-e Dasht area alone, specifically its traditional houses and Dalans, has not been undertaken as a subject of study.

This study looks at how the Bagh-e Dasht area was developed, transformed and preserved, focusing on Dalans and traditional houses with domical vault roofs. The aim of the study is to examine the extent of physical changes to the area. Following the introduction in Section I, Section II explains the research methodology. Section III describes the historical

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background of Bagh-e Dasht. Section IV explains the physical characteristics of Bagh-e Dasht. A conclusion is drawn in Section V.

II. RESEARCH METHOD

In this study, high-resolution satellite images of Herat (2017) were used in order to determine the study area. Based on an analysis of the satellite images, Bagh-e Dasht was identified as one of the areas in which traditional houses with domical vault roofs are concentrated in Herat. Moreover, it was determined that the area near Joy-e Injil (canal) was the best-preserved area in Bagh-e Dasht with the highest concentration of traditional houses with domical vault roofs. This area was therefore selected as the study area (Fig. 2).

Next, a comprehensive field survey was conducted from January to March of 2018 to observe the physical and social aspects of the study area. In the survey, we delineated the boundaries of all buildings and spaces while documenting physical information on each building and space. We surveyed all alleys/roads in detail. Regarding Dalans (covered alleys) in the study area, we took measurements and distributed questionnaires to the residents of 32 houses face to Dalans. The Wakil (local chief) of the study area, local historian, and residents of all houses in the study area were also interviewed. To provide insight into the construction process of a Dalan in Herat City, Abdul Salam Abdul Hamid (Age 67), a traditional builder with 25 years of experience in the construction of vault structures and Abdul Ghafoor Sultan Ahmad (Age 62), who has 20 years of experience in the construction of vault structures, were interviewed in February 2018.

Finally, the results of the study were examined alongside the existing literature in order to draw a conclusion.

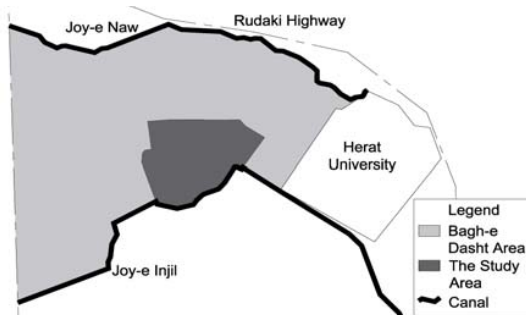


Fig. 2 Bagh-e Dasht and the study area (Drawing by K. Kawish 2018)

III. HISTORICAL BACKGROUND OF BAGH-E DASHT

According to Heravi [7] and corroborated in an interview with Walishah Bahre, a prominent historian in Herat in January 2018, there were historically many Baghs (Gardens) in Herat city, among which existed seven major ones; Bagh-e Dasht, Bagh-e Morad, Bagh-e Nazargah, Bagh-e Zobaida, Bagh-e Safid, Bagh-e Zaghan, and Bagh-e Masan. Bagh-e Dasht was one of the most popular Baghs. However, at the time of the Mongol invasion of Herat (1221), only agricultural land plots existed between Joy-e Injil and Joy-e Naw, the two

main canals in Herat city. There were no buildings or other constructions. The area was used for horse riding and seasonal picnics held by the upper class during the Timurid Empire (1405-1507). In the vicinity of Joy-e Naw, known as Darvishan Cave, there was a ruined garden with destroyed walls and palaces called Bagh-e Dasht. Ali Sher Nawaee, the public adviser to the Timurid Empire (1441-1501), played an important role in the regeneration of Bagh-e Dasht by reconstructing palaces and mosques to recreate a recreational place. Today, there is no trace of such a garden, and the area is covered by settlements [7].

Intense urban development took place during the Timurid period, including the development of Herat beyond the boundary of the Old city. There are still more than sixty Timurid structures in Herat. Large-scale transformations occurred. The recreational area was expanded from the slopes of the mountains in the east and to the north of the town outside Herat beyond its former limit at the Joy-e Injil. The Timurid established a series of large gardens outside the city [8]. These Baghs (such as the Bagh-e Morad or Bagh-e Jahan ara) constituted the real centers of power, since it was here that the king or governor resided most of the time. During the Timurid Empire, Herat was effectively divided into three different stages on which politics were played out: the citadel, the various royal Baghs and the city itself. Royal authority was gained in the Baghs, the citadel provided protection and the city was a space in which popular acclaim might be found [9]. Thus, the Baghs were recreational places as well as political centers in the Timurid Empire. The town in the main preserved its earlier topography during the Safavid period (1510-1716); a plan of Herat drawn by Tumanovich shows the major buildings mentioned in the Safavid sources [10]. From 1537 onwards, the Safavids pursued urban development after a long period of neglect of the town. Thus, the development of Bagh-e Dasht began as agricultural lands between two main canals, Joy-e Injil and Joy-e Naw, due to the need for accessibility to water for irrigation. Later on, many gardens with palaces and mosques were constructed in the same area to create a recreational space for governmental and other high ranking citizens in the Timurid Empire, driven by a cultural interest in the construction of gardens and large scale buildings. Up till this point, there had been no residential settlements in Bagh-e Dasht.

After the Timurid Empire, it appears that the Safavid Empire was not quite as powerful, and as a result the people could construct several settlements, pools and other structures in this previously exclusive area. Furthermore, the Safavid concentrated on the construction of settlements rather than gardens because of the war struggle. Thus, agricultural lands and gardens were replaced by settlements. The map in Herat the Islamic city [4] shows a monument in Bagh-e shah in the vicinity of Joy-e Injil, behind the study area prior to the establishment of Bagh-e Dasht (Fig. 3). It seems that the settlement process began in this area due to security reasons, being close to the residential area. Later, the settlement was expanded to Bagh-e Dasht in the vicinity of Joy-e Injil. Reference [4] also shows a few settlements of Bagh-e Dasht

area which are only in the vicinity of Joy-e Injil canal in 1963. According to interviews with locals and the wakil of Bagh-e Dasht in January 2018, Bagh-e Dasht is more than 400 years old, created during the period of the Safavid. The residents were mostly relatives and familiar with one other, and the local people were mostly farmers.

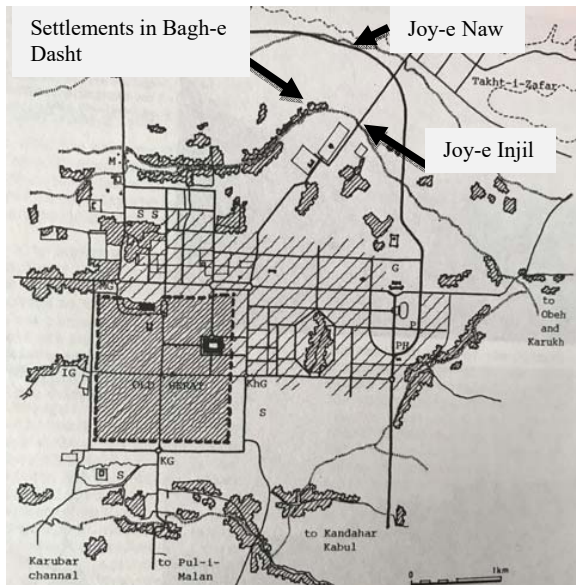


Fig. 3 Map of Herat in 1963 (Drawing by Lezine 1964, [4])

IV. THE PHYSICAL CHARACTERISTICS OF BAGH-E DASHT

Bagh-e Dasht's traditional architecture is extremely well-preserved compared to other areas of Herat city. According to our surveys conducted in 2018, the main architectural features of traditional houses in Bagh-e Dasht are Dalans and the houses built over them.

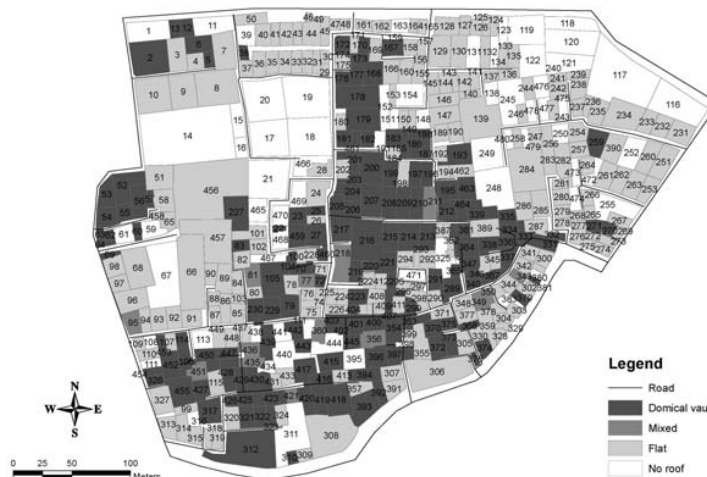


Fig. 4 Roof types in the study area of Bagh-e Dasht (Drawing by K. Kawish 2018)

It is possible that Dalans were constructed in the Safavid Empire in Bagh-e Dasht, at the same time as traditional houses with domical vault roofs. Construction of Dalans became

Traditional houses in Herat are constructed with sun-dried brick masonry (mud-blocks) due to factors such as a dry climate, available materials and the regional culture. Masonry curved roof construction (mainly domical vaults) is used for the roofs [5].

A. Land Uses /Houses

According to the survey, the study area has 480 buildings and spaces in total; 411 are buildings (407 houses and two mosques) and 71 are other spaces (18 farm lands, four gardens, nine ruined places and 40 empty spaces). Among the 411 buildings, 165 (40%) (164 houses and one mosque) have domical vault roofs, 232 (56.5%) (231 houses and one mosque) have flat roofs and 14 (3.5%) houses have mixed roofs (both domical vault and flat).

The survey shows that the study area is now filled with residential houses and that green areas/gardens are scarce. The number of house lots is similar in both the southern and other parts of the study area, but small lot houses are mostly distributed near the main Dalan in the southern part of the study area.

Through examining the distribution of domical vault roof and flat roof houses, it is found that domical vault roof houses are mostly concentrated in the southern part toward the center of the northern part of the study area, and in a concentrated spot in the west. Flat roof houses are distributed in the north eastern and north western parts of the study area (Fig. 4). Since smaller house lots, irregular road networks and domical vault roof houses indicate the old age of the area, it can be thought that the settlement process of the study area began in the southern part and expanded to the central part toward the north. Later, the settlements developed in the north eastern and north western area and further (Fig. 9).

common in the Safavid Empire when there was less security, but over time the need for Dalans decreased due to improved security and the construction of uncovered walkways.

Nonetheless, construction of traditional houses with domical vault roofs continued until 30 years ago as they were the cheapest to construct using locally available materials. According to interviews with local people and residents of the flat roof houses, most of the flat roof houses in the southern parts of the study area were former domical vault roof houses which had been replaced by new flat roof houses. There are several reasons explaining the demolition of traditional houses with domical vault roofs; one is that the population of the community has been increasing, and there is a need for larger and multi-story buildings. Another reason is that the improved economy now allows locals to build modern houses. Changes in the lifestyle of the people and a lack of modern facilities in traditional houses are other reasons given to explain the replacement of traditional houses by modern houses.

B. Streets/Dalans

The German word “arcade” comes from the French ‘passage’, which was used as early as the 18th century to refer to the narrow private streets that divided and connected the interiors of larger building blocks. An arcade not only eases traffic in a congested area, but also provides a weather protected area, accessible only to pedestrians. There are three common types of arcades; passage, Suq and Dalan. Passages are common in Europe and feature glass roofs. “Passage du Caire” is the name of one of the Parisian arcades built in 1799 [1]. The term Suq means a place for goods and necessities (market) and is used in streets and other localities where there is a market. The Suq is one of the pre-requisites for an Arabic-Islamic city. Suq al-Attarine, the perfumers’ market in Tunis, is a good example of a Suq [11]. The word “Suq” most likely refers to Arabic/North African traditional markets, which have fired-brick structures. The name “Bazaar” is commonly used for marketplaces in Persia, which are similar to the Suq in Arabian countries. Isfahan Fabric Bazaar is an example of

such a bazaar in Iran [1]. The Dalan is also a type of arcade which is common in Persia. It features a sun-dried brick barrel vault roof and is found in residential areas. It is unique compared with other arcades due to the sun-dried brick barrel vault roof and its usage in residential areas, while Passage, Suq and Bazaar are used only in commercial areas. The city of Bam in Iran is well-known for the historical citadel of Arg-e-Bam, which is about 2,000 years old [12]. Bam has been inhabited since the Achaemenids period (550-330 BC). Besides the citadel, the main part of the ancient city was founded during the Sassanid period (224-37 AD). Most of the remaining ruins were built during the Safavid period (1502-1722 AD) [13]. According to photos taken by Mitsuteru in 2001 [14], Bam citadel includes Dalans (walkways covered by vaults).

According to interviews with traditional builders, the process of Dalan construction begins with building load-bearing walls with a thickness of around 1.4 m at two ends of the walkway. The first sun-dried brick (0.3 m×0.3 m×0.05 m) course, which is skewed toward the supporting walls, is then laid. Other courses of sun-dried brick are laid toward the other end of the wall. The joints between sun-dried bricks are filled with Gel (mud). Finally, the roof is covered with layers of 0.04 m of Gel and 0.04 m of Kah-gel (mud with straw). Occasionally, after the final cover is dried, another layer of 0.03 m of Kah-gel is added to the roof to prevent rain or snow water penetration to the substrates. The interior of the Dalan is also covered with a layer of 0.015 m thick Kah-gel (Fig. 5). Kawish et al. [5] explain the construction method of domical vault roofs in detail as well as its different patterns. Although the construction material of the domical vault and the Dalans is very similar, the method of laying bricks is different (compare Figs. 5 and 6).

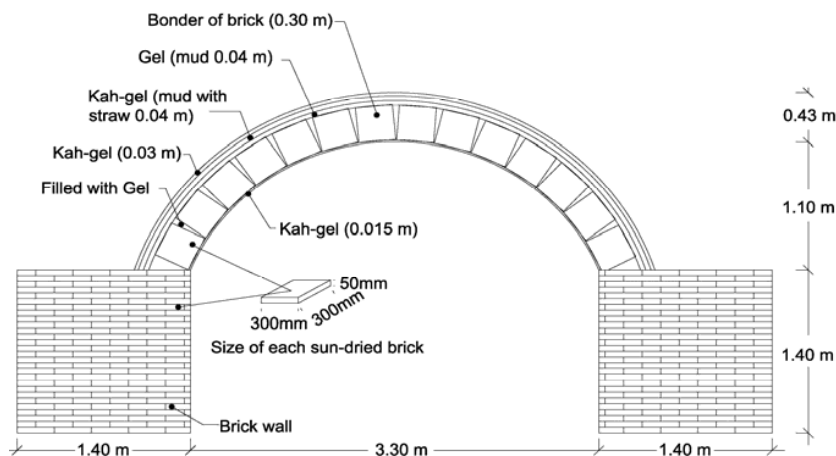


Fig. 5 Details of construction of Dalan, barrel vault (Drawing by K. Kawish 2018)

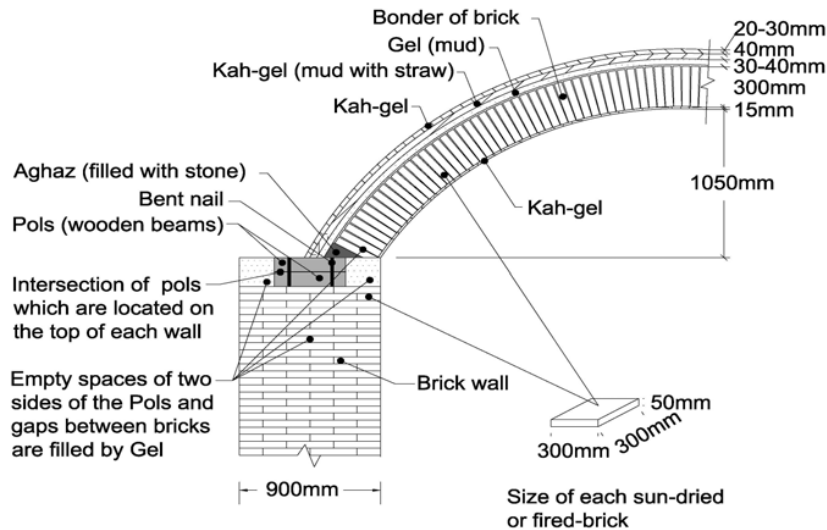


Fig. 6 Details of construction of domical vault, Chahar Sawrak pattern (Drawing by K. Kawish [5])

According to our survey, there are 50 roads and 34 Dalans, adding up a total of 84 in the study area. Among the 34 Dalans, 11 were destroyed during the war and other periods. Thus, only 23 Dalans remain (see Fig. 7 for the details and photographs of all existing Dalans). All of the roads/Dalans are paved with the exception of road number 52. Among the total of 84 roads/Dalans, 66 are car accessible.

Each Dalan includes several houses. Their entrances are inside the Dalan. In interviews with 32 residents of Dalan houses and 12 locals, all stated that the land owner of the Dalans were Dalan house families. In addition, the usage of each Dalan has always been private. Only the residents of the Dalan house and their guests could use the Dalan, especially in the past.

There are several reasons to construct Dalans, but their main function has traditionally been security [4]. The irregular, covered, and twisted streets and alleyways were designed to ensure safety from any aggression. The other function of the Dalan was weather protection; to minimize heat gain or loss, softening sun in the built up environment through the creation of shadow and decreasing the force of dust storms. According to interviews with local people and Dalan house residents, a third function of Dalan was the privacy of women. Privacy was always the concern of people during the Islamic period. Furthermore, since all of the alleys were paved in the study area, the alleys (Dalan) were covered to avoid rainfall during the winter.

One of the special features of Dalans are over path houses, which are houses constructed above the Dalan. Over path structures are also seen in Europe and Arab counties. In Baghe Dasht, people constructed houses or rooms above Dalans. These over path houses were mostly constructed at the same time as the Dalan itself. People constructed such house/rooms above the Dalan because of strong family relations and dependency (When the family members increased, they constructed house/rooms above the Dalan), a poor economy and for better ventilation.

Although there were several houses inside each Dalan, only one or two families would construct a house/rooms above the Dalan. The families living in the Dalan houses negotiated with one another and based this decision on necessity. The negotiations were very easy as residents were mostly relatives and therefore familiar with one another, having a strong community. The roofs of the Dalans require yearly restoration due to the sun-dried bricks, which are covered by mud-straw. In the past, families kept the Dalans in better condition due to the stronger sense of community.

The exact age of each Dalan is not clear, but all of them are more than 100 years old according to interviews with the residents of each Dalan house. Among the 34 Dalans, 11 are broken and damaged. Some were destroyed to provide more light for the walkway. When families demolished their traditional houses with domical vault roofs to build new flat roof houses, they also destroyed Dalans as the foundations of the Dalan and the houses were connected. Most existing Dalans are not being reconstructed. Only their roofs are covered with mud-straw to avoid snow and rainwater penetration. While Dalans numbers 60, 62, 66, 68, 70 and 71 are maintained with traditional materials in the traditional style by the families, the roof of Dalan number 82 and the initial part of roof of Dalans 67 and 72 have been reconstructed a flat shape. Dalan number 73 is damaged and has not been reconstructed yet.

According to interviews with the 32 residents of the Dalan houses, only one preferred the Dalan over a road, largely due to changes in the community and lifestyle of the people. In the past, the residents of the Dalan houses were mostly relatives who protected their privacy and security with the Dalan, and did not own cars. However, the current residents of the Dalan houses are not necessarily relatives, and lead a different lifestyle. Women go outside to study, work, and conduct other duties, and no longer require privacy as in the past. Furthermore, the Dalans are now a cause for lack of security as they create shadowed areas. Many families want to own

cars, and some of the Dalans are not car accessible. Finally, as Dalans are high maintenance and require restoration every year, people want to destroy and replace their traditional homes with modern constructions. The main reason why the Dalans still exist is the poor economy.

Our surveys show that most of the existing Dalans are situated in the southern part of the study area (Fig. 8). As Dalan structures and over path Dalan houses with domical vault roofs are made using a very old technology, the southern part of the study area and some of its central parts are considered older than the other parts. The map drawn in 1963 [4] shows that settlements of the Bagh-e Dasht area are only located near the Joy-e Injil canal in the southern part of the study area in that year. Dalans and over path structures along

the main Dalan nearby the Joy-e Injil show that the area nearby Joy-e Injil is the origin of settlements in Bagh-e Dasht. Thus, Dalans indicate the southern part of the study area locally named Mahall-e Dalan due to existence of the main Dalan and a spot area in the west of the study area as the oldest parts of Bagh-e Dasht area (Fig. 9).

Through examining the size of each Dalan, it was found that the main Dalan and Dalans situated south of it are mostly wider than the Dalans situated north of the main Dalan. Furthermore, the Dalans situated north of the main Dalan are very simple in design compared to the Dalans situated along and south of the main Dalan. Thus, older Dalans were larger than newer ones.

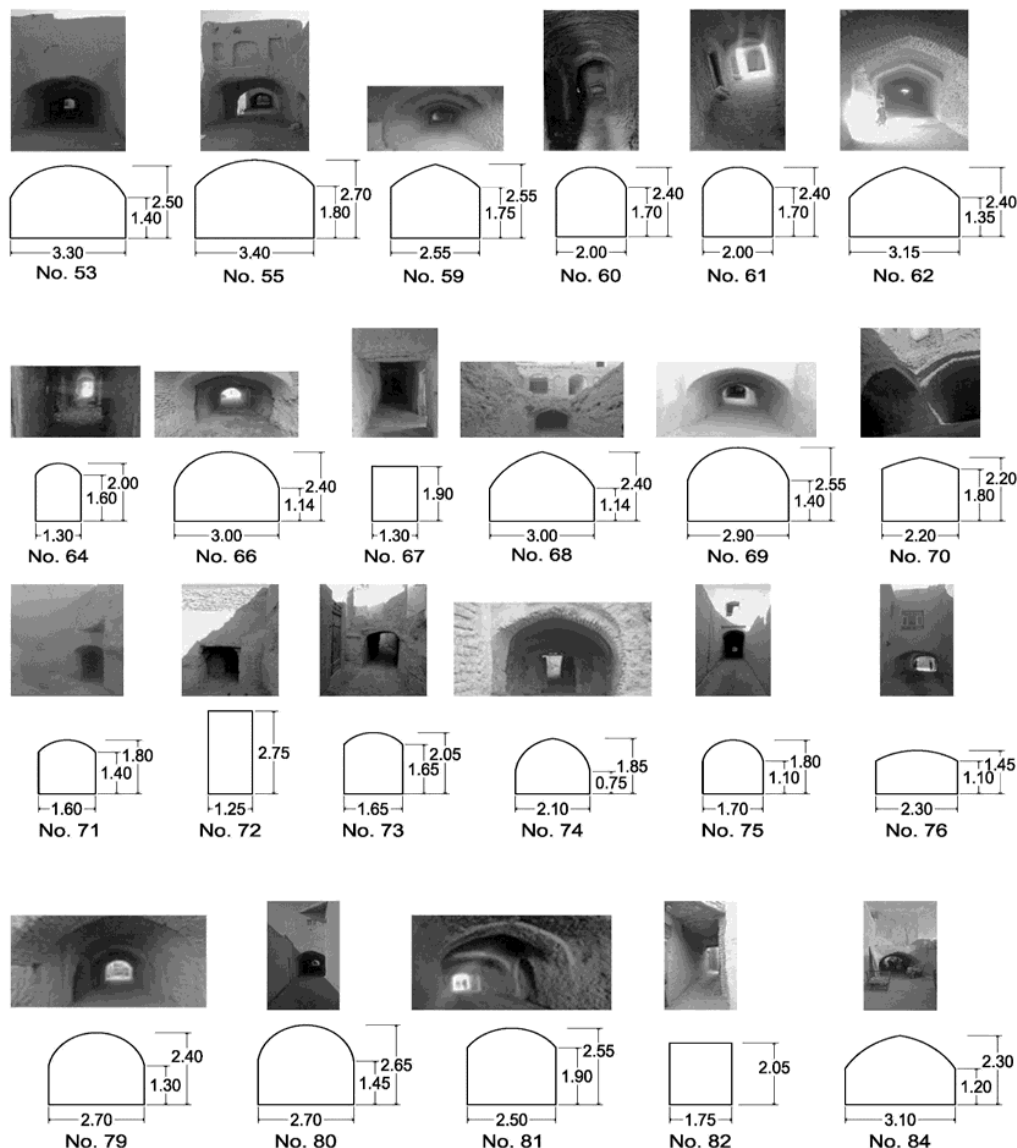


Fig. 7 Details and photographs of all existing Dalans (Drawing and Photographs by K. Kawish 2018)

V.CONCLUSION

Bagh-e Dasht was only agricultural land plots at first, and during the Timurid Empire in the 15th century many gardens and palaces were created due to their cultural interest in green areas. Settlements in Bagh-e Dasht began to be constructed in the Safavid Empire in the 16th century. This study found a distribution pattern where the Dalans and domical vault roof houses are located. The oldest area of Bagh-e Dasht, the southern Bagh-e Dasht, has both Dalans and domical vault roof houses, while the next part to the north of the oldest area has only domical vault roof houses. Other areas have modern flat roof buildings. This may explain the historical development process of Bagh-e Dasht (Fig. 9). The oldest part, locally called Mahall-e Dalan, has about 400 years of history.

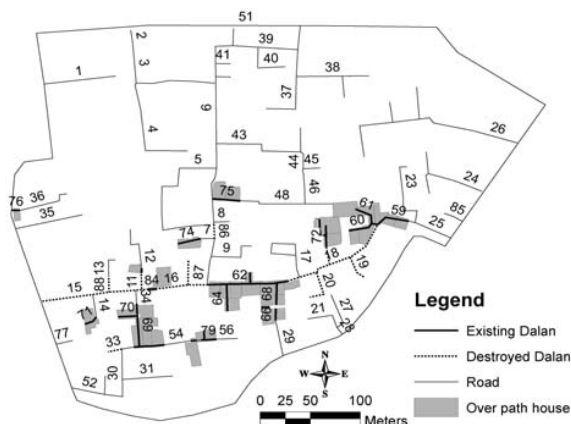


Fig. 8 Existing Dalans, destroyed Dalans and roads in the study area (Drawing by K. Kawish 2018)

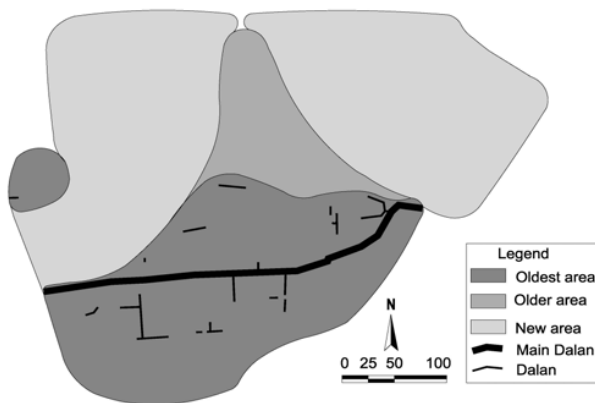


Fig. 9 The oldest, older and new area of Bagh-e Dasht (Drawing by K. Kawish 2018)

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