


Hanok: Architectural and Cultural Aspects of the Korean Traditional House

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Maria Daniela Donoso¹

ABSTRACT

This article seeks to approach Korean culture through the description and critical analysis of the house in hanok architecture, in addition to highlighting its technical-constructive and cultural aspects. Hanok is the term used to refer to buildings in the traditional Korean style. These had their main features crucially developed during the Joseon Dynasty (1392 -1897). Then, a critical analysis of the residential design typologies that make up this culture is developed. From these reflections, the repercussions of these architectural traditions and their contributions to the present day of this culture are also analyzed.

Keywords: Oriental Architecture, Domestic Architecture, Tradition, Historic Houses, Culture.

¹ Graduated in Architecture and Urbanism from the School of Architecture and Design of the Federal University of Minas Gerais (UFMG). Specialist in Environmental Comfort, Energy Efficiency and Sustainable Construction Technologies from the School of Architecture and Design at UFMG.



INTRODUCTION

Hanok is the term used to refer to a house built in the traditional Korean architectural style, however, in a broader sense, it also includes all types of traditional Korean architecture, such as palaces and temples (RESTREPO, 2014). According to Article 2 of the Architecture Law, signed by the Department of Architectural Planning of the Ministry of Land, Infrastructure and Transport of South Korea, *hanok* means a building whose main structure consists of wooden columns, which features Korean-style beams and roof frames, and which reflects the traditional style of Korea (SOUTH KOREA, 2014). Also according to this article, the "architectural style in *hanok*" corresponds to any building that applies the *hanok* form and structure simultaneously, and can also make use of modern materials and technologies (SOUTH KOREA, 2014).

The architectural features of the traditional Korean house are directly related to Neo-Confucianism, adopted as a state ideology in the first centuries of the Joseon Dynasty (KRZYSZTOFIK, 2020). Existing between the years 1392 and 1897, the Joseon Dynasty was established on the Korean Peninsula by General Yi Seong-gye. Because it was founded with the support of Neo-Confucian scholars, the Joseon Dynasty legitimized Neo-Confucianism as its official ideology (JEON, 2016). After being adopted by the entire Korean population in their daily lives, the ideology also began to strongly influence the design and organization of residences (KRZYSZTOFIK, 2020).

Due to this and other cultural factors, the issue of spatiality and experience in Korean architecture is quite distinct from Western architecture (KRZYSZTOFIK, 2020). For Confucianism and Taoism, protagonism is not given by human reason, but by the reason of nature, a situation that is deeply reflected in Korean architecture (JUNG, 2019; RESTREPO, 2014).

In addition to cultural factors, geographical and climatic aspects have also shaped Korea's traditional architectural style (AHN, 2014). The relief of the Korean Peninsula is characterized by being predominantly mountainous, which explains a specific organization for the villages, with houses distributed at different elevations and facing different directions (KRZYSZTOFIK, 2020). The climate, on the other hand, is defined as temperate, with the four seasons well defined and with a notable climatic difference between the regions (AHN, 2014). These characteristics have given rise to the development of very specific architectural solutions, which combine elements that meet the four seasons of the year (KRZYSZTOFIK, 2020). An example corresponds to *the ondol* and its derivatives, which, according to Jeon (2016), is the most striking characteristic that differentiates Korean houses from those of other countries (AHN, 2014; RESTREPO, 2014).

Created around the twelfth century, the *ondol* is a floor heating system consisting of underground conductors connected to an oven and corresponds to a unique feature of traditional Korean houses, since it is not found in any traditional architecture of another country (JEON, 2016).



Also according to Jeon (2016), it is possible to categorize the history of the Korean house into before and after the invention of *the ondol*, since this system played a significant role in the *spatial layout* and in the formation of units of Korean houses.

Hanok residences were commonly found in South Korean cities until the 1960s and 1970s. However, these were quickly replaced by large apartment complexes and factories, as a result of the sudden process of industrialization and urban expansion that marked the second half of the twentieth century in South Korea (CHO, 2021). Especially from the 1980s onwards, the policies of reurbanization of the "old" areas of large urban centers led to the demolition of traditional single-storey houses to make way for multi-storey residential and commercial buildings (RESTREPO, 2014). As a consequence, the *hanok* house represents a small percentage of residential buildings today and is mainly relegated to rural areas due to the little space available in large cities (RESTREPO, 2014).

On the other hand, due to the growing popularization and appreciation of South Korean culture, the interest in its unique residential tradition, and the search for a healthy and environmentally friendly environment, the demand for *hanok* residences has resurfaced in South Korea recently, in a junction of traditional and contemporary (KWON; AHN, 2021).

Based on these considerations, this article aims to approach traditional Korean culture through the description and critical analysis of hanok architecture residences. To this end, it was sought to present some values present in Korean culture such as Confucianism and Taoism, which are reflected in the domestic environment, as well as to describe the Korean vernacular residential space, with special emphasis on the one existing during the Joseon Dynasty. In addition, it sought to highlight the special consideration of the *hanok* for the natural environment and, thus, the regional variations and the materials and techniques used for the conception of this distinct architecture are exposed and investigated.

PHILOSOPHICAL CONCEPTS OF HANOK

Harmony and the relationship with the environment are highly valued by traditional Korean architecture and this is due to the fact that it has Taoist and Neo-Confucian influences (HAN, 2013). The teachings of Lao Tze, founder of philosophical Taoism, can be seen in the construction process of some architectural works, which do not consider nature as an obstacle, but rather as a kind of guide for constructions (RESTREPO, 2014).

Neo-Confucianism emphasizes the idea that man and nature are one, so according to this philosophy, architecture, a human product, must have a technology that respects the laws of nature (KIM, 1999). In addition, Neo-Confucianism emphasizes the spirit of modesty and restraint of the human being in relation to all spaces and natural resources, which means valuing respect and



coexistence with nature (KIM, 1999). The design of a *hanok* house must create a relationship with the surrounding natural environment, and in this way, traditional Korean culture applies the *pungsu* method, known in Chinese as *feng shui in its architecture* (JEON, 2016).

Pungsu or *feng shui* was developed in China about three thousand years ago and brought to the Korean Peninsula by the Chinese (HAN, 2013). This complex body of knowledge is based on an understanding that nature is responsible for helping to balance the energetic forces of environments in order to ensure good health and prosperity for its inhabitants (HAN, 2013). Thus, such a method aims to harmonize built structures with the natural environment (ZLATARITS, 2018). The mountain and rivers are the main elements of *pungsu*, since it was considered that mountains are necessary for the circulation of wind, while rivers represent a source of water (KIM, 1999).

According to the theory of *pungsu*, nature corresponds to a world of abundant energy, known as *ki*, which constantly moves and changes (KIM, 1999). In this conception, the flow of *ki* means the movement of energy from the sky, the earth and humans, something considered healthy in an environment (HAN, 2013). Building on land with an adequate configuration of mountains and rivers was thus considered the most favorable means of harnessing the energy of nature. A place with an abundance of *ki* was considered ideal for human settlement, since this energy would flow to the inhabitants (KIM, 1999). In this context, *pungsu* guided the arrangement of a house on the land, as well as determined its *layout* by clarifying the ideal orientation of each room for better use of natural ventilation and sunlight (ZLATARITS, 2018).

SPATIAL ELEMENTS OF THE KOREAN HOUSE IN THE JOSEON DYNASTY AND ITS REGIONALIZATIONS

The architectural features of the *hanok* are directly related to the traditional social order in Korea developed during the Joseon Dynasty in line with the ideology of the state (KRZYSZTOFIK, 2020). The Joseon Dynasty was established in 1392 on the Korean Peninsula by General Yi Seong-gye, who would later be named Taejo, the first king of Joseon. Yi Seong-gye received the support of official Neo-Confucian scholars to found the new dynasty, and so Joseon adhered to a new system based on Neo-Confucian ideals (CHOI, 2007). Although Neo-Confucianism was admitted as a state ideology in the early years of the Joseon Dynasty, it was only in the fifteenth and sixteenth centuries that the doctrine was adopted by the entire Korean population in their daily lives (JEON, 2016). This fact is due to the influences of the content of a work entitled *Rituals of the Family of Zui Xi* (*Zhu Xi Jiali*), written by the Chinese philosopher Zhu Xi (JEON, 2016).

Zhu Xi's work describes proper conduct within the family according to the philosophies of Neo-Confucianism, where human relationships and the obligations of the different strata of society should be strictly defined (KRZYSZTOFIK, 2020). Family rituals were introduced to reinforce and



maintain the patriarchal system of Korean society, where clans played a key role (KRZYSZTOFIK, 2020). Residential architecture has also been influenced and adapted to the profound changes in Korea's social life (KRZYSZTOFIK, 2020).

Choi (2007) highlights three major changes that Neo-Confucianism brought about in Korean society in the Joseon Dynasty and, in turn, in the characteristics of the residences built in this period. The first change is the development of the extended family system, where several generations descended from the same patriarch live together (CHOI, 2007). In this system, the family, and not the individual, emerged as the basic unit of society, in addition to the fact that the central relationship, characterized by authority, obedience and respect, was not between husband and wife, but between parents and children (PARK, CHO 1995). In this way, primogeniture influenced the spatial arrangement of the house, in which the room intended for the eldest son was arranged next to the room of the head of the family (CHOI, 2007).

The second change in architecture induced by Neo-Confucianism highlighted by Choi (2007) refers to the emergence of pavilions dedicated to the ancestors of the family in the residences. These pavilions correspond to environments closely linked to Confucian philosophy and culture, which has filial piety as a precept, that is, the virtue of respect for parents and ancestors (ZLATARITS, 2018). Based on the content of Zui Xi's Family Rituals, the state encouraged that the residences, both of the elite and of members of the lower classes, have a space dedicated to the memory and worship of the family's ancestors (KRZYSZTOFIK, 2020).

Choi (2007) also points out that the third change caused by Neo-Confucianism in Korean society is the strict separation between feminine and masculine, which reflected profoundly on the organization of the residential space. Neo-Confucian doctrine emphasized the difference between genders, which was rooted in patriarchy (PARK, CHO, 1995). In this way, women occupied an inferior status in society, being restricted to the private sphere and subject to the authority of the father, husband or eldest son (ZLATARITS, 2018). In the residential sphere, women had their rooms separated from men or, in the case of upper-class houses, there were differentiated buildings for men and women, along with their respective dependencies (CHOI, 2007)

The spatial structure of a *hanok*, whether composed of one or several buildings, corresponded to a kitchen and compartments based on *the ondol* and *the maru*, which refer to two unique floor systems of Korean architecture (SHON, 2011). The *ondol* is a floor heating system used as a solution for winter (JEON, 2016). Traditionally in this system, hot smoke from a fireplace, located in the kitchen or outdoors, flowed into ducts under the floor, heated it, and finally exited through a chimney (SHON, 2011). The floor of rooms with *ripple* was made of stone and clay and covered with several layers of paper greased with oil (SHON, 2011).



The *ondol floor* not only brought changes in the spatial composition of the room, but also influenced the general and spatial characteristics of the house (JEON, 2016). For example, the rooms that contained *ondol* and the kitchen were usually located close together, because, to save fuel, a single fire was used both to heat the *ondol* and to cook for the family (JEON, 2016). *Maru*, on the other hand, refers to a system of floors of thin wooden planks arranged in an elevated position and was generally used in lobbies or semi-open rooms (CHO, 2013). The elevated position of *the maru* allowed ventilation and cooling of the room, so it was a comfort solution for the summer (ZLATARITS, 2018).

A difference between the traditional Korean residence of the Joseon Dynasty and Western residences is the issue of the use of rooms. The room is translated as *bang* in Korean. Both the western room and the *bang* correspond to unitary spaces of architecture, but there is a clear distinction between both (JUNG, 2019). Western-style rooms have a delimited function, such as dining, studying, living, or sleeping. On the other hand, *hanok dwellings* did not have room differentiation in terms of their use, that is, the *bang* did not have a fixed function. The only differentiation that the rooms of the *hanok house* received was in relation to their occupant and their position within the building (JUNG, 2019). For example, the *anbang* corresponded to the internal compartment used by the family wife, the *geoneonbang* named the room opposite the *anbang*, and the *sarangbang* was the compartment used by the head of the family (JUNG, 2019).

Unlike the Western room, the compartments of the traditional Korean house did not have a fixed use, being characterized as multipurpose spaces where various activities were carried out by the residents. These compartments could have both *maru* and *wavel* floors, systems referring to the character of the space, not to the functional space for a specific purpose (JUNG, 2019). In the *hanok* residence, only the kitchen and the storage room could distinguish the functions, however, the traditional Korean kitchen is a multipurpose space, as it was cooked, food was stored and the heating of the house was controlled (JUNG, 2019).

The use of a *bang* in the domestic space in the Joseon Dynasty as a multipurpose space is deeply related to the Korean lifestyle of the period (KWON; AHN, 2021). In the Western house, each daily activity is performed in a specific room. In the traditional Korean residential space, domestic life was mostly carried out in the *bang*: in a single room the resident slept, had meals, studied or received guests (JUNG, 2019).

Hanok houses did not have a *design layout* that was equally distributed throughout the Korean Peninsula, and variations occurred according to the region and the social condition of the family that inhabited the residence (JEON, 2016). Residences of different social classes had rooms founded on *the ondol* and *the maru*, although there were functional differences when comparing hanok layouts *belonging to members of high or low purchasing power* (ZLATARITS, 2018).

During most of the Joseon Dynasty, the Korean Peninsula was divided into eight provinces (Figure 02). Each province developed its housing plan according to the average annual temperature difference between the geographic regions (AHN, 2014). In addition, the *layout* of the house varied according to the preference of its owner, as well as the technique used by the builder (LEE, 2018).

FIGURE 01- Map of Korean provinces during most of the Joseon Dynasty (1392-1910)



Source: The author..

The four most common models of residential floor plans corresponded to linear, L-shaped, U-shaped, and rectangular shapes, with each floor plan designed for different proposals that met various climatic and environmental situations (LEE, 2018). Jeon (2016) proposes that the residential varieties found on the Korean Peninsula during the Joseon dynasty were divided into twelve areas, which did not necessarily follow the official provincial divisions. In the north of the peninsula are Hamgyeong, Pyeongan and Hwanghae. In the central portion are present Andong, Yeongdong and the Central Region. The south is comprised of Honam, Hoseo, the Southeast Coast, and Yeongnam. The islands of Ulleungdo and Jeju have developed different building traditions, so they can be considered a different category.

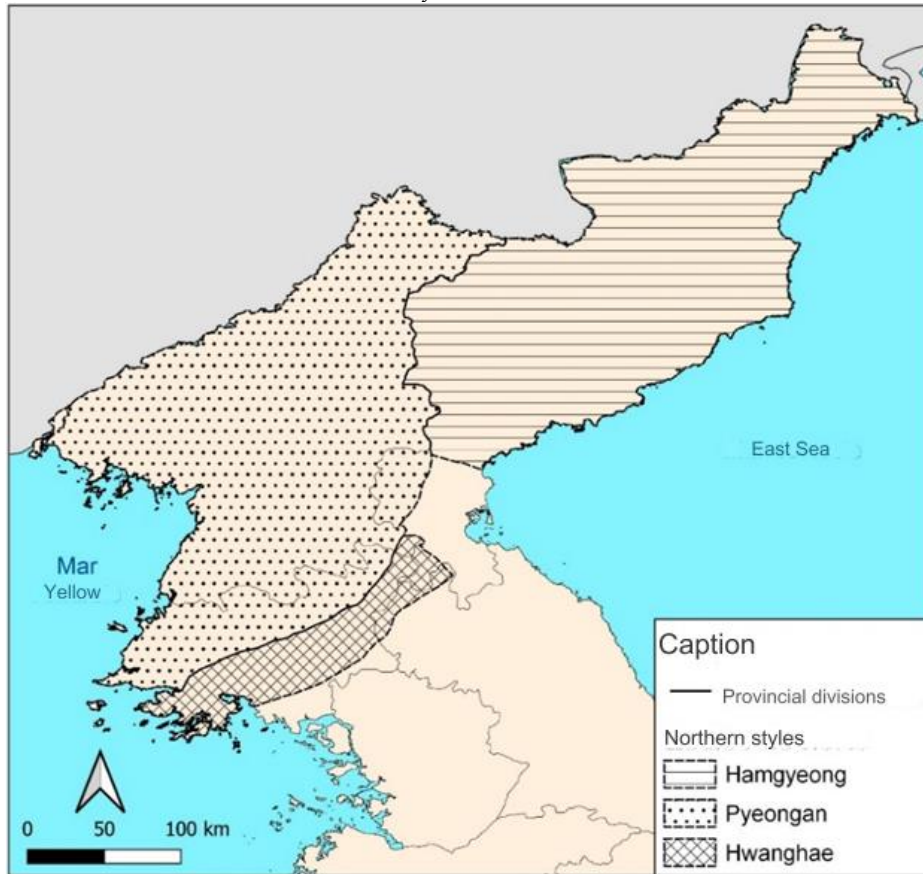
FIGURE 02- Korean Peninsula in the Joseon Dynasty and divisions by residential typologies.



Source: The author.

In the northern portion of the Korean Peninsula, which today comprises North Korea, rectangular typologies predominated, created from the arrangement of rooms in two rows, or linear, with the rooms arranged side by side in a single row. Considering that rectangular typologies are larger and incorporate more rooms than U- or L-shaped houses, it can be seen that the internal space of the residences further north of the peninsula was larger compared to houses in other regions. In addition, due to the fact that the north of the Korean Peninsula has a colder climate, *hanoks* built in this portion did not have rooms with *maru* floors, whose function corresponds to cooling the environment, a strategy considered unnecessary for such a region.

FIGURE 03- Location of *hanok styles* in the North on the Korean Peninsula.

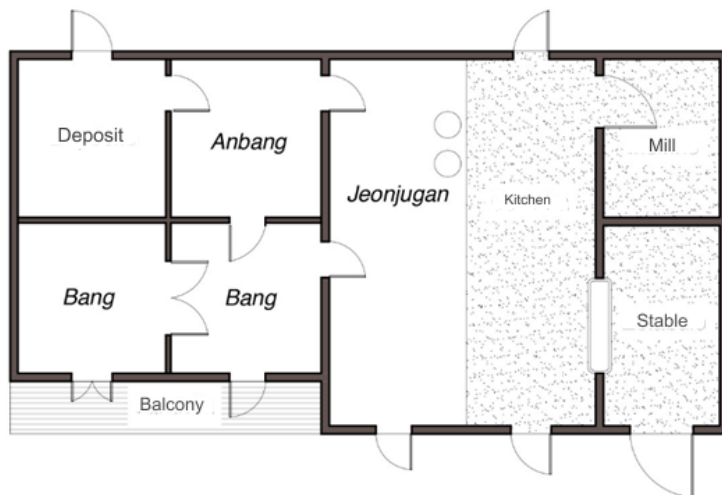
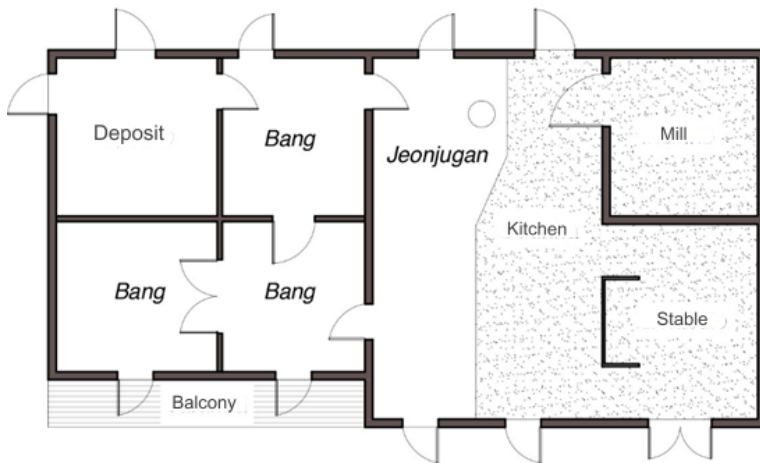


Source: The author.

Hamgyeong-style residences, found primarily in the province of the same name, were characterized by a rectangular shape with rooms organized in a compact way, as this way the internal spaces were kept warm and protected from cold winds. The bedrooms and kitchen were arranged around a transitional room that usually served as a living space for residents, called *jeongjungan*. This space functioned as an open living area where residents usually ate meals or performed household chores. Because it has a heated floor with the *ondol system*, the *jeongjungan* was occupied for a long time by residents on cold days.

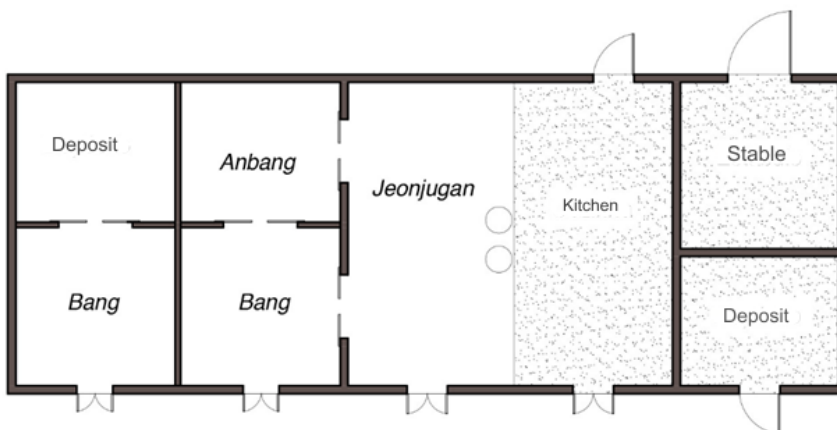
FIGURE 04- Hamgyeong-style house plans

Hamgyeong style



Caption

- Bang: multipurpose room that can be used for multiple domestic tasks.
- Anbang: a bang (generic room) located in the innermost part of the residence. It corresponds to the main space of the female head of the family.
- Jeonjugan: transition room, located between the kitchen and the residents' rooms (bang), without walls and equipped with heating. Used as a living space or for meals and housework



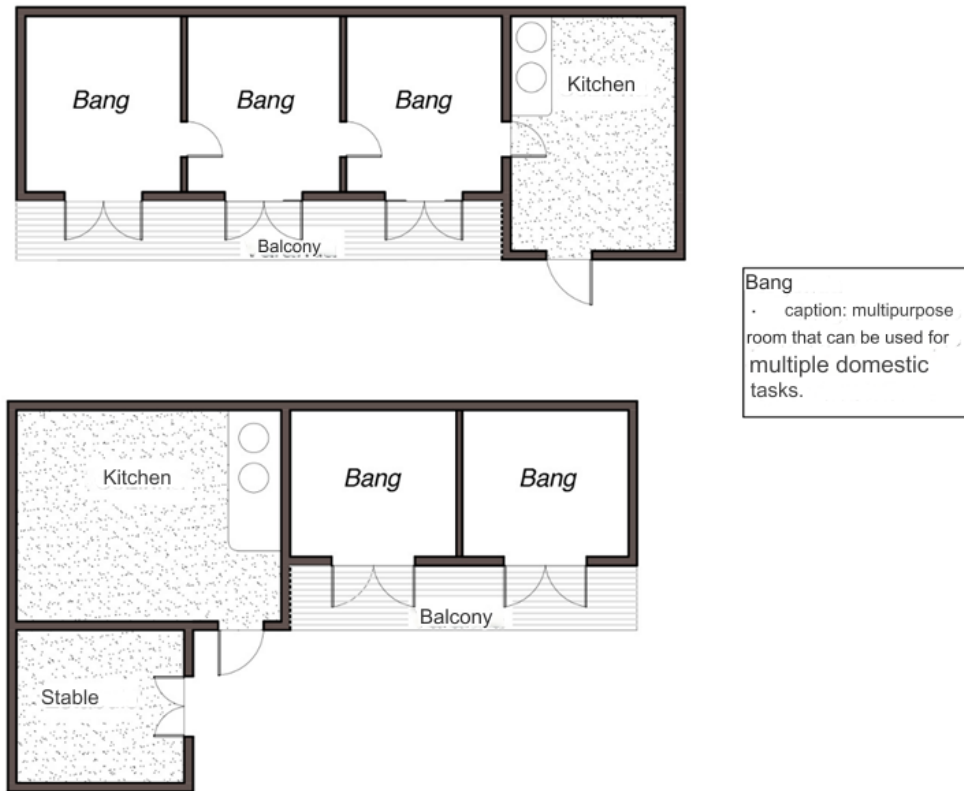
Source: The author. (adapted from SHON, 2011; JEON, 2016; ZLATARITS, 2018)

The northwestern portion of Korea, especially the province of Pyeongan, had as its main residential typology the Pyeongan style, characterized by a linear arrangement. The most simplified arrangement found in this region of the peninsula featured a kitchen at the far end of the residence

and two or three compartments arranged side by side. In many cases, the residences contained an attached stable. The villas also featured a narrow front porch with wooden floors.

FIGURE 05- Pyeongan style house plans

Pyeongan style

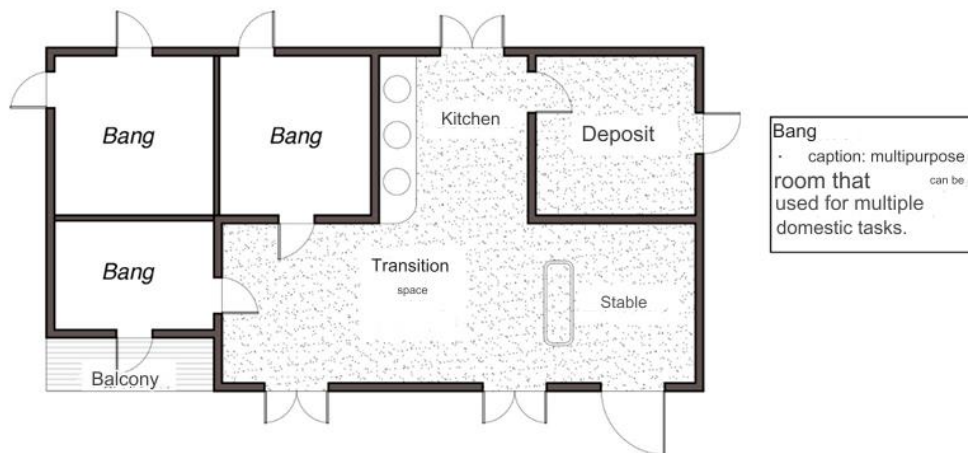


Source: The author. (adapted from SHON, 2011; JEON, 2016)

The Hwanghae style, present mainly in the province of the same name, had a spatial arrangement similar to the Hamgyeong typology, with the rooms adjacent to each other. However, unlike this one, it did not contain a *jeongjungan*, but rather a front transitional space between the compartments and the kitchen. In this space, the residents of the residence carried out domestic work on rainy days or in winter. Possibly to optimize such tasks, the animals were kept in an environment right at the entrance, with the kitchen attached to it at the back.

FIGURE 06- Hwanghae style house plan

Hwanghae Style

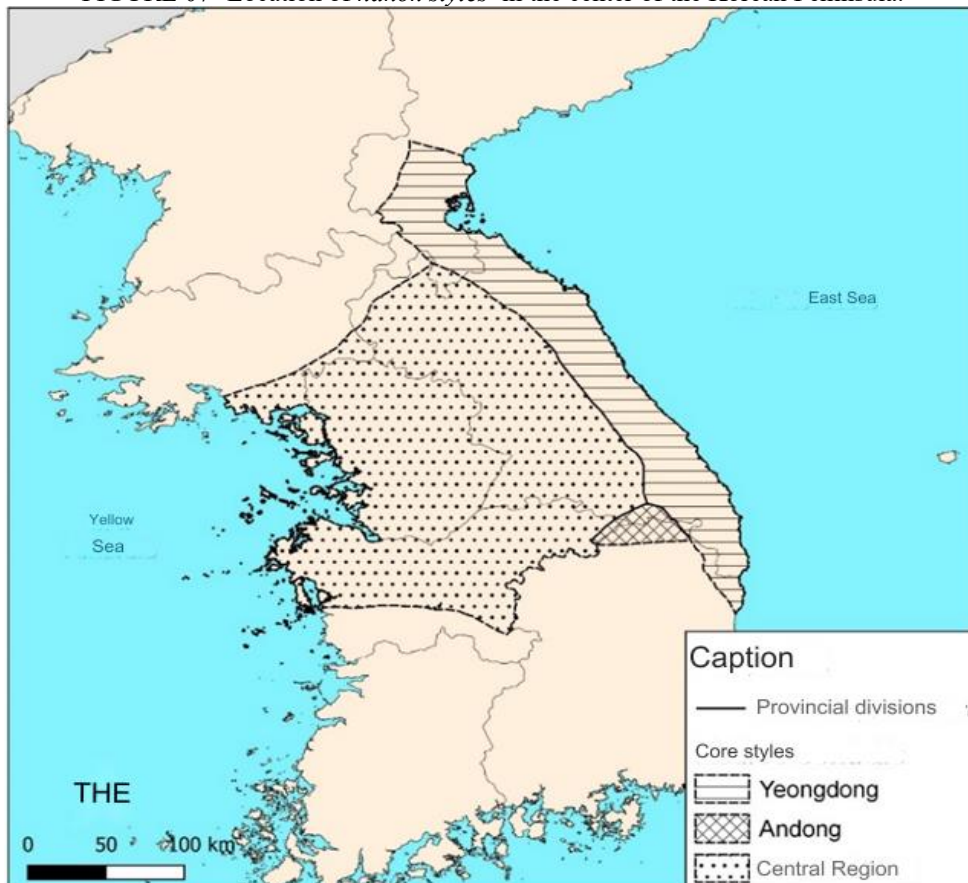


Bang
 caption: multipurpose room that can be used for multiple domestic tasks.

Source: The author. (adapted from JEON, 2016)

In the central portion of the Korean Peninsula, the common typology for dwellings was "L" shaped, although dwellings with a U-shaped or rectangle-shaped plan were also in existence. It can be said that the typologies of central provinces corresponded to a combination of the styles existing in both the north and south of the peninsula.

FIGURE 07- Location of *hanok styles* in the center of the Korean Peninsula.

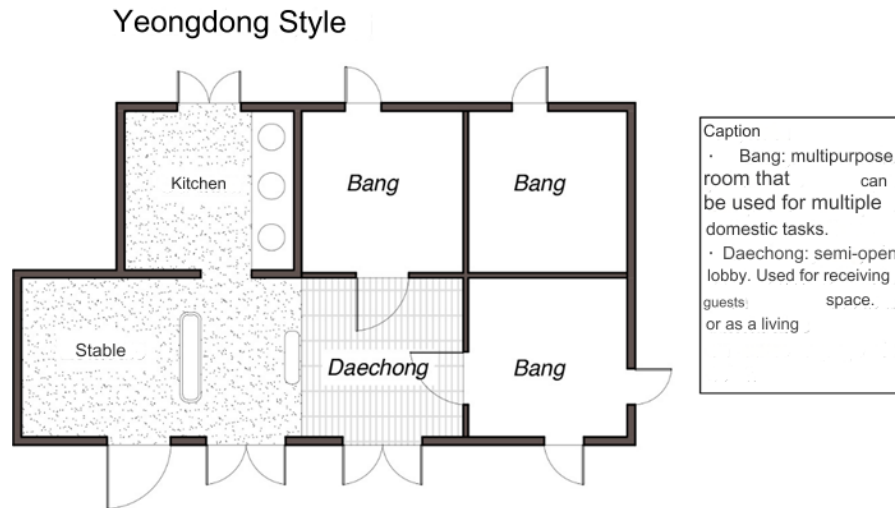


Caption
 — Provincial divisions
 Core styles
 ▨ Yeongdong
 ▩ Andong
 ▤ Central Region

Source: The author.

Yeongdong-style residences were prevalent in much of the east coast of the Korean Peninsula. These residences had a semi-open lobby, with *maru* floors, surrounded by rooms on its three sides. This environment, called *daecheong*, was mainly used in the summer to receive guests or as a living space for residents.

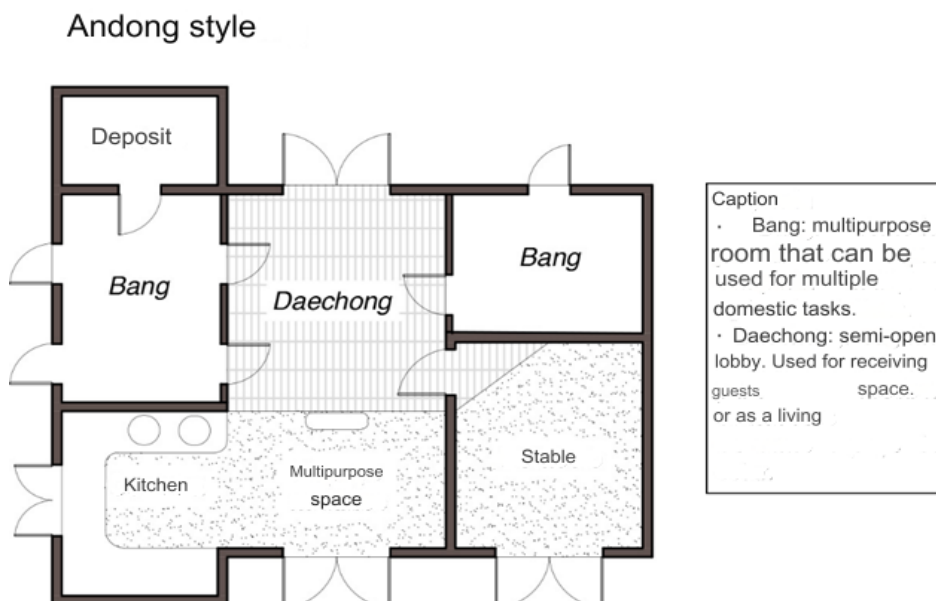
FIGURE 08- Yeongdong style house plan



Source: The author. (adapted from JEON, 2016)

The Andong style, very similar to the Yeongdong style, predominated in a small region in the interior of the peninsula. It was also characterized by the presence of rooms surrounding the three sides of a semi-open lobby. The kitchen featured an adjacent multipurpose space, where household chores were performed.

FIGURE 09- Andong style house plan



Source: The author. (adapted from JEON, 2016)

Residences in the Central Region of the peninsula usually had an "L" shape. *Hanoks* in this portion of Korea had the semi-open lobby, or *daechong*, as an important bioclimatic strategy, considering that this space helped in ventilation and in the control of natural lighting in the building. The rooms of the residence were preferably connected by the side walls, while the front and back walls had openings in order to remain unobstructed to the external space. By creating an entrance at the front of the room and windows at the back, air circulation and natural lighting were improved, a formation that suits the mild climate of this portion of the Korean Peninsula.

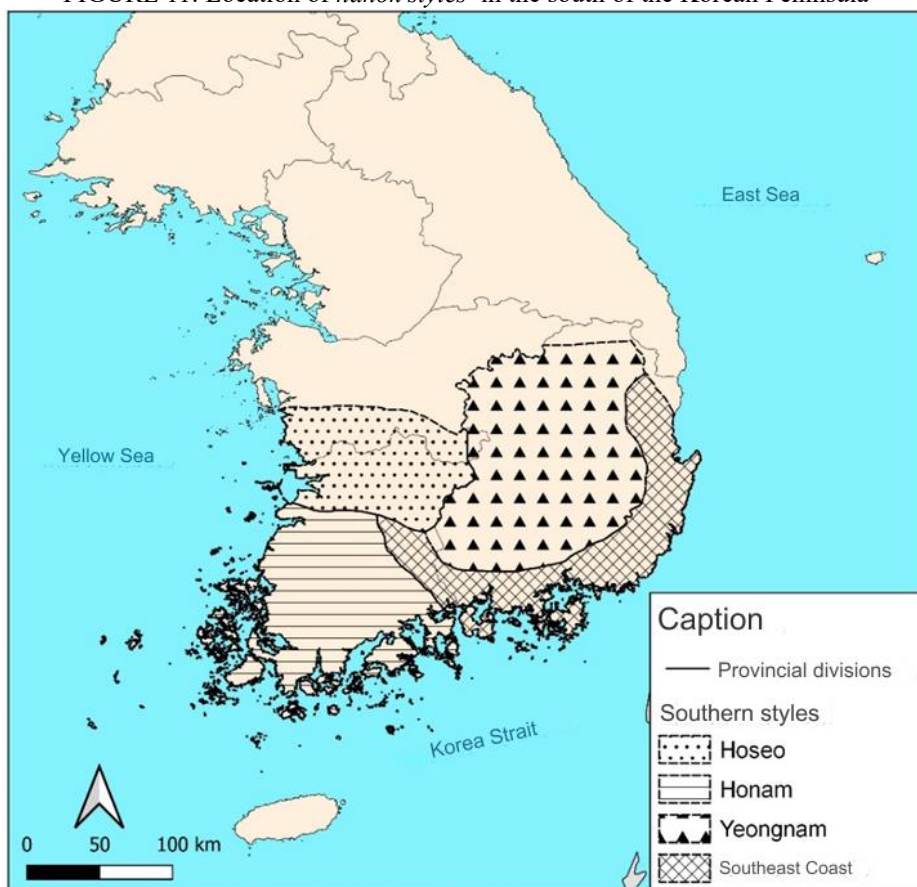
Figure 10: Floor plans of Central Region style residences



Source: The author. (adapted from SHON, 2011; JEON, 2016; ZLATARITS, 2018)

The south of the Korean Peninsula, currently located in South Korea, has a warmer and more humid climate, with a mild and prolonged summer, which requires a configuration that ensures good ventilation in the building. The residential format considered most suitable for this purpose corresponds to the linear. For this reason, the residences in this region usually had the rooms arranged linearly. Compared to the other formats used in Korean dwellings in the Joseon Dynasty, the linear styles of the southern portion of the territory were more compact and had more openings, a solution that allows greater ventilation and natural lighting. Another distinguishing feature of the residences in the southern portion of the Korean territory was the possibility of openings on the four sides of the building.

FIGURE 11: Location of *hanok* styles in the south of the Korean Peninsula

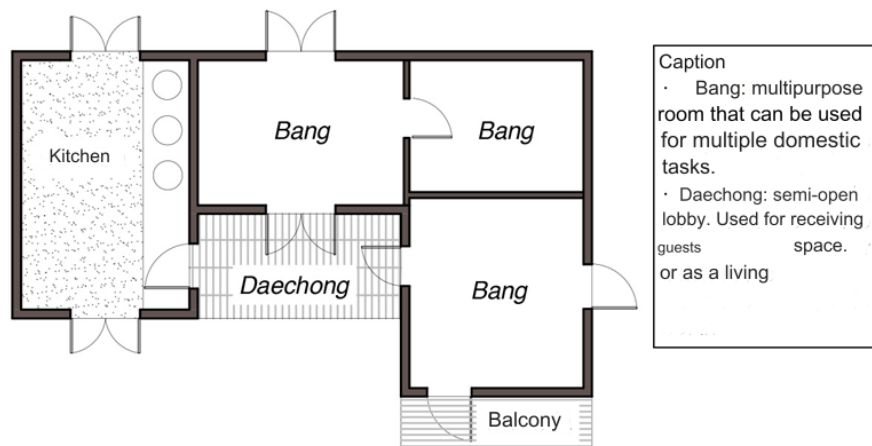


Source: The author.

The Hoseo style, the most prominent in the southwest of the Korean Peninsula, has its *layout* as a result of the population growth suffered by the region in the nineteenth century.

FIGURE 12- Hoseo style house plan

Hoseo Style

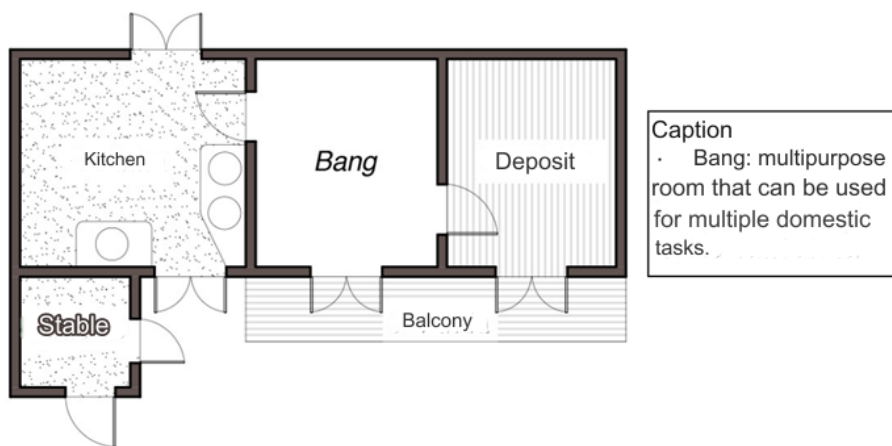


Source: The author. (adapted from JEON, 2016; ZLATARITS, 2018)

In most of the province of Jeolla, the Honam style predominated. This was characterized by being linear, but could also be added to its ends according to demand, just like the Hoseo style. Unlike the other styles of southern Korea, the Honam style generally did not contain rooms with *maru floors*.

FIGURE 13- Honam style house plan

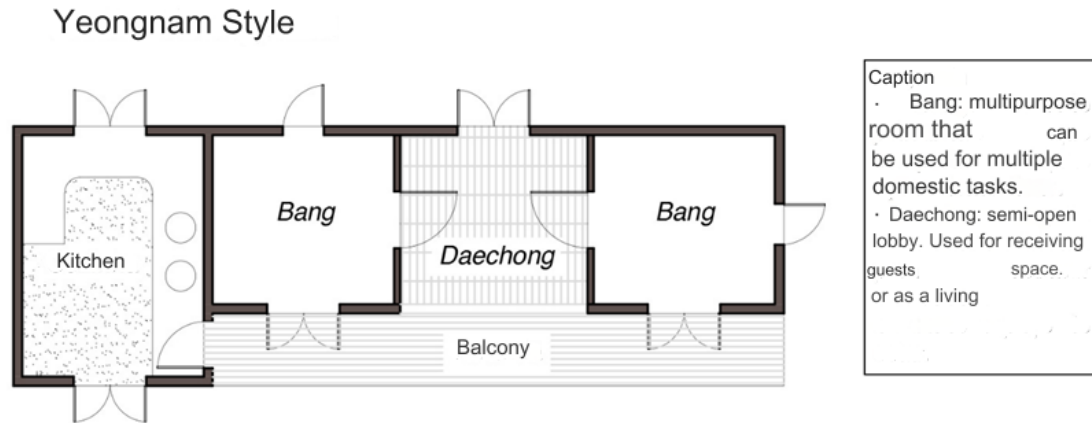
Honam Style



Source: The author. (adapted from JEON, 2016)

The Yeongnam style was characterized by a linear format, with the kitchen positioned at the west end of the residence. Next to the kitchen, the residents' compartments (*bang*) were positioned, usually separated by a semi-open lobby (*daechong*) with *maru floors*. The way in which the room with *maru* was positioned between two compartments, as found in this style, shows a milder climate that does not demand so much heat conservation.

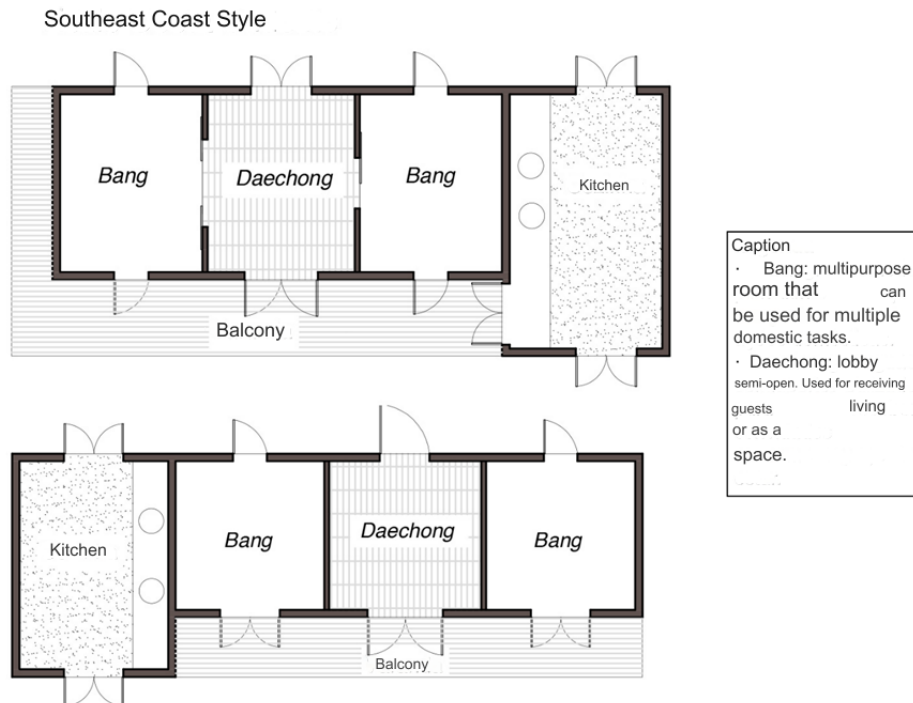
FIGURE 14- Yeongnam style house plan



Source: The author. (adapted from JEON, 2016)

Both Southeast Coast style *layouts* of the Korean Peninsula were characterized by being similar to the Yeongnam style, featuring a linear shape, a kitchen at the end, and a semi-open lobby (*daechong*) with *maru* flooring between two multipurpose compartments (*bang*). It is suggested that this arrangement of rooms also did not need consideration for harsh winters. The spaces of the Southeast Coast style were also characterized by being connected by a narrow and long wooden balcony.

FIGURE 15: Southeast Coast style house plans

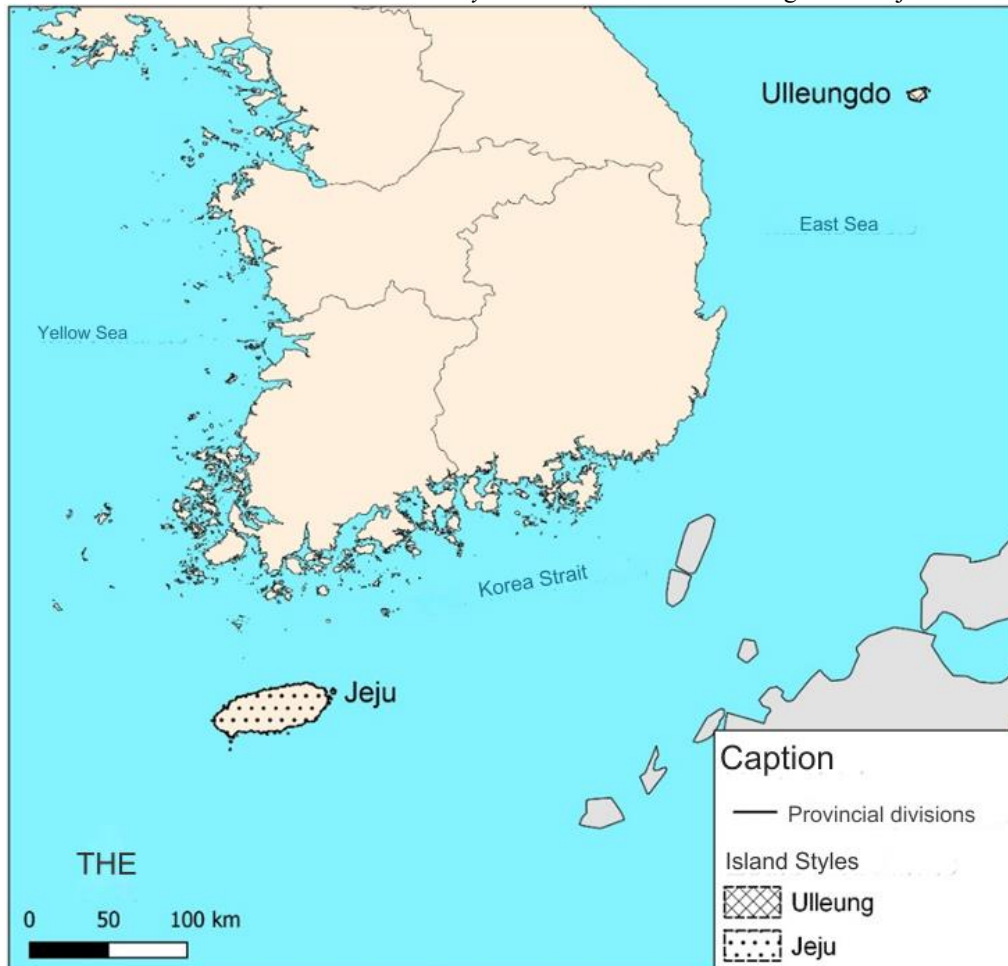


Source: The author. (adapted from JEON, 2016; ZLATARITS, 2018)

The islands of Ulleungdo and Jeju, currently belonging to South Korea, have a different climate and topography from the rest of the Korean territory, which has resulted in forms of unique

dwellings. These islands do not experience dry seasons: summer is characterized by being hot and humid, while winter is marked by weak sunlight and frequent rain, as in the case of Jeju, or snow, as in the case of Ulleungdo. These attributes made Ulleungdo and Jeju have unique residential typologies during the Joseon Dynasty.

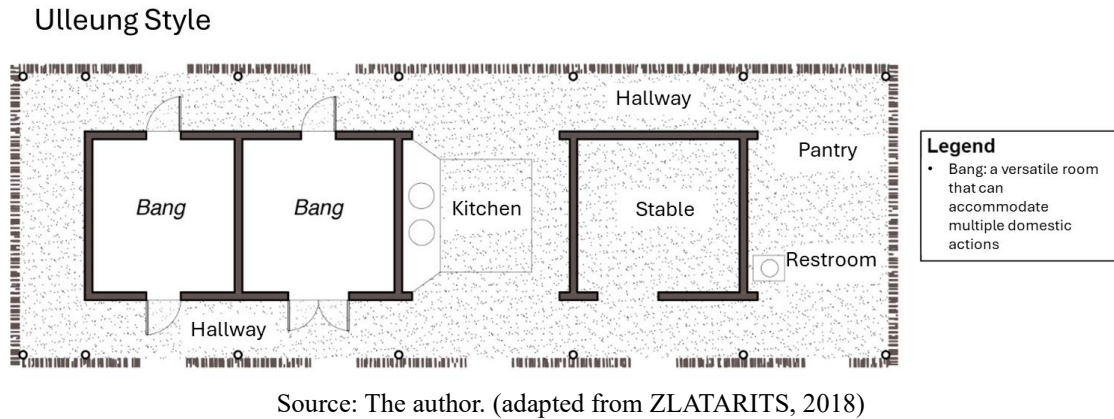
FIGURE 16- Location of *hanok* styles on the islands of Ulleungdo and Jeju



Source: The author.

The Ulleung style, present on Ulleungdo Island, had a linear format, suitable for the local climate, in addition to which subordinate spaces, such as barns and sheds, were connected to the main building. Possibly, the biggest differential of Ulleung-style residences corresponds to the presence of an autonomous wall installed under the eaves of the building that had the function of protecting against snow and cold winds. This wall was conceived through the weaving of corn husk and a local kind of grass and attached to the wooden columns that delimited the exterior of the building (JEON, 2016). The walls of the main building, on the other hand, were characterized by having a structure of logs stacked parallel to the ground, capable of sustaining greater loads (JEON, 2016). This set proved to be efficient in withstanding the high amount of snow in winter, as well as bringing comfort to residents during this season.

FIGURE 17- Ulleung style house plan



The Jeju style, predominant on the homonymous island, had as its main differential aspect the material used for the design of the residences. Walls and fences were designed with volcanic stones, the most abundant material on the island. The houses were also designed with thatched roofs tied with straw cords to withstand the strong winds. In addition, as winters on the island are characterized by being milder, *wavel* floors were rarely used (JEON, 2016). Another differential of the residences in Jeju corresponded to the *gulmok*, a heating system that does not exist in other regions of Korea.

FIGURE 18- Jeju style house plans



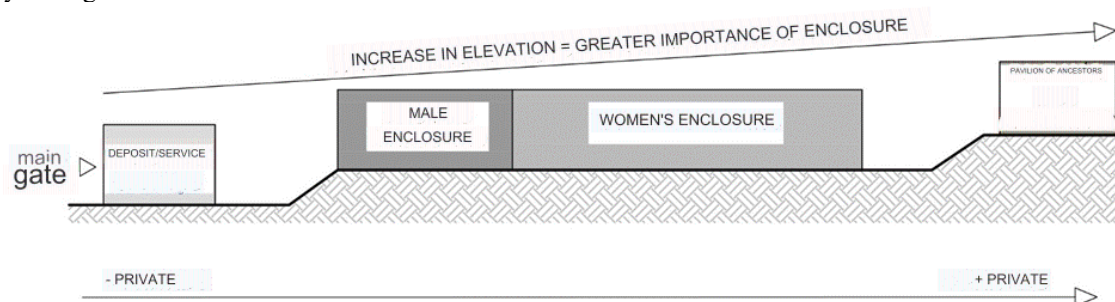
THE KOREAN HOUSE AND ITS SOCIAL HIERARCHY

Korean society in the Joseon Dynasty was also organized into classes, which reflected in the different styles of hanok (LEE, 2018). Residences of members of wealthier classes were called *banga* and, according to Zlatarits (2018), are what is now widely considered the epitome of the traditional Korean house. On the other hand, classes with lower purchasing power inhabited houses called *minga*. Also according to Zlatarits (2018), the main difference between these two types of *hanok* lies in the fact that houses of the poorest population were strictly focused on functionalism, while homes of more affluent families also gave importance to aesthetic factors.

The basic configuration of a *banga*, a residence belonging to members of the upper classes of the Joseon Dynasty, featured separate enclosures for men and women and a pavilion for ancestors (KRZYSZTOFIK, 2020). Most of these residences also had separate spaces for servants and warehouses, where items such as tools or grain were stored (ZLATARITS, 2018). This entire set was surrounded by a perimeter wall (JEON, 2016). As the residences of the elite were composed of several buildings, they were considerably larger than the residences belonging to members of lower purchasing classes (ZLATARITS, 2018).

Based on their importance, all the buildings that made up a *banga* were arranged in specific areas of the land, according to the distance from the entrance gate: the farther from the gate, the more relevant the enclosure was (CHOI, 2007). Along with orientation, the elevation of buildings also reflected hierarchy, where taller buildings were more important (ZLATARITS, 2018). Elevation was achieved both through the topography of the land and by artificial construction or, in most cases, through the combination of both (ZLATARITS, 2018).

FIGURE 19- Enclosures of a residence in relation to the main entrance gate and the elevation of the land, indicating hierarchy among its residents.



Source: The author. (adapted from ZLATARITS, 2018)

Near the entrance gate of the residence, in the lower portion of the land, were located the warehouse and the servants' enclosure (ZLATARITS, 2018). The serfs' enclosure was the space where the servants of the house worked and slept, however, in many cases, the serfs could have rooms inside the bosses' buildings (CHOI, 2007).



The central part of a *banga* corresponded to the space reserved for the lord and his family, which, following neo-Confucian precepts, was divided according to the gender of the resident (CHO, 2013). The interior of each of the enclosures was presented as a continuous space, with individual areas connected to each other instead of making use of physical barriers (ZLATARITS, 2018). This configuration was due to the fact that the house was used for multiple purposes, which required an uninterrupted interior (ZLATARITS, 2018).

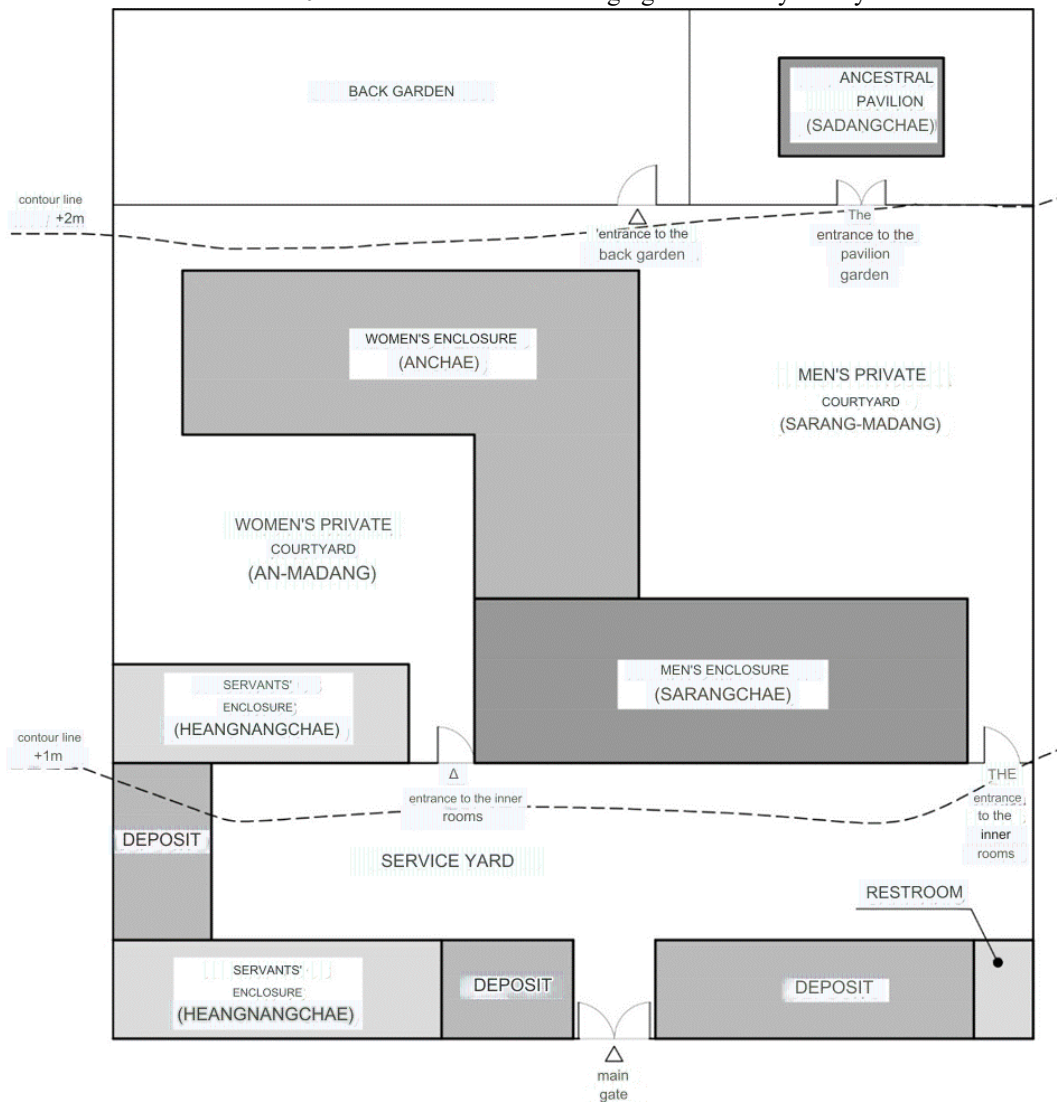
The enclosure of the lord of the house corresponded to the *sarangchae*, which generally included a private room, a bedroom, a lobby and a balcony, which were differentiated not by walls, but by the type of floor (CHOI, 2007). In these spaces, the head of the family carried out all daily activities, such as sleeping, eating, reading, drinking tea, receiving guests, resting, studying, practicing calligraphy, playing instruments, and playing games (KRZYSZTOFIK, 2020). The *sarangchae* also had a private patio, an exclusive space for the lord and other male members of the house, who used it to read and think (CHOI, 2007). Depending on the size of the family, many elite households could have more than one *sarangchae*, with the largest being intended for the head of the family and the smallest reserved for male children (ZLATARITS, 2018).

Next to the *sarangchae*, behind a low wall, was the enclosure intended for the wife of the head of the family (KRZYSZTOFIK, 2020). This enclosure, called *anchae*, usually had a private room, a lobby and a patio (CHOI, 2007). In many cases, the *anchae* also had a room for the family's daughter-in-law (SHON, 2011).

Residences of larger families also had an enclosure called *byeoldangchae*, which was close to the *anchae*, if inhabited by women, or close to the *sarangchae*, if inhabited by men (CHO, 2013). This structure was intended for the elderly parents of the lord or other dependent family members, such as unmarried daughters or young sons (KRZYSZTOFIK, 2020). Generally, the *byeoldangchae* had a room with *maru*, a room with *wavel*, a study room, a balcony and a patio (CHOI, 2007).

On the highest portion of the land, at the back of the main part of the house, the *sadangchae* was built, a pavilion reserved for the memory of the family's ancestors (CHO, 2013). In this pavilion, the residents of the house performed daily prayers and commemorative rituals on the date of death of each of the ancestors (CHOI, 2007).

FIGURE 20 - Plan of a residence belonging to a wealthy family.



Source: The author. (adapted from ZLATARITS, 2018)

On the other hand, in the period of the Joseon Dynasty, individuals of medium and low purchasing power, who constituted the majority of the population, inhabited the *minga*, a residence composed of a single building (ZLATARITS, 2018). The simplest layout of a *minga* was composed of a kitchen and two rooms with *a wave* (JEON, 2016). To contain a *maru*, the house needed to have a layout of at least four rooms. Therefore, this type of floor appeared more frequently in the homes of families with medium purchasing power (JEON, 2016)

As in the homes of families with high purchasing power, the *minga* contained separate multipurpose spaces for male and female residents, following the prevailing precepts of Neo-Confucianism (SHON, 2011). Closer to the entrance gate was the room of the male head of the family, called *sarangbang* (JUNG, 2014). The room intended for the wife of the head of the family, nicknamed *anbang*, was located in the innermost part of the house, which guaranteed greater privacy to the resident (JUNG, 2014). In the homes of low- and middle-income residents, the *anbang* was



almost always attached to the kitchen, where the woman performed most of her household chores (JUNG, 2014).

In many houses, the rooms of the owner of the house and his wife were separated by a main central lobby, usually with *maru* floors, called *daecheong* (ZLATARITS, 2018). This space was used for holding important family events, such as weddings, and also served as a dining room and reception room for guests (JEON, 2016). Unlike the residences of wealthier families, houses of low and medium income individuals had the kitchen in the same building as the residents' private spaces (ZLATARITS, 2018). In addition to serving as a space for cooking food, the kitchen also functioned as a storage space (JEON, 2016). Minga residences also contained a place reserved for the memory and worship of the family's ancestors, a distinctive feature of Joseon Dynasty dwellings. However, these places did not function in a separate building, as occurred in *bangas*, but in a space inside the house, usually located on the opposite side of the rooms of the head of the family (SHON, 2011).

MATERIALS AND STRUCTURE OF TRADITIONAL KOREAN ARCHITECTURE

Originally, hanok architecture made only use of natural materials, with stone, wood, and clay being the main materials used in the making of buildings (LEE, 2018). Paper was also frequently used in hanok houses because it has a soft texture and offers great flexibility (ZLATARITS, 2018).

Good quality stones, such as basalt, gneiss, andesite, limestone and sandstone, were widely used for the construction of residences (AHN, 2014). In particular, granite was widely used in the foundation, base and walls of buildings, especially those belonging to the higher classes (AHN, 2014). On the other hand, high-quality wood was not easy to obtain due to the topography, low rainfall, and dry air present in most of the Korean Peninsula. Thus, the material was used sparingly (AHN, 2014). Pine wood was the most used for the construction of *hanok building structures* due to the fact that it is characterized by being resistant and more malleable (LEE, 2018).

Because it is easily obtained and therefore inexpensive, clay was a fairly common building material in Korea during the Joseon Dynasty (ZLATARITS, 2018). The clay used for the construction of *hanoks* could be made with different types of soil, and the material was used in the design of bases, walls and floors (NATIONAL HANOK CENTER, 2017). In addition, clay was a fundamental component of roofing, because in addition to serving as a raw material for the manufacture of tiles, a layer of the material was applied above the wooden trusses to function as a thermal insulator (ZLATARITS, 2018).

The columns of the *hanok* were directly supported on foundations made of natural or polished stone, which transferred the load of the building to the ground or to a platform, similar to a stylobate (NATIONAL HANOK CENTER, 2017). This platform had the function of bringing a greater amount of sunlight into the house, preventing soil moisture from coming into contact with the floor and



better distributing the loads of the building to the foundations (CHO, 2013). The material, height, and surface face of the platform indicated which class the owner of the residence belonged to (CHO, 2013). In the Joseon Dynasty, most of the population had their houses built on platforms made of clay with the addition of gravel and pieces of wood, while houses of the elite usually featured platforms composed of granite (NATIONAL HANOK CENTER, 2017; CHO, 2013).

Although some special settlements of the wealthier classes used the stone structure, most of the houses in *hanok* had the wooden structural system (ZLATARITS, 2018). Typically, the wooden structure of the *hanoks* was all coupled by means of fittings in the wood, without the use of nails or glue (LEE, 2018). The most frequent type of fitting in *hanok* homes corresponded to the dovetail joint, where the connection of each of the elements was made with trapezoidal-shaped fittings (ZLATARITS, 2018).

The columns of the buildings were positioned on the stone foundations without the use of any type of connecting mortar (CHO, 2013). To do this, a method called *deombeong jucho* was applied, where the contact surfaces of the column and foundation were prepared in such a way that the two structural components remained interlocked (ZLATARITS, 2018). Thus, the structure remained stabilized and displacements due to horizontal movements caused by strong winds or earthquakes were avoided (KIM, 1998).

At the top of the columns there were pins and recesses for the fitting of the beams, which, after being placed, had the roof trusses fitted to them (LEE, 2018). After all the wood work was finished, the structure received a few coats of oil in order to ensure protection against humidity and attacks by xylophagous insects (ZLATARITS, 2018). The entire wooden structure was capable of supporting the weight of the roof, while the walls had no structural function (CHO, 2013).

The traditional walls of the *hanok* house were composed of a lathed weave filled with clay mortar, in a technique similar to wattle and daub (NATIONAL HANOK CENTER, 2017). For the making of the slats, preference was given to locally found materials, and bamboo, lespedeza strips or sorghum strips could be used (NATIONAL HANOK CENTER, 2017). The slatted weave received three layers of clay mortar, both internally and externally, and this was composed of clay, sand, chopped straw and water (NATIONAL HANOK CENTER, 2017). From the nineteenth century onwards, traditional walls were frequently replaced by dry wall panels (CHO, 2013).

Or *Hanji* corresponds to Korean handmade paper, a material used in the construction of houses in Korea since ancient times (ZLATARITS, 2018). Usually made from Chinese mora fiber (*Broussonetia papyrifera*) or *Hanji* it is a translucent and light paper, but at the same time, strong and durable, so it was used to cover doors and windows (LEE, 2018). Most of the openings were rectangular in shape and adapted to the human scale, based on the average height of the population at the time of the construction of the residence (ZLATARITS, 2018). Normally, doors and windows



used various wooden lattices covered with paper as closures *Hanji*, which, because it was translucent, allowed the visualization of the lattice patterns (ZLATARITS, 2018). Or *Hanji* was appropriate to protect the interior space of homes from various natural influences, because although it has an extremely thin thickness, the material has the ability to regulate humidity and offers good acoustic and thermal insulation, in addition to allowing the Partial entry of non-ambient natural light (ZLATARITS, 2018).

The ceiling of the hanok house varied according to the room, and could be suspended, flat and with a lower ceiling height or open to the roof and, therefore, with a higher ceiling height (CHO, 2013). The rooms heated with the *wavel* had a suspended and flat ceiling, which consisted of a lattice wooden structure filled and covered with rice paper or Chinese mora fiber paper (CHO, 2013). The other areas used the open roof for the roof, which left the beams and rafters of the residence exposed and the spaces between the structures were filled with white plaster (CHO, 2013).

The roof is an especially significant component for the identity of traditional Korean architecture (PARK, 2010). Furthermore, the first impression provided by a *hanok* depended heavily on the type and size of its roof because this element demonstrated both the structural and aesthetic characteristics of the residence (NATIONAL HANOK CENTER, 2017). In the Joseon Dynasty, the roofs of *hanok* houses had a diversity of materials and shapes, varying proportionally to the purchasing power of the homeowner, climatic influences, and the local availability of the material (ZLATARITS, 2018). Regarding the materials, they could be covered with tiles, rice straw, stone, eulalia grass or oak bark, and the most common types corresponded to the roof covered by ceramic tiles and the braided rice straw roof (LEE, 2018). Ceramic tiles were often used on the roofs of palaces, temples, and *hanoks* of elite families, while most homes of ordinary individuals featured thatched roofs (NATIONAL HANOK CENTER, 2017).

TECHNICAL-CONSTRUCTIVE AND CULTURAL LEGACIES OF CASA HANOK IN CONTEMPORARY TIMES

The traditional Korean house underwent a notable change during the second half of the nineteenth century, when the introduction of contemporary construction techniques and materials began in Korea (SOHN *et al.*, 2006). After a long period of voluntary isolation, Joseon opened its ports to foreign nations in 1876 and from this moment on, began to experience various external influences (JEON, 2016). Consequently, the *hanok house*, despite maintaining its distinctions, began to adopt the use of industrialized materials, such as glass, brick and metal, in addition to having partially experienced a standardization (JEON, 2016).

In 1910, Japan annexed Korea to its territory, beginning a colonial regime on the peninsula that lasted until 1945. Although in this colonial period Korea needed to respond to strong changes in



the pattern of urbanization and residential distribution patterns, as well as experiencing the arrival of modern elements to housing, such as electricity and running water, the way of living and the traditional residential spatial organization were not completely abandoned (SOHN *et al.*, 2006).

Considering that housing is a combination of the apparent architectural style and the internal way of life, it is hardly possible to modify the type of housing without changes in lifestyle (SOHN *et al.*, 2006). Thus, during the Japanese colonial regime, the Korean population did not immediately absorb foreign housing styles in the way they were (CHO, 2021). In reality, these were transformed into eclectic housing types based on the circumstances of the Korean Peninsula at that time, which resulted in complex styles with Korean, Japanese, and Western characteristics (SOHN *et al.*, 2006). For example, rooms, structures, and exteriors incorporated foreign attributes, but *ondol* continued to be massively used to solve issues related to thermal comfort (SOHN *et al.*, 2006).

In 1945 Korea gained its independence from Japan, and in 1950 it was plunged into a civil war that would last three years. As a result, the peninsula was divided into north and south and an armistice was signed between the two newly formed countries. Soon after this truce, South Korea began a housing reconstruction project, where the construction industry focused on the rehabilitation of buildings destroyed during the Korean War (JEON, 2016). To solve the housing deficit caused by the war, the government started a housing construction project, which did not adopt the *hanok* style, but the westernized one, due to financial issues and the greater availability of so-called modern construction materials (JEON, 2016).

Until the 1960s and 1970s, Korean cities abounded in *hanok* houses, but these were quickly replaced by large apartment complexes and industries after this period (CHO, 2021). This replacement was due to the significant economic growth experienced by South Korea, which resulted in an accelerated process of urbanization and industrialization and a consequent change in the housing market (JEON, 2016).

At this time there was an imbalance between supply and demand for building materials, where while wood was scarce, industrial materials, such as bricks and cement, were available at a more affordable cost (SOHN *et al.*, 2006). *Hanok* constructions required continuous repairs that were not compatible with the routine of urban workers (JEON, 2016). The memory of the Korean War instilled the desire to have a strong and fireproof house and, in addition, the nuclear family became habitual from this moment on, and its size also played an important role in the prevalence of westernized residences (JEON, 2016). Due to the low availability of buildable areas in the country, numerous examples of one- or two-story *hanok* residences were demolished to make way for multifamily buildings that sought to meet the rapid and continuous population demand for housing in urban centers (LEE, 2018).



With this process, *hanok* buildings were on the verge of disappearing (KWON; AHN, 2021). However, in recent years, the trend towards the primacy of extensive apartment complexes has been reversed as the architectural legacy of traditional Korean houses has been rethought (CHO, 2021). An impetus for this corresponds to the bursting of the housing bubble in the wake of the Asian financial crisis in 1997, which brought awareness that reckless and overcrowded development would benefit neither landowners nor the general population (JEON, 2020). Eventually, the metropolitan government of Seoul, the country's capital, devised a plan to preserve traditional Korean houses as unique neighborhood attractions, and then the trend of regenerating *hanok* clusters spread to other provincial cities in South Korea (JEON, 2020).

It is currently a consensus that from a cultural and historical point of view, the preservation and protection of *hanoks* are essential to maintain Korea's heritage (KWON; AHN, 2021). Therefore, efforts have been made at the local, national and international levels to support and sustain the life of historic residential buildings (SHON, 2011). A recent movement is the adaptive reuse of traditional Korean buildings, which undergo renovations and are transformed into cafes, shops, libraries, and community service centers, among other facilities (CHO, 2021). This trend has gained space especially due to the growing wave of appreciation and popularization of Korean culture and the greater demand for buildings with identity and individuality, which has led to the rediscovery of *hanok* as a place with elegance and personality to enjoy (CHO, 2021).

The legacy of the *hanok* house is also present in contemporary Korean architecture, in an amalgam of twenty-first-century technologies, modern lifestyles, and contemporary culture (CHO, 2021). One of the factors leading to this *hanok* renaissance can be attributed to an increased awareness of environmental issues (JEON, 2020). The traditional Korean house is premised on harmony with nature, and constructions of this type seek integration with the surrounding natural environment and employ the use of natural materials and techniques that have less impact on the environment (AHN, 2014). In this way, it is a construction with sustainable aspects, a principle widely sought after by architects today.

Modern architecture in *hanok* is inspired by the natural principle of positioning the house to show and frame the landscape, in addition to remaining faithful to the materiality and characteristics of the interior (KWON; AHN, 2021). Although industrial materials are employed in *modern hanoks*, there is a preference for the use of traditional materials, which are considered more sustainable (CHO, 2021). For example, wood, widely used in neo-traditional Korean building structures, is a natural and biodegradable material and, at the same time, resistant and relatively light, which allows the installation of large and strategically positioned windows to allow a good view of the surrounding nature (KWON; AHN, 2021).



FINAL CONSIDERATIONS

In this article, it was evidenced that traditional Korean architecture is not exactly an object of visual appreciation, but a tool of aesthetic awareness that leads to the unity of nature, humans and the universe. Primarily, *hanok* houses aimed at harmony with the environment, climate, geography, landscape, human psychology and personal relationships, with architecture being treated as a holistic natural living element. Hanok seeks to take advantage of what the natural environment offers to improve man's habitation, in addition to the fact that this can also be understood as a form of expression in which Koreans show their spirituality and connection with heaven and earth. As a result, each region of the Korean Peninsula features traditional houses with different aspects, befitting each natural feature.

In recent years, the characteristics of the *hanok* have been re-examined and this type of residence has attracted interest as an alternative to apartment complexes. Sustainability has been a factor required by civil construction in current times and *hanok architecture* stands out in this regard for having the premise of adapting and using the natural environment to its advantage, as well as prioritizing the use of materials less harmful to the environment. What's more, the *hanok*, with its beauty and uniqueness, represents an identity for Korean culture by reflecting the country's history and society.

The house is the living space for human settlement, and its importance and condition in a person's life are determined by the society of their time. In this way, architecture in *hanok* currently undergoes a critical reinterpretation and is amalgamated with the way of life of the twenty-first century or has its principles applied in modern buildings. In addition, in contemporary times, hanok has been used for purposes other than residence.

Architecture is not just about filling the space with buildings, but about understanding the place taking into account its social, cultural, historical, and environmental essence. Each community has its own style of architecture that highlights its main characteristics and cultures, in addition to rescuing a sense of heritage, which provides them with a unique appearance. These styles cannot be separated from the culture in which they were developed and result in a regional and economic aesthetic of their own. In this context, *hanok* has a lot to teach about sensitivity and understanding of the essence of traditional Korean history and culture.



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