Spatial Transformation and Functions of Bulteok as Space for Haenyeo on Jeju Island, Korea

Kyeonghwa Byun1, Eun-Jung Kang2*, Changgen Yoo3 and Kyu-Han Kim4

1Assistant Professor, Waterfront and Coastal Research Center, Catholic Kwandong University, Korea
2Doctor, Department of Tourism Management, Jeju National University, Korea
3Associate Professor, Department of Architecture, Mokpo National University, Korea
4Professor, Department of Civil Engineering, Catholic Kwandong University, Korea

Abstract

Bulteok is a unique outdoor stone structure used by haenyeo – female divers who harvest marine products – and is representative of the haenyeo culture on Jeju Island, Korea. This study aims at examining the structure, form, function, and spatial transformation of bulteok on Jeju Island. Through historical records, literature reviews, and field surveys, this study has identified their structure, form and materials. The study analyzes their function and spatial characteristics through field surveys and measurement, interviews with 12 haenyeo, and observation of their behavior at bulteok on Udo Island, Jeju Province. The original bulteok are open-air structures with no roof, but new buildings for haenyeo have been constructed as replacements for those spaces. Old bulteok were mostly built in the form of a rectangle or a circle by piling up stones found on the coast. The materials of the bulteok researched are categorized into four types based on the wall enclosing the fire space: natural rock-hole, stone only, stone and cement, and stone and brick. Bulteok function as spaces for community life, changing of clothes by haenyeo, protection from weather, work activities, and training.

Keywords: bulteok; haenyeo (women divers); spatial function; Udo Island; Jeju Island

1. Introduction
1.1 Background and Purpose

Recently, an increasing interest in the sea has led many scholars in Korea and Japan to conduct research on haenyeo – female divers – from various perspectives. Haenyeo, literally meaning "women of the sea," refers to the female divers of Jeju Island who collect seafood and seaweed without the use of breathing equipment (Jwa, 2007).

The haenyeo culture is representative of Jeju Island. It also symbolizes the strong spirit of Jeju women and their strength resulting from their work in the harsh natural environment. Jeju women had to support their households, and their strong spirit became a driving force in boosting the Jeju economy.

For centuries, many Jeju haenyeo have been the main breadwinners in their families. They are largely characterized by being strong, independent and diligent. These characteristics are well reflected in their unique working spaces and culture. Representative items of their working culture are labor songs, shamanistic beliefs, and diving tools. Their working spaces include the sea where they harvest marine products, shrines in which they pray for their safety at sea, and dressing rooms where they change into their wetsuits.

Jeju Island is located off the southwest coast of Korea and is a one-hour flight away from the nation's capital city of Seoul. Jeju encompasses 90 islands,
including eight inhabited and 82 uninhabited. It is close to China, Taiwan, and Japan. Eighteen major cities with populations over five million, including Seoul, Beijing, Tokyo and Taipei, are located within a two-hour flight (Fig.1.). Jeju has become a popular international tourist destination due to its accessibility, natural environment, and unique culture.

During the Japanese occupation, Jeju haenyeo even went abroad to Japan, China and Russia to make a living. However, in spite of their long history and extensive activities, research on them began only recently, in the 1980s. For decades, their numbers have been rapidly decreasing, and most of them are now in their sixties or older. In an effort to preserve and understand haenyeo culture, which is at risk of dying out, haenyeo-related research is being carried out from various perspectives. In recent years, many studies have been carried out on haenyeo. Studies conducted from a historical perspective explore their history (Kim, 1991; Ko, 2005), the areas where they worked in the past, resistance movements they led (Jang, 2011; Kim, 2010), and their songs (Moon, 2005). Studies on their working areas mostly examine shrines where they pray for their safety in the water, their working patterns, and the profession of female diver (Moon, 2008a).

The bulteok is a representative architectural and cultural artifact of the haenyeo; however, there have been few studies on them. It is a unique outdoor stone structure that represents the haenyeo culture on Jeju Island. The term bulteok is a Jeju word for "buljari," meaning a bonfire (Han, 2013a). It is a compound word, with 'bul' meaning 'fire' and 'teok' meaning 'space.' The name of each bulteok normally stems from the name of the village or area where it is situated. While there are some studies on the definition or types of bulteok, there are few studies about their spatial characteristics or spatial functions.

This study examines the spatial transformation and functions of bulteok on Jeju. To this purpose, the researcher analyzed their materials, forms, structures and functions through literature records, field surveys, measurement, interviews and behavior observation. For field study, the researcher also selected Udo Island, where the largest number of haenyeo are still working compared with other areas in Jeju Province.

1.2 Study Method

In order to examine bulteok as representative of Jeju women's culture, the study methods selected were literature review, field study, interviews, and observation of haenyeo behavior at the bulteok. For the literature review and field study, the researcher identified haenyeo historical records and the location, structure, form and materials of bulteok on Jeju Island.

In order to analyze more definitely the function and spatial characteristics of bulteok, the researcher conducted field surveys, interviews with 12 haenyeo, and observation of haenyeo behavior at bulteok on Udo Island, one of the islands annexed to Jeju. The field study on Udo was conducted from March 1-9, 2014, with a 20-30 minute interview with each of 12 haenyeo in addition to observation of haenyeo behavior at bulteok. One interviewee was in her fifties, four were in their sixties, and seven were in their seventies. During the observation, the researcher watched for three days what haenyeo did at the bulteok before entering the water and after returning from it.

2. Literature Review

2.1 Historical Review of Jeju Haenyeo

In the mid-17th century, men also worked as divers, gathering seafood alongside the women. Thus, both male and female divers were referred to by the term haein, meaning "person of the sea." However, over time, offshore diving became women's work, probably because women's body fat better enabled them to endure the cold water (Ko, 2005).

The diving seems to have begun before the Three Kingdom Period (before the mid-seventh century) in Korean history, as there is a record of the laying of pearls at the king's feet. According to Jeju Topography, written by Lee Gun in 1629 during the Joseon era, haenyeo harvested abalones. Another historical book, Jhaewonok, written by Lee Ik Tak (Jeju provincial governor 1694-1696), recorded that he ordered a quota of dried abalones from the jammyeo (another Jeju word for haenyeo).

The earliest surviving drawing of Jeju haenyeo is the Tamnasulyeokdo, a 42-painting album of 1702. Lee Hyun Sang, the Jeju provincial governor 1702-1703, began an inspection tour across two subordinated towns and nine military fortresses on the shoreline of Jeju in the fall of 1702. He ordered a local painter, Kim Nam Gil, to draw the Tamnasuleokdo. Thus these paintings show the way of life and scenery of Jeju Island in 1702. One of the 42 paintings also portrays haenyeo working in the sea (Fig.2.).

![Fig.2. Haenyeo Portrayed in Tamnasuleokdo (1702) Source: Jeju Special Self-Governing Province (2008)](image)

During the Joseon era, which lasted from the late 14th century to the early 20th century, diving began women's work only (Ko, 2005). The numbers of haenyeo did not change significantly after that until the middle of the 20th century. Economic development on Jeju led to the creation of various other jobs for Jeju women and improvements in women's education levels, which in
turn led women to choose other work. Thus, since the 1960s their numbers have been rapidly decreasing, and the majority are now in their sixties or older (Fig.3.). In an effort to preserve and pass down haenyeo culture, which is at risk of dying out, haenyeo-related research is being carried out from a variety of approaches.

2.2 The Effect of the Wetsuit

Developments in Jeju society and modern technology have brought about many changes to the lives of haenyeo. First, their diving suits have changed. Until the mid-1970s, they wore flimsy cotton outfits called mulsojungi (or mulot, meaning “water clothes”) and goggles. The cotton outfits were so thin that haenyeo could not work long hours during frigid winters. They often came out of the sea and warmed their frozen bodies at the fire in the center of bulteok (Han, 2013). Because of this, they worked relatively short hours in the sea and stayed longer in the bulteok. As a result, they harvested only small amounts.

In the mid-1970s, wetsuits were introduced, which allowed haenyeo to stay in the water far longer, gathering far more marine products. Thanks to wetsuits, they worked five to six hours at a time even during winter. Wetsuits, however, are difficult to put on and take off without assistance (Moon, 2008b). Besides, they are so lightweight that they make it difficult for haenyeo to dive down in the water. Haenyeo thus wear a belt of lead weights to combat the wetsuit’s buoyancy. The wetsuit and belt of lead weights are now considered the uniform of haenyeo.

The introduction of the wetsuit brought about changes to bulteok. When haenyeo wore cotton outfits, bulteok, the stone walls of which were built thick to keep out strong winds, were important places where haenyeo could warm themselves in order to continue working in the water (Jeong, 2007). However, with the introduction of wetsuits, their importance lessened (Moon, 2008a; Han, 2013). The length of stay in the bulteok was shorter. Nevertheless, the role of the bulteok was still important for haenyeo.

3. The Status of the Bulteok in Jeju

3.1 Locational Condition of Bulteok

According to a 2013 report on an examination of haenyeo cultural remains, produced by the Jeju Development Institute and Jeju Special Self-Governing Province, a total of 34 bulteok were researched in 2013 in Jeju Province (Fig.4.).

It can be assumed that the number of bulteok would be larger if very small bulteok and vestigial traces of bulteok were included. However, it is obvious that the number of bulteok has been decreasing. Only nine of the 34 were still in use. The decreasing number of bulteok generally results from two reasons: the decreasing number of haenyeo and the construction of modern facilities to be used instead.

Bulteok on Jeju Island are usually located on the seashore because they were built to be used by female divers. Therefore, most seaside villages have established bulteok (Fig.4.).

As haenyeo needed to haul their net sacks heavy with seafood to the bulteok, barefoot after hours of diving, they were built in areas strewn with relatively flat lava rocks (Moon, 2008a). Thus bulteok were located in a convenient place from which to enter the sea and with easy access to the roadside, and in a place with minimal wind if possible.

3.2 Materials of Bulteok

There are four types of material used to construct bulteok, based on the materials of the walls enclosing the fire space: natural rock-hole, stone only, stone and cement, and stone and brick (Fig.4.). The most basic material is the natural rock-hole (the first two images in Fig.5.). The oldest and original bulteok was a large natural rock-hole and its surroundings, which protected haenyeo from strong wind and rain. However, natural rock-holes did not exist where they were needed and were not sufficient for the number of haenyeo. They needed new bulteok instead of natural rock-holes.

Stones were a highly suitable building material because they are highly resistant to fire and were easily found everywhere on Jeju, which is a volcanic island. So locals began to build bulteok by piling up stones. However, they would collapse due to strong winds and the frequent summer typhoons because they were constructed by village people who were not professional builders. They had to be restored or rebuilt.
frequently, so it was necessary to construct stronger bulteok.

The importing of cement to Jeju resolved these problems in the 1980s. Stone and blocks began to be used with cement in constructing bulteok, so they became more diverse in terms of materials and structurally stronger as well.

In recent years, bulteok have been replaced by more modern types of buildings, and concrete is utilized as one such building material.

3.3 Forms and Size of Bulteok

Bulteok is an open-air structure with no roof, and the entrance consists of two overlapping walls to prevent those outside from seeing in. It has only one entrance, which is positioned on the opposite side from the sea. Given that haenyeo were coming in and going out to work in the sea, it would be more convenient for the entrance to face the sea. Despite the inconvenience, the entrance is positioned where it is because of the strong wind from the sea.

Bulteok were built with several forms. In the earliest stage, they were built in straight form. Some were built in a shape similar to the Korean letter 'ㄷ' (Jeju Development Institute & Jeju Special Self-Governing Province 2013). Others were mostly built in the form of a rectangle or circle by piling up small and large stones found on the coast. Because the history of bulteok is as long as the history of haenyeo, their original forms or types have changed, and roofs have been added using new materials. There was no standard to decide that a bulteok should be circular or rectangular in plan. The most appropriate form for the local topographic characteristics was used. At present, new spaces for haenyeo have been constructed as other building types.

Sizes of bulteok vary according to the number of haenyeo using them. A bulteok used by a group of five haenyeo is small, with a height of one to two meters and an area of 6.6 to 9.9 square meters. Those used by larger groups are much bigger (Jeju Development Institute, 2009). For example, Sonobi Bulteok in Gimnyeong village, where the annual shamanic rite Jamsu-gut is held, is much more spacious, covering an area of 99 to 132 square meters (Cultural Tourism Guides Association of Jeju Special Self-Governing Province, 2009). The number of bulteok in a village was usually proportional to the number of haenyeo. For example, when a group of five or six haenyeo shared a bulteok in a village with 30 haenyeo, six bulteok were built close to one another on the seaside.

4. Bulteok on Udo Island

4.1 The Status of Bulteok on Udo Island

Udo, a representative haenyeo community, is located off the eastern coast of the main island of Jeju. It is the largest inhabited island among the annexed islands of Jeju. There are 12 small villages on Udo, with 11 on the coast and the other located in the center of the island. The population stood at 1,610 in December 2013, with 823 males and 785 females. As the island has become a popular tourist destination since the early 2000s, a higher proportion of the population now works in the tourism industry. In the past, most of the women on the island worked as haenyeo, and even today 341 women, or 43.4 percent of all Udo women, are haenyeo.

The number of haenyeo currently living on Udo Island is larger than in any other area; therefore, the number of bulteok there is higher than in other areas. The haenyeo actively participate in the production of seafood. The island is one place where the development of the bulteok can be seen — from stone to cement to modern bulteok with dressing rooms, as also seen in other areas of Jeju. Old bulteok are preserved and often introduced to tourists as representative cultural assets related to haenyeo. The bulteok on Udo Island were therefore selected for this research; they are typical Jeju bulteok which the haenyeo used.

The report by Jeju Development Institute and Jeju Special Self-Governing Province (2013) identified three unused bulteok on Udo Island (Fig.4.). In addition, there are seven bulteok and 11 modern bulteok facilities in the 11 seaside villages, found through field survey (Fig.6.). Modern bulteok facilities are located on the coast of Udo Island, and the village located in the center of the island has no bulteok.

Most of the bulteok on Udo are located on the north side of the island rather than the south side. The north
side of the island is a flat area occupied by six small villages. In contrast, the south side is characterized by a hilly area and two ports for ferries between Udo and the main island of Jeju. The hilly area with sea cliffs is inappropriate for the construction of bulteok, and the port area is also inappropriate because haenyeo are not permitted to work along ferry routes due to potential accidents caused by ferries or fishing boats.

Among the seven bulteok, six were constructed with stone only, and another with stone and cement. The bulteok made with stone and cement was built in the 1980s and is in fairly good condition. The others have been restored after being destroyed in strong winds or a typhoon. None of the seven are used anymore because the modern bulteok have better facilities for haenyeo such as showers and resting rooms.

In order to identify the spatial characteristics and functions of the bulteok, the researcher selected three well-preserved old bulteoks, plus one modern facility that haenyeo currently use. The researcher also measured their sizes, interviewed haenyeo, and observed their behavior at the bulteok.

### 4.2 Spatial Characteristics of Bulteok

The three bulteok selected were built with stone only, or stone and cement. People on Udo Island call them "circle bulteok" (first image, Fig.7.), "rectangle bulteok" (second image, Fig.7.), and "cement bulteok" (last image, Fig.7.). The names are given to reflect a noticeable feature, irrespective of standards of material or shape. In this paper, the same names are used.

Circle bulteok and rectangle bulteok built with stone only are open-air spaces without roofs. The interior consists of a single undivided space. The cement bulteok is different from those two types both in terms of material and division of space. Its walls are built with stone and cement, and a dividing wall inside is made with cement and block. One structure with a roof had a simple floor plan consisting of one interior space only. Though this structure had a simple floor plan, it is interesting that the bulteok space began to be divided. This cement bulteok was built the most recently.

Interviewing haenyeo revealed that the structure did not have a name, but was used for various functions. Its most useful function was that of a changing room, and the space was especially useful in wet or windy weather. It functioned as a utility room for haenyeo. On an island where women’s labor was necessary, structures with a roof had significant meaning for survival in the harsh natural environment. Therefore, bulteok became a symbolic cultural heritage showing the strong spirit of Jeju women.

The size of bulteok usually depends on the number of haenyeo who will use it. A small bulteok is normally shared by five to ten haenyeo, whereas a large one can be used by 30 haenyeo.

| Bulteok Type | Area (m²) | Height of wall (m) | Entrance width (m) | Diameter of Bonfire (m) |
|--------------|-----------|-------------------|--------------------|------------------------|
| Circle       | 19.6      | 1.2               | 1.2                | 1.2                    |
| Rectangle    | 30        | 1.2               | 1.2                | 1.2                    |
| Cement (Utility Room) | 30 (18) | 1.2 | 2.0 | 1.2 |

The areas of the three bulteok vary from 19.6 to 48 square meters. The cement bulteok is the largest, but the area of exterior space only, not including the utility room, is the same as that of the rectangle bulteok. The height of the enclosing walls averages 1.2 meters, which would prevent anyone on the outside from seeing in. This wall height was chosen considering the fact that the heads of haenyeo sitting inside would then barely be seen. The wall height could not be made any lower because haenyeo changed their clothes there. The walls of some bulteok were higher, or they even were built up as roofed structures.
All three bulteoks have one entrance. Entrances to the circle bulteok and rectangle bulteok are 1.2 meters wide, but, the cement bulteok entrance is 2.0 meters wide. There are two potential reasons. Firstly, the function of the protection from weather might affect the width of the bulteok entrance. The cement bulteok is divided into two areas – the bonfire area and the utility room with a roof. Haenyeo might stay in the utility room on a windy or rainy day, instead staying by the bonfire outside. Thus, the entrance of the cement bulteok does not need to be narrow. Secondly, the entrance is related to maintaining the privacy of the haenyeo. The utility room in the cement bulteok might be used for changing clothes and storing things. Thus the entrance at the bonfire in the opening area does not need to be narrow. On the other hand, the entrance of the utility room is narrow like other bulteok, approximately 1.1 meters wide.

The bonfire ring is 1.2 meters in diameter. A bonfire is usually placed at the center in bulteok, but it is placed off-center in the cement bulteok due to the proximity of the entrance to the utility room.

### 4.3 Space Plan in Modern Bulteok Facility

Previously, bulteoks were built by piling up stones found on the coast, so they were easily damaged or destroyed by typhoons or tidal waves. Furthermore, as they had no roofs, they could not properly protect the haenyeo from strong winds or rain. In order to resolve these problems, they were built using cement in the 1980s. The bulteok with a roof not only protected haenyeo from wind and rain but also protected their privacy when changing their clothes. In the 1990s, new bulteok facilities began to be constructed for haenyeo with the support of the local government.

From the viewpoint of function, old bulteok made with stone and cement had only one room, where haenyeo changed their clothes, rested, and worked after coming in from the sea with their day’s catch. Next, space began to be separated functionally inside bulteok when roofed structures were built. Recently, in modern bulteok facilities, the division of space is even more specific. The modern facilities tend to be planned spaces divided up for varied functions.

One modern facility on Udo Island is separated into three main spaces: bulteok space, shower room, and resting room (Fig.8.). The total area of the facility is 190 square meters. The largest of the three spaces is the bulteok space, at 105 square meters, subdivided into three areas. This is more than half the area of the facility, which is a reflection of its relative importance.

However, the function of the bulteok space has changed. Among the various behaviors carried out in old bulteok, bulteok space in the present is mainly used for changing clothes before and after working. Haenyeo also do simple work there, such as sorting the seafood they have caught, when it is windy or raining. Because the main function of the space is that of a changing room, windows are either small or nonexistent, so it is often dark inside. The bonfire inside old bulteok is replaced with a wood stove. The bulteok space is subdivided, and haenyeo usually use the same space every time, even though it is allowable to use another space, because they want to use the part of the bulteok where their working things are kept. Therefore, which haenyeo use the same bulteok becomes a rule in their society.

In space planning, the biggest change when comparing new with old bulteok is the installation of a shower room. All haenyeo share the shower room, which has an area of 30 square meters. The resting room maintains the same function seen in old bulteok but is now equipped with air conditioning and a heating system – ondol, the Korean floor heating system. The resting room is shared by all haenyeo and is 40 square meters in area.

It seems that the most difficult thing for haenyeo in old bulteok was to change from their ordinary clothes to their working clothes and back again. People on Udo Island called this modern bulteok facility the “building for haenyeo to change their clothes.”

The 11 modern bulteok facilities on the island differ in size. However, the bulteok space, shower room, and resting room are basically planned in all modern bulteok facilities. The sizes of shower rooms and resting rooms differ because the sizes of the facilities themselves are diverse. However, the number is the same, and they are planned with one space in the modern bulteok facilities on Udo Island. Bulteok space is different from shower rooms and resting rooms and varies in number and in size because it depends on the number of haenyeo in the village.

| Table 2. Size of Modern Bulteok Facility |
|----------------------------------------|
| **Bulteok** | **Area (m²)** | **Height (m)** | **Door width (m)** | **Size of wood stove (m)** |
| Bulteok Space | 35(3) | 2.4 | 1.2 | 0.7 ×0.7 |
| Shower Room | 30 | 2.4 | 0.9 | - |
| Resting Room | 45 | 2.4 | 1.2 | - |
4.4 Moving Flow in Modern Bulteok Facility

The modern bulteok facility is built for use by women only. Therefore the use of the facility is simple and the moving flow is simple as well. Fig.9. shows the moving flow before working (left image, Fig.9.) and after working (right image, Fig.9.).

Before going to work in the sea, a haenyeo enters a bulteok space, changes from her ordinary clothes to her working clothes, and goes to work.

Upon her return, she goes to the shower room. After showering, she rests and then goes back to the bulteok space again to hang up her wetsuit and store her other working equipment. In addition, she sorts all the seafood she caught that day at the wood stove in the bulteok with the other haenyeo. The seafood sorting takes from 10 minutes to over one hour depending on the day's catch. After completing all work in the bulteok, she returns home. In such a case, the role of the wood stove and the bulteok is still important for haenyeo while working at sea, because it protects haenyeo from harsh weather, particularly in winter or the rainy season.

The interesting point in this moving flow is the fact that there are two doors into the shower room. After passing the main entrance, the haenyeo goes to the shower room using the door connected to the entrance and comes out into the resting room. The space she used before showering is to move through with her wetsuit, whereas the space used after showering is for resting with dry clothes. In this respect, the modern bulteok is characterized by a space design that reinforces the facilities for haenyeo and reflects the details of haenyeo's behavior patterns.

5. Functions of Bulteok

The structure is defined as a space where haenyeo change clothes before and after diving, and warm themselves after working.

Results from the analysis of the interviews with haenyeo show that bulteok have served as a space for the following purposes: community life, changing clothes, protection from the weather, work activities, and training.

- **Space for Community Life**

  A bulteok is a small space but is shared by at least five haenyeo. A group of haenyeo sharing a bulteok becomes close. They often gather round the fire at the center and discuss various issues ranging from personal matters to community policies. Particularly, issues related to work are decided in the bulteok, such as the time to harvest seaweed or the suspension of diving when something has happened in the village.

  Bulteok have also helped mold haenyeo into a cohesive group. As the work is perilous, haenyeo always dive in pairs or larger groups, ensuring each other’s safety. After returning to the bulteok, they gather at a bonfire with the day’s harvest and talk about various issues while eating.

- **Space for Changing Clothes**

  Bulteok are places where haenyeo change their clothes before and after diving. Wetsuits are difficult to put on and take off alone, so haenyeo help one another. In addition, when their wetsuits need repairs, they often mend them at the bulteok before entering the water. Stone bulteok built in the past were open-air places with no roof. Their walls were at least 1.2 meters high, and the entrance was composed of two overlapping walls to make it impossible for those outside to see in. In short, bulteok served as changing rooms for haenyeo.

- **Space for Protection from Weather**

  Bulteok also serve the function of protection. Although stone bulteok had no roof, they protected haenyeo from strong winds by being situated behind a hill or large rock. Most bulteok built after 1980 were roofed, and haenyeo could warm themselves at a bonfire even on rainy days.

- **Space for Working**

  As the haenyeo’s main workplace is the sea, little attention has been paid to their work on land. When they come out of the sea with net sacks full of seafood, their work is not finished. They must sort and prepare their catch for sale. This work takes at least 20 minutes, and at most two to three hours. They do this work in the bulteok, helping one another.

  Bulteok also serve as storage facilities for diving equipment. In the past, when haenyeo used stone bulteok, they kept firewood and some diving tools there. Today, they keep all their diving equipment, including wetsuits and goggles, in the dressing rooms, with name tags attached to indicate ownership.

---

Fig.9. Moving Flow in Modern Bulteok Facility

Fig.10. Haenyeo Warming Themselves and Talking in a Bulteok before Diving

*Source: Haenyeo Museum*
Space for Training

Bulteok have served as places to train new haenyeo. Old, experienced haenyeo teach new haenyeo basic things about diving, such as how to put on a wetsuit and lead belts, how to conserve oxygen to extend their dives, and how to determine which sea creatures are dangerous. In the past, there were many young women learning tips on diving from veteran haenyeo, but today few want to become haenyeo. In addition, those who do want to can learn the necessary skills at the haenyeo school on Jeju Island.

6. Conclusion

The spatial characteristics and functions of bulteok on Jeju Island in Korea were studied through historical literature records, field surveys and measurement, interviews and behavior observation.

The design of bulteok, created for haenyeo, is simple, but makes it possible for them to be used in various ways. As seen in various cases on Jeju Island, bulteok have been efficiently used as places for enriching community life, changing clothes, training, and working. Changes in the types and structures of bulteok are closely related to the effective use of space.

As haenyeo needed to haul their net sacks heavy with seafood to the bulteok, barefoot after hours of diving, bulteok were located in a convenient place from which to enter the sea and with easy access to the seaside and were placed with minimal wind if possible.

Original bulteok were built with stone, were relatively small, and were situated on safe sites on the seaside to make it convenient for haenyeo to use them. They were open-air spaces with no roofs, built using materials easily found nearby. Stone bulteok contributed to the haenyeo developing a cohesive community culture, but their function as a place for changing clothes and protecting haenyeo from weather was not satisfactory. In order to resolve this problem, cement bulteok appeared. They were more solid and not easily damaged by typhoons. They had roofs, were larger than stone bulteok, and were comprised of two separate spaces for changing clothes and working. However, they did not serve as resting places and lacked shower facilities.

New bulteok facilities carry on the main function of old bulteok, as they are built stronger structurally and provide spaces which are divided by function. Moreover, the spaces are all planned from the standpoint of being for female use only.

Jeju haenyeo, who have a history dating back hundreds of years, have played a major role in developing Jeju's unique culture. Bulteok became a symbolic cultural heritage, showing the strong spirit and strength of Jeju women. However, with the number of haenyeo decreasing rapidly, their culture is at risk of dying out. Therefore, in recent years, there have been various efforts to preserve it.

Some have worked to register the Jeju haenyeo on the list of UNESCO World Heritage Sites, and an increasing number of people have contributed to bulteok and other haenyeo-related cultural assets. Bulteok are an eco-friendly structure built using easily-found local materials. Old stone bulteok are not used today, but are quite valuable as a cultural tourism asset, and modern dressing rooms are significant in that they serve various functions.

This research focused on the bulteok of many haenyeo-related cultural assets. Thus, the roles or the structures of other haenyeo-related cultural assets remain as subjects for further research.

Acknowledgement

This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIP) (NRF-2013R1A2A2A04015403).

References

1) Cultural Tourism Guiders Association of Jeju Special Self-Governing Province (2009) Gasdam and bulteok of Gijjaweub, Jeju: Gak publishing.
2) Haenyeo Museum (2012) Jeju Haenyeo, Jeju Media, September, pp.36-37.
3) Han, R. H. (2013a) Jeju Haenyeo Community - Bulteok. Open Jejusi, 81, pp.12-13.
4) Han, R. H. (2013b) Jeju Haenyeo Community - Bulteok. Open Jejusi, 82, pp.16-17.
5) Jang, H. R. (2011) Multicultural Society and The identity of Migrants; Jeju Haeyeos-Transnational Nomadic Subject Crossing the Sea. Comparative Korean Studies, 19, pp.195-222.
6) Jeju Development Institute (2009) Jeju Woman Cultural Remans 100: Jeju Development Institute.
7) Jeju Development Institute & Jeju Special Self-Governing Province (2013) Haenyeo Cultural Remains. Jeju: Jeju Development Institute.
8) Jeju Special Self-Governing Province (2008) Tamansulyeokdo Younginbong. Jeju: Jeju Special Self-Governing Province.
9) Jeju Special Self-Governing Province (2013) Statistics of Maritime Fishery. Jeju: Jeju Special Self-Governing Province.
10) Jeong, G. J. (2007) Work Place of Jeju Woman. In C. o. J. Women (Ed.), Jeju Woman’s Living and Space (pp. 85-163). Jeju: Jeju Woman Development Forum.
11) Jwa, H. K. (2007) The culture and Livlihood of the Haenyeo. Jejudo Study, 32, pp.229-259.
12) Kim, S. K. (2010) The Historic Consideration About the Japanese Advance of the Jeju Woman Diver Japanese Language and Literature Association of Korea and Japan, 14, pp.189-207.
13) Kim, S. M. & Hwang, K. S. (2012) Public welfare services and the needs of the Haenyeo and a comparative analysis. Journal of the Korea Academia-Industrial cooperation Society, 13, pp.4557-4563.
14) Kim, Y. D. (1991) A study on women divers in Cheju island. Korean Classics Studies, 24, pp.27-93.
15) Ko, C. H. (2005) The history of Jeju Haenyeo and the inheritance of Haenyeo culture, the Annual Conference of Korean Society of Civil Engineers Jeju.
16) Moon, S. H. (2005) Musical Study on the Woman Diver's Rowing Song Transmitted to Western Kyeong Nam Journal of Korean Folk Song.
17) Moon, S. D. (2008a) The Catural Status of Jeju Woman's Cultural Remains. Jeju Special Self-Governing Province Magazine, 112, pp.219-220.
18) Moon, S. D. (2008b) Review of Jeju Woman Cultural Remains, the Jeju Development Forum, Jeju.