

The Exploration on the Modularization Design of the Landscape Supporting Facilities for the Aging Communities

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Abstract:

Since the beginning of 21st century, in order to the acceleration of China's aging development, most of our communities are in the situation that the service facilities cannot keep pace with the demand of the elderly. This phenomenon leads to a variety of chaos in the community. As an important selling point of various real estate enterprises, the community landscape has always been the image project to which the developers pay special attention. At the same time, the community landscape has also become an important part of the residents' daily outdoor leisure. The high cost of pre-investment in the landscape facilities often causes that the developers want to cut off their investment in the supporting facilities or even do not invest in the supporting facilities for saving money. This leads to the unsatisfactory of the health and the convenience of the elderly. Also, this cannot meet the demand of the environmentally-friendly and efficient community lifestyle. This paper explores the modularization of the landscape facilities from the perspective of the practicality and the applicability in order to meet the living environment of people with high-quality.

Keywords:

Aging Communities, Modularization Design

1. Aging Communities Concept and Characteristics of Supporting Facilities

With the aging situation in China continuously accelerating, the communities' supporting facilities for the elderly need to be upgraded. First of all, the concept of aging communities needs to be sort out. In the aging communities which exist nowadays, situation exists where a large number of facilities in the community do have problems including the number, the type, the freshness and the quality. According to the classification criteria which were set by the United Nations *Population Aging and its Social and Economic Consequences* in 1956, when the proportion of the elderly population aged 65 and over exceeds 7% of the total population in a country or a region, it means that the country or the region has become an aging society. At the end of November 2000, in the fifth census in China, the

number of elderly people over 65 years old has reached 88.81 million, which accounts for 6.96% of the total population. And, the number of elderly people over 60 years old has reached 130 million, which accounts for 10.2% of the total population. If the above ratio is compared with international standards, China has already become an aging society as early as 2000.

The elderly belongs to the groups which community services are needed. There are three aspects which the elderly needed for the community. A) The need to enjoy the body and the mind. The physical fitness of the elderly has declined as they age passed by. It is necessary for them to maintain the health of the body through outdoor recreation and exercise. B) The need for the communication. After retirement, there are fewer people with who the elderly could contact usually. In particular, the elderly whose sons and daughters are not live with them even in a worse situation. It is significant for the community to make a plan for a suitable area of communication of the elderly. C) The need for basic living security. Many elderly people live alone for a long time or both people of the couple are old, they need the basic cares of the community [1].

In response to the basic needs of the aging community, the community needs to provide comprehensive supporting facilities especially for the elderly. The features of the facility are mainly reflected in the easy operation of the facility, the absence of the sharp angles, the ability to meet the diversity of different activities, and the ability to meet the long-term activities.

2. The Analysis of the Types and the Current Status of the Landscape Supporting Facilities in the Aging Communities

There are several of types of the landscape supporting facilities in the aging communities. And, the landscape supporting facilities which are most closely related to the people, are the guidance system and the leisure system. The landscape guidance system includes four aspects i.e. a visual guide system represented by the street signs, the house numbers, the grass cards, the indicator signs; an auditory guidance system which is distinguished by the sound; an olfactory guidance system which is distinguished by the taste and a tactile sense represented by the texture. The landscape leisure system includes the leisure tables and chairs, the landscape installations, the event facilities and equipment, etc.[2] (Figure 1)

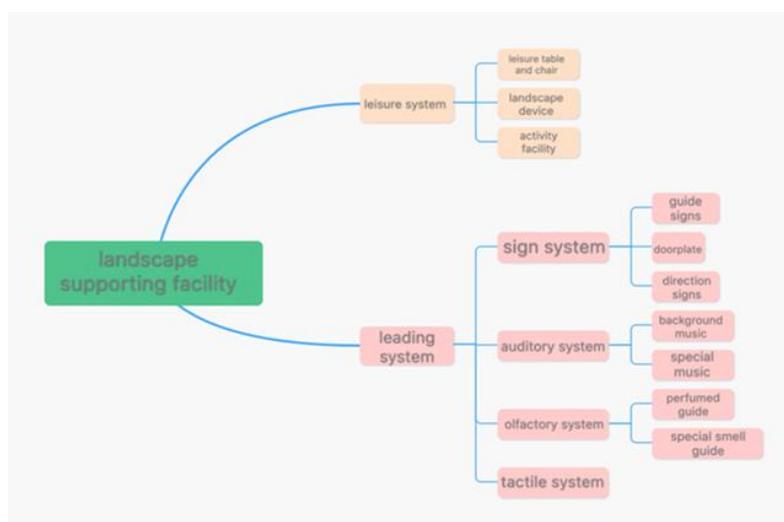


Figure 1. Normal landscape supporting facility of communities.

At present, community facilities are usually arranged and placed separately in the community. For example, the common way to set up the guide system is to erect the signs separately, which made them stand out and stand alone. When the leisure seat is set up, it will also be placed separately, which made them single and private. The landscape device will often be placed in the visual center for people to enjoy. It will not be shared with others. With such exquisite designs, each landscape facility is a relatively independent individual. The result came from these designs is that under the limited land resources of the community landscape, the number of landscape facilities within the unit area is insufficient. The types and the functions of supporting facilities are relatively lacking [3].

The aging society has put forward higher requirements for community facilities. It is required that the facilities not only meet the needs of the elderly in terms of the selection of materials, but also be in line with the activity needs of the elderly from the design aspects. Our survey of elderly people over 60 years old from 100 local families indicates that the most popular outdoor activity of the elderly is walking around the community and more than 70% of the elderly do it every day. The second preference is the square dancing which more than 40% of the elderly people do every day and over 60% of them would often do it. Travelling is the third place with more than 40% of the elderly going travelling more than once a year for an average of over 3 days. The comprehensive survey and analysis shows that outdoor activities of the elderly are mostly physical exercises near their home.

Elderly people may have difficulty moving around so they need accessible facilities in their daily outdoor activities. At the same time, the facilities need to be designed for the convenience of the elderly. Nowadays, accessible design is seldom considered in community landscape facilities, which makes them inconvenient for the elderly to use. For example, the armrests are seldom placed on the tables and benches in the community and it makes it difficult for old people to stand up from the seats. The tables and chairs beside the squares are not equipped with sunshades, which makes it hard for pedestrians in cities along the Yangtze River and southern cities to sit down and rest in summer. The square dancing always has loud music, and requires bigger squares to do sports. However, there are few facilities for square dancing in the community, resulting in contradictions between square dancers and residents. The lack of supporting landscape facilities has caused contradictions in the use of many communities, which is almost a common problem faced by most communities [4].

3. Modularization Design of the Landscape Supporting Facilities

Modularization of the landscape facilities is the transformation of the different landscape facilities into the modules through the proper design. Each of the landscape modules has its own function. There can be geometrically connected interfaces and consistent input and output units between different landscape facilities for connecting. The same landscape facility modules can be repeated and interchanged throughout the whole combination. That different module combinations can be formed according to the specific needs could meet different standards and requirements. In this way, the landscape facilities can be used more easily, the functions of them will be more abundant. The service of them will become more convenient, and the overall cost of them will be lower.

3.1. The Combination of the Modularization Design in the Landscape Supporting Facilities

There are a wide variety of the landscape facilities, and the modular theory can be used in a variety of formats to design the combination of the different landscape facilities. Through the analysis of the guidance system and the leisure system, there are two main forms of module design in the landscape supporting facilities. A. The functional matching form. Different landscape facilities have different functions. If the functions between the different facilities are opened, one facility or a group of facilities can implement multiple functions. For example, the leisure seat and the outdoor table can be combined with each other, at the same time; they can be combined with the device to form a multifunctional combination table and chair. The guide card in the guide system can be matched with the trash can, and it can also be combined with a chair to form a composite function.[5](Figure 2)

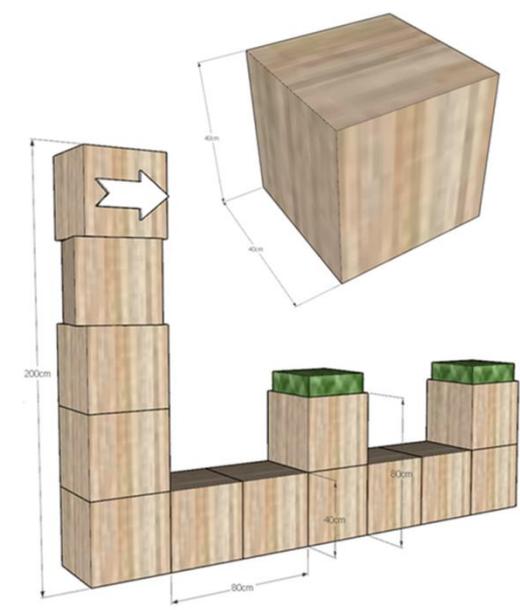


Figure 2. Modularity landscape facility multiple-functional combination.

In this case, the 40CM*40cm*40cm wood box is used as the standard set for modular combination of functions. The combination form is leisure chair + guide card + leisure table. This combination is a blending of leisure and guidance functions, which makes it easy to use. At the same time, modules can be arranged in different combinations to perform different functions. The functions can be simply achieved by different arrangement and combination in the basic module. The ultimate goal is to achieve material recycling and sustainable development.

B. The formal matching form. It is a form which applies collocation form for combination. Group combinations are formed by the different combinations of the positive and the negative shapes, the concavo and the convex shapes, and the different size combinations. The use of the visual delay effects creates a new sense of the identity in the form of a mix of the different landscape facilities. Example could be found in such landscape facilities as the trash cans made with the positive and the negative shapes of the Eight Diagrams, the various types of the landscape supporting facilities that use the concave and the convex shapes for combination. (Figure 3)

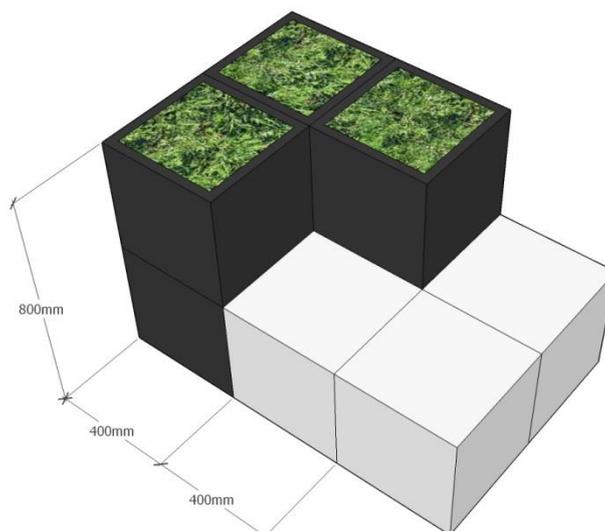


Figure 3. *Modularity of formal matching.*

This case uses the combination of positive and negative forms. It can also be extended by two or four consecutive cubes. As a supporting facility of landscape, it both meets people's needs of using the functions, and meets people's aesthetic needs. In the communities where more elderly people live, the modules can be used to build stages and leisure facilities to meet the needs of the elderly. Therefore, it is a facility of multiple advantages

From this point of view, to achieve multi-purpose ancillary facilities by combining different modules has a large market. Contemporary people have adapted to the fast rhythm of efficient life, so multi-purpose ancillary facilities are in line with the current habits of people. The mode of multi-module combination is convenient and enables people to use it more efficiently. At the same time, it is relatively convenient to invest and maintain facilities on the property side.

3.2. The Common Design Ideas, the Materials Usage and the Size Requirements for the Landscape Leisure Supporting Facilities

The leisure facilities are one of the most frequently used facilities for the elderly in an aging community. No matter what kinds of the leisure activities such as the square dance, the fitness, and the communication do the elderly need to deal with such facilities. For the elderly, the main aspects of the outdoor activities are the temperature, the humidity, the convenience for the usage, the comfortable body feeling and the appropriate visual effects. Therefore, the materials with which the leisure supporting facilities made often have the low thermal conductivity. [6]The outdoor wood is a good choice. What make this material stands out in the materials of the outdoor facilities is that the outdoor wood has features of the low thermal conductivity, the water resistance, the high temperature resistance, and the good body feeling. Besides the outdoor wood, Acrylic is also an available material. Acrylic has the characteristics of the various colors, the diverse shapes and the comfortable body feeling. It can endure the water and different humidity, but it is sensitive to the sunlight.

From the perspective of the use habits of the elderly, the size of the seat should not be too high. The proper height is about 38cm-40cm. It is not advisable to be too short, because it is not easy for the elderly to get up after sitting down when the legs and feet are inconvenient. The height of the handrail that is often used by the elderly is

preferably 80cm-100cm, and it is better to place the handrail next to the seat. Accessible design is very important in the elderly activity area. It shows the “people-oriented” humanistic care.

Our country's elderly community solutions are in the initial stage, while our neighboring country Japan have more mature solutions, both in the mature and detailed daily care of the elderly, diet and living and the details of daily facilities. (Figure 4)

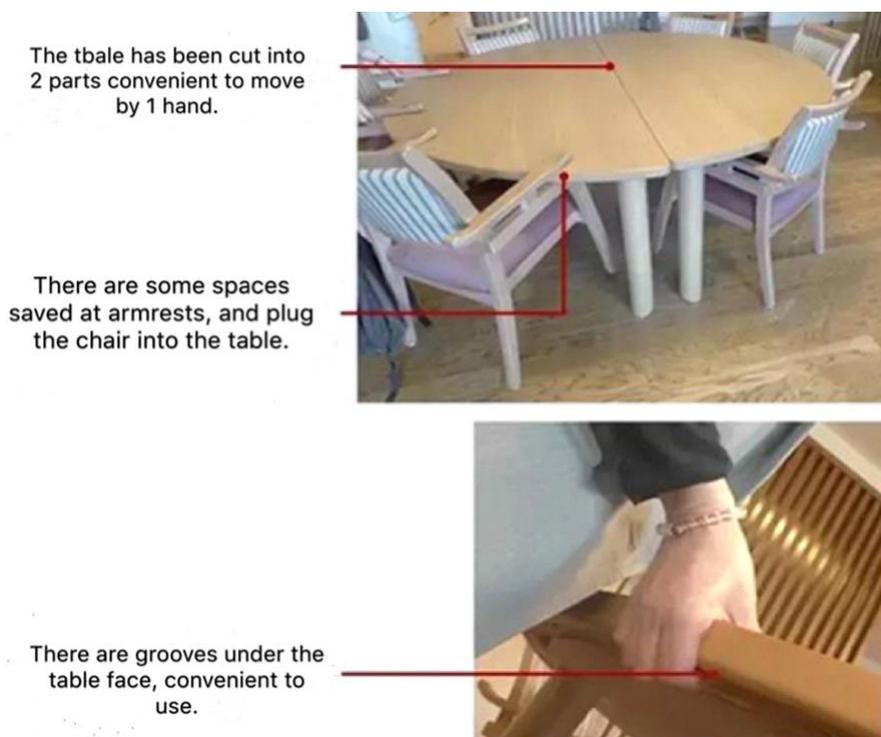


Figure 4. Design scheme of aging communities in Japan.

As is indicated in the picture, Japan has explored the details of every facility in the elderly community. From the placement of tables and chairs to the handling of details, it has truly realized the respect for the elderly and the service personnel.

3.3. The Problems Faced by the Modularization Design in the Landscape Supporting Facilities

The modularization design of the landscape facilities has many advantages, but it also faces many disadvantages. A) The landscape facilities in the aging community are not properly valued and emphasized. Although the degree of the population ageing worse off continuously in China, there are very few of the developers who really recognize this problem. Nor will they specifically design and develop the landscape facilities for the elderly. B) The aging of the population is accompanied by the failure of the service facilities that frequently cause conflicts within the community. People often only recognize the problems of the elderly or the young people but they do not deeply think the reason why such kinds of the problems occur. Therefore, the contradiction has always not been fundamentally resolved. C. In the aspect of design, there exist many references but few innovations. The landscape facilities are so uniformed and the innovation is not enough.[7]

4. Application Prospects and Government Expectations of the Modularization Design in the Landscape Supporting Facilities

At present, many problems which are faced by the aging community make the modularization design of the landscape supporting facilities stand out as a highly operational, reproducible and low-input product. Today, the country advocates the energy conservation and the emission reduction. [8] The modularization design of the landscape supporting facilities has a stronger market expectation than before. It is difficult to achieve the successful modification works of the landscape supporting facilities in the aging community only drove by people. Fortunately, the government has a clear understanding and action of the aging of the population. In the latest *Notice of the General Office of the State Council on Printing and Implementing the Implementation Plan for Improving the Consumption System (2018-2020)*, it clearly states that “carrying out special measures for the construction of the service standards system for old-age care institutions and the service quality action for old-age care institutions, promoting full coverage of community aged care facilities.” Through the intervention of the government and the efforts of the people, the modularization design of the landscape supporting facilities will guide the landscape market because its strong vitality.

5. Conclusions

Through the analysis of the current situation and trend of landscape supporting facilities in the aging community, there are several parts that need to be developed in the aging community in our country. Firstly, at the present stage in our country, they are lacking in knowledge about the aging and relevant facilities. Secondly, the number of communities for the elderly is too small to keep up with the speed of aging in China. Thirdly, there are insufficient supporting services for the elderly community in both category and quantity. Fourthly, many people need to speed up the modular facilities solutions for the elderly. Whether from the perspective of ease of use or operation and maintenance, the modularization of facilities has incomparable advantages.

In the future, the rapid growth of the elderly group will lead to the rapid aging of the community. Operators can make comfortable life for the elderly through the optimization and upgrading of facilities, and managers can also actively improve people's living standards with a reasonable range of investment.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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