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# An Experience Inspired by the Evolution of Community Gardens in New York City

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**Abstract:** In many highly dense urban environments, the urgent needs of residents for increasing green space, improving the quality of the community environment and reconstructing the relationships among residents have given birth to the new space type of community gardens. However, China still lacks this relevant experience. In contrast, New York City's community gardens had a relatively early start, and they now have rich experience in space construction, operation and maintenance. Given their level of experience, they can be used as references for the development of community gardens in China. This paper adopts a bibliometric research method, identifies 201 periodical literature sources published between 2000 and 2020 from the core library of the Web of Science as the object of study, and finally assesses the research hotspot for transferring from macro-research to space-type construction method, social impact, and so on, through CiteSpace software analysis. By virtue of the research process analysis and the results of field surveys and interviews, this paper probes the development status of space construction and social organization construction of the community gardens in New York City, and summarizes that area's effective experience of development. Based on the current development situation of China's community gardens, it is proposed that the development of community gardens should be directed by ensuring the land for development, giving full play to social benefits, and mobilizing social organizations, so as to effectively realize urban space construction and social governance.

**Key words:** CiteSpace; community garden; public space; social benefits; urban agriculture

## 1 Introduction

In recent years, community gardens have sprung up in various cities in China, and they have become a beneficial supplement to the urban green space landscapes. Combining urban open spaces with agricultural landscapes plays a vital role in biodiversity, micro-climate and other fields, as it can effectively improve the quality of the urban spaces (Speak et al., 2015; Hou, 2019). Community gardens have also contributed to residents' food safety and health (Bijkerk et al., 2018). Most importantly, the participatory nature of community gardens provides opportunities for the local residents to communicate and build gardens together, which is conducive for improving neighborhood relations and en-

hancing cohesion among the residents (Kremer et al., 2013; Filkobski et al., 2016).

The remarkable social and environmental benefits brought about by community gardens have led to their vigorous development. Some pioneering practical projects—including the Shanghai Chuangzhi Community Garden, the Changsha Doll Agricultural Park, the Beijing Keyu Community Garden, and the Tianjin Wanying Community Food Forest—have been undertaken, recognized and valued by the local government and all social forces (Ding et al., 2019; Liu et al., 2019). Meanwhile, there are also various spontaneous gardening activities in the old residential areas of various cities in China, but they lack management and ef-

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fective guidance (Zhu, 2016). These two kinds of community gardens are associated with either formal organizational exploration or informal social phenomena, which manifest a “bottom-up” grassroots nature and they have not yet established a complete participation mechanism. The fertilizers used in community gardens and the garbage they generate are being handled just by the farmers, without training and supervision; hence, it is difficult for them to fulfill their ecological role. Moreover, some projects have caused social contradictions due to chaos and uncertainty regarding land ownership, space construction and maintenance, which violate the original intent of community garden construction.

In these situations, Shanghai, Shenzhen, Beijing and other cities have since explored options for the policy guidance and supervision of community gardens, and have consciously cultivated or supported relevant non-profit organizations that have developed the construction of community gardens. These cities hope to integrate the “top-down” and “bottom-up” forces through the participation of social organizations. This is a new opportunity for China to draw lessons from the development experiences of other countries or regions, and to put forward corresponding development strategies according to the country’s unique conditions.

Presently, the United States is one of the most developed countries in the world. Its community gardens have a long history, alongside high resident participation and well-developed self-organization (Qian, 2011). In particular, its non-profit organizations play a vital role in promoting community garden development at all levels. At the national level, the American Community Garden Association (ACGA) promotes the establishment of community garden networks among states and regions, as well as the long-term and stable development of community gardens. At the regional level, the network involves the government, public institutions, social organizations and private groups, all of whom provide the material, human and technical support needed for the long-term development, promotion and daily management and operation of the community plantations (Ding, 2020). Among these regions, New York is one of the most active cities in community farming. Several of its community gardens have become a significant part of its urban public space and its residents’ public life (Cai, 2016). At the same time, there are several government agencies and non-profit organizations that are working to promote the development of these community gardens.

The history of community gardens in New York City has been studied extensively (e.g., Englander, 2001; Eizenberg, 2012; Guitart, 2012; Johnson, 2019). These studies have either focused on the historical context during the early embryonic stage – leading to a lack of analysis of the current development situation in recent years – or categorized the development stages of community gardens according to the time when a relevant organization emerged (The New York City Community Garden Coalition, 2010; GreenThumb,

2019), leading to conclusions that focus on the 20th century, rather than the 20 years of work so far in the 21st century. Since the construction of New York’s community gardens manifest a continuous optimization process, their development over the past 20 years provides a great inspiration and referential significance to China. However, most of the domestic studies pertain only to the assessment of the Western literature, so they lack any current analysis and discussion based on field research. In this regard, several relevant questions remain unanswered: What is the current research and development status of the community gardens in New York? What experiences can be drawn from the construction and development of these gardens? What referential significance can this bring to the development of China’s community gardens? All of these questions require further analysis and study.

To provide a real and effective reference for the research and construction of community gardens in China, the authors analyze the current situation of community garden development in New York City and confirm the need for a change in China’s community garden construction strategy.

## 2 Materials and methods

Through a combination of bibliometric analysis and field investigation, this paper assesses the developmental progression and present situation of community gardens in New York City within the 21st century.

### 2.1 Bibliometric research

This part is based on the core collection database in the Web of Science platform.

Source: In the core collection database of Web of Science platform, the retrieval time range was from 2000 to 2020. The search condition was subject = “New York” AND “Community Garden”. A total of 215 articles were obtained.

Research method: A bibliometric method was used. Combing and visual analysis were conducted through the Java-based bibliometric analysis software CiteSpace.5.7. R2. Firstly, a total of 201 articles were selected from the original data after removing non-academic articles, repeated articles, and conference or newspaper abstracts. Secondly, the research hotspots and trends in recent years are presented by mapping the knowledge of community gardens in New York with respect to the following four aspects.

(1) Time distribution characteristics of New York community garden research. The literature volume is a significant index to reflect the characteristics of time distribution in field research, and serves as an important basis for the analysis of evolutionary trends in field research. This analysis counted the number of published papers each year, used Microsoft Excel to draw the interannual variation curve of the number of published papers, and analyzed the time distribution characteristics and research evolutionary trends.

(2) Literature co-citation and cluster analysis. The total of

201 documents were co-cited and analyzed by the CiteSpace software. A cluster distribution map was generated to reveal the research core and hotspot direction in the relevant field.

(3) Analysis of evolution characteristics. The timeline view and emergent word detection technology were applied in CiteSpace to determine the evolving situation and hotspot distribution in the relevant field.

(4) Analysis of the development stage of metrological and policy backgrounds. Based on the analysis of the evolutionary process of community garden research, historical events and policy documents, the development process of community gardens in New York was assessed.

Regarding the development process, this research includes both preposition and lag, which do not necessarily correspond completely. Nevertheless, the change in research focus can be used as a reference for the change in development focus.

## 2.2 Field research

From July to August 2019, the author travelled to New York City to investigate the development of the region's community gardens. Focusing on the East Manhattan Village as the research object, as it is the most intensive construction of community plantations in New York City, this paper selects the Campos community garden, Children's Garden, Laplaza Cultural-Armando Perei community garden, Vamos a Sembrar, and the campus plantation of the Urban Farm Laboratory in New York University as the key cases for carrying out the field investigation and semi-structured interviews with the participants. As for the social organizations and academic institutions, the author visited GrowNYC United Plaza office, NYU Urban Farm Lab, and Stone Barns Center for Food & Agriculture, which are all located in New York's suburbs, and conducted a semi-structured interview with the person-in-charge, GNYC's assistant supervisor Cheryl Huber.

## 3 Results

### 3.1 Visual analysis of the evolutionary trend and hotspot distribution of community garden research in New York

**3.1.1 Analysis of temporal distribution characteristics**  
Based on the 201 articles selected, the interannual variation curve of the number of published papers was drawn (Fig. 1). Prior to the 21<sup>st</sup> century, there were only a few papers on community gardens in New York. Since 2000, several related studies have emerged. This research field has exhibited a characteristic of rising and then falling, with intermittent fluctuations, and the number of published papers reached its peak around 2017.

A subject word search of all papers in the Web of Science library (from 1950) reveals that only a few papers were published earlier, in 1972 (1), 1997 (2), 1998 (3) and 1999 (1), while the core library (from 1985) has not included any

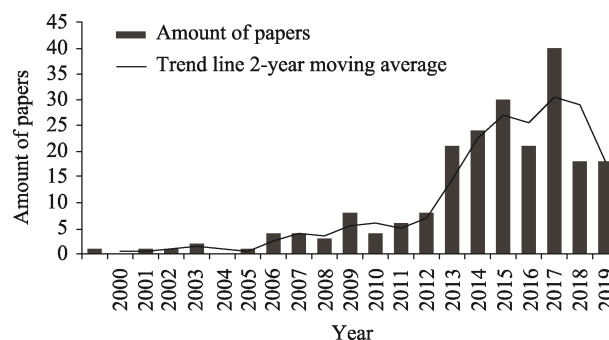


Fig. 1 Interannual variation trend of papers on New York community garden research from the core library of Web of Science (2000–2020).

papers prior to 2000. Therefore, although this paper concentrates on the development and changes within this century, its results are deemed applicable to the entire research development process.

#### 3.1.2 Literature co-citation and cluster analysis

Co-citation analysis refers to a correlation analysis of the co-cited literature. Research on high citation or high-centrality citation characteristics in a literature collection can reveal the core research direction of the relevant field.

The co-citation visual knowledge graph was mapped, and a cluster analysis was conducted (Fig. 2). Research on New York community gardens can be classified into nine categories based on the citations – comparative analysis, urban community garden development, urban horticulture, social benefits, residential gardens, farmers markets, mitigating leads, urban gardens, and water access – as ordered by the spring embedding (Kamada and Kawa) graphic layout algorithm. From the results, the primary research

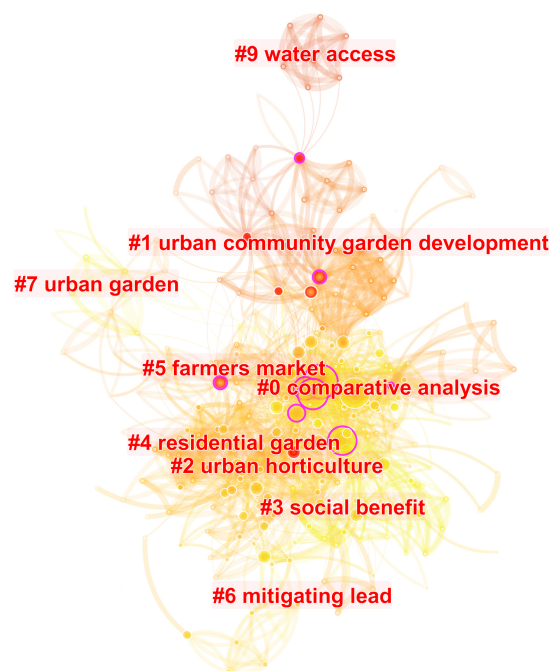


Fig. 2 Co-citation network cluster map of New York community garden research (2000–2020)



method in this field is comparative analysis, while the main research directions include urban community garden development, urban horticulture and social benefits.

### 3.1.3 Research evolutionary feature analysis

From the view of the timeline of keyword changes, the hotspot distribution and evolutionary trend of research literature can be reflected in the time dimension. The direction of changes in the research field associated with the subject can be revealed through a short-term surge of new words or a dynamic change of word frequency in the evolutionary stage by using emergent word measurement technology (Fig. 3).

By combining the keyword timeline distribution map and the analysis of emergent words, the research course regarding community gardens in New York during this century can be roughly divided into three stages: 2000–2008, 2008–2013, and 2014–2020. Further analysis of the results shows that the frequencies of some keywords have significantly increased with the annual approach.

For instance, the high-frequency keywords in 2000–2008 include “urban community garden development” and “water access”; while in 2008–2013, they include “farmer market”, “urban horticulture”, “residential garden” and “mitigating lead”; and in 2014–2020, they include “social benefit” and “urban garden”. With this evolution of the research, macro-research related to community gardens has been reduced, while studies on space type, construction mode and social influence have increased.

## 3.2 Historical changes of New York community gardens

Based on the evolution of community garden research in New York, and the social and policy background of the region, the three main developmental stages of community gardens in New York are as follows.

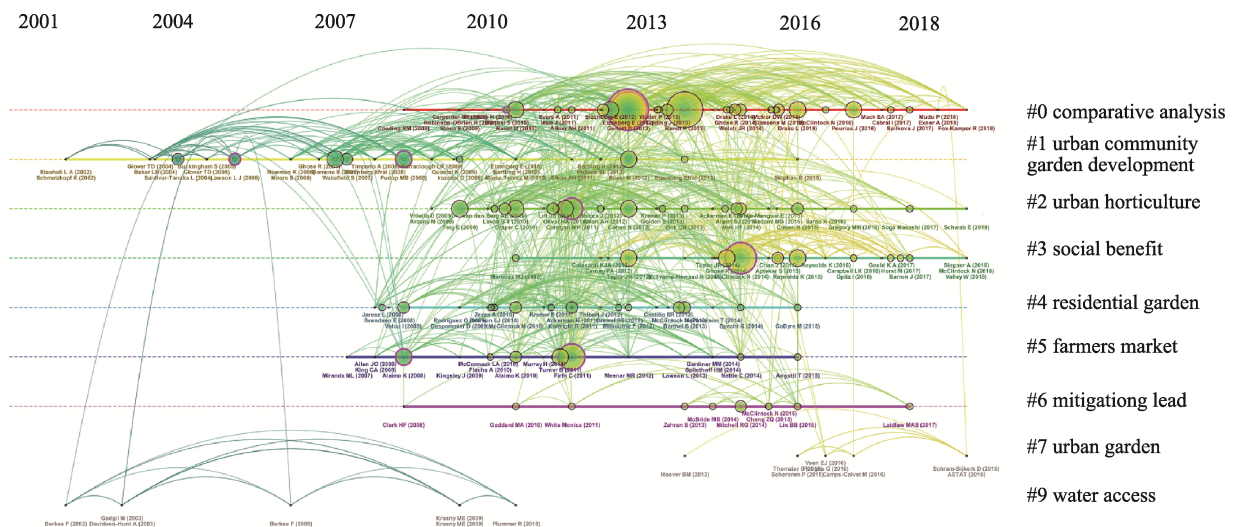


Fig. 3 Keyword timeline distribution map of New York community garden research (2000–2020)

### 3.2.1 Spontaneous construction by residents and social organization cultivation (before 1998)

The development and protection of community gardens has manifested a constant struggle in New York for decades. Due to a decline in environmental quality and the shortage of a fresh food supply, low-income urban residents spontaneously began to turn unused land next to apartment buildings into public urban gardens, community centers, gathering places, and entertainment and food production sites (Nilsen, 2019).

Since the 1970s, with the support of the city government and various social organizations, community gardens have extensively ushered in construction as a form of urban land in the central urban area of New York City. The city launched the Green Thumb program (now affiliated to the New York City Department of Parks & Recreation) in 1978 to coordinate the city's vacant leased land and help develop the community gardens. In 1984, Green Thumb launched its Community Garden Conservation Program, and facilitated a

ten-year lease between the city and various community groups. The City Land Committee introduced the title “preservation site” in 1989, which promised to maintain actively maintained sites for permanent use as community gardens.

Since the 1990s, alongside economic recovery and an increase in housing demand, there has been a trend toward converting original community garden land into housing construction (Schmelzkopf K., 1995). In 1996, the New York City Community Garden Coalition (NYCCGC) was established to promote the conservation, creation and empowerment of community gardens through education, advocacy and grass-roots organizations (NYCCGC, 2010).

### 3.2.2 Government-unified management and infrastructure improvement (1998–2007)

The Community Garden Auction Scheme (Corey Johnson, 2019) was promulgated in New York City in 1998. Under the pressure of urban land development, more than 150 plots were re-purposed for commercial development to meet the

housing needs in New York City, while the remaining approximately 400 community gardens were retained under governmental jurisdiction. In 1999, the non-profit organization New York Restoration Project (NYRP) and the state organization Trust for Public Land purchased more than 110 gardens (Ben Hagen, 2018; TPL, 2018). Since then, community gardens have gained policy legitimacy, with the establishment of public status and the involvement of various social organizations bringing forth the vigorous development of community gardens in New York City.

During this period, there were only a few of studies on the relevant topic. In the early stage, a large amount of macro-research pertaining to “urban community garden development” had emerged due to the need to protect community gardens and explore the advantages and disadvantages of protection and development. After they were determined to be under the government’s formal jurisdiction and obtained the systematic support of social organizations, gardens have experienced space and infrastructure reconstruction. Consequently, “water access” and other issues have become the focal points of research. Before 2008, the literature mainly focused on macro-research topics regarding the development of community gardens in New York, while specific studies emphasized space construction.

3.2.3 Community garden development, food policy leadership (2008–2013)

In 2006, the Agriculture Market Service (AMS) of the United States Department of Agriculture promulgated the Farmers Market Promotion Program (FMPP) to expand access to locally-produced farm products and to develop new market opportunities for farms and rangelands involved in direct agro-marketing. Consequently, the total number of farmers’ markets in the United States increased by 76% from 2008 to 2014, reaching 8268 markets in 2014.

In 2008, New York governor Spitzer reinstituted the Food Policy Committee. The Mayor’s Executive Order No. 122 (2008) promoted the development of community agriculture by advocating the purchase and consumption of locally-produced food, and by promoting rooftop greenhouse installation. During this period, New York City also issued a number of policies, programs and official reports, including *Food Standards*, the Study on “Market Survey Results (su-

permarket shortage)”, Food Retail Expansion to Support Health (FRESH), and “Citywide School Garden Program”, to help promote community garden development.

At this stage, the frequency of keywords “farmer market”, “urban horticulture”, and “residential garden” in the bibliometric survey significantly increased. This shift corresponds to issues related to social background such as farmers’ market attention and school garden construction.

3.2.4 Cultivation of the “community”—based stage alongside social capital generation (2014–present)

In 2014, Brad Lander, a Member of Parliament of New York City, submitted a bill proposing the establishment of the NYC Food Policy Committee, which would include members of anti-hunger, public health, education, child welfare, health promotion, food justice, and public assistance advocacies (Figueroa and Dunlea, 2013). The OneNYC 2050 released in April 2019 included commitments to expand food production, reduce food insecurity and expand GrowNYC green markets in low-income communities (City of New York, 2019). This stage of New York’s development program is characterized by increased considerations of food equity, education, community development and other social benefits. Since then, social organizations have issued several green infrastructure manuals, community garden manuals and technical guidelines for rainwater collection, permeable paving, and rainwater gardens, among others, which has accelerated the construction of community gardens.

From a timeline view, attention to “social benefit” and other keywords has significantly increased after 2014. Meanwhile, the keyword “mitigating lead” can reflect the attention to the ecological environment in the process of community garden development during this period.

3.3 Development status of community garden spaces in New York City

Currently, community gardens have become unique green spaces in New York’s high-density urban environment. There are more than 550 community gardens in New York, with a total area of more than 100 acres (about 40 ha) and with approximately 20000 participants.

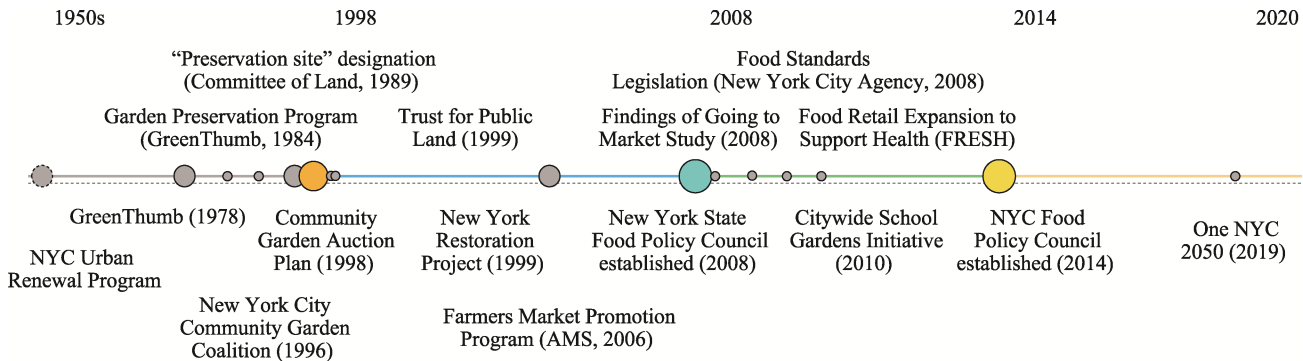


Fig. 4 Timeline of policies pertaining to New York City’s community gardens

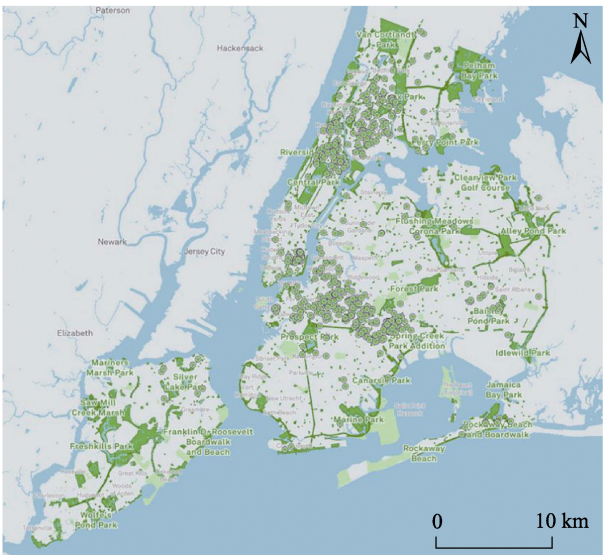


Fig. 5 Distribution of New York City's community gardens  
Source: New York City "Green Thumb" Project (<https://greenthumb.nycgovparks.org/gardensearch.php#garden-list>)

Combining interviews with users and field research on key cases, this paper analyzes several key aspects.

3.3.1 Basic attributes of research cases

Traditional community gardens: Plantations in various areas of East Manhattan are located on open spaces between two buildings on a block; land ownership belongs to the park authority, and the management agency is the management committee; and their construction time was early. At the time of construction, most of them were co-built by the community; later, they were taken over by the management committee, and all of them underwent reconstruction. Most of the reconstruction was accomplished under the guidance of NGOs or with the cooperation of the residents. For instance, the Campos community garden was spontaneously built by the residents in 1982, and was rebuilt by GNYC after its ownership was transferred the park authorities in

2004. The plantation of the Urban Farm Laboratory of New York University is located on an open space next to the teaching building. It belongs to the NYU Food Studies Department, and is constructed and managed by that Department's faculty and students. It has the characteristics of both a community plantation and a private space.

3.3.2 Spatial characteristics

(1) Plan layout: Community gardens include major planting, public exchange and infrastructure areas. Most of them are mixed and not clearly distinctive. Generally, the main planting area is located in the sunny portion, the communication area is situated in the shadowy areas, and the facilities are located on the site's boundaries (Fig. 6).

(2) Visible accessibility: Community plantations are co-managed by the users, with a certain degree of publicity. Typically, there is a net wire fence by the roadside. Residents passing by can see the farm and talk to people inside the garden, but they cannot easily break through the door (Fig. 7).

(3) Planting areas: Planting areas are classified into private planting areas and public planting areas. In private planting areas, planting boxes or ground divisions are typically used to define each plot's scope. Each family is responsible for a piece of land and decides how and what to plant. Generally, vegetables and fruits are planted; trees are not allowed to be planted to prevent shading of the edible crops. In public planting areas, community volunteers plant flowers and fruit trees like figs and peaches, and distribute the fruits after harvest.

(4) Infrastructure area: The infrastructure includes rain-water collection facilities, irrigation facilities, composting facilities, toolshed/stacking areas and operation platforms. The government provides soil, fertilizer and tools; the soil is a non-polluting type that is transported by the health bureau from other places. Composting is primarily provided by the Brown Trash Can project; the compost is obtained and treated in the city, and then distributed to the commu

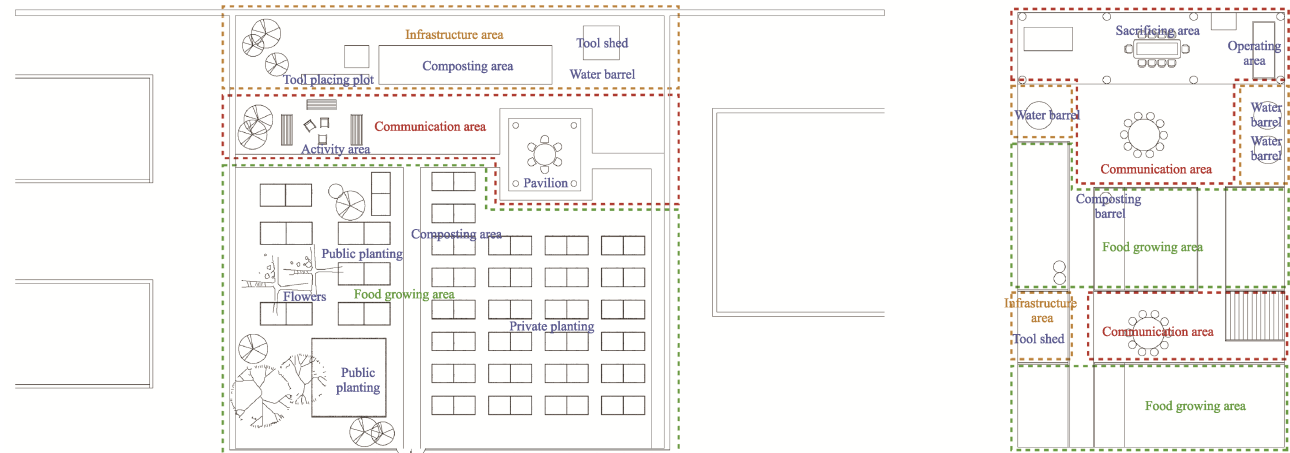


Fig. 6 Layouts of Campos community garden and Vamos a Sembrar after reconstruction





Fig. 7 The net wire fence between the community farm and the road boundary

nity plantations. A small portion of the compost can be replaced by organic fertilizer produced by the community. Community residents take their kitchen waste to the farms for composting (Fig. 8). The water used in the garden is from fire hydrants on the opposite side and delivered by a long pipe, which is highly inconvenient. This may explain

why “water access” was a fundamental issue in early community agricultural park research. Therefore, various rainwater collection facilities were added in the later stage of construction, while irrigation facilities were also considered at the beginning of the construction of new agricultural gardens.



Fig. 8 Some of the facilities in community gardens: (a) rainwater collection facilities; (b) preliminary disposal of collected organic waste; (c) prepared fertilizer; (d) toolshed.

(5) Public exchange areas: There are pavilions in the plantations, which include long tables for discussion or dining activities. Some plantations are equipped with large public activity areas with benches, round tables and even stages. Others are even equipped with sacrificial tables for people of certain nationalities or ethnic groups to exercise their beliefs (Fig. 9). Most of the gardens are equipped with several movable seats to accommodate public activities.

### 3.3.3 Management characteristics

(1) Cultural activities and community construction: The users of community plantations tend to have multi-ethnic attributes. Residents can celebrate different cultural festivals together, such as Mexico’s day of the dead, Jewish Yom Kippur and Muslim Eid al Fitr, as well as some typical local festivals like Christmas. In addition, each family’s land often reflects its own national characteristics. For instance, tomatoes and basil are typical American family crops, while melons and beans are common for a Bangladeshi family.

Residents often provide each other with harvest or national food, which helps promote ethnic exchanges.

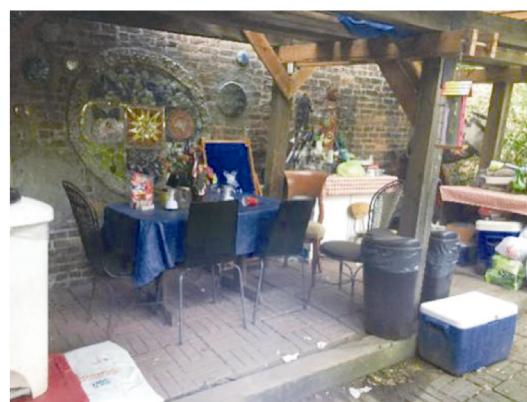


Fig. 9 A sacrificial table in the public exchange area of a community garden

(2) Construction process: The construction of community plantations involves three parties: the government that provides land, the management of a community volunteer organization that puts forward the construction request, and the non-profit organization that provides technical support. One of the authors visited a community plantation named El Sol Brilladtejr.sr that was reconstructed during the course of the investigation (Fig. 10). Since the visit happened to occur on the volunteer day of a Brooklyn business,, a group of GNYC volunteers came to rebuild the plantation.

(3) Problems: Community plantations are not indicated as land for green on maps. Therefore, once there is housing demand, it can be used for construction. According to the management requirements, the contract is revised every four years; and when the contract is updated, the government may repurpose the land if the contract is not signed, which leads to a great sense of insecurity among the participants. However, there are several new community plantations that



Fig. 10 Volunteers were taking part in activities in the El Sol Brilladtejr.sr community garden

can effectively avoid the land use problems of traditional community plantations, including the Governor's Island Swale Project. This mode of using water surfaces, roofs and other idle public spaces is worth being used as a reference.

#### 3.3.4 Participation characteristics

Regarding the participation of community agricultural residents, semi-structured interviews with six participants were conducted in New York. The answers to questions pertaining to participation characteristics are statistically analyzed here.

(1) Regarding the reasons the residents chose to participate in community agriculture, about 10% answered with each of: "healthy and safe vegetables", "exercise to relieve stress", "missing country life", "enriching life and increasing fun", "educational and labor opportunities for children", "beautify home or community", or "promoting communication and friendship". Meanwhile, a small number of residents answered "vegetable subsidy", "shade in summer", or "ecology".

(2) More than half of the residents believed that there

was "a lack of healthy oil" or "a lack of water". Around 22% thought that "no time" was the main difficulty in community agriculture participation, while others thought that there were also difficulties in obtaining "funding" and "labor".

(3) Regarding the question "Do the agricultural products that you plant meet your daily needs for vegetables and fruits?", more than half (57%) of the residents had sufficient products from the garden and did not need to buy vegetables, with three-quarters of them even having extra products for sale to others. The other 29% were partially satisfied and still needed to buy some vegetables. Some gardens provided products for chef dinners and the volunteers.

(4) As for the average hours spent on agricultural activities per day, half of the residents spent less than one hour, and two-thirds of them spent over one hour. Around 17% of the residents were fully employed.

(5) Regarding the activities in the gardens, 30% involved agricultural cultivation, 15% agriculture landscaping, 10% communication with neighbors, and the other activities included walking, playing with children, sitting or thinking, sports and education.

(6) With regard to access to agricultural resources like tools, planting techniques and training, most of the residents chose to self-purchase in shops. This was followed by "unified purchase of tools by communities" and "online self-learning" (17% each). The other residents opted to learn from experienced neighbors, to be collectively trained by community-related institutions, or to learn from third-party cooperative institutions. A few others indicated resources like tools as gifts.

### 3.4 Development status of social organizations in New York community gardens

The community gardens in New York are subsidized by municipal funds, including Federal Housing and Urban Community Development Funds. They are coordinated by academic research institutions through policy formulation and technology research and development. Their operations are mainly coordinated and guided by the Green Thumb program and various other social organizations, as discussed below.

Support garden construction: The Trust for Public Land and the New York Restoration Project assist in the establishment of community plantations through land acquisition. Green Thumb provides services and material support for the construction of the plantations. GrowNYC has established a community garden rainwater collection system for five districts of New York City, as well as an interactive community garden spatial information system (OASIS). Its Green Space project provides vital technical support for the community plantations.



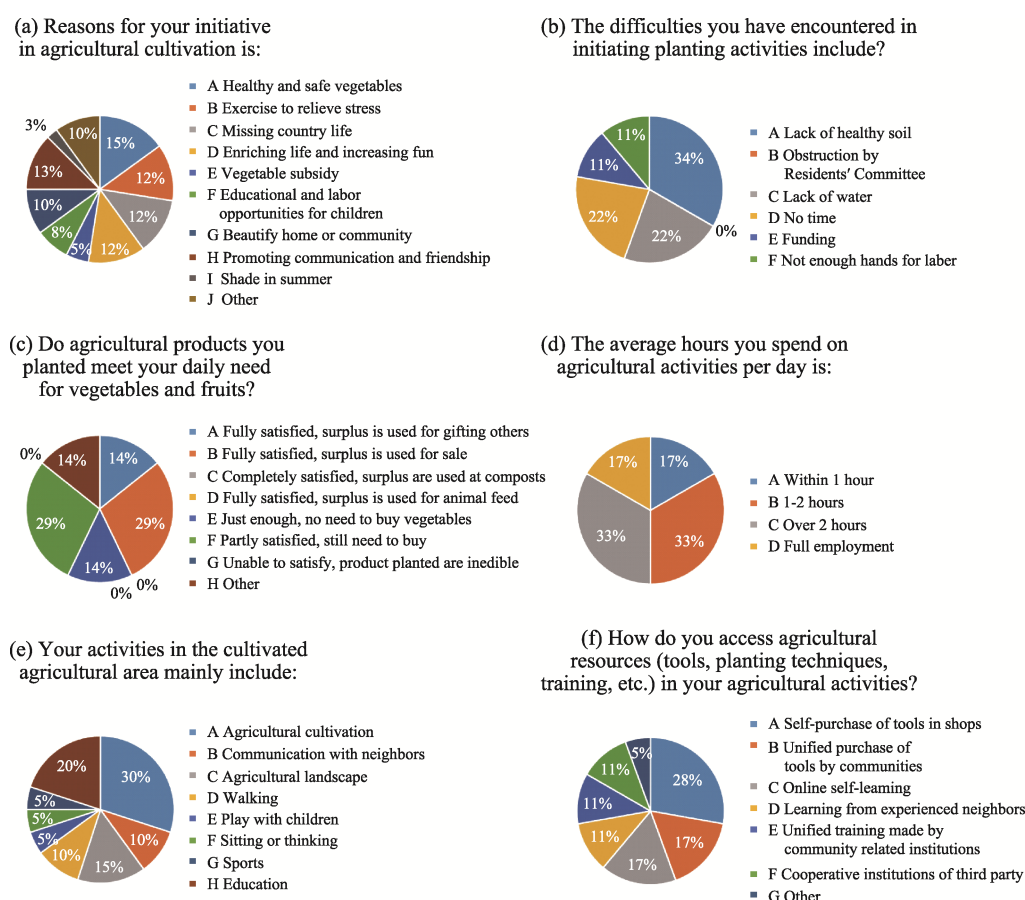


Fig. 11 Statistics on the survey of participation characteristics in community gardens

**Train participants:** The Green Thumb Project conducts regular monthly workshops on community organization, garden design and horticultural knowledge, among others. Green Thumb and GrowNYC have published technical guidance manuals for the construction of community plantations to guide the community volunteers in the management and construction of their community plantations. Meanwhile, the Community Development Program “Bronx Green-Up”, which is implemented by the New York Botanical Garden and the Community Garden Alliance, and was proposed by the Brooklyn Botanical Garden Community Greening, has strengthened interactions among farmers through workshops, seminars, online gatherings and other means.

**Public awareness:** The Green Guerillas and the New York City Community Garden Coalition are committed to raising the public awareness of community gardens through education and publicity, so that the community plantations have more rights to speak during the planning phase.

**Improvement of community food systems:** GrowNYC provides seeds and nursery services for community farms. This is particularly realized by Greenmarket Co., Youthmarket, Fresh Food Box, Wholesale Greenmarket and other institutions and projects for promoting local food, especially the distribution of products from small farmers. This allows consumers to have opportunities for face-to-face communi-

cation with the producers. As for waste, GrowNYC has a long-term partnership with the New York City Health Bureau’s Zero Garbage Project. All farmers’ markets have kitchen waste collection points, which centralize the wastes for the production of fertilizer to be sent to the community plantations. In short, social organizations are committed toward linking the entire process of the food circulation system involving “seed acquisition-food production-distribution-processing-consumption-waste recovery (for) production of fertilizer-fertilizer distribution and use.”

**Promotion of children’s natural education:** The campus farm, as a typical representative of a new community plantation, has rapidly developed in recent years. Half of New York’s public schools have GrowNYC on-campus farms. They organize student visits to greenmarkets or children’s fairs to sell, make and taste their own food. “Follow him, nurture it and eat it,” Huber said. This experience has a profound influence on the development of community plantations decades later.

**Academic research:** The urban agriculture laboratory of New York University is committed to addressing potential urban pollution, and has identified ways for improving the safety of urban soils. As a non-profit farm and education center, Stone Barns Center for Food & Agriculture is committed to developing tools for small-scale agricultural gar-



Fig. 12 Residents in a farmers' market, agency staff, sellers and citizens who are tasting food.

dens through the “slow tool program”. It also promotes diversity through breeding, and explores various ecological and economic benefits from a soil-raising aspect through comparative experiments on organic manure, soybean feed and nitrogen-fixing mulching crops.

## 4 Discussion

### 4.1 New York City's community garden development experience

New York's community gardens are primarily located on idle land in highly dense urban spaces, supported by municipal funds, and managed by either social organizations or resident organizations. Their development course has adapted to the changes in New York City, always responding to various environmental and social issues. As urban green spaces, community gardens have effectively enhanced the spatial quality of the city center, reduced crime rates, and brought about cultural prosperity (Corey, 2019). As open spaces shared by neighbors, New York's community gardens play a vital role in environmental education, social interaction and cohesion.

In terms of space, diversity is a major feature of the community gardens in New York. Various forms bring forth multiple functions to the community gardens and attract a variety of users and activities. Plants in the community gardens are usually mixed to improve ecosystem services, and the entire food cycle is emphasized. The infrastructure is inclusive enough to meet users' needs. In community gardens, residents with differing cultural backgrounds and growth environments can partake in various social and cultural activities, including parties, picnics, music parties, dance performances and educational projects. In addition, the construction and management of community gardens can provide community members with relevant experience in landscape design, leadership and organization, with a resonating impact on all other aspects of their lives.

The development of community gardens in New York is inseparable from the contributions of several related organizations. Both the New York City Department of Parks & Regeneration (NYC parks) and Green Thumb, as well as

social organizations like the New York City Recovery Project, National Organization Public Land Trust and GrowNYC, have played significant roles in the provision of funds, site acquisition, technical support, construction implementation, and organization management, among others. Social organizations have become a strong connection between the government and garden participants, and play a vital function in the construction of New York's community gardens.

It should be emphasized that academic research, plantation construction, community construction, policy promotion and social organization promotion are intertwined. Academic achievements direct the construction of plantations, and the needs of various participants and social organizations cause changes in academic concerns, resulting to related policies. Such changes likewise lead to a transformation in the construction of community plantations. Meanwhile, policies guide academic attention and the development of plantations.

However, in the face of a benefit-oriented urban development, New York's community gardens have been facing issues of land scarcity and excessive land prices. Despite the support of the Urban Land Commission and other relevant departments, some community gardens are not adequately protected. With the emergence of New York community plantations, they definitely have the character of temporary occupation of the land, and it is such a flexible land attribute that promotes the development of these plantations. Temporary occupation can be recycled at any time, which provides users a great sense of insecurity. Nevertheless, this new type of urban agriculture can effectively address this problem.

### 4.2 Enlightenment of community garden development in China

Many Chinese residents are yearning for a pastoral lifestyle, which provides a suitable social foundation for the development of community gardens. However, compared to the relatively mature community gardens in New York, community gardens in China began late and are still in the initial exploration stage.



Presently, China is in a stage of rapid development and expansion of the cities, with metropolises often lacking green spaces and having expensive land prices. The low-cost, small-scale and flexible participation in community garden construction and operation provides an effective solution to alleviate urban problems. Due to population density and other legitimate reasons, the scale of community gardens in China is usually smaller compared to the large-scale community gardens in New York; as such, only small-scale food production activities can be undertaken in China. The impacts are focused on social benefits, and they fail to produce economic advantages including sufficient food, and thus fail to solve the living problems of most poor people through providing jobs and yielding an appropriate food output. However, since the differentiation of social strata in China is not apparent compared to that of New York, participants in China's community gardens typically have more similar life backgrounds and lifestyles, making it easy to form a closer organization within a short time span.

Based on the experiences of community garden development in New York, four main suggestions are put forward for the development of community gardens in China.

#### (1) Protect community garden lands from a policy level

Based on New York's experience, the policy legitimacy of community gardens and access to land are fundamental to development. To promote the development of community gardens, government guidance and policy protection must be implemented first. An appropriate land fiscal policy can be established to provide economic support for the construction of community gardens. This can be realized by levying heavy taxes on idle land and providing tax relief to community gardens. Likewise, community gardens should be included in urban park systems as a vital supplement to the existing urban planning system. An urban agricultural office should be set up by legislation, and community agricultural land should be regarded as a tool for urban agricultural production and urban climate change adjustment. A spatial database of community gardens should be developed to establish an evaluation index system for community gardens. A viable strategy should be formulated to ensure that urban community gardens are permanent. Urban idle land, urban parks, building roofs, and others can also be chosen as candidate sites for community gardens.

#### (2) Orient spatial construction by social benefits

The necessity of community garden construction is fully explained by China's population density and the shortage of public open spaces in its big cities. However, they are not likely to realize considerable economic benefits due to the small scale of community gardens in the country; hence, community garden construction should be guided by social benefits. Therefore, it is significant to enhance the vitality of urban space, provide social and sharing platforms for community residents, and improve the quality of space environment and community cohesion amid China's current

urban development environment. Community gardens can be utilized to educate and promote social equity by providing farm literacy and dietary health guidance to the residents. They can support equal opportunities for children to receive farm education. They can support urban farm training for low-income local residents, prepare adults for various work opportunities, and increase their equitable access to healthy food. Indeed, they should be regarded as community economic development assets, as their economic benefits can be distributed to low-income communities as a way to promote income redistribution. Opportunities for young people to work in community gardens can be established through youth summer employment schemes.

#### (3) Actively cultivate the strength of social organizations

In view of the organization and management of community gardens, one should draw upon the mature experiences of New York's case, by establishing community garden management organizations and actively mobilizing the strengths of various social organizations. Such organizations can collaborate and participate in every aspect of community garden construction and management through financial and technical support, and participation in construction, activities, outreach and promotion. Mature community garden organizations can effectively help in improving the quality of community gardens, enhancing the openness of community gardens to the public, and promoting residents' participation. Likewise, people can establish and standardize the construction and management of community gardens to promote their high-quality development.

#### (4) Strengthen the relevance of academic research, policy formulation and plantation construction

Currently, there is little research on community gardens in China, and the nationwide construction of community gardens is in a random and uninformed state. The uneven quality of related projects is mainly due to the personal experiences and abilities of each project's organizers. However, one can learn from the relevant experience of other countries, in order to strengthen the research of community gardens according to China's specific conditions, promote policy formulation by virtue of academic research, and provide guarantees and guidance for plantation construction. Scholars can assist the government in formulating relevant policies and construction guidelines for community gardens, and in applying the research results in various practical projects. Research institutions can utilize community gardens as a research base to address the actual needs of participants and social organizations at any time, so as to keep academic focus close to the actual situations.

## 5 Conclusions

This paper analyzes the relevant literature on community garden research in New York City from 2000 to 2020, discusses the hotspots and evolution characteristics of the research, and summarizes the developmental course of New York's community gardens during the 21st century accord-

ing to related policies and events in various periods. Combined with a field survey of the space construction of community gardens and social organizations, this paper summarizes a generally mature experience in terms of land security, space construction, organization, operation and other aspects, and puts forward some pertinent suggestions for the development of community gardens in China.

Since the beginning of this century, the research focus on community gardens in New York has presented a shift in approach from macro-research to research on space type, construction mode, and social influences, among others. The development of community gardens in New York falls into four stages: spontaneous construction by residents and social organization cultivation before 1998, unified government management and infrastructure improvement from 1998 to 2007, expansion of the connotation of community gardens under the guidance of food policies from 2008 to 2013, and “community-oriented” generation of social capital from 2014 to the present. From the field survey results of the community garden in the East Village of Manhattan, the garden’s layout includes a main planting area, a public communication area and an infrastructure area. In terms of management, it is often teeming with cultural activities and community construction like ethnic integration promotion, so it can be utilized for special purposes including children’s education, crop breeding and funerals. New York’s community gardens are subsidized by municipal funds, such as federal housing and urban community development funds, supported by various academic research institutions in terms of policy development and technology research and development, and supported and directed by several social organizations, including Green Thumb, Grow NYC, Trust for Public Land, New York Restoration Project and New York City Community Garden Coalition, regarding aspects like garden construction, training participation, public awareness, improvement of food systems, promotion of natural education and academic research.

The developmental course of New York community gardens has adapted to the changes in New York City, and has always paid attention to the improvement of environmental quality and to the solution of various social problems. This focus plays a significant role in improving the quality of urban space, promoting social interactions and enhancing residents’ cohesion. Diverse spatial organizations provide a basis for various functions and activities, and the government and various organizations serve to coordinate and guide the development of the community gardens. In this process, several aspects – academic research, space construction, community construction, policy promotion, and social organization promotion – jointly work to promote the development of the community gardens. In this view, the development of community gardens in China should also be multi-pronged, providing guarantees on a policy level, conducting social-benefit-oriented space construction, actively

fostering social organization forces, and strengthening academic research and policy formulation.

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## 纽约社区花园的发展经验与启示

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**摘 要:** 在高密度的城市环境下, 居民对增加绿地面积、提升社区环境品质以及重建居民关系的迫切需求催生了社区花园这一新的空间类型。但我国尚缺少相关经验, 而纽约社区花园建设起步较早, 在空间建设和运营维护上都有着丰富的经验, 可以为我国社区花园发展提供参考。本文首先采用文献计量研究方法, 以 2000–2020 年 Web of Science 核心库的 201 篇期刊文献为研究对象, 借助 CiteSpace 软件分析, 得到纽约社区花园的研究热点从宏观研究向空间类型、营造方式、社会影响等研究转移; 之后结合研究历程分析与实地调研访谈结果, 对纽约社区花园的空间建设发展现状及社会组织建设发展现状进行探究, 总结出纽约社区花园发展的有效经验。针对我国社区花园的发展现状, 提出中国社区花园应以保障发展用地、发挥社会效益、调动社会组织力量为导向进行发展, 从而成为城市空间建设和社会治理的有效途径。

**关键词:** CiteSpace; 社区花园; 公共空间; 社会效益; 城市农业