Research on Community Garden Practice – Taking "the Kid's Garden" in Hunan Agricultural University as an Example

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As the urbanization process is accelerating, city inhabitants enjoy all life conveniences, but they are also trapped in a cage of reinforced concrete. The instinctive human demand for being close to and contacting with nature is satisfied by the emergence of urban green spaces. As a form of urban green space, community gardens have provided urban residents with various environments to meet their social, economic and health interests [CAI Jun 2016].

At present, community gardens are still in the form of allotment garden in most European countries and regions while in China, they are still in the exploration stage. The common goals of community garden designers are to make them public, open and shared. This article uses literature research methods and case study method to explore a community garden building model, which is supported by universities to offer more options for the spread of community gardens.

Overview of community garden development

A community garden is any piece of land cultivated collectively by a group of people; the garden activities include planting fruit and vegetables, as well as ornamental plants.

The origins of community gardens date back to the Allotment Garden Movement of the United Kingdom in the 19th century. To meet the livelihood demands of city inhabitants who lost their jobs in the industrial revolution, governments or landowners divided large areas of land into small pieces with each allotment being smaller than half an acre and rented them to the poor who could plant fruit, vegetables and herbs on these plots of land. Sometimes, the poor were also allowed to breed livestock there, to meet their basic life requirements [Birky 1999]. Subsequently, the concept of community gardens has gained support of the authorities, thus obtaining the legislative guarantee for its development. In the world, Germany is the only country that introduced national legislation to support the so-called "Kleingarten", and provides long-term protection through urban planning. In United Kingdom, the law stipulates that more than 6 permanent electorates could apply to local government for an allotment garden. In 1921, the Federal League of allotment gardens in Germany, France and Poland established the international organization – Office International du Coin de Terre et des Jardins Familiaux – whose current aim is to persuade the European Parliament to protect allotment gardens. At present, there are 14 members in the organization [Qianjing 2011].

With the perfect guarantee system in Europe, allotment gardens have been transformed from a means that guaranteed sustenance to a place of recreation.

Compared with the stable development of allotment gardens in Europe, the community garden development in America was intermittent. The immigration wave to urban areas caused by industrial expansion in the late 19th century led to multiple environmental issues and social contradictions. Though urban gardens seem insignificant among a series of other reform measures, they have been widely recognized. The appearance of the vacant-lot cultivation associations, the children's school gardens, the civic garden campaign and other forms of urban gardens have made cities more livable, and provided the rudiments for community gardens in America. From 1917 to 1945, the urban garden programs, arising out of national crisis, included the war garden campaign during World War I, work-relief gardens and sustainable gardens during the Depression of the 1930s, and the American victory garden program during World War II. They guaranteed food safety and nutrition supply for the society during special periods. After the Second World War, however, public attention to the communal gardening was minimal and it resurged only in the mid-1970s because of the energy crisis, rising food prices, and an emerging environmental ethics. The Urban Gardening Program that ran from 1976 until 1993 was operated by the United States Department of Agriculture. It has been strengthening and deepening the community garden movement until the present. Since the 1970s, the community garden movements have revealed a shift towards increasing user involvement in planning and development. The gardens tended to rely on local control and maintenance. In 1979, the American Community Gardening Association (ACGA) was officially founded. Nowadays, ACGA is a bi-national nonprofit membership organization of professionals, volunteers and supporters of community greenery in urban and rural communities [Lawson 2005]. Though community gardens have played a positive role in community development, they are still considered as a temporary form of land use in most regions of America, and they have lacked policy support for a long time. Therefore, the main reason why community gardens have developed for a long time and manifested in multiple forms in America is that they have been widely supported by some social activists, environmentalist and the grassroots movement. Meanwhile, the support from NGOs, volunteers and community residents is definitely not to be neglected [Qianjing 2011a].

According to the development history of community gardens both in Europe and America, they developed from places that guaranteed food safety during crisis periods into urban green spaces with numerous functions related to individual health, food safety, social interactions, cultural exchange, environmental protection and economic development, etc. The difference is that the dominant form of community gardens in Europe are allotment gardens, which have developed top-down with systemic guarantees of governments and the participation of citizens, thus ensuring the stability of community gardens. However, their influence and service range are limited as well. On the other hand, in America, the development of community garden lacks policy support; however, the bottom-up mode has contributed to the diversity of community gardens. In particular, all kinds of community gardens have played a positive role in numerous aspects of environmental education of young people, sustainable development practice and community revitalization, etc.

Development status of community gardens in China

Community gardens have been completely non-existent throughout the history of China's gardening. From traditional gardens for individual service to present urban green spaces that serve the public, the Chinese government has made great efforts to establish numerous urban green spaces for relaxation, entertainment and exchange so as

to improve the living environment of urban residents. Both forms are urban green spaces, but what are the significant differences between a park and a community garden? In 1987, Mark Francis, a professor of University of California drew a conclusion after a comparative study of an adjacent city park and community gardens in Sacramento (Tab. 1).

Compared with urban parks, community gardens have played an indispensable role in terms of maintaining biological diversity, science popularization and enhancing community bonds, etc., in urban areas. At present, the community garden practice in China is still in the exploration phase, mainly representing two modes, namely, the spontaneous gardening of the public and the leisure agricultural tourism.

It is a universal phenomenon in China that the public grow vegetables in front or behind their houses, in roof gardens, or vacant plots in cities, which fully reflects the demands of urban residents to experience farming work and obtain healthy food. Though such kind of unorganized gardening work has taken the shape of "community garden", the lack of unified management has damaged the integral urban image, and the gardens have always been reshaped and rearranged by administrative departments. However, most urban farming gardens which are based on agricultural leisure development are functioning under the capital operation of entrepreneurs. Some of them have gained the support of governments and been driven by NGOs. Urban residents can experience farming activities and obtain agricultural products by means of renting or adopting allotment gardens. However, most of such gardens are located in the suburbs and dominated by commercial interests, and city inhabitants go to these gardens during weekends and holidays with their whole families. Therefore, they cannot be referred to as actual "community" gardens.

At present, both the leisure agricultural development led by Chinese governments or with the capital support of entrepreneurs, as well as the construction of urban green spaces are dominated by political power and commercial interests. However, the internal development demands and specific historical background have also driven the development of the participation landscape in China, which has been clearly proven by community gardens that have come forth in recent years [Qianjing 2011a]. For example, the Knowledge & Innovation Community Garden (KIC Garden) in Shanghai has spent two years on gradually exploring a set of implementation mechanisms suitable for the community garden. Namely, it uses social organizations as a link to connect the powers of self-governing organizations, voluntary organizations and enterprises in the community, and to establish partner relationship with functional government departments, thus giving

Table 1. Comparison of a park and a community garden [Francis 1987]

	Park	Garden
Characteristic	Passive	Active
	Quiet/Relax	Activity/Work
	Be alone	Get together
	Clean/Neat	Messy but cared for
	To look at	To participate in
	Built/Designed	Natural
	Publicly-controlled/managed	User-controlled/managed
	Permanent	Temporary
	Relaxing	Renewing
	Greenery attracts people	People attract people
	Liked	Loved
Activities	Playing, talking, eating/drinking, walking, sitting, sun bathing, reading, etc.	Gardening, planting, talking, walking, sitting, etc.

full play to positive powers of governments, enterprises and the public to realize community gardens jointly established and shared by community residents [Liu Yuelai et al. 2017].

The successful practice of the KIC Garden shows that to realize a community garden, it is a must to take full advantage of the existing resources, analyze community environment and the mass organizations, as well as to explore the development paths suitable for that community garden under local conditions.

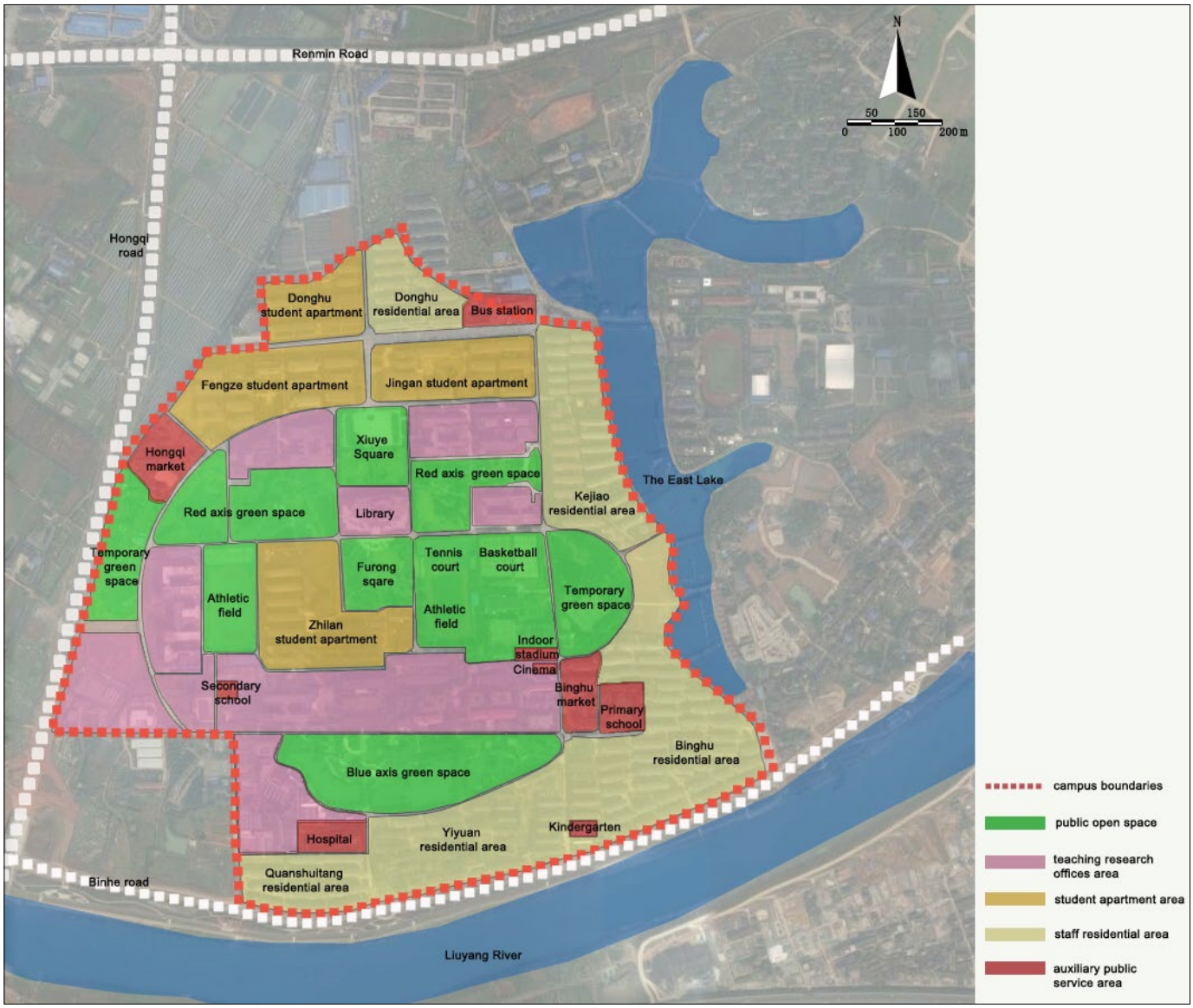

Fig. 1. The functional layout of the campus (drawn by Zhaohui Hu)

Research in practice – "Kid's Garden" in the Hunan Agricultural University

Outline of the situation

Hunan Agricultural University is located in Furong District, Changsha City, Hunan Province, and covers an area of 2.27 km^2. There is beautiful scenery of East Lake to its north, and the picturesque landscape of the Liuyang River to its south. The whole campus has a centralized layout and complete component elements. The land utilized there can be classified into five major functional styles, namely, area for teaching research offices, the student accommodation (dorms) area, the staff residential area, public open spaces and auxiliary public service area (Fig. 1). They are used to serve a population of about 35 000 permanent residents, including 28 000 students and 7000 teaching and administrative staff as well as their family members.

The "Kid's Garden" is located in the Yiyuan residence zone in the campus of Hunan Agricultural University, occupying an area about 3100 m^2. The nature of the land is green space adjacent to a dwelling district. At present, the base center is a weedy field with hardened soil at present. However, soil in the edge areas is fertile due to the humus that is created from fallen leaves. The primeval vegetation on the base is in good condition. The eight well-grown trees, such as *Ligustrum lucidum*, *Platanus orientalis*, *Paulownia*, *Morus alba*, *Cinnamomum camphora*, etc., and dungarunga cluster, mainly represented by *Osmanthus fragrans*, have enclosed a plant space with open land in the center. In terms of space formation, it is a typical vacant land, which has been utilized by nearby residents for parking and outdoor activities. Occasionally, there will be potted seasonal vegetables and other gardening work (Fig. 2, 3). The areas surrounding the site are inhabited by a mature community since the site is surrounded by resident dwellings of teaching and administrative staff as well as their family members. Most of the scattered green spaces in the dwelling zones are governed by residents separately, becoming private vegetable gardens. Within the service radius of 300 m, there are multiple public service facilities, such as a kindergarten, a primary school, a hospital, etc.

Construction goals

As a community garden jointly established by students and teachers in an agricultural university, the "Kid's Garden" has three missions, namely, teaching, scientific research and social service. Therefore, the constructions goals of the project are as follows: (1) to satisfy urban residents' demands on being close to the nature. By attracting the kids, who are the best communicative media, the Garden will encourage the participation of family members, which facilitates interaction between generations and community communication. It

Fig. 2. The basement current situation 1

Fig. 3. The basement current situation 2

Fig. 4. Plan of the Kid's Garden (Designed by XNMC group)

will also enable children and their family members to be close to the nature, to understand it better and to improve their sense of environmental protection in the process of being engaged in farming and garden management activities. (2) It will create a professional practice base, for the realization of joint-establishment between students and teachers, joint-governance among residents and sharing within the community, as well as establishing a community garden that integrates teaching, scientific research, relaxation, sightseeing, a children's playground and agricultural science while exploring the landscaping treatment technology of community gardens with use of the excellent resources of the Hunan Agricultural University. (3) It will explore a mode that integrates construction, management and operation of community gardens supported by universities to establish a bridge that connects universities with communities so as to drive the construction and development of community garden.

Design layout

The general layout of the Kid's Garden includes the Entertainment Zone with Touring Cars, the Shared Vegetable Garden, the Sunshine Lawn and the Botany Teaching Base (Fig. 4).

Entertainment Zone with Touring Bus

An abandoned bus was recycled to establish an entertainment zone with a touring bus through refitting techniques and aesthetic treatment, as well as providing tables and chairs, and a projector on the bases of the surroundings. The zone is located at the main entrance in the west. It is used as a base area of the Kid's Garden, an indoor and outdoor "nature

classroom" for children, a meeting hall for parents, volunteers and workers, as well as an exhibition room for science. This zone is the main location of various kinds of activities, and it also prevents adverse influences of bad weather on parent-child activities.

Shared Vegetable Fields

The shared vegetable fields are located in the southern and northern parts of the Kid's Garden, including public vegetable fields and one-square-meter vegetable beds.

The public vegetable beds are the main research, gardening and demonstration area, which are uniformly governed by the management team. Their main purpose is to research such landscaping treatment techniques of natural farming, as rainwater collection and recycling, soil improvement, natural fertilizers, etc., to select edible flowers, ornamental vegetables and fruits and other varieties of horticultural plants, as well as to study the intergrowth mode of flowers and vegetables. Meanwhile, lectures are given by experts periodically for everyone to experience them by themselves, as well as to promote knowledge about recognizing horticultural plants, cultivating, management and post-harvest treatment of crops, etc.

One-meter-square vegetable beds are the adoption experience area for residents. Residents can apply for the maintenance and management rights to 1 m^2 pieces of land. They can also select the variety of horticultural plant as they wish, as well as harvest the crops in their fields. The management team provides the seeds, tools, fertilizers and technical support.

Sunshine Lawn

This part of the garden takes full advantage of the five existing big trees to create a sparse woodland lawn in the central area, which offers the children an opportunity to satisfy their natural needs to run and play. There are log cabins, jumping pits and wooden platforms under the trees, and all of them provide more ways for playing and learning, as well as enable children to have close contact with the sunshine, trees and soil.

The Sunshine Lawn also provides students of the landscape architecture faculty with a place for outdoor creative activities and displaying their works. On the one hand, the design works becoming reality improve the students' professional cognition and learning interest; on the other hand, the design works of students also foster the artistic and academic atmosphere in the garden, improve the influence of the specialization, as well as increase the students' motivation for learning.

Botany Teaching Base

The ways to create a beautiful, ecological and environmentally friendly vegetative landscape and ecological environment in the garden by connecting vegetables, flowers and other plants will be one of the key teaching and scientific research contents of "Kid's Garden". Therefore, the entire garden will be a base for botany teaching and scientific research. Meanwhile, the wetland research area for collecting rainwater at the south entrance is the base for wetland research and popularization of science by growing aquatic vegetables and bog plants. The glasshouse in the woods in the eastern part of the area is a greenhouse practices base, which satisfies the demands for breeding and seedlings, dissemination of knowledge about plant growth, and enriching the biodiversity in the garden.

Construction process

The Kid's Garden has been designed by teachers and postgraduate students from the faculty of landscape architecture, and it has been constructed in a joint effort of a professional construction team, together with postgraduate and undergraduate students. The entire construction process adheres to principles of multiple participation, eco-environmental protection, resource saving and cost reduction, etc.

The works are guided by teachers, and coordinated by the construction team, with the participation of students, taking into account suggestions from residents

Apart from some civil engineering works and difficult gardening engineering performed by a professional construction team and observed by students, the rest of the works are completed by students wholly or

Fig. 5. Students participated to the engineering construct: a. built paths, b. built planting bed, c. built gabion (photo by Tong Li)

partially (Fig. 5) As a landscape architecture practice base in campus, students have participated in building the paths, gabions, the timber deck, log cabins, placing potted vegetables, etc., in the garden. They have experienced the transformation from drawings to reality, and witnessed the realization of every landscape. At the beginning of the design and during construction, the team also collected opinions from local residents by means of a questionnaire and spot coverage, and put reasonable suggestions into life so as to ensure that the results will satisfy the demands of various groups of people.

Waste recycling

To implement the ideas of sustainable development, the whole construction process of Kid's Garden is based on the recycling and reuse of waste. For example, an abandoned bus was transformed into an activity room, spoil from a stone factory was recycled to pile up in form of a gabion (Fig. 6), scrap wood from wood-working factory was used to build a planting bed and for other purposes, wood shavings from a wood-working factory and tea grounds from a tea factory, mushroom dregs from an edible mushroom workshop and other similar things were used as soil matrix; tree leaves, pine needles and vegetable leaves were used as raw materials of organic fertilizer, etc. All of these practices not only save construction costs, but they also make "Kid's Garden" a textbook on environmental protection as it advocates energy-saving and an artistic lifestyle.

Operation & maintenance plan

Domination of teachers and student volunteer team, and participation of residents at the earlier stage

Upon the completion of the construction process, the operation & maintenance of Kid's Garden will be dominated by teachers and a student volunteer team. The teachers will mainly conduct scientific research on the breeding and configuration mode

Fig. 6. The built process of the gabion: a) collect the stones, b) select the stones, c) the achievement (photo by Chen Zhou)

of gardening vegetables, landscaping treatment techniques of natural farming and environmental behavior characteristics of community residents. Meanwhile, they will develop some practical contents of the specialized courses such as design fundamentals, landscape engineering, landscape planting and environment behavioral sciences of the landscape architecture faculty, as well as vegetable cultivation and other courses of the horticulture specialization, thus achieving a win-win result between teaching and operation and maintenance. On the other hand, the student volunteer team is responsible for daily management and service, including daily maintenance, routine services, organizing and managing gardening activities of residents, as well as running the student management club and other public-interested student clubs, etc. At this stage, residents' participation is in exploration stage. The goal is to foster the residents' sense of belonging and identification with the community and to encourage them to participate in science popularization education activities organized by the team with their whole families, thus gradually taking over and adapting the land.

Guidance of teachers, and joint governance of students' club and residents at the intermediate stage

The layout and operation of the Kid's Garden will be optimized with the support of scientific research results obtained at the earlier stage. During this phase, apart from developing teaching and public science popularization activities, teachers will delegate powers to students' clubs to develop community building activities together with the management personnel of the community. The garden will be adapted completely. Meanwhile, building and management activities will be introduced through encouraging specific groups, such as the elderly, the mothers' group and children's group, etc., as well as farming mass organizations.

Support of colleges and universities, and self-governance of community and residents in the future

Once the operation & maintenance of the Garden is mature, the main objectives will be to enhance the influence of Kid's Garden, as well as to obtain support from governments and enterprises. At that time, it will be possible to provide technical and artistic support by means of voluntary service of teachers and student club, and to achieve the self-governance of the garden, which will be taken over by the community in co-operation with residents and mass organizations.

In this phase, the research findings of "Kid's Garden" will enter the promotion stage and they will be disseminated to urban communities, kindergartens, as well as primary schools and high schools. The mode of realization of the "Kid's Garden", with the support of academic centers, will build a bridge between universities and urban communities, becoming the medium and strength for driving the development of community gardens in China.

Discussions

Currently, community gardens have become a mature and stable system in numerous diversified forms as a result of more than a hundred years of development in Europe and America. Numerous studies and practices have proven that they play a positive and extensive role in the society, economy, culture and environment, etc. The development of community gardens has just started in China. Although the state encourages urban garden and community building, this form of urban green space, whose social benefits are larger than economic ones and that require long-term operation & maintenance and management, cannot achieve containable healthy development only by means of political power or commercial interests. Cultivating the grassroots foundations and exploring the "bottom-up" implementation form are ways worth of exploring.

At the beginning of implementing the "Kid's Garden" in Hunan Agricultural University, it was confronted with many potential demands of community and residents while having no policy or funding support. With help of the advantages offered by the profound professional background of the University, and solid grassroots strength, the team has explored the

community garden building model, which is supported by universities with the goals to reward the society, as well as to achieve a double-win result between practice and teaching. This experience is hoped to consolidate foundations of the masses, and to popularize community gardens so as to make contribution to a harmonious society.

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