THE ROOF REPAIR OF A BORANHANE

Assoc. Prof. Dr. Şefika Ergin, Berfin Aydınalp,
Berhat Yakut
Faculty of Architecture, Department of Architecture
Dicle University, Diyarbakır
erginsefika@hotmail.com

ABSTRACT

Pigeons have had an important place since they have been benefited from many of their features from the past to the present. In addition, pigeon manure was used in agriculture to obtain fertile products as well as gunpowder production. Pigeon manure and eggs are still used today. Throughout history, people who have benefited from these features of pigeons have built shelters in many countries to protect pigeons. In Turkey, different names have been given to these shelters, which were built specifically for the regions. These shelters are named as "burç" in Gesi region of Kayseri province and "güvercinlik" in Cappadocia region. In Diyarbakır province of the South-eastern Anatolia, these structures built for the protection and breeding of pigeons were called "boranhane". These *boranhane*s built in Diyarbakır represent a symbol of the lost cultural heritage and tradition. It is important to protect these structures, which are important both culturally and as a part of the tradition, in order to pass them on to future generations. In addition, it is of great importance to protect these structures, which still exist today, in order not to disturb the ecological balance. As a result of the increase in the use of artificial fertilizers instead of pigeon manure around Diyarbakir, *boranhane*s are no longer used. Over time, these unused structures have suffered many damages due to neglect, such as the damages on the floors above the ground, on the walls, and on the parts that provide the entry and exit of the pigeons. In addition, as a result of insufficient attention and protection, some of these structures have been destroyed and some of them have survived to the present day with great damage.

In this study, the architectural features of the existing *boranhane*s in Diyarbakır as well as the building materials, planning and forms used during the construction were examined. In addition, the repairing applications of the damaged roof of one of these traditional *boranhane*s with the traditional system were examined in detail. Today, these structures are faced with the problem of losing their originality due to the decrease in traditional construction techniques. In order to solve this problem caused by the gradual decrease in traditional construction techniques, it is aimed to observe and document every stage of this traditional construction technique.

In this context, the roof construction phase of a *boranhane* located in Diyarbakir has been observed practically. The surveys and the plans of the examined *boranhane*s, located within the borders of the province were drawn, their architectural features were examined on-site and their original conditions were photographed and archived.

Keywords: Boranhane, Pigeon houses, Soil based top cover, Traditional structures.

INTRODUCTION

Throughout history, humans have valued the birds, benefited from their fertilizer, eggs, and meat, and used their feathers to do pillows, quilts, and beds; and use the birds to communicate. Also, because they can fly they have seen as sacred beings because they get closer to the god (Özçakı, 2020). One kind of bird that humans love and benefit from is the pigeon (Bekleyen,2007). The pigeon is a member of the Columbidae family. The pigeon is middle sized, it has a small head a short neck, and short legs. Also, it is fast, it can fly for a long time and it produces some special voices (Yılmaz et al., 2012). The pigeon is the first bird known as domesticated (Yılmaz et al., 2012). According to the scientists, it is domesticated approximately 6.500 years ago in Iraq (Boz et al., 2012). Pigeon is affected by natural conditions such as temperature, frequency of precipitation, duration of daytime, and speed and strength of the wind. That's why it is known that pigeons in the south live longer than pigeons in the north (URL-1).

In most countries and areas, shelters are built for the protection of pigeons. According to the regions these shelters are named differently. In Cappadocia region shelters named as "güvercinlik", in Gesi region in Kayseri they called as "burç" and in Diyarbakır they called as "boranhane" (Bekleyen, 2007). In Kayseri, shelters generally found in Gesi, Efkere, Gürpınar, Kayabağ (Darsiyak), Güzelköy (Nize) regions (Büyükmıhçı, 2006). In Cappadocia, it is known that there are pigeon shelters in the valleys in Nevşehir, on the high levels of the valley, in rocky places, and the carved Fairy Chimneys (Maraşlı, 2019). The geomorphology of the volcanic tuff and basalt rocks in that area makes it easier to build a shelter.

Pigeon shelters are built to let pigeons survive. They are generally shaped like a tower, a castle, or rectangular and they have holes to let pigeons pass. They are built to protect pigeons from animals such as wild birds, wolves, and foxes; for their nutrition and reproduction and to benefit from their fertilizer (Maraşlı,2019). The fertilizer gathered in those shelters was used to get a better product from the soil and in making gunpowder and shoe leather (Yılmaz et al., 2012). The fertilizer is used in vineyards in the Cappadocia region, vineyards and gardens in Gesi in Kayseri, and in cultivating watermelon, lentil, melon, bean, cotton, and pistachio in Diyarbakır (URL-2). Because the fertilizer of pigeon is consist of 25% organic matter, 2% nitrogen, and 1-1,5 % phosphoric acid, it is more effective than the fertilizers of sheep and goats, and thus it is preferred to be used (URL-2). Plants cultivated in soils that used pigeon fertilizer grow faster, be resistant to bad conditions, and are more fruitful. Chemical fertilizers affect water pollution and air pollution negatively (URL-2). That's why using organic fertilizer is important to maintain the ecological balance and human health.

These pigeon shelters are made by the public and have forms, functions, and materials peculiar to the region. They are ecologically compatible and have an important place in terms of natural and cultural heritage (Büyükmıhçı,2006).

Recently, because there is artificial fertilizer now and it is very cheap, pigeon fertilizer is not preferred in Diyarbakır. That's why "boranhane" is not used. They are not protected well and are neglected, so in time they are destroyed and other constructions are made instead. In some neighborhoods and villages in Diyarbakır region, because false floors and walls of pigeon shelters are broken down, those boranhanes are in danger of collapse. It is important to examine their architectural features and register them in terms of cultural heritage. Examining their features of design and repairing them according to their original systems are necessary to transmit them to the next generation. In this study, the repair of the roof of the boranhanes which have minor damage is observed in place and the construction system is examined and recorded in detail and step by step.

2. Architectural Features of Boranhanes in Diyarbakır

2.1. Features of Boranhane's Project

In Diyarbakır pigeon fertilizer is used for agriculture. Pigeon fertilizer is preferred to increase the fertility of many products such as watermelon and lentil (URL-2). People build pigeon shelters to

obtain the fertilizer. These shelters are called "boranhane". The origin of the name is "boran" which means wild pigeon (Özçakı, 2020). People who work in agriculture in Diyarbakır's rural areas, build pigeon shelters near their houses or on high hills (Bekleyen,2007). Those shelters are generally placed in regions near the shores of Dicle river (URL-3). Boranhanes in Diyarbakır city is in Erimli and Karaçalı neighborhoods (Figure 1). The boranhanes in this region are rectangular and constructed by simple planning.

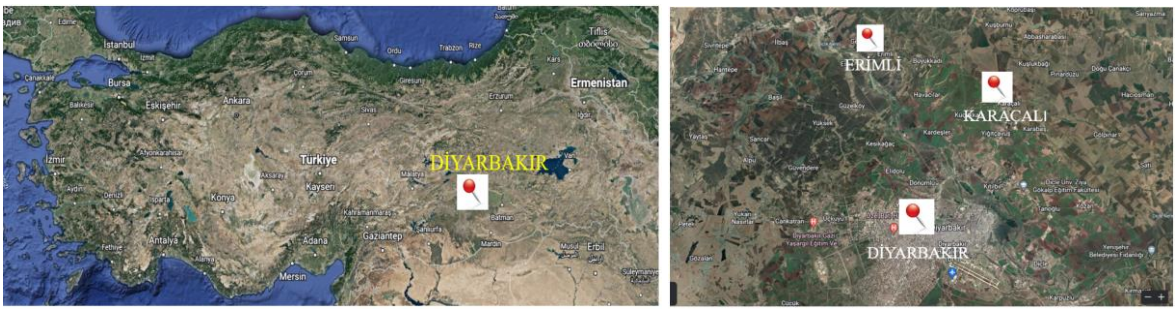

Fig 1. Karaçalı and Erimli neighborhoods (google earth excerpt)

In the shelters, there are small doors open temporarily, once a year, which let people enter to gather the fertilizer. The height of the entrance door is approximately 99 cm (Figure 2). After people take the fertilizer, the door is closed by using adobe. Boranhane is planned as one part or 2-3 parts connected (Figure 3-4). Local people called these parts "lüle" (Bekleyen,2007).
The plans of the parts are similar, the only difference is the size of the space. The length of the parts is in the range of 775-1200 cm and the width of the parts is in the range of 160-245 cm. The average length is 975 cm and the average width is 188 cm. In the connected parts, transmission is caused by little holes whose heights are 99 cm.

Fig 2. Boranhane doors.

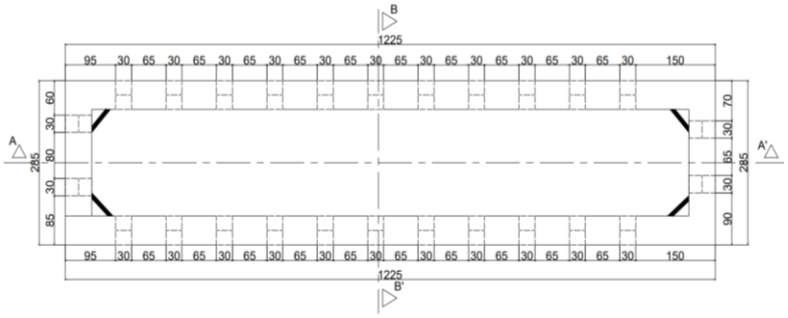

Fig 3. Boranhane plan consisting of a single compartment (Drawer: Rahşan Sala)

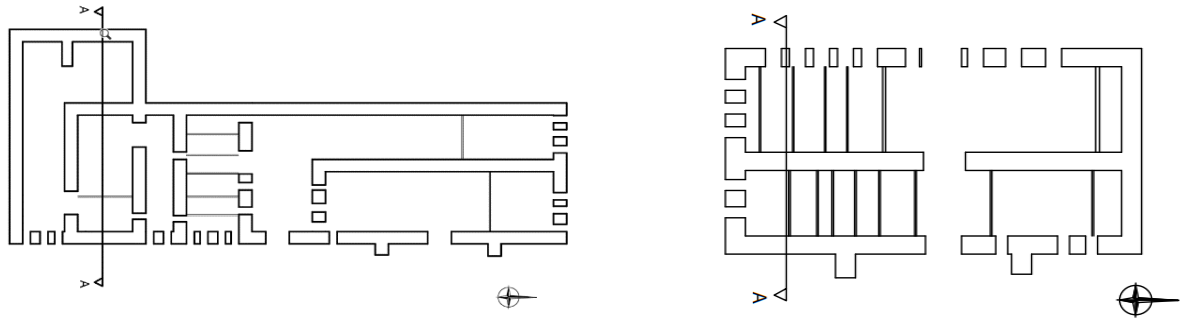

Fig 4. Boranhane plan consisting of more than one compartment (Drawer: Merve Sincar).

In boranhanes in this region has wooden stakes on their long walls inside. The diameter of those stakes is in the range of 10-15 cm. Also, they are placed at two different heights changing between 130-200 cm (Figure 5). The first level of height is in the range of 130-160 cm and the second level of height is in the range of 215-300 cm. Those wooden stakes increase the strength of construction and they are used to hang baskets (Figure 6). Also, to let pigeons enter and exit the shelter, approximately 30 cm under the roof made by soil, holes whose sizes are 25x25 or 25x30 are built (Figure 7). Their façade is plain and there are many holes (Figure 8).

Fig 5. Wooden poles

Fig 6. Baskets suspended on wooden poles

Fig 7. Spaces left for the entry and exit of pigeons

Fig 8. Boranhane facade (Drawer:Melek Geçirgen)

2.2 Techniques of Boranhane's Construction and Material

The walls of boranhanes Erimli and Karaçalı neigbourhoods in Diyarbakır are made of adobe. The thickness of the walls is in the range of 50-55 cm. Adobe is compressed and built with cast adobe 80-100 cm above the ground (Figure 9). 35x15x10 cm adobe blocks were made on the cast adobe.

Fig 9. Wall mesh system

The height of floors generally falls between 3.5 and 5 meters. Also, to increase the durability of the walls, supporters are built from the inside and outside (Figure 10-11). The door which let the transmission between the parts has 10 cm lintel on the top of them (Figure 12). In addition, the roof of these structures are flat and made of soil.

Fig 10-11. External and internal support

Fig 12. Lintel use

3.The Process of Restoration in a Boranhane in Diyarbakır

The unused boranhanes in Diyarbakır are damaged greatly because of environmental factors. The boranhane which is examined in this study is in the Karaçalı neighborhood. The plan of the structure consists of two parts. One part of the height is 4 meters and the other part of the height is 3.5 meters
It has 23 windows on the northern front, 34 on the southern front, and 6 on the eastern front. There is no window on the western front (Figure 13). Among these boranhanes, the one whose carrier system is fine but the top cover system is damaged is protected from being destroyed by restoring its roof which is damaged because of neglect and its decayed wooden carrier beams. The stages of restorations are conducted compatible with the original system of the structure. In the restoration process, the removing of the roof and renewing it are observed by examining them in place.

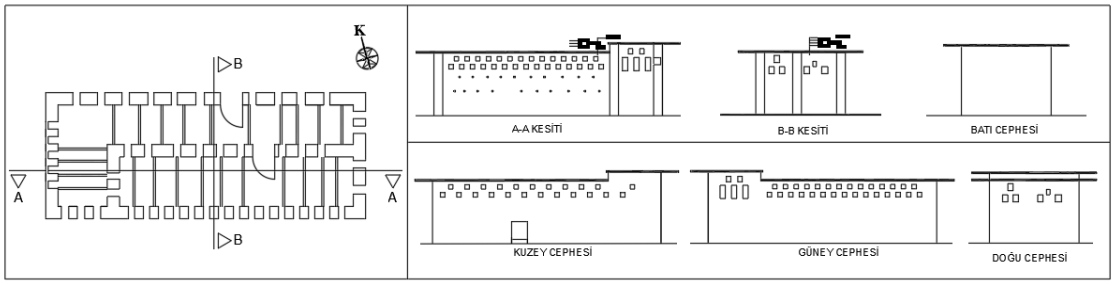

Fig 13. The repaired boranhane (Drawer: Muhammed Özalp)

Before the restoration, the soil layer which constitutes the top layer of the roof is removed. It is observed that the linoleum which is placed under the soil layer and leads to water insulation is damaged partly over time and lost its ability to insulate. Because of these damages, linoleum and bushes under it are removed. Branches of trees that are under these layers are also completely removed (Figure 14). After removing the layers of the roof, the wooden carrier beams showed up. The beams which have corruption and cracks are detected and the highly damaged ones are renewed. To extend the short eaves distance, thick lumbers and main carrier beams are put together with nails. The distance of eaves is extended and more decent eaves are obtained. Also, the corner points of the eaves are strengthened by the woods. On the extended eaves, the lumbers whose length is 20 cm and whose width is 2-3 meters are nailed, and by doing so the top of the carrier is totally covered. The elements of the extended eaves are filled with mortar whose length is the same as the wall's and the top of the eaves is totally covered by the lumbers (Figure 15). By doing so, the flatter and the stronger ground is made. The linoleum that helps insulation and protects the soil layer from spilling on the place is nailed to lumbers and is immobilized. The reeds obtained from the basins of the region are placed one by one and smoothly in order to get a flat ground. Also, because reeds are harsh and sharp, the chaff is put on them to make them smoother. It is important to put the chaff evenly and completely on the roof to avoid the sharp parts of the reeds harming the linoleum. After the roof is covered completely with the chaff, 2 layers of nylon are put for water insulation. A soil local is brought from a hill that local people called "Tilalo". The soil is mixed with water and chaff thinner than the former and put on the nylon (Figure 16). The soil which is the top layer gets stuck approximately in 1 year. It is recommended that

in dry seasons of that one year the surface of the roof should be made smoother by plaster mortar by the roofer.

Fig 14. Dismantling of the roof

Fig 15. Regeneration phase

Fig 16. Completion phase

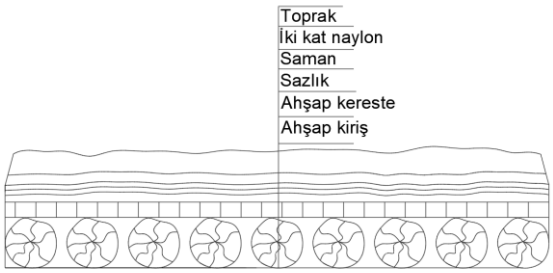

Fig 17. Material detail

Fig 18. Condition before and after repair

Conclusion and Evaluation

Recently, because artificial fertilizer is preferred now, the boranhanes are used less and are in danger of extinction. These unused structures are damaged highly in time and some of them are destroyed and other constructions are made instead. The culture of the region is also started to disappear.
For a long time, pigeon fertilizer is used in many ways, and to obtain it the shelters are built in Diyarbakır region. In terms of culture, it is important to transmit these structures, that have endured from past to present, to the next generations.
The boranhane examined in this study is one of the examples of these kind of structures. Also, in this study, it is underlined that, in terms of the cultural heritage, it is important to protect boranhanes that are about to extinct. The restored boranhanes could be the pioneers of the restoration of other damaged ones and it is important to transmit them to the next generations.

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INTERNET RESOURCES

- URL-1:https://tr.rozsavagecoaching.com/1384-how-long-do-pigeons-live
- URL-2:https://www.gubreler.com/guvercin-gubresi-ve-faydalari_481.htm
- URL-3:https://www.gazeteistasyon.com/2020/02/13/bir-zamanlar-boranhaneler-vardi-1-ahmet-sumbul-ozel-haber/