A Comparison of Young Generation’s Perception Regarding Home Garden in Urban Area: Case Study of Indonesia and Japan

Y Mao,1* I D Imara2 I M P D Natawiguna,2 P I Pratiwi,2 T Oka,2 K Furuya2
1 Department of Environment Science and Landscape Architecture, Chiba University, Japan
2 Department of Landscape Architecture, IPB University, Indonesia
E-mail: skyisyui@gmail.com

Abstract. Urbanization has had an impact on various aspects of urban living, including rapid population growth and a decrease in green spaces. These changes can affect the health and well-being of the community. Creating a home garden in an urban dwelling can promote a healthier lifestyle and support the sustainable development of the landscape. The United Nations has agreed upon the Sustainable Development Goals (SDGs), and there are three goals that correlate with urbanization and home gardens: Goal 11 (Sustainable Cities), Goal 2 (Zero Hunger), and Goal 3 (Good Health). Recently, the number of young people who are concerned about maintaining a healthy lifestyle has increased, and it is important to understand their perception of and preference for home gardens. The purposes of this paper are to publish the result of identify the landscape images that appeal to the young people, know the attributes influencing their perception, and formulate the differences between home gardens. In this study, questionnaires were distributed to 122 young people, 62 from Japan and 60 from Indonesia. They were asked to fill in their personal attributes, provide keywords, describe the garden, and draw a sketch of how they imagined their home garden should be. The Landscape Image Sketch Technique were used to analyze the results. The results show that there are two important points of focus: the plant and the garden. Indonesian data indicated that a majority of them are interested in big plants like trees, for shade and aesthetics. The sketches mostly show preferences for outdoor gardens such as back and front yards. The Japanese data indicates an interest in the usage of small plants for healing and sketches of small indoor gardens. The data also indicates that young people in both the countries have little interest in gardening. Therefore, to support sustainable landscape development and the three SDGs, it is important to promote the information about the benefits of home gardens to increase community’s awareness and interest.

Keywords: home garden, perception, young generation, Indonesia, Japan, LIST method

1. Introduction
1.1. Background
In recent years, most of countries in the world have experienced urbanization. This phenomenon is represented by a significant change in each demographic composition and expansion of the urban landscape. [1] The most obvious changes are seen in urban green spaces that continue to decline as a result of land-use changes. These changes need to be mitigated; with the thinking of “modern problems require modern solutions”, the land shortage problem could be solved by promoting agriculture in small spaces such as home garden. The home garden could be incorporated indoor and outdoor areas, connected directly with people’s daily life. The small-area agriculture can also be implemented in many ways, including planters, vertical garden, and pot planting. This solution will also give the many benefits as regular urban agriculture, especially for daily self-consumption. Nowadays, the small-area agriculture
is also be promoted as a kind of lifestyle for a healthier life. The tradition of planting and 
maintaining home gardens is an expression of culture and represents an intense interaction 
between humans and plants.[2] Talking about the research of home gardens, researchers have 
not emphasized the function of home gardens, and books and reports dealing with home 
gardens are rare.[3]

In Japan, the “Nature Conservation Ordinance” was amended in April 2001, in addition 
to the above-ground planting, it was obliged to plant more much green space with architecture 
in urban area. In addition, it is obliged to submit a greening completion document after 
completion of construction along with the greening plan. With the concentration of population 
in urban areas, the number of housing in Japan is still growing. The number of single-family 
homes has increased moderately by 1.3x over the last 30 years (1978-2018), while apartments 
increased by nearly 3x. Even in Tokyo, the proportion of apartment houses exceeds 70%.[4]

Seeing this fact, it could be said that the number of households with private gardens is 
decreasing. On the other hand, horticultural activities are attracting attention of the 
community as it promotes physical and mental well-being. The major problems related to this 
in Japan is the declining of birth-rate and the aging of population. A study focusing on 
agriculture at home reported that over 70% of the total number of respondents who answered 
“I do” or “I am interested in” making vegetables at home is identified as Japanese. It turns out 
that they are very interested in growing edible plants in their apartments.[5] Even so, it is not 
possible to perform enough horticultural activities in an apartment house without a personal 
garden [6].

The government in Indonesia has reached the target of 1 million housing construction; the 
housing development law stated that the allocation of building takes up 45%-60% of the of the 
construction land. It means that around 40%-55% of the land can be used for open space. [7] 
This open space is very potential to be used as a greenery area or home garden. Home garden 
of Indonesia is commonly called as pekarangan and influenced by tradition and culture 
background. The home garden basically has production and social function and benefits that 
could fulfil the community’s needs.[8] The typical home garden in rural area is large in size 
and usually could be used by not only the landowner but also the community. However, in 
the urban area, just like in Japan, the lack of green space is also a problem; the size of pekarangan 
is little to none.

There are only a few studies focusing on the matter currently, but especially in urban area 
where there is only a little land but many buildings, the importance of the small-space 
agriculture will increase as the time goes on. That is why, promoting a small-space agriculture 
as a form of home garden could help very much in sustaining the urban community’s life. Also, 
according to the Ministry of Internal Affairs and Communications of Japan, over 60% of the 
people who do the horticultural activities are over 60 years old, and it is thought that young 
people are less interested [9]. Therefore, in this study, we focus on greening where agricultural 
activities can be performed in a small space such as a veranda or indoors and also the 
preferences of young generations towards the home garden.

1.2. Objectives of this study
The purposes of this paper were to publish identify the landscape images that appeal to the 
young people in Japan and Indonesia, to reveal the attributes influencing their perception, and 
to formulate the differences between the home gardens. The object of the research was the 
students’ perception and preference of landscape of the home garden in Japan and Indonesia.

2. Method
2.1. The participants
In this survey, to clarify the preference differences between Japanese and Indonesian 
students regarding the home garden, we examine images associated with "home garden". The
images were taken from sketches and short paragraphs. As many as 62 students from Chiba University in Japan and 60 students from IPB University in Indonesia were selected as the respondents. The survey was conducted from May until August 2019, in the form of questionnaire.

The questionnaires also required the students to tell if they have home garden in their house, how they think about their home garden and - if they don't have - where they would like to arrange such garden. Landscape Image Sketching Technique (LIST) was used to analysis the results of the questionnaire, including the sketches (see Figure 1) and a short paragraph description. In term of sample size, the number of students was sufficient, because the research sample or research object for each country was more than 30 respondents.[10, 11, 12] The data were obtained through survey by using questionnaire and tested to university students (in total 122 questionnaires before and after class). The questionnaire was arranged using each student's native language for an equal understanding of the questionnaire as a research instrument and was filled out by students for about 15 minutes using pen to avoid a systematic error.

Figure 1. An example of a landscape image sketch in Indonesia

2.2. Landscape image survey
LIST is one of the effective methods to analyze the meaning of environment. The research procedure for developing a design concept consists of landscape image survey, landscape image analysis, and landscape of home garden interpretation.[13] The students were asked to describe their ideal home garden. This part was the first step in applying the LIST method.[14, 15, 16, 17, 18] The students were asked to draw a sketch of their ideal home garden. Generally, the meaning of the environment might be only interpreted through verbal description. Using landscape image sketch, it is expected to be a method that can complement incomplete data (see Figure 2).
2.3. Landscape image analysis
Visual and verbal data were analyzed in three phases of LIST, the analysis was implemented onto three landscape conditions (landscape image aspects), namely [16]:

A. Identification of landscape elements (through spatial view and linguistic knowledge);
B. Structure of person - environment relationship (through self-orientation);
C. The meaning of place (through social meaning). This method provides new insights into the understanding of public image through landscape perception.

3. Results and discussions
3.1. LIST analysis between the students in Japan and Indonesia
There were as many as 122 questionnaires collected from this survey; the respondents were consisted of 62 students from Japan and 60 students from Indonesia. The purpose of using LIST was to capture the landscape image of a home garden as the visual data. The landscape sketches were expected to have differences between Japan and Indonesia students, caused by the influence of each country’s culture and such. Even so, there were some trends that can be seen through international comparisons.[19]

The verbal explanation, or the short paragraph description of the sketch, showed a relatively wide range of vocabulary and expressions. The respondents usually associated the word "home garden" with various keywords and sentences described for remembering experiences and knowledge, but in the landscape, image sketches most of the irrelevant keywords have been incorporated into a single landscape sketch by visualization. From this data we could see that the respondents provided much more consistent information about the sketches than the verbal questions.

3.2. Linguistic knowledge
The coding result of visual target components of the landscape elements in the sketches shows that there are 11 classification frames, divided into two groups (see Table 1 and Table 2), the ‘Nature Creature’ (living elements that are connected to nature: plants and animal) and the ‘Others Element Without Nature’ (other non-living landscape elements). Considering the landscape elements in the sketches have visible characteristics and each student have different sketching skill, the landscape elements were labelled and calculated not only by observing the visual shapes of the sketches but also by considering the sentence described in the verbal answer.[20] Also, it could be seen that almost every sketch contains symbol of plants with some specific shapes.
Table 1 Linguistic knowledge of nature creature

| Linguistic Knowledge (%) | Edible | Decorative | Greenery | Animal |
|-------------------------|--------|------------|----------|--------|
| **Nature Creature**     |        |            |          |        |
| **N**                   | 45     | 80         | 48       | 13     |
| Japan                   | 62     |            |          |        |
| Indonesia               | 60     | 73         | 100      | 17     |
| **T-value**             | 0.04   | n.s.       | 0        | n.s.   |
| *p*<0.05                |        |            |          |        |

Table 2. Linguistic knowledge of other element without nature

| Linguistic Knowledge (%) | Decorative | Home Furniture | Home Space | Materials | Appliance | Background | Landscape Features |
|-------------------------|------------|----------------|------------|-----------|-----------|------------|--------------------|
| **Others element without nature** |            |                |            |           |           |            |                    |
| **N**                   | 68         | 55             | 58         | 45        | 23        | 33         | 15                 |
| Japan                   | 62         |                |            |           |           |            |                    |
| Indonesia               | 60         | 70             | 47         | 59        | 5         | 58         | 87                 |
| **T-value**             | n.s.       | 0.03           | n.s.       | n.s.      | 0.02      | 0.006      | 0                  |
| *p*<0.05                |            | *p*<0.05       | *p*<0.001  | *p*<0.001 |           |            |                    |

The ‘visible elements’ in the sketches from students were classified as shown in the table1 and table2. The explanations of the tables is as of follows: tomatoes, potatoes, and small fruit trees were labelled as 'Edible'. Different types of flowers and bonsai were listed as 'Decorative'. Grasses, shrubs, and different kinds of trees were categorized as ‘Greenery’. Animals such as koi fish, birds and insects were collectively grouped as 'Animal'. Vase, tableware, organic candles, and other similar things were combined as 'Decorative Furniture'. Some sketch showed table, chairs, and desks as the common combination in their home garden, these were classified into 'Home Furniture'. Kitchen, bedroom, balcony, and small corner were labelled ‘Home space’. The ‘Appliance’ means a device or piece of equipment designed to perform a specific task, consisted of electronic items such as refrigerator and stove. The sun, clouds, moon, and stars as 'Background' were added to the category list. Finally, elements such as pond and soil/ground were listed as 'Landscape Features'.

The results between Indonesia and Japan show a matrix of two trends depending on nationality and local landscape. The results show trends by country. Although this research specifically asked to draw a general home garden image, the represented garden types often reflect the local dominant landscape. The sketches do not always reflect the actual landscape and local native vegetation, but instead, imply the subject's cultural perspective of the home garden.

The T-test results indicate significant response differences in the category of 'Greenery' (*p*<0.01) between Indonesia and Japanese respondents. 100% of the Indonesia respondents depicted 'Greenery' and 'Landscape Features' in their sketch, while most of the Japanese respondents tend to place furniture in their sketch to show their life much closer with nature. Comparing Indonesian and Japanese results may suggest that the Japanese do not care about large scale landscape features in their home garden. The landscape images in Japan (Figure 3)
are much more characterized by detailed descriptions from the home garden with different kinds of edible plants while Indonesia landscape images (Figure 4) are characterized by 'background' such as city science and sky from their sketches.

Figure 3. Sketches from Japanese students

Figure 4. Sketches from Indonesia students

3.3. Spatial view
The view of the landscape image sketch reflects the distance and angle of view of the subject. According to the type and size of the elements in the landscape, the distance inside the landscape images were divided into three groups: short, medium and far. The medium distance consisted of two types of viewing angles, horizontal and bird's eye view. The landscape image views were classified into four groups: "Close-up view", "Sideway view", "Bird's-eye View" and "Top/map View" (Table 3).[21] Statistically significant differences between Japan's results were seen only in the 'side-way view' category (p <0.05). The 'side-way view' suggested that the Japanese landscape image sketch depicted a view or conceptual view from within a more accessible garden. These variations can be understood in terms of accessibility to the understanding of home garden.
3.4. Self-orientation
The results of the ‘self-orientation’ aspect showed the most striking features of the human-environment relationship. This part consisted of 4 groups, namely ‘Single Objective’, ‘Objective Scene’, ‘Surrounding place’, and ‘Scenic Place’. The orientation of the body and object from the combination of landscape elements and viewpoints were analyzed in sketches,[15] The spatial continuity from the viewpoint of sidewalks, stream water, architecture, etc. suggested various activity of the target person in the home garden and their availability, and objective descriptions of the garden as the target in the landscape is considered as the subject. From the point of view, the subject themselves might be drawn in the sketch. More importantly, since verbal descriptions objectively describe home gardens, the basic human-environmental relationship is not always related to oral descriptions in home gardens.

The sketches of the "objective scene" were drawn most frequently between both Indonesia and Japanese students. These sketches were consisted of various elements such as natural and different kinds of furniture and architecture. Statistically, there were some notable differences between the "objective scenic" (p <0.01) and "scenic place" (p <0.05) categories. From Indonesia, "objective scenes" were predominant. Meanwhile, the results were divided into different categories (Table 4). As a result of the self-orientation test, the subjects from Indonesia students have a certain perceptual distance from their daily life in their imagination home garden, and the scenery image from Japanese students differed with the garden and also depending on their daily gardening activity and their objective perspective and attitude.

| N | Close-Up View | Sideway View | Top/map View |
|---|---|---|---|
| Japan | 62 | 21 | 35 | 15 |
| Indonesia | 60 | 23 | 21 | 48 | 25 |

Table 4 Self-orientation test result

| N | Single Objective | Objective Scene | Surrounding place | Scenic place |
|---|---|---|---|---|
| Japan | 62 | 2 | 47 | 32 | 26 |
| Indonesia | 60 | 8 | 75 | 42 | 12 |
| T-value | n.s. | 0.001 | n.s. | 0.05 |

3.5. Social meaning
The three aspects of the landscape image have been restructured to outline the social meaning of the home garden using linguistic data as complementary information. The 'social meaning' was classified into the following six categories based on scenic view, recreational space, ecological system, food-production, indoor and outdoor (Table 5). Since verbal explanations provided useful information, only the part of the text that matched the visual image sketch was used to interpret social meaning.[22]
Table 5 Classification of social meaning

| Social meaning (%) | N | Scenic view | Recreational space | Ecological system | Food production | Indoor | Outdoor |
|-------------------|---|-------------|--------------------|------------------|----------------|--------|---------|
| Japan             | 62| 66          | 37                 | 8                | 29             | 53     | 59      |
| Indonesia         | 60| 55          | 55                 | 43               | 17             | 5      | 95      |

Since home gardens other than garden elements is often composed in a plurality of meanings, therefore it is redundantly classified with the respect to the elements of the garden and the structure of the landscape, though the total of the elements of these categories is not 100%. For example, some sketches represent the home garden as a small animal habitat such as koi fish and turtle. In both results, there are some similarities in terms of both landscape culture. The T-test shows clear differences in knowledge classified as “ecological system” (p <0.01), “indoor” (p <0.01), and “outdoor” (p <0.01). The image of the home gardens was associated with the use of local traditional culture and pastoral natural scenery. The Indonesian students preferred to have their home garden outdoors, with a small ecosystem yard. Meanwhile, the Japanese students preferred to combine their home garden with their indoor house parts to show the closeness of the garden with their daily life.

4. Conclusion
In this study, the LIST method was used to examine the students from Japan and Indonesia’s preference and perception of the home garden as a natural environment with their daily life. The components of the environment can be divided into multiple types. In this study, the landscape elements were classified by nature creatures and other elements without nature. The image of the elements was different for each of these two categories, and the element type for obtaining the impression of the object itself. By using these findings as a reference when developing a landscape plan, people can become more closer to the landscape. Furthermore, it is necessary to verify the hypothesis by quantitative evaluation such as the Likert scale in the next step, considering the findings suggested in this study as a hypothesis and considering the difference in the living environment as future research development. In addition, it is necessary to expand the survey subjects to non-environmentally interested students and other age groups.

References
[1] Tripathi S Rani C 2017 The impact of agricultural activities on urbanization: evidence and implications for India International Journal of Urban Sciences 22 123-144
[2] Giay T 1998 Utilization of wartime nutrition survival experiences Asia Pacific Journal of Clinical Nutrition 7 3/4 311-313
[3] Kumar BM Nair PKR 2006 Tropical Home Gardens: A Time-tested Example of Sustainable Agroforestry Springer Science Introduction 9
[4] Ministry of Internal Affairs and Communications 2018 Results of 2018 housing and land statistic survey (平成 30年住宅・土地統計調査 調査の結果) www.stat.go.jp
[5] Amemiya M, Terada T Yokohari M Asami Y 2012 Relationship between agricultural activities and daily diets of urban residents – role of agricultural activities in solving the “food desert” problem in suburban areas Journal of the City Planning Institute of Japan 47 3 229-234
[6] Iwasaki Y 2018 Past and future issues of the green and health research subcommittee Journal of the Japanese Society of Revegetation Technology 44 287-290
[7] Peraturan Menteri Pekerjaan Umum Nomor 6 Tahun 2007 tentang Pedoman Umum Rencana Tata Bangunan dan Lingkungan www.pkpt.litbang.pu.go.id
[8] Arifin HS 1998 Study on the vegetation structure of pekarangan and its changes in West Java, Indonesia Graduate School of Natural Science and Technology Okayama University Doctoral Dissertation
[9] Ministry of Internal Affairs and Communications 2017 Results of 2016 basic survey on social life (平成28年 社会生活基本調査の結果) www.stat.go.jp
[10] Gay LR Diehl PL 1992 Research Methods for Business and Management New York: Macmillan
[11] Roscoe J 1975 Fundamental Research Statistics for the Behavioral Sciences New York: Holt, Rinehart, & Winston
[12] Fraenkel JR Wallen NE 1993 How To Design and Evaluate Research in Education Singapore: McGraw-Hill
[13] Lucas OWR 1991 The Design of Forest Landscape New York: Oxford University Press
[14] Ueda H 2006 A comparative study on forest image in Japan and German Journal of the Japanese Institute of Landscape Architecture 67 5 691-694
[15] Ueda H 2009 A study on resident landscape perception through landscape image – four case studies in Germany and Japan rural communities University of Kassel Dissertation
[16] Ueda H 2010 The Image of the Forest Südwestdeutcher Verlag für Hochschulchriften AG & Company KG: Saarbrücken
[17] Mizuuchi Y Son Y Furuya K 2013 A comparative study on forest image between Japan and Korea JMHT 20 3 167-178
[18] Pratiwi PI Sulistyantara B Gunawan A Furuya K 2014 A comparative study on the perception of forest landscape using LIST method between university students of Japan and Indonesia JHMT 20 3 167-178
[19] Ueda H Takayama N 2011 A study on the spatial conditions constituting the image of bathing in a forest atmosphere Landscape Research Japan Online www.jstage.jst.go.jp
[20] Kakiuchi E 2017 Cultural heritage protection system in Japan: current issues and prospects for the future Gdańskie Studia Azji Wschodniej
[21] Shinohe H Ueda H 2014 Relations between ‘favorite landscape’ as an individual consciousness and ‘districted identifying landscape’ as a group consciousness Journal of the Japanese Institute of Landscape Architecture 76 5 575-578
[22] Matsushima H Oikawa M Ueda H 2013 Study of mindscape figure of university students for coastal landscape Journal of the Japanese Institute of Landscape Architecture 75 5 537-540