

MTPHs, an Aesthetic Aspect of Local Architecture of Lenjanat

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Among the variety and diversity of pigeon houses, Multi-Tier Pigeon Houses are distinguished from the functional and aesthetic point of view and are considered as a specific local architectural sights of Lenjanat. However, few studies have been conducted to study this type of pigeon house and these constructs have remained unknown. In this study we have conducted library and field studies because of the profusion and diversity of these pigeon houses in the Mobarakeh region and Flavarjan region. The aim of this study is typology and classification of Multi-Tier Pigeon Houses (MTPH) based on plan, structural, and technical analysis of these constructs. The results of this study show that the congestion of these pigeon houses has been in Lenjanat, and the geographical and climatic conditions have been effective in construction of these structures. The necessity of typology and classification of these constructions is crucial in saving the native architectural heritage of these areas.

Keywords: MTPHs; Lenjanat; Mobarakeh region; Felavarjan region; Local architecture

Introduction

Although pigeon houses are located in different parts of Iran, Isfahan province is distinguished in having them. The era of their popularity synchronizes with the Qajar and Safavid dynasties and the evidence for this popularity has been recorded in travelogues of the travelers that had traveled to Isfahan, such as, Chardin (1995: 1361), Olearius (1990: 216), kaempfer (1981: 217), Sheil (1989: 197), Gobineau (1988: 190).

Among the types of pigeon houses such as rectangle-shaped, cylinder-shaped MTPH are distinguished for their special form and function. These MTPH are located mainly in Lenjanat region (Felavarjan, Mobarakeh, Lenjan) and are recognized as one of the special local architectural elements of this region and their number and variety are most notable in Mobarakeh and Felavarjan.

One of the effective factors in construction of MTPH is geographical and climatic conditions of Lenjanat which has made this region fertile and rich in agriculture. For this reason, the necessity of building many pigeon houses near the farms to provide manure needed for farming. The MTPH had some advantages which made them proper for the farmers; they have been recognized in Lenjanat.

Despite the variety of pigeon houses and their specialty, not many comprehensive studies have been conducted and these local buildings have remained unknown. With regard to development of the cities and the changes in the city life patterns, they have lost their function and are in danger of dilapidation. The necessity of typology and classification of these buildings is essential for maintaining the special local architectural legacy of this region.

Methodology: the methodology which has been used in this study is descriptive-analytical and in addition to library research, some field studies have been done due to the abundance and variety of MTPH in Mobarakeh and Felavarjan. In this study we have introduced and presented the typology and classification of MTPH in Lenjanat in terms of architectural plans. Also we have presented structural analysis of these buildings.

Literature Review

There are few studies on pigeon houses. Farhadi (1993) has described the history of pigeon houses in different historical and literary texts and sources in his book. Mahmudian and Chitsaz (2000) have introduced some pigeon houses in different regions in Isfahan and have referred to some of their classifications. In recent years, some papers have been published in this regard, such as Mirzaee

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(2003: 115-139), and Zarghami *et al.* (2012: 37-52). A thesis by Heidari-Babakamal has investigated the pigeon houses in Khansār and Golpāyegan.

There have also been studies done in other countries on MTPHs, the most important of them are the works of Cooke (1920), Peter and Jane Hansell (1998) and Jean Hansell (1992) and different papers written by Husselman (1953), Imamoglu (2005) and Ramsay and Tepper (2010). The main research on MTPHs is available in a book, *Isfahan Pigeon Houses* by Mahmudian and Chitsaz (2002) which introduces and describes some of the MTPH which are ruined.

Geographical conditions and historical background of Lenjanat

Lenjanat region is located in west east of Isfahan and is mostly consisted of green and fertile fields. This region was segregated into the three independent towns of Felavarjan, Mobarakeh, Lenjan (Alian 1998: 149-151). Lenjanat has been taken into regard in different historical periods because of its climatic and geographical location; we can confirm the importance of its villages by reading some texts.

The existence of a village called Khulenjan is mentioned in some geographical and historical books with its original name, Khan Lenjan. Ibn Hawqal the famous Arabic traveler and geographer in the 4th AH century described Khan Lenjan as a small town blessed with sweet water and a lot of trees. (Ibn Hawqal 1987: 108-109). In the 4th AH century Muqaddasi also described Khulenjan near Khuzestan as a vast and fertile land. (Muqaddasi 1982: 580).

In his travelogue, Naser Qosro who entered Khanlenjan in 4th AH century wrote: and thus we arrived in Khanlenjan and the name of Sultan Beik was written on the city gate and its distance from Isfahan was 7 farsang. The people of Khanlenjan were safe and happy and they were busy doing their jobs (NaserQosro 1969: 137).

Lenjanat region was damaged severely in Mongol attacks and its agriculture and gardening

were completely destroyed. However, because of having ecological and geographical capacities, it didn't lose its importance during Ilkhanan government. Firuzan area was regarded significant and some important historical buildings were built in this region (Alian 1998: 51).

In the Safavid period this region could flourish again because of the security and peace during this period. Safavid kings made hunting grounds and big gardens in this area. In the Qajar period many lands of this region were in the possession of Qajar princes (Karimi 2003: 16). Zelo-Sultan states in his diary that he bought a lot of the lands in Lenjan (Zell-e-Soltan 1983: 251).

Because of special geographical conditions, the opportunity for agriculture has provided Lenjanat various crops such as rice, wheat, barley, legumes, vegetables, millet, grass, onion and different kinds of fruits such as plums, apricots, cherries, sour cherries, walnut and apple. This geographical condition has been taken into regard by governors in different periods.

The Pattern of disparity of MTPHs in Mobarakeh and Felavarjan

Two towns, Mobarakeh and Felavarjan in the Lenjanat area are distinguished for the abundance and variety of their MTPH. These MTPH are mainly built in the northern part of Mobarakeh and in the middle and southeastern parts of Felavarjan. It seems that the structural style of MTPHs is exclusive to the towns and villages in this area and in other areas there are only single cylinder-shaped pigeon houses. According to documents and field studies there are twenty pigeon houses in Mobarakeh (ten of them are still upright and ten are dilapidated) and there are fifteen pigeon houses in Felavarjan (eleven of them are upright and four of them are dilapidated) (Fig. 1).

The Architecture of MTPH

MTPHs are composed of multiple towers attached together. The number of the towers attached together varies from two to twenty and are



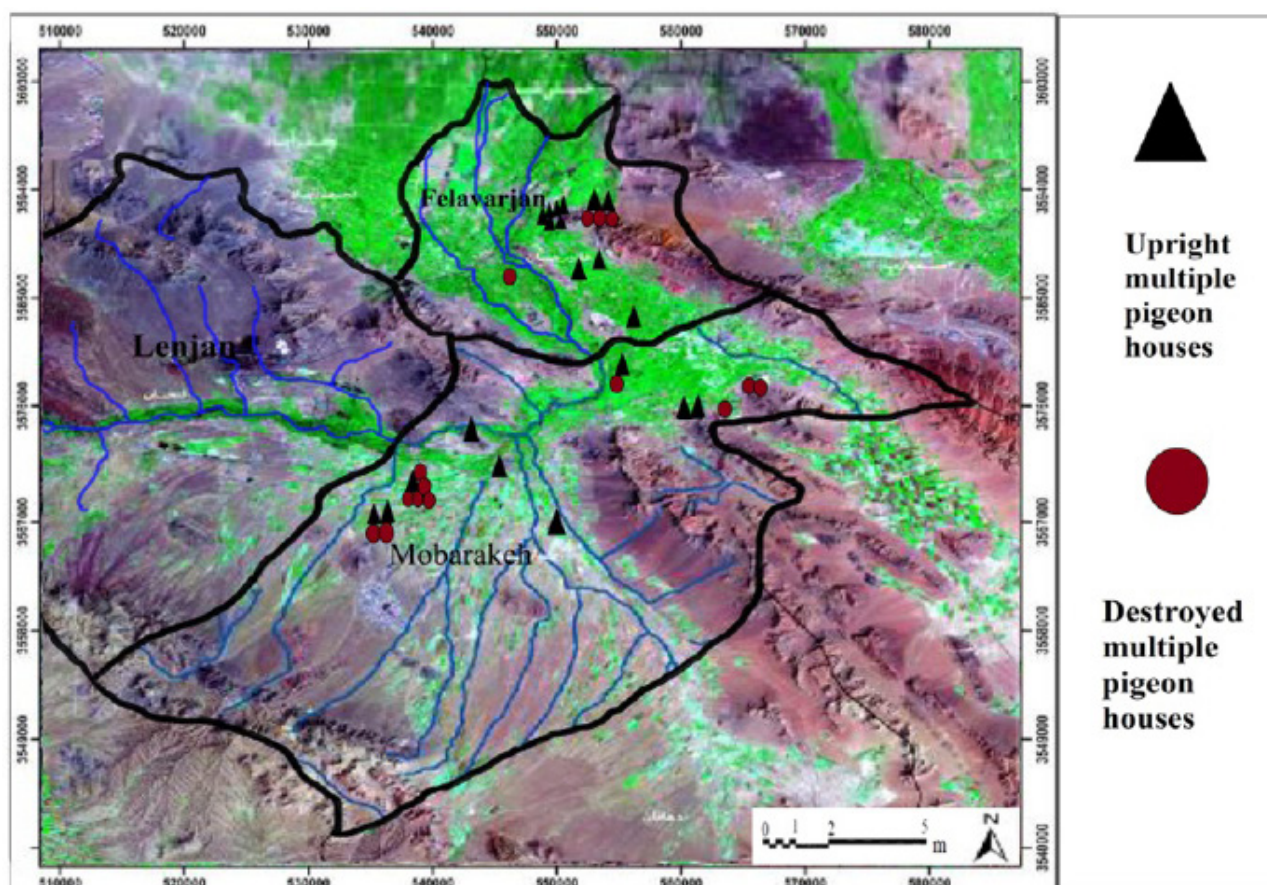


Fig.1: Display of the pattern of disparity of upright and destroyed MTPH of Mobarakeh and Felavarjan (After: Authors).

usually about eight to ten meters high. In order to build MTPHs, with attachment of cylinder-shaped with a diameter of 2 meters, the architects had attempted to build several towers in a small space and by building the nests in straight rows in height and width the best use of the space has been made. The dimensions of the nests are usually 20*20*27 cm.

In contrast to other pigeon houses their trunks are really thick, about 1.5, the thickness of the pigeon houses usually is between 30-35 cm and this has helped in cost by using the materials and making the building light.

The MTPHs usually are located in farms and were usually built near the villages. Some of these pigeon houses have two floors and they had been used as pigeon house-garner and for this reason they were built near residential houses. The downstairs rectangle-shaped space had been used as a garner.

The underside space of the pigeon house has been covered by vault and squinch and the vaults in the internal walls are used for making the walls lighter.

Closeness of these buildings to towns and their existence near residential houses and also the extension of cities and the changes in city life patterns have caused these important buildings to lose their usage and to be in danger of collapse and dilapidation.

There is no evidential documents to show the age of the MTPHs. Most of the elderlies and owners assume they are about 100 to 200 years old and it seems most of these pigeon houses were built during the Qajar dynasty and then in later years they have been rebuilt. The ownership of the MTPHs mostly had been private ownership, and usually the land owners had the possession of them and because of the high expenses of these pigeon houses and exclusive possession of farms, farmers could not



afford their maintenance, unless they managed to build these pigeon houses with the financial aid of other partners.

In recent years several factors have caused destruction of MTPHs. In present because of using chemical manures, using pigeon house's manure is not economical due to the costly expenses of maintaining and protecting the pigeon houses. According to some villagers in the past, the farms near pigeon houses were used for special crops such as cucumber; however, today these farms are used for growing rice, so pigeon houses have lost their function. Furthermore, several pigeon houses have been ruined because they are located in farms and water has penetrated their bases and they can collapse every now and then. Closeness of the pigeon houses to cities, their existence near residential houses, development of towns and the changing patterns of city life style has caused them to lose their original function and get exposed to destruction.

Classification of MTPHs

The MTPHs of Lenjanat are classified into three main groups in terms of plan:

1) MTPHs with buttresses 2) MTPHs without buttresses 3) the compound MTPHs (including the first group and the row pigeon houses).

The first group: MTPHs with buttresses. The towers of these pigeon houses were connected by horizontal and vertical walls; so it has created a space that makes the connection between them. The buttress help to make them much stronger than other types of houses. If sudden waves were generated when the birds flapped suddenly, other parts were not influenced by this flapping. These pigeon houses are also classified into two groups in terms of plan.

The pigeon houses that are directly built on ground and nests are built from floor to the top. These pigeon houses have only been used for keeping pigeons and they are located in Mobarakeh and Felavarjan, for example the 12 cylinder pigeon house in Ejgerd (Figs. 2-4).

Some of the MTPHs built with two floors and the pigeon house is located on the second floor and the underside space has been used as a garner and had been covered by a vault and squinch. This type of



Fig. 2: Pigeon house of Ejgerd. (After: Authors).

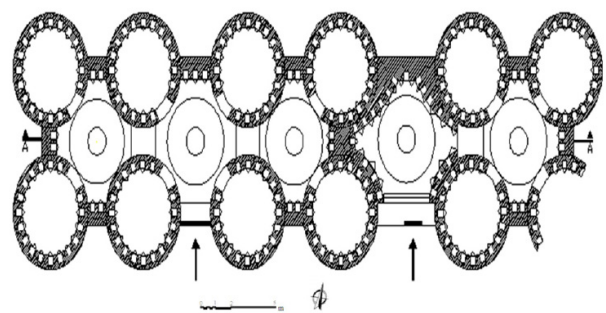


Fig. 3: Ground plan of pigeon house of Ejgerd. (After: Authors).

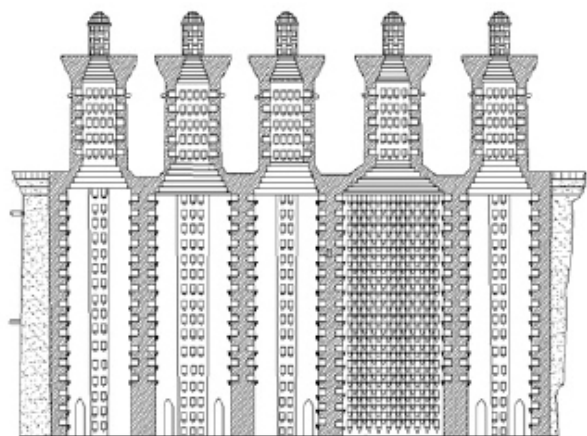


Fig. 4: . Section of pigeon house of Ejgerd (After: Authors).



pigeon house had been close to residential areas and three of them are located in Mobarakeh for example the 10 -cylinder pigeon house in Lenj (Figs. 5-7).

The second group: MTPHs without buttresses. Those pigeon houses whose towers had been connected without help of vertical and horizontal walls are located in a row. The towers vary from



Fig. 5: Visage of Lenj pigeon house . (After: Authors).

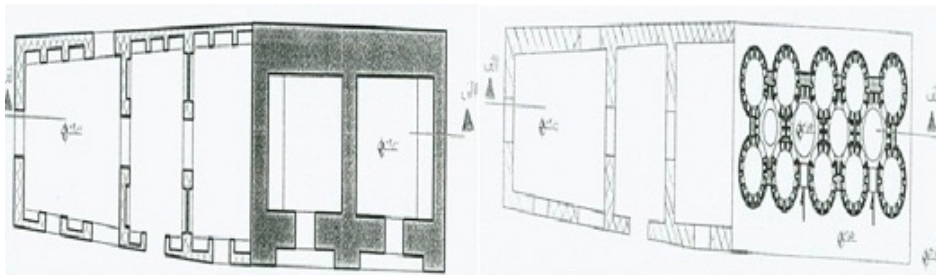


Fig. 6: .Plan of the first and second floor of Lenj pigeon house (After: The recorded documents of Cultural Heritage, Handicrafts and Tourism Organization of Isfahan).

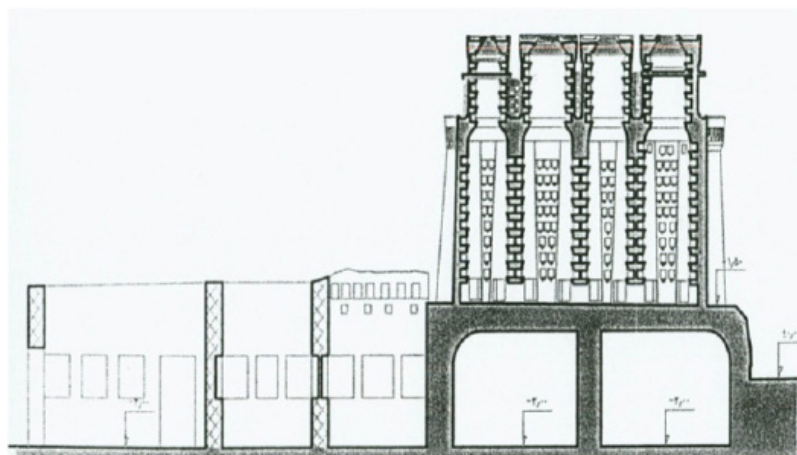


Fig. 7: The section of Lenj pigeon house (After: The recorded documents of Cultural Heritage, Handicrafts and Tourism Organization of Isfahan).



2 to 5 cylinders, for example the 5-cylinder pigeon house in Karkevand (Figs. 8-10). This type of pigeon house doesn't have much solidarity and strength and are more likely to be ruined. Some of

the MTPHs had been built on the roof of residential houses.

The third group: The compound MTPHs



Fig. 8: Pigeon house in Karkevand (After: The recorded documents of Cultural Heritage, Handicrafts and Tourism Organization of Isfahan).

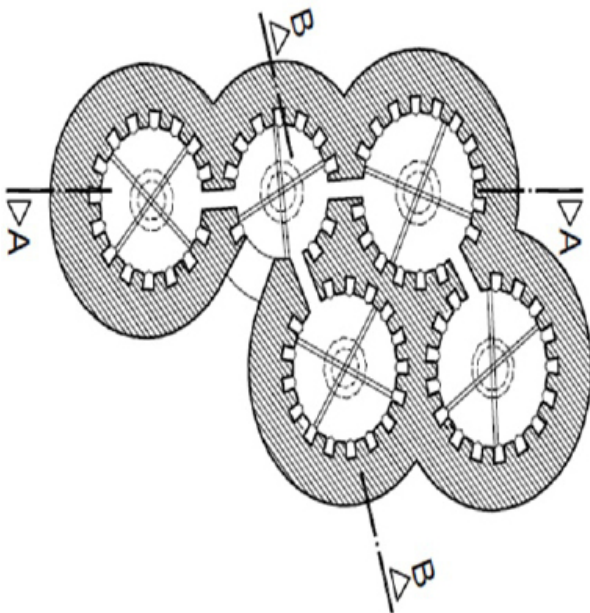


Fig. 9: The plan of the floor in pigeon house (After: The recorded documents of Cultural Heritage, Handicrafts and Tourism Organization of Isfahan).

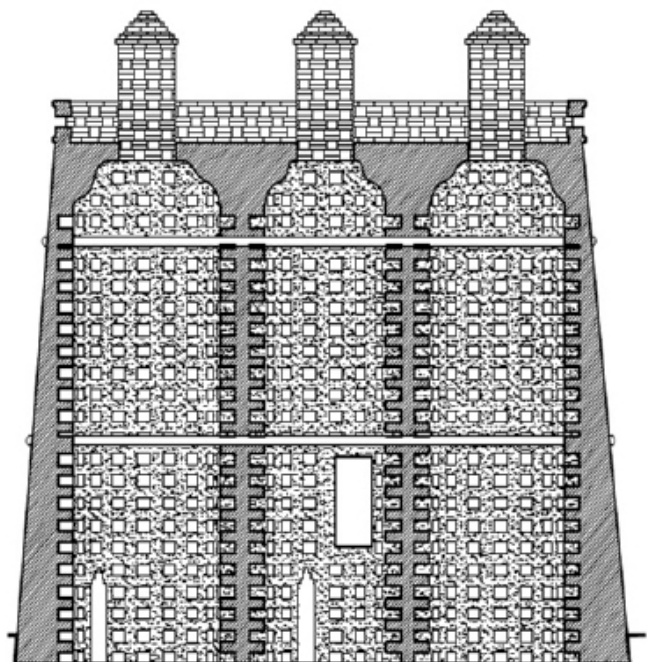


Fig. 10: The section of pigeon house (After: The recorded documents of Cultural Heritage, Handicrafts and Tourism Organization of Isfahan).



(composed of the first group and row pigeon houses). These MTPHs are connected with thin walls and are located in a row. The middle towers are not as strong. So for more protection four towers which are connected by horizontal and vertical walls are built on two sides of the pigeon house. The diameter of side towers is usually larger than middle towers and their role is protecting the pigeon house

and they help with structural integrity. Two of them are located in Felavarjan, and one with 20 cylinders in Kelisan village, which is unique (Figs. 11-14).

The Reasons of Building MTPHs in Lenjanat

MTPHs are mainly located in the Lenjanat region. This region has been an important



Fig. 11: Cylinder pigeon house in Kelisan (After: Authors).

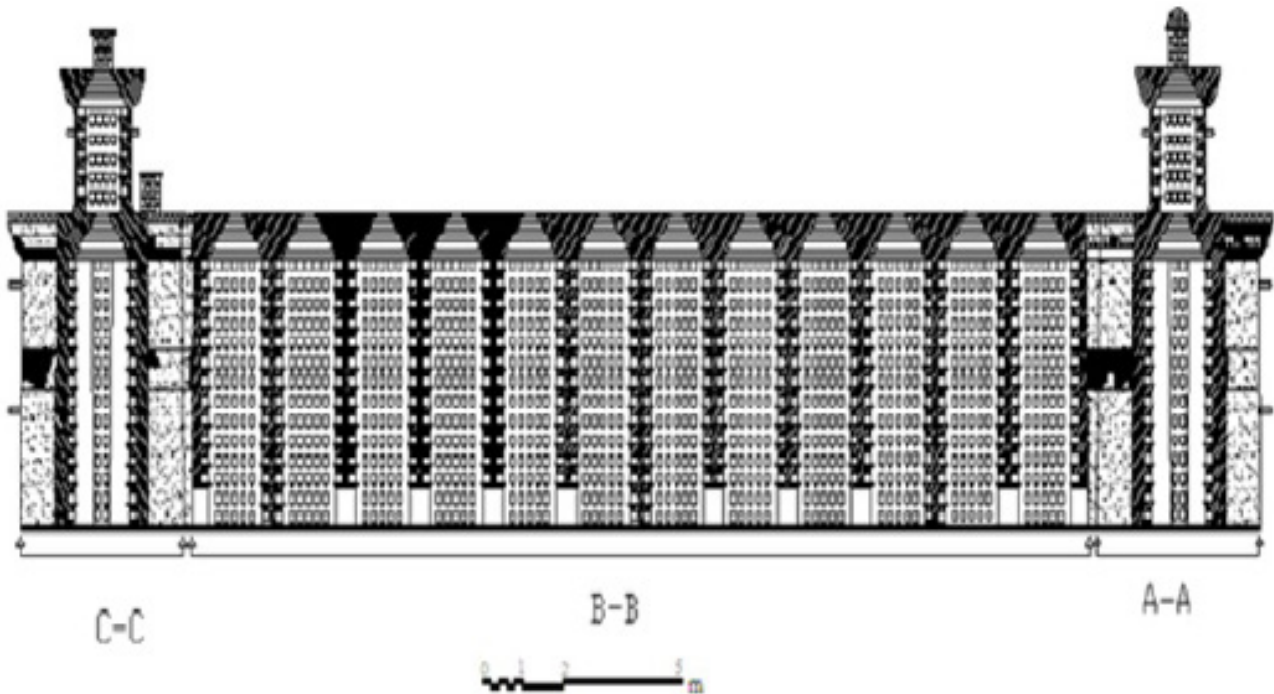


Fig. 12: The section of pigeon house in Kelisan (After: Authors).



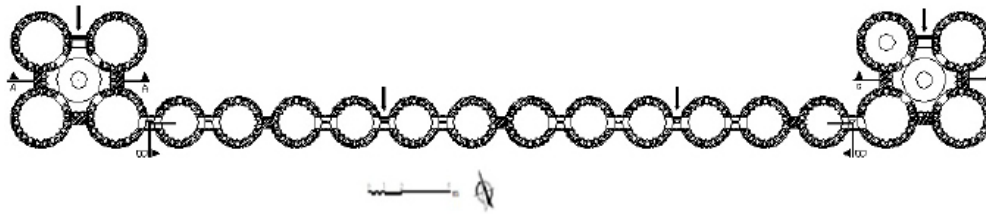


Fig. 13: The plan of the floor pigeon house in Kelisan (After: Authors).

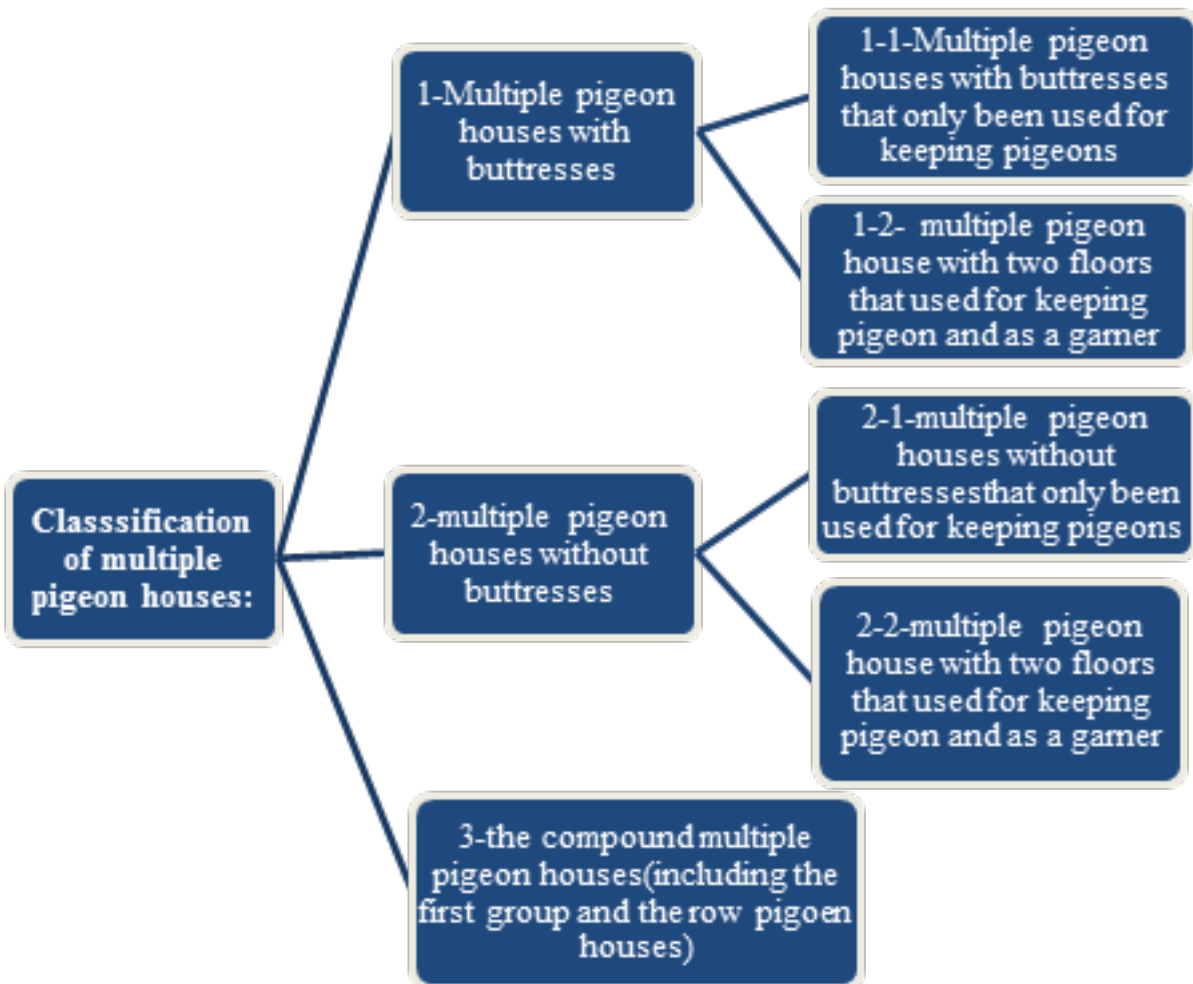


Fig. 14: Classification of MTPHs (After: Authors).



agricultural area because it has fertile soil, mild climate and the existence of a river (Zayanderood). For a long time, the pigeon manure has been the best manure for agricultural crops especially the crops which are grown in the fall and this reason justifies the existence of these pigeon houses near farms. The necessity of constructing these pigeon houses near farms has made architects offer new designs by using their own experiences. So the architects invented MTPHs with their information about single pigeon houses and by considering geographical environment. Thus, single cylindrical pigeon houses are among the primary and common kinds of pigeon houses and were built in different parts of Lenjanat in various plans; they have complex architecture, so it is assumed that their construction and architecture developed during the Safavid and Qajar dynasties. MTPHs are an improved form of cylindrical pigeon houses. The architects had good experience at building different kinds of cylindrical pigeon houses and with their knowledge of technical and architectural points, could design new constructions which are noteworthy in terms of architecture and they started building MTPHs during The Qajar dynasty.

Building MTPHs were the first attempt to change the plan of pigeon houses and MTPHs can be regarded as an evolutionsal form of single pigeon houses. The MTPHs were accepted by farmers for their structural advantages and were built in different places.

The design and application of MTPHs are noteworthy and have more geometrical order than other types of pigeon houses.

The walls of the MTPHs are the same at the bottom and the top of the towers and the solidarity is guaranteed by connecting walls, so there is no need to use more materials to establish solidarity. The mild climate needed a lot of materials to make the walls thicker. The walls were thick enough to keep heat in the winter and the coolness in the summer and the right amount of energy could circulate in the pigeon house. While the thick and wide walls with the size of about 0.5 to 1.5 meters in single pigeon houses are essential for reduction of structural tension of them and the lower parts of pigeon houses are thicker.

The circular space of the towers of MTPHs were used most efficiently and had a lot of nests from floor to the top of the tower. Despite the small diameter of towers and thinness of the walls, a lot of nests have been built in a small space and this was because the nests were built in a row and in a direct way, both horizontally and vertically. Therefore more pigeon manure could be taken from the MTPHs, for example the 12-cylinder pigeon house in Ejjard has 5100 nests and had had the capacity of keeping more than 10,000 pigeons. The position of nests in cylindrical pigeon houses is in a way that after a row of nest, the upper row and the lower row are placed in reverse like a chess board and nests are filled and emptied one by one. Construction of chess nests in single pigeon houses needed more materials and space, so their diameters varies from 5 to 15 meters (Figs. 15-16).

A noteworthy point of these buildings is the method of separating spaces of the towers so that different parts can be separated by walls and at same time keep connection between them.

In MTPHs if something scared the pigeons, they wouldn't fly to other parts and thus the wave which was created by flapping did not multiply.

Single pigeon houses have been used only for keeping pigeons; however, in some MTPHs the space between the pigeon house and garner has been common. Less materials have been used in MTPH

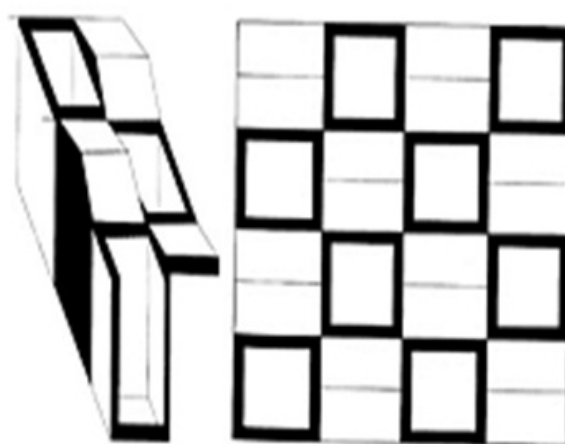


Fig. 15: . The chess nests of single pigeon houses (After: Mahmudian and Chitsaz 2000: 209).



because the walls were thin and the building was light and this also made an opportunity for building them on the roof of houses, like the four-cylinder pigeon house of Khulenjan (Figs. 17-20). The single pigeon houses have never been built on the roofs of houses because in that case more materials were used and would become too big.

The MTPHs are located approximately 100 to 200 meters away from cities and usually are near farms and in some cases they are near residential houses or on the roofs. Single pigeon houses have never been built on the roofs of residential houses due to their use of more materials and their size.

Maintaining and preserving of MTPHs was easier than building several single pigeon houses on farms, and the needs of farms could be met extensively.

In sum, it can be said that passage of time and gaining experience and climatic conditions had been effective in the changes occurred in plans of pigeon houses. We should understand the importance of different plans and expertise used in building them and try to preserve these precious local buildings (Tables. 1-3).

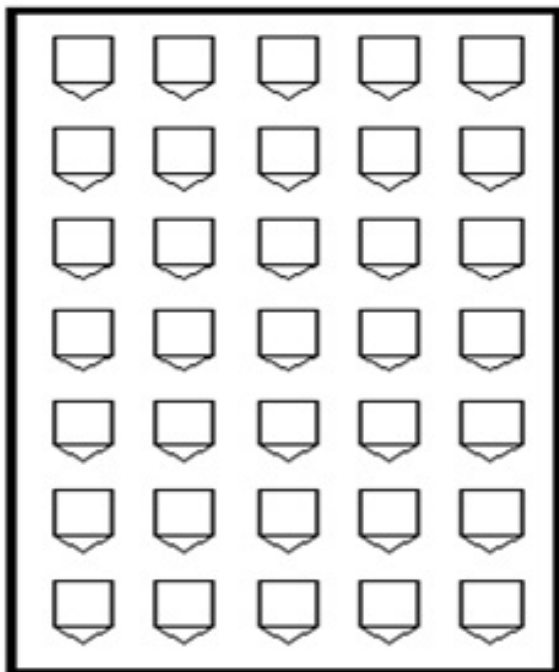


Fig. 16: The row nests of MTPHs (After: Authors).



Fig. 17: Khulenjan pigeon house (After: Authors).

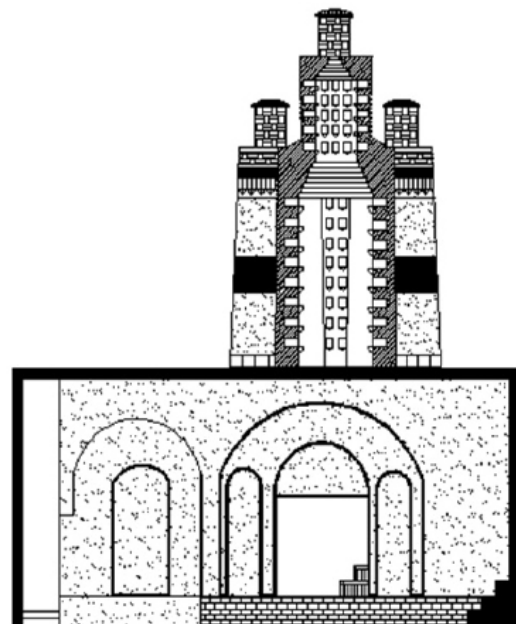


Fig. 18: The section of Khulenjan pigeon house (After: Authors).



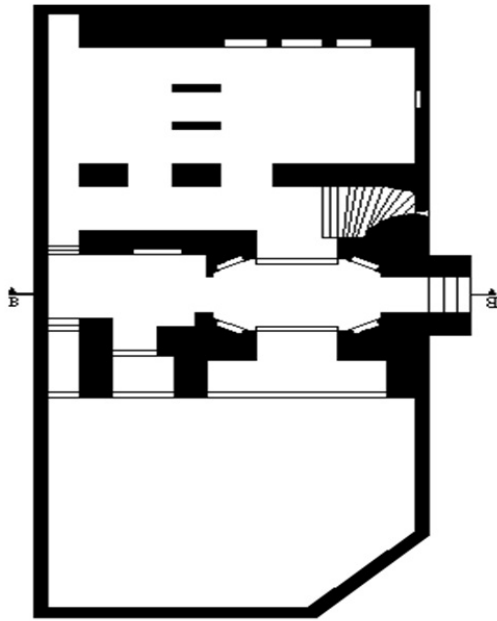


Fig. 19: Plan of the first floor of Khulenjan pigeon house (After: Authors).

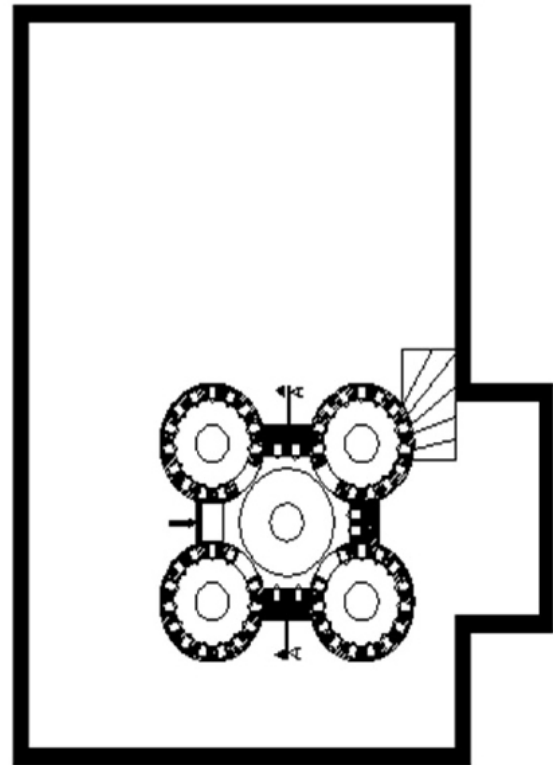


Fig. 20: Plan of the second floor of Khulenjan pigeon house (After: Authors).

Table 1: Comparison of single cylindrical pigeon houses and MTPHs.

Criteria	The feature of single cylindrical pigeon houses	The feature of MTPHs
Antiquity of pigeon houses	There is no exact information about the date of construction of first pigeon houses but their popularity has been during Safavid and Qajar dynasties	They have been mainly built since Qajar dynasty
Disparity of pigeon houses	They are located in all parts of Lenjanat	They are mainly located in the northern part of eastern part of Mobarakeh and east south of Flavarjan
Location of pigeon houses	They are mainly away from cities and towns and are built on farms and directly on the ground	Mainly located near cities and villages and in some cases are directly on the ground
The number of floors	In some cases two or three floors and their function just as pigeon houses	In some cases they have two floors and used as pigeon house-garner
Diameter of pigeon houses	Usually between 5 to 10 meters	Diameter of MTPHs about 2 meters
The thickness of pigeon house walls	Usually between 0.5 to 1.5 meters	Usually between 30 to 35 centimeters
The position of nests in pigeon houses	After one row of nest, the nests in upper and lower rows are located in reverse like chess board	The row nests in a direct way both horizontally and vertically



Table 2: Some of indicator MTPHs of Mobarakeh.


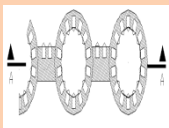
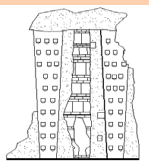

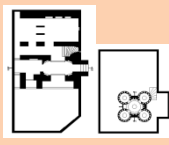
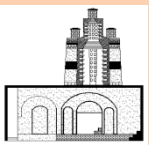
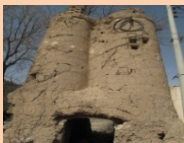
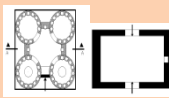
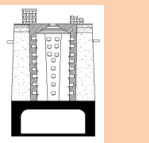

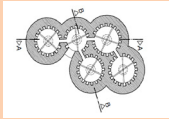
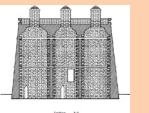

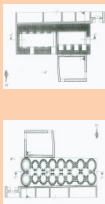
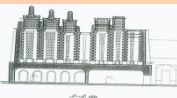

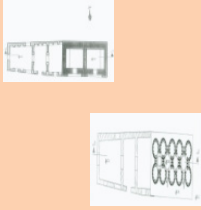
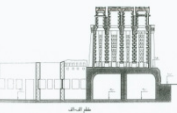
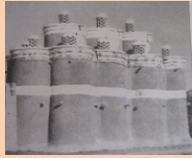

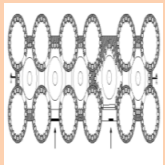
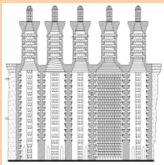

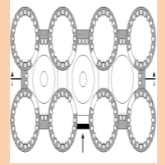
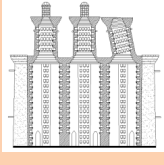
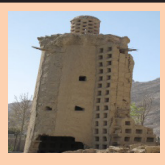

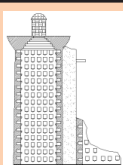

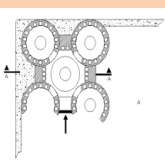
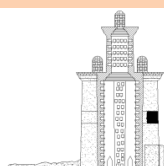

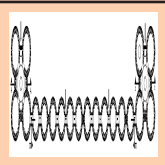
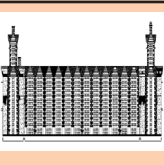

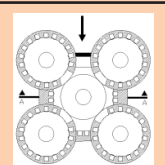
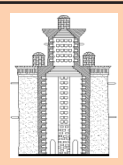


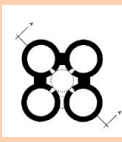
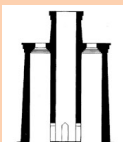
Location	Number of tower	Group 1,2 or 3	Upright or destroyed	Picture	Ground plan	Section
Asiyabad	10	1	upright			
Khulenjan	4	1	upright			
Ghahnaviyeh	4	1	upright			
Karkevand	5	2	upright			
Lenj	16	1	upright			
Lenj	10	1	upright			
Koshkicheh	10	1	destroyed		-	-



Table 3: Some of indicator MTPHs of Falavarjan.

Location	Number of tower	Group1,2 or 3	Upright or destroyed	Picture	Ground plan	Section
Ejgerd1	12	1	upright			
Ejgerd2	8	1	upright			
Ejgerd3	4	1	upright			
Juchi	4	1	upright			
kelisan	20	3	upright			
Sahlovan1	4	1	upright			
Sahlovan2	4	1	destroyed		-	-
Largon	4	1	destroyed			



Conclusion

The congestion of MTPHs is mainly in Lenjanat region especially in the northern part of Mobarakeh and the middle and east south of Felavarjan. This area has been an important agricultural zones for a long time. With such agricultural conditions and production of different crops the necessity for building a lot of pigeon houses seemed unavoidable. MTPHs met the agricultural needs of this area.

MTPHs have various types in terms of plan and they are regarded significant from aesthetic and application point of view, they are also examples of local architectural beauties of Lenjanat region. MTPHs are classified in terms of plan 1) MTPHs with buttresses.2. MTPHs without buttresses 3.Compound pigeon houses.

The first type of pigeon houses are prevalent in this region and the second group have been observed in Mobarakeh and the third group have only been seen in Felavarjan.

MTPHs of Lenjanat are regarded as the first attempt in changing the plan of pigeon houses and is an evolutionary form of single pigeon houses that have been built since the Qajar dynasty.



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