

*Assessment Indexes for Habitability Performances Applicable to Hanok Focused on Household Types*

Han, Seung-Hoon\* · Lee, Mi-Hyang\*\* · Cheon, Deuk-Youm\*\*\*

\* School of Architecture, Chonnam National University, South Korea (hshoon@jnu.ac.kr)

\*\* Doctoral Program in Cultural Properties, Chonnam National University, South Korea (dahyeon01@naver.com)

\*\*\* Corresponding Author, School of Architecture, Chonnam National University, South Korea (dycheon@jnu.ac.kr)

**ABSTRACT**

**Purpose:** The purpose of this study is to propose a fundamental scheme of an assessment framework for habitability towards Hanok, the Korean traditional housing. For this research, the comprehensive degree of residential performances of Hanok has been analyzed and its assessment factors have been classified by three major indexes: architectural planning (spatial composition), site planning (town settings) and sustainability (environmental performance). **Method:** For this study, survey results from main users, the specimen residents living in Hanok currently, were collected for checking of the habitability. Many precedent researches about the residential performance for Hanok, first of all, were performed to induce the assessment elements of the proposed indexes and the evaluation framework. This paper also includes a knowledge-based qualitative analysis of the design indexes in aspects of both architectural space and site components, and examines the effectiveness of the environmental sustainability as well. **Result:** This research has finally suggested an integrative evaluation framework for Hanok the field of habitability that could assess over real residents of the interior Hanok space in living conditions by checklists. As a result, the proposed framework has great possibility in applicability to keep its own values for the practical field of Hanok professions.

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**KEYWORD**

Environment-Friendliness  
Residential Performance  
Habitability  
Hanok  
Korean Traditional Housing

**ACCEPTANCE INFO**

Received June 20, 2018  
Final revision received July 25, 2018  
Accepted July 26, 2018

**1. INTRODUCTION****1.1. Habitability as a Main Factor for the Residential Performance**

Recently, there have been a series of governmental projects regarding a revival of Hanok, the traditional residence in Korea, that aims at preserving the unique building style and evaluating for its own cultural values [1]. The projects are widely including a remodeling of the single house, a renewal of the governmental office, a planning of the new-styled Hanok village and so on, but they are unlikely being accepted as a type of the contemporary housing in Korea, because it is normally composed of the wooden structure and causes a problem for mass-production [2].

This study, therefore, tries to establish the main concept of Hanok habitability compared to that of the contemporary housing and propose the evaluation system for the comprehensive residential performance. For this, precedent researches about Hanok performance have been investigated, main evaluation indexes for the habitability induced, and the preliminary checklist for the assessment organized. This research, then, aims at verifying the suggested evaluation system with the

residents who are students and/or professionals in the field of Hanok industry.

Hanok needs to expand its meaning in aspect of architectural design and construction to experienced space containing human cognitions and traditional thoughts rather than its physical or economic status for production. It means national own values in spaces like unique histories, places, images, memories, symbols and so on [3]. In addition, it is emphasized that environments and relationships among human beings have to be understood with the concept of natural recognitions, behavioral perceptions and living experiences.

With these considerations, residential performance of Hanok could be assessed in conditions of two main categories such as qualitative and quantitative. The former can be measured in forms of numerical data with the scientific methods and tools, and the later requires human experiences and responses about the space with the questionnaire [4, 5].

The residential performance for Hanok, in this sense, can be divided into three subcategories that comprises habitability performance, environmental performance and comfort performance. The habitability performance is a sort of qualitative factor in design capabilities and includes architectural planning, site planning and sustainability indexes for the evaluation. The environmental performance proves physical conditions such as air tightness, air cleanness, heat insulation,

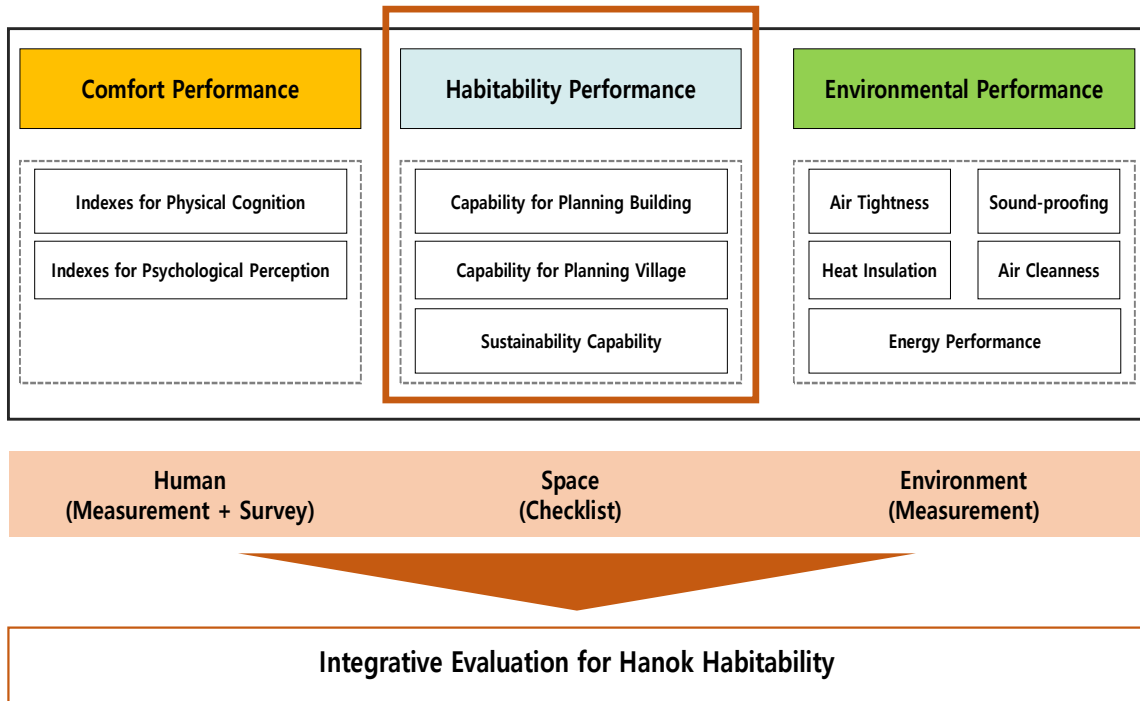


Fig. 1. Integrative Scheme of the Evaluation System for Residential Performance towards Hanok

soundproofing and energy performance. And, the comfort performance is composed of factors in physical cognition and psychological perception.

The method of evaluating for environmental performances towards Hanok employ the official guideline defined as Korean Standards [6, 7]. The target for the assessment is both interior and exterior settings like natural atmosphere and indoor spatial environment. Additionally, simulation programs to prove energy performances are to be used for the comprehensive evaluation.

Therefore, the main methodology of assessing comfort performances should be a kind of integrative way and could be classified into two categories for the effectiveness of evaluation. The one is psychological indexes brought from user surveys such as spatial usability and building beauty. The other is physical indexes based on environmental experiments for the interior space such as temperature, humidity, air tightness, and etc.

Among the above three categories, this study is focusing on the habitability performance. Hanok has been built with following the principal of the habitability in contrast to the contemporary building that pursues functionality fit to the modern life. The original concept of the habitability includes a capability of the self-controllability for spaces by users themselves and this specialty is called planning capabilities for interior spaces and outdoor sites. Because the contemporary housing is losing the above theory, the habitability is one of the most important characteristics while building Hanok.

## 1.2. Household Pattern as an Identifier of the Assessment Framework for Hanok Habitability

Hanok has many advantages which including both cultural and environmental values. However, Hanok has a lot of problems that do not meet the conditions of modern society, especially in the area of collective housing, and it is difficult to have spatial rationality [8]. This shows that there is a problem of the Korean traditional architecture, which does not match the trend of modern society that emphasizes rationality, and there is a limitation that the Hanok cannot be activated as a modern residence in Korea. Nevertheless, the cultural value of Hanok and the habitability value of Korea, that are traditional residence values regarding Korea, are not negligible compared to the comfortability of modern residence.

It can be seen from the case of the national project and mentioned that promotion policy by Korean government for the construction of the Hanok suggests that its values in aspects of tradition and habitability are very important. While there is such a social background, Hanok is hardly realistic to accommodate various users' needs. Therefore, it is necessary to introduce the necessary factors according to the characteristics of each user in order to evaluate the settlement of Hanok, besides the elements unique to the Korean traditional residence.

This study focuses on identifying the concept of the resident habitability and introducing it into the Hanok evaluation for residential performances by classifying the unique residential values from various user groups, that can be defined as household types in the modern society according to the lifestyle. For, it can be the ultimate goal of the study to propose a modern method of evaluating the habitability

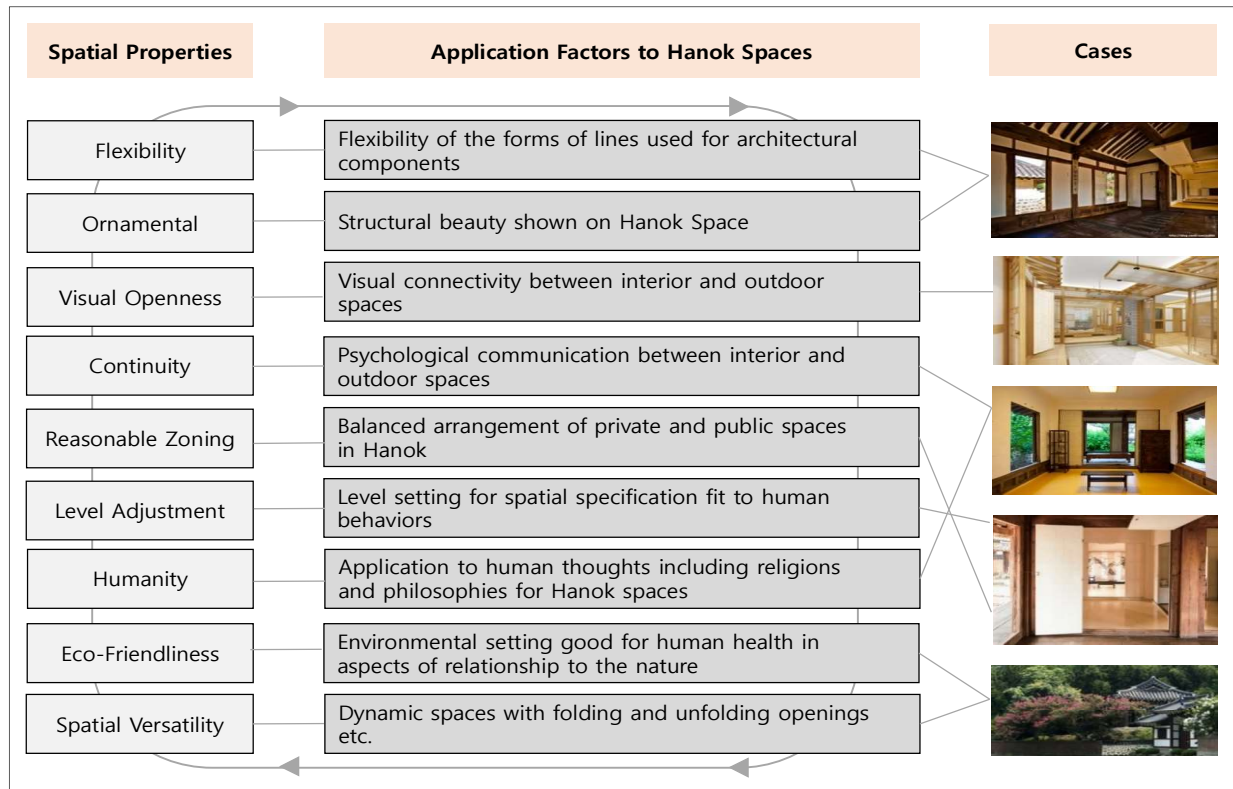


Fig. 2. Traditional Spatial Concepts Adapted to the Hanok Habitability

performance of Hanok using household patterns.

So, the main target of this study can be said as Hanok residence, but the main application would be the form of modernized Hanok simultaneously. That is because the traditional dwelling has disadvantages in various aspects such as convenience and human scale in comparison to the modern housing, although those have been becoming major components of the traditional Hanok architecture.

The reason why general architecture is not the main object for this study is because the majority of the buildings built in Korea are lack of traditionalism, and the other values like rationality rather than traditional one such as habitability is considered more importantly [9]. Naturally, the existing evaluation system for the residential performance of modern buildings is too robust to be applied to Hanok and an alternative evaluations framework can be suggested accordingly.

In this study, after analyzing the habitability evaluation presented in the previous researches, the detailed items constituting for the habitability evaluation were divided into six categories according to main common points. And the residents of Hanok are classified by two criteria like age and family structure, and the characteristics of the residential value for each type in the classified group are derived and suggested. The characteristics of the residence values from each type are summarized through the analysis of the above process, and the standard of the residential values are established as the evaluation indexes.

## 2. DERIVATION OF EVALUATION CRITERIA FOR HANOK HABITABILITY

### 2.1. Classification of the Household by Lifestyle

As a sample of the construction for evaluation items of Hanok, this paper collected and sorted findings from the previous researches first. Mainly, the composition of the evaluation items was classified by three aspects in them: spatial components, village panning indexes and sustainability for the traditional housing. There were subcategories applicable to all major categories such as planning, performance, convenience, safety and so on. In addition, there were also residential values such as resource utilization and human centrality in dependent on the characteristics of each major category.

The value of each residence was listed without a consistent standard that seems to follow the general evaluation system of the modern housing without specific criteria in the process in preceding researches. Moreover, some residential values were perceived as meaningless items for certain users. The detailed evaluation items from those data can be composed of thirty two items that have common characteristics from each item in five elements of the planning part, area, safety, convenience and management performance in spaces. Additionally, local factors and natural affinity has existed as characteristic elements.

The residence values with common characteristics were grouped into only habitability characteristics without distinction of major

classification, and nine subcategories were constructed accordingly. Those established subcategories consisted of six items that could be evaluated in all major categories found by previous studies and three items could individually be evaluated. The above items were divided into spatial planning, territory, safety, convenience, manageability, and variability, and classified into locality, sociality, and sustainability according to the unique characteristics of the major categories.

As modern society developed, the performance of housing required by residents' needs and the type of housing have changed accordingly depending on the required performance. For example, one of residential performances required in agricultural society was large work space, and the performance required for housing in the industrialization period was shortening construction period [10]. However, the demands of users in modern society are very diverse. The traffic location is more important than the large space in the residence of university students, and access to the medical facilities is important for old age residence. As a result, the types of dwellings have been divided into various categories such as studio, apartment, and detached house. In this situation, assessing the dwelling performance of such a variety of residences from a single point of view is not a valid evaluation method. Therefore, it was recognized that various aspects of users' lifestyles should be added to the performance evaluation item.

In reality, it is impossible to distinguish all the users of the modern society. This is because there is no absolute criterion for classifying the residents. Therefore, the lifestyle was selected as the most common standard for identifying the type of user. There are various criteria such as age, family composition, salary, personality and so on in the lifestyle [10]. When the research group is divided into the types based on the criteria included in the lifestyle, various approaches are possible and the missing parts in the research process can be coped with. In addition to the lifestyle, various criteria such as history, area, and distance exist, but those are concluded that lifestyle is the most universal standard considering to be applied into lifestyle.

As mentioned before, lifestyle has various criteria. So, among these criteria, the investigation could be established with the most representative criteria related to the residence value. Factors influencing residence value among the criteria included in the lifestyle include age, family type, individual history, economic ability, personality, and individual aesthetics. However, individual history and personal aesthetics are too large in the range of the judgment category that each user has, and there is no meaning in selecting a criterion. On the contrary, there is no meaning of criterion because economic ability can be a factor to select space as an external factor irrespective of individual preference for residence value. Therefore, age and family type were selected as the most appropriate criteria among the suggested factors.

The first criterion, age, can form a group with a certain level of validity through group formation through a range of compartments. In

addition, age is a standard that is representative enough to be used because of a reference in research that exists in other fields. The second criterion, the family type, can confirm both the physical condition of space and the aesthetic condition of user at a certain level. In addition, because it changes in response to social change, it can grasp the change of the house according to the change of society. Based on the above judgment, this study has set the specific standard of the lifestyle to the age and the family form [11].

According to lifestyle standards, the user groups are divided into groups of five age groups and three family types, respectively. The age-based groups were classified into five groups: adolescence, adulthood, marriageable, manhood, and Senescent. They are based on various factors such as the identity of space, economic capacity, Conditions were taken into account in the case of the family type, the group of two households and one household.

Table 1. Resident Group Classification by Age

Classification	Age	Explanation
Adolescent	10~19	The age of formation of the value of space takes place
Adulthood	20~29	The age that interested in housing and interior
Marriageable	0~39	The age that have own a house in various forms
Manhood	0~59	The age since the child's independence from family and house
Senescent	60~	The age after the retirement age of 65 or older

In the case of the family type, one-person household, classified according to the characteristics of the modern society, two-person households and first generation household were classified into groups. In addition, the other family types classified as second generation households and third generation households are not included in the group because they are the combination of the three family types mentioned above.

Table 2. Resident Group Classification by Family

Classification	Explanation
One-person Household	One person takes care of all the activities necessary to maintain a living, such as cooking, sleeping, etc.
Two-person Household	A household composed of the same age as the newly married couple before having a child
First-generation Household	Households where parents and unmarried children live together

## 2.2. Features and Values of the Household

Regardless of the group, the common characteristics are that the space preference changes according to various criteria such as the user's life cycle, children, and activity time, and the safety and the convenience that residences should possess.

1) Adolescent

Adolescents are less mature than others in their dominance over space, and have vague personal standards rather than specific factors such as physical and environmental performance of space [12].

2) Adulthood

In adulthood, the point of difference in residential value and space structure and preference differs depending on the sexes. Especially, in the case of the activity space, the male prefers the physical activity space, and the female prefers the dress space [13, 14].

3) Marriageable

The criterion of preference for space changes from family to center rather than individual, and values related to children become important. In addition, there is a growing interest in health and well-being, including old age and healthy living [15].

4) Manhood

As the family form of grandparents, parents, and children enter the modern society and become nuclear family, the elderly independent household composed of the first generation is increasing, and the concept of housing is in the process of changing from property to settlement [16].

5) Senescent

Senescent prefer to live independently from their children such as children and grandchildren, and they also want a form and function of space that can accommodate the uncomfortable change of the body [16]. Table 3. below shows the residence values that age-specific users consider important. Younger people tended to emphasize the use of space, but elder people tend to emphasize sociality. The whole group has recognized as an intermediate space that distinguishes between the 'open space' and the 'entry space' in the form of pursuing a space independent of individual or group. In addition, the community space and the public space are also of high importance. This seems to be indirectly related to the communication of users in the household and the guarantee of the personal area.

Table 3. Residence Value for Classified Group by Age

Classification	Residence Value
Adolescent	Safety, Eco-friendly, Territory, Convenience
Adulthood	Usable, Sociality, Traditional Value
Marriageable	Variability, Expandability, Eco-Friendliness
Manhood	Settlement, Barrier Free, Sociality
Senescent	Convenience, Barrier Free, Sociality

6) One-person Household

Recently, there are various types of households such as elderly households and female nursing homes like multi-family housing, studio, dormitory, etc [17].

7) Two-person household

In the future, changes in family members may appear. In terms of size, it has a similar size to that of the first-generation house, but the use

of the free space is mainly used for personal life such as hobby space, guest space and public space [18].

Table 4. Residence Value for Classified Group by Family

Classification	Residence Value
One-person household	Practicality, Territory, Traffic Facility
Two-person household	Common use space, Variability
First-generation household	Territory, Space plan

8) First-generation Household

There are similar size to the size of the residence of two-person household, but there is a difference in the composition of space such as existence of child space. Table 5. shows the residential value of each household. The larger the household scale, the greater the importance of territory.

Table 5. Space Diagram for the Classified Resident Groups

Classification	Space Diagram	Main Space
Adolescent		Living Personal Space Green Area
Adulthood		Living Storage Community Education
Marriageable		Living Storage Health Care Space
Manhood		Bedroom Health Care Space Traffic Point
Senescent		Personal Space Common Space Guest Space Activity Yard
One-person Household		Bedroom Bathroom Storage

Classification	Space Diagram	Main Space
Two-person Household		Living Bedroom Child-care Facility
First-generation Household		Living Bedroom Education Facility

The importance of the space existing inside and outside the house also changes due to the difference in the residence value that is important for each classified group. The main space has the similar importance in all the groups as the bedroom and the living room, but there is a difference in the sanitary space and the space ranking in the external space. The main space of each group is showed as Table 6.

The importance of the space existing inside and outside the house also changes due to the difference in the housing value that is important for each classified group. The main space has the same importance in all the groups as the bedroom and the living room, but there is a difference in the sanitary space and the space ranking in the external space. The main space of each group is summarized as below.

Overall, priorities are reflected in the space in which users are primarily active, such as living rooms, bedrooms, and private rooms. The characteristics of the age group show that the requirements that the age can have or the changing housing value are reflected in the space. Adolescence does not take into consideration the whole of the housing. On the other hand, marriageable reveals overall consideration for housing. In addition, as the age increases, the plan performance of the space that can accommodate the fluidity and the body change of the space is required rather than the space use performance. The characteristics of the group according to the type of family can also be seen through the pictures.

All three groups prefer to make a distinction between the private territory and the public territory, and thus the territory is an important factor in all family types. On the other hand, the demand for external space or convenience facilities differs from group to group. The external space that is important for one- person household is storage. This is probably due to maximizing the use of personal space in one-person household, which emphasizes practicality of space. On the other hand, it can be seen that educational facilities have the highest priority as convenience facilities required by first-generation households. This seems to be due to education concerns for children, which is the most important housing value in first-generation

households.

### 3. EVALUATION FRAMEWORK FOR HANOK HABITABILITY

#### 3.1. Evaluation Elements for Hanok Habitability

##### 1) Architectural Planning Factors

The Hanok habitability basically have followed the original concept of the space design shown on Korean traditional architecture. Korean own space has been planned with the relationship between human and nature, and its theories include flexibility, ornamental simplicity, visual openness, continuity, reasonable zoning, level adjustment, humanity, eco-friendliness, spatial versatility and so on. These spatial keywords have been adapted to Hanok and absolutely important to try its revival in forms of the contemporary space. So, the Hanok habitability is deeply engaged to planning capabilities.

Table 6. Evaluation Criteria for Hanok Habitability in Architectural Planning

Factor	Behaviors	Method
Exterior Space	Working	Checking spatial efficiency by survey
Madang (Garden)	Circulation and facing visitors	Checking specification of garden and parking lots by drawings
Utility	Cooking and washing	Checking spatial usability by survey
Entrance	Connection between inside and outside	Checking functionality by drawings
Bedroom	Sleeping and resting	Checking resident satisfaction by survey
Living Room	Hobby activities and serving visitors	Checking functional flexibility by survey
Kitchen and Dining Room	Cooking and dining	Checking connectivity of spatial functions by drawings
Bathroom	Shower and bathing	Checking human scales and usability by drawings
Common	Collaborating with the neighborhood	Checking specification and effectiveness by survey and drawings

The planning capabilities can be considered with the scope of physical boundaries comprising Hanok. Those ranges are divided into three areas in terms of spatial scales: house, village and nature. First, the scope of house is composed of the building space called Chae and the garden which is Madang in Korean, and Chae is divided into Sarang-Chae (visitor's room), An-Chae (resident's room and Haengrang-Chae (service room) in detail. Each Chae has Maru (corridor), Bang (room) and Boeok (kitchen). The scope of village is planned for a few block having grouped houses, roads connecting them and community spaces for village people. The scope of nature is the farther environment like mountains, hills, rivers and streams surrounding the Hanok village, and it provides comfort settings for Hanok.

The AHP (Analytical Hierarchy Process) questionnaire and the evaluation questionnaire could be strong alternatives for qualitative evaluations in this step and require definitions for each element. These

definitions serve as the basis for the AHP pair-wise comparison and are used as a measure for evaluation in the evaluation questionnaire. The definition of each element is summarized in the order of material aspect and architectural aspect as follows.

### 2) Site Planning Factors

The evaluation index for the Hanok habitability in site planning is cordially related to the status of the surrounding area and physical properties. First, spatial composition in aspect of the neighborhood is important, and it means regional tradition is the main factor for defining the characteristics of the site. Second, reasonable circulation among housing blocks determines the identity of the village and relation of the neighborhood. Third, spatial composition according to the terrain level is a sort of the concept in traditional site planning in Korea. Table 7. indicates the evaluation indexes about the Hanok habitability in site planning.

Table 7. Evaluation Criteria for Habitability in Site Planning

Factor	Behaviors	Method
Region and Neighborhood	Considering for regional identity and recognition of the village boundary	Interviewing with residents and checking drawings
Circulation and Connectivity	Accessibility to the housing block and house unit, and relationship to the neighborhood	Interviewing with residents and checking drawings
Terrains and Levels	Setting terrain levels and settling house planes	Interviewing with residents and checking drawings

### 3) Sustainability Factors

The evaluation index for the Hanok habitability in sustainability is engaged to the status of the surrounding environment and natural properties. It also includes the spatial flexibility and veracity. First, spatial flexibility in aspect of the succession to the future generation is important, and it means essential values is to be adapted to coming ages. Second, eco-friendliness determines the fundamental identity of the green housing like Hanok. Third, maintenance capability is a sort of a traditional concept in asset preservation technology. Fourth, structural stabilization will make Hanok last as a valued traditional asset. Table 8. explains the evaluation indexes about the Hanok habitability in sustainability.

Table 8. Evaluation Criteria for Hanok Habitability in Sustainability

Factor	Behaviors	Method
Spatial Flexibility and Veracity	Controllability for spatial composition and components	Checking drawings by experts
Eco-friendliness	Harmony with the nature and the surrounding environment	Collecting and analyzing simple data
Maintenance Capability	Effectiveness of the maintenance using simple operation	Checking detail drawings by experts
Structural Stabilization	Structural sustainability supporting stable living spaces	Checking sectional details by experts

The evaluation methods for Hanok habitability in aspect of sustainability is mainly for physical conditions, and is a form of the questionnaire based on residents' responses derived from the field survey. In addition to the resident surveys, a set of drawings about sectional details of Hanok structure are essential for the assessment.

### 3.2. Supplementary Evaluation Criteria for the Habitability

The importance of six residence values that are not affected by the category of large categories such as spatial planning, convenience, and safety has remained largely unchanged, and all the above factors are important in all groups. Of course, the details of the arguments given above and the reasons for their importance differ, but this seems to be due to the fact that the user's needs were most clearly reflected in the planning. Or it may be because it is a human primary requirement.

On the other hand, the emergence of residential value that is peculiar to a specific group such as sociality and stronghold is also noticeable. The sociality appeared mainly in the adulthood and the elderly, this is because both groups have a new lifestyle or change their surroundings, away from existing lifestyles.

Regardless of the change in family type, the important factor is territory. Because of the feature of private territory, the user wants to own territory regardless of the family type. Furthermore, there was a tendency to reduce the accessibility of private territory and to set buffer space to protect private territory.

Regardless of the group or the standard, the feature revealed was that the external space required by the family form over time showed a similar pattern. In the group classified by age, there was a tendency to require space related to children as children existed. Likewise, in the group according to the family type, the children were included in the family members, and showed a tendency to demand a space that could be helpful to the child.

Based on the characteristics of each group, the new habitability evaluation items were added to the existing habitability Evaluation and the existing habitability evaluation items were modified based on the items with the common parts. The classification of the items is shown in Table 9.

This index includes the evaluation items for habitability performance. An item for habitability evaluation is a unique performance of Korean traditional architecture and it can be said that it is a criterion to judge whether it has a habitability performance by applying it to a modern Hanok. Therefore, if it is possible to evaluate modern Hanok based on this evaluation items and evaluate the Hanok habitability performance by complementing this evaluation method, this study could suggest an evaluation system that can evaluate the inherent performance of Korean traditional house.

Table 9. Comprehensive Evaluation Indexes for Hanok Habitability

Main Category	Detailed Category	Detailed Evaluation Item	Checkpoints
Architectural Planning	Planning Performance	Space planning	Rationality such as appropriate space size, public space planning
		Plan of transportation	Rationality of inner and outer connection of the yard, kitchen and dining room
		Elevation plan	Plan openings considering sunshine, ventilation, ventilation, and visual openness
		Barrier-free plan	Barrier-free elements such as chin, ramp, step height, floor height etc.
		Reflecting human-centered elements	Appropriate size plan such as window height, furniture, ceiling height, and emotional space elements to feel the beauty of Hanok
	Convenience	Lifestyle change response	Schematic configuration that can flexibly respond to lifecycle (occupant behavior) such as flexibility, scalability, and storage space
		Presence of accessory space	Proper space to accommodate the size of residential space such as balcony, multipurpose room, warehouse etc.
	Territory	Harmony between interior and exterior spaces	Area classification, traditional Hanok arrangement, existence of wall, mutual penetration of inner and outer space
Independence of residence area		Ensuring independence of privacy space, consideration of external soundproofing and dust-proofing	
Site Planning	Planning Performance	Housing planning	Adoption of a variety of housing types to meet local needs and surrounding contexts and harmonious complex placement
		Plan of transportation	In cases of roads, walkways, alleys, etc
		Community planning	Ensure residents' participation space and facility, park / square installation, use and access
	Convenience	Accessibility of traffic facilities	Selection and use of station, subway, bicycle storage facility, parking lot
		Service facility adequacy	Establishment of appropriate service facilities in the complex including garbage separation facilities, mail,
		Amenities nearby	Access to neighborhood living facilities such as schools, hospitals, and commercial facilities
	Safety	Safety plan	Sprinklers, fire extinguishers, fire brigades, signs, guard systems (with or without guard), shelter and CPTED plans
		Safety equipment	Installation of CCTV, outdoor safety facilities (street lamps, playgrounds, etc.), evacuation induction facilities, disaster group response manuals, and disaster broadcasting facilities
	Territory	Composition and arrangement of Hanok village	Adaptation to the topographical plan and application of traditional simple layout techniques
		Village boundary and area castle	Adoption of planning elements that emphasize complexity / coherence
Sustainability	Panning Performance	Plan that reflects local environmental characteristics	Nnatural environment, local production materials reflected
		Composition of green space	Establishment of green spaces in houses and villages, and continuous measures for environmental protection
		Energy saving plan	Use of resources (water resources, resource recycling, etc.), efficient use of renewable energy facilities
	Locality	Village identity	Adopting differentiation factors to provide aesthetic identity of Hanok and Hanok Village by expressing only the image of the city adopting the urban context and traditional elements of the village
		Landscape conservation	Harmonization with the surrounding landscape and the environment, and creation of landscapes and plans to share memories against the generations
	Maintainability	Facility management	Presence of communication equipment (internet, Wi-Fi), sanitary facilities, heating and cooling facilities, introduction of ubiquitous, existence of certified facilities, existence of A / S
		Guidance and manual management	Management system for building space and village maintenance manual, transformation and transformation





Fig. 3. Representative Test-beds for Evaluating Hanok Habitability  
(Image Sources: CNU Hanok R&D Team and the Sixth from Google Images)

### 3.3. Final Assessment Framework

As mentioned previously, Hanok has unique residential values that match the Korean culture. The characteristic that the user is staying in the residence as long as possible is the most representative value like the comfort of the residence and the environmental performance around it. However, as Korea enters into modern society, it is affected by Western culture and various lifestyles are born, and traditional residence values are becoming meaningless. But, traditional residences have a tradition and emotion that are unique to Korea, and have representative images of Korea.

Therefore, it is very important to understand the benefits and cultural values of Korean traditional houses to Koreans. As suggested, this study has built a new evaluation system that insert the lifestyle of modern people in addition to the evaluation system of the domicile performance which is the inherent residence value of the Hanok. The suggested evaluation framework needs considerations for contemporary residence value items at the same time with traditional values, and is trying to apply and evaluate it as a modernized Hanok.

Finally, this study could verify detailed items through the supplementary evaluation criteria to create a new evaluation item for assessing the Hanok habitability, and could propose an integrated evaluation item that evaluates the habitability of various Korean traditional houses as shown on Fig. 3 and evaluates the value of modern houses at the same time. Based on this evaluation item, Korean traditional houses show the strength of the habitability side.

The suggested evaluation system includes both numerical quantitative analyses and qualitative survey prediction that could provide more accurate comprehensive results. It can be emphasized that the result showed reasonable records towards the evaluation

guideline for assessing Hanok habitability.

## 4. CONCLUSION

The purpose of this study is to suggest new habitability evaluation methods that targets the Hanok and to propose the new way of the assessment system to be used for Hanok professions. Its assessment factors for habitability tend to be categorized by architectural planning, site planning and spatial sustainability. It was turned out that both quantitative and qualitative factors have to be analyzed towards the integrated evaluation, and this study has suggested the comprehensive assessment for Hanok habitability.

This study started to suggest evaluation items for the performance evaluation method of the Hanok and suggests that the evaluation methods considering the users should be added. By analyzing the existing researches, it was possible to compress the habitability evaluation items, and the six evaluation factors were obtained accordingly. In addition, this study could identify issues and requirements of each user through the classification according to the lifestyle of the users, and apply them to the habitability evaluation items so that the characteristics of the users can be reflected in the habitability performance items.

As provided in the previous chapters, this study has suggested a new assessment indexes that insert the lifestyle of contemporary residents to be used for the evaluation system of the habitability performance that is the inherent residence value of Hanok. The results of this study can be used as a basic data to build up the performance evaluation system of the Hanok in the future. Furthermore, this study will be recognized as a basic research that can construct the evaluation item and habitability evaluation system through the follow-up study. Through these

processes, it is expected that the habitability performance evaluation system will be used for actual residential performance evaluation.

Then, an integrated habitability scores would be derived using the weight. As a result, the newly suggested evaluation method is expected to insure high efficiency of the living experience by the residents. The proposed system includes correlative factors that would show more precise results. It was turned that the result showed satisfactory records towards the needs of Hanok residents in aspects of the habitability than ever before.

As ongoing research study, verifying performance grades using AHP should be processed to apply the suggested evaluation system for pilot cases and the practical field of Hanok. Each weight for habitability factors could finally be established using AHP, when examinee surveys would be conducted and its approximate tendency could be assessed by residents; this part remains as an ongoing study for the near future. After analyzing the surveys, the habitability elements with the respective evaluation indexes are measured through a form of the questionnaire.

### Acknowledgements

This research was supported by a grant from Urban Architecture Research Program (Technology Development of Design and Construction for Large-Space Hanok over 10 Meters, Development of Hanok Technology, Phase III) funded by Ministry of Land and Transport Affairs of Korean Government. (Project No.: 18AU DP-B128638-02).

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