



**THE VALUE OF MULTI-FUNCTIONAL URBAN AGRICULTURE IN
CREATING SUSTAINABLE CITIES**

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Doctor of Philosophy

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Newcastle University
June, 2021

Abstract

China's cities continue to expand rapidly and under severe challenge of sustainable urban development. The Chinese Government has decided to bring agriculture back into the city in a state-controlled way and to re-educate urban residents to enjoy agriculture activities in urban areas. This research explores the Chinese Government's approach to new urban agriculture in China. It seeks to better understand and evaluate the impacts of multifunctional urban agriculture on sustainable urban development.

The work is set within the context of China's extremely rapid urbanization and concerns about pollution, poor lifestyles and an over-emphasis on manufacturing as the economic driver of growth. This thesis has presented a first attempt to redefine the term 'urban' in relation to urban agriculture, extending it to the urban core areas, desakota areas and exurban areas. In this way it suggests a new typology of urban agriculture in China, with a potentially broader range of objectives and possibilities that might normally be associated with the subject or practice.

Taking Beijing as the case study city, this study selects 3 of its 16 districts: Chaoyang, Changping and Miyun representing core, desakota and exurban areas. The specific projects in these three districts are totally different, and together they represent the three levels in the model of Chinese new urban agriculture. Each level of model is informed and supported by case study of practical projects. These are: Government fully-owned large projects, Government-supported privately run projects and Folk Custom Villages. Data was collected from direct observation, documentation, archive, physical survey, interviews and questionnaires.

This thesis found that the "Chinese" urban agriculture model, through three different types of projects, aims to make people rethink the role of agriculture and see it not simply as something undertaken by others in a rural area, nor as something simply to provide food. Rather, it can be something which enhances the urban experience, improves the urban environment, offers leisure facilities, engages people in traditional culture and provides a diverse range of employment and livelihood activities.

A well planned modern agricultural production is required to create an agricultural environment with reasonable spatial layout to reduce pollution and to create aesthetically pleasing and sustainable landscapes. It can help urban agriculture

integrate into the city system in a more sustainable way by reconnecting urban life and rural culture. This model, therefore, sets urban agriculture in a central role within planned urbanization. In summary, this thesis suggests that this model could become an important strategy for land use planning, urbanization and the sustainable development of Chinese cities, indeed, all cities, in the future. This study will be of interest to those scholars who are seeking to explore the Chinese urban agriculture as an effective method for land use in sustainable urban development.

Acknowledgements

I would like to express my sincerest gratitude to my supervisors, Dr. Suzanne Speak and Dr. Cat Button, for their continuous and invaluable advice and guidance throughout my research project at the University of Newcastle. In particular, I am deeply grateful to Suzanne's help during my life in Newcastle since 2012, for pursuing both a Master's and a PhD. She helped me restore the confidence and her generous support encouraged and pushed me to complete the whole research. I would like to thank Dr. Jane Midgley and Miss Maggie Roe for their guidance in the first year of my research project. I would also like to acknowledge the support from Marian Kyte and APL School. They provided a comfortable learning environment throughout the research.

The deepest thanks go to my families, my father Xudong Li, my mother Dongmei Dong and my wife Yaxuan Liu. I appreciate all the help, encouragement and support they have provided throughout my whole life. My sincere appreciation is extended to Chinese colleagues in Newcastle who made me feel not alone in a foreign country - Qiaowei Yang, Yitang Chen, Lu Wang, Ning Lu and many others too numerous to mention. Also my warmest thanks go to other relatives of my family and my friends in China and around the world. Without their intellectual and emotional support I would not have been able to arrive at this point today.

My sincere appreciation is extended to Liyuan Feng, Lingling Meng, Limei Gao and Xia Du who helped in numerous ways during the fieldwork. I must thank my friendly landlords in Beijing, Olivia and Abby who had been supportive during my stay. I would like to thank each of my participants in this research for sparing time for interviews and questionnaires and sincerely sharing their views with me. I must not forget to thank Paul Lancaster for proofreading this thesis.

Finally, I would like to thank my cat Mengruan who woke me up at 6 a.m. every morning. Therefore, I became an early bird and never had a lazy morning. Without her mercy, this research may not have been possible. I am really thankful to the technology for letting me obtain everything I need through the Internet, computer and mobile phone, and for always being there when I needed them.

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Lists of Acronyms

APP: Mobile Application Software

AVA: Agri-Food & Veterinary Authority

BJstats: Beijing Municipal Bureau of Statistics

CNTV: China Network Television

CNY: Chinese Yuan, 1 CNY≈0.145 USD, the currency was updated on 27 September 2018, see footnote 23

CPBJstats: Beijing Changping Bureau of Statistics

CSA: Community-Supported Agriculture

CYBJstats: Beijing Chaoyang Bureau of Statistics

FAO: Food and Agriculture Organization of the United Nations

FEC: Food Ethics Council

FESLM: Framework for the Evaluation of Sustainable Land Management

GBP: British Pound Sterling

GDP: Gross Domestic Product

GNP: Gross National Product

GIS: Geographic Information Systems

HLTF: A High-Level Task Force

MAFF: Ministry of Agriculture, Forestry and Fisheries

MARA: Ministry of Agriculture and Rural Affairs of the People's Republic of China

MYBJstats: Beijing Miyun Bureau of Statistics

NBSC: National Bureau of Statistics of China

PA: Peri-urban Agriculture

PCCD: Population Census of China Data

RUAF: Resource Centre on Urban Agriculture and Forestry

SPFS: Special Programme for Food Security

UA: Urban agriculture

UK: United Kingdom

UN: United Nations

UNDP: United Nations Development Programme

UN-Habitat: United Nations Human Settlements Programme

UNICEF: United Nations Children's Fund

UPA: Urban and Peri-urban Agriculture

USA: United States of America

USD: United States Dollar

USDA: United States Department of Agriculture

WMO: World Meteorological Organization

WHO: World Health Organization

ZFarming: Zero-acreage Farming

Part 1

Chapter 1 Introduction

1.1 The research context and problem

This study of multifunctional urban agriculture is set within the context of unprecedented, economic, physical and social change in China, as the Government pursues policies of urbanization in support of economic growth. Because of the problems rapid urbanization and industrialization have caused in many Chinese cities, the Government has decided to bring agriculture back into the city in a state controlled way and to relocate manufacturing to the peri-urban area, or further afield. This is a very different approach to urban agriculture than which other countries have adopted and therefore may require a different definition of what is urban agriculture. The thesis sets out to specifically explore these differences and the way in which urban agriculture is set up in the Chinese Government's Five Year Plan and to understand the ways in which it can support the Government's aims of making cities more sustainable.

Due to the rapid development over the past 30 years in Chinese cities, the built-up area continues to be expanded with the loss of open space and traditional forms of smaller-scale food growing in urban areas. China's agricultural resource has declined, farmland has decreased and many other resources, including water are scarcer. Cities are seeing increasing urban population, serious imbalance of food supply and demand. They are experiencing significant problems, with great pressure on urban wastewater and garbage treatment, air pollution and the severe challenge of sustainable urban development. It is predicted by the McKinsey Global Institute that the urban population of China will be increase from 572 million in 2005 to 926 million in 2025 according to current development trends, and that the urbanization rate of China will be up 58% in 2020 (Woetzel *et al.*, 2009). The Chinese Government's own statistics suggest the urbanization rate climbed from 43% in 2005¹ to 50% in 2010². It is expected to be 63% by 2020 in "2016-2020 China Urbanization Rate Growth Forecast Report"³. According to the United Nations'

¹ Statistics were published in Chinese. Available from: <http://www.nhfpc.gov.cn/guihuaxxs/s3585u/201305/e5a376a7007a4adfaf190ac23629f986.shtml> (Accessed: 19 September 2018).

² Statistics were published in Chinese. Available from: <http://www.nhfpc.gov.cn/guihuaxxs/s3585u/201305/358859f35ff64c65a2ca9264d6e30af2.shtml> (Accessed: 19 September 2018).

³ Statistics were published in Chinese. Available from: http://shs.ndrc.gov.cn/shfzdt/201701/t20170118_835514.html (Accessed: 19 September 2018).

definition, urbanization is “*integrally connected to the three pillars of sustainable development: economic development, social development and environment protection*” (UN, 2014, p. 4).

As China's urbanization continues to expand rapidly, the phrase “*农用地转为建设用地 (Nóngyòngdì zhuǎn wéi jiànshè yòng dì)*” meaning “transforming agricultural land into construction land” represents that vast tracts of rural land have already been absorbed into the urban areas. The urban built-up area has covered an area of 35,000 km² in 2007⁴. It is reported by Ministry of Natural Resources of the People's Republic of China that the national urban land area has increased by 1.65 million hectares during 2009-2014. The increase was 22.8%, with a 4.2% average annual growth rate.⁵ In addition to reaching a basic balance in 2013, the cultivated land decreased in other years, for example the net reduction of cultivated land area was 769,000 hectares in 2016. This has brought about a shift in population and society, from a largely rural, agrarian society to one that is urban. This expanding urban population is also living in densely populated and polluted cities with all the associated stresses and health problems, as well as raising cultural issues. Indeed, the change in Chinese society is such that traditional cultures and cultural lifestyles are under threat as many rural people are encouraged to migrate to cities for work.

⁴ Statistics were published in Chinese. Available from: http://www.mohurd.gov.cn/xytj/tjzljxxytjgb/tjxxtjgb/index_2.html (Accessed: 19 September 2018).

⁵ Statistics were published in Chinese. Available from: http://data.mlr.gov.cn/qtsj/201512/t20151229_1393418.htm (Accessed: 19 September 2018).

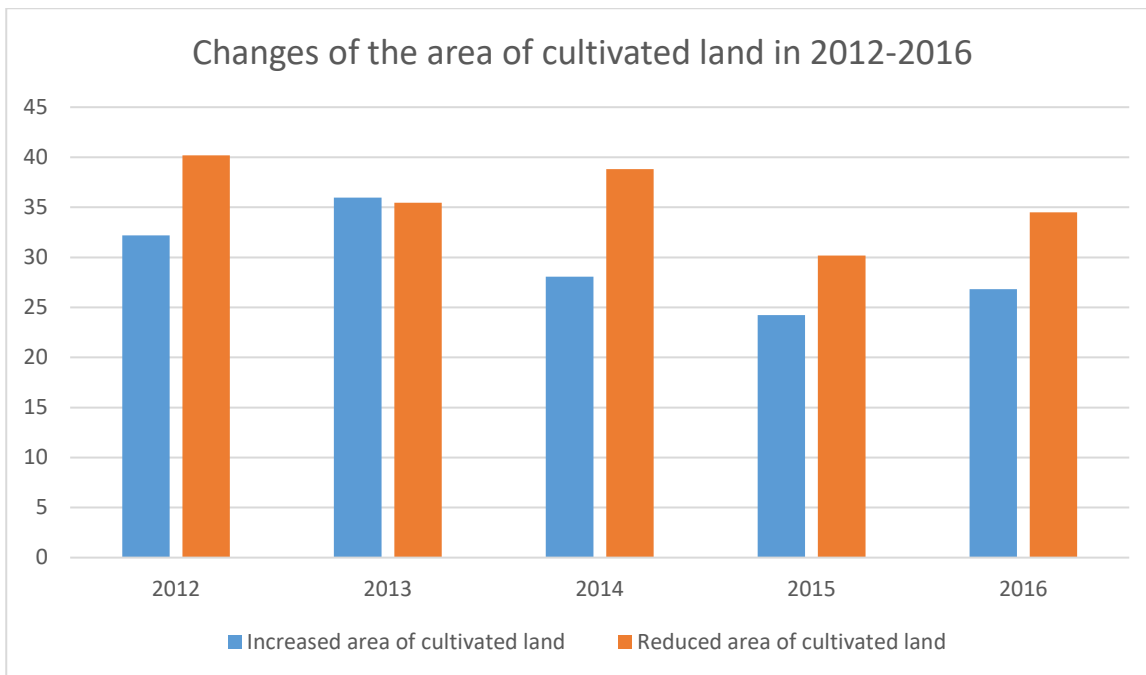


Table 1: Changes of the area of cultivated land in 2012-2016. Source: Author (2018) adopted from China Land and Resources Report (2016).⁶

To respond to the loss of this smaller-scale, personal agriculture in China, to address the bad environment in many cities, and to meet the requirement of building the international economic central city, Beijing and Shanghai put forward the idea of moving industry and factories out of the Core District of Capital Function (Inner Urban) and the Districts of Urban Function (Outer Urban) and replacing it with a focus on the type of agriculture which was happening in the New Districts of Urban Development (desakota). Premier Wen Jiabao pointed out, in the fourth meeting of the Eleventh National People's Congress in 2011, China should strive to develop agricultural production and ensure the production and supply of main agricultural products, basic necessities of life, and important means of production⁷. He suggested that basic vegetable areas and fresh food supply capacity should be available in suburban areas of large and medium-sized cities. The Chinese government has also made it clear in the "12th Five-year Plan"⁸ (from 2011 to 2015) that the agricultural modernization shall be promoted simultaneously with the in-depth development of industrialization and urbanization, so as to improve the development of modern urban

⁶ The report was published in Chinese. Available from: <http://www.mlz.gov.cn/sjpd/qtzygb/201704/P020170428532821702501.pdf> (Accessed: 19 September 2018).

⁷ Report was published in Chinese. Available from: http://www.gov.cn/test/2006-02/16/content_200719.htm (Accessed: 19 September 2018).

⁸ Available from: <http://english.agri.gov.cn/hottopics/five/> (Accessed: 19 September 2018).

agriculture for the purpose of providing high-quality agricultural products and optimizing the ecological environment. From this grew the start of a planned programme of new urban agriculture in Chinese cities, beginning with the development of Agricultural Carnivals. Eventually this brought the growing of food together with tourist parks to produce in Agricultural Holiday Resorts and experiencing rural style life with protecting folk culture in Folk Custom Villages, which will be discussed in part 2.

There is a significant raft of publications focusing on the role of urban agriculture in the context of urbanization, especially in those developing countries where urban agriculture seeks to integrate the act of growing food into the urban realm. However, although there is a global literature on urban agriculture, much of the writing, definitions and perceptions of urban agriculture are generated in the 'West', written by western scholars and often based on how and why urban agriculture is practiced there. In many countries, urban agriculture has been seen as an 'add on' to urban lifestyles, largely filling gaps in the provision of food or income opportunities. From this perspective, urban food production and food security, as two key elements of economic functions of urban agriculture had become important. However, China's cities have a very different relationship with agriculture than do cities of other countries, especially in Europe or North America. Moreover, the goals, ideology and strength of the Chinese Government is also very different from those of many other countries. As China grows and develops, and becomes increasingly and rapidly urbanized, it is interesting to see how its cities are approaching the accommodation of urban agriculture into the urban area. Due to the success of existing urban agriculture projects, the Chinese Government's new model of urban agriculture may provide a solution for above problems and re-balancing the urban-rural relationships by developing the functions of urban agriculture in Chinese cities. This study, therefore, seeks to fill a gap in the current somewhat westernised view of urban agriculture, as well as showing that agriculture can be a central element of sustainable urbanization.

More than simply looking at what the functions of urban agriculture are, or how successfully those are achieved in China, this work seeks to show that the Chinese context and culture offer an opportunity to reconceptualise the relationship between agriculture and the city. The work starts from a philosophical point that the urban

dichotomy is artificial, and varied definitions and statistical measures of urbanity itself do not apply to urban agriculture.

The lack of understanding of what constitutes an urban area or metropolitan area may lead to confusion about the relationship between agriculture and the city in China. When considering Asian urbanization, especially in South East Asia, McGee (1991) used the term “desakota”, which is from the Bahasa Indonesian words for village “desa” and town “kota”, to describe the fringe regions between large cities and surrounding rural areas. However, the urban fabric is complicated in China, with desakota being more suitable for the lower Yangtze River Delta, such as Suzhou-Wuxian Region (Xie *et al.*, 2007). These points will be addressed throughout this study.

Over the years there has been a convergence of public interest in contemporary urban agriculture and its ability to meet the demand of food production. However, in China, many of today’s citizens, who are participating in the urban agriculture, do so because they wish to experience a “pastoral life” for their spare time in the urban area. Urban agriculture in China has evolved, offering a great diversity of activities combined with agricultural elements which is changing our understanding of rural and urban and also may be changing the behaviour of citizens. In order to help promote urban agriculture, the more stylish, social and cultural functions of it are gradually replacing the economy functions in new projects. Such enthusiasm about urban agriculture has spawned new initiatives in China such as Agricultural Carnivals, Agricultural Holiday Resorts and Folk Custom Villages. These new functions will be explored in part 2. From powerful governmental efforts, to the personal engagement of citizens, amongst the diversity of urban agriculture practitioners and supporters there is a widespread desire for urban agriculture to change into multifunctional activity. This drive for social change provides a backdrop for the image of multifunctional urban agriculture as an integral part of sustainable urbanization.

These brings together what has been learned to present a ‘bigger picture’ of urban agriculture as a potential underpinning for sustainable development in the Chinese context of rapid urbanization. This bigger picture suggests that urban agriculture, as it is practiced in China, and as the government is promoting and supporting, could become a much more central element of sustainable development than it generally is. This thesis seeks to explore how this new Chinese model of urban agriculture support the sustainable development by forming the basis of a sustainable land use

planning framework. Under this framework, urban agriculture are not only helpful to preserve the farmland and integrate new production functions into urban environments, they also help to justify the social and cultural features.

1.2 Research aims and questions

Given this background above and the problems generated by China's urban development which will be discussed in greater detail in chapter 4, this thesis aims to examine the potential of multifunctional urban agriculture to change the nature of Chinese cities and to rebalance the urban/rural dichotomy. It seeks also to highlight and understand the ways in which the very specific context of China might influence how urban agriculture is understood and accommodated within a modernising China.

The work is underpinned by the following main and sub research questions:

Main Research Question:

What might be the value of the Chinese Government's approach to multifunctional urban agriculture in the context of rapid urbanization in China?

Sub Research Questions:

1. What are the Chinese Government's main objectives in respect of the programme of Multifunctional Urban Agriculture and how is it seeking to achieve these objectives?
2. What factors and drivers are influencing the recent growth of multifunctional urban agriculture activities in China?
3. How is the Chinese model different from urban agriculture in other parts of the world?
4. What are the outcomes in relation to domains of sustainable development, in the context of rapid urbanization?

1.3 Methodology

This work adopted a mixed but largely qualitative approach based on a detailed study of urban agriculture in Beijing. The work began with a review of the literature on urban agriculture to understand current knowledge and definitions. Later, a further review included an exploration of literature on sustainable development. The recent changes in China's economy and society were explored so that the researcher could identify how the Chinese context differs from other countries. The policies relating to

Chinese urban agriculture over the last 20 years were reviewed to ascertain their objectives and approaches.

Fieldwork was undertaken in 7 projects (Beijing Agricultural Carnival, Beijing Xiedao Agricultural Resort and five different Folk Custom Villages) in three districts of Beijing. These projects were purposively sampled to ensure the inclusion of each of the three main types of urban agriculture currently being promoted by the Chinese Government. In each area a questionnaire was undertaken with project users and households and followed by more in-depth interviews. Managers and operators of projects were also interviewed. The fieldwork produced 400 valid questionnaires (89 of the respondents were willing to accept a further unstructured interview) and 30 in-depth interviews in total. Observational methods were used, including photography, to record the operation of different projects to support chapter 6 in its describing of those projects. The methodology is described in detail in chapter 5.

1.4 Organization of the thesis

The thesis is organized into two main parts. Part 1, the first 5 chapters, act to describe the research problem and background, the current state of knowledge on urban agriculture and sustainable development, and to set the context of China and its recent developments. Part 2, chapters 6 to 8, delivers the findings from the fieldwork in the different projects studied, the analysis of these findings and presents a discussion of the potential for the Chinese Government's new model of urban agriculture to deliver a reconceptualization of 'urban', and a new approach to sustainable urban development. The chapters, in more detail, are as follows:

Part 1

Chapter 1 has introduced the background problem and the focus of this work. Chapter 2 provides a literature review of urban agriculture research that sets a context against which to analyse the way in which urban agriculture is defined, perceived and used in China. Chapter 3 explores the literature on sustainable development to understand how the concept might be used as a framework for evaluating the new urban agriculture in China. Chapter 4 provides a historical and current overview of urban agriculture in China and the Chinese context as the basis for the study. It includes the structure of Chinese city administration, the unprecedented change which has taken place in China in recent years and the Government's new focus on urban agriculture. Chapter 5 presents the

methodological approach taken to the study. It describes the context of the case study sites: Miyun, Changping and Chaoyang in Beijing. This includes an overview of the urban agricultural system, geographical features and demographics, giving details of specific study sites and the data collection tools and methods used for data collection and methods of analysis.

Part 2

Chapter 6 reports the findings from the field research, including three practical projects – Government fully-owned large projects, Agricultural Holiday Resorts and Folk Custom Villages. It explains what the objectives of each project are and gives some quantitative data on their activities and outputs. This chapter also identifies some of the problems with the projects, as highlighted by visitors and operators. It presents an analysis of the way in which the three types of projects are functioning and highlights the perceptions of users and visitors. This chapter begins to highlight the wider implications of the new model.

Chapter 7 discusses how the projects work collectively, as a model, then identifies the main offering of this model to the sustainable development of Chinese cities. This chapter highlights the main offerings to scholarship of the new approach.

Chapter 8 concludes the whole thesis and indicates the limitations of this research, then points out suggestions for further research.

Chapter 2 Urban agriculture – understanding the existing knowledge

2.1 Introduction

This chapter considers the literature on urban agriculture internationally to set a context against which to analyse the way in which urban agriculture is defined, perceived and used. Section 2.2 begins by exploring definitions of urban agriculture, highlighting the differences between urban and more mainstream rural agriculture. Next, the basic trends and scope of urban agriculture are discussed, including historical changes in its methods, use and outputs. This section identifies “urban” as including urban core areas, desakota areas and exurban areas, and so urban

agriculture covers all agricultural activities in these areas. Section 2.3 goes on to look at urban agriculture's multiple functions in different international contexts. It includes four aspects: food security and livelihood, income and economy, ecological and environmental impact, and social cohesion and solidarity. In each aspect, it seeks to identify both the positive and negative aspects of each function. After this, section 2.4 seeks to provide a brief summary of the literature relating to different typologies and trends of urban agriculture by drawing connections with the different locations and functions of urban agriculture as addressed in sections 2.2 and 2.3. This section goes on to suggest that urban agriculture can be divided into three types. Finally, section 2.5 considers the new technology being adopted by urban agriculture and some detailed examples are given.

2.2 Definitions of urban agriculture: location, scale and produce

Urban agriculture is an increasingly commonly used term in urban planning and yet it is a dynamic concept, difficult to define precisely, that comprises a variety of location, scale and produce with different national conditions. The key literature of urban agriculture is the book named "*Urban agriculture: food, jobs and sustainable cities*" from Smit *et al.* (1996b). For Smit *et al.* (1996b), urban agriculture refers to:

An industry that produces, processes, and markets food, fuel, and other outputs, largely in response to the daily demand of consumers within a town, city, or metropolis, on many types of privately and publicly held land and water bodies found throughout intra-urban and peri-urban areas. Typically urban agriculture applies intensive production methods, frequently using and reusing natural resources and urban wastes, to yield a diverse array of land-, water-, and air-based fauna and flora, contributing to the food security, health, livelihood, and environment of the individual, household, and community.

This definition draws from an international development context in which urban agricultural production is considered a livelihood strategy for city dwellers in the Global South (Van Veenhuizen, 2006). After this, urban agriculture was considered as a new industry which has a difference with traditional agriculture or rural agriculture and the definition of urban agriculture has been developed in these years.

Garnett (1996, p. 300) gives a definition:

Urban agriculture or food growing encompasses the production of all manner of foodstuffs, including fruit and vegetable growing, livestock rearing and beekeeping, at all levels from commercial horticulture to community projects to small scale hobby gardening.

One factor that has likely contributed to the lack of common understanding about what urban agriculture is, and what it is not, is the focus on the geographic element (i.e. within a town, city or metropolis). In an era that has seen a rapid increase in urbanization, some new urban areas have appeared. However, it is hard to find a clear distinction or a uniform standard to distinguish urban, peri-urban, and rural areas. Particularly in China, the rapidly urbanization leads to confusion of the boundaries of urban areas. For example, “*cheng zhong cun* (城中村)” meaning “village in urban” is a unique phenomenon that formed as part of China’s urbanization efforts. These villages are original villages with poor living conditions and living environment that, owing to urban expansion, are surrounded by other modern urban constructions (Guldin, 1996). They appear on both the urban and peri-urban areas of major Chinese cities (Chen, 2007). Also, in China, urban agriculture in built-up areas is mainly controlled under the legislation on urban planning, with urban agriculture in peri-urban areas falling under the legislation on land use and farmland protection. In addition, the scale of urban agriculture are quite different from that in rural agriculture due to its limited land and agricultural conditions, such as community gardens in USA are much smaller than the size of a commercial farm in rural area (Lovell, 2010). Types of agricultural products in developed countries are mainly high value-added, for example Netherlands mainly grows flowers (Altes and van Rij, 2013). However, in developing countries in Africa, urban agricultural products are almost the same as traditional agriculture (Drechsel and Dongus, 2010). Therefore, these characteristics could be other dimensions for defining urban agriculture.

2.2.1 Locations of urban agriculture

Location is used by Mougeot (2010) to explain differences in subject of urban agriculture. Urban agriculture usually takes place in the central urban areas and peri-urban agriculture appears around the edge of an urban area, while rural agriculture is the original and foundation of agriculture in rural areas. However, there are many conflicts about this issue, such as how to define the phrases of different areas in urban, and whether these phrases used for different urban studies are similar and comparable to each other.

Difficulty in clarifying the locations of urban agriculture begins with confusion about the definition of ‘urban’ that varies between countries, subjects and contexts. It is difficult to give any one clear definition. The term ‘urban’ is variably based on

population size and density, or by type of economic activity. Various terms are used by different statistical authorities (table 1).

Urban Area Terminology	
Nation	Term: English Equivalent
Australia	Urban centre
Canada	Population centre
Denmark, Finland, Netherlands, Norway, Sweden	Urban area
France	Urban Unit (Unité urbaine)
India, United Nations	Urban Agglomeration (land area data not available)
United Kingdom	Built-up urban area
United States	Urban area (includes urbanized areas and urban clusters)

Table 2: Urban area terminology. Source: Demographia (2018, p. 2).

For example, United Nations Children's Fund (UNICEF.) reports that:

An urban area can be defined by one or more of the following: administrative criteria or political boundaries (e.g., area within the jurisdiction of a municipality or town committee), a threshold population size (where the minimum for an urban settlement is typically in the region of 2,000 people, although this varies globally between 200 and 50,000), population density, economic function (e.g., where a significant majority of the population is not primarily engaged in agriculture, or where there is surplus employment) or the presence of urban characteristics (e.g., paved streets, electric lighting, sewerage). Fund (2012, p. 10)

UNDP (1996, p. 9) defines urban broadly "... to encompass the entire area in which a city's sphere of influence (social, ecological, or economic) comes to bear daily or directly on its population". However, this still leaves confusion about what 'city' is and where it ends.

The Census Bureau of USA defined urban area in their website that:

An urban area will comprise a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. (Bureau, 2010)

Also, 'urban' is widely used as a place-based characteristic by scholars. Weeks (2010) defines an urban place "as a spatial concentration of people whose lives are

organized around non-agricultural activities". Importantly for this thesis, Weeks' point about urban is that it is 'non-agricultural', but this definition is in conflict with urban agriculture. National Geographic (2016) also mentioned:

Most inhabitants of urban areas have non-agricultural jobs. Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. (Geographic, 2016)

In addition, also important for this thesis is Scott *et al.* (2007) pointing out that division between rural and urban areas is becoming more unclear and Tacoli (1998, p. 3) notices "... a lack of recognition of the complexity of rural–urban interactions which involve spatial as well as sectoral dimensions".

Definitions of 'urban' for locating urban agriculture are equally complex. The increase in urban agriculture and in non-agricultural rural activities and livelihoods means these distinctions are now too simple. It is generally believed that urban agriculture is located in the core urban and peri-urban locations of large cities. It is also accepted that in some countries, where urban areas are expanding quickly, cities start to encompass existing, previously rural agriculture (Smit *et al.*, 1996a; Mougeot, 2000; De Zeeuw, 2004; De Zeeuw *et al.*, 2006; Mougeot, 2010; De Zeeuw *et al.*, 2011).

However, agriculture is very often not really isolated from rural areas. Mwalukasa (2000, p. 150) points out urban agriculture is:

... carrying out farming activities in built-up areas where open space is available, as well as keeping livestock (dairy, cattle, goats, sheep, pigs and fowl) in built-up and in peri-urban areas.

Therefore, considering all this, within the multiple definitions, urban agriculture can be seen to take place at several levels of the urban realm, from urban core areas to peri-urban (suburb) and exurban.

With the development of urban agriculture, the FAO (2011) uses urban and peri-urban agriculture (PA) as an important component of their Special Programme for Food Security (SPFS). UPA (urban and peri-urban agriculture) is:

...a spontaneous response to the increased demand for food linked to urban population expansion, which is more pronounced in developing countries as a result of high birth rates and immigration from rural areas. (FAO, 2011, p. 8)

There appear to be four main different definitions of the areas in which urban agriculture takes place. These are:

Agriculture in the core area and urban area on the small farmland among different districts of the city, such as the scattered farmlands which might remain as the city expands or develops for example in Tokyo and Osaka (Holland, 2004; Broadway and Broadway, 2011; Pickett *et al.*, 2011; Specht *et al.*, 2014);

Agriculture in once rural or peri-urban areas but now subsumed into the urban area as the city expanded (Argenti, 2000; Bellin-Sesay and Krawinkel, 2002; Corrigan, 2011; Badami and Ramankutty, 2015);

Agriculture in the peri-urban area at the city's outskirts, as long as the population and region area of a city reached a certain size. Thus this type of urban agriculture is the agriculture that belongs to the scope of a large city administrative area or metropolitan area (Smit *et al.*, 1996a; Mougeot, 2000; De Zeeuw, 2004; De Zeeuw *et al.*, 2006; Lee-Smith, 2010; Mougeot, 2010; De Zeeuw *et al.*, 2011);

Agriculture in rural or countryside areas but which urban citizens participate in for relaxation and to deal with deterioration of the urban living environment. Therefore, this type of urban agriculture includes sightseeing agriculture, leisure agriculture and tourism agriculture that belongs to the scope of a metropolitan area or exurban urban (Cánoves *et al.*, 2004; Sharpley and Vass, 2006).

The definition of 'suburbs' is the secondary and sub regions and 'outskirt' indicates the peripheral and marginal areas of the downtown. Suburbs mainly define the relationship between the urban area and the suburban area in the aspects of function and structure, while outskirts expresses the location of the suburb from the point of geographic space. In the beginning of the 19th century, in Thünen's ideograph for the use of the agricultural land which was designed to centre on the cities, the most inner ring was the 'free agricultural belt' which provided vegetables and fresh milk for the city, the second ring was the 'forestry belt' which provided the firewood for the city. Both rings belong to the suburb (Lambin *et al.*, 2000).

Demographia (2018) used 'exurban' to define the rural or countryside areas around urban areas that "*is within a metropolitan area, but outside the urban area*". Although, this area originally belonged to rural land. It is under a similar form of development with urbanization which is non-rural development. Exurban has two types of development: exurb and low density development. An exurb is:

A municipality (or a community) or urban area in a metropolitan area that is separated by rural territory from the principal urban area. For

example, DeKalb and Kankakee are exurbs of Chicago. The urban areas that are within the London metropolitan area, but outside the greenbelt, are exurbs, such as St. Albans and Milton Keynes. (Demographia, 2018, p. 5)

Low density development means a large number of residential developments in the area but its density is not enough to be considered as urban. It needs to be mentioned that this area is not about agriculture, so it will not be discussed in this thesis.

Considering the discussion above, of the definition of the urban area and locations in which urban agriculture takes place, the definition of urban agriculture in this thesis is based on the concept of an administrative region which covers a core urban area, peri-urban (or suburb) area and exurban area.

However, such varying terms and phrases of peri-urban area or suburb area, as highlighted above, still cause confusion. It is necessary to find a particular phrase to summarize them. The areas explored in this thesis include urbanization in the suburb or peri-urban area of cities. In English, the word 'desakota' can be used to define these areas rather than the words 'suburbs' and 'peri-urban'. Desakota is

An area of mixed rural and urban land use in which agricultural and industrial activities are dynamically related by the mobility of workers between them. (Castree et al., 2013, p. 99)

As for the conceptions of the desakota, different scholars have different understanding. Sui and Zeng (2001) consider that the desakota is the region of the administrative and organizational system which is very close to the downtown (built-up area) in the scale of a city but excludes the counties under the jurisdiction of a municipality which is relatively prominent in the economic independence inside the county. Xie *et al.* (2007) believe that the desakota is the area of mixed rural and urban characteristics which comes under the city administration. In this area the Government's seeks to improve development so that it meets current requirements for the recent urban construction and layout.

From the perspective of the relationship between the areas around urban areas and the urban economy, Guldin (1996) believes that the desakota is included in the range of the city. It is a transitional area from the downtown to the rural area and its economical level, social lifestyle, and ideology are different from those in the traditional rural area and the urban area. McGee (2009), who coined the term of 'desakota', states that it is the ring-like area which surrounds the city and neighbours

the city. To be specific, it is the landscape area surrounding the urban land inside the municipal administration boundary and the economic regions of agricultural and sideline products which serves it. This means *desakota* is an important part of the city.

The definition of the *desakota* in this thesis combines the contents of the above: the area between the downtown area and rural area inside the urban area; this area has close social, economic, cultural and ecological connections with the downtown and is the space where the future downtown extends to. The specific characteristics of that area are: the relatively low population density; the distribution is relatively scattered, and the agricultural population and the agricultural labour is relatively more; most land is the agricultural land which produces and provides the agricultural and sideline products for the downtown, and with the agricultural production turning out to be distributed throughout a circle. It is deeply influenced by the urban area's radiation and the social, economic and cultural living standards are relatively high. Compared with the rural area, the natural village has changed into well-organized habitation with close to the urban standards of living, where the infrastructure is sound, and the transportation and internet is well developed.

Thus far, the thesis has argued that the literature suggests 'urban' in the context of urban agriculture includes urban core areas, *desakota* areas and exurban areas, which means that urban agriculture covers all agricultural activities in these areas.

In China, most cities have followed the complex administrative division that is discussed in chapter 4, which presents the context of China more fully. However, there are some cities which operate under special policy. For example, there are six Special Economic Zones (Shenzhen, Zhuhai, Xiamen, Shantou, Hainan and Kashi), and two Special Administrative Regions (Hong Kong and Macau). As a result, 'urban core', '*desakota*' and 'exurban' may have different ranges and cover different areas compared with most other countries. However, broadly in China, the term 'urban agriculture' refers to the agriculture within the entire metropolitan area.

2.2.2 Scale and produce

According to the previous section, urban agriculture is practiced in a variety of places. The scale and produce of urban agriculture thus are complicated. The scale varies from the micro level which is for purely subsistence farming or recreational facilities in small places (such as roofs and balconies), through to small-scale or

semi-commercial private urban farmers which generally use greenhouse systems, to medium- and large-scale commercial enterprises that can use mechanized or industrial agriculture (De Zeeuw *et al.*, 2011). This leads to the fact that perishable and high-value products, for example off-season fruits, seasonal vegetables and flowers, are often produced in urban agriculture because they can be grown in limited spaces (Lovell, 2010).

Although urban agriculture may be perceived to be small in scale in many countries, globally it produces a significant amount of the world's food. Precise data on the extent of urban agriculture globally is difficult to obtain and it is unclear. Armar-Klemesu (2000) estimates 200 million urban residents are involved in urban agriculture, providing between 15 and 20% of the world's food. However, according to the widely-used data from UNDP (1996), 800 million people were engaged in urban agriculture and the relevant enterprises and industries, and were equivalent to 14% of the world's population. It estimated that 15-20% of the global food production is related to it, which has provided the food supply which costs 0.2 billion USD for urban residents and directly and indirectly has created job positions which generate an income of 150 million USD. Whilst this report was published in 1996, to date the data is still being used as valid data by organizations such as the UN and FAO and within new articles such as Lin *et al.* (2015). It shows that urban agriculture has an important impact on the worldwide agriculture industry.

Others have also highlighted the scale of production. For example, urban agriculture provides 30% of vegetable consumption quantity in Kathmandu (NEFEJ, 2014), 50% in Karachi, and as high as 90% in Accra (Baumgartner and Belevi, 2001). In Osaka and Tokyo, urban agriculture has paid little attention to grain production, and focuses on vegetable and fruit production based on the market demand; in particular, vegetables that are not suitable for storage and transportation account for 59% in the total agricultural production in the region (Lewis, 2010). In Hanoi, 40% of eggs, 50% of pork, poultry and freshwater fish and 80% of fresh vegetables are all from urban and suburban agriculture (Anh *et al.*, 2004).

Various literature discusses the produce of urban agriculture. This produce may be different in both amount and type from rural, mainstream agriculture and industrial intensive agriculture. For example, from the agriculture aspect, Bruinsma (2001, p. 325) holds the view that urban agriculture has four forms: urban livestock- "*Animal production is and has been part of urban agriculture in many growing cities*"; urban

horticulture- *“the production of a range of vegetables, aromatic plants, medicinal plants, flowers, ornamental plants, fruit trees and mushrooms”* (p. 353); urban forestry- *“urban forests as a vital component of the urban landscape, infrastructure and quality of life”* (p. 427); and urban aquaculture- the farming of aquatic organisms in *“urban settings, or areas subject to urbanisation, incorporating by definition, peri-urban areas”* (p. 448).

With the continuous development of urban agriculture, Mougeot (2010) classifies urban agriculture produce into food and non-food, but they can be classified in more detail. For example, non-food can include urban agriculture for sightseeing or tourism with a cultural character. Food can be either long-term food for storage or perishable food, which may be high-value products that directly reflect consumers' preferences.

Urban agriculture has obvious advantages of geography and so it can produce the fresh perishable products which need to be rapidly delivered after harvest. As RUAF (2018) notes in their website: *“Production units in urban agriculture in general tend to be more specialised than rural enterprises and exchanges are taking place across production units”*. For example, in Tokyo and Osaka, most agricultural enterprises produce various short-term green leafy vegetables. Some vegetables can be harvested and appear on the market 7 or 8 times per year in some places, so that the supply of fresh agricultural products and the competitiveness of urban agriculture can be thus ensured (Lewis, 2010). It thus can be seen that in terms of produce and scale, urban agriculture complements traditional agriculture and improves the efficiency of the food system and range of food in various countries.

2.3 Multiple functions of urban agriculture

With the development of science and technology, human needs for agriculture have been changed from original agricultural products to a combination of products and services including tourism, entertainments, leisure and other aesthetic activities, as well as more standard agricultural produce (Perring *et al.*, 2012). In addition, people hope that agriculture can bring more ecological benefits to an urban area, especially after human development has caused environmental degradation (Pywell *et al.*, 2011).

Urban agriculture, therefore, serves multiple functions. Sometimes these functions may be mixed within one site, alternatively they may be specific to a given site. This section outlines several of these functions.

2.3.1 Food security and livelihood

The Zero Hunger Programme from World Bank⁹ estimated that “821 million people – one in nine – still go to bed on an empty stomach each night.” The majority of these people live in the low-income countries of the developing world, where 12.9 percent of the population is undernourished (Bank, 2016). Urbanization is highest in the developing countries, especially sub-Saharan Africa and South Asia, as people in rural areas immigrate to urban areas to seek more economic opportunities. This has led to the urbanization of poverty.

As Mougeot (2005) mentioned, poor families may spend more than 60-80% of their total income on food. Moreover, the urban poor may pay up to 30% more for food than their rural counterparts because most food is purchased in urban areas (Bank, 2016). The main reason is reported by FAO¹⁰ is that many of the urban poor have to buy street foods for a majority of their caloric intake because they need to rely on income from unstable informal employment to support their livelihoods. Street foods are often more expensive than home-prepared foods which increased the cost of food. Another reason is urban poor who lived in City slums have limited access to food, increasing time and distance costs. In addition, some of these urban poor are immigrants. They have to not only maintain their own life in the urban, but also provide financial support to their family members in their hometown, bringing more stress on income. All this means urban poor’s livelihoods are unstable and urban agriculture has a potentially vital role to play in feeding the urban poor.

In addition, infrastructure construction in urban central areas cannot meet the needs of a fast-growing urban population. It is not always conducive to the supply of the traditional rural agricultural food chain for cities (George *et al.*, 2015). Therefore, many urban migrants from rural areas, with agricultural knowledge and skills, have established some agricultural systems in urban areas to provide food and increase incomes. It is, thus, important that governments and city authorities work to solve poverty and hunger.

However, the researches on food security has been overwhelmingly on developing countries which means it is mainly from the perspective of national strategy to address the problems of traditional agriculture and issues of availability. Other

⁹ Available from: <http://www1.wfp.org/zero-hunger> (Accessed: 19 September 2018).

¹⁰ Available from: <http://www.fao.org/right-to-food> (Accessed: 19 September 2018).

perspectives has been somewhat overlooked. Indeed, even as far back as 1999, Maxwell noted that:

Food insecurity is relatively invisible to urban planners and managers in comparison with more urgently visible urban political problems - unemployment, the burgeoning informal sector, overcrowding, decaying infrastructure, and declining services - even though food insecurity (and malnutrition) are intimately linked with all of these other problems. (Maxwell, 1999, p. 1940)

In light of this increasing urban food need, especially for the growing numbers of urban poor, and given the scale of urban agriculture discussed in section 2.2.2 above, it is clear that urban agriculture has some significance to poverty and food security. Although there is no current and accurate data from authoritative organizations, individual studies show that urban agriculture has some economic function and is a way to solve urban poverty and hunger. In Harare, the urban population with low income produce and consume 60% of food by themselves (Bowyer-Bower and Drakakis-Smith, 1996). In Kampala, urban producers can harvest food from their own urban garden, which can meet 40-60% and even more their own food needs (Maxwell *et al.*, 1998).

Therefore, it can be seen that urban agriculture has a positive role to play in the provision of fresh food for food and nutrition security, with implications for health. Zezza and Tasciotti (2010) noted that urban agriculture increases nutrition security. In particular, Lee-Smith (2010)'s research in Kampala pointed out that urban livestock can have a positive impact on nutrition security because the animal-sourced foods improve child health and nutrition. In Kampala, compared with children from families that are not engaged in agriculture, children below 5 years from rural families in the cities have more nutrition and can better grow. From this point of view, urban agriculture should be encouraged and supported in cities.

However, there are public health arguments against urban agriculture, which cannot be ignored. An book from Cole *et al.* (2008) discussed health risks of urban agriculture in Kampala in detail, which was a co-operated work with Lee-Smith. It indicated that transmission of diseases from livestock to humans were mainly through milk in Kampala. They also suggested that urban agriculture need to be balanced after analysing a policy. Ensink *et al.* (2002), on the other hand, used Haroonabad in Pakistan as case study because untreated urban wastewater was used in urban agriculture. Their research assessed untreated wastewater can produce lower quality

food and bring more healthy risks for farmers. Therefore, other options are suggested to be considered as replacement methods for use of untreated wastewater in Pakistan and other countries using wastewater.

2.3.2 Income and Economy

In addition to providing food for the urban poor, urban agriculture plays a huge role in improving the income of the urban poor and creating employment opportunities. According to the FAO (1996), it is estimated that about 100 million people have earned a portion of their income from urban agriculture, just 1/8 based on UNDP report (UNDP, 1996). This, somewhat out of date statistic, remains the most reliable, as newer work does not disaggregate urban agriculture from all agriculture. According to another widely-used and more recent data, Zezza and Tasciotti (2010) selected 15 developing countries and countries in transition as samples to show that although urban agriculture played a very limited role in incomes in those sample countries, and other countries except for African countries, agriculture was involved in 10-70% of urban families and could not be ignored in the urban economy.

In Mexico, urban farmers obtain 40-60% of their income from keeping pigs, and urban cattle farmers can get as high as 100% household income through dairy products. However, in the suburbs, corn products account for 10-30% in total income, but vegetables and beans account for as high as 80% in family incomes (Torres-Lima and Rodríguez-Sánchez, 2008). In Japan, in the case of average income, farmers who engage in urban agriculture have higher income than other employees, and 50% of incomes are from agriculture for part-time farmers (Kiminami and Kiminami, 2006). In Dar es Salaam, for urban farmers, the average annual profit has reached 0.6 times the minimum wage standard (Sawio, 1998).

In addition, many literatures point out that urban agriculture provides potential job opportunities for migrant workers through different productive activities such as processing, packaging and sales output. and a buffer for the groups with low labour skills to enter cities as they absorb the migrant population (Smit *et al.*, 1996b; Mougeot, 2000; De Zeeuw *et al.*, 2006; Mougeot, 2010; De Zeeuw *et al.*, 2011). Bell *et al.* (2007) argued that urban agriculture plays an important role in the social stability, the employment and overall development of urban residents. As urban agriculture grows, it becomes ever more important to the everyday life of cities and has great significance for women's economic capacity. For example, as men are

more generally employed in other sectors, such as manufacturing or industry, women are an important workforce in urban agricultural development (Nugent, 2000). This is also because urban agricultural and the relevant processing and marketing activities can fit well with other tasks in the family very easily. As the economic benefits of urban agriculture improve, women create considerable economic income for the family and thus improve their social status. Urban agriculture also offers women a way to earn income in some societies where they may be excluded from other forms of work, either for religious or cultural reasons. In general, the proportion of women to participate in urban agriculture is the largest in Africa, for example most of this work is undertaken by women in Harare (Armar-Klemesu, 2000). In Dar es Salaam, commercial enterprises of urban agriculture allocate the house farms to women rather than men. In Cairo, women are primarily responsible for small livestock (Nugent, 2000). As a result, urban agriculture can ease the difficulties of fluctuating employment and provides security for the weak in the city to some extent. This may not happen to the same extent in traditional rural agriculture.

2.3.3 Ecological and environmental impact

Urban ecology is a complicated concept that can be approached from many different perspectives in both natural science and social science. Bruinsma (2001) believes that urban ecology is commonly applied to study biological aspects of urban areas in natural science. On the one hand, it is the urban natural species and natural systems, including agriculture, fisheries, horticulture and forestry. On the other hand, the urban area is regarded as a complete open ecosystem to closely connect and interact with the surrounding ecosystem. However, the interaction among urban residents is emphasized in social science, which is called human ecology (Zipf, 2016). Therefore, urban agriculture is better dependent on the natural sciences of urban ecology, so functions of urban agriculture can be defined from the perspective of natural science. At the same time, Urban agriculture is directly defined as a part of the urban ecosystem by the FAO (1996). Thus urban agriculture can also be regarded as an important part of urban environmental management system in order to make contributions to sustainable development of an urban ecosystem.

By analyzing urban environmental challenges, De Zeeuw *et al.* (2011) put forward that urban agriculture can play an effective role in improving the urban environment and adapting to climate change, especially in reducing climate change's impact. Similarly, the World Meteorological Organization (WMO, 2007) suggests that urban

agriculture should be applied to deal with climate change in the urbanization process, which is an effective way to be more consistent with the urban sustainable development. The World Bank and the European Union have also explicitly proposed that urban agriculture and urban forestry have great potential in improving the urban environment and adapting to climate change, especially for African, Caribbean and Pacific countries (UN-Habitat, 2009).

In view of the above, although it is generally accepted that urban agriculture plays an important role in the urban ecology and environment, most articles only roughly put forward ideas or make a few discussions. There are only a few studies that have focused on positive and negative effects and roles of urban agriculture in the urban ecology and environment, including provision of biological and abiotic resources to urban areas and functions of ecosystems. Earlier studies mainly focused on exploring impact on the environment from the aspect of agriculture, that is, the agricultural production, which is similar to the study of rural agriculture.

By discussing projects of community gardens in Philadelphia and the San Francisco area, Ferris *et al.* (2001) have recognized the positive role of urban agriculture in the environment, and have stressed that these projects are fully applicable to UN Local Agenda 21 and sustainable development policies. As far back as 1996, Hynes (1996) introducing urban agriculture projects in Harlem, San Francisco, Philadelphia, and Chicago, emphasized their significant role in sound buffering and air purification. However, through their case study in Jordan, Faruqui and Al-Jayyousi (2002) showed that the urban poor population in that country are allowed to use untreated municipal waste water for food production in urban agriculture due to lack of capacity to treat waste water. This has had a certain negative impact on the environment compared with the ordinary tap water especially in terms of the salinity. However, Ruel *et al.* (1998) think that advantages of reusing municipal waste water in urban agriculture outweigh disadvantages, and actually it plays a positive role in the environment. Based on research in Mexico, Losada *et al.* (1998) believe that producers of urban agriculture can reuse the degraded land in urban areas for agriculture, which is a new way to deal with urban waste. However, Hara *et al.* (2005) have identified potential negative effects by investigating farms of urban agriculture in Bangkok, such as pollution caused by fertilizer. In general, the content of this kind of literature is based on the agricultural activity, so actually it is about the impact of agriculture on the environment which occurs in the urban area.

With the development of urban agriculture, the research is no longer limited to the nutrition, waste water and solid waste of agriculture, but expands to the urban climate and ecology. By producing fresh food in urban areas or suburbs, urban agriculture reduces the transportation distance and more efficiently conducts packaging and processing. Therefore, it's possible to reduce energy use and emissions of greenhouse gas. In many industrialized food systems, Heinberg and Bomford (2009) stress that energy used by food, from farm to table, is more than four times as much as food directly obtained from the farm. Hird *et al.* (2000) believe the best food policy is: "...the closer the consumer can be to the grower, the better, as produce should be stored and transported less". Therefore, compared with the traditional food system, agricultural production in or near urban areas is more favourable to the environment, which helps to reduce the food ecological footprint. A High-Level Task Force (HLTF) on the Global Food Crisis was decided to establish by UN, it was described as:

Any long-term strategy to deal with food and nutrition security needs to encompass more effective strategies to promote sustainable urbanization.... A paradigm shift in design and urban planning is needed that aims at: ...Reduce the distance for transporting food by encouraging local food production within city boundaries and in immediate surroundings... Invest in transport infrastructure such as rail, trunk and feeder roads to bring agricultural produce to markets in order to raise local farm productivity...Reduce the need for energy-intensive transport through better land-use planning and more compact and complete cities and communities... (UN, 2008, p. 24)

However, Economy and Programmed (2009) argues that it is not appropriate to solely rely on distance assessments. For example, although transportation of food from Africa consumes more energy than transportation from local areas, purchasing from poorer countries can help them tackle poverty. Therefore, the Food Ethics Council (FEC, 2007) stresses that energy use and contribution to climate change should be regarded as the main consideration in the sourcing of seasonal foods, such as fruits and vegetables, and not just transport distance. The environmental cost of the energy used in the local production of out of season foods, such as tomatoes or strawberries in winter, may outweigh the savings of not transporting them from a warmer climate. Thus the footprint of seasonal or non-seasonal food consumption depends on the combined effects of production, transportation and storage, rather than using "food miles" as an absolutist approach.

In addition, urban agriculture also plays an important role in maintaining urban green space and accelerating the 'greening rate' of urban spaces. Environmental impacts of urban agriculture are a consequence of the location of green areas (Zheng *et al.*, 2013). As most mentioned in literature, agricultural features can be considered as an "advanced version" of green areas in cities. The combination of agriculture and natural not only can provide urban residents with a diversity of beautiful agriculture landscapes in order to reconnect urban life and better environment, it also help protect agricultural culture and create an agriculture-style surrounding environment for urban residents, especially those children who have limited chance to get in touch with nature (Smit *et al.*, 1996b; Holland, 2004; Kerton and Sinclair, 2010; Lovell, 2010). The effect may be positive, with the carbon fixed and temperature regulation, translated into a better microclimate, where air pollution is quite often a serious problem. In particular, Tidball and Krasny (2010) point out that urban forestry is helpful to improve the local environment. The urban heat island can be reduced by increasing the coverage of urban plants. Deelstra and Girardet (2000) agree the micro-projects represented by green roofs and balcony gardens can insulate buildings, and reduce energy needs for regulating temperatures. In terms of other large-scale projects, especially those projects that build on land subject to natural disasters, such as floods and landslides, risks can be reduced by maintaining agroforestry space in these areas (Holmer and Drescher, 2005). For example, open green spaces are helpful to increase water storage and accelerate drainage of rain water by increasing land permeability. Bernholt *et al.* (2009) focus on the plant species richness and diversity in urban and peri-urban gardens of Niamey, Niger and state that urban agriculture can also contribute to conservation of biodiversity to some extent, especially when native species are incorporated into the entire urban ecosystem.

In summary, urban agriculture can solve many ecological and environmental problems. The urban microclimate can be particularly improved by adjusting humidity, air quality and land condition, thus providing additional ecological effects for urban areas. However, it should be noted that specific urban areas or scenarios should be analysed before formulating the relevant research agenda during studying the effects and influence of urban agriculture on a particular urban ecology and environment.

2.3.4 Social cohesion and solidarity

The social function of urban agriculture refers to the provision of places and opportunities that are available for urban residents to be in contact with nature, leisure, culture and neighbourhoods in the community or even other residents in the city.

Sharpley and Vass (2006) argue agriculture sightseeing, travel and leisure are the important components of urban agriculture. Based on their case study in Northeast England, a great demand for agricultural visiting was highlighted by analysing the statistics of day visits from urban to the surrounding rural areas. In this view, urban agriculture provides people with recreational space by offering leisure facilities for citizens to go sightseeing, enjoy leisure and entertainment activities, in order to alleviate the pressure of work and life to achieve the goal of refreshing health and heart and physical fitness.

Furthermore, some literatures mentioned that urban agriculture can promote cultural exchanges between urban and rural areas. It has a strong educational function and can educate directly the urban residents about agriculture technology, agriculture knowledge, agriculture condition, agricultural custom and farming (Bellin-Sesay and Krawinkel, 2002; Corrigan, 2011; Badami and Ramankutty, 2014). While the unique traditional culture of rural areas may be continued, extended and developed due to the development of urban agriculture. As many Chinese articles mention (Lisheng, 2001; Chen, 2007; Zheng *et al.*, 2013), socio-economic impact of urban agriculture may be significant in Chinese conditions. Lisheng (2001) agreed that with urban agriculture, relationship among neighbourhoods in community can be improved by participating in urban agriculture, particular for children and young people.

Agricultural skills can be taught in the process of growing. Chen (2007) pointed out that in many cases of urban agriculture such as roof gardens and city farms, potential meeting places are provided for both indoor and outdoor activities. For example, urban residents can either drink coffee in a roof garden café or pick up food with friends in a city farm. Yang *et al.* (2010) gave a good example of China that agro-tourism provides farming education courses for primary school. A few articles suggest that urban agriculture has a subtle influence on urban residents through different activities and products with agricultural character, even making some urban residents prefer the rural style of life and start to get tired of city life. Some argue that, in relation to urban agriculture, metropolis and capital cities, rich in science and

technology, talent-intensive and connected to international and domestic information, have a significant exemplary and leading role to play for surrounding small cities and other cities in the nation because of their powerful role in location, politics and culture (Zheng *et al.*, 2013).

Smit *et al.* (2011) further described urban agriculture as having an informal element, related to social networks, as well as a more formal part related to social development programs. It also helps health equity in cities in low and middle –income countries. These networks are enhanced, and unemployment and poverty are reduced, as community members become employed, while the community involvement needed to develop and manage the project helps to build community capacity and social networks.

2.4 Typologies, trends and changes

Across the world, urban agriculture developed in very different typologies and trends. In sub-Saharan Africa, Latin America, Southeast Asia and other developing countries and regions, the urban agriculture has developed into a necessary choice to improve food security and support the lives of urban residents (Mougeot, 2010). It focuses on the role of the most basic food safety and livelihood, with food being supplied mainly through a variety of agricultural production methods to meet the needs of local urban residents (Mougeot, 2010; Redwood, 2012). In these areas, the main form of urban agriculture is agricultural activities on urban farmlands such as planting and breeding by the household, which are relatively simple in function. A representative example in Koont (2009) research is Cuba, where the urban agriculture program aims to invest 3 m² of land per person in the city and around the city, with the goal that this land will provide more than half of the minimum vegetable demand. By the late 1990s, Havana had more than 35 thousand hectares of urban agriculture land (Altieri *et al.*, 1999). Since 1997, due to the use of organic pesticides and the promotion of other agricultural technologies, the production of vegetables in Havana has increased by 13 times in 8 years, and the average growth of urban agriculture is up to 38% annually (Koont, 2009; Koont, 2011). Therefore, this form of urban agriculture is an important source of food consumption for low-income families, which can improve the livelihoods of the urban poor population.

The application of urban agriculture in developed countries is more extensive. Many cities have formulated planning or policy strategies to provide a new way of land

planning and land use for urban planners in the process of urban development and urbanization. Although commercial agricultural production is still the essential part in these countries, the important role of urban agriculture on the ecological environment, social function and sustainable development is emphasized on the basis of the production of food. This will now be discussed in respect of three different regions: the United States, Western Europe and Asia.

2.4.1 United States

The United States has been focusing on agricultural development for many years that is applied to the vast territory with a sparse population (Brown and Bailkey, 2002). Urban agriculture, however, which has applied the agriculture within urban area, accounts for 10% of the total area in the United States. The value of agricultural products produced by urban agriculture makes up nearly one third of the total value of agricultural products (Kaufman and Bailkey, 2000; Brown and Wardwell, 2013).

Urban agriculture in the United States stressed productive and economic functions in the past. On the one hand, there was enterprise-type agriculture dependent on the international market and with the advantages of new technology and scale benefits. On the other hand, there was family-type agriculture that meets people's demand for healthy food and community life. However, with more recent development of urban agriculture in the United States, it also focuses on environment and cultural needs. The food system has been incorporated into the planning process under the support of policy and legislation, which requires planners to support the improvement of the health of the residents, the sustainable development of the environment and a food system that reflects the cultural heritage of ethnic minorities (Brown and Bailkey, 2002; Boody *et al.*, 2005; Lovell, 2010).

There are mainly three types of urban agriculture in the United States: small commercial farms or community-supported agriculture (CSA), community gardens, and private garden. Small commercial farm is defined by the United States Department of Agriculture (USDA, 2017, p. 2) as "...a producer-consumer local production and marketing partnership that involves a subscription-based contract for the delivery of seasonal products from the farm". Since 1994, the number has increased by nearly 50%, and CSA has increased from more than 1700 in 2005 to 12,617 in 2012 (USDA, 2017). The community garden is the main form of urban agriculture in the United States and the number has exceeded 18,000, covering

communities, public spaces and schools (USDA, 2017). This is a form of urban agriculture that relies on mutual help between farmland and the community and builds a direct connection between production and consumption. It has developed fast and has become an effective way to improve the food safety and health of the urban poor population in the United States (Brown and Bailkey, 2002; Saldivar-Tanaka and Krasny, 2004; Johnston and Baker, 2005). In particular, mentioned in these articles are projects run by local governments and non-profit organizations in places such as California and New York. They encourage the production and distribution of food to those people who need them, which solves the food health and safety problem of the low income population and some of the marginalized people in the city, such as the homeless (Walker *et al.*, 2010). These urban residents can participate in the community gardens and share the production cost, risk and profit with farmers or owners of community gardens, while gardens can provide safe, fresh agricultural products at a price lower than the retail price in the market. This form of urban agriculture supplies farmers with a stable marketing channel and realizes mutual benefit (Blaine *et al.*, 2010). Therefore, community garden is a kind of innovation and reform, which strengthens the relation between farmers and consumers, increases the food supply for local areas, and facilitates the agricultural development of the local area. At the same time, it can also promote the contact and cross-cultural communication among the members of the community (Hynes and Howe, 2002; Blaine *et al.*, 2010), so as to improve the mental health and improve the sense of belonging and identity of those members (Okvat and Zautra, 2011; Turner, 2011). The private garden is the smallest form of urban agriculture, which produces food on the balconies, roofs and backyards (Brown and Bailkey, 2002). As a kind of private behaviour, it is also related to personal hobbies, cultural identity and social status on the basis of self-reliance in solving food health and safety, and has a positive effect on the community environment and neighbourhood relations (Kortright and Wakefield, 2011).

In addition, the United States pays great attention to the national planning of urban agriculture and development of recreation and tourism (Lovell, 2010). This kind of planning not only fully reflects agricultural patterns in the United States, but also shows the local characteristics and combines urban characteristics with local agricultural characteristics closely. The Atlantic coastal area is a typical example. The strip domain, which is formed by five metropolitan coordinating regions - Boston, New

York, Philadelphia, Baltimore, and Washington - is called the Northeast megalopolis (also Boston–Washington corridor or Bos-Wash corridor) (Brown and Bailkey, 2002; Boody *et al.*, 2005; Lovell, 2010). In this area, cities are integrated with the countryside and studded with an agricultural network, which forms a unique landscape of urban agriculture. It provides a large number of green and recreational resorts. Some recreational vehicles, which hold interesting exhibitions and activities related to urban agriculture and outdoor markets attract a lot of tourists (Lovell, 2010), not only providing leisure and recreation, but bringing considerable economic profits.

2.4.2 Western Europe

Due to their developed economy and cultural tradition, urban agriculture in European cities focus more on harmonious coexistence between the human and natural environments, and the improvement of life quality that is applied to the area. Urban agriculture aims to strike a balance between resource and population, and that stresses the ecological and social functions of urban agriculture.

Greater London has 11,760 hectares of commercial farmland, of which 94% are used for grazing, breeding and other non-horticultural crops, with the remaining 6% used for the very intensive and high value agricultural activities of horticultural production (Defra, 2010). However, there are also various forms of self-supporting agriculture, including urban farms, community gardens, private gardens, school gardens and parks (Garnett, 1996). Most urban farms provide urban residents with teaching facilities for understanding and undertaking agriculture. About 10% of the London population visits these farms every year (Garnett, 2000). The private garden, a common location for urban agriculture in the UK once occupied 20% of the total area of Greater London (Dawson and Worrell, 1992). However, the pressure for development land has, no doubt, reduced this. In addition, the most common and most popular form of urban agriculture in the UK is allotments (Van den Berg *et al.*, 2010), for example in London, in 2012 there were more than 700 allotment sites, with each site having a different size and containing a different number of plots (CPRE, 2012). A plot is usually 253 m², and the rent varies from 10 to 140 GBP (approximately equal to 183.4 USD)¹¹ per year, while the average rent is about 50-60

¹¹ In order to use one currency, the author calculated the USD after the GBP in this thesis. 1 GBP≈ 1.31 USD, the currency was updated on 27 September 2018 by XE Currency. <https://www.xe.com>

GBP (approximately equal to 65.5-78.6 USD) per year (LondonAssembly, 2006). It should be noted that the products produced by an allotment cannot be sold unless the profits are allocated to the community (Mok *et al.*, 2014).

Zasada (2011) pointed out that Germany does not stress economic benefits blindly in agriculture. On the contrary, they pay more attention to green, healthy and delicious food. They not only treat green, sunny rural areas and countryside as their main resorts, but think delicious food is an indispensable part of their life. FoodTank (2014) reported 10 urban agriculture projects in Berlin to show that the main target is to upgrade the existing variety of composition of agricultural products, to replace processed food with green food, and to drive the development of some new-emerging enterprises and services of production. The agriculture-stressing and agriculture-strengthening consciousness of Germany not only creates supportive conditions for the development of urban agriculture, but plays an important role in driving the development of future urban agriculture. Ideologically, Germany treats the agricultural experience, leisure agriculture, and the environment as the key points of urban agriculture development (Zasada, 2011). At the early stage, Germany adopted city gardens and gave small-sized land to farmers to meet their needs for agricultural and subsidiary products. But later the city gardens that Germany put forward was aimed more towards providing urban citizens with the opportunities to experience farming.

With regards to the environment, one publication noted that:

Since the municipal forest was acquired in 1372, when it covered 1,077 hectares, around one-seventh of the area has been lost to construction, sports stadiums, airport extensions, and rail and road routes. (Frankfurt, 2011)

As a result, Frankfurt is one of the trial cities in Germany, which started environmental coordinated development and developed the Forest City Initiative to reduce pollution.

As reviewed above, people's agriculture culture and agriculture-loving consciousness plays an indispensable role in the urban agriculture development of Western Europe. Consciousness leads to action, so the urban agriculture practice of the Western European countries is marked with a high sense of participation. According to people's demand for consumption and psychologies, Western European countries give priority to the ecological, landscape and educational functions of urban

agriculture, which not only increases the income of farmers, but meets urban residents' spiritual demand.

2.4.3 Asia

Compared with the developed countries of the west, Asian countries started late in urban agriculture. However, the urban agriculture of Japan and Singapore is very well developed and has achieved good results. In Japan, 60% of domestic food demand is met by overseas markets, but its self-sufficiency rate of vegetables amount to more than 90% (Kako, 2010). Many lands around cities are used to plant trees to beautify cities and bring the ecological function of trees into full play. Hence, 60% of Japanese land is covered by forest (Rozman, 2015).

Urban agriculture not only provides produce close to markets and consumers, but also creates strong added value. As Japan fully realizes the advantages of urban agriculture, it develops urban agriculture in various forms and delivers economic, social and ecological benefits. During the practice of urban agriculture, Japan used the forms of the United States and Europe for reference and highlights its development characteristics and applies the model that gives consideration to different functions (Boestel *et al.*, 2013). For example, in 1989, the Agricultural Land Lease Act used the British allotments for reference, allowing urban farmers and growers to rent land for gardens or private use (Wiltshire and Azuma, 2000), but they offer only 50 m² per plot (Yokohari *et al.*, 2010). Shimin Noen ('citizen-garden') has been developed with reference to German leisure gardens. They provide a large number of leisure and entertainment services for residents and the community generally (Wiltshire and Azuma, 2000; Yokohari *et al.*, 2010).

The urban agriculture of Japan is very diverse and is accepted by many organisations (Boestel *et al.*, 2013). This means governmental departments, peasant associations, research organizations and Japan citizens lay importance on, and become involved in, the development of urban agriculture. Governments at all levels in Japan put urban agriculture into their annual plans and adopt positive policies to it (Rozman, 2015). The Peasant Association and Agricultural Promotion Department have increased their publicity for urban agriculture, hold training classes, and improve the quality of the labour (Kimura, 2011). This kind of wide, top-down participation makes the urban agriculture of Japan develop rapidly. The Ona Seido (ownership system) allows urban residents who are not farmers to rent land for

agricultural activities, and by 2008 there were 187 Ona Seido projects in Japan (Kieninger *et al.*, 2011). It is worth noting that the food education law is standardized in Japan, and the national food education law emphasizes that school education needs to pay attention to the traditional Japanese diet culture and the eating habits of dining with family, the school nutrition program, and the increase of local food consumption etc. (Kimura, 2011; Miyoshi *et al.*, 2012). It has played a positive role in promoting urban agriculture, especially in social culture.

In Singapore, Lee and Tan (2011) argued that, due to the lack of natural resource, the city-state cannot feed itself with enough agricultural products. Singapore can only produce a small amount of vegetables, flowers, eggs, aquatic products, and milk, so it imports 90% of food from overseas markets (Johnson, 2017). Consequently, with the constant decrease of farm lands caused by urbanization, Singapore attaches much importance to urban agriculture and turns to the development of high technology and high output value. Thus, the important form of urban agriculture is high-tech urban farmland and agro-technology parks which are specific projects in Singapore. Singapore's Agri-Food & Veterinary Authority (AVA) plans to build ten agro-technology parks and has already completed six which cover an area of 465 hectares (FocusSingapore, 2018). These six parks have more than 200 farms in an area of 7 hectares which occupies nearly 50% of the park area. They are built by the government and are rented to businessmen or companies for ten years through a bidding system.

Moreover, in growing food by aquaponics methods, or other high-tech methods, people can cultivate food on roof tops or in pipes and other suspended growing systems. For example, there is a project that adopts an aquaponics method (namely, to plant vegetables in a 1.5 metre tall 'growing tower') to grow nutritive, safe and fresh vegetables in a tropical country to supply the market. This tower has:

A tank filled with water and nutrients at the base. The mixture is pumped up to the top of each tower and flows down by gravity through a series of seven pipes arranged in a zig-zag manner.
(Zachariah, 2017)

The ComCrop Company has grown food on a 600 square feet roof by vertical growing techniques (Johnson, 2017). Singapore provides a useful insight into ways of providing produce combining urban agriculture with agriculture scientifically to connect ecological agriculture and economic function.

This section has sought to provide a brief summary of the literature relating to different typologies and trends of urban agriculture in different countries. Making connection with different locations of urban agriculture in section 2.2, it can be seen that urban agriculture can be divided into three types. It needs to be mentioned that many countries do not have desakota areas, but they have peri-urban areas or suburb areas. As section 2.2 discussed, desakota is more comprehensive than peri-urban or suburb for representing areas.

Urban agriculture in urban core areas is mainly practiced in the surrounds of the house (roofs, balconies), idle land, the courtyard or garden area and the park, most of which take the form of small-scale greenhouse or high-tech farming systems.

Urban agriculture in desakota areas generally takes the form of medium to large-scale farms and gardens. They are located in the areas around the city which are served by developed transport, have convenient links to markets and high population density. They can accommodate and operate ornamental horticulture, greenhouse vegetables and flowers, grazing and poultry. Projects tend to be located near both sides of a highway or railway for convenient transport.

Urban agriculture in an exurban area is the closest to rural agriculture. It is a kind of outer edge area agriculture surrounding the periphery of urban areas that is relatively stable farmland. The size depends largely on transport efficiency and geomorphological features, but it is similar with large-scale commercial agriculture.

Of the three types, urban agriculture in desakota areas is the part that uses most land, and offers most employment and output. Thus, most urban agriculture is concentrated in this area. The reason is that this area tends to be the main expansion area in a period of rapid growth of urbanization. The pattern of land use may transfer from rural land into the city residential, industrial, and constructional and development of afforestation.

2.5 Urban agriculture and technology

In some cases, urban agriculture also uses the highest or newest technology and information, and can adopt various modern production facilities and technologies to obtain professional management. For example, greenhouse technology has been applied to urban high-rise buildings for vertical cultivation. These buildings usually have double-layer glass curtain surfaces (figure 1).



Figure 1: Future farms. Source: (left to right) Kiss and Cathcart; New York Sun Works and Arupa¹².

According to evaluation by researchers, a typical 30-floor farmland whose size is similar to an American city block, can meet the food demands of 50,000 people (Vogel, 2008). Such buildings can be designed with functions such as hydroponic cultivation and poultry and fish feeding functions. Waste in the production process can be reused and energy can be saved by making use of renewable energies to heat the greenhouse. A 23-floor urban agriculture centre has been designed by the Mithun Building Firm in Seattle. By making full use of water and energies, food that can meet 450 people's requirements can be produced (Mithun, 2018).

High-tech agriculture facilities are commonly applied for urban agriculture in the Netherlands (Schimmel, 1990). In 2001, the national glass greenhouse area reached 10,600 hectares, accounting for 25% of the total greenhouse area in the world. In three provinces in Western Netherlands (Utrecht, Noord-Holland and Zuid-Holland) in particular, there are about 7,080 hectares of glass greenhouses in total, accounting for over two thirds of the national glass greenhouse areas (Peet and Welles, 2005). Zuid-Holland itself has 55.6% of the country's glass greenhouses (Altes and van Rij, 2013), forming the internationally renowned 'glass city'. Supporting facilities in these greenhouses are complete along with the heating system mainly by burning natural

¹² Available from: <http://www.nysunworks.org/> (Accessed: 19 September 2018).

gas (providing a CO₂ fertilizing system as well), ventilation system, sunshade and heat preservation curtain, nutritious liquid circulated irrigation system and a manual light supplementation system, thus realizing the comprehensive full-automatic computer control over the temperature, light, water and air.

The main form of urban agriculture in Singapore is high-tech agricultural gardens, such as farms growing vegetables using the aeroponic method (Astee and Kishnani, 2010). Aeroponic is carried out in a glass greenhouse with air conditioning facilities (figure 2). There are fine meshes around the upper side of the seedbed to avoid insect pests. It is not allowed to spray pesticides. Seedlings are grown in the foamed plastic seedling beds and then transferred to the cultivation box (6m×1.2m). The vegetable should be hung up with the roots exposed in the air. Cold water with nutrition and fertilizers should be sprayed every five minutes, so that the root can absorb nutrients. Mist should be created at the same time to allow water to be gathered on the leaf surface, so as to lower the temperature. The growth period of vegetables has reduced from 60 days by land farming to 30 days. Aeroponic can not only save the land area, its water use amount is only 10% of that by hydroponic (Astee and Kishnani, 2010). All water can be recycled in use, thus realizing the maximum protection of the environment.

HOW DOES AEROPONICS WORK?

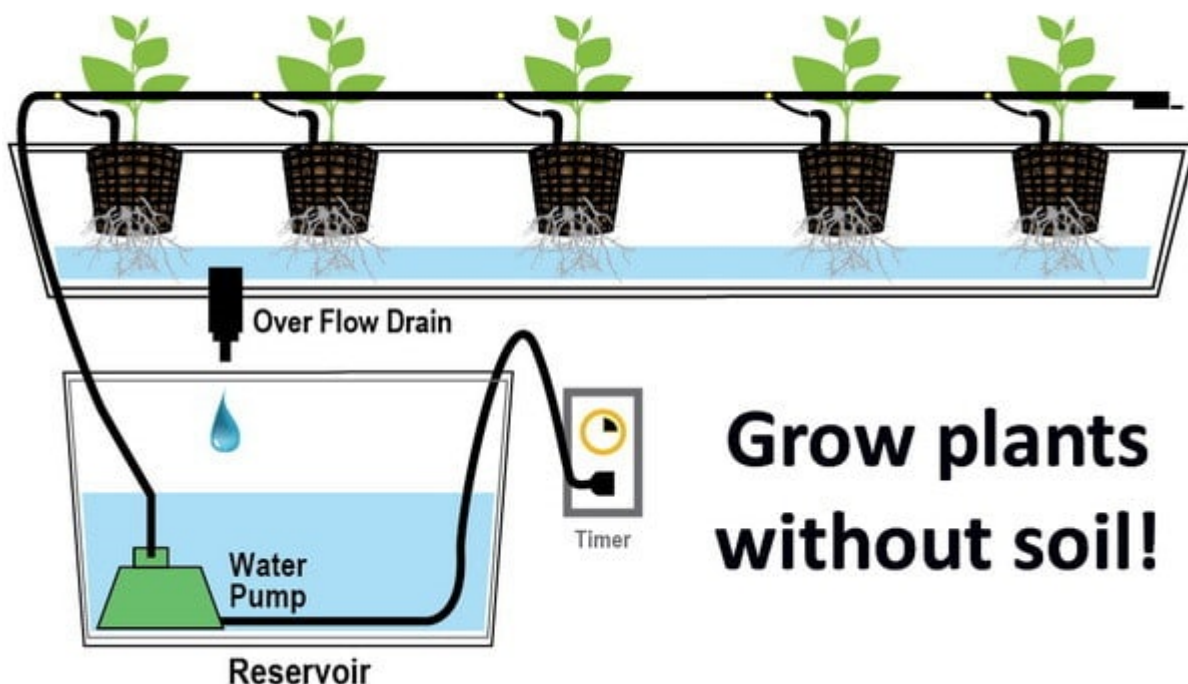


Figure 2: How does aeroponics work. Source: Remove and replace¹³.

Similarly, according to the survey for Tokyo and other areas in Japan by Ministry of Agriculture, Forestry and Fisheries in 2014, cultivation facilities have been available for over half of the agriculture. The MAFF (2014) reported that the proportion of farmers having glass greenhouses and plastic sheds has been significantly higher than the average level nationwide. After the intelligent and facility-based production is realized, various clean and fresh fruits and vegetables can be planted throughout all four seasons. The full-automatic vegetable transfer plant machines have started to replace the manual operation. Farming is arranged by networking of computers, and robots are used to control the farming work. The temperature and humidity in greenhouse sheds can be adjusted automatically. These high technologies were applied initially in suburb villages of Tokyo. In respect of fruit production, unmanned plant disease and insect pest prevention and control machines have been developed and popularized; in the livestock raising field, automatic raising management instruments depending on the wireless telemetry system and the labour-saving technologies have been popularized; the milking robots have been developed along with effective ventilation, and dust collection facilities, thus making the labour environment of livestock raising seem comfortable (MAFF, 2014).

2.6 Conclusion

This chapter has set the context of urban agriculture by considering the different elements. Importantly, in order to make this complex and confusing concept clearer, the chapter has explained and decided on a new definition of urban for urban agriculture, which includes urban core areas, desakota areas and exurban areas. As such, urban agriculture covers all agricultural activities in these areas. Based on this, the scale and produce of urban agriculture thus are complex. It leads to the fact that perishable and high-value products are often produced in urban agriculture. As a result, this chapter has highlighted five different functions including food security and livelihood, income and economy, ecological and environmental impact, and social cohesion and solidarity that urban agriculture can provide for urban residents. This chapter has also identified the common trends, typologies and technologies in urban agriculture around the world. In respect of these, this thesis agrees that urban

¹³ Available from: <https://removeandreplace.com/2014/05/03/diy-homemade-aeroponics-system-grow-plants-without-soil/> (Accessed: 19 September 2018).

agriculture has a strong connection with sustainable development, which will be discussed in chapter 3. However, the literature has considered the wider international circumstances and does not really reflect what is happening in China. The Chinese Government and administration, as well as terminology, are very different from other countries, which will be discussed in chapter 4.

Chapter 3 Sustainable Development and Urban Agriculture

This chapter will explore the literature on sustainable development to understand how the concept might be used as a framework for evaluating the new urban agriculture in China. It starts by understanding the concept of sustainable development and goes on to look at sustainable development in connection with urban agriculture.

3.1 Understanding sustainable

For the early ideas of sustainable development, economists and ecologists conducted discussions in terms of their goals. One goal was the long-term survival of human beings and continued economic development, at least detriment to the planet. Goodland and Daly (1996) believed that the elementary objectives of sustainable development are to ensure livelihood for as many human beings as possible within the longest survival time, with the approach of zero population growth and an increase of non-renewable resources and consumption per person. According to the law of entropy and the economic process, Georgescu-Roegen *et al.* (1999) and Georgescu-Roegen (2011) thought that the overwhelming growth of world population and economy can hardly ensure the longest human survival time. Therefore, the way to achieve the target is to shrink the scale of population and economy to make the livelihood and survival of humans only dependent on the renewable resources.

Pearce *et al.* (2013) defined sustainable development as maximum net income of economic development, under the condition that the quality of natural resources and services provided by it is protected, to ensure the survival of most human beings. Constanza (1992) thought that sustainable development is the relation between a dynamic human economic system and the ecosystem changing slowly under normal conditions. This would mean the indefinite: survival of human beings with everyone

fully supported and a continued development of human culture. But this relation also means that the impact of human activities need to be restrained within a certain limit to prevent the destruction of the diversity, complexity and functions of a survival supporting system in ecology. Although the different views were and still are held by different experts, the common point is that the goal of sustainable development shall be ascribed to the development and maintenance of survival of human beings.

At the same time, the concept of sustainable development was posed by ecologists as 'ecological sustainability', mainly aiming at the balance between economic development (environment included) and ecology. Redelif *et al.* (1997) pointed out that the resilience of a production and economic system will slow down with the impact of deterioration of the environment and other conditions. Species will be reduced and environment quality will be deteriorated due to pollution caused by economic behaviour, thus, from a long-term point of view, the eco-system will be hard to maintain. Therefore, the nature of sustainable development lies in maintenance of the resilience of the production and economic system which can also be seen as a dynamic connection and balance between the economy and environment. Similarly, Pearce *et al.* (2013) agreed with Redelif's view and summarized that the goal of sustainable development is to pursue a dynamic connection and equilibrium between the economy, environment and ecology. Specific to practices for this balance, product design was a good example. According to Ramani *et al.* (2010, p. 091004), "*product design is one of the most important sectors influencing global sustainability.*" For example, the choice of materials used in manufacturing can influence the degree of sustainability of a product and its impact on the environment. Indeed, we now recognise the critical need to reduce the amount of plastic being used in the manufacturing of everyday objects.

Thus, sustainable development is the dynamic adaptive capacity of the economic system to support the environment and ecology, and is a series of practical steps to enable the economic system going forward towards stability. As a result, the concept of sustainable development from an ecological view can be defined as protection and strengthening of production in balance with the ability of the environmental system to renew itself. This means that, to be sustainable, development cannot surpass the regeneration capacity of the environmental system.

Sustainable development also has a social and economic component. The Brundtland Commission's brief (WCED 1987, p. 16) defined sustainable development

as the “*ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs*”. This has become a standard and widely used definition. Similarly, Pearce and Atkinson (1992) argued that sustainable development focusses on pursuing generations of ‘intergenerational equity’, meaning development which can ensure support for the present generation without damaging the welfare of future generations. Tietenberg and Folmer (2000) stated that the core of sustainable development is fairness that makes the economic welfare of future generations at least not less than the contemporary age, which means that the utilization of environmental resources by the present generation shall not impact the future generations in terms of lower living standard. Carley and Christie (2017) pointed out that sustainable development is to give the same amount or even more wealth per capita to the descendants than that which we currently possess. The basis of the aforementioned views is on fairness, so that the future generations will not be suffering the consequence caused by reduction of the economy and environment due to the too rapid development of the contemporary economy.

However, from a social-political aspect, sustainable development refers to the active participation of everyone, equitable distribution of income and cooperation, between human beings and nature in a social and political system (Dempsey *et al.*, 2011). Robinson (2004) thinks that the meaning of this concept not only includes the protection of the natural environment but also the development of a globally equitable social-political system. This means that sustainable development is the harmonious development between ecology and society, so that one group of people do not take resources to the detriment of another group.

In addition, a few articles provide discussion on the relationship between energy use and sustainability. Segnestam *et al.* (2003) mentioned that sustainable development is to establish clean energy systems and technologies that produce little waste and contamination. Dincer and Rosen (2012) expanded this concept from the technical point of view. They believe that sustainable development is a technology which is more effective, which will approach to zero release of pollution and use technologies in order to reduce the consumption of energy and other natural resources.

3.2 Urbanization and urban sustainable development

A city is a complicated system with interaction between human activities and the natural environment, which can be a good way to fully demonstrate the conflict and discord between human life, production and environment. The complexity of urban sustainable development means that research on it has to be increasingly comprehensive and interdisciplinary.

Urbanization is the outcome of the economic development. With the continuous accumulation of industry and the improvement of the industrial structure and activities, regional urbanization is promoted (McCarthy and Knox, 2012). Currently, the definition of urbanization has not come to a unified standard and the understandings of different subjects vary. The sociologist Mellor (2013) believes that from the perspective of humans, urbanization is the process during which the rural population gathers into the cities and towns and the living style and thoughts are changed by the cities. The economists define urbanization as the process during which the agricultural production transforms into non-agricultural production and capital, labour, land and other production elements concentrate in the cities and towns (Kotze *et al.*, 2011). The geographer understands urbanization as the process during which the population gathers in the cities and towns, the urban land aggresses the rural areas continuously, and the internal function and structure of the cities and towns are optimizing (McCarthy and Knox, 2012). Summing up the above, this thesis considers that the urbanization indicates the career transition process during which the rural population is going from the primary industry to the secondary and tertiary industries, and the spatial clustering process during which the place of residence changes from the rural areas to the urban areas. The contents can be generalized as: the conversion from rural population to urban population; the conversion from the rural industries and production modes to the urban industries and production modes and the gathering of it, which means the agricultural modernization and non-agriculture products; the conversion from the rural living style to the urban living style, which means the urbanization of the living style; and the process of the expanding scale of the urban land and the changing regional space structure. The measuring indexes of urbanization are mainly the land urbanization, population urbanization, industrial urbanization, the urbanization of the lives of the resident, and the landscape urbanization (Hugo, 2017). The measuring standards about the population urbanization are: the percentage of the urban population in the total regional

population; the percentage of the non-agricultural population in the total regional population (Hugo, 2017). Each measuring standard has its own advantages and the measuring standards of urbanization are different because of the different regional conditions.

The research on urban sustainable development from the resource perspective mainly focuses on the conflict between the natural resource endowment and urban economic development. As a consumer, a city will use the non-renewable resources and renewable resources within its production system to provide services for life for citizens and for the systems of economic production (industry, commerce etc.). In parallel, a city also destroys and wastes resources by its unreasonable utilization (Campbell, 1996). Although the consumption of resources, especially the non-renewable resources, by the city have met the requirement of the development of contemporary urban areas, the fact that this has become a limiting element to long-term stable and sustainable development in the future is increasingly obvious. Siembab and Betal (1992) believe that reasonable utilization of the resources is a factor for sustainable development. Toman (2006) suggests that the people should be asked to undertake certain responsibilities to establish minimum 'safety standards' in terms of protection of resources. Thus, protection of non-renewable resources, maximum utilization of renewable resources and cyclic utilization of resources are shown as being the basic principles of urban sustainable development, while conducting research on such a topic.

The research on urban sustainable development from an environment perspective also includes the conflict between the pollutant discharges from urban economic, and other activities, and the self-capacity of the natural environment. This focus puts emphasis on the urban environmental pollution improvement and technology, economy and legal means for emission reduction. Scholars have produced a significant amount of research on how to deal with the urban environmental problem. For example, Tjallingii (1995) proposed, when researching on the increasingly severe urban environment issue, that as a 'Responsible City', the sustainable city shall absolutely not leave the current environment issue to the future generations or spread its pollution globally. Four standards for evaluating the sustainable development policy, which are proposed by Goodland and Daly (1996) and Daly and Farley (2011), are considered to be a concise and easily understandable theoretical framework for research on urban sustainable development. These standards are:

environmental implication should be less than carrying capacity of the environment; utilization of renewable resources should be less than the speed of regeneration; waste generated by human beings should be less than the absorbing ability of nature; and utilization of non-renewable resources should be less than the speed of replacement by other non-renewable resources in different forms.

More articles explore the urban sustainable development based on the relation between the economy, resources and environment. As a manufacturing entity, the economic activity of a city will produce material products through input of labour force, raw material and capital etc. (Wheeler and Beatley, 2014). This will on the one hand meet the requirement and living needs of citizens and society, and on the other hand its secondary product or waste will also bring inconvenience to people. Production and economic output will constantly be expanded due to the unceasing expansion of a city and its population; therefore, the impact will also constantly increase. Although for many cities, improving production efficiency and outcome of material product can ensure a vigorous and vitalized future, WHO (Organization, 2016) put forward that the sustainable development of a city shall make the economy more efficient, stable and innovative by requiring minimum utilization of resources. Rodwin *et al.* (2013) believe that if a city maintains the stability on a long-term basis among its economy, resources and environment, this city can consolidate the position and role of the urban system and explore its potential to develop high quality of society, economy and technological outcome.

In addition, there are some research and literature on urban sustainable development from the sociological perspective. Weingaertner and Moberg (2014) proposed that the sustainable development of a city requires pursuance a state in which the interaction between human beings, information spreading and culture can be greatly improved, and marked by being vigorous, stable and equitable and without any crimes. Knox and Pinch (2014) also pointed out that the social characteristics of a sustainable city should include two aspects: firstly, a sustainable city is like a Living City which promotes a healthy urban service in conjunction with ecological protection. A city shall not simply be viewed as a single entity but also should consider making different environments meet the requirement of different ages and lifestyles. Secondly, a sustainable city should be a participatory city which enables everyone including the public, organizations, governmental agencies and the private business sector actively take part in the discussion of urban issues and decision-making.

3.3 Models of sustainable development

Over several years there have been further models of sustainable development designed. The 2030 agenda for sustainable development and its 17 sustainable development goals (figure 3) was proposed and approved at the General Assembly of the United Nations in September 2015, to take effect on January 1, 2016 (UN, 2018). This means that sustainable development is of great significance to all countries and people.



Figure 3: 17 sustainable development goals. Source: United Nations (2018)¹⁴.

The United Nations (UN, 2018) considered that, “*For sustainable development to be achieved, it is crucial to harmonize three core elements: economic growth, social inclusion and environmental protection. These elements are interconnected and all are crucial for the well-being of individuals and societies.*” The main model of sustainable development consists of three dimensions: society, economy and environment. The 3-legged stool model (figure 4) emphasizes the importance of three dimensions that jointly support sustainable development (Dawe and Ryan, 2003). However, this model puts the three dimensions on an equal position, which means if any one dimension is different, the whole model cannot reach a balance. It

¹⁴ Available from: <https://www.un.org/sustainabledevelopment/news/communications-material/> (Accessed: 19 September 2018).

ignores the important connection between the three dimensions that can compensate and balance each other.



Figure 4: 3-legged stool sustainability model. Source: Hummel (2016)¹⁵.

However, a model based on three overlapping circles (figure 5) recognizes that the three dimensions have both separate content and some overlapping content (Connelly, 2007). This shows the relationship between the three dimensions but it does not reflect the differences among the three dimensions and cannot explain the dependency relationship between them (Todorov and Marinova, 2009). Different stakeholders have obvious differences in the three dimensions. For example, businessmen pay more attention to the economic dimension, because economic benefits are crucial to their success. Urban residents may attach more importance to social contacts and a good living environment because it is closely related to their life. It is worth noting that the three dimensions are all separate dimensions in these two models, which suggests that the economy can exist independently of society and environment. However, this uncoordinated relationship does not fully conform to the core concept of sustainable development.

¹⁵ Available from: <https://nexuspointblog.wordpress.com/2016/02/01/social-sustainability-the-shorter-leg/> (Accessed: 19 September 2018).

3-Overlapping-Circles Model

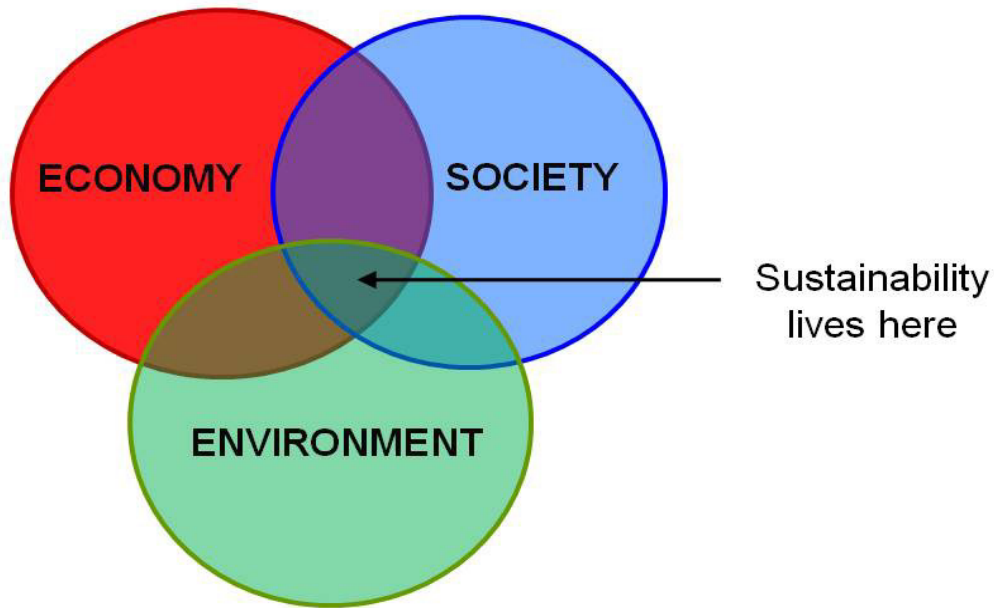


Figure 5: 3 overlapping circles model. Source: Willard (2010)¹⁶.

On the basis of the above-mentioned two models, the 3 nested dependencies model (figure 6) emphasizes the symbiotic and dependent relationships among the three dimensions (Flint, 2013). People have created the economy and decided which economic model to use (Todorov and Marinova, 2009). If they find that the current economic model cannot improve their quality of life, they can choose to change that model. In turn, the good or bad economic situation will also affect the social relations between people. However, both the economy and society are embedded in, and depend on, the environment. Although this model shows the relationship between the three dimensions, it does not take into account the time dimension, that is, the dynamic connection mentioned in section 3.1.

¹⁶ Available from: <https://sustainabilityadvantage.com/2010/07/20/3-sustainability-models/> (Accessed: 19 September 2018).

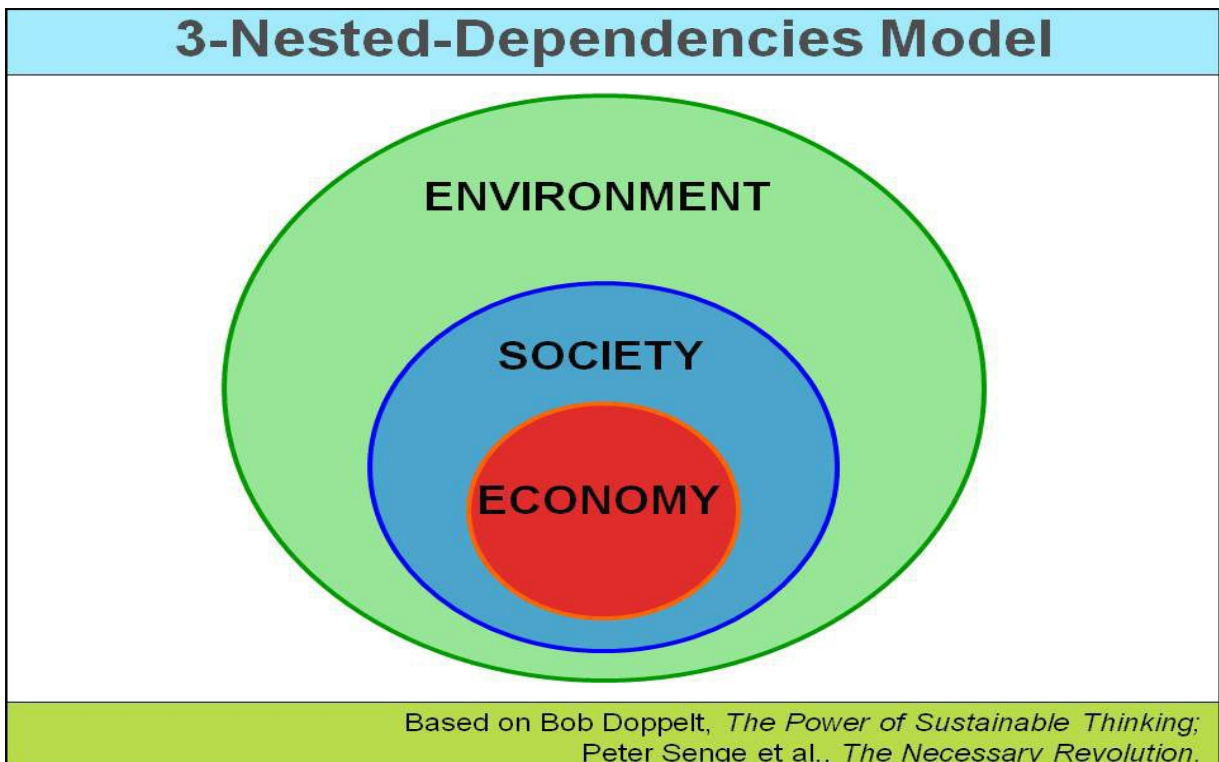


Figure 6: 3 nested dependencies model. Source: Willard (2010)¹⁷.

A more recent model is the two - tiered sustainability equilibrium model (figure 7) (Lozano, 2008). First, the three dimensions of economy, environment and society overlap each other in disjointed and non-concentric circles. This suggests that they have different agendas at their centre. This first stage describes the interdependence of the three dimensions on a single time node, usually representing the present. Next, the dimensions are seen to completely overlap each other, in equilibrium. This is referred to by Lorenzo as the First Tier Sustainability Equilibrium. Finally, Lorenzo presents the dimensions as a cylinder, to acknowledge the time dimension as the Second Tier Sustainability Equilibrium. This indicates that the current decision on sustainable development also has a dynamic influence on the availability of future sustainable development decisions.

¹⁷ Available from: <https://sustainabilityadvantage.com/2010/07/20/3-sustainability-models/> (Accessed: 19 September 2018).

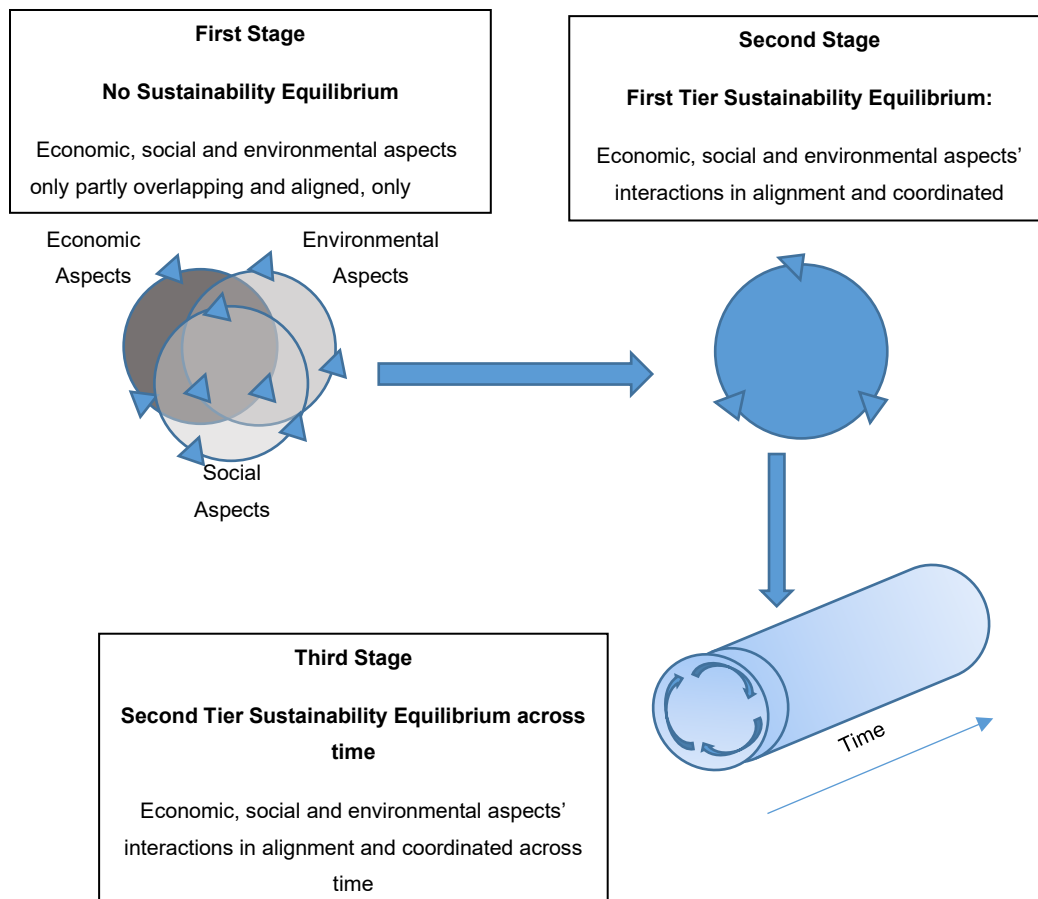


Figure 7: Two-tiered sustainability equilibria model. Source: Author (2018). Adapted from Lozano (2008).

In summary, the model that best represents sustainable development is the two tiered sustainability equality model, because it not only considers the complex relationships among the three dimensions of society, economy and environment, but also includes the dynamic changes brought about by the time dimension. However, more work and discussion are needed to prove whether this model is fully applicable to urban agriculture, especially considering the perspective of different stakeholders.

3.4 Sustainable development and urban agriculture

So far, there is no standard way to evaluate the sustainability of urban agriculture (Pearson *et al.*, 2010). The literature usually focusses on the role of urban agriculture according to the three dimensions of sustainable development which are society, economy and environment, or to understand the role agriculture plays in the process of urban sustainable development. Drechsel and Dongus (2010) analysed the changes of agricultural open space in the city of Dar es Salaam in Tanzania from 1992 to 2005 and compared it with other cities. They used the FAO Framework for the Evaluation of Sustainable Land Management (FESLM) to evaluate the

sustainability and dynamic effects of agricultural production on land use in sub-Saharan African cities. Ultimately, they argued that agricultural production in urban open spaces is a feasible, dynamic and sustainable strategy of solving livelihood issues for poor urban residents. Raschid-Sally and Jayakody (2009) considered that agriculture in the city has greater potential to impact and solve environmental and health problems, after they analysed 53 cities in developing countries worldwide. Especially, in three-quarters of the cities, they argued that safer agricultural irrigation plays an important role in the sustainable use of urban water resources and the treatment and use of polluted water. As a result, from the perspective of environmental sustainability, urban agriculture is used to improve the relationship between the health of urban residents and the environment (Leake *et al.*, 2009). Ackerman *et al.* (2014) took New York City as an example to show that urban agriculture, as a form of green infrastructure, plays an important role in the sustainability of the urban environment. Urban farms and community gardens can help reduce the urban heat island effect, relieve the impact of urban rainwater, and cut down energy consumption in food transportation. Cohen and Reynolds (2015) show that the urban agricultural system in New York is unequal, and there are huge differences in the access to resources around the city.

Actually, this process of coordinating resources should be a dynamic, democratic decision-making process. Cohen and Reynolds (2015) argue that sustainability needs to be based on fairness, even if social justice is not a specific goal that urban agricultural stakeholders seek. With the passage of time, urban agriculture has the potential to ensure urban sustainable development and equality. For example, working in a city farm or community garden can mitigate some injustices in terms of race, gender and economy to a certain degree. At the same time, places where residents can gather together, such as gardens or roof top farms, can also strengthen the social and cultural identity of urban residents.

Based on these ideas, some literature attempts to explore the possibility of sustainability in urban agriculture in other ways. Holmer and Drescher (2005) pointed out that urban planners should firstly study land features and draw green infrastructure through spatial data using Geographic Information Systems (GIS), which can provide support for evaluating the function of urban agriculture in the sustainable development of cities. Secondly, after understanding, through literature and existing studies, other cities using urban agriculture, and cities with similar

characteristics but limited urban agriculture, the impact of an agricultural system on urban environmental planning and sustainability can be evaluated through research projects, data collection and other methods (Tress and Tress, 2003). In this way, urban agriculture can be incorporated into the city's future landscape alternatives and compared according to various sustainability indicators selected by experts and / or stakeholders. This would help to provide decision makers with different plans for sustainable land use in cities (Walz *et al.*, 2007). Pearson *et al.* (2010), through a thorough review of the literature, suggested that sustainability could be achieved through a new institutional environment willing to strategically determine the principles of sustainable urban agriculture, so as to help policymakers design resilient cities and test innovative systems and mechanisms in business. For example, the development of African cities can increase the demand for urban food, yet there are limited farming options for family-oriented urban farmers. All these structural and institutional changes could affect specific policies.

Specht *et al.* (2014) set forth 'Zero-acreage farming' (ZFarming) to describe urban agriculture activities that do not use farmlands or open spaces. In this scenario, agricultural production, architectural design and technology are combined to show that green urban buildings can produce food, on a large scale, either on the surface or inside of buildings. Lastly, a framework of sustainability was used to evaluate the significance and limitations of ZFarming, indicating that it has the potential of realizing a win-win situation for both sustainable development and urban development.

On the basis of the review of different functions and models of urban agriculture in chapter 2, tourism is a unique and important aspect and manifestation of urban agriculture in this thesis. Therefore, it will be discussed with sustainable development separately in the next section.

3.5 Sustainable development and tourism

3.5.1 Sustainable tourism development

The relationship between tourism development and environmental protection has become an important topic within sustainable development. Cater (1995) considered that there are four fundamental development patterns (including win-win, win-lose, lose-win and lose-lose) in respect of the environment and tourism development. Likewise, Hunter (1997) pointed out four common patterns of tourism development,

including priority given to the environment, tourism development following the environment, environmental protection following tourism and priority given to tourism. Godfrey (1998) noted that sustainability development is a crucial concept for reducing negative impacts of tourism. However, for sustainable development of tourism, more attention should be paid to social and environmental factors as much as short-term economic benefits. Besides, it was advocated that sustainable development of tourism should be achieved by integrating interested tourism departments. Clayton (2002) agreed with this view as well. Thereafter, Johnston and Tyrrell (2005) examined relationships between environment and economy more intensively from the perspective of tourism development. They thought that there were no simple and universal ideal models of sustainable development, because policies excessively highlighting environmental protection and leading to environmental deterioration would cause tourism to be unsustainable. By evaluating and comparing impacts of some special tourist products, Hunter and Shaw (2007) considered that some ecological tourism products would positively contribute to conserving resources on a global basis. The tourist communities have become increasingly important in examining models for sustainable development. Apart from governance of tourism, Bramwell and Lane (2010) proposed in their discussion of sustainable tourism that adequate importance should be attached to tourists and the public of communities. Matarrita-Cascante *et al.* (2010) explored how to implement economic, social and environmental practices through community organizations in the course of developing tourism. In addition, Turnock (1999) and Fons *et al.* (2011) discussed models of sustainable development for rural tourism. Based on the theory on consumers' pyramid, Kozak and Martin (2012) explored homogeneity of development patterns in tourist areas. After comprehensively studying patterns for sustainable development of tourism, Weaver (2012b) thought that sustainable development of tourism is generally achieved through three approaches, those of market, governance and a comprehensive approach. The proposal of these three approaches indicates that sustainable tourism is cognized to be environmentally pragmatic in the academic circle and practices. However, Peeters (2012) opposed this viewpoint, deeming that Weaver's views were somewhat inconsistent with systematic ideas and somewhat biased. Subsequently, Weaver (2012a) pointed out in his essay that although Peeters's doubts were definitely correct, the above three evolutionary approaches are still quite valuable for being used as references under existing theoretical assumptions without considering dynamics and uncertainties

affecting sustainable tourism. These two scholars' arguments generally reflect research findings about current models of sustainable tourism development.

In 1998, Garrod and Fyall (1998) put forward that research focus may be shifted from the definition of sustainable tourism development to the practices, establishing a framework for measuring sustainable tourism. As people are acquiring an increasingly deeper understanding on connotations of sustainable tourism development, evaluation indicators for sustainable tourism development and their application are constantly developing as well. For instance, there is a growing amount of culture-related studies about sustainability, whereas studies on sustainability of the economy, environment and market are decreasing. Evaluation indicators have developed from qualitative to quantitative ones. At present, quantitative indicators are used in combination with qualitative ones. Various planning frameworks are applied in developing evaluation indicators for sustainability, such as carrying capacity, acceptable changes, tourists' preferences and experiences, destination life cycle, comfort indicators and tourists' impacts on management. Pertinent research has developed from evaluation of sustainable tourism in ordinary tourist destinations to assessment of some special tourist destinations. Miller (2001) explored roles of consumers' pressure in evaluation indicators for sustainability and highlighted the importance of consumers.

Tepelus and Cordoba (2005) considered that cultural, economic and social impacts of tourist behaviours should also be included in evaluation indicators for sustainable tourism in addition to common environmental performance indicators. Thereafter, a lot of literatures extended this research idea (Ko, 2005; Blancas *et al.*, 2010; Castellani and Sala, 2010; Cernat and Gourdon, 2012), namely evaluation indicators were comprehensively established for sustainable tourism development from the perspective of population, economy, environment and resources, etc. Besides, some scholars have established evaluation indicators for sustainable tourism in special tourist destinations. For instance, Teh and Cabanban (2007) evaluated the sustainable development capacity of marine tourism. Assessing dimensions of urban agricultural ecotourism and comparing the importance of different dimensions, Wu *et al.* (2010) considered that economic factors were not as important as social or environmental factors, but that community residents' factors were fairly important for evaluating urban ecotourism. Blancas *et al.* (2010) also put forward a sustainability

evaluation index system for cultural tourist destinations according to theories of target planning from the perspective of information interpretation and decision-making.

3.5.2 Ecotourism

Concerning connotations of ecotourism, importance is attached to protection of natural landscapes and the sustainable development of tourism. Therefore, ecotourism is considered as one of the important practical models for sustainable development of tourism. From studies about ecotourism, Stronza (2001) discovered that most studies about the origin of tourism focused on tourists, while impacts of tourism were explored from the perspective of destinations. Thus, social, economic and environmental benefits of ecotourism to local areas should be comprehensively examined by exploring tourists' motives and impacts as well as origin and influences of destinations. To explore this point, Li (2004) established an index system of ecotourism management according to a pressure-state-response model, while Weaver (2005) pointed out the importance of comprehensive consideration in ecotourism development. Recreation and public health are extremely important in the highly urbanized areas (De Vries *et al.*, 2003). The agricultural production is dominant in the use of land in peri-urban areas, but it also brings about more benefits (Bryant and Johnston, 1992). As the study of north-east England shows (Sharpley and Vass, 2006), a tourist attraction is needed among the people based on a large number of visits to the countryside nearby the city. As a survey of urban residents in Brussels found, a few people, about 24%, take advantage of the diversified measures oriented by entertainment (Boulanger *et al.*, 2004). Tsaur *et al.* (2006) analysed connections among resources, areas and tourists during sustainable tourism development as well as their mutual understanding. What is more common, the visitors enjoy the suburban landscape informally. As Agger and Council (2001) argue, agriculture makes it easier for various activities, such as walking and hunting. More convincing, suburban farmland is equipped with entertainment value, which is appreciated by city residents. The city is required to add more open space in order to meet the growing demand for green areas, including arable land with huge valuable potential, and entertainment and leisure to improve the quality of life. By investigating tourism companies and foreign tourists, Gurung and Seeland (2008) found that tourists fond of natural scenery stayed longer than those enthusiastic about cultural landscape, which was favourable for developing ecotourism in local rural communities. Krider *et al.* (2010) examined characteristics of tourists' attitudes

toward the environment and ecotourism. With an overview of development of ecotourism research on a global basis, it may be found that interactions between tourists and tourist areas have been always concerns of scholars. In fact, Weaver and Lawton (2007), as well-known tourists, evaluated such a status quo in their work in 2007. They considered that it was also urgent for them to pay attention to exploring quality control over ecotourism, the ecotourism industry and external environment and so on. Nevertheless, there are very few research findings about multiple disciplines across social and natural disciplines. Hence, it is considered in this thesis that there is still potential for exploring sustainable tourism development by integrating different social disciplines with urban agriculture.

3.5.3 Agricultural tourism (Agri-tourism or Agro-tourism) – a typical practice for sustainable development in urban agriculture, combined with tourism

Based on the above sections, agricultural tourism attracts tourists or visitors to one or many regions for agricultural purposes. Usually, sightseeing alone can attract a large number of tourists (Hui and Mu, 2015). Such a mode is contradictory to the small owners' hope to increase agricultural input through attracting sightseeing, while agro-tourism is the opposite. From this point of view, agricultural tourism is a kind of industrial sightseeing tourism. As Zhang *et al.* (2008) indicates, tourists pay visits to operations and products related to agriculture as well as rural life, customs and habits, including agricultural skills, gardening skills, forests, livestock, sericulture, aquatic production, agricultural processing, agricultural machinery, water and soil conservancy, agricultural economy, agricultural promotion, agricultural cooperation and agricultural education. By their research, agricultural tourism includes recreational sightseeing for the purpose of realizing mental and physical adjustment, getting rid of exhaustion, cheering up and making innovation and creation. In other words, it refers to making use of the site, equipment, product, operation and research achievements in agricultural production and organization to provide sightseeing and relaxation for tourists. With this process, agricultural tourism can be seen as a "new" industry for cities combined with some characteristics of agriculture, tourism and economies, such as a model of a large-scale enterprise-based agriculture and tourism as shown in figure 8.

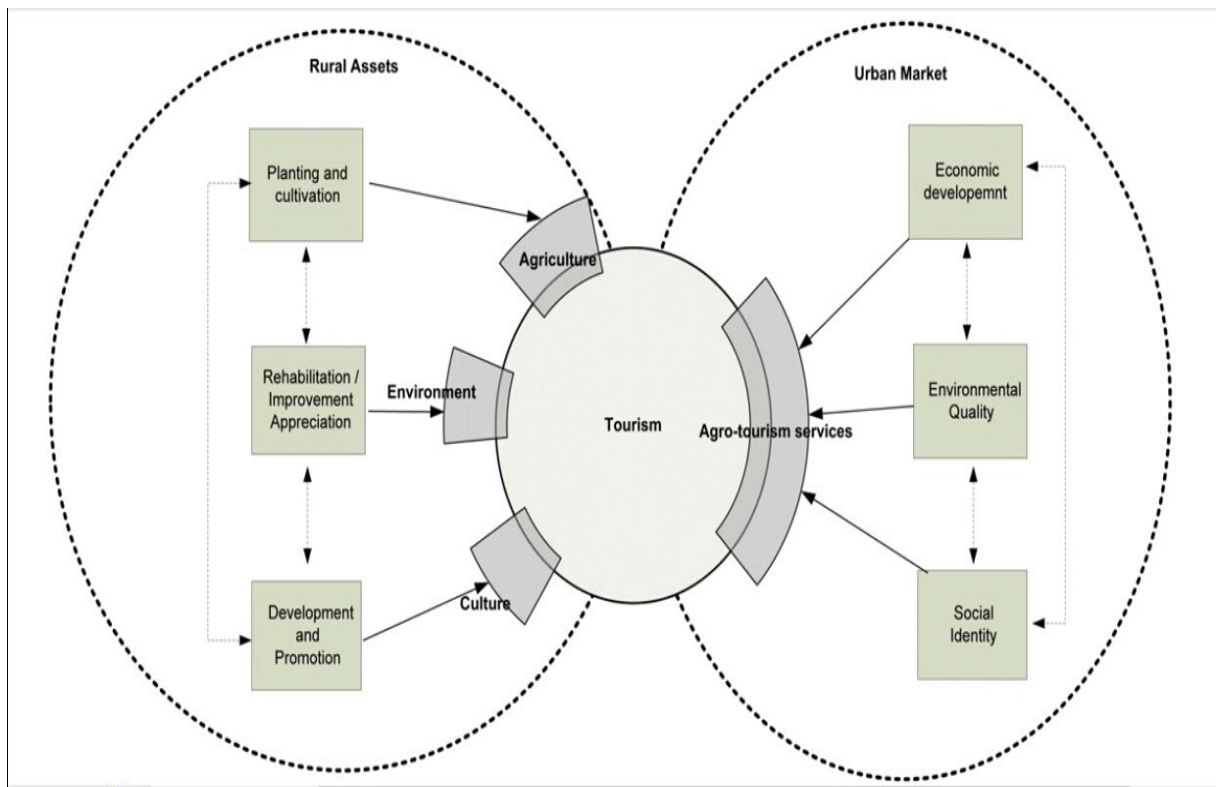


Figure 8: A model of a large-scale enterprise-based agriculture and tourism. Source: Yang *et al.* (2010).

Therefore, agricultural tourism in this thesis is defined as a special agricultural form, which is an entertaining farming activity that is combined with tourism. It mainly makes use of the local favourable natural conditions to open up activity places. According to the different contents and scopes, agricultural tourism is classified into a broad and narrow sense. In the narrow sense, it bases on agricultural resources and injects the connotation of tourism into plantation sightseeing, exhibition of agricultural skills, supply of agricultural products and transfer of agricultural space as well as other agricultural production and business. In addition, agricultural production and business is combined with tourism. Through optimizing the structure of agricultural production and structure of types as well as planning the layout reasonably, landscape beautification, environmental protection, sightseeing tourism, labour allocation, fresh food learning and tasting can be realized. In a broad sense, agricultural tourism refers to making use of rural areas in a wide range, developing agricultural natural resources and rural cultural resources, expanding the sightseeing tourism functions in rural areas, and satisfying tourists' demands at different levels. It not only includes the traditional agricultural production and business, but also agricultural sightseeing tourism and related tourism business, tourism services and

so on. It can be explored into some special form based on the rich culture in China such as “Nongye guanguang yuan”¹⁸ (Translated as Agricultural Park which can be seen in section 4.5.1) and “Nongjiale”¹⁹ (Translated as Happy Farm House which can be see section 4.5.2).

3.6 Conclusion

This chapter has explored the concept of sustainable development and the models which have been presented to conceptualize it. The author suggests that, because of the inclusion of the temporal dimension, the most suitable model to represent sustainable development, in the context of urban agriculture, is the two-tiered sustainability equality model (Lozano, 2008). It not only considers the complex relationships among the three dimensions of society, economy and environment, but also includes the dynamic changes brought about by the time dimension.

It can be seen that the literature on sustainable development and urban agriculture mainly adopts case studies and descriptive research as the research methods. The sustainable elements of urban agriculture, including society, economy and environment are emphasized. It can also be seen that the extensive functions provided by urban agriculture afford a possibility of multi-functional land use for the sustainable development of the city. Particularly, agricultural tourism provides distinctive services and supplies with rural features in terms of food, accommodation, transportation, entertainment and shopping as well as satisfies urban residents' eagerness for natural scenery and rural culture.

The models of sustainable development highlight the interconnectedness of society, economy and environment within sustainable development. They now acknowledge the importance of understanding the dynamics of these connections across time. Studies clearly show that urban agriculture has a role to play in supporting sustainable development. For decision makers, many successful cases highlighted in literature can show that protecting existing agricultural land in urban areas and expanding agriculture in some areas are helpful to the sustainable development of cities. For city planners, on the basis of providing certain production benefits, city agriculture balances input and output, recycles wastes, reduces energy use and optimizes green infrastructure, which is in line with the sustainable development goal.

¹⁸ Transliteration from Chinese name “农业观光园”

¹⁹ Transliteration from Chinese name “农家乐”

Urban residents can participate in agricultural activities through additional different types of urban agricultural projects, thus deepening the connection between human beings and nature.

However, there appears to be no model that puts urban agriculture at the very heart of sustainable development. Nevertheless, as a scheme of urban sustainable land use, urban agriculture may have a much more significant role to play in sustainable development. One of the most important issues to emerge from the literature review is that it has acted to make the author question if China's new model of urban agriculture could act as a basis for sustainable development, rather than simply as a contribution to sustainable development.

Chapter 4 Understanding the Chinese Context

4.1 Introduction

The Chinese Government and administration, as well as terminology, are very different from UK or Western ways. It can be very difficult to understand how things translate between languages and practices. This chapter seeks to help the reader understand the Chinese context as the basis for the study. First it discusses the structure of Chinese city administration to clarify the way in which the terms urban, desakota and exurban are used. Next it highlights the unprecedented change which has taken place in China in recent years. It shows how life has changed as the economy has grown and the Government has encouraged urbanization. Following this, the chapter identifies some of the concerns which are beginning to develop about the problems of urban life, including a poor environment and the stress of urban living, which the Government is hoping to address through its new focus on urban agriculture.

Finally, it explores the history and current situation of urban agriculture in China and the context of Beijing in particular. It discusses the evolution of the terms used to describe urban agriculture and highlights the Government's efforts to introduce it further into the urban area.

4.2 Understanding the Chinese city-Beijing as a example

The administration of Chinese cities is quite difficult to understand. This section will attempt to explain, using Beijing as an example. It starts by explaining the administrative division of the country.

Under Article 30 in Constitution of the People's Republic of China²⁰, the administrative division of the People's Republic of China is as follows:

1. The country is divided into provinces, autonomous regions and municipalities directly under the Central Government;
2. Provinces and autonomous regions are divided into autonomous prefectures, counties, autonomous counties, and cities;

²⁰ It was published in Chinese. Available from: http://www.npc.gov.cn/npc/xinwen/node_505.htm (Accessed: 19 September 2018).

3. Counties and autonomous counties are divided into townships, nationality townships, and towns.

Municipalities directly under the Central Government, and other large cities, are divided into districts and counties. Autonomous prefectures are divided into counties, autonomous counties, and cities.

This section will use Beijing as a typical example to explain the administrative division and make a clear distinction to divide 'urban core', 'desakota'²¹, and 'exurban'²², which have been identified in chapter 2. Beijing is a municipality and part of the Jingjinji metropolitan region, as well as the national capital region of China. However, in the People's Republic of China, a direct-controlled municipality is a city with equal status to a province. Also, for Westerners, because of Beijing's extreme size and the fact that each of its divisions/districts has an urban core within it, it is easier to think of Beijing as another province. Beijing is divided into four types of district, described as:

1. Core District of Capital function – can be thought of as urban core.
2. Districts of Urban function – can be thought of as a combination of urban area and desakota.
3. New Districts of Urban development – can be thought of as desakota.
4. Ecological Development Preservation Districts – can be thought of as exurban.

It is important to understand that Beijing is extremely built up and urbanized across its entire area, with only Ecological Development Preservation Districts having any open rural space (see figures 9 and 10).

²¹ Most Chinese articles have translated this area from “城乡结合部” into suburb.

²² Most Chinese articles have translated this area from “城郊” into country.

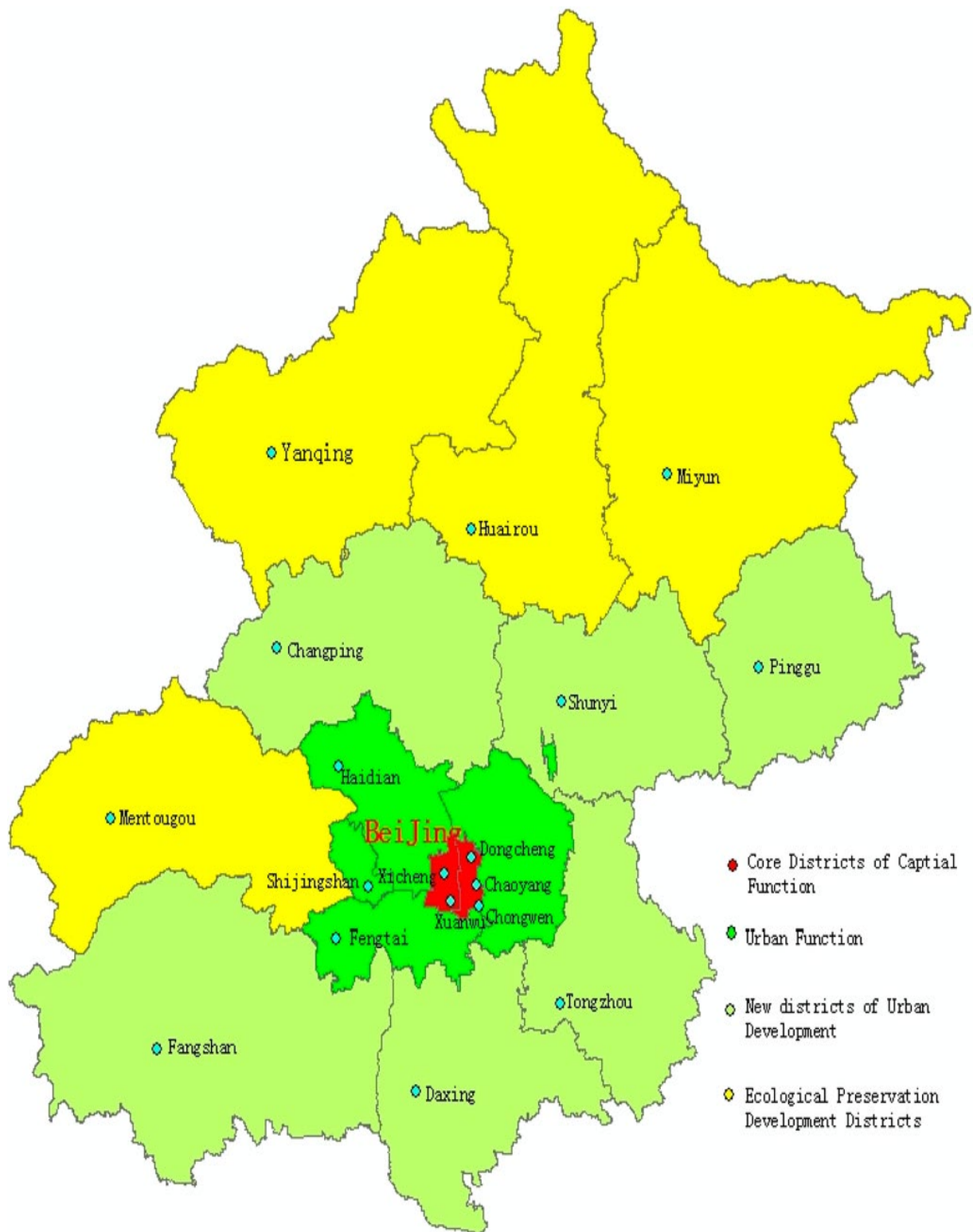


Figure 9: Administrative divisions of Beijing Map English Version. Source: Zong *et al.* (2015)²³.

²³Available from: http://www.mdpi.com/sustainability/sustainability-07-09587/article_deploy/html/images/sustainability-07-09587-g001-1024.png (Accessed: 19 September 2018).



Figure 10: Administrative divisions of Beijing Map English Version. Source: Future time line²⁴.

The Beijing Government published 'Beijing's Main Functional Area Planning' ²⁵in 2017 as an official policy and strategy for the following 13th Five-year Plan (2016-2020). In this planning, the four categories of functional areas, listed above, were created by the government to replace the old categories (urban districts, near or

²⁴ Available from: <http://www.futuretimeline.net/21stcentury/images/china-beijing-districts-coal-2020-map.jpg> (Accessed: 19 September 2018).

²⁵ It was published in Chinese. Available from: <http://fgw.beijing.gov.cn/zwx/ztl/sswqh2016/ghwb/201703/P020170315347908873205.pdf> (Accessed: 19 September 2018).

inner suburbs, outer suburbs and counties) to guide the development of Beijing urban planning. These four functional areas cover the whole area under Beijing's jurisdiction, with a total area of 16,410.5 km². The total regional economic output value ratio of these four categories of functional areas is 23:47:26:4; the resident population ratio is 11:49:27:13; and the land area ratio is 0.6:7.8:23.0:68.6.

Regarding this planning strategy, the following four paragraphs are a summary of it as translated by the author.

The capital function core area, including the East urban (Dongcheng) district and West urban (Xicheng) district, covers 32 sub-districts and a land area of 92.4 km², with a total resident population of 2.162 million. This region is the completely urbanized area with the highest development intensity in this city. The main function is to optimize the development. At the same time, it also needs to protect the prohibited development areas such as the Imperial Palace within the region, and appropriately restrict the related functions that are in inconformity with the core area.

The urban function expansion area, including Chaoyang District, Haidian District, Fengtai District, and Shijingshan District, covers 70 sub-districts, 7 towns, 24 townships, and a land area of 1,275.9 km², with a total resident population of 9.554 million. This area is the incompletely urbanized area with relatively high development intensity in this city. The main function is to focus on the development and insist on the high-end industries, development internationalization, and urban and rural integration. At the same time, it needs to optimize and improve the Central Business District (CBD), Zhongguancun core area and other relatively mature high-end industrial functional areas, and strictly protect the prohibited development areas such as the Summer Palace and Xishan National Forest Park.

The urban development new area, including Tongzhou District, Shunyi District, Daxing District (Beijing Economic and Technological Development Zone) and the plain regions in Changping District and Fangshan District, covers 24 sub-districts, 56 towns, 1 township, and a land area of 3,782.9 km², with a total resident population of 5.418 million. This is the area with the largest development potential in this city, where the urbanization needs to be improved. The main function is to focus on the development and accelerate the key new town construction. At the same time, it needs to optimize and improve the Linkong Economic Zone, Beijing Economic and Technological Development Zone and other basically mature high-end industrial

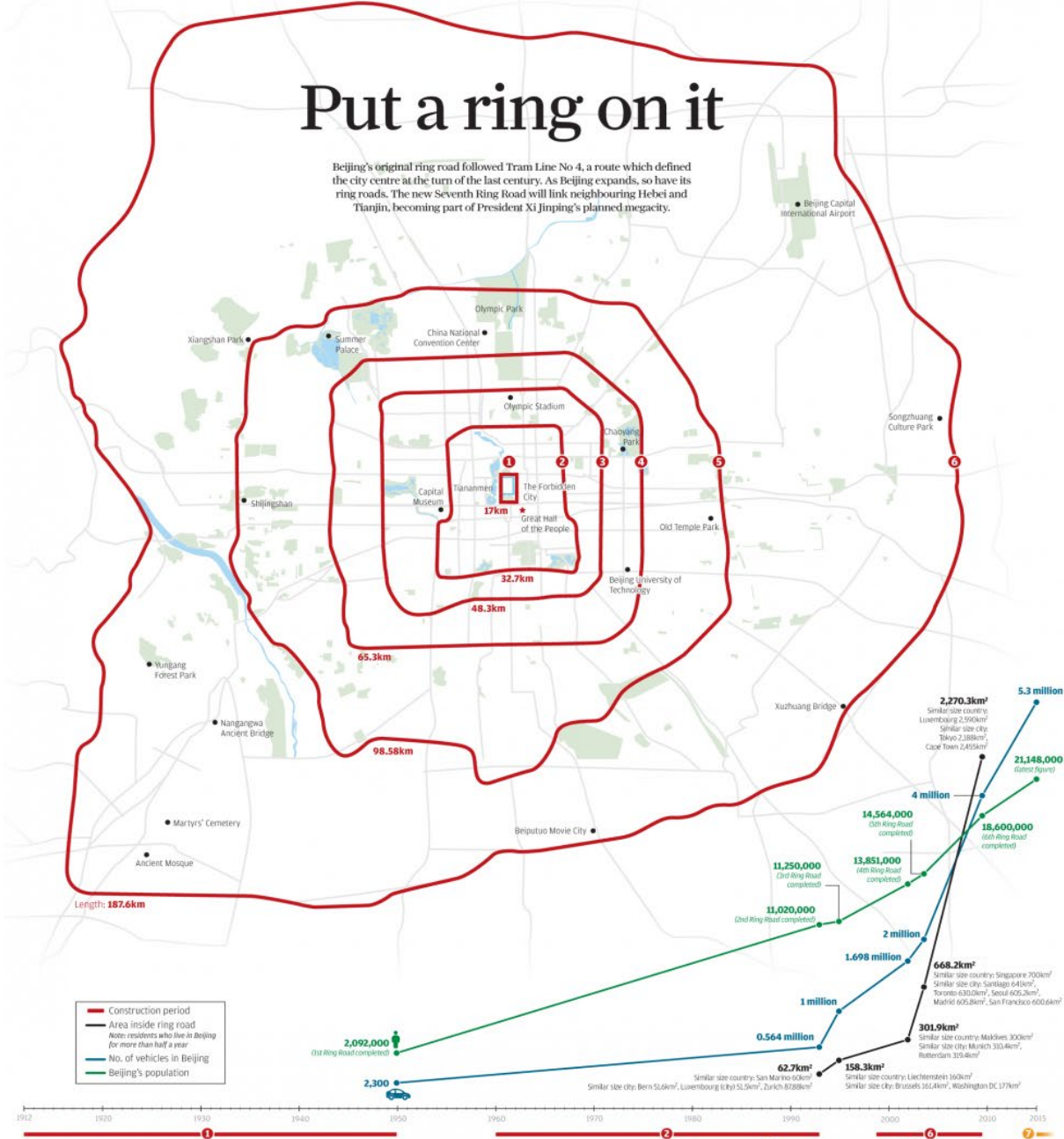
functional areas, and strictly protect the prohibited development areas such as Hanshiqiao Wetland Nature Reserve.

The ecological conservation development area, including Mentougou District, Pinggu District, Huairou District, Miyun County, Yanqing County and the mountainous areas in Changping District and Fangshan District, covers 14 sub-districts, 79 towns, 15 townships (including 7 towns in Changping District, and 1 sub-district, 9 towns and 6 townships in Fangshan District), and a land area of 11,259.3 km², with a total resident population of 2.478 million. This area is the important region for guaranteeing the ecological security and water resource conservation in this city. The main function is to restrict development and the large-scale high-intensity industrialization and urbanization development. It focuses on the cultivation of tourism, leisure, fitness, cultural innovation, ditch areas and other industries, and promotes the construction of new towns, small towns and new villages. It also needs to strictly protect the prohibited development areas such as the Great Wall and Badaling-Ming Tombs Scenic Area.

There is another way to classify the area of Beijing, namely 'Beijing Ring Roads' (see figure 11). Based on this method, the city centre (capital function core area) is the area inside the 2nd Ring Road. The urban area (urban function expansion area) is the area between the 2nd Ring Road and the 5th Ring Road. The desakota area (urban development new area) is the area between the 5th Ring Road and the 6th Ring Road. The exurban area (ecological conservation development area) is the area outside the 6th Ring Road.

Put a ring on it

Beijing's original ring road followed Tram Line No 4, a route which defined the city centre at the turn of the last century. As Beijing expands, so have its ring roads. The new Seventh Ring Road will link neighbouring Hebei and Tianjin, becoming part of President Xi Jinping's planned megacity.



1st Ring Road
Completed: **During the Republic of China (1912-1949)**
Route: **Tiananmen - Xidan - Xisi - Pinganli - Dianmen - Gulou - Jiaodaokou - Dongdan - Tiananmen**
Note: Not the official name. Developed from an old tram line (Line No 4) that was in operation from the 1920s to the 1950s, which was known as the "Bao Road".

2nd Ring Road
Construction began: **1960s**
Completed: **1992**
Note: The old 2nd Ring Road was first built based on the inner city walls. The expanded southern part was built based on the outer city walls. It now forms a rectangular loop around central Beijing, an area that is roughly equivalent to the old city. When the expansion was completed in 1992, the 2nd Ring Road became the first enclosed elevated expressway without traffic lights.

3rd Ring Road
Construction began: **1980s**
Completed: **1994**
Route: **The ring road runs through the busy central business district in the east through Panjiayuan and Fenzhongsi, linking up with the Jingjintang Expressway. It continues south toward Muxiyuan and Yuqianying, linking up with the Jingka Expressway. It then proceeds west, linking up with the Jingshi Expressway before running into the western segment, which is linked with the Wuosong residential area, television broadcasting centres, and, in the northwest, Zhongnancun IT zone. The northern segment is equally busy, running through Beitaitinghuang, with links to the Badaling Expressway and the Jingcheng Expressway.**
Note: In 1950s, the 3rd Ring Road existed only in segments encircling the northern, eastern and southern parts of the city. At the time, it was known as Beihuan (North Ring), Donghuan (East Ring), and Nanhuan (South Ring). There was no official "3rd Ring Road" on the map of Beijing. The western segment was completed in 1981, and the whole ring was officially named the "3rd Ring Road". The 3rd Ring Road was finally completed as an expressway in 1994.

4th Ring Road
Construction began **1990**
Completed: **2001**
Distance to city centre: **8km**
Route: **Siyuan Bridge - Chaoyang Park Area - Sihui - Sifang Bridge - Shibailidian - Dahongmen - Majialou - Yuegezhuang Bridge - Fengtai Area - Sijiqing Area - Zhongnancun Area - Jianxiang - Asian Games Village Area - Wanghe Bridge - Siyuan Bridge**

5th Ring Road
Construction began: **January 2000**
Completed: **October 2003**
Distance to city centre: **10km**

6th Ring Road
Construction began: **December 1998**
Completed: **September 2009**
Distance to city centre: **15-20km**
Route: **Liyuan Bridge - Liqiaozhen - Sanhui Bridge - Zhangjiawan - Majuqiao - Huangcun - Liangxiang - Mentougou - Zhalkou/Wenquan - Xishatun - Gaoliying - Huosiying - Liuyuan Bridge**

7th Ring Road
Construction expected to begin: **2015**
Note: The 7th Ring Road encircles the city limits of Beijing and links the neighbouring provinces and cities.

These countries have about the same size population as Beijing:

Beijing	Sri Lanka	Australia
21,148,000	20,483,000	23,130,900
Area: 16,410.54km ²	65,610km ²	7,692.024km ²



Sources: Beijing Municipal Statistics Bureau, The World Bank (2013)

SCMP graphics: Joe Lu

Figure 11: Beijing Ring Roads. Source: Infographic on South China Morning Post²⁶.

In China, academics must translate their article abstracts into English. In this process, most scholars translate words referring to peri-urban or other areas surrounding a city as ‘suburb’ (‘suburb china’ has 63,700 results in Google Scholar). This is true for many disciplines, for example land science, environment science, urban planning, and regional development. Comparing the articles before and after ‘Beijing’s Main Functional Area Planning’, table 3 lists the relationship and connections among these phrases. In most Chinese articles, ‘urban area’ means urban district and near (inner) suburbs, ‘suburb area’ means ‘outer suburbs’ and ‘rural area’ means ‘counties’.

In this thesis		In Chinese articles’ translation	Beijing’s Main Functional Area Planning	Beijing’s Ring Roads System	Other Possible Phrases
Urban	Urban Core	Urban District	Capital function core area	Inside 2 nd Ring Road	Urban central area
	Urban Area	Near (Inner) Suburbs	Urban function expansion area	2 nd to 5 th Ring Road	Urban area
Desakota		Outer Suburbs	Urban development new area	5 th to 6 th Ring Road	Suburb, outskirts
Exurban		Counties	Ecological conservation development area	Outside 6 th Ring Road	Rural

Table 3: Relationship among phrases. Source: Author (2016).

4.3 Changes and the problems of contemporary Chinese cities

After 1949, China endured a tortuous process of urbanization. Until the implementation of reform and opening up policy in 1979, there was very little urbanization or modern urban planning in China. However, in the 1980s, due to severe shortage of supply of various infrastructure facilities in the city, and lack of capital investment on large-scale urban construction, the Central Government promoted the development model of township enterprises "away from land but not the countryside". This meant that the focus should shift from agriculture to other economic activities but remaining in the countryside or rural area and making small towns become the focus of development in this period. Academics usually refer to this period as the ‘rural urbanization period’ (Cui and Ma, 1999). During 1980-1990,

²⁶ Available from: <https://www.scmp.com/infographics/article/1571954/infographic-put-ring-it> (Accessed: 19 September 2018).

the urbanization population level increased from 19.4% to 26.4%, an increase of 7%, and an average annual increase of 0.7% (Zhang and Song, 2003). Under the Chinese system, the government's policy has a decisive influence not only on the process of urbanization, but the Government can also create non-agricultural jobs through investment directly driving urbanization.

Since the government has different levels, decision-making and administrative competence is different, too (Zhang and Song, 2003). So the government's role can be discussed in respect of urbanization from two different levels of central and local governments. The role of Central Government in urbanization is reflected in the following three points: first, policy changes, from policy "*to encourage farmers away from land but not the countryside*" in the 80s to let farmers go out for work, which allows free movement of Chinese farmers, and cancels the policy of restricting the development of big cities. Second, delegate some of the decision-making in economic development and administrative authority to local governments, to implement revenue-sharing, which contributed greatly to the local government initiative in economic development. Third, starting from the '10th Five-year Plan (2001-2005)', raising the urbanization strategy to the height of national strategy, through policy and investment guidance to promote the process of urbanization (Zhang and Song, 2003). Local governments after obtaining the appropriate economic development and management rights, by means of investment and land finance, also play an important role in China's urbanization process: on the one hand by providing non-agricultural employment opportunities such as infrastructure, development zones, construction of new cities, attracting farmers to do business; on the other hand through the old city reconstruction and city construction, promote the migration of population of the old city to the suburb, making it appear the phenomenon of urbanization.

After more than 30 years of reform, China's economic strength is becoming increasingly strong, urbanization is speeding up, and non-agricultural industry is quickly developing. According to the statistics from National Bureau of Statistics of China (NBSC)²⁷, at the end of 2015, the rate of urbanization reached 56.1%, with non-agricultural land within urbanised areas reaching 90%. Per capita GDP reached

²⁷ The statistics were published in Chinese. Available from: <http://data.stats.gov.cn/> (Accessed: 19 September 2018).

over 46,600 CNY (approximately equal to 5,892 USD)²⁸ in 2014. According to the development progress and trajectories of some provincial areas, China's economic and social development is in an accelerating transformation period. The country's agricultural production has played a huge role in solving the food needs of China's sharp growth of population and has guaranteed basic social stability. However, overall, the function has changed from mainly increasing agricultural production and guaranteeing supply, to increasing farmers' incomes, and focusing on improving agricultural quality and benefits. Agriculture dropped 3.9% to 10.1% of GDP in 2010 in China, which was already very low (NBSC, 2016). Agricultural development was a stage of marginalization. Especially in some metropolis, agricultural share has not passed 1%. For example, the agricultural output of Beijing accounted for 0.1% of the city's GDP (NBSC, 2016). The unemployment of peasant farmers has occurred. Nevertheless, agriculture as the foundation of the regional economy still guarantees the orderly operation of the urban social-economic system.

Under the influence of this dynamic mechanism of urbanization discussed above, China's urbanization in the recent 20 years has a number of features. The urbanization speed is high and the scale is large. The peri-urbanization phenomenon is obvious. As Gu *et al.* (2012) pointed out that China's urbanization rate was only 19.39% in 1980, far behind the world average level of urbanization. By 1990, its urbanization rate reached 26.44%. And in 2010, the rate had risen to 49.95% as shown in NBSC. Therefore, within 20 years, China's urbanization rate increased by 23.5%, with an average annual increase of over 1%, and a net increase of urban population of 369 million (NBSC, 2016).

Such massive, rapid urbanization is closely related to the government-led policies. In addition to natural growth of population, migration has also increased urban populations. The new-town population mainly comes from rural areas, which can be divided into two parts - the transformation of local farmers, and migrants from the countryside and which make up the majority. Tabulation of the 2010 Population Census of China data (PCCD)²⁹ shows that a total population of national registered permanent residence in non-local places reached 261 million, of which floating population in cities and towns totalled 226 million, and 34.97 million people of floating

²⁸ In order to use one currency, the author calculated the USD after the CNY in this thesis. 1 CNY≈ 0.145USD, the currency was updated on 27 September 2018 by XE Currency. <https://www.xe.com>

²⁹ The statistics were published in Chinese. Available from: <http://www.stats.gov.cn/tjsj/pcsj/> (Accessed: 19 September 2018).

population in the rural areas (PCCD, 2010). These populations can be roughly divided into 3 types, namely local county (city, district) other counties in the province (municipal and district), and outside the province. Each type accounts for a third, where 79.04 million of urban population flow between the sub-districts in the county (city, district) can be viewed as a separation of population and the transformation limitations between urban and rural household within the county being less restrictive (PCCD, 2010). So, if only calculate inter-county, inter-provincial migrants, this is a total of about 140 million (in many large cities the regional population flow is actually caused by the separation of population and household), accounting for 21% of the total urban population. But the population flow across counties and provinces also includes urban population flow (PCCD, 2010). As such, migrants from the countryside are fewer.

The registration system of 'separation of rural and urban households' has been implemented since the late 50s. After 1980, the traditional system of household registration was reformed, allowing farmers to deal with their own food and settle themselves in small towns (Zhang and Song, 2003). However, it is not possible for households from rural populations to own a home in the city. So, despite the fact that peasants change occupation, they cannot get the city's legal residence and enjoy appropriate social welfare. This means they have to commute between rural and urban areas each year, forming a unique phenomenon of floating population. Therefore, our urbanization has some of the characteristics of seasonal economic migration.

Meanwhile, under the background of urbanization, China's agricultural resource limitation has become greater and the resources of farmland and water are scarcer. Chinese farmland experienced a net decrease of 1.467 million hm^2 during the 30 years from 1949 to 1980, the net decrease of farmland of 5.4 million hm^2 during the 15 years from 1981 to 1995, and even the net decrease of farmland of 8,353.3 million km^2 during the 12 years from 1996 to 2008. The urban built-up area increased from 20,660 km^2 in 1996 to 40,058 km^2 in 2010, increasing by 19,398 km^2 in 14 years, most of which being taken from the farmland (NBSC, 2016). This indicates that China's farmland is getting more occupied, especially the cultivated land under the promotion of urbanization and industrialization. The conflict between the increasing demand for construction land and the decreasing farmland becomes more serious. This phenomenon is getting increasingly serious in the suburb area of cities.

With the trend of the agriculture in the suburb areas of cities not being for food, the security of the demand for the agricultural and subsidiary products and the security of supply problems will grow. As China's urbanization has been in the accelerating process and the rural population who used to produce the agricultural products swarm into cities and become the consumer group of the agricultural products, so the supply shortage of agricultural products becomes more serious. Compared with ten years ago, the urban population had increased by 210 million and the grain consumption increased by more than fifty billion kilograms in 2010. At the same time, the grain used for fodder and industry increased by about 40% and 60% respectively (NBSC, 2016). It is clear that with the joint promotion of urbanization and industrialization, the situation of China's agricultural production is very serious and the issues of supply of agricultural products and the quality safety are becoming more prominent. How to coordinate the agricultural development and the promotion of urbanization in a period of social and economic transformation has become a significant problem that is being faced currently.

4.4 The history of urban agriculture in China

This section seeks to figure out a specific history of urban agriculture and explain what the Chinese Government did in urban agriculture in China prior to the current new approach, which is the focus of this thesis. Throughout the practice of urban agriculture in China, this thesis argues that it can be divided into two types, Agricultural Parks in large urban cities and Happy Farm House in part of the provincial capital cities and other cities. This section will focus on the context of Agricultural Parks in Beijing and Happy Farm House in other cities. Both of these focus on leisure rather than the production of crops and could, therefore, be considered as agricultural tourism. This is referred to by agriculture and tourism specialists as 'agro-tourism' (Fleischer and Felsenstein, 2000). These practices have been created and promoted since the late 1990s in China, as will be discussed below.

4.4.1 The history of urban agriculture in China

Urban agriculture in Chinese cities is not new. China is an ancient agriculture civilization country with a lot of material and non-material civilization and culture, its heritage carrier is agriculture. Until about 20 or 30 years ago it was common for people to grow food, for personal consumption or for selling, in their personal spaces,

on roofs or in gardens. Nowadays, the carrier of much non-material cultural heritage is also from agriculture and rural areas. However, as Chinese cities grow, the people have been losing the space for this and urban agriculture has been lost from many large cities. There have traditionally been many different terms or names for different types of growing. It was not until the early 1990s that the umbrella term 'urban agriculture'³⁰ was used. The term was specifically used in Shanghai, Shenzhen and Beijing, and other places located in the Yangtze River Delta, the Pearl River Delta and the rim area of Bohai Gulf were among the earlier beginners (Li *et al.*, 1999).

Beijing tried to build modernized urban agriculture at the world-class level matching the identity of an international metropolis, and developing to be the first domestic city that lists urban agriculture in a Five-year Plan - the 9th Five-year Plan (1996-2000)- and with the future vision of 2010 depending on the radiation and self-accumulation of a central city (Fang *et al.*, 2008). To date, it has gained significant achievements in the development of facilities, sightseeing and leisure in respect of urban agriculture. This will be discussed in chapters 6 and 7.

In 1995, Shanghai and Osaka Prefectural Governments conducted an international cooperative study on urban agriculture, and convened the 'Shanghai-Osaka Prefectural Government International Seminar on Urban Agriculture' (Zhao and Zhang, 1998). In 1998, all scholars present in the first 'national seminar on urban agriculture' reached one key point: urban agriculture is a city planning agriculture (Duan, 1998). As urban agriculture is located in the fringes and outskirts of a city, it has been incorporated into the general planning of urban development. However, this overall planning is not a law that must be followed, but is instead a directive guidance. Therefore, urban agriculture ranging from infrastructure to trees and bushes must comply with the requirement of urban planning, all its activities must be approved by the government and authorities concerned and all its processes must be under their regulation.

According to Article 2 under the *Urban and Rural Planning Law of the People's Republic of China* promulgated on January 1st of 2008³¹, "*Making and implementing urban and rural planning as well as conducting construction activities in planning areas shall be governed by this Law. The term 'planning area' as mentioned in this*

³⁰ Urban agriculture in Chinese is 都市农业 (Dūshì nóngyè).

³¹ The law was published in Chinese. Available from: http://www.gov.cn/jffg/2007-10/28/content_788494.htm (Accessed: 19 September 2018).

Law refers to the built-up areas of cities, towns and villages as well as areas that must be under planning control for urban and rural construction and development.”

Built-up areas and planning areas are two essential concepts in the legal system of urban and rural planning.

Some representative viewpoints by Chinese scholars are given as follows. Li *et al.* (1999) argued that urban agriculture refers to an agriculture located in a city and the extended zones substantially relying on the city, and in turn serving the city. It is a comprehensive concept of modern agriculture adapting to the survival and development of the modern city. It has integrated the efficient production agriculture and the ecological aspects of agriculture enabling a virtuous cycle and sustainable agriculture, which serves the development of the urban economy and sets a role model for the modernization of overall agriculture and the rural economy in the external sense. Yu (2001) believed that urban agriculture means the sustainable modern agriculture located in the urban areas or its peripheral areas, which mutually benefits and integrates the urban economy, culture, ecosystem and some other aspects with the economic, ecological and cultural functions. Huang and Liu (2002) asserted that urban agriculture refers to urban agriculture and urban rim agriculture in a broad sense. Urban agriculture means planting crops or keeping small poultry or livestock within the smaller areas (e.g. a small empty parcel of land, garden, or balcony and the containers which can hold plants) of an inner city for the purpose of self-consumption or marketable sales in the community. Urban rim agriculture means the intensive semi-commercial or purely commercial agricultural activities conducted in the farms close to the city, mainly including the cultivation of vegetables and other horticulture as well as the feeding of poultry and other livestock (primarily for the purpose of producing milk and eggs).

Many scholars (Liu, 1997; Zhao and Zhang, 1998; Yu, 2001) considered that suburban agriculture is more like the original rural agriculture. However, urban agriculture is a more complex industry that is an extension of and different from traditional rural agriculture, featuring the common development of production, living and ecology, so they advocated the transformation from suburban agriculture to urban agriculture. Fang *et al.* (2008) believed that the primary feature which makes urban agriculture different from rural agriculture is that urban agriculture infuses with the urban economy and ecosystem, rather than the different geographical location separating urban agriculture from rural agriculture. Some domestic scholars also

compared urban agriculture and rural agriculture and believed that their essential difference lies in the fact that rural agriculture is self-sufficient while urban agriculture depends on the city while also serving it (Cao and Gao, 2005).

It is obvious that Chinese scholars have not defined urban agriculture consistently. A clear description of concept is too difficult due to the diversity of urban agriculture behaviour, subjects and the multiplicity of regions. Sometimes urban agriculture need to be defined in consideration of the local conditions rather than confine ourselves to the existing ones. And most of the relevant studies in the Chinese academic society lack a theoretical basis of economics. Yan *et al.* (2006) explained the formation of domestic and foreign urban agriculture by applying the agricultural location theory of neoclassical synthesis. They believed that the formation of foreign urban agriculture can be better explained by the location rent theory. Urban agriculture farmlands have higher rent because of location which requires that the crops planted by famers can provide the extra profit needed to cover the extra rent for operators. Common crops with lower comparative benefit cannot provide such high profit, while some fresh products and dairy products, with higher comparative values, can provide high profit, enabling operators to bear higher land rent. However, the theories mentioned above cannot explain the inherent reasons for the formation of China's urban agriculture.

Chinese rural farmers are unable to transfer the ownership of lands or the right to use their land, they can only use it to support themselves and their households. However, multiple choices of land are available at the rim of a city and urban farmers have an easy access to industry and agriculture. Therefore, higher opportunity cost is the fundamental cause of the formation of China's urban agriculture.

4.4.2 The urban agriculture in Beijing

According to the Beijing Statistic Yearbook (2006, 2008), 1,012 Agricultural Parks were established in Beijing in 2005. These original Agricultural Parks are discussed in detail below, but they are effectively large parks, for leisure, wholly owned and run by the government, and which are accessed with a paid ticket. They were the starting point for the new form of Agricultural Holiday Resorts which will be discussed in chapters 6 and 7.

Beijing has proposed that modern agriculture needs to be a new growth point for the 'urban economy' (Zheng *et al.*, 2013). It should adopt the benefits of science and technology and the market, and strengthen the functioning of its food supply,

ecological protection, technology demonstrations and leisure sightseeing. In fact, by 1997, the Beijing experimental area of urban agriculture (Beijing Chaolai Agriculture Park) began to take shape. It was located 3 km north-east of the Beijing Asian Games village (see figure 12) and covered an area of 30 hectares (Wenping *et al.*, 2011). As shown in their website³², it was built from the end of 1996 and opened to the public on June 8th of during the urbanization and expansion process of Beijing. It was developed on the fields near Chaolai Forest.

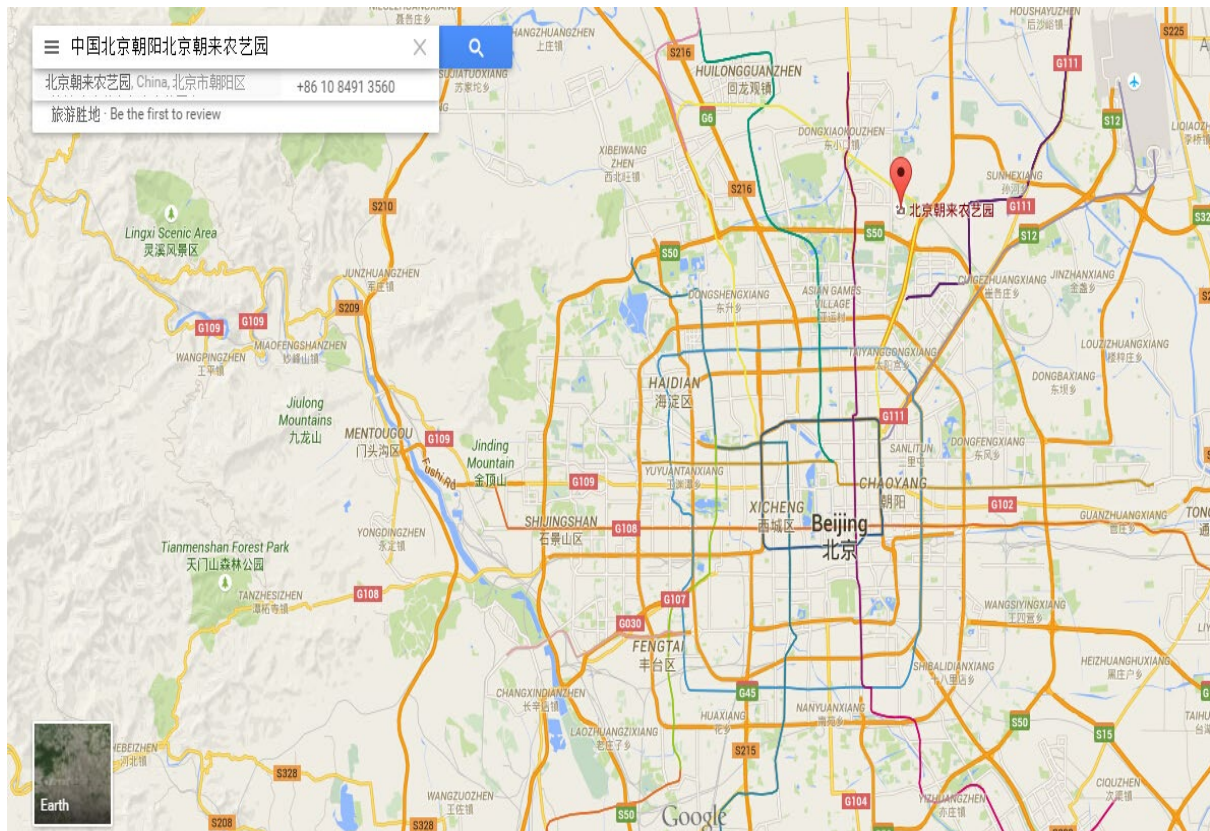


Figure 12: Location of Beijing Chaolai Agriculture Park. Source: Google map³³.

This project was used for a case study in Wenping *et al.* (2011)'s research. The whole area is divided into production, storage, processing, recreation, sightseeing and high-tech district. The site introduced new fruits, vegetables and flowers from home and abroad and applied advanced production technologies, such as soilless cultivation, nutritional balance, pollution-free, CO₂ fertilization, and irrigation and computer control. This project was called an 'Agriculture Park'. Tourists could visit

³² Available from: www.chaolai.net (Accessed: 19 September 2018).

³³ Available from:

<https://www.google.co.uk/maps/place/%E5%8C%97%E4%BA%AC%E6%9C%9D%E6%9D%A5%E5%86%9C%E8%89%BA%E5%9B%AD/@40.030544,116.447817,17z/data=!3m1!4b1!4m2!3m1!1s0x35f1aa9e138cb4e3:0x124fe531ea477471?hl=en> (Accessed: 19 September 2018).

and go sightseeing in the park, take part in all kinds of agricultural activities and experience pastoralism (see table 4). As a result, it is listed as an attraction by official government reports. The most prominent development for Beijing's urban agriculture development was Chaoyang urban agriculture in the suburb of Beijing. Zheng *et al.* (2013) pointed out that this site takes advantage of its location that links to the Beijing urban area and develops urban agriculture with the function of tourism, sightseeing and a pollution-free environment. Since the project started in 1997, the region has formed five urban agriculture demonstration and experimentation villages (Guangyin, Jingzhuan, DongBa, LouZiZhuang and Wangsiying), three types of comprehensive experimental areas, and 12 project partitions (see figure 13).

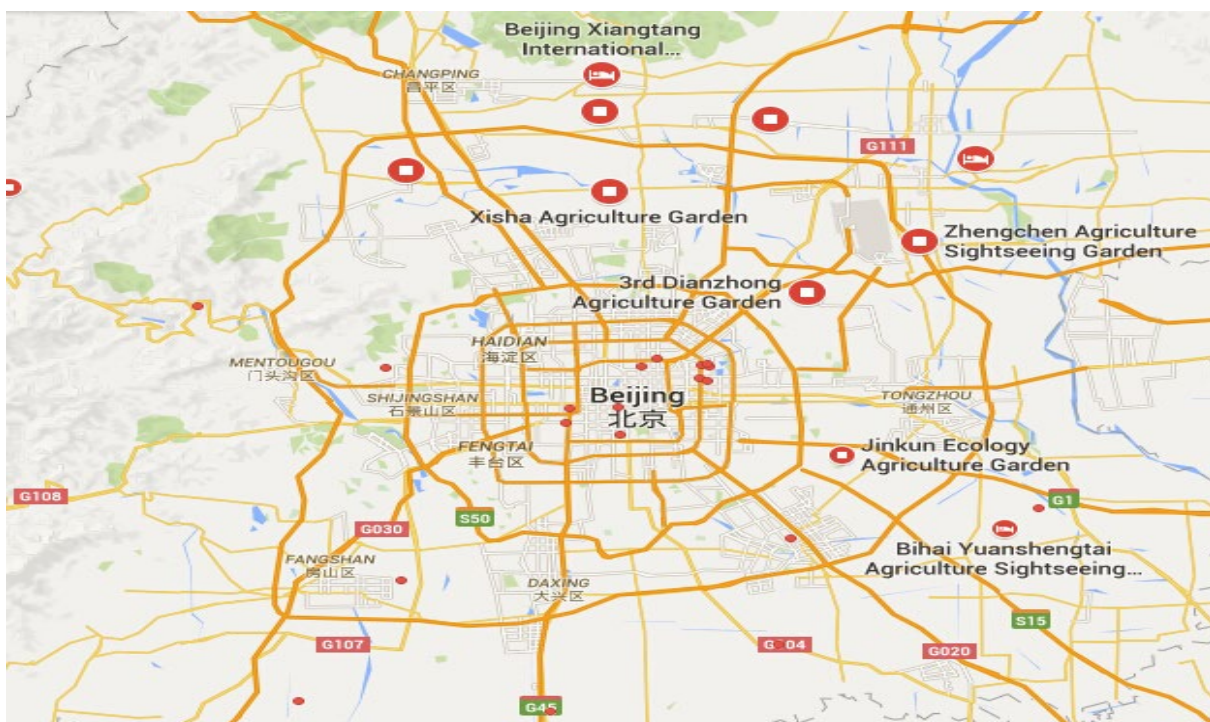


Figure 13: Locations of urban agriculture demonstration experiment areas in Beijing.

Source: Google map³⁴.

As a result, the agriculture park was the major form of the multifunctional urban agriculture practice in Chinese large cities prior to the new approach (Tsaur *et al.*, 2006; Wu *et al.*, 2010; Yang *et al.*, 2010). It had developed into a multifaceted activity rooted in both the environment and resources (figure 14).

³⁴ Available from:

<https://www.google.co.uk/maps/search/Agriculture+Garden/@39.8852845,116.336274,9.72z>

(Accessed: 19 September 2018).

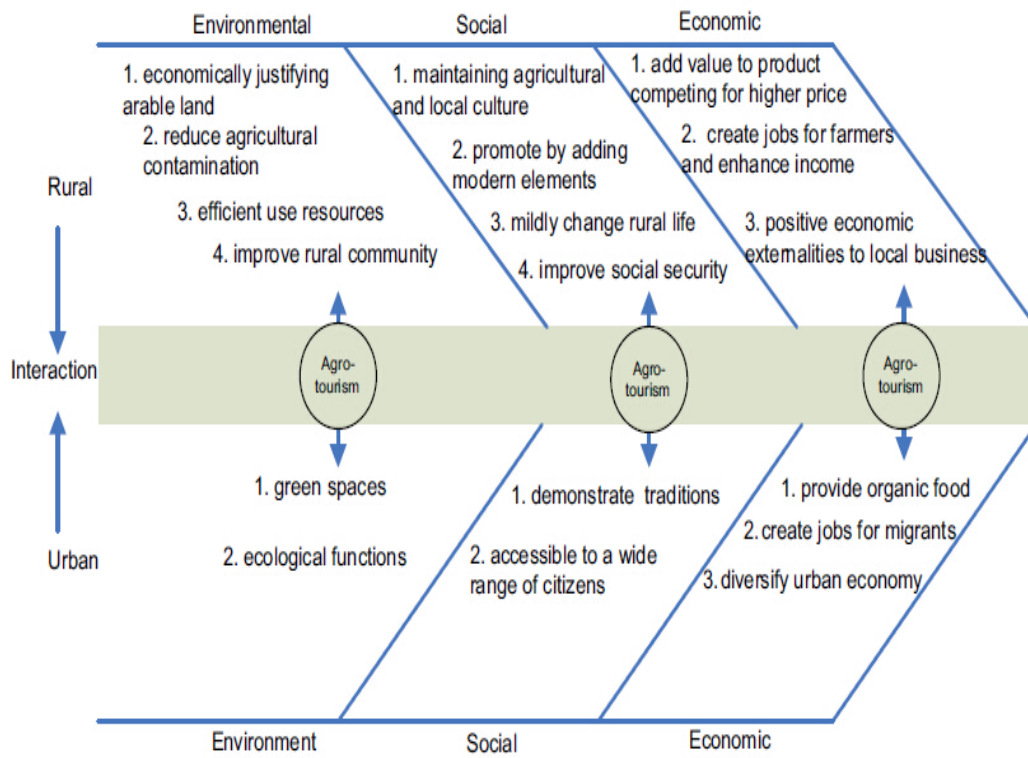


Figure 14: Agro-tourism in integrated urban and rural development. Source: Yang *et al.* (2010).

		Chaolai Agriculture Park
Economic Function	Efficient Food Production (Including low-cost and stable food supply, high-tech food supply)	Yes (It has 48 Solar Greenhouses to grow rare varieties of vegetables)
	Good supply of food (Including fresh, delicious, variety, perennial supply)	Yes (Providing Pitaya pick-up service which are unusual fruits in northern region)
	Food security	Yes (Providing Organic vegetables and healthy vegetable processing service)
	Others (Combining with tourism and business)	Yes (Providing restaurants, housing, KTV, bath, massage, meeting room. Meanwhile, this park requires an entrance ticket)
Ecological function	Protection of the natural environment (Including maintaining the ecosystem, natural reservoirs, water conservation, protection of soil, flood control, animal and plant protection etc.)	Possibly (Animal breeding area, high-tech area to decrease the fertilizer use, help to protect Chaolai Forest)
	Protection of living environment (Including protection and purification of water, protection and decontamination of the atmosphere, noise, green spaces etc.)	Yes (High-tech water recycling, provision of a large green space for urban residents)
	Sustainability of agriculture (Including biological control: improvement, breeding and natural enemies. Organic farming, conservation of biological diversity)	Yes (Organic farming area, animal breeding area for rare animals)
Social and Cultural Function	Social communication (including different levels of communication)	Yes (Exchange of experience between governments--- ripple function, farming technology communication, social network activities for general urban residents)
	Social justice (including employment and occupation space for the work of different ages, gender and the disabled)	Possibly (Providing jobs for farmers who lost their farm land, do not have sexism)
	Education (Including understanding of nature, school farm, skills courses, rural life experience)	Yes (It has been designated as a youth education practice group by the Beijing Tourism Bureau, providing different skills courses)
	Leisure and entertainment	Yes (Providing most common leisure and entertainment activities and facilities)

Table 4: Connection between Chaolai Agriculture Park and Multi-Functions. Source: Author (2015) adopted from www.chaolai.net

4.4.3 Happy Farm House in part of the provincial capital cities and other cities

One of the significant activities within this early phase of urban agriculture was that of Nongjiale, or Happy Farm House tourism. This mainly occurs in the directly controlled municipalities and provincial capitals such as Tianjin, Chengdu, Guangzhou, Wuhan, Chongqing, as well as the developed coastal areas of Shandong Weifang, Jiangsu Suzhou, Wuxi and Changzhou. These cities are trying to realize the transform from the traditional suburban agriculture to urban agriculture, from the past single production function to multi-function, such as economic, social, and ecological directions, and from the outer circle to a network development space layout. Meanwhile, these cities are exploiting their geographical advantages and with the application of high-tech to develop urban agriculture also becoming a tendency.

As Lu and Song (2006) mentioned, Tianjin is one of the important economic centres, a northern industrial city and modern port city. So it has the convenience to develop export-oriented agriculture and the import and export of commodity crops. It is an important production and logistics base to develop international and open type urban agriculture. Jin *et al.* (2008) pointed out that the main characteristics of the development of urban agriculture in Tianjin are as follows: relying on the modern port city to develop corresponding coastal open type agriculture. As a port city, it benefits the city to develop bulk farm-products' import and export, which can effectively drive the rapid development of open type agriculture. Located in the north China plain (Jin *et al.*, 2008), the cultivated land area is quite regular and flat. The natural production condition is quite preferable, which is suitable to develop large-scale agricultural crops. By taking full advantage of high technology and enhancing the yield and quality, the export of staple crops is mobilized, and the economic function has been promoted. Tianjin is expanding its urban culture function, urban landscape, leisure sightseeing function and social function of urban - rural integration. Li and Sun (2005) thought Tianjin's urban agriculture has devoted itself to a comprehensive development of marine resources. In the Binhai economic zone, the coastal city agriculture with Tianjin characteristics has formed. Relying on rich marine resources, it may comprehensively develop seafood production, marine tourism, marine culture and port trade through a synthetic plan and develop Binhai, Binhu ecological tourism depending on the natural environment, such as the sea, the lake and the wetland.

Chengdu is the big key city of western China. Bixian County in Chengdu is the birthplace of the Chinese Happy Farm House (Ke, 2011), known as Nongjiale in

China. Its urban agriculture started early and developed quickly with high quality. It mainly develops urban agriculture for sightseeing, landscape gardening, and further processing of agricultural products. Ke (2011) gave a detailed background about this practice. In 1992, Bixian County started to develop agri-tourism and its scale expanded quickly in 1997, which mainly focused on Nongke village in Youai town. By 2014, the village had more than 70 rural home inns³⁵. They gradually transformed themselves from sightseeing to garden plant, sales, and landscape gardening design and construction, and have formed a large-scale and intensive operation. The village is called Village with Flowers; a park without a fence for the village is covered with nursery-grown plants, flowers and gardens. Li (2006) pointed out that in 2004, the village's tourism economy and landscape gardening business revenue reached 100 million CNY (approximately equal to 14.51 million USD), while farmers' per capita income was 21,000 CNY (approximately equal to 3,048 USD). The main business model gives priority to the villagers' individual management, because the village has a tradition of garden planting. On the basis of their own responsibility farmland, they lease the adjacent land and gradually increase. At present, there are investors from other provinces and cities to lease and contract the original rural home inns, or lease the land to do the management (He *et al.*, 2004). Since the gardens are linked together, it became the urban agriculture development demonstration area in the western part. Chengdu is promoting the urban and rural integration project, which plays an important role in promoting urban agriculture development.

Red Sand village is a village on the edge of Jinjiang district, Chengdu city. The urban planning restricts this region by preventing the development of industry and logistics as it is located in the air vents of Chengdu (Ke, 2011). In addition, the water resource is very low, so it developed slowly in the past years and was one of the poverty villages in the city. He *et al.* (2004) mentioned that since 2003, through the guidance of the government's financial support and planning, the village has taken advantage of villagers' residences, increased the supporting facilities, afforested the surrounding environment, and formed a unique residence village with a beautiful natural environment. It has developed tourism of sightseeing, seniors and children's farmhouse to attract a large amount of the aged to come there for long-term living. At the same time, the village has created a lot of facilities suitable for children's living

³⁵ The information was published in Chinese. Available from: <http://www.pxknc.cn/> (Accessed: 19 September 2018).

and entertainment to attract a large number of children and parents to come there for relaxation. Its business model is given priority to family operation. Because the investment is not large, many small- and medium-sized investors have leased farmers' houses to accommodate tourists in the tourist season, and meet their living requirements at the same time. Thus the living quality has been improved. Similarly, He *et al.* (2004) provided another case study. Since 2004, the adjoining Merlin Village has developed 'Happy Meilin', based on the prune trees plant, appreciation and research. Its appearance has enriched the urban agriculture's content, which attracts a large number of tourists to come there in the winter and spring for sightseeing.

4.5 Identifying functions of 'official' urban agriculture in China

China is a country with a large population, little cultivated land per capita and lacking of agricultural investment for a long time. One of the most important tasks is to satisfy people's need for agricultural and associated products. Cities have two basic tasks: to guarantee rural farmers self-sufficiency and offer food for cities. China's agriculture area near the city is quite large, and can be divided into three levels as discussed in section 3.2 when defining the urban area, suburbs and countryside. So, the development of urban agriculture in China should be multi-directional and at multi-levels. Considering the aims of the central government for sustainable development, the choice of China's urban development should be the adoption of a pattern taking account of economic, social and ecological benefits.

The Chinese Government 'No.1 Central Document' in 2007³⁶ officially proposed to develop a variety of functions of urban agriculture and, for the first time, clearly defined the six functions of agriculture: first is food security, second is the raw material supply, third is employment and income, fourth is ecological protection, fifth is tourism and leisure and sixth is cultural heritage. In the past, more attention was paid to food security, raw material supply and employment income generation because these three functions are directly related to economic benefit and fitting into China's economic development needs.

Straw, corn, potatoes and other produce are the important sources of biomass. Raw material supply is agriculture operating as an important source for industry. Indeed,

³⁶ The document was published in Chinese. Available from: <http://english.agri.gov.cn/hottopics/five/> (Accessed: 19 September 2018).

agriculture is not only a source of raw materials for some traditional industries, but also an important source of new industry and growth potential. After 2007, the functions of ecological protection, tourism and leisure, and cultural heritage received extra attention. The following section will discuss urban agriculture's relationship with tourism, leisure and culture.

4.6 Leisure, tourism and culture related to urban agriculture – agro-tourism

Aitchison *et al.* (2014) pointed out that the concept and act of leisure extends to the tourist industry through agriculture. By taking the characteristic of agriculture, Zheng and Zhang (2013) argued that agricultural experience and rural style provide peaceful, fresh and beautiful rural landscapes and an ecological environment for the sightseeing, relaxation and vacation of urban residents via the display of rich agricultural culture, thus meeting the consumption needs of returning to nature, and enjoying the quiet and peaceful life of people (Wu *et al.*, 2010).

As urban residents begin to feel the pressure of city environments, spending more spare time in the surrounding countryside for outdoor recreation is an important part of a healthy life (Bell *et al.*, 2007) by putting the urban residents into a more natural world. It has been concluded that, when evaluating the influence of visible landscapes, the visible natural landscape has more positive effects on human health than the man-made landscape (Velarde *et al.*, 2007). Therefore, recreational activities in natural landscapes should be more convenient for potential users. Thus, locations such as landscapes and activities in the city centre, peri-urban environments or open space, have been the key factors for the leisure function in the agricultural field. This form of leisure related to urban agriculture is a new industry with the integration of relaxation, sightseeing, science popularization, demonstration and tourism, which fulfils the content and function of traditional agriculture and extends its external boundary. Therefore, leisure function in this thesis is defined by author as:

a new agricultural production and business form that combines agriculture and tourism, makes use of farming landscape, agricultural production and business and agricultural natural environment to attract tourists to appreciate the scenery, taste local food, learn, relax, experience farming life, take exercise, undertake scientific research, draw pictures, take photos, shop and spend their holidays.

In China, the leisure function is an important driver of urban agriculture development. The quantity, quality and efficacy of leisure agricultural parks construction directly

reflect the urban and rural development situation of a region (Zhao *et al.*, 2014). Zheng *et al.* (2013) argued that the leisure function has five main manifestation patterns as shown below.

Agricultural parks. Areas with a pleasant climate, fresh air, beautiful landscape, and unique natural views are selected. Exotic flowers and herbs, rare plants or distinct local agricultural species are planted, and landscape and auxiliary facilities are constructed, in order to create high-quality parks taking agriculture as the theme, thus providing a healthy and attractive leisure environment for people to enjoy (Feng *et al.*, 2012).

Village tours. By making use of the natural environment, beautiful landscape, characteristic culture, folk and customs, farmyard meals and other traditional resources, the family-based operation can be adopted to construct beautiful villages and enable people to feel the unique folk and customs, so that they can experience the rural life through the elegant and peaceful environment (Zhao *et al.*, 2014).

Farm experience. According to the characteristics of the four seasons, vegetable gardens, fruit gardens and agricultural gardens can be constructed in different seasons, and various service facilities can be provided for tourists in these gardens, so that they can experience the pleasure of picking produce and personal engagement in the growing of produce, while understanding and being educated about the agricultural production process while having fun (Sun, 2015).

Educational agricultural parks. By making use of the farmyard environment and industrial resources, the parks can be modified to outdoor classrooms for schools and internship bases for students. Facilities related to cultural education and leisure entertainment can be built inside, such as the insect zone, floral zone, specimen zone and advanced production technology zone. In this way, tourists will be able to enjoy both relaxation and study (Peng *et al.*, 2015).

Comprehensive farms. The above functions can be integrated along with the larger scale and more diversified operational projects (Shi *et al.*, 2012).

There are also many different translated names for leisure agricultural parks in Chinese articles which are based on the understanding from different perspectives. These include sightseeing agricultural parks, urban agricultural parks, agricultural parks, agricultural sightseeing parks, leisure agricultural park areas, ecological

agricultural park areas, high-tech agricultural technology industry development areas, and modern agricultural demonstration park areas.

Scholars have defined leisure agricultural parks in accordance with different emphases and depths (Feng *et al.*, 2012; Zhang and Yang, 2014; Peng *et al.*, 2015) as shown in table 5 below. They generally believe that leisure agricultural parks belong to a special agricultural form integrated with sightseeing picking, technological demonstration, leisure vacation and agricultural education. It takes agriculture as the basis and core along with the combination of the agricultural industry and tourist industry. In Zhang and Yang (2014)'s article, they listed geographic photos to show that most leisure agricultural parks locate in suburbs of metropolises, and they are established in a specific area with a clear spatial boundary. By taking agricultural production and operational activities as the focus, leisure agricultural parks also provide a tourist operation and tourist services related to rural sightseeing and travelling (Wu *et al.*, 2010). They can provide eating, living, transporting, travelling, shopping and entertainment services with rural characteristics for tourists, offer services like rural technological demonstration and teenager agricultural education, so as to meet the demands of leisure relaxation, sightseeing and entertainment for urban residents.

In addition to being an industry, tourism related to agriculture can have a role in the preservation of traditional culture and lifestyles, by developing a variety of cultural tourism products (Garrod *et al.*, 2006; Cawley and Gillmor, 2008). There has certainly been an element of this within the Chinese Government's objectives for official urban agriculture for many years. Zhao *et al.* (2014) argued that in the development process, leisure tourism should integrate with the special national condition of China as an agricultural country, so as to combine agriculture with the tourist industry. The joint development of the agriculture and tourist industries can significantly expand the rural agricultural production space, adjust the agricultural production structure and carry forward innovative agriculture. It also supports the rational planning of agricultural resources, improves the agricultural production level in China, boosts the rural economy, helps to balance the ecological environment, and promotes development of the Chinese rural economy dramatically.

Meanwhile, new forms of tourism related to urban agriculture should be expanded, thus extending the depth and width of agricultural leisure tourism. For example, the tea culture of China has a long history. The agricultural conditions of tea planting are

superior, and there are multiple types of tea plants which can produce high-quality tea leaves (Sun, 2015). Therefore, developing tours and sightseeing tea parks, and taking agricultural sightseeing around the industry and agriculture of tea is an obvious move. This would allow tourists to participate in the tea leaf collection, tea leaf drying, tea making and tea tasting process and which is a novel tourist way that has been favoured by urban residents and overseas guests. Fishing tourism and orchard tourism as the supplementation to existing agricultural leisure is also a positive strategy to give full play to China's agricultural advantages, reduce costs and improve the economy. Since China is a place with abundant agricultural resources and outstanding characteristics, the integration of the root of Chinese culture in its folk and customs to allow people to understand the ancient Oriental civilization is the essence of developing leisure agricultural tourism.

It can be seen that 'leisure' and 'culture' both demonstrate the combination of 'agriculture' and 'tourism'. In terms of the connotation, they are basically consistent with each other. They both refer to the similar agricultural form. However, it can also be clearly found that the two concepts have different focuses. The former one stresses the use of agricultural resources and the realization of modern ecotourism. It is the tourism on the basis of agricultural resources. The latter one emphasizes sightseeing tourism. Besides agricultural resources, it also includes customs, culture and folk habits. Considering that agro-tourism is a new industry, scholars and experts in their fields have their own definitions. The definitions are made from different perspectives and depths. However, with regard to the connotation, they are basically similar. Drawing on ideas in literature, culture based on urban agriculture in this thesis are shown from those practices retaining the traditional folk culture and architecture style which are used for tourism activities based on urban agriculture. The precise details of these essentially depend on specific local historic and cultural landscapes as well as natural resources. Through evoking certain behaviours, thinking and feelings of tourists, this approach aims to create the cultural atmosphere, convey the cultural information and construct the cultural artistic conception for tourists to enjoy.

From this, the author proposes that whether leisure agriculture and agriculture tourism belongs to agriculture or tourism depends on researchers' perspectives. It is not the focus of this study to fully clarify the definitions, so the author spares the discussion. Instead, this thesis's emphasis is the essence of the functions of 'urban

agriculture' in China that is the combination of 'leisure', 'tourism' and 'culture'. They are indispensable to each other. In this sense, agro-tourism is a good phrase to represent a Chinese urban agriculture practice. It has two different focuses. On the prerequisite of developing traditional agricultural resources and based on farming activities, it explores tourism services as added value to integrate agricultural production with exhibition, business, tourism sightseeing and relaxation. Different from traditional agricultural industry, the tourism values are added besides the agricultural values. It shows a new agricultural operation form. For the tourism industry, correlated to agriculture, it refers to the extension from tourism activities to agriculture and enrichment of the contents and scope of tourism activities, which means agriculture works as a new feature. The next section will discuss the value of agro-tourism in Beijing.

Types	Characteristics	Typical example (in Beijing)
Sightseeing picking parks	By taking the production of agricultural products, horticultural crops, flowers, tea and fruits as the main products, it is to provide a place for the sightseeing, shopping and entertainment of tourists. Generally, no accommodation is supplied and there are not many supporting service facilities. It mainly includes the sightseeing of fruit gardens, vegetable gardens and fishing parks.	Yanzhao Picking Park (Yuxin Park) (Shunyi), Group Sightseeing and Picking Park of Beijing Xinte Fruit Development Centre (Shunyi)
Agricultural technology parks	Depending on various modern scientific and agricultural technologies, modernized manual planting and cultivation technologies, and agricultural technology achievements, high-tech agricultural demonstration parks are established within the certain regional scope. The main function is to produce high-quality and characteristic agricultural products and develop agriculture through modern and high-tech agricultural science and technology, so as to improve the economic efficacy of agriculture and play the great role in demonstrating and pioneering, which is vigorously supported by the government.	Beijing Xiaotangshan Modern Agriculture Technology Demonstration Park (Changping), Beijing Shunyi Sangao Technological Agriculture Pilot and Demonstration Area (Shunyi)
Citizen agriculture parks (allotments)	Based on the pursuit for food safety and sustainable life, citizen agriculture parks aim to turn over the agricultural land near big cities to several communities and rent it to citizens for the experience of farming.	Wanke Agriculture Art Garden, Xiaomaolv Citizen Agriculture Garden
Leisure agriculture parks	Comprehensive leisure agriculture parks are integrated with various forms such as agricultural sightseeing, experience, leisure, vacation and meetings. Generally, the scale of these parks is large along with a beautiful ecological environment and sound supporting facilities.	Xiedao Green Ecological Vacation Village (Chaoyang), Anlilong Ecological Agriculture Tourists' Mountain Villa

Types	Characteristics	Typical example (in Beijing)
Ecological agriculture parks	<p>Carry out agricultural design from production to the consumption section based on the theory of the circular economy. From the perspective of saving agricultural resources, protecting the ecological environment and improving the economic benefits, constructing the substance regeneration cycle and multi-level energy utilization mode among different function zones and inside the ecological system rationally.</p> <p>The comprehensive production structure with positive sustainable regeneration capacity is established in order to create a new agricultural system that can achieve rational resource utilization, ecological environment enhancement and comprehensive agricultural benefit improvement.</p>	<p>Fuheng Ecological Agriculture Sightseeing Park (Fangshan), Beijing Xinghu Green Ecological Sightseeing Park (Tongzhou)</p>
Cultural innovation agriculture parks	<p>Culture innovation agriculture parks refer to the production of innovative agricultural products and innovative agricultural development modes via technological means and artistic creativity, thus integrating the connotation of agriculture with its extension. As a result, agricultural products can receive rather high added values and the maximum agricultural value can be realized.</p>	<p>Beijing Zihaixiangti Vanilla Art Manor (Miyun), Qicai Dieyuan Park (Shunyi)</p>
Agriculture parks	<p>According to the operational idea of parks, these combine the agricultural production place, agricultural product consumption place and leisure tourism place together, and construct comprehensive sightseeing zones based on local agricultural landscapes.</p>	<p>Grand World Flower View Garden (Fengtai), Beijing Changping Apple Theme Park (Changping)</p>

Table 5: Leisure tourism based on urban agriculture. Source: Author (2015), based on Feng *et al.* (2012), Zhang and Yang (2014) and Peng *et al.* (2015).

4.6 From urban agriculture to multifunctional urban agriculture - analysis for existing agro-tourism in Beijing

Based on section 4.1.1, there are many existing urban agriculture practices in Beijing. The main problem is unbalanced distribution. During the formulation of city planning, the emphasis is on urban agriculture giving priority to the function of production and the economy, but paying attention to the ecological, social and cultural functions. However, these practices are mainly operated in specific areas of the city: rural far away from urban areas; exurban that are mostly undeveloped; and other areas which the Regional Government has designated. With this point of view, it is not 'real' urban agriculture.

According to table 6, the latest official data on agro-tourism in Beijing in 2006 which was published by the Beijing Government in 2008, there were more than 70 thousand employees and the number of visitors reached 219 million with 1.415 billion CNY (approximately equal to 205.35 million USD) total revenue. However, only 10% of these happened in the urban function expansion area (Inner Suburbs). None of the activity was located in the capital function core area (Urban District). Li *et al.* (2013b) indicate that rapid growth in economic value of urban land was a major driver of urban land development in China. Therefore, urban green space for agriculture, woodland, nature or recreation may come under pressure from potential developers (Li *et al.*, 2013a). Wang *et al.* (2012) discuss that using land for agriculture may be a waste of precious urban space, as it brings more economic value to use these lands to build housing, business districts, shopping malls etc.

	Total	Capital function core area	Urban function expansion area	Urban development new area	Ecological conservation development area
Employees(person)	71,081	N	7,910	32,048	31,123
Visitors(person)	21,931,325	N	2,431,936	6,549,527	12,949,862
Total operating revenue (ten thousands)	141,474	N	31530	54,527	55,417

Table 6: Beijing agri-toursim data in 2006. Source: Beijing Second National Agricultural Census Data (2008)³⁷

³⁷ The statistics were published in Chinese. Available from: http://zfxqk.beijing.gov.cn/110037/tjgb53/2012-07/18/content_312860.shtml (Accessed: 19 September 2018).

As a result, Zhang (2012) agreed a view from RUAF that “*a major challenge to the viability of urban agriculture is land availability and access*” (De Zeeuw, 2011, p. 45) and mentioned particularly in the urban areas of China, agricultural land is almost non-existent. Hoornweg and Munro-Faure (2008, p. 40) further explained FAO’s point that “*urban agriculture is influenced by rapidly changing land rights, uses, and increasing land prices*”. Based on these, many Chinese researchers indicate that securing access to farmland in the city need to be at affordable prices and with considerable economic benefits. In this case, urban agriculture can be developed in a stable and sustainable way (Zhang *et al.*, 2008; Du *et al.*, 2012; Shi *et al.*, 2012; Zhang, 2012). Also peri-urban areas, that still have an agricultural vocation or function as a greenbelt, are increasingly experiencing changes under the influence of the growing city (Zhao *et al.*, 2011). Newcomers may seek to access land for speculation purposes (waiting to sell off the land again when prices have risen), land is used for infrastructure development or for construction, resulting in increased competition for land and accordingly, increased land prices. Next to that, local governments may have little planning and management capacity to maintain agriculture and green areas in and around the city (Wang *et al.*, 2013).

During the 10-year period from 2006 to 2015, there was an improvement in distribution practices (see figure 15). Some small-scale urban agriculture practices (Happy Farm House) by providing housing services in the rural style, ‘pick-up your food and cook by yourself activities and farming entertainment projects are supported by government (Zheng *et al.*, 2013). The Chinese Government tried to encourage small-scale practices to explore the potential of urban agriculture in the capital function core area and urban function expansion area (which is thought of as ‘urban area’ in this thesis). However it still uses the same practices but on a small scale.

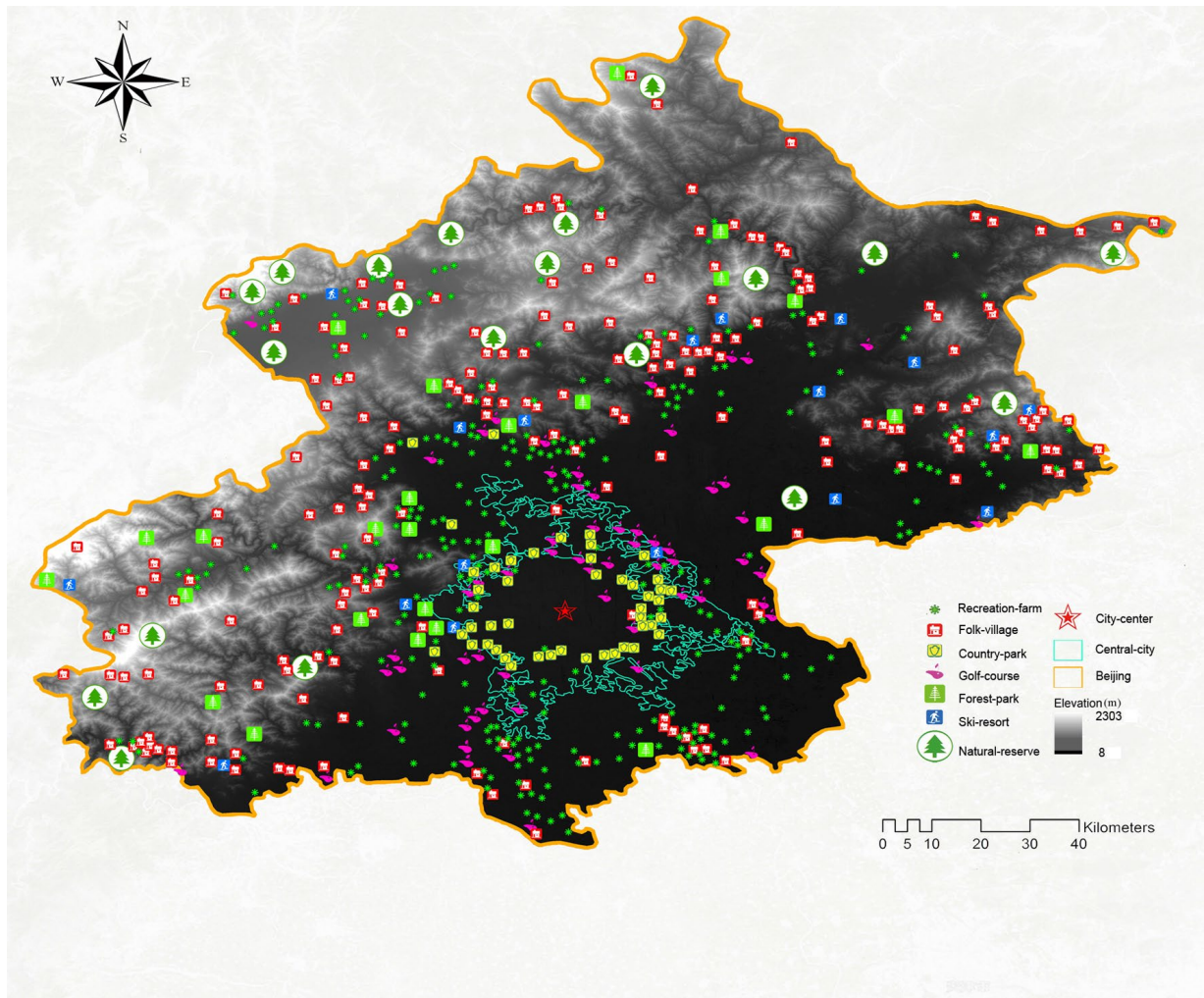


Figure 15: Distribution of urban agriculture practices in Beijing in 2010. Source: Zhang and Yang (2014).

4.7 Conclusion

This chapter has set the context of China and the changes it has experienced through urbanization in recent years. It has explained that the concept of ‘urban’ in the context of ‘urban agriculture’ needs to be broadened for the Chinese case. Importantly, the chapter has highlighted that the Chinese Government has been interested in using agriculture within what, in the Chinese context, can be thought of as ‘inner and outer suburban’ areas for many years as desakota area. The chapter highlights that the government’s approach recognises the value of linking agriculture in these areas to tourism and leisure in order to support social, economic and environmental sustainability. And the official data shown in section 4.8 provide strong evidence to indicate that urban agriculture in China contribute great value in different dimensions.

As a result, the development of multifunctional forms of urban agriculture, including educational and demonstration projects, tourism and leisure, has become an effective method linking residents' urban life to the natural environment and agricultural activities, as well as a substantial contribution to address problems caused by urbanization. The way in which the Chinese Government has subsequently developed urban agriculture along these lines, and its potential, will be discussed in chapters 6, 7 and 8.

Chapter 5 Methodology

5.1 Introduction

This chapter details the design of the research, the methods used to collect, analyse data and the overall conceptual framework used to make sense of the findings, and to locate them within what is currently known about urban agriculture around the world.

According to section 3.4 in chapter 3, there is no standard method or model to evaluate the sustainability of urban agriculture from a comprehensive perspective. Current literature uses both qualitative research and quantitative research to assess urban agriculture based on a single function or single dominant objective of, for example, the economy, environment and ecology or society (Pearson *et al.*, 2010; Ewert *et al.*, 2011). This does not fit the aim of this thesis which is to examine the potential of multifunctional urban agriculture. It is especially problematic once it is realised that the findings are beginning to suggest that urban agriculture has the potential to change the nature of Chinese cities. Table 16 shows the specific number of values of the modern urban agricultural ecological service in Beijing (including direct economic value, ecological and environmental value, amongst other values). However, it is impossible to know how this calculation was undertaken. Thus, it is difficult to evaluate how multifunctional urban agriculture contributes to sustainable development in the same way.

However, chapters 2, 3 and 4 have portrayed that China's new model of urban agriculture could act as a basis for sustainable development, and with the literature on urban agriculture mainly adopting case studies and descriptive research of projects as research methods. As a result, this thesis adopted a mixed but largely

qualitative approach based on a detailed case study of urban agriculture in Beijing, to investigate the value of the Chinese Government's approach to multifunctional urban agriculture in the context of urbanization in China.

The following section explains how the research was undertaken. It begins with a discussion on sampling, giving a rationale for the choice of Beijing as the case study and of the sampling of stakeholders. After this the process of the research is discussed, beginning with an explanation of the desk-based work then moving on to explain the fieldwork. This includes a detailed discussion of the visiting of different projects to collect primary data, as well as an explanation of the data collection and analysis processes.

5.2 Methodological approach

The work is a mixed but largely qualitative approach and based on both desk and field research, underpinned by a review of literature on urban agriculture and sustainable development. Desk-based work included the literature review and a review of documents about the Chinese Government's programme of urban agriculture, both past and present. It also included documentation about individual projects which were visited. It is focused on a case study of Beijing, China and in-depth engagement with stakeholders, including project operators, visitors and government officers and farmers, through the use of questionnaires, interviews and observation. What follows is a discussion on the selection of Beijing and the sampling of specific areas within the city.

5.2.1 Case study

The case study as a research method was defined by Yin (2009, p. 18) as:

An empirical inquiry about a contemporary phenomenon (e.g., a "case"), set within its real-world context—especially when the boundaries between phenomenon and context are not clearly evident.

Yin (2011) also mentioned that almost all social science research methods indicate or guide the case study method. Similarly in the subject of urban planning methods, much literature states that a case study is an appropriate method for any of qualitative, quantitative and mixed methodological approaches (Krueckeberg and Silvers, 1974; Wang and Hofe, 2008; Bracken, 2014). In addition, "*the relevant case study data are likely to come from multiple sources*" (Yin, 2011, p. 4). In this sense,

case study is an acceptable approach in this thesis to find answers to the ‘how’ and ‘why’ questions. Therefore, an organizational case study of Beijing that combines qualitative with quantitative evidence was undertaken.

5.2.2 Rationale for Beijing as the case study

As chapter 4 mentioned, the Central Government of China has provided a structure for local governments in China to follow in order to develop urban agriculture. However, not all cities are practicing urban agriculture and it is dependent on the local government as to whether or not a city takes up the programme. This research is based on fieldwork in the capital city of Beijing for six main reasons as follows.

First, Beijing is the city where urban agriculture has become relatively well established already. According to the Beijing Statistic Yearbook³⁸, Agricultural Parks were established in the urban and desakota areas in 2005-2012. As table 7 below shows, in 2007, the number of Agricultural Parks increased by 29%, reaching to 1302 and occupying nearly 16,000 hectare of land. Therefore, there are plenty of locations to study and these sites have had time to establish themselves and have an impact. Total revenues of these Agricultural Parks were over 193 million USD. As a part of urban agriculture, these profits statistic of agricultural parks can prove that urban agriculture has become a competitive industry in Beijing.

	No. of gardens	Area (ha)	Employment (at peak time)	Visitors	Turnover (1,000USD)
2005	1012	12,588	40,729	8,924,787	115,897
2007	1302	15,844	51,392	14,468,297	193,371
Increase %	29%	26%	26%	62%	67%

Table 7: Performance of Agricultural Parks in Beijing. Source: Adapted from Beijing Statistic Yearbook (2006, 2008).

Second, Beijing is one of the top level cities, based on GDP, and thus has the economic strength to pursue new policies and programmes. In the national city GDP rankings in 2015, Beijing ranks in second place, and its GDP had increased from 316.17 billion CNY (approximately equal to 45.89 billion USD) in 2000 to 2.2968 trillion CNY (approximately equal to 0.33 trillion USD) in 2015, with a 10.2% rate of increase, and the per capita GDP increased from 2,915 USD in 2000 to 17,064 USD in 2015 (BJstats, 2016). The supply-demand relationship of the majority of

³⁸ The statistics were published in Chinese. Available from: <http://edu.bjstats.gov.cn/tjsj/> (Accessed: 19 September 2018).

agricultural products has transformed from the sellers' market to the buyers' market, and the demands in the market of agricultural products have become increasingly diversified and superior. Meanwhile, the fiscal revenue of Beijing has maintained relatively fast growth, and the capability of regulation has become increasingly reinforced. The 267.877 billion CNY (approximately equal to 38.87 billion USD) general budget revenue of local public finance has been completed in 2009 (BJstats, 2016). The financial agriculture-supporting fund has been increasing. Its total amount has increased from 192 million CNY (approximately equal to 27.87 million USD) in 1978 to 1 billion CNY (approximately equal to 0.15 billion USD) in 2004, to 4.87 billion CNY (approximately equal to 0.71 billion USD) in 2010, which represents a 25 times' increase in total (BJstats, 2016). Thus, the variations in Beijing's fiscal expenditure on agriculture support can assist the development of urban agriculture. It will be interesting to understand how this support influences the roll out of projects. If a poorer city was chosen, the lack of financial support might lead to the suggestion that urban agriculture was not viable, or that it was not popular with the public. Whilst two cities could have been chosen for this research, the limitations of time and the need for in-depth research across many individual projects suggested it would have been too difficult. In the end it seemed better to research, fully, one city and so avoid overstressing the research project.

Third, table 8 shows that the disposable income per capita of Beijing exceeded 10,000 CNY (approximately equal to 1,451 USD) in 2001, and rose to around 26,738 CNY (approximately equal to 3,380 USD) in 2009. The Engel coefficient was 36.3% for 2001, and has a fluctuating change in the next few years. In 2009, it was 33% (BJstats, 2016). The rapid increase of urban residents' disposable income per capita and the fluctuating Engel coefficient suggest that amongst urban residents some basic demands, such as food, clothing and accommodation, are basically satisfied. As a result, residents' consumption gradually shows an inclination towards diversified, superior and personalized material and spiritual consumption. This group of consumers will increase, and further become the primary group of consumers in terms of modern urban agriculture in Beijing.

Year	The disposable income per capita: CNY	Engel coefficient
2001	10,000	36.3%
2006	20,000	30.8%

2008	24,725	33.6%
2009	26,738	33.0%

Table 8: The disposable income per capita and Engel coefficient of Beijing. Source: Adapted from BJstats (2016).

Fourth, since the Olympic Games in 2008, Beijing has become a symbol of China's new approach to environmental improvements. In preparation for the Olympics, the government relocated industry and has, subsequently, sought to initiate 'greening' policies. Since 2006, the Beijing financial department has arranged 60 million CNY (approximately equal to 8.7 million USD) annually to support the development of urban agriculture instead of the traditional industries (BJstats, 2016). Focusing on supporting the development of the agricultural theme park and agro-tourism, Beijing is seen as an example for the world to see a new, environmentally cleaner face of China. It already has a relatively complete policy system (see table 9). The new urban agriculture policy fits well into this plan. The local government made agricultural tourism part of municipal and district level planning; established an agro-tourism association and information dissemination service; assists interested farmers with business planning, tax exemptions and funding of infrastructure development; and provides subsidized water and electricity. This will be discussed in more detail in chapters 6 and 7. In this sense, Beijing is in a position to act as a political example for other local governments to follow.

Name	Year	Relevant content
Regulations on the Administration of Tourism in Beijing Municipality	1999	Define the responsibilities of the Beijing Tourism Administration; specify regulations on protecting and utilizing tourism resources
Regulations on the Protection of Forest Resource in Beijing	1999	Define the responsibilities and suggest methods for managing forest resources in Beijing to promote appropriate usage
Interim Measures on Designation of Folk Culture Families	2002	Define criteria for approving rural families to operate as folk culture families
Standards of Folk Culture Families	2002	Define criteria that folk culture families need to meet
Standards of Folk Villages	2003	Define criteria that folk villages need to meet
Regulations on Constructing Pick-your-own Orchards	2006	Define the quality standards of pick-your-own orchards
Regulations on Food Safety in Rural Folk Culture Families	2007	Define the standards and management measures of food safety in folk culture families
Guidance on Constructing Country Parks inside the Greenbelt	2007	Set up a goal to construct 60 country parks in two years and stipulated detailed requirements for landscaping and facilities
Guidance on Promoting Suburban and Rural Tourism	2011	Provide governmental opinions on promoting suburban and rural tourism in Beijing
Regulations on Protection of Wetlands	2013	Regulate the use of wetlands in ecotourism

Table 9: Major codes and regulations relevant to outdoor recreation issued by the Beijing Municipal Government. Source: Zhang and Yang (2014).

Fifth, the urban area has expanded and the population has increased continuously. The permanent resident population in Beijing has risen from 8.715 million in 1978 to 12.511 million in 1995, and 21.70 million in 2015 (BJstats, 2016). Furthermore, a consequence of this has been the annually increasing population density, especially the increase of the density of the urban population, which is faster. These have been a particularly significant phenomena of urbanization. Due to the rapid rise of the

urban population, the demand for urban gardens, green land, and leisure venues and facilities exceeds the supply. Therefore, under this circumstance, urban residents have the desire of tourism and leisure consumption in both urban and desakota areas. Walking out of the city towards the nature, appreciating the natural and countryside landscapes, and experiencing the country life has already become a new pursuit and fashion at the moment. Meanwhile, associated with the moving of industry to the outskirts of the city, Beijing experienced higher unemployment amongst the rural migrants who moved into the city to work in the factories. These migrants have rural skills and are well suited to agriculture. As a result, urban agriculture can provide both job opportunities for migrants and a new way of life for urban residents which is closer to nature.

Finally, Beijing is home to some of China's top universities and technological research centres. In terms of the scientific and technological resources, urban-oriented modern agriculture of Beijing relies on its advantages in science, technology and education as the capital of China. Within the city limits, agriculture-related science, technology and knowledge-intensive areas have been formed, a batch of national and municipal scientific and technological innovation platforms have been established, and an array of advantageous fields have been built. There are 25 central scientific and technological research units on agriculture, 11 national major agricultural laboratories among 18 laboratories nationwide, as well as over 30 agriculture-related research institutions and over 20,000 agricultural technicians in Beijing (BJstats, 2016). A complete research promotion system integrating agriculture, science and technology has been established in the city. It incorporates the two layers of central and local privately-owned enterprises and involves agriculture, forestry, animal husbandry, fishery, water conservancy and meteorology. This provides powerful academic and technical support to urban agriculture in Beijing.

5.2.3 Identifying the relevant stakeholders

Identification of the relevant stakeholders in Beijing was conducted during 11/08/2016 to 15/08/2016 in order to help organize the collection of primary and secondary data and support the design of the rest of the fieldwork. Stakeholder refers to one or more interest-related individuals and groups existing in an institution, organization, environment or system regardless of direct or indirect interest relationship. A stakeholder is deemed as an individual or group affecting, or being

affected by, an organization or the action of others in relation to a specific issue (Freeman, 2010).

Drawing on work on stakeholder theory by Mitchell *et al.* (1997), it was important to select a broad range of stakeholders, but also to recognise that their interests and agendas may clash and that they may be both in competition but also collaborating with each other. Care had to be taken to ensure that all viewpoints were heard equally. The importance of the agricultural industry is embodied in industries concerned with the national economy and the people's livelihood. Thus, as shown in figure 16, stakeholders of China's modern urban agriculture stated and identified in this thesis refer to individuals and groups interacting with the development of China's modern urban agriculture, including the government, agriculture-related enterprise, academic institutions, farmers and visitors to projects (urban residents as consumers).

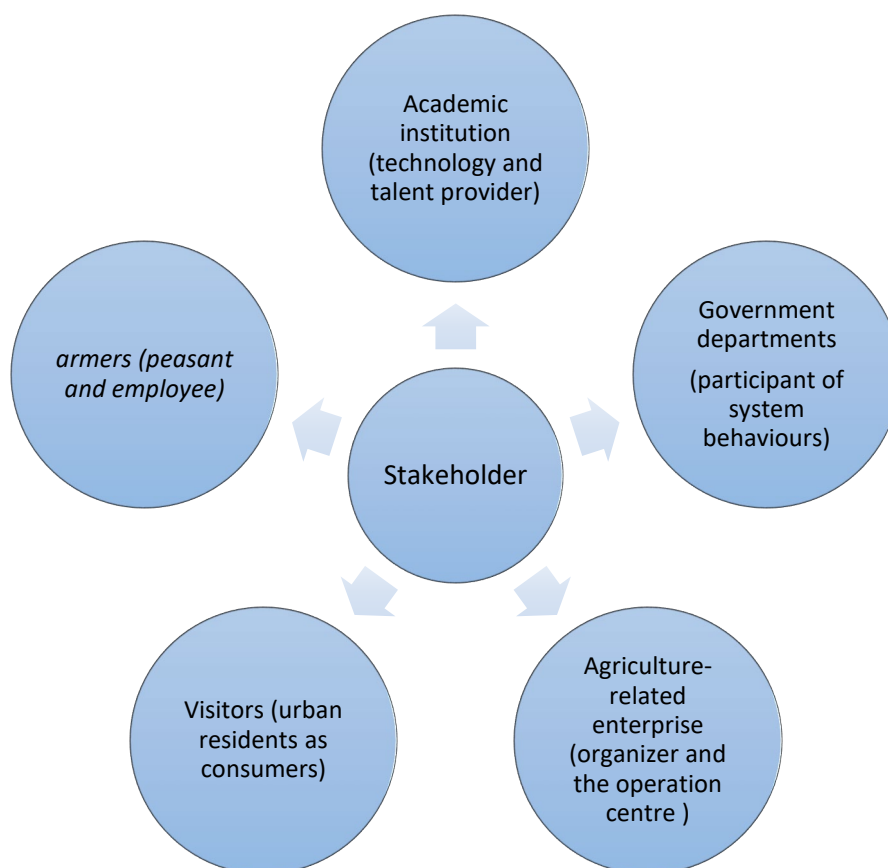


Figure 16: Stakeholders of China's urban agriculture. Source: Author (2016)

1. Government

Based on chapters 2, 3 and 4, the Chinese Government has two kinds of interest in this thesis, economic interests such as Gross National Product (GNP) and fiscal

revenue, and non-economic interests such as environmental concerns, level of social progress, degree of social harmony and social recognition of governing capacity. The government considers such development goals as food safety, increase of farmers' income, agribusiness development and ecological environmental protection while developing macroeconomic policies, guaranteeing normal operation of systems and mechanisms and financial investment, and to be in charge of support, guidance, coordination, standardization and service delivery in the development of modern urban agriculture. Moreover, the government carries out macro regulation and strives to create a market with fair competition so as to further increase the fiscal revenue, continuously drive regional development and to facilitate more people to overcome poverty and achieve prosperity. Specific to the development of urban agriculture, the government is not only the dominator of all stakeholders and policy and the rule maker, but also works as a participant with different roles in the whole system. Different departments play different roles during the advancement of China's modern urban agriculture (table 10). This is a key issue in China's new urban agriculture model, and the government's role in different projects of urban agriculture will be discussed further in chapters 6, 7 and 8.

Department of Government	Role
Municipal governments	Planner of macroscopic development
Agricultural sector	Macro regulator
Financial sector	Financial supporter and regulator
Department of environment protection, industry and commerce, tax, tourism and education	Executor of administrative instruction and public service provider

Table 10: Roles of different departments in China's modern urban agriculture.

Source: Author (2016)

2. Agriculture-related enterprise

The agriculture-related enterprise is the organizer and the operation centre of urban agriculture's development. Based on chapter 4, in this thesis, agricultural enterprise or agriculture-related enterprise is an important part of Chinese enterprises, mainly consisting of: (1) agricultural material enterprise, which provides agricultural production with means of production and service guarantees; (2) manufacturer of agricultural products; (3) processor of agricultural products in charge of processing primary agricultural products; and (4) circulator of agricultural products (table 11). They have the basic characteristics in three aspects. The first is independent

operation, independent accounting, and sole responsibility for profit or losses, pursuit of economic targets and independent assumption of economic financial responsibilities. The second is agriculture-oriented, control of such scarce resources as capital, technology and operating management required by modern agricultural production. The third is the intermediary between peasant households and the market. The agriculture-related enterprise in different projects of urban agriculture will be further discussed in chapters 6, 7 and 8.

Agriculture-related enterprise	Role
Agricultural material enterprise	Provides agricultural production with means of production and service guarantees
Manufacturer and processor of agricultural products	Processing primary agricultural products
Circulator of agricultural products	Transport of agricultural products
Comprehensive enterprise (agribusiness)	The integrated operation relates to many aspects

Table 11: Roles of different agriculture-related enterprises in China's modern urban agriculture. Source: Author (2016)

Zhang and Jiang (2008) carried out exploratory research on how the 'innovation ability index system of urban modern agricultural enterprises evaluates the innovation ability. Chen (2006) thought that new agricultural high-tech enterprises played an important role in the transition from traditional agriculture to modern agriculture, and proposed countermeasures and suggestions for the incentive of research personnel in the angle of intrinsic incentive, external incentive and binding incentive. Zhang (2012) established the relationship between agriculture-related enterprises and agricultural colleges, carried out a detailed analysis of the demand structure of agricultural talents with agriculture-related enterprises in developed areas as the research object, and tabled countermeasures and suggestions for talent training of agricultural colleges based on the evaluation of the cultivation of agricultural talents. In recent years, a series of preferential policies have been developed in Beijing city under the instruction of promoting modern agricultural development nationwide (see table 10 in section 5.2.2). These policies support new rural construction, such as integrated development of grain, farming industry, livestock, planting industry, tourism industry and other industries by virtue of distinctive resource advantages, energetic support of listing financing and expansion of agriculture-related enterprises. This helps agriculture-related enterprises be the main force for modern urban agriculture development and economic development of Beijing city. According to

statistics, there were 184 registered enterprises listed by 2011 in Beijing city, of which 10 were from the agricultural portfolio and 26 were registered in rural areas, and the total number of listed agricultural enterprises and village-town enterprises (agriculture-related enterprises) consisted of 19.3% of the listed enterprises (BJstats, 2016).

3. *Academic institution*

Academic institutions were considered as stakeholders because, in China, they play a dual role of education and policy development for the government. Academic institution refers to institutions or organizations equipped with clear research orientations and tasks, a batch of high-quality academic leaders and a certain number of researchers as well as basic research conditions and able to carry out long-term research and development activities organically. It refers to agricultural colleges and research departments related to urban agriculture in this thesis, such as Chinese Academy of Agricultural Sciences, China Agricultural University and Beijing Agricultural Institute. They are equivalent to the academic department of the government in different projects to provide academic and technical support.

Lakai *et al.* (2012) proposed to establish high-level agricultural education systems in accordance with modern urban agriculture and strengthen the construction of innovative talent teams. Tian (2009) stood for giving full play to talent, intelligence, discipline and technology of agricultural colleges through realizing the targets of modern urban agriculture, establishing scientific schooling philosophy and innovating the talent training mode. Tian (2009) also pointed out that the specialty structure of disciplines needs to be adjusted according to talents' demands. This can reform the education and teaching mode to build up an agricultural science-technology popularization system based on agricultural colleges. Meanwhile, constructing the mechanism can lead graduates of agricultural colleges to rural areas, and encourage them to obtain employment and start up business in the primary-level in rural areas. Kitchen *et al.* (2002) defined the concept of the interaction between vocational education and modern urban agriculture and expounded the significance, necessity and feasibility of clarifying the benign interaction. From the point of scientific research and technology promotion, Kitchen *et al.* (2002) indicated that the construction of the supporting system of urban modern agricultural science and technology had become the top priority of urban development, and that we should focus on the development

of an agricultural science and technology innovation system with agricultural industrial technology innovation alliance as the main carrier.

4. Farmers (peasant, employee and farming household)

China's agriculture is mainly family-based farming, and they decide how to carry out their own agricultural activities. Some of these continue to farm on land which has now become urbanized as the city has expanded to meet them. As cities in China have expanded, original peasant farmers have lost their land. Others are migrant farmers. Drawing on chapters 2 and 4, 'farmers' in this thesis contain different groups. Peasant farmers in this thesis refers to permanent residents who live in the city, people who once lived in rural areas but who now live in the city permanently. They are now employed in many of the formal urban agriculture projects the government is introducing. For example, they may be employed within the agricultural parks, to grow food. In this way they are still using their traditional skills and knowledge. The farming employee represent employees working in any agriculture-related project or enterprise. They may not have professional agricultural skills, but contributes in other aspects, such as managing, financial and IT support. The farming household can be considered as the most basic decision maker of agricultural production, which means they are the most important stakeholder engaged in agricultural operation.

Depending on the metropolitan economic zone, farming households concentrate on family interests and carry out agricultural activities through farmland with the purpose of increasing their income, achieving prosperity, and improving the living quality. It includes pure agricultural households and agricultural-related peasant households as well as peasants who lose farmland arising from urbanization and become employees of agriculture-related enterprises, or peasant households engaged in agriculture-related activities.

Lakai *et al.* (2012) considered that the healthy development of urban agriculture required a batch of new labourers armed with modern science and technology, namely urban peasants, and to develop vocational education of agriculture. As the leading force of agricultural development, they are improving their market awareness and knowledge level. In order to satisfy the increasing need for commodity consumption and facilitate peasant households to invest in high-profit industries, peasants have to pursue more monetary income. In this sense, it is the combined

unit of the society and economic functions. Agricultural activity means not only traditional agricultural production, but also agriculture-based economic activities and social cultural activities in this thesis. From this it became important to understand how peasant farmers were perceiving and undertaking the more social aspects of multifunctional urban agriculture, not only the actual growing/agricultural aspects. Therefore, an exploration of these aspects was included in the research on such farmers.

Chen *et al.* (2008) carried out a questionnaire survey of 1396 households in 74 villages of 38 counties in Jiangxi province in the aspect of service needs of agricultural science and technology, farmers' information requirements, market requirements of agricultural products and requirements of farmers' cooperative organization in order to explore the feasibility of scale operation of agriculture industrialization of peasant households. This survey discovered that these peasant households in suburban counties do need to be supported as a group or collective operation rather than a solo family-based farming operation. It also proved the necessity of developing Folk Custom Villages.

5. Visitors (or tourists acting as consumers)

Visitors are very major stakeholders and their opinions were vital for this research. They act as consumers for projects of urban agriculture. For the connection with other stakeholders, the most important impact of consumers is their buying power (Jones, 1995). Therefore, Verbeke (2009) states that satisfactory services and products should be provided to interested consumers. Also potential consumers should be attracted as much as possible. Considering sustainability, Vermeir and Verbeke (2006) argued that personal characteristics and awareness of sustainable development have a positive impact on the attitude towards buying sustainable products, which also has a close connection with the willingness to buy. Most importantly, their research demonstrated that *“some of these key determinants, namely involvement, perceived availability, and perceived consumer effectiveness, can be successfully influenced through communication efforts and the provision of information, which is an effort that can be taken up by any stakeholder involved with sustainable food chains”* (Vermeir and Verbeke, 2006, p. 188). Similarly, D'Souza (2004) pointed out the importance of consumers' attitudes and buying behaviour in the environmental dimension. The concerns about safety and environmental

protection have led to consumer behaviour being affected by the environment. As a result, consumers are starting to prefer to be 'green' consumers.

According to chapter 4, in China, the demand of urban residents for urban agriculture has changed from food supply to multifunctional agricultural activities. Many of today's citizens, who are participating in the urban agriculture, do so because they wish to experience a 'pastoral life' for their spare time in the urban area. This helped to develop the questionnaires for particular questions to visitors in the aspect of consumers, such as 'why' and 'how', in order to explore their feelings of participating in the urban agriculture, and these issues were asked in further interviews and discussion with visitors.

The visitors in different projects of urban agriculture will be further discussed in chapters 6, 7 and 8. Such ideas, of the change of consumers' attitudes to buying in general and urban agriculture in particular, became important in the development of the questionnaire, with these issues being drawn out in analysis and discussion in the interviews with visitors or tourists acting as consumers.

5.3 The research process

The research process was undertaken in three stages. Stage 1 was the review of existing secondary data of the government, agriculture-related enterprises and academic institutions. Connecting with chapter 4, this part was particularly helpful in selecting the study projects of three types of urban agriculture. It identified key stakeholders and developed a detailed understanding of the specific districts to be visited.

Stage 2 selected the different projects. This provided a detailed understanding of the objectives and approaches of the projects prior to the full fieldwork.

Stage 3 included visiting the projects and collecting primary data. This was the key stage of the whole research. For this stage different groups were interviewed and a questionnaire was undertaken with project visitors and followed by more in-depth interviews. Observational methods were also used.

5.3.1 Stage 1 Secondary data

Stage 1 was conducted during 15/08/2016 to 20/08/2016. The bulk of the secondary data needed for this study was available in the policies, reports and statistics produced by the government, agriculture-related enterprises and academic

institutions. Most data were collected from the Beijing Municipal Bureau of Statistics website. Also, contextual documents including government annual report, newspapers, publications and brochures about urban agriculture in Beijing were examined. The detailed information for specific municipal departments and research agencies are shown in table 12. Information, data and statistics are mostly published on the website, while some articles and research reports need access. However, urban agriculture is a relatively new agriculture form in Beijing, and so there was a lack of studies and data about earlier time periods, and the latest official statistics was published in 2008. Although this data is not up to date, it still proves the value of urban agriculture in urbanization.

Name	Function	Source
Beijing Municipal Bureau of Statistics	A survey, collects and gathers data or information for all professions and trades, collates and provides related statistics for Beijing. Also, it includes data and statistics for all the districts and counties of Beijing, but not detailed as sub-website.	http://www.bjstats.gov.cn/
Beijing Miyun Bureau of Statistics	Same as above, more detailed data and statistics of Miyun are provided.	http://www.my.bjstats.gov.cn/
Beijing Changping Bureau of Statistics	Same as above, more detailed data and statistics of Changping are provided.	http://www.cptjj.bjchp.gov.cn/
Beijing Chaoyang Bureau of Statistics	Same as above, more detailed data and statistics of Chaoyang are provided.	http://www.chystats.gov.cn/
State-owned Assets Supervision and Administration Commission of People's Government of Beijing Municipality (Beijing SASAC)	Mainly responsible for human resource management, the development plan and investment scale of state-owned assets. UA practices which are fully or mostly belonging to state-owned assets are under SASAC's supervision and management.	http://www.bjgzw.gov.cn/
State-owned Assets Supervision and Administration Commission of Miyun (Miyun SASAC)	Same as above, but only invests in Miyun county.	http://www.bjmy.gov.cn/
State-owned Assets Supervision and Administration Commission of Changping (Changping SASAC)	Same as above, but only invests in Changping district.	http://cpgzw.bjchp.gov.cn/

State-owned Assets Supervision and Administration Commission of Chaoyang (Chaoyang SASAC)	Same as above, but only invests in Chaoyang district.	http://gzw.bjchy.gov.cn/
Beijing Municipal Commission of Agriculture	Formulation and implementation of policies related to agriculture, management of planting and breeding industry, supervision and management of Beijing agricultural industry.	http://www.bjny.gov.cn/
Miyun Commission of Agriculture	Same as above, but more detailed for Miyun county.	http://www.myag.gov.cn/
Changping Commission of Agriculture	Same as above, but more detailed for Changping district.	http://www.bjchp.gov.cn/
Chaoyang Commission of Agriculture	Same as above, but more detailed for Chaoyang district.	http://www.cynw.gov.cn/
Beijing Municipal Commission of Tourism Development (BJTD)	For urban agriculture, BJTD is mainly responsible for the development plan and publishing information, formulation and implementation of policies, supervision and management of Agro-tourism and Folk-culture village.	http://www.bjta.gov.cn/
Miyun Commission of Tourism Development	Same as above, but more detailed for Miyun county.	http://www.mylvyou.com.cn/
Changping Commission of Tourism Development	Same as above, but more detailed for Changping county.	http://www.chply.com/
Chaoyang Commission of Tourism Development	Same as above, but more detailed for Chaoyang county.	http://www.cyly.gov.cn/
Beijing City Agriculture Research Institute	It was set up in 2009, based on Beijing University of Agriculture. It aims to build up a promotion platform for modern urban agricultural science and technology innovation, and provide theory, policy, technical and professional training and other support for the development of Beijing's urban agriculture.	http://dyy.bua.edu.cn/
Beijing Zhongnong Futong Horticulture Co., Ltd	It is a research agencies' corporate enterprise based on Chinese Academy of Agricultural Sciences, Beijing Academy of Agriculture and Forestry Sciences, China Agricultural University and Beijing University of Agriculture. It provides different types of	http://www.agrifaci.com/

	agricultural park planning and design, agricultural facilities design and construction, agriculture landscape design and technical, theory, research, planning support services.	
China Academy of Urban Planning & Design	It is the National Urban Planning, Design and Academic Information Centre in China.	http://www.caupd.com
Beijing Academy of Urban Planning & Design	Provide planning services for urban construction and the construction of macroeconomic policy-making of Beijing municipal government.	http://www.bjhhlv.com

Table 12: Detailed information for municipal departments and research agencies.

Source: Author (2016)

There are also useful websites from which to collect secondary data. The location and weather information of three districts can be searched on the China Weather website, which is '<https://www.weather.com.cn/>'. The official website of Beijing Agricultural Carnival is '<https://www.bjnyjnh.com/>', which provides relative information and services of the project. Beijing Xiedao Agricultural Resort uses '<https://www.xiedao.com/html/>' as a platform for information sharing, accommodation booking and a visitor online information centre. The reviews and information of Folk Custom Villages can be found on many travel websites, which are run by private companies. These helped with the process of project selection. Although there may be some incorrect information due to some issues such as advertising price and search priority by paid service, these did not affect the primary data collection in Stage 3.

5.3.2 Understanding the districts

The preliminary research in Beijing was conducted during 28/07/2016 to 10/08/2016 in order to have a deep understanding of three districts within Beijing. There are multiple sites of urban agriculture which could be studied in Beijing. However, time constraints meant limited sites were chosen in different locations in three districts within Beijing: Miyun, Changping and Chaoyang. These three districts can be seen in figure 17 below. These locations were purposively sampled to ensure the inclusion of each of the three main types of urban agriculture project currently being promoted by the Chinese Government, and include the three areas defined as urban as identified in chapter 2 – Chaoyang representing urban area, Changping representing desakota

area and Miyun representing ex-urban area. It needs to be mentioned again that no formal urban agriculture is currently taking place in central Beijing (see figure 15 in section 4.8). It was decided that, if new sites became available in the core area, which is the red area in figure 17, they would be added. However, none did become available during the fieldwork period.

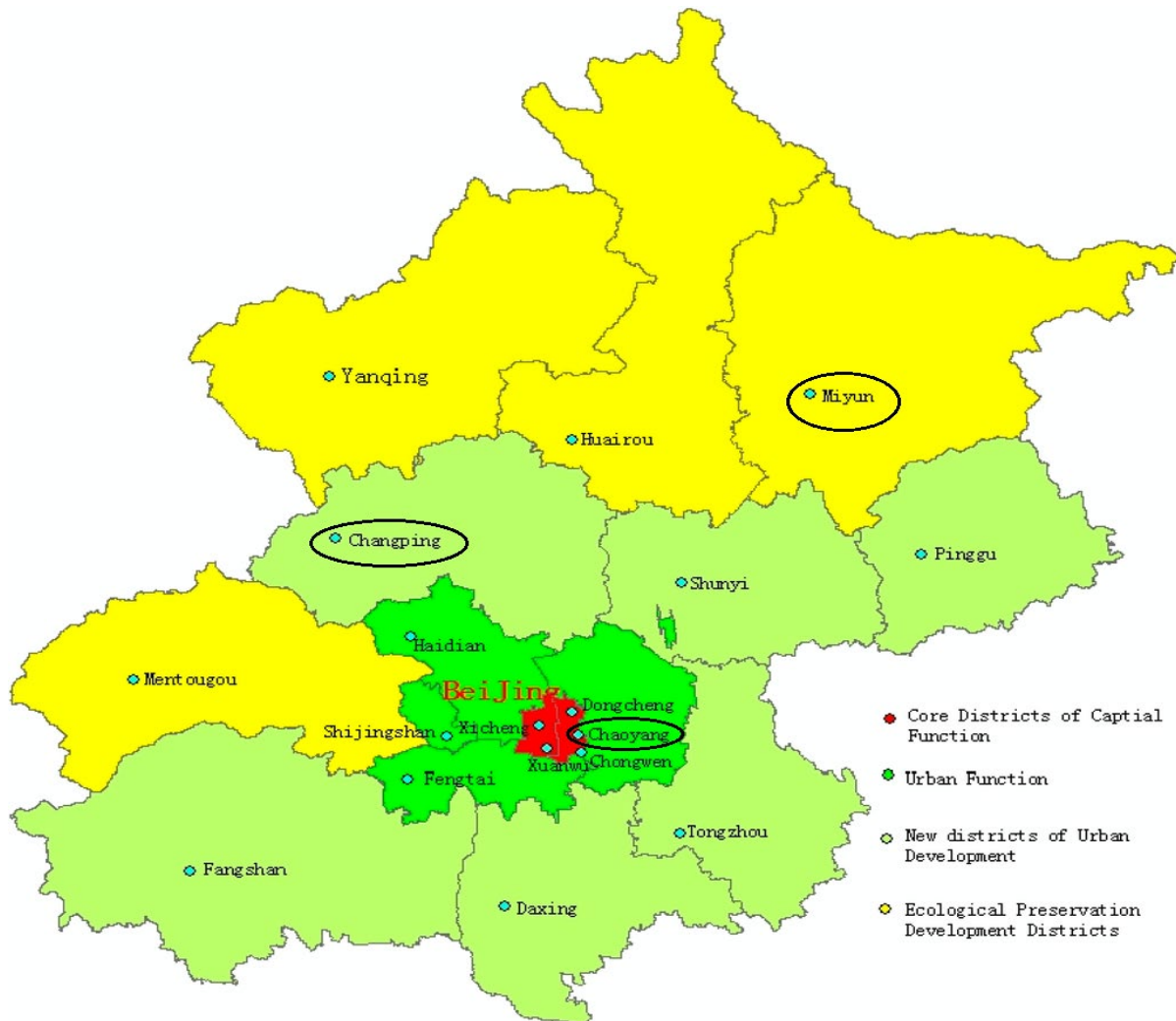


Figure 17: Locations of three districts in Beijing. Source: Adapted from Zong *et al.* (2015)

5.3.3 District 1: Miyun County

Miyun County is one of the important bases of international communication and leisure tourism for Beijing. It is the research and development base and talent development base of agricultural multifunctionality, bearing the important functions of water source protection and ecological protection of the capital.

Location and Weather

Miyun County is at the intersection of the Yanshan Mountains and North China Plain, located in the northeast of Beijing and is the traffic bridge between North China and Northeast and Inner Mongolia, hence it has the name of “capital key”. Miyun County, a total area of 2,229.45 km², accounting for 13% of the Beijing city area, is the largest county/district in Beijing. The county’s mountainous area accounts for 79.5%, which is 1,771.75 km²; its plain area accounts for 11.8%, which is 263.4 km²; its water area accounts for 8.7% with 194.3 km² (MYBJstats, 2016). In addition, it is rich in light and heat resources and reclamation is about 15%, suitable for the development of agriculture (MYBJstats, 2016). Miyun County is of warm temperate continental semi-arid climate. Its northern mountains play a role of barrier for the county. The climate presents the feature of piedmont warm area and the temperature is slightly higher than neighbouring districts at the same latitude. According to the weather information on China Weather³⁹ website, the county average annual temperature is 10.8°C. Spring temperatures are at 5-20°C and the guarantee rate of desired biological minimum temperature of 10 to 15°C in spring planting is up to 80%. Under the control of the strong Siberian High⁴⁰, its winter is cold and dry, and snowless. The average temperature of the plain in the coldest month of January is -6°C. Average time with the temperature below 0°C for many years in Miyun County is 93 days. The annual average precipitation is 661.3 mm and annual average precipitation days is 75 days. The precipitation in summer is the most, accounting for 76.4% of the annual amount; the annual average precipitation days in winter is 6 days with precipitation intensity of 1.5 mm/day.

Urban agriculture and economy

The natural tourism resources are abundant with the reputation of the grand northern landscape and the country park of the capital, the tourism environment is unique. The county forest coverage rate is more than 60% and per capita public green area is 25.63 km². Water quality reaches the national level-two standard. Air quality reaches the national level-two standard as well, and air quality in most areas reaches the national level-one standard. These three indexes are at the top of all the districts/counties in Beijing (MYBJstats, 2016). It can be said that Miyun County has become a ‘green park’ of clear water, pure land, clean air and pollution-free for

³⁹ The information was published in Chinese. Available from: <http://www.weather.com.cn/> (Accessed: 19 September 2018).

⁴⁰ Also named Siberian Anticyclone

Beijing. In addition, as an important water source conservation development area of the capital, water protection has been the main task of Miyun. Decades of universal water protection has formed a beautiful ecological environment there, enabling Miyun to become the solid ecological barrier and the ideal place of public leisure and vacation in Beijing. In 2008, Miyun was named “national ecological county” by the State Environmental Protection Department and was listed as one of the six pilot areas of ecological civilization. In 2009, the county’s comprehensive evaluation of ecological quality ranked first in the 18 districts/counties in Beijing (MYBJstats, 2016). Good ecology and liveable environment become the greatest competitive advantage of Miyun’s tourism industry.

In 2008, Miyun County accepted 7.073 million tourists, outputting a comprehensive revenue of 943 million CNY (approximately equal to 136.86 million USD) (MYBJstats, 2016). It has excessively been awarded the “Chinese charm county” and “Chinese county tourism brand top 100”. In recent years, the proportion of Miyun County’s tourism industry has been increasing. Revenue from tourism accounted for 2.01% of regional GDP in 1990, and the proportion rose to 8.81% in 2009 (MYBJstats, 2016). As a large tourism county in the suburb of Beijing and a national ecological county, it has push forward a healthy tourism development strategy and become an important pilot of the national ecological civilization construction. According to the functional orientation of the ecological leisure and vacation tourism zone, Miyun County comprehensively promotes the development and integration of the tourism resources. An agricultural leisure industry belt project surrounds several large leisure and vacation zones themed in the traditional agricultural culture. Agricultural leisure and agricultural experience are actively promoted. The figure shows that, with the increase of the consumption level, Miyun County tourism per capita cost was 25.4 CNY (approximately equal to 3.89 USD) per person in 1990, and in 2009, the number rose to 140.0 CNY (approximately equal to 20.32 USD) (MYBJstats, 2016).

On the basis of taking agriculture economic function as the centre, Miyun County has begun to focus on the development of agriculture ecological function and social function. In addition, the county has also built some new agricultural gardens, which have become an important part of the urban ecological system in Beijing. At present, 1651 folk tourism households and 152 agricultural tourism gardens have been built (MYBJstats, 2016), which not only creates favourable conditions for farmers’ economic benefits but also provides a place of contacting with nature, an agricultural

experience and tourism and leisure for urban residents, laying a good foundation for accelerating the development of modern urban agriculture. In order to promote the development of modern agriculture in the suburb of Beijing, Miyun has developed 30 tourist centres, more than 50 tourism hotels and restaurants, 40 Folk Custom Villages, 1,583 tourism specialized Happy Farm House households, 105 ecological fishing villages, 100 country hotels, 35 leisure farms, more than 40 tourism picking parks and 3 agricultural tourism demonstration zones. There are 24,000 tourism practitioners in Miyun County, of which there are 12,000 farmers directly engaged in tourism reception (MYBJstats, 2016). In 2009, Miyun County accepted 7.576 million tourists, outputting a comprehensive revenue of 1.06 billion CNY (approximately equal to 0.15 billion USD). And 4.975 million tourists have been accepted in leisure agricultural tourism to achieve a comprehensive revenue of 244 million CNY (approximately equal to 35.41 million USD), accounting for 65.4% and 23% of the county's total tourism respectively (MYBJstats, 2016). Leisure agriculture has become an important part of the Miyun tourism industry and farmers' income has significantly increased.

5.3.4 District 2: Changping District

Changping district is best known as the 'back garden of Peking', with a total area of 1,352 km², and an agricultural area of 280,000 mu⁴¹ (CPBJstats, 2016). It is adjacent to the Olympic village, only 33 km away from central Beijing, and must be passed through to get to Badaling (the Great Wall), so it has a strong advantage of tourism.

Location and Weather

Changping district belongs to a warm temperate zone, which is a semi humid continental monsoon climate. It has four distinctive seasons: arid and windy in spring, burning hot and rainy in summer, nice and cool in autumn, and it is cold and dry in winter, with annually 2,684 hours of sunshine, average temperature of 11.8°C, and an average precipitation of 550.3 mm (ChinaWeather, 2016). It has a thin layer of cinnamon soil resulting from rock weathering, which is suitable for developing the fruit industry, while it has a thick layer of moisture soil in the south plain resulting from the fourth alluvium deposit, which is suitable for all kinds of crops (ChinaWeather, 2016). Thereby, with great advantages for developing agricultural

⁴¹ Mu, a Chinese unit of land area. 1500 mu = 1 km²

productions, Changping district has been regarded as a pilot project of the urban type of modern agricultural service construction in Beijing.

Urban agriculture and economy

Recorded from the 2010 sixth national population census, permanent resident population in the Changping area was 1,660,500 people in that year, and total registered population was 533,000, up 1.9% compared to the end of the previous year, among which, the agricultural population was 207,000 people, which was 38.8% of the district's total, down 1.5 percent points compared to the end of the previous year (CPBJstats, 2016). Compared with the fifth national census in 2000, the population had increased 1,045,700 people within ten years, up 170.09%, with an annual growth of 104,600 people, and annual growth rate of 10.45% (CPBJstats, 2016).

In 2009, the total value of agriculture, forestry, livestock and fishery industries was 1.535 billion CNY (approximately equal to 0.22 billion USD), increasing 4.5% year on year, among which, the value of agricultural production was 586.47 million CNY (approximately equal to 85.10 million USD), increasing 7.5% year on year (table 13). The total crop planting area was 124,627 mu, decreasing 10,805 mu year on year, down 8.0%; the total output was 33,516 tons, decreasing 9,925 tons year on year, down 22.8% (CPBJstats, 2016).

	Total: CNY	Compared with the same period the previous year
Forestry	151.13 million	Increasing 3.8%
Livestock	707.08 million	Increasing 1.4%
Fishery	38.49 million	Increasing 23.9%

Table 13: Numbers of agricultural production in Changping in 2009. Source: Adapted from CPBJstats (2016)

In 2009, with increasing intensity of agricultural facility construction, the floor area of these facilities was 9,313 mu, increasing 17% year on year. These facilities' income has reached 17.936 million CNY (approximately equal to 2.60 million USD), increasing 19.1% year on year (table 15). The number of sightseeing places had reached 207, increasing 3% year on year, and the employees for the sightseeing during peak period growing 38.2% year on year, and with visitors' numbers growing

19.8% year on year. The operators of folk tourism had reached 465 houses, up 14.3%, and the employees for the sightseeing during the peak period grew 13% year on year, and visitor numbers increased 31.7% (CPBJstats, 2016). The total income of sightseeing and folk tourism was 230.529 million CNY (approximately equal to 33.45 million USD) (table 14).

	Total: CNY	Compared with the same period the previous year
Facility income	17.936 million	Increasing 19.1%
Sightseeing	182.918 million	Increasing 22.8%
Folk tourism	47.611 million	Increasing 27%

Table 14: Incomes of different urban agriculture in Changping in 2009. Source: Adapted from CPBJstats (2016)

5.3.5 District 3: Chaoyang District

Chaoyang district is located in the eastern part of Beijing city with a total area of 470.8 km² and average elevation of 34 metres, and it is the largest district among the desakota area of Beijing city. With advanced industries, it is the important industry base in Beijing, as well as the main area for industry migration in Beijing. The multitude of manufacturing enterprises will migrate to Hebei province. The urban agriculture supported by Chaoyang district fills in the blanks left after industry migration, and all kinds of agricultural sightseeing, agricultural science park and high technology agricultural industries facilitate the development of urban agriculture in this district.

Location and Weather

Chaoyang district is situated in the Beijing plain, with a northwest terrain tilting gradually downward to the southeast. Its average elevation is 34 metres, with a highest elevation 46 metres (ChinaWeather, 2016). It belongs to the continental half humid monsoon climate, with four distinct seasons and precipitation concentration: spring is dry and windy, with high temperature difference; summer is hot and rainy; autumn is sunny and rainless, with appropriate temperature and sufficient sunshine; winter is cool and dry, windy and snowless. Its annual average temperature is 11.6°C, the average temperature of the coldest month in January is 4.6°C, the hottest month

in July is 25.9°C, and the annual frost-free period is 192 days. The average annual precipitation is 581mm (1971-2000 year), with summer accounting for 75% of the whole year. Chaoyang district has rich underground water, with most of district being a water abundant area (ChinaWeather, 2016).

Urban agriculture and economy

Recorded from the 2010 sixth national population census, the permanent residential population was 3,545,000 people in that year in Chaoyang district, and had increased 1,255,000 people within ten years compared with the fifth national population census in 2000, up 54.8%, with an annual growth of 126,000 people and annual growth rate of 4.5%. Among the permanent residential population in this district, the people coming to Beijing from other provinces was 1,515,000, accounting for 42.7%. In 2007, the GDP in this district was 167.04 billion CNY (approximately equal to 24.24 billion USD), accounting for 18.5% of the whole Beijing city. District tax revenue was 57.9 billion CNY (approximately equal to 8.40 billion USD), increasing 40.4% year on year, accounting for 1.14% of national treasury tax revenue. Fiscal revenue in the district was 14.15 billion CNY (approximately equal to 2.05 billion USD), increasing 32.8% year on year (CYBJstats, 2016).

In 2014, the income of sightseeing agriculture was 370.697 million CNY (approximately equal to 53.80 million USD) in Chaoyang district, ranking in the top three of the whole of Beijing city. Meanwhile, the enterprises have been gradually adjusting the direction of their management, and developing new operational projects to attract the participation of citizens, thus the visitors for sightseeing agricultural has been rising somewhat with 1.439 million trips in 2014, increasing 266,000 trips year on year. In recent years, it has promoted the Jinzhan Blues Agricultural Holiday Resort and Xiedao Agricultural Holiday Resort, constructed 8 multi-span greenhouses with a total size of 85,000 m². And another 9 parks are under construction, including Heizhuanghu Dushi Nonghui, a second phase for Cherry Orchard, second phase for Vineyard, Langzao Biological Garden, Greenland Blackberry Garden, Peking Lanyuan Garden, and Gelin Wande Agricultural Science Park. It is predicted that the total income will be 2.46 billion CNY (approximately equal to 0.36 billion USD), and will provide 3,650 job positions after construction. In order to meet the requirements of citizens for the organic and healthy products, Chaoyang district has established an organic agricultural production base, and set up a batch of high-end organic vegetable quality brands including No 1 Manor, Xiedao,

and Yongshunhua. Facilities planting vegetables and blueberries have been picked mainly for sightseeing agriculture, and the income for sightseeing facilities in 2014 was 6.352 million CNY (approximately equal to 0.92 million USD), accounting for 10.5% of the total planting industry in this district (CYBJstats, 2016).

5.3.6 Stage 2 Selecting the individual projects

Stage 2 was conducted during 20/08/2016 to 22/08/2016 to select the suitable study projects of the three types of urban agriculture. The Beijing Agricultural Carnival in Changping was selected as an example of a government fully-owned large project. Beijing Xiedao Agricultural Resort in Chaoyang was selected as an example of a Modern Agricultural Holiday Resort. Five villages were selected as examples of Folk Custom Villages. The detailed defining and understanding of these projects will be further discussed and analysed in chapters 6 and 7, combining with the fieldwork data.

5.3.7 Stage 3 Visiting projects and primary data collection

Stage 3 was conducted during 22/08/2016 to 13/11/2016. While much of the secondary data can be gained from government reports, this cannot be taken at face value. In particular, the effectiveness of the urban agriculture projects, in relation to the objectives of sustainable development needs to be assessed also by project visits. The fieldwork seeks to compare the data drawn from government reports with what is happening and being experienced in the individual projects. In the collection process, a valid questionnaire return means all questions are answered and the answer is valid for analysis. Every questionnaire was checked for validity at the time of receipt and the process of survey in each project was stopped after the number reached 100.

During the fieldwork in the Beijing Agricultural Carnival, 10 in-depth interviews of staff members (representing government officials and academic researchers) and 10 in-depth interviews of exhibitors were conducted, each with an approximate length of 20 minutes. A total of 100 valid questionnaires (116 were issued) for visitors were conducted in order to let them express their responses for experiencing the carnival. Among these 100 visitors, 17 of them were willing to accept a further brief and unstructured interview to discuss their personal feelings and thinking about this kind of project.

During the fieldwork in the Beijing Xiedao Agricultural Resort, a total of 10 in-depth interviews of managers and workers were conducted (3 managers and 7 workers), each with an approximate length of 20 minutes. A total of 100 valid questionnaires (131 were issued) were conducted in order to analyse tourists' acceptance of and satisfaction with the Modern Agricultural Holiday Village. The questionnaire included a Likert Scale to assign tourists' evaluation with a score: with very satisfied, satisfied, neutral, unsatisfied and very unsatisfied being assigned the scores of 5, 4, 3, 2 and 1 respectively. Among these 100 visitors, 24 of them were willing to accept a further brief and unstructured interview to discuss their personal feelings and thinking about this kind of project.

During the fieldwork in the five Folk Custom Villages, the survey issued 624 questionnaires to visitors with 500 valid returns, 100 for each Village, in order to understand tourists' views and attitudes about the Folk Custom Villages and Happy Farm House Tourism. Among these 500 visitors, 21 of them were briefly interviewed following the questionnaire to discuss their personal feelings and thinking about this kind of project.

The research also included a survey with 121 farming households (operators and relevant employees) involved in tourism and received 100 valid returns, 20 for each village, in order to investigate whether they have different attitudes to the development of the Happy Farm House or not. Among these 100 households, 17 of them were chosen to a further semi-structured interview to discuss their personal feelings and thinking about this kind of project, each with an approximate length of 10 minutes.

The timetable of each type of project is shown in table 15.

Project	Time	Participation	Methods
Beijing Agricultural Carnival	22/08/2016 to 18/09/2016	Exhibitors and visitors	Questionnaires In-depth interviews Observations
Beijing Xiedao Agricultural Resort	19/09/2016 to 16/10/2016	Managers, workers and visitors	Questionnaires In-depth interviews Observations

Five Folk Custom Villages	17/10/2016 to 13/11/2016	Farming households and visitors	Questionnaires In-depth interviews Observations
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Table 15: The timetable of each type of project. Source: Author (2016)

5.3.8 Interviews

The interview, used by researchers, “*attempts to understand the world from the subjects' points of view, to unfold the meaning of people's experiences, to uncover their lived world prior to scientific explanations*” (Kvale, 2008, p. xvii). This means the interview is an interactive conversation between an interviewee and an interviewer to share and exchange their experiences and knowledge. It helps in obtaining more detailed and comprehensive information about a particular topic (Adams and Cox, 2008).

According to the outcome of the literature review and Stage 1 and 2 of the fieldwork, the interviews in this thesis were designed as one-to-one in-depth interviews with staff members (representing government officials and academic researchers), exhibitors in the Beijing Agricultural Carnival, managers and workers in the Beijing Xiedao Agricultural Resort, as well as visitors who wished to accept further brief and unstructured interviews after the questionnaire was undertaken in both projects. In the five Folk Custom Villages, households (operators and relevant workers) and visitors (tourists) who wished to accept a further brief and unstructured interview after the questionnaire was undertaken were also interviewed.

The main sampling technique for the in-depth interviews was the snowball technique, where “*research participants recruit other participants for a test or study*” (Stephanie, 2014, p. 1). The technique started with key informants who had been searched for and identified in Stage 1. They were contacted by email, telephone or social media, where contact details could be found on the Internet or had been given by a friend who had been interviewed previously.

The interviews with staff members (representing government officials and academic researchers) in the Beijing Agricultural Carnival aimed to know the picture of programmes regarding policy implications and the government’s blueprint for the future of urban agriculture in Beijing. Moreover, to check with officials about statistics from the earlier time period and the latest data.

The interviews with exhibitors in Beijing Agricultural Carnival were taken with their own characteristics on the following major themes:

1. The history and dynamics of the practice (enterprise).
2. The characteristics of the practice (enterprise), general and particular.
3. The characteristics of employees.
4. The impacts of the practice (enterprise) on rebalancing the relationship between the environment and economy.
5. The impacts of taking participant in the Carnival.

The interviews with different positions of managers and employees in the Beijing Xiedao Agricultural Resort, including farmers in planting and husbandry, service staff in different departments, engineers or technicians, and other relevant employees, focused on their identity, working status, living status and attitudes towards urban agriculture.

The further questions in brief and unstructured interviews focused on the influence of development of urban agriculture on participants' daily life status, living environment and attitude towards urban agriculture.

As described in section 5.3.3, the interviews included two parts. The in-depth interviews were designed to be semi-structured, with a total of 30 being undertaken. The author prepared a specific schedule for each group of interviewees. Although the interview questions were predetermined by the author, they were not asked directly one by one. And a few questions were not asked during the interview in some cases, for example if the intended sought for information had already been contained in the previous answer. Only visitors (tourists) were interviewed in a brief and unstructured way in order to let them express their opinions freely, with there being 89 such interviews in total.

For in-depth interviews, every interviewee was informed about the nature of this research and given an information sheet which provided a brief introduction of the research process, and explained their rights in the interview such as withdrawing from the research. A consent form was also given to every interviewee to read and sign.

The interviews were all recorded by notes including both in-depth interviews and unstructured interviews. A voice recorder was used in some interviews when the

interviewee agreed. During the whole fieldwork, the author kept updating a reflective diary and separate notes for each interview in order to help check and review the process of the fieldwork and continuous support to develop the further research. The sample interview form can be seen in the appendix 1. A list of interviewees with interview dates can be seen in the appendix 5.

5.3.9 Questionnaires

The questionnaire is an “*important instrument of research, a tool for data collection...its function is measurement*” (Oppenheim, 2000, p. 100). Adams and Cox (2008) state that two important concepts need to be considered in questionnaire design: ‘reliability’ and ‘validity’. “*Reliability refers to the consistency of a measure whilst validity refers to its ability to measure what it is supposed to be measuring*” (Adams and Cox, 2008, p. 18). As a result, a questionnaire should have a set of written or oral questions in a particular subject or topic. These questions, therefore, need to be easily understood, interpreted and completed by the reader (Adams and Cox, 2008). This in turn can help improve the accuracy of answers.

According to the outcome of the literature review and Stage 1 and 2 of the fieldwork, the questionnaires in this thesis were designed as a questionnaire survey on visitors (tourists) in each project and households (operators and relevant workers) in five Folk Custom Villages. It needs to be mentioned that 100 valid questionnaires were achieved in each group in order to calculate exactly as an integer. A total number of 475 questionnaires were actually received, with 400 of them being valid in answering all questions. The questions were related to visitors’ and households’ (operators and relevant workers) characteristics, purposes and experiences of their participation in urban agriculture activities. The purpose of this survey was to assess different projects of urban agriculture in three districts and their established connections between urban and rural areas. These questionnaires were all completed anonymously.

The main sampling technique for the questionnaires was convenience sampling by sending paper questionnaires to the projects. It is “*a method of non-probability sampling that involves the participants being drawn from a close population group*” (Gaille, 2020, p. 1), The data can be used immediately and “*This sampling method provides a wealth of qualitative information*” (Gaille, 2020, p. 1). In this process, each participant was independent of the others, but households (operators and relevant

workers) had the risk of being like-minded people in some cases because they worked as a group, which might mislead the research finding.

The process in Beijing Agriculture Carnival as follow:

1. Location and Number: Gate A-23 (20 valid), Wisdom and Technology Agriculture Exhibition Hall-24 (20 valid), Creative Agriculture Exhibition Hall-23 (20 valid), Agricultural Experience Park-22 (20 valid), Agricultural Amusement Park-24 (20 valid). 116 were issued (100 valid).
2. Sampling technique: Around 3 to 4 pm in the afternoon in both weekdays and weekends, visitors were randomly selected at the above locations. In this way, an accurate evaluation can be received after a day of experience especially those who come for the first time. This also solves the limitation to a certain extent, because some of the interviewees are here for the first time.
3. Restriction: The interviewees are visitors who have entered the Carnival, this means that they have recognized this kind of project and have chosen to experience, so the data collected is almost positive. There is no data for those citizens who know but don't choose to come, or citizens who never know this project.

The process in Xiedao Agricultural Holiday Resort as follow:

1. Location and Number: Gate-39 (30 valid), Front Store-52 (40 valid), Backyard Area-50 (40 valid). 131 were issued (100 valid).
2. Sampling technique: Around 5 to 6 pm in the afternoon in both weekdays and weekends, visitors were randomly selected at the above locations. Before sending the questionnaire, the visitors were asked whether to stay overnight. Some photos of the accommodation or activities were provided, or we went directly to the accommodation area to see.
3. Restriction: There are two main types of visitors, one is day trip, and another stay in Resort overnight. There will be differences in the evaluation of some service items, such as accommodation, night activities, etc.

The process in five Folk Custom Villages as follow, the specific location on the map can be seen in figure 46:

1. Location and Number of farming households: Zhenzhuquan Village in Yanqing-24 (20 valid), Yangtaizi Village in Changping-26 (20 valid), Diaowo

- Village in Huairou-23 (20 valid), Haizi Village in Haidian-23 (20 valid), Huangcaowa Village in Shijingshan-25 (20 valid). 121 were issued (100 valid).
2. Location and Number of visitors: Zhenzhuquan Village in Yanqing-125 (100 valid), Yangtaizi Village in Changping-131 (100 valid), Diaowo Village in Huairou-119 (100 valid), Haizi Village in Haidian-121 (100 valid), Huangcaowa Village in Shijingshan-128 (100 valid). 624 were issued (500 valid).
 3. Sampling technique: The farming households were chosen as this way: According to the Dianping App⁴², the top 2 scores were selected, and another 3 from the 4-4.5 partition (5 points) were randomly selected. Then the researcher randomly enters the house to send questionnaires until the valid number reaches 20 in each village. The visitors were chosen as this way: some were randomly selected in the same farming households. Others were randomly selected throughout the village, including bus stops, shops, and streets etc. until the valid number reaches 100 in each village. The time is not in the afternoon like the other two, but randomly throughout the day.
 4. Restriction: Different villages have different characteristics, Zhenzhuquan Village and Yangtaizi Village have most kinds of traditional cultural expressions which are related closely to the life of local people. Diaowo Village, Haizi Village and Huangcaowa Village have folk custom diet including materials, methods, flavors and seasonings of cooking. So visitors have different purposes but this research did not have a separate questionnaire for each village. Visitors may have different criteria when answering questions.

However, the main limitation of whole process of convenience sampling are:

1. Researcher's point can enter into the sampling technique because the design of the questionnaire may produce some potential guidance, such as the sorting of scoring, the content of options, etc.
2. Although there are hundreds of samples in this research, there can also be issues with under-representation with convenience sampling for the huge number of visitors for urban agriculture.
3. There may be some problems with accuracy because people don't want to be disturbed when visiting. The answers they fill in may not be true.

⁴² 大众点评 Dianping App(offering local business search, user generated reviews, detailed business information, featured discounts, group buying and other merchant services)

Despite these limitations, the data of the questionnaire can receive specific feedback from individual perspectives. A lot of qualitative analysis information can be obtained in a shorter time. And the problem setting also maximizes accurate correlations.

The other technique was Likert Scale that was used to indicate the extent of tourists' satisfaction of the projects. *“Ideally a full Likert scaling should be undertaken by developing groups of items that are statistically tested to identify the degree to which they measure the same things”* (Adams and Cox, 2008, p. 21). Due to limited time, Xiedao Holiday Village Resort was chosen as the project to use a Likert Scale in questionnaires because visitors had more time for answering questions than those visitors in the Beijing Agricultural Carnival, and samples were more concentrated than those visitors in the Folk Custom Villages. It used the scores of 5, 4, 3, 2 and 1 to represent very satisfied, satisfied, neutral, unsatisfied and very unsatisfied, respectively, through which the evaluation was digitally quantified and analysed. The data of Likert Scale can be seen in the appendix 3 and the result of SPSS⁴³ can be seen in Chapter 6.

After finishing the questionnaire, every participant was asked whether he or she would accept a further brief and unstructured interview with flexible time, in order to help express their options and feelings freely. These interviews were also recorded by notes but no voice recording. The sample questionnaire and examples of questions in brief and unstructured interview can be seen in the appendix 2.

5.3.10 Observations

Observation is a complex method that *“may be seen as the very foundation of everyday social interaction: as people participate in social life, they are diligent observers and commentators of others' behaviour”* (Śliwa, 2017, p. 33). According to the outcome of the literature review and Stage 1 and 2 of the fieldwork, observation in this thesis included direct involvement in each project by the author and observing other participants, in order to understand the daily operations of different projects in the three districts, and how different visitors (tourists) get involved in the urban agriculture. These observations were recorded in photographs and a log of observations and informal interactions. The photographs and content of log are used in this thesis.

⁴³ Statistical Product and Service Solutions: A statistical analysis software

5.4. Data analysis

To analyse the data collected throughout the fieldwork, the following steps were used in this thesis.

First, familiarization with the data:

In this step, all kinds of data including primary data and secondary data were organized by the author: the data in Chinese were translated into English; the records were reviewed and transcribed into words; the photographs were added a title and brief introduction.

Second, defining and organizing themes:

In this step, the data was processed into two parts. The first part was defining and understanding the projects in order to explore the way in which the Chinese Government has tried to establish urban agriculture through a series of different types and scales of project in Beijing. This will be shown in detail in chapter 6. Another part was setting up different themes to help analyse the data to reflect the sub research questions and literature review, and which can be seen in chapter 7.

Third, processing and analysing data:

In this step, statistics data from the questionnaires were processed by using Microsoft Word, Excel and SPSS. The results were created as tables and deeply analysed in chapters 6 and 7, in order to answer the sub research questions.

Fourth, writing up:

In this step, the first chapter of the findings from the fieldwork was written in respect of the types of project in order to understand what the government's urban agriculture programme is delivering. Based on chapter 6, chapter 7 was written in respect of different themes within the three types of projects to present a picture of how visitors use and perceive the projects and what the projects are offering both to the individual visitors and, more generally, to the urbanization process in Beijing.

5.5 Ethics

Local permissions: All of the secondary data in this thesis were published on open access. The projects could be entered after paying for the tickets or using the booking services. The photography was available in all projects. Therefore, this

research had access to the whole fieldwork and would not be involved in any relevant local or national legislation (data protection, intellectual property, etc.).

Participant information sheets (PIS): The author introduced himself as a PhD student and explained the purpose of the research before conducting any research in the field. The contact details of the university and supervisors were also provided. Each participant was informed about the purpose of the research and the consequences for them of taking part. The participant information sheets were translated into Chinese by the author.

Consent: The consent form was adapted from the sample form of Newcastle University. It was provided to each interviewee in order to provide flexibility on the subject of anonymity and voice recording for in-depth interviews. The consent form was translated into Chinese by the author. Both the interviewee and the author signed the consent. The author kept an English copy, while the interviewee kept a Chinese copy.

Participants: All participants were given time to consider whether they would like to be involved in this research. They were informed that they could end the process and withdraw from the research at any time without any reason. This research did not involve any minority groups or vulnerable members of the community and did not cover any sensitive or critical subject in the participants' personal lives.

Confidentiality: The real names did not have any impact on the research. The questionnaires and interviews were all anonymous during the whole fieldwork. The personal information are only used for checking the accuracy of the research study. All the electronic data were saved on the author's personal laptop and hard drive with password protection. All the physical materials were kept in the author's home. The data in the thesis which was saved on the author's Newcastle University account will be stored securely for ten years in accordance with the Data Protection Act 1998, as stated by the Newcastle University IT guidelines.

5.6 Learning from the process

The questionnaire survey on visitors (tourists) and households (operators and relevant workers) were considered as the most difficult part of the fieldwork before starting, because people may not be willing to participate in such a random questionnaire from a stranger. The total number of planned valid questionnaires were

not expected to be achieved. However, during the process, most visitors (tourists) and households (operators and relevant workers) were very happy to answer the questionnaire. Particularly with family visitors or group visitors, other members would take the initiative to also participate in the survey while a member was answering the questionnaire. As a result, the accepted proportion and valid rate were very high.

Another issue was found during the fieldwork that there was a clear gap between urban residents in Beijing and visitors from other places about understanding urban agriculture and in experiencing the projects. Especially in new projects such as the Beijing Agricultural Carnival, local tourists clearly knew that they can participate in the carnival and intuitively understood the projects of many exhibitors. This effective way of having information can help them make decisions about which specific urban agriculture project to visit in their daily lives. However, visitors from other places thought this was just a carnival, and most of them came to participate because their children wanted to play. Their understanding of urban agriculture was more about the Happy Farm House that has existed in China for a long time, as shown in section 4.4.3. This shows that the Beijing government has had great contributions and support in re-educating urban residents' experience of urban agriculture and helping create a new 'urban hobby' for them to have a 'pastoral life'. In turn, such urban residents also ensure that urban agriculture projects have a good market environment and a large number of loyal users and potential consumers. Governments in other places can learn from the experience of Beijing to develop China's new model of urban agriculture.

After the fieldwork had been undertaken, a very new rural comprehensive development model called 'rural complex' was published in No.1 Central Document in February of 2017 as a central government strategy. It aims to develop rural villages combining modern agriculture, leisure travel and rural community by learning from the successful experiences of the Folk Custom Villages in the urban areas. It actually belongs to rural agriculture and also it is impossible to discuss and analyse this strategy in this thesis because of time restrictions. However, it may be connected with China's new model of urban agriculture so as to explore the multi-functionality and sustainability for both urban and rural agriculture, and even another central framework for 'agriculture' planning at the national level for other governments in the future.

Part 2

Chapter 6 The urban agriculture projects

6.1 Introduction

This is the first of two empirical chapters yielded from the fieldwork. It begins by discussing the way in which the Government sought to stimulate and support urban agriculture. It does this by outlining the major Government policies and circulars which encouraged the development of new projects. Following this, the chapter presents the three different types of urban agriculture projects which were visited to explore the way in which the Chinese Government has tried to establish urban agriculture through a series of different types and scales of project in Beijing. The three types of practical projects are: government fully-owned large projects, Modern Agricultural Holiday Villages, and Folk Villages (which include Happy Farm House Tourism). Each of which is informed and supported by what is called the Field Research Project. The chapter focuses on the three practical projects in order to understand what the government's urban agriculture programme is delivering and draws on data from the questionnaires and interviews with different participants to the projects and other secondary data relating to their outputs. It seeks to present a picture of how visitors use and perceive the projects and what the projects are offering both to the individual visitors and, more generally, to the urbanization process in Beijing. The following chapter will dig deeper to analyse how these projects are responding to three domains of sustainable development, how successful they are and how they may be improved.

6.2 Government objectives and policy support

Since the year of 2015, multiple departments of the Chinese Government have jointly formulated and issued a series of policy and opinions. In 2015, the ministry of agriculture, together with the ministry of finance and other 11 departments, issued the notice on actively developing multiple functions of agriculture and vigorously promoting the development of leisure agriculture. In 2016, the Ministry of Agriculture, in conjunction with the national development and Chinese reform commission and other 14 departments, issued the guidelines on vigorously developing leisure agriculture. In 2017, the general office of the Ministry of Agriculture issued a notice on promoting the implementation of policies on the development of leisure agriculture and rural tourism. From this beginning, the Chinese Government began to officially

promote the leisure agriculture and agricultural tourism as the main form of the new multi-functional urban agriculture.

There are four main purposes for the Government to establish and operate large-scale projects.

First of all, it is to provide a new way to solve the problem of urban poverty and re-employment in China, and increase economic sustainability. This is because there is a large number unemployed people in cities who are in urgent need of finding employment opportunities. This surplus labour force consists of laid-off workers, impoverished retirees with the ability to work, especially those who have been forced to retire early owing to enterprise restructuring and institutional reform or people with disabilities who can still work. Many unemployed people are also migrants from the countryside moved to the cities in the process of urbanization and have agricultural skills. However, they may have low levels of education, and it is difficult for them to master modern professional technology. Under the urban market economy model, these people are often in a weak position in terms of employment. The five categories of people listed above are also the main components of the urban poor people.

In the interview with Mr.Chen Qingjiang, the industrial office of Changping District Agricultural Service Centre, it's verified that the economic drive produced by agricultural carnival for these urban poor people is obvious:

"More than 2000 jobs can be provided for farmers in Beijing Agricultural Carnival activity and related projects, including security, greening, cleaning of home hall and surrounding business, catering services of the park and so on. Some exhibitors and venue operation and maintenance units have rented nearly 250 houses around the park."

The data of *Beijing Agricultural Carnival Report* was provided by Mr. Chen. Only strawberry picking has been brought a total of more than 2000 farmers to achieve employment income for the surrounding Xingshou Town, Maizhuang Village and other strawberry professional towns, professional villages, including these professional farms. Also, the previous data from the government was Zhang and Yang (2014) also obtained. The first five agricultural carnivals have received a total of 5.895 million visitors, which has led to the surrounding strawberry garden to receive more than 12.8 million visitors, then strawberry sales revenue reached 829.4 million CNY, driving the surrounding Yanshou, Xingshou, Xiaotangshan and other towns to

realize 504 million CNY of folk tourism income. The increase in income has been verified by data in Mr. Chen's interview:

"I can also calculate a number for you. For example, taking strawberry yield with a thousand jin per mu per household, the picked price is more than higher than the wholesale price per jin, while visitors from agricultural carnivals can make the picking rate reach 50 to 70 percent, as a result, each farmer will be able to increase the income of at least 10,000 CNY."

Secondly, urban agriculture offers an opportunity to link the leisure needs of urban residents with the economic agenda and policy. Urban agriculture is a mechanism to turn sightseeing, leisure and tourism, and more traditional landscape resources and uses, such as agricultural production into consumerist activities. In this way, the new type of urban agriculture can be developed into a new urban economic growth point which is suitable for the needs of modern society.

In the interview with Ms. Liu Fang, Office of Culture and Tourism Bureau of Chaoyang District of Beijing, it shows that citizens with leisure time have a higher pursuit of diet, green space and cultural experience. The spatial distance between urban and rural areas promotes the rapid development of agricultural tourism. Under the action of automobile and information transmission, it has shortened the distance among all cities. In addition, as the frequent interaction between urban and rural areas involves the development of management mode of modern agricultural enterprise, the extension of agricultural tourism activities is driven.

"As people's living standard has been improved and consumption concept has been changed, traveling on holidays has gradually become part of people's way of life. People are more inclined to the choice of tourism project that returns to nature. In the tourism activity, people are paying more attention to personal participation, experiencing the fun of farming, and having a understanding of the relationship between natural laws and agricultural production."

Thirdly, by focusing on the peri-urban area as the main location for urban agriculture, the Government has effectively acknowledge and supported alternative land uses other than industrial. This may help to stem the sprawl of polluting industry around cities.

In the interview with Ms. Gao Aihua, Office of Ecological Environment Bureau of Chaoyang District of Beijing:

"Under the context of urbanization, large-scale development of agricultural tourism in urban suburbs has effectively protected

agricultural land, which lies in the following factors, for example, it's conducive to improve rural landscapes and reduce agricultural pollution, besides, the recycling of water and waste has a direct contribution to nearby villages. From the perspective of urban development, the green space, such as agricultural tourism theme park, has provided a place for leisure and entertainment for citizens from different walks of life. In the sense, economic, social and ecological functions can be integrated and enhanced in a sustainable manner."

Moreover, Beijing can provide a high demonstration role for other cities in China and guide the governments of other cities, Ms. Gao pointed out:

"In recent years, with the strong support of national policy for agriculture, rural areas and farmers, there are more government organizations working in agriculture, in which they provide planning, construction and operation and other professional services to enhance the connotation of agricultural carnival. After Beijing, Agricultural Carnival has been successfully held in China, such as Nanjing, Anhui, Guangxi, Sichuan and Guizhou etc, all of which have achieved good social and economic benefits."

Last, it's indicated by officials of Agriculture Bureau that as a "green industry" with low energy consumption, high added value and high knowledge, the cultural industry has opened up a new path for the industrial transformation and upgrading of agriculture. Culture, science and technology and agricultural elements are integrated by means of the use of cultural and creative logic, which is an important part of the cultural and creative industries. Mr. Niu Youcheng, Beijing Standing Committee clearly stated in "*Thinking, Connotation and Approach of Urban Modern Agriculture Development in Beijing*" that there is necessary to vigorously develop creative agriculture, do a good job in the cultural injection of agricultural products, develop towards high-end consumer groups, complete the process of agricultural production and to improve the appreciation and added value of agricultural products.

The interaction between urban and rural areas is increased. Visitors from cities radiate the political, economic, cultural and awareness information of modern cities into the countryside so that farmers can accept modern consciousness and living customs without going out then it's to improve their quality.

He also said:

"to fully aware of the value of agricultural cultural heritage and actively engaged in the protection of agricultural cultural heritage can not only help create an ecological and livable rural environment, but the development of modern organic agriculture, ecological

agriculture, leisure agriculture and sightseeing agriculture can be guided, achieving the rural revitalization objective that the prosperity of the industry leads to the prosperity of farmers.”

Agricultural cultural heritage is the wisdom crystallization of Chinese farming culture, which is with improved traditional knowledge, technical system and unique eco-cultural landscape, rich in biology, technology and culture, therefore, it's with important practical significance for rural revitalization. The landscape of the agricultural cultural heritage on display in the venue runs through the protection of ecosystem and the sustainable use of resources in the green development of agriculture, demonstrating a rural industrial system adapted to local conditions and sustainable development by fully exploring its biological, ecological, cultural and landscape resources advantages of heritage sites.

These aims are discussed in a number of specific Government circulars. For example, “*The Circular on Promoting the Implementation of Policies on the Development of Leisure Agriculture and Rural Tourism*” clearly stipulates that the development of leisure agriculture and rural tourism should be promoted from the aspects of land use policy, fiscal policy, financial policy, public service, brand creation and promotion (MARA, 2017a). Therefore, in terms of fiscal policies, the Chinese Government has increased financial support by means of replacing subsidies with awards, building projects before subsidies, fiscal interest subsidies, and the establishment of industrial investment funds. At the same time, different financing models are provided, encouraging the use of PPP mode (Public—Private—Partnership), crowd funding mode, Internet plus and private bond issuance to guide various types of social capital to invest in leisure agriculture and rural tourism. In terms of financial policies, the Government has built a platform for connecting banks and enterprises, and promotes banking and financial institutions to expand the scope of collateral, increase credit support for leisure agriculture, and drive more social capital to invest in leisure agriculture and rural tourism.

The construction of new socialist countryside is one of the most important national strategies proposed by The Chinese Government in the eleventh Five-Year Plan. In 2007 the Central Committee of the Communist Party of China made suggestions about the positive influence of modern agriculture to advance the socialist new rural construction. In 2017 the suggestions were made, in a notice issued by the MARA,

about Promoting the Implementation of Leisure Agriculture and Rural Tourism Development Policy (MARA, 2017b). The notice suggests that the leisure agriculture industry should become one of the highlights of agricultural and rural economic development.

Supported by the Government, a type of agricultural project developed combining enterprise plus peasant households. The main features of this are that companies are conducting the development, operation and management of projects, and the farmers undertake the agricultural activities. The company directly contacts and cooperates with farmers. The formation of this mode is usually by the company buying out the land management rights of farmers and benefit farmers through the form of dividends. Such projects by attracting the farmers to participate in community urban agricultural development of the project, make full use of idle assets, the community with the surplus labour force, the rich farming activities in the development of strong agricultural tourism resources, thus to increase the income of farmers, enrich tourism activities, and show the true agricultural culture to the tourists. At the same time, through the introduction of modern enterprise management and standardizing service, the well-being of tourists involved in the project is improved.

In 2018, Action Plan to Promote the Quality and Upgrade of Rural Tourism Development (2018-2020) was published (Plan, 2018). This introduced training classes for leisure agriculture and rural tourism and poverty alleviation learning exchange activities. This Plan focuses on training the principals of leisure agriculture and rural tourism to the demonstration counties, the village cadres and the cooperatives in the poor areas.

Supported by this Government plan, the model, the resulting type of urban agricultural is the peasant household model, which means that an individual peasant household, or several, can combine freely to participate in the development and management of rural tourism. Resource sharing can be achieved through cooperation among farmers in a rural area. In rural areas because of being far away from the market, farmers have some concerns about enterprises' involvement in rural tourism development.

Most farmers are reluctant to hand over funds or land to companies for operation, and they trust those demonstration model households who receive Government

education and training. In these rural and peri-urban villages, it is usually the model 'households' that first develop rural tourism and achieve success. Driven by their demonstration, farmers join the programmes of tourism and learn from the experience and technology of the model households. This model usually receives less investment from Government or private investors, but the rural culture remains the most authentic, and tourists can experience the most authentic local customs and culture with less money.

However, when suburban agricultural tourism is creating rich economic benefits for farmers, it is likely to stimulate more farmers to participate in the operation, which will inevitably occupy more agricultural land. If traditional agriculture is replaced by agrotourism, the food security in tourist destinations will be effected. With the rapid development of agricultural tourism, while it attracts more foreign tourists, local traditional folk culture is at risk of shock and social sustainability must be considered. Also, In the process of integrating agriculture and cultural and creative industries, homogenization phenomenon is serious, so that it's in lack of repeated construction of regional characteristics, and the local attraction to tourists will be weakened. Moreover, in the development of urban agriculture, it's insufficient for the scientific and technological innovation ability to support the development, the level of transformation and application of scientific and technological achievements is still low. The reason is the construction of agricultural science and technology talents is lagging behind. Despite government support, investment from companies and individuals in agricultural science and technology is insufficient. These result the overall technological innovation capacity of agricultural enterprises is not strong.

Despite these problems, the four aims of the government have shown good results by strong government support. As portrayed in table 16, in 2017, the annual value of the Beijing urban modern agricultural ecological service had reached 363.546 billion CNY (approximately equal to 52.76 billion USD), realizing an increase of 3% over the previous year. The discounted present value had reached 1,076.936 billion CNY (approximately equal to 156.28 billion USD), realizing an increase of 1.9% over the previous year. Among them, the annual value of direct economic value had reached 37.260 billion CNY (approximately equal to 5.4 billion USD), realizing an decrease of 6.0% over the previous year and accounting for 10.23% of the total value; the annual value of indirect economic value had reached 121.415 billion CNY (approximately equal to 17.62 billion USD), realizing an increase of 5.6% over the previous year and

accounting for 33.40% of the total value; and the annual value of ecological and environmental value had reached 204.871 billion CNY (approximately equal to 29.73 billion USD). The latter was affected by the reduction of rainfall and the substantial decline of the total water volume in 2017, meaning it realized an increase of 3.2% over the previous year, accounting for 56.34% of the total value.

Among the 12 secondary indexes, the scale of traditional agricultural production continued to decrease, and the total output value of farming, forestry, animal husbandry and fishery agriculture decreased by 8.8% from last year. This means agricultural production function is further weakened. Indirect economic value was still the main growth point of agricultural ecological service value, which was 5.6 % over the previous year and the contribution rate to total value was 33.4%. Within the indirect economic value, the value of cultural tourism services kept rapid growth, which was 8.4% over the previous year, and the contribution rate to indirect economic value reached 66.3%. It is obvious that climate regulation value and value of biodiversity are two main sub values of ecological and environmental value, the contribution rate was nearly three quarters.

Index Name	Annual value		Discounted present value	
	Year 2017	Increase on the previous year	Year 2017	Increase on the previous year
Modern urban agricultural ecological service value	3,635.46	3	1,0769.36	1.9
1. The direct economic value	372.60	-6.0	372.60	-6.0
a. Value of farming, forestry, animal husbandry and fishery	308.32	-8.8	308.32	-8.8
b. Water Value	64.28	10.2	64.28	10.2
2. Indirect economic value	1,214.15	5.6	1,214.15	5.6
a. Cultural tourism service value	804.78	8.4	804.78	8.4
b. Hydroelectric value	8.68	-10.1	8.68	-10.1
c. Landscape added value	400.70	0.8	400.70	0.8
3. Ecological and environmental value	2,048.71	3.2	9,182.61	1.8
a. Climate regulation value	732.34	5.6	2,328.74	2.7
b. Water conservation value	287.78	10.2	402.98	7.5
c. Environmental purification value	118.83	-3.3	984.83	0.9
d. Value of biodiversity	670.07	0.3	2,898.67	1.2

e. Protection and disaster-reduction value	222.58	0.3	1,540.38	1.2
f. Soil conservation value	3.37	-12.6	9.77	-4.7
g. Soil formation Value	13.74	1.6	288.54	1.6

Table 16: Beijing modern urban agricultural ecological service value (Unit: 100 million CNY, %). Source: Beijing Statistical Information Net⁴⁴.

Note:

1. Annual value, namely the annual output value, refers to the urban modern agricultural ecological service value output within a year.

2. Discounted present value refers to the total value after discounting the future value of agricultural ecology and environment, and then adding the values of other parts. The ecological and environmental value of the four ecological systems consisted of forest, farm, grassland and wetland has continuity and sustainability. In order to reflect the overall value of the ecological resources in Beijing from the perspective of sustainable development, this monitor carries out discounting of the ecological and environmental value, so as to reflect the overall value of the Beijing urban modern agricultural ecological service more completely.

6.3 Government fully-owned projects: the Beijing Agricultural Carnival

There are two main categories of government fully-owned large projects. These are: Beijing Agriculture Carnival and Ecological Agriculture Parks. The main differences between these two categories is the business model and agricultural activities.

1. *The Beijing Agriculture Carnival* represents the new creative projects and has operated for nearly 4 months each year from 2013. This category of project is more like an ‘agriculture expo’ for which visitors need to buy tickets to enter. The Beijing Government provides the spaces and general management and maintenance for exhibitors. The carnival mainly takes the form of indoor or greenhouse agriculture based on advanced agricultural facilities and high technology. It aims to promote the appropriate use of agricultural technology through combining it with a variety of exhibitions, landscape design and entertainment/leisure projects. At the same time, different conservatories and exhibition halls are designed and organized in themes to explore and present the specific characteristics of the local area being used for that year’s carnival. In this way it demonstrates the new agricultural production methods

⁴⁴ Available from:

http://www.bjstats.gov.cn/tjsj/ndtjzl/2018ndtjzl/nyjncj_6702/201801/t20180110_390666.html

(Accessed: 19 September 2018).

and relevant agricultural knowledge to farmers, ordinary citizens, students and visitors through what might be thought of as a form of agricultural educational tourism. In this form of project, the interactive, entertaining, consumer experience is more important than direct economic income.

2. *Ecological Agriculture Parks*, which open the whole year round, have existed as a large project in China since 2000. This category of project is more like a large modern agricultural production base with high levels of technology. It generally covers an area of hundreds of Mu and offers free entry for citizens who want to know the process of cultivation and buy the produce. These projects aim to maximize the economic benefits of agriculture using limited land on the basis of ensuring the optimal ecological environment. With this in mind, high value horticulture, organic vegetables and fruit are the main cultivated products rather than grains. Similar to traditional agriculture, these projects aim to earn profit through the sale of agricultural produce.

The key to these projects is efficient use of resources and indeed they have a lot of focus on ecological landscape design and construction. However, the extensive use of greenhouses makes these projects look like an 'indoor park' (figure 18).



Figure 18: Greenhouses in an Ecological Agriculture Park. Source: Author (2016).

Owing to the climatic conditions of Beijing, the agricultural products cannot be grown outside for 4-5 months of the year. The outdoor land in large projects can only be used as open space and horticulture during this period (figure 19).



Figure 19: Outdoor land used for wedding photography and horticultural landscape in an Ecological Agriculture Park in October. Source: Author (2016).

6.3.1 Beijing Agriculture Carnival

In this section, the Beijing Agriculture Carnival will be discussed in detail as an example of a government fully-owned large project (figure 20). The carnival has

taken place for four months each year since 2013. The project has specific objectives of communicating new ideas about urban agriculture to the public and businesses, under the unified command of the government. In order to achieve those objectives, the Beijing Agriculture Carnival established an executive agency, core operation team and perimeter security team, set up a project operation command and a dispatch centre.

The government bears all the costs of the project. It also provides adequate site conditions to support the enterprises with the intention to allow free entry to the project, and allow individual companies to operate and promote themselves independently of each other or the government. In addition, the government acts as a key promoter of the carnival through the provision of a website for the project and giving access to CNTV (China Network Television), Beijing TV. More than 200 media outlets such as bloggers, Chinese on-line video sites, magazines, newspapers etc. also participate in promoting the carnival to ensure the intensity of publicity and media coverage.

Through the operation of this type of project, the government aims to build a good platform for exchange, interaction and development between producers and consumers, to explore a new development path for China's urban agriculture by re-educating the public and re-engaging them with rural, agricultural practices, values and lifestyles.



Figure 20: Map of the Beijing Agriculture Carnival. Source: Author (2016) adopted from Beijing Agriculture Carnival.

6.3.2 Five new types of urban agriculture in the Agriculture Carnival

In the Agricultural Carnival, five types of urban agriculture are mainly demonstrated. These are each discussed below.

1. Self-help agriculture

Self-help agriculture is that which can be undertaken in the smallest home using a starter pack which can be bought from the carnival. It is based on the planting of leafy seed, like rape or lettuce. Seeds with a short growth time and low growing requirements, environment and conditions can be planted in a plastic box or a flower pot with a growing compound. No fertilizer or pesticide is needed and the seed relies completely on its own stored nutrient (figure 21).



Figure 21: Self-help farming for citizens to buy. Source: Author (2016).

After the citizen buys a self-help agriculture pack it only needs regular watering and sun. These plants not only keep fresh but they can be picked as and when you want to eat them. This shows urban residents a new idea of 'self-help' farming at home and encourages them to eat fresh produce and to move the little garden into the home.

2. Hydroponic indoor agriculture

With the accelerated process of urbanization, household agriculture has become a public fashion aimed at getting 'closer to nature' or 'a greener life'. The idea of growing produce at home is taken a stage further with 'household hydroponic agriculture'. This is promoted to those with a little available space in the house for the cultivation of vegetables or other food plants (figure 22).



Figure 22: Sprouts household agriculture. Source: Author (2016).

As shown in figure 23, this kind of agriculture has no need of soil or fertilizer and seeds can be grown on the floor, wall, balcony or table with the help of very simple devices, which deliver nutrients via a watering system. The produce not only has edible value but also a visual value such as the vegetable floor lamp, vegetable room decoration, a mural made of flowers and so on (figure 23).



Figure 23: Vegetable room decoration and vegetable floor lamp. Source: Author (2016).

3. Viewing innovative agricultural developments

There are visual demonstrations and exhibitions of new, extraordinary and special agricultural products, which have been developed by the combination of science, technology, agriculture and creativity (figure 24). These present developments such as the thumb watermelon, sweet potatoes grown in the water and in the air, a green corridor covered with pepper and eggplant, giant pumpkin and a fish tank co-culturing fish and vegetables by recycling the fish waste as fertilizer for the plants, etc. The aim is to entertain and also educate the public about the technology which is being put into agricultural development, and to encourage them to see vegetables and agriculture as innovative and technological, rather than simply rural and old fashioned.



Figure 24: Landscape design based on vegetables. Source: Author (2016).

4. *Agricultural experiences*

The aim of agricultural experiences is to let citizens participate in a farming and produce processing experience that is different from traditional agriculture, so that they realize the specialties of agricultural value and gain a different kind of joy and enthusiasm. For example, visitors can fill their own wine containers and make their own personalized label in the wine estate (figure 25). They can also identify the

varieties of tomatoes in a tomato maze, learn to extract tomato pigment, make a toilet soap in the herb garden and make a cup of vegetable juice in the vegetable garden. In this way visitors, especially those from urban areas where food has become a highly industrialised commodity, can begin to reconnect the process of growing and production with the quality of the end product – food.



Figure 25: Pick up grape and make your own wine. Source: Author (2016).

5. 'Smart' agriculture

Within the carnival each exhibiting company has its own website and smart phone application (App). All products have their own bar code. The system allows a 'one

stop' network not only for shopping but also to track produce from farm to basket and eventually to the door for delivery. When the citizen buys the vegetables and fruits on line, they fill in the delivery details so that the goods can be delivered to their home (figure 26).



Figure 26: Agricultural product online App. Source: Author (2016) adopted from app store in iTunes⁴⁵.

Extending this engagement with the growing process and improving on the usual online systems, through this system, customers can watch staff pick their produce and get the order ready. Moreover, customers can use the App on the phone to control the watering and light levels to grow vegetables. The growth of plants in the farm can be seen at any time on the App. Customers can also learn about the produce and eventually these vegetables and fruits will be delivered to their home by special staff and a special car equipped with a route tracking device (figure 27). This

⁴⁵ Available from: <https://itunes.apple.com/cn/app/id1111573647?mt=8> (Accessed: 19 September 2018).

system reflects the growth in technology take-up in China especially amongst the younger generation and white collar workers.

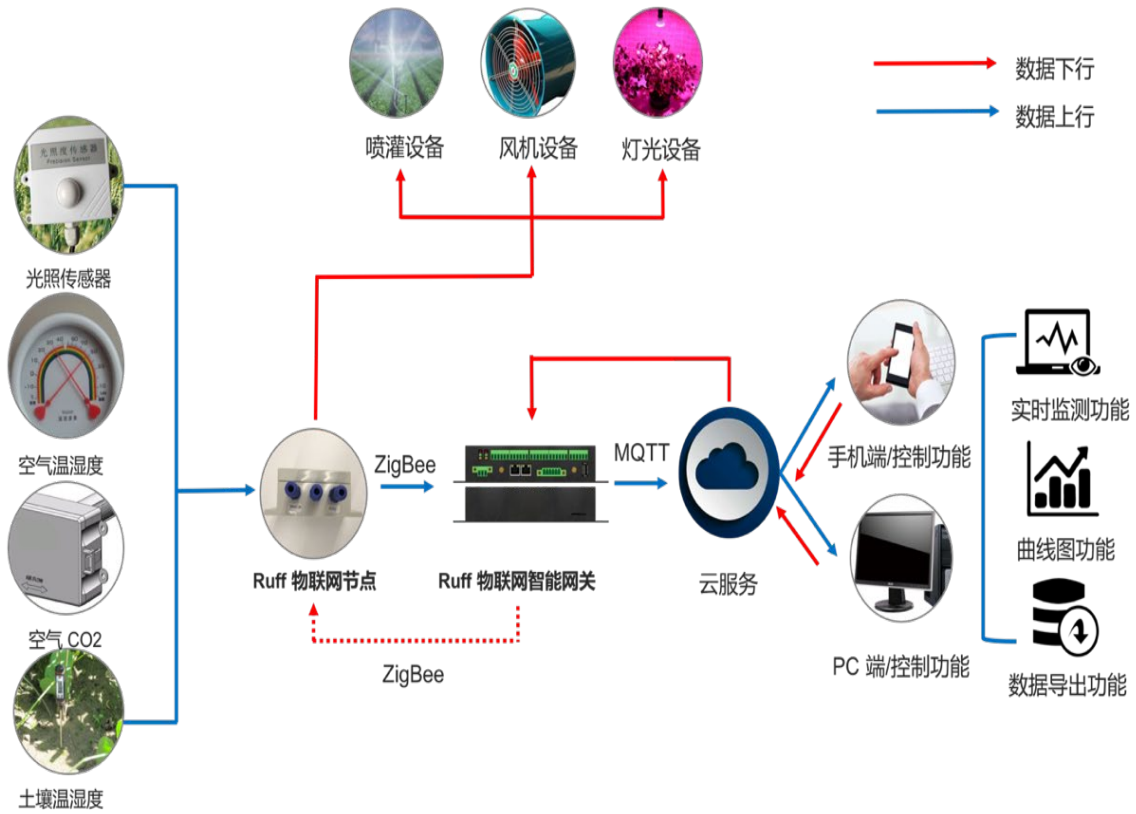




Figure 27: Video live and intelligent control on the App. Source: Author (2016) adopted from website⁴⁶.

6.3.3 Benefits for exhibitors participating in the Beijing Agriculture Carnival

A level of success can be gauged from the statistics of the sales revenue of Agriculture Carnival exhibitors. This reached 40.982 million CNY (approximately equal to 5.95 million USD), 65% of the exhibitors reported that the expected outcome has been achieved, 75% reported that they are willing to come in the next year. The products with the largest amount of tourist consumption are food and beverage, picking agricultural products, and buying specialty products. 22.8% spent more than 300 CNY (approximately equal to 43.54 USD) excluding the entrance ticket to the park, 40% contacted the farmers by scanning QR codes on the packages, and still joined in the picking activities after the end of the carnival.

⁴⁶ Available from: http://www.jdzj.com/jiage/3_32408353.html (Accessed: 19 September 2018).

Moreover, the Agriculture Carnival has also boosted the agricultural development in the surrounding areas. The number of visits to the surrounding strawberry gardens generated 2.576 million CNY (approximately equal to 0.374 million USD), the sales volume and revenue of strawberries reached 3.028 million kg² and 158 million CNY (approximately equal to 22.93 million USD), respectively.

One sweet potato exhibitor described their first day of sales to prove the contribution of the carnival as a platform connecting them and the citizens:

“This is our first time as exhibitor, we set up a multimedia centre to introduce our products. We had prepared six tons of sweet potatoes at the beginning, (it’s) one week of stock. But, what a surprise! It has been sold out by 2 p.m. on the first day. We made an emergency 3 tons of supplementary goods that day, all sold out.”

Another exhibitor noted that many visitors had a great interest in their new technology and a good communication with them:

“Many visitors scanned our QR code, our background data show that there are more than one hundred thousand. This is a great help for us, I believe that it will bring us more economic benefits in the future.”

These suggest that the Agriculture Carnival has established a good platform for the interaction between vendors and consumers and has greatly contributed to the economic benefits for exhibitors.

6.3.4 Visitors’ responses

Drawing on 100 valid questionnaires from visitors to the Beijing Agriculture Carnival (116 were issued), this section seeks to analyse how well it is meeting its aims and how it might be influencing visitors. It is helpful to remind ourselves of the main aims of the Agriculture Carnivals so it can be discussed if they are achieving those aims of: 1. Building a good platform for exchange, interaction and development between producers and consumers; and 2. Re-educating the public and re-engaging them with rural, agricultural practices, values and lifestyles.

Reasons for citizens participating in the Beijing Agriculture Carnival

The carnival has taken place for four months each year since 2013. Of the respondents, 31 had been to it the previous year, while 69 had not. The main reasons for going to the carnival are varied. The most prominent reason was simply for recreational and sightseeing purposes, with 45% suggesting this as their main

reason, and 23% went because they wanted to know about agriculture. It was encouraging that 11% went specifically to pick vegetables and fruits. Moreover, when asked “*Will you go to the Specialty Exhibition to buy specialty products?*” 72% reported that they would. Importantly, 54% of respondents reported that they will try to pick agricultural products after the visit, which indicates that citizens have the demand for picking agricultural products.

A 56 year old female described the product as:

“Its quality looks very good, very ecological and healthy, and some are local food, you see this bag of bean sprouts which I bought, the colour is very good.”

However, with 46% reporting that they will still buy fresh produce from supermarket after the visit, there is still a lot of potential to improve the current situation. One 64 year old male refuted the idea that the Agriculture Carnival represented a new/alternative agricultural paradigm as:

“These things are very interesting, but in fact my life seems to have no effect from them, and I will still go to the supermarket to buy vegetables and fruits. I came here for a visit and that’s all, nothing else.”

One 42 year old father spoke of the reason for participating:

“The weather is getting cooler and better, so I take my children to feel the atmosphere of the Agriculture Carnival and see what exactly the charm is.”

Another, a 23 year old female student, shared her view as follows:

“I prefer something interesting, there is a lot of fun in the carnival. For example, I saw a copper tablet and zinc copper wires are inserted into some fruits and vegetables such as potato, apple and lemon. Then use the wire to connect the tablets. It can actually generate electricity!”

People learned about the carnival through different channels and, as noted earlier, the government has played a major role in promoting it. However, the most common way to hear of the carnival was by word of mouth, with 32% learning about it this way. This is followed by 28% who attributed their access to the Internet. The information dissemination of new media, such as Wechat⁴⁷ has had a tremendous effect. The government has specifically used this method of promotion. Of other conventional information channels, 21% learned about it from TV programmes, while

⁴⁷ Wechat is a widely used social media mobile application software in China.

14% and 5% attributed it to newspaper and radio programmes respectively. Despite the relatively low ratio of each of the other two channels, they are total to 19%, which means that they are also essential channels.

The government's publicising about the Carnival, especially through new media, accesses wide audiences, promoting different functions and characteristics of such agricultural activities.

One 19 year old male student introduced how knowledge of the Agriculture Carnival was spread quickly by new social media:

"The Agriculture Carnival is already the top 10 hottest local topic in Weibo⁴⁸. Many people are involved in the discussion and leave a message."

According to the official data released by the Beijing Agriculture Carnival Report in 2016, the accumulated number of visits is 1.188 million (Carnival, 2016). In terms of the geographical distribution of the visitors, 87.4% are from Beijing and its districts. In addition to Beijing, 12.6% are from other provinces and cities (Carnival, 2016). While this shows that the carnival is still mainly attracting local people from the Beijing area it is also attracting some visitors from further afield.

The composition of visitors shows that about 60% visited with their families, with the majority taking their children (30%) or spouses (29%). Most people (55%) visited for only 2-4 hours. However, a significant minority of 30% visited for 4-6 hours. This indicates that the carnival provides an interesting experience and properly takes visitors' social and cultural benefits into consideration.

Thus far, very importantly, the Beijing Government gives the Agricultural Carnival a sense of importance and these efforts have established a certain influence of it, which in turn makes such a new urban agriculture accepted and recognized by the citizens.

Expectations and recommendation for the Agriculture Carnival

Of the 31 questionnaire respondents who visited the carnival the previous year, they all thought that there was an improvement this year. 6 believed that this session had a higher technological content; 10 believed that this session was more creative; 9 felt it had a stronger participating experience; and 6 believed that the current session

⁴⁸ Weibo is a Chinese microblogging (weibo) website, akin to a hybrid of Facebook and Twitter.

was more interesting. This suggests that most respondents believed that carnival was improving with time and offering them a better experience and pleasure.

A 55 year old female articulated her point as follows:

“I am a local resident, and I have participated in the carnival several times during these years. It’s my second time here this year because it often has something different. For example, I have just tasted a yellow watermelon in the exhibition hall there (figure 28). Very delicious, I have never seen it in the supermarket.”



Figure 28: Yellow watermelon. Source: Author (2016).

In response to questions about *“How the carnival could be improved”*, 37 reported that traffic is the most prominent problem. More specifically, the traffic jam and the long tour route was felt to be a deterrent to going to the carnival. Another 31 reported that food and beverage also needs to be improved. In addition, people reported other points for improvement, including poor experience of the activities (10), creative design (8), landscape (6), and agricultural science and technology demonstrations (4).

In contrast with the recommendation for improving the traffic and food and beverage, there were relatively fewer recommendations for improving the venue design and project design. A 47 year old man pointed out a place where he was dissatisfied:

“I was with my mother, but my mother's leg was not good, so she needs a wheelchair. But there is almost no easy access facilities. It makes me feel much inconvenienced.”

People felt that not enough was provided in the way of food and drink outlets or entertainment, and these are important issues for the development of new urban agriculture carnivals. However, the responses indicate that the carnival is relatively successful in terms of agricultural science and technology demonstrations, recreation and sightseeing, and cultural communication.

With respect to the item “*Are you expecting that the Agriculture Carnival will be held in the next year?*” 49 of the respondents (almost half) expected that it will be held in the next year, which indicates a sense of acceptance and the embeddedness of it in the minds of the public, and are willing to accept and participate in such activities. However, 12 respondents, a relatively low number, reported that there is no need of holding such activities in the next year. Their negative attitude towards it may be attributed to some issues when the carnival was held, which failed to meet their own expectation. Another 39 held a neutral attitude and reported that they do not care if it will be held in the next year or not, which is a relatively high ratio, and indicates that the carnival fails to meet their needs.

6.4 Government-supported privately run projects: Modern Agricultural Holiday Resorts

Modern Agricultural Holiday Resorts are large-scale, high-quality tourist resorts partly supported by the Chinese Government as a new type of Chinese modern urban agriculture project. They are invested in, and mainly run by, private individuals and companies and focus more on consumption and entertainment that meets consumers’ diverse demands. These projects aim to build green, environmentally friendly, countryside tourism, recreational and sightseeing agricultural resorts integrated with plantation and breeding, and renewable biological energy.

The development, production, processing and marketing of organic foods is the principal agricultural activity, with tourism and vacation being the main draw to attract people to visit and engage. The key point of this project is providing the experience of ‘green country life’ including an original rural environment and health food for urban residents.

6.4.1 Principles of Modern Agricultural Holiday Resorts

Modern Agricultural Holiday Resorts can take one of four forms, either focusing on plantation of crops, rearing of livestock, fishing or a mixture of these. Most are mixed

use. The establishment of Modern Agricultural Holiday Resorts should abide by relevant laws and regulations, and meet the general conditions hereinafter (Ministry of Agriculture of People's Republic of China, 2016)⁴⁹:

1. Modern Agricultural Holiday Resorts' planning needs to be scientific.

The Modern Agricultural Holiday Resort is under unified planning entirely with a scientific and reasonable layout; various functions like agricultural production and leisure tourism etc. are mutually coordinated and organically integrated with an obvious space boundary. In principle, the Modern Agricultural Holiday Resorts of plantation covers an area of no less than 5,000 mu (approximately equal to 3.33km²), with those of livestock being no less than 1,500 mu (approximately equal 1km²), and those of fishery no less than 1,000 mu (approximately equal to 0.67km²). If the Modern Agricultural Holiday Resorts are mixed, the area can be considered according to the circumstances.

2. Regional environment is appropriate.

Located on the periphery of a city or district centre, on tourist routes or in the vicinity of tourist attractions, it enjoys a relatively strong vacation atmosphere, powerful market attractiveness, distinctive and bright resource conditions, traffic convenience, suitable climate and beautiful environment.

3. Agricultural production is advanced.

The dominant industry is prominent with a relatively high production level of specialization, intensification, mechanization and information provision, good-quality facilities and equipment, full-course standardized production, healthy traceability systems of agricultural product quality, as well as high-quality and safe products.

4. Tourism functions are highlighted.

It enjoys a characteristic nature or humanistic resources that are of high quality and available for relaxation and vacation with the tourist projects having distinct themes, outstanding features and abundant forms; the basic functions of accommodation and catering, relaxation and entertainment, farming experience, product display and cultural exhibition etc. are complete, and infrastructures are perfect, advanced and

⁴⁹ The document was published in Chinese. Available from: http://www.moa.gov.cn/zwllm/tzgg/tz/201611/t20161125_5378416.htm (Accessed: 19 September 2018)

practical, with the health and safety of various facilities meeting the country's corresponding standards; it has a relatively high tourism bearing capacity and has no multiple inevitable natural calamities, with the Modern Agricultural Holiday Resorts' receiving no less than 400,000 visits per year.

5. Operation and management are normative.

The management operating system is complete with a relatively high management level of operation, service and safety etc.; it enjoys comparatively good economic, social and ecological benefits, which are higher than the local average.

If a project or a Modern Agricultural Holiday Resort meets all conditions as above, the owner can apply for government support. The Chinese government will invest as much as 50% using the principle of "*The government only makes the good better, not making the bad better.*" As stated by the Ministry of Agriculture of P.R. China and the China National Tourism Administration in November of 2016, more than 100 Modern Agricultural Holiday Resorts will be built or supported by 2020 (Ministry of Agriculture of People's Republic of China, 2016).

These projects are essentially tourism economic activity based on agriculture. The one studied for this thesis has a tourism economic zone and agriculture zone in general. Each zone (e.g. agriculture or tourism) is managed separately with independent accounting. Agricultural Holiday Resorts have hotels and other tourist facilities as the tourism economic zone, such as spas, golf courses, conference venues and restaurants. These are managed by hospitality professionals.

Complementing this tourism zone, and acting as the main attraction, the resorts are based on modernized agricultural production. A group of local farmers will be employed to run the farm and deliver the profits to the main company.

More concretely, the agricultural zone includes:

a. Agricultural Trading Venue: providing tourists with local agricultural products and by-products, including orchards for picking, direct points for selling the agricultural products and by-products, and a village fair.

b. Countryside Space: providing tourists with places to stay within a countryside setting either constructed by nature or man-made.

c. Experience and Exchange Venue: promoting exchanges between urban and rural residents through participating in a country lifestyle and characteristic entertainment activities, such as traditional countryside celebrations and recreational activities as well as agricultural internship tourism etc.

The agricultural zone meets the consumers' demands as follows:

a. Green environment: along with the deterioration of the global environment and the damage of natural resources, human beings have an increasingly urgent need of returning to a more tranquil, rural life (von Reichert *et al.*, 2011). In China in the 21st century, there are many people who are tired of city life, determined to move to settle in the country after selling their urban house (Han and Jiang, 2013). Although there is a concerted effort by the government to encourage rural to urban migration (Sun, 2010), there are increasing numbers of people who now seek to return to a rural lifestyle. Indeed, there is even a television show named 'Happy Life'⁵⁰ where celebrities are invited to live in a house in a rural area and they must make a living through their own efforts in the original rural way.

Urban residents who have been living in hectic noisy cities amongst high-rise buildings for a long time yearn for the serenity of nature and pastoral style of life. Many adore the natural ecological beauty and the harmonious integration between humans and nature. Therefore, the Agricultural Holiday Resorts need to combine agriculture, full of ecological nature, with leisure tourism to create a tranquil, nature-filled experience. This is aimed especially at the needs of urban consumers who are in poor health or who are in need of tranquillity and rest brought about by reconnecting with the natural world.

b. Health food: Within the urban market, food quality has decreased due to over processing and significant use of chemical fertilizers and pesticides whose safety cannot be guaranteed. Food poisonings and dangerous chemical residues are frequently reported by the media. Therefore, 'health foods' and organic foods are increasingly popular (Gale and Huang, 2007). However, Chinese consumers are mostly shopping at supermarkets and stores rather than markets since the 1990s. This makes shopping more convenient but it only offers a combination of processed, prepared, packaged and frozen foods (Veeck and Burns, 2005). Citizens cannot easily check the source and origin of food by themselves. Thus, in the agricultural

⁵⁰ Translated from the Chinese name “向往的生活”. Available to watch on YouTube.

plantation zone, the project has developed health foods and organic foods in a comprehensive manner, formed its own brand and marketed these foods to consumers in strict accordance with the requirements of ecological agriculture (attaching most importance to organic matter fertilizer and biological control) and organic agriculture (non-use of chemical fertilizers and pesticides).

By offering health foods and organic vegetables with the combined features of reputation, specialty, high quality and freshness, the project has made a profit in both tourism and agriculture. In this way “the agriculture zone is promoting the tourism economic zone”, and “the tourism economic zone is nurturing the agriculture zone”.

6.4.2 Beijing Xiedao Agricultural Holiday Resort

In this section, the Beijing Xiedao Agricultural Holiday Resort will be discussed in detail as an example of a Modern Agricultural Holiday Resort. In the interview with Ms. Liu Fang, Office of Culture and Tourism Bureau of Chaoyang District of Beijing, Xiedao Agricultural Holiday Resort is recognized as a typical case study.

“Xiedao is a good example, and it's of great significance to the development of urban and rural integration for such kind of business model. Market mechanism has played its key role with sustainable way to achieve multiple functions of agriculture for urban-rural integration. Taking into account the successful development of Crab Island, it's shown that agricultural tourism has something to do with the context of urbanization, which not only provides opportunities for citizens to participate in agricultural tourism, but creates a space for leisure and relaxation. Agricultural tourism has become a way in the improvement of the efficiency of agricultural production. Organic production is consistent with the healthy lifestyle that people are in pursuit of, and it's also born out of fierce market competition. By the integration of tourism activities, the value of agricultural production has been improved. With the development of agricultural tourism, more employment opportunities have been provided for suburban farmers and their income has also increased. There are a large number of people who used to go out to work have returned to the suburbs for leisure agriculture currently, which has reduced urban employment and environmental pressures, in addition, the development of agricultural tourism plays a role in shortening the gap between urban and rural places, promoting the development of urban-rural integration. Rural local culture and traditional farming connotation will be enhanced when agricultural tourism is integrated into the modern life elements that citizens are crazy about. In comparison with long-distance travel, agricultural tourism has provided a way to enjoy life for more people, as it's with cheap price, it will be easy to attract more tourists.”

Beijing Xiedao is located within Jinzhan Township, Chaoyang District, Beijing, only 7 kilometres away from Beijing Capital International Airport. It is situated in the south of the airport side road's middle section, which can be reached in about 15 minutes by taking a taxi from the airport. There is a direct bus line from DongZhiMen (2nd Ring Road) to XieDao and many other buses also stop here (figure 29). It takes 40 minutes from the 2nd Ring Road of Beijing and 20 minutes from the centre of Chaoyang District by car. Therefore, it is easily accessible to very urban Beijing residents.

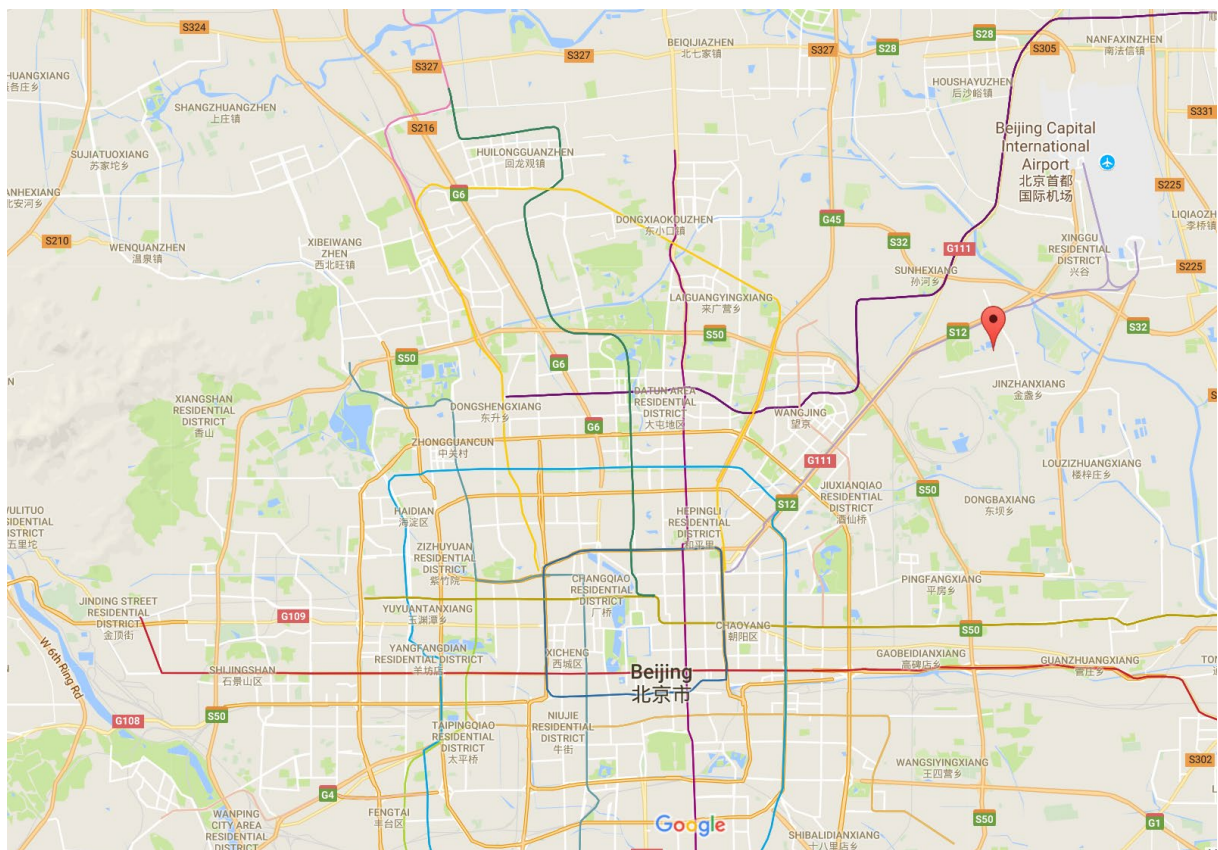


Figure 29: Location of Xiedao Agricultural Holiday Resort. Source: Author (2016) adopted from Google map⁵¹.

The project covers a total area of 3,300 mu (approximately equal to 2.2km²), and includes two main functional areas named as:

1. *Front store*, with an economic focus on tourism and includes an accommodation zone, entertainment zone, catering zone and shopping zone.

⁵¹ Available from:

<https://www.google.co.uk/maps/search/Beijing+Xiedao/@39.9819635,116.4470002,11.33z?hl=en>
(Accessed: 19 September 2018).

2. *Backyard area*, which focuses economically on agriculture and includes a planting zone, breeding zone and renewable energy zone.

Front store (tourism economic zone):

a. The accommodation zone (figure 30) offers tourist accommodation in twin rooms, a business suite, a peasant household, and the 'antique-looking' cottage. The architectural style remains that of a rural 'village appearance' and the decorative layout demonstrates the local folk cultures of residences in old Beijing; and countryside and peasant life experience is provided.



Figure 30: Accommodation zone. Source: Author (2016).

b. An Entertainment zone (figure 31) provides a sports palace, crab palace, pet paradise, a special bridge built out of food such as corn, a water park, and a man-made lake for fishing and other activities. More comprehensive and modernized entertainment activities are enjoyed also, including angling, folklore performance, pet performance, cock fighting, goat fighting, camel riding, goat-drawn carriage, pig-drawn carriage and dog-drawn carriage. Urban relaxation and rural entertainment are combined. Although some of these may not be to Western tastes, they are traditional forms of entertainment in Chinese rural villages.



Figure 31: Entertainment zone. Source: Author (2016).

c. The catering zone (figure 32) hosts visitors in a range of establishments for food and drink, including the Kaifan Building, Tianheyuan, Mongolia Palace. The Kaifan Building provides 'organic foods' with original flavour, highlighting 'freshness'; all foods are pure and natural without pollution, absolutely stressing 'greenness' and healthy eating.



Figure 32: Catering zone. Source: Author (2016).

d. The shopping zone (figure 33) brings tourism and agriculture together again, offering tourists an opportunity to buy agricultural products and by-products and an exclusive point for processing foods. Organic produce is available, such as grains, oil, beans, woods, fruit, vegetables and flowers etc. There are over 10 kinds of livestock and poultry available also, including pig, cattle, goat, horse, donkey, mule, chicken, duck and geese etc., as well as over 10 kinds of aquatic products such as fish and crab etc. At the same time of guaranteeing the supply of meat, poultry, eggs and milk needed by the restaurants, large-scale processing production has been conducted, which has succeeded in building up the organic food brand of 'Xiedao'.



Figure 33: The shop, and crabs ready to buy. Source: Author (2016).

Backyard area (agriculture zone):

a. The planting zone (figure 34) demonstrates a full range of northern crops and has a high-tech greenhouse. It has sightseeing events such as the agricultural machinery station, agricultural farmyard, open canal and waterwheel etc. By walking into a natural setting and getting into contact with organic agriculture, citizens can gain agriculture knowledge and enjoy organic foods. In addition, the joy of a simple 'peasant lifestyle' can be experienced here.



Figure 34: Planting zone. Source: Author (2016).

b. In the breeding zone (figure 35) various kinds of livestock and poultry are reared and processed for sale in ‘a coordinated process’ of production, processing and marketing. Citizens can taste all kinds of fresh livestock products, watch animals’ daily life, experience rural breeding and process agricultural livestock products etc.



Figure 35: Breeding zone. Source: Author (2016).

c. The renewable energy zone produces energy from a solar farm (figure 36) and a biogas generating pit. It also has a waste water recycling and treatment plant. These are the elements which construct the park’s ecological chain. Here, citizens can view, learn about and experience the recycling and renewable energy economy.



Figure 36: Renewable energy zone. Source: Author (2016).

6.4.3 Visiting Xiedao Agricultural Holiday Resort

It was not the intention of the study to explore in detail the perceptions and opinions of managers and investors in these projects. That would have been both too time consuming and difficult given the complexities of engaging with those involved. It seemed more important to explore how well the projects are being received, on the basis that this will influence how well they meet their objectives of re-engaging urban people with what are perceived to be more rural activities and cultures of agriculture. Therefore, this section presents the views of visitors.

From 131 questionnaires issued to tourists in the Beijing Xiedao Agricultural Holiday Resort, 100 valid ones were returned. The aim was to analyse tourists' acceptance of and satisfaction with the Modern Agricultural Holiday Resorts, and which aim to:

1. Provide the experience of 'Green Country Life' including an original rural environment and health food for urban residents.
2. Focus on consumption and entertainment that meets consumers' diverse demands on agricultural tourism.

Here the chapter presents who the tourists are, how frequently they are prepared to visit, how they learned about the resort, how they travel and their levels of satisfaction with different aspects.

Of those who responded, 46% of tourists were in their first visit to the Xiedao Agricultural Holiday Resort this year. However, 21% have paid two or three visits and 27% over five visits during this year (table 18). This suggests that the rate of revisiting it is relatively high, which likewise suggests visitor satisfaction. One of the main reasons for tourists' revisiting might be that a Modern Agricultural Holiday Resort is mostly a venue for the recreation of the surrounding area's residents, especially those people who have already experienced the traditional rural life and agriculture.

For these local people, visiting the Modern Agricultural Holiday Resort has become a very important choice for weekend breaks. The environment in these is quite favourable, and the air quality is more satisfying than cities. Importantly, it appears that traditional Chinese agricultural culture and a wide variety of agricultural activities are being accepted and recognized by citizens. Because of this, citizens are more willing to pay more visits, as shown in table 17 below.

Frequency	Number	Percentage
1	46	46%
2-3	21	21%
4-5	6	6%
More than 5	27	27%

Table 17: Tourists' frequency of visits in this year. Source: Author (2017).

Most of Xiedao Agricultural Holiday Resort's tourists are family-focused and families represented 59% of the total respondents. Families' children constitute nearly a half of the total families. Thus, children may play a favourable role in promoting these trips.

Tourists who travel alone merely constitute 1% of the total respondents, whilst tourists who travel together with friends is more commonplace, and they occupy 28% of the total respondents (table 18). It is worth noting that during this survey, a considerable proportion of tourists were traveling together with their colleagues in trips organized by the employer. These tourists, who are mainly involved in outward bound and corporate conference business, are an important constituent part in the structure of tourists, and they occupy 12% of the total respondents. This shows that Modern Agricultural Holiday Resorts might be popular and suitable for family trips but they may also have a corporate element.

Types	Number	Percentage
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Family	With children	28	28%
	With adult relatives	31	31%
Friends		28	28%
Group		12	12%
Single		1	1%

Table 18: Tourist types analysis. Source: Author (2017).

The modes of travel adopted by Xiedao Agricultural Holiday Resort tourists are relatively simple. In the survey, there are only four primary modes, which are private car including shared car, official car, bus and taxi. Specifically (table 19), the bus is the first choice for 40% of the total respondents; this is followed by private cars, for 38% of respondents; tourists who travel by taxi occupy the smallest proportion - 11%, which is probably related to the location of this Resort. It is relatively costly to travel by taxi if the destination is far away, and taking the bus is more convenient. Furthermore, there is still a small proportion of tourists who choose to travel on foot or by bike, and these tourists merely occupy 3% of the total respondents. The tourist types may have influence on transportation because family trips and people who travel together would prefer private vehicles and the bus. In addition, whether it is a holiday or weekend and the weather conditions may affect people's choice of transport.

A 34 year old man who takes the bus with his family noted that:

“Our family take the bus to here, although the conditions are not as good as private cars, I don’t need to drive. It makes it very easy for me. But if it is in summer, I will drive.”

Transportation	Number	Percentage
Private vehicles	38	38%
Official vehicles	8	8%
Bus	40	40%
Taxi	11	11%
Other	3	3%

Table 19: Tourist transportation analysis. Source: Author (2017).

The main source of information about Xiedao Agricultural Holiday Resort is word of mouth, which amounts to 40.6% of the total respondents (table 20). This suggests that public praise is an excellent mode of publicity for this Resort. Among the commonly utilized strategies of publicity, the Internet and publicity documents occupy a relatively small proportion. It is found through the survey that only a few Modern Agricultural Holiday Resorts have their own websites, and the publicity documents are mostly seen inside the Modern Agricultural Holiday Resorts or school campus,

which suggests that the popularization rate of website construction is not high. The limited coverage of publicity documents suggests that Modern Agricultural Holiday Resort should attach much importance to the effect of other means of media and reinforce their own publicity.

Information Source (Multi choice)	Number	Percentage
TV advertisement	24	12.2%
Internet advertisement	29	14.7%
Print media	51	25.9%
Word of mouth publicity	80	40.6%
Other	13	6.6%
Total	197	100%

Table 20: Tourists' information source analysis. Source: Author (2017).

The survey suggests that 'sightseeing', which covers more generally seeing and experiencing a new place and the beauty of the landscape, is still the primary reason for tourism to the Resort, accounting for 31.3% of the total. Besides this, catering and purchasing agricultural products are the other main objectives held by the tourists, and they occupy 18% and 20.6% of the total respondents respectively (table 21). This suggests that tourists approve of the leisure agriculture-involved catering service and the setting of leisure agricultural scenes to a large extent. Phrases and words such as "*The environment is good, fresh air, feel very relaxed, fresh food, and good quality*" were regularly used by respondents.

Activity (Multi choice)	Number	Percentage
Sightseeing	73	31.3%
Catering	42	18%
Agricultural products	48	20.6%
Agricultural education	30	12.9%
Experiencing farming	21	9%
Other	19	8.2%
Total	233	100%

Table 21: Analysis of tourists' participation in the activities. Source: Author (2017).

At present, there are still some concerns about the costs involved in visiting Xiedao Agricultural Holiday Resort. Only 12% of tourists believe all the consumption items are a reasonable price; 27% and 24% of tourists express a relatively high degree of satisfaction towards agricultural products and catering consumption respectively (table 22). It is important for the operators to get the pricing right because the characteristic of the agricultural product is the foundation on which the Resort

depends for survival. However, catering consumption is faced with fierce competition from surrounding merchants.

Tourists expressed the lowest degree of satisfaction towards travel arrangements for visiting the resort, and only 7% of tourists are satisfied in this aspect. This might be related with the geographical location and size of the Resort. Due to the extra cost of travel, the degree of satisfaction is relatively low. This is mainly reflected in two aspects. Firstly, some local taxis and chartered buses offer inflexible pricing and, consequently, some tourists believe the price is excessively high. Secondly, the cost of parking increases the cost of visiting the Resort for those who drive there.

Career	Number	Percentage
Catering consumption	24	24%
Agricultural products	27	27%
Agriculture education	10	10%
Entertainment	7	7%
Transportation	7	7%
Service charge	10	10%
Other	3	3%
All is reasonable	12	12%

Table 22: Tourist consumption satisfaction analysis. Source: Author (2017).

6.4.4 The influential factors in the tourists' satisfaction

A Likert Scale is adopted in this section to assign tourists' evaluation with a score. Specifically speaking, very satisfied, satisfied, neutral, unsatisfied and very unsatisfied are assigned the scores of 5, 4, 3, 2 and 1 respectively, through which the evaluation is digitally quantified and analysed. Through the descriptive statistical analysis of the score of satisfaction scale in tourists' evaluation, an overall understanding of the survey results of all the variables in the satisfaction scale of Xiedao Agricultural Holiday Resort tourists is obtained. In accordance with the convenience in traveling, reputation and environment of the Resort, activities that can be involved in, personnel service, price perception, tourists' satisfaction and positive effect, an analysis is conducted (table 23).

The Factor		Mean value	Ranking	Standard deviation	Ranking
Convenience in travelling	Convenient traffic	3.24	13	1.272	1
	Convenient parking	3.44	7	1.225	3
	Acquisition of tourism-related information	3.36	8	1.226	2
	High popularity	3.53	3	1.193	4

Reputation of Xiedao Agricultural Holiday Resort	High reputation	3.49	5	1.193	4
Environment of Xiedao Agricultural Holiday Resort	Comfortable environment inside the Xiedao Holiday Village Resort	3.69	2	1.021	14
	Beautiful scenery	3.72	1	1.064	11
	Infrastructure perfectness	3.09	17	1.083	9
	Favourable ambient environment	3.51	4	1.068	10
Activities that can be involved in	Distinctive	3.07	18	1.018	15
	Diversity	3.33	10	1.035	13
	Interesting	3.29	11	1.166	6
	Educational	3.22	14	1.040	12
Service	Service staff's appearance and behaviours	3.13	16	1.012	16
	Service staff's attitude	3.26	12	0.960	18
	Service staff's strong ability of handling problems	3.19	15	1.143	7
Price perception	High cost performance of various consumption	3.36	8	1.106	8
	Reasonableness of total expense	3.47	6	0.989	17

Table 23: The influencing factors of the descriptive statistics. Source: Author (2017).

The influential factors in the tourists' satisfaction sheet are listed as a scale to the mean value, standard deviation and overall arrangement of the various observation indexes. Furthermore, shallow filling and deep filling are utilized respectively to line out the observation indexes in the front and the back.

As a whole, tourists' evaluation of Xiedao Agricultural Holiday Resort is between 'neutral' and 'satisfied' in the various items, which suggests that the current situation of the Resort still needs further improvement. A certain extent of differentiation exists in tourists' perception of Modern Agricultural Holiday Resorts, and the standard deviation is between 0.960 and 1.272, which suggests that market demands are diversified, and the market should be segmented, and relevant market positioning or categorized management should be pursued. In terms of the mean value score, the five superior items from the top to the bottom are beautiful scenery, comfortable environment inside the Resort, high popularity, favourable ambient environment and

high reputation respectively. The distribution is centralized in the environment and reputation of the Resort. The five inferior items from the bottom to the top are distinctive activities, infrastructure perfectness, service staff's appearance and behaviours, service staff's strong ability of handling problems and educational meaning of activities. The distribution is centralized in activities and personnel service. In terms of the standard deviation, the five superior items from the top to the bottom are convenient traffic, acquisition of tourism-related information, convenient parking, high reputation and high popularity. The standard deviation of these five items is above 1.19. In terms of the activities, the five inferior items from the bottom to the top are service staff's positive attitude, reasonableness of total expense, service staff's appearance and behaviours, and distinctive and comfortable environment inside the Resort. The standard deviation of these five items is below 1.03. The distribution manifests the highest level of concentration in price perception.

In terms of the convenience in travelling, tourists' evaluation of convenient travel, parking and acquisition of tourism-related information, the ranking of the overall evaluation is in the middle range. People's perception also manifests great differentiation and a lot of questions, which suggests that further improvement is still needed in this aspect. The differentiation is caused by different transportation. For example, some tourists who choose to travel by bus feel uncomfortable because there is no place for them to have a rest and avoid the sunshine inside the Xiedao Agricultural Holiday Resort. In terms of the Resort's reputation, the tourists' evaluation is relatively high, which suggests that its operation and management is well-organized, that the practical situation of the Resort is consistent with the publicity, and that there is rarely any fraudulent conduct. Although tourists' evaluation of the reputation is high, there is tremendous differentiation in perception, which is probably because the above-mentioned publicity of the Resort is not perfect enough, or the current competitiveness of its leisure attraction is quite weak.

In terms of the environment of the Xiedao Agricultural Holiday Resort, tourists offer the highest evaluation in comfortable environment and graceful scenery inside the Resort and its favourable surroundings. However, the evaluation of infrastructure is quite low. Tourists' main complaints relate to the rough and outdated infrastructure that does not receive proper maintenance, as well as the deficiency of scientific and educational information.

In terms of activities available for the visitors, the overall evaluation is relatively low and a certain extent of differentiation in perception also exists. A lack of diversity of activities was the main complaint, followed by a lack of explanation of activities. This demonstrates that there is a deficiency in the leisure activities being offered.

In terms of service, the overall evaluation is also quite low. Tourists' perceptions show slight differentiation, but there are many common points. Generally speaking, it is the service staff's appearance and behaviours, and the performance in handling problems, which are quite neither satisfactory nor unsatisfactory. Meanwhile, the evaluation of service staff's attitude and level of service is also not very high. The strongest feedback from tourists is that there is a lack of guidance, for example in suggesting what events or activities to engage in and how to find them, especially during non-festival periods.

In terms of price, most tourists perceive that the travelling expense to the Resort is relatively reasonable. In terms of the cost performance, most tourists express that the quality is relatively poor for the price, and the pricing of some consumption items is relatively high in comparison with the current quality. However, perceptions of price and value for money are influenced greatly by the difference in income level amongst tourists.

Tourists also manifest a relatively high degree of satisfaction towards leisure agriculture, and the evaluation is still between 'neutral' and 'satisfied'. The degree of satisfaction is relatively high as a whole. However, the degree of satisfaction is still lower than that expected by the operator, and due to the difference and ambiguousness of tourists' degree of cognition, tourists are quite hesitant when answering this question, and they manifest differentiation to a large extent. This is probably because tourists failed to objectively understand the destination before heading out to it, and they hold relatively high expectations towards the destination.

To conclude this section, Xiedao Agricultural Holiday Resort is an economic success story. The resort enjoys a double income channel of agriculture and tourism, which have decreased the risk and mutually intensified each other's income. In 2001, it paid a tax of over 2 million CNY (approximately equal to 0.29 million USD); this had increased to over 5 million CNY (approximately equal to 0.73 million USD) in 2002. Despite the influence of the outbreak of the 'SARS' epidemic, which reduced international tourism and limited tourism within China, the revenue reached up to 140

million CNY (approximately equal to 20.32 million USD) in 2003. Xiedao Report⁵² showed that it was receiving 2,000 tourists daily by 2008, with the annual revenue of 250 million CNY (approximately equal to 36.25 million USD). In 2014, the daily tourists' number had reached 3,600, with the annual revenue of 432 million CNY (approximately equal to 62.69 million USD). In terms of land distribution, 90% is used for agriculture, with the remaining 10% used for economic tourism. While in terms of revenues, 70% are from tourism and 30% from agriculture.

6.5 The Folk Custom Villages: professionalising rural culture

Folk Custom Villages have developed from original villages which existed within the greater urban area. These were once rural villages which people would go to for holidays and visits and where they would stay in farmhouse accommodation, as described in chapter 4. However, as Beijing has expanded they have become incorporated within the urban area to a greater degree (figure 37). Moreover, rather than simply being a place where individual households made an income from renting accommodation, now, the entire village has become a professional tourism entity, offering a range of agriculture and traditional lifestyle-related activities and events. These are supported by private investment from both villagers and outside investors.

A central element of these villages is 'Happy Farm/Folk House Tourism'. This is a continuation of farmers and householders offering accommodation, catering and an opportunity to experience agricultural life. This has happened for many years across rural China. However, now, within these Folk Custom Villages, it happens as part of a wider, more professional tourism environment. Holiday accommodation is generally operated by a couple or two generations, and the employees are mostly their relatives. This provides what is known as 'Nongjiale' or 'Mingsulvyou' through which tourists can experience simple farm life, appreciate the idyllic scenery, eat fresh vegetables and fruit, and participate into the local village cultural activities. Happy Farm House Tourism will be discussed in detail later in this section.

One of the government's aims for this form of urban agricultural tourism is to solve the livelihood issues of farmers who lost their land in the process of urbanization. It is also hoped that this approach might help to preserve traditional Chinese farming culture. Happy Farm House tourism is attractive to these newly semi-urbanised

⁵² The report was published in Chinese. Available from: http://www.xiedao.com/html/www/main_2.asp (Accessed: 19 September 2018).

farmers who are willing to start this small urban agriculture project, rather than focus entirely on traditional agricultural activities, because it requires less physical work but provides a good income.



Figure 37: A Folk Custom Village (Cuan dixia Village⁵³) in Beijing. Source: Author (2016).

6.5.1 The ‘government-company-farmer’ model and the development of Happy Farm House Tourism

To achieve its aims the Chinese Government uses the ‘government-company-farmer’ model to develop Happy Farm House Tourism by reconstructing and enlarging the farmers’ private property and improving infrastructure in the village. In Beijing, this model is, in essence, the ‘corporate farmer’ under the guidance of the government. During the Happy Farm House tourism development, the county and township governments and the Tourism Administration determine the location, content and time of development in accordance with the market demand and overall tourism planning of the whole county. They also motivate the local villagers to increase implementation and development. During the development process, the government and tourism department provide necessary support and guidance to farmers, households and villages, including stipulating industrial standard, improving the

⁵³ Direct translation from the Chinese name “爨底下村”.

infrastructure and providing funding, training and promotion services. These will now be discussed.

1. Stipulating industrial standards

At present, a four-level management system of district/county, competent tourism department, township and Folk Custom Village has been established. The Municipal Council of Agriculture and Tourist Administration have introduced the '*Beijing Suburb Folk Custom Tourism Reception Family Evaluation Standard*' and the '*Beijing Suburb Folk Custom Tourism Village Evaluation Standard*'⁵⁴. Since the introduction of the former in 2002, 4,166 listed municipal folk custom tourism reception households have been approved; and since the introduction of latter in 2003, the first batch of 35 listed municipal Folk Custom Villages have been approved (Report, 2009).

2. Improve the infrastructure

Changping District has organized and carried out village appearance improvements and environmental governance/rectification work. Using four demonstration villages, such as Yangtaizi Village of Nankou Town for example, efforts have been made to carry out the rectification and regulation work Folk Custom Villages in the whole district. Pinggu, Changping, Fangshan and Daxing Districts have attached great importance to the roads and environment construction in Folk Custom Villages. The roads to these villages have been renovated, afforested and beautified, the infrastructure construction for these villages has been strengthened, parking lots have been built, and they have also built star-rated toilets and installed street lamps (Report, 2009).

3. Funding, training and promotion services

In 2003, various districts and counties invested around 112.6 billion CNY (approximately equal to 16.34 billion USD) in infrastructure construction, environmental rectification and beautification, and service facility improvement. The district/county governments of Changping, Yanqing, Pinggu, Fangshan, Mentougou and Daxing have also allocated 1 to 10 million CNY (approximately equal to 0.145-1.45 million USD) every year as the folk custom tourism development fund (Report, 2009). In the meantime, the Tourist Administrations of various districts and counties

⁵⁴ The standards were published in Chinese. Available from: <http://www.nongjiayuan.org/njlxw/sjmsbhz.html> (Accessed: 19 September 2018)

have also actively developed various forms of training activities. Training has also been provided to practitioners in Folk Custom Villages, mainly on the aspects of catering, etiquette, safety and foreign language, and tourism journals and discs are also issued to various Folk Custom Villages.

With this government support and guidance, local villagers, or the local villagers in collaboration with external investors, can set up a Happy Farm House tourism development limited liability company. This encourages the tourism operation and management to be conducted based on this Chinese corporate model. The profits will be shared by the villagers, the resource owner and any external investors in accordance with certain proportions. The proportion is not fixed but is discussed and negotiated by the government, investors and farmers' representatives according to the different situation of each place.

The Folk Customs Villages are developed in both urban areas and suburban areas in Beijing. An important element of these villages is that individual farming households and other traditional households can also earn income by providing accommodation and catering services in their own homes to the tourists through Happy Farm House Tourism.

At the end of 2007, 154 municipal level villages in more than 50 towns of 11 districts and counties in Beijing had developed folk custom tourism service work. Within these towns an agricultural population of more than 40,000 (including more than 17,000 farm family and 8,713 folk custom family) was conducting folk custom tourism service work. At least 8.93 million tourists have attended folk custom tourism programs, and the suburb and rural folk custom tourism income had reached 1.05 billion CNY (approximately equal to 0.15 billion USD) (Report, 2009).

This form of urban agricultural and traditional culture tourism can provide a lot of employment, and the local villagers can make money without leaving their homes and migrating further into the city of Beijing. For example, before developing the folk custom tourism, the per capita income in Diaowo Village, Huangsongyu Township, Pinggu was less than 1,000 CNY (approximately equal to 145 USD); now, more than 90% of the village residents receive folk custom tourists, and their annual average income is higher than 11,500 CNY (approximately equal to 1,669 USD). Through the development of folk custom tourism, the participating village can be transformed into a professional village with a more diverse economy based upon rural, cultural and

agricultural tourism. The economic gain comes from renting accommodation, holding cultural events and from selling agricultural produce. In locations such as Haidian, Mentougou and Shunyi, the price tourists pay for 'pick your own' cherries is nearly 5 times higher than the market sales price. After developing a traditional Tofu Dinner as a cultural event, Liugou Village of Yanqing County received 420,000 tourists in 2007, the folk custom tourism income reached 15 million CNY (approximately equal to 2.18 million USD), and each family had an average income of more than 200,000 CNY (approximately equal to 29,025 USD) (Report, 2009).

6.5.2 Characteristics of Happy Farm House and Folk Customs Village in Beijing

Characteristics of Happy Farm House and Folk Customs Village in Beijing mainly contain three aspects: culture, agricultural produce and folk custom diet.

1. Cultural characteristic refers to customs and habits which are created and shared by people who live in this area. It includes most kinds of traditional cultural expressions which are related closely to the life of local people. That is to say, it is a kind of cultural heritage. For example, HuoKang, is a Chinese traditional heating equipment which were widely used in northern China where there was a cold climate in winter in the past. It is a masonry, brick or fired clay structure of the building facility. The space below is used to burn wood or coal for heating. People can sleep on it or have other daily activities (figure 38). Other typical examples in Beijing are Manchu wedding and funeral custom activities in Daxing, the 'Beijing Suburb Manchu Custom Garden' of Huairou (figure 38), a traditional 'Eight-eight banquet' in the wedding receptions of Xiaohetun Village, the printing and dyeing custom in Chadaocheng Village, shoe-pad of Zhenzhuquan Village in Yanqing, hand knitting of Yangtaizi Village in Changping, etc.



Figure 38: Huokang and Manchu wedding. Source: Author (2016).

2. *Agricultural produce characteristic* refers to the fact that this place can produce some unique agricultural products due to the different natural conditions. The ‘uniqueness’ can be reflected in multiple ways such as types, tastes, exterior and methods of production, for example white apricot of Haidian District, cherry in Changping District, flat peach of Pinggu District, watermelon of Daxing District, Chinese chestnuts in Huairou, Chinese date in Miyun (figure 39).



Figure 39: Chinese chestnuts in Huairou and Chinese date in Miyun. Source: Author (2016).

3. *Folk custom diet characteristic* represents preferences for the food of local residents. It includes materials, methods, flavours and seasonings of cooking. For example, Tofu feast is a traditional Chinese wedding and funeral event banquet meal in Liugou Village in Yanqing County. The feast uses Tofu as the main cooking material by traditional production process, supplemented by other dishes (figure 40). Other typical examples in Beijing are roast whole lamb of Diaowo Village in Pinggu District, fish-head stew of Haizi Village, Dong cuisine of Xiong'er village, and wild spinach of Huangcaowa Village.



Figure 40: Tofu feast and whole lamb feast. Source: Author (2016).

In summary, it has been shown that the 'government-company-farmer' model can reduce government input on tourism investment by attracting private investment and truly improving the income of local villagers. In the meantime, it can provide original rural life services suitable for urban citizens seeking relaxing, comfortable and memorable experiences, and reduce the daily management difficulty of the tourism management department because it is a form of privatization. As a result, the 'village' with its own characteristics can be finally established, which is called the 'Folk Customs Village'.

6.5.3 Views of the visitors

The survey issued 624 questionnaires to tourists within these villages, with 500 valid returns. It also surveyed 121 farming households involved in tourism and received

100 valid returns. It is helpful to remind ourselves of the main aims of the Happy Farm House Tourism so it can be discussed if they are achieving them, namely:

1. Evaluate and protect agricultural culture and social issues affecting the area.
2. Provide original rural life services suitable for urban citizens seeking relaxing, comfortable and memorable experiences.
3. Solve the livelihood problems of landless peasants.

In this section, the survey data of tourists' travel frequency, transportation, information source, participating activities and satisfaction are mainly analysed. It aims to offer an understanding of tourists' degree of acceptance and satisfaction with the Folk Custom Villages and Happy Farm House Tourism.

Only 15% of tourists were in their first visit to farm house tourism, which can be mainly attributed to the fact that this form of tourism has been developed for nearly 20 years in China. It is a relatively familiar and accepted form of tourism with the public. 63% tourists have paid two to three visits to the Happy Farm House Tourism accommodation. Moreover, 10% of tourists have paid over five visits (table 24). This shows that the rate of revisiting these is relatively high. But most tourists do not have too many visits to the same farm house. Tourists prefer to go to another farm house with a different folk background after visiting two to three times one farmhouse.

A 29 year old man evaluated the farmhouse he visited as:

"I mainly come to taste the special food. It's really good and I haven't tried before. But I won't come here again because there is a lot of food waiting for me. I want to taste as much as possible."

Frequency	Number	Percentage
1	75	15%
2-3	315	63%
4-5	60	12%
More than 5	50	10%

Table 24: Tourists' visiting frequency statistics. Source: Author (2017).

Most farm house tourism tourists are family-based, making up 71% of the total respondents. However, those with small children, under pre-school aged children is less than 6% of the total respondents, families which involve the children (under 18 years old), occupy nearly a half of the total families. Thus, spending time with the children becomes the goal of going out for half of the families, and the children (under 18 years old) play a favourable role in promoting these trips. Tourists who

travel together with friends is also relatively commonplace, and they occupy 19% of the total respondents (table 25). Tourists who travel alone only have 4% in this survey, so it is a quite rare occasion. This inconsistency may be due to a farm house as being a simple life experience and not suitable for single people because of the lack of communication and sharing.

Structure		Number	Percentage
Family	With children	180	36%
	With adult relatives	175	35%
Friends		97	19%
Group		30	6%
Single		18	4%

Table 25: Tourist types analysis. Source: Author (2017).

The modes of travelling adopted by Happy Farm House Tourism tourists are relatively simple. In the survey, there are only four primary modes, which are private car, official car, bus and taxi. Specifically, private vehicles is the first choice of travelling, with 78% of tourists travelling there by their own car. Only 12% of tourists travel by bus (table 26). A possible reason for this might be that the bus only stops in a limited number of locations in each village, leaving people needing extra transportation to reach the specific farm house. Furthermore, there is still a small proportion of tourists who choose to travel on foot or by bike, with these merely occupying 3% of the total respondents.

A 21 year old man was saddened when he talked about his experience of coming to the farm house:

“There is no direct public transport to here. I had to take a city-line bus at first, then transferred to a town-village bus. It's not finished yet because it only stopped at the edge of the village, then I spent 40 mins to find my reserved house since I've lost my way. I should call the landlord before I arrived and let him pick me up.”

Transportation	Number	Percentage
Private vehicles	390	78%
Official vehicles	5	1%
Bus	60	12%
Taxi	30	6%
Other	15	3%

Table 26: Tourist transportation analysis. Source: Author (2017).

In consideration of the diversity of the channels of acquiring tourism-related information, this question provides multiple choices. It can be seen that the main

source of information regarding farm house tourism is by word of mouth publicity, which mainly relies on the recommendation by social relations, such as friends and colleagues, and they occupy 52.5% of the total respondents. This suggests that public praise is an excellent mode of publicity for Folk Custom Villages. Although the total amount of information acquired through the Internet is relatively high at 27.7%, it is only half of the word of mouth equivalent. This is influenced by travel reviews websites. Other information sources are all below 10% (table 27). A possible explanation for this might be that as the farm house is operated by the locals, they will not choose to use a very high cost of publicity. It is found through the survey that the common way is the government of villages and towns providing a web page to promote the whole village and town.

Information Source (Multi choice)	Number	Percentage
TV advertisement	65	7.3%
Internet advertisement	245	27.7%
Print media	60	6.8%
Word of mouth publicity	465	52.5%
Other	50	5.7%
Total	885	100%

Table 27: Tourists' information source analysis. Source: Author (2017).

When asking people what they liked to participate in when they were in the Folk Custom Villages, a multiple choice questionnaire was offered. The results showed that accommodation is the primary item of the tourism, accounting for 29.9% of the total. Besides accommodation, catering and experiencing farming are the main objectives held by the tourists, and they occupy 22.2% and 21.3% of the total respondents respectively (table 28). This suggests that tourists approve of farm house tourism as a good way to experience the farming life instead of urban life. From this point, most tourists just transfer their daily life (eating and sleeping) into the farm house.

Activity (Multi choice)	Number	Percentage
Sightseeing	50	4.8%
Catering	230	22.2%
Agricultural products	130	12.6%
Accommodation	310	29.9%
Experiencing farming	220	21.3%
Other	95	8.2%
Total	1035	100%

Table 28: Analysis of tourists' participation in the activities. Source: Author (2017).

At present, the satisfaction of tourist consumption are nearly similar for each selection (table 29). There are 19% of tourists who believe all the consumption items are at a reasonable price, which is the highest of all options. Only 4% of tourists express satisfaction towards entertainment. It is worth noting that during the survey, many tourists expressed more acceptance and tolerance because they know the operators of farm houses are not professionals. They will not use the requirements of hotels or tourist attractions to evaluate the taste of food, accommodation conditions and service quality. Their satisfaction is more dependent on the emotional not physical.

Career	Number	Percentage
Catering consumption	65	13%
Agricultural products	90	16%
Accommodation	80	15%
Entertainment	24	4%
Transportation	75	15%
Service charge	75	15%
Other	15	3%
All is reasonable	95	19%

Table 29: Tourist consumption satisfaction analysis. Source: Author (2017).

In terms of expenses, the statistics of the respondents' expenses suggests that the average expense of taking a trip to the village is 363 CNY (approximately equal to 52.68 USD), and 90% of tourists believe this price is acceptable. Only around 7% of tourists think it is a little expensive and unreasonable, which suggests that the expense of travelling is no longer the key factor influencing people's trips to orchards. Most people are already financially capable of undertaking a farm house tourism trip.

6.5.4 Experiences of the Happy Farm House operators

The basic information statistics of the local operators survey was carried out mainly from the ten aspects of basic characteristics of the individual, such as gender, age, education level, family composition, time of engaging in the Happy Farm House, direct and indirect engaging in farm house projects, annual family income and annual family income from the Happy Farm House, number of family members' participation in the Happy Farm House. From different characteristics of the groups, the author investigated whether they have different attitudes to the development of the Happy Farm House or not.

On the aspect of gender, it can be seen from the table 30 that there are 60 males, taking up 60% of the surveyed population and 40 women accounting for 40%, i.e. the male population was 20 percentage points higher. In terms of age, according to the statistics, the age of the local operators surveyed mainly concentrated in the 31-50 years old which accounts for 78% of the surveyed group, and with an age of less than 18 accounting for 1%, 18-30 year olds accounting for 3%, 51-60 year olds accounting for 17%, and those aged beyond 60 accounting for 1%. From these statistics, it can be seen that a great part of the young and middle aged labour force in the Folk Custom Village are engaged in the Happy Farm House's management. In the aspect of education level, the statistics show that in the surveyed group, 64 operators' education level was high school or beyond, taking up the 64% of the overall percentage, and therefore the majority. The other 36 operators' education level was junior high school and below, accounting for 36%. The age of these 36 operators were concentrated in the age group of 41-50, which conformed to their education level. This result may be explained by the fact that people in this age group were local farmers before the urbanization expansion process, and whose opportunity to receive education is much lower than that of urban residents.

Basic information		Number	Percentage
Gender	Male	60	60%
	Female	40	40%
Age	Under 18	1	1%
	18-30	3	3%
	31-50	78	78%
	51-60	17	17%
	Above 60	1	3%
Educational	High school or beyond	64	64%
	Junior high school and below	36	36%

Table 30: The survey on the basic information of the local operators. Source: Author (2017).

In respect of the family composition of Happy Farm House participation, the statistics (table 31) show that the main concentration is in families with three members, accounting for 49% of the overall total. That is followed by the living with parents' composition, accounting for 39%. Couples composition accounts for 12%. In the family composition part, the model of only one member of the family participating in the Happy Farm House is up to 38%. While the model of two members of a family participating is almost the same as the former. Combining with the data on three

members of a family, it can be seen that after losing the land, a Happy Farm House has become the main income resource of these families.

Family situation	Number	Percentage
Family with three members (the operator couple with one child)	49	49%
The operator living with parents	39	39%
Couples	12	12%
Members to participate in	Number	Percentage
Only one member	38	38%
Two members	37	37%
Three members	15	15%
More than three	10	10%

Table 31: The local operator family members' participation in the Happy Farm House. Source: Author (2017).

In the investigation of the time engaging in a Happy Farm House and participation in Happy Farm House projects, the statistics (table 32) show that the people who have participated in a Happy Farm House for more than three years make up 44% of the total. While those people whose participation time is about two years to three years accounted for 31%. And those whose participation time is less than one year account for 25% of the whole population. From which we can know this business activity of a Happy Farm House can develop constantly and steadily.

Time	Number	Percentage
More than 3 years	44	44%
2-3 years	31	31%
1 year and less than	25	25%

Table 32: The time engaging in a Happy Farm House. Source: Author (2017).

Leisure projects engaged in Happy Farm Houses include catering, accommodation, recreation, leisure goods and others. In the surveyed population (table 33), people directly engaging in catering take up the main part with the population of 45, and therefore which accounts for 45% of the participation number. Accommodation takes the second place in these projects in which 33 people engage, accounting for 33%. Catering and accommodation are the biggest two projects, which also shows that a Happy Farm House mainly provides catering and accommodation as the leisure programs. In terms of directly engaging in a Happy Farm House, the largest component is in the provision of agricultural and by-product products, with a total of 68 people, accounting for 68%. The rest include 9 people engaging in the rental

industry and 23 people engaging in the sale of daily necessities, with these therefore accounting for 9% and 23% respectively. Meanwhile, the survey found that people who are directly engaged in Happy Farm House projects were also taking care to provide basic agricultural and by-product products to increase their income. That is, they provide agricultural and by-product products on the basis of taking into account the leisure projects.

	Projects	Number	Percentage
Leisure projects	Catering	45	45%
	Accommodation	33	33%
	Recreation	9	9%
	Leisure goods	8	8%
	Other	5	5%
Agriculture projects	Provision of agricultural and by-product products	68	68%
	Rental industry	9	9%
	Sale of daily necessities	23	23%

Table 33: The statistics of local operators' participation in projects. Source: Author (2017).

In terms of comparing the income of families who operate a Happy Farm House and before, the statistics (table 34) show that the annual incomes of the local operators that fell into the former category were mainly concentrated in the 30,000 CNY (approximately equal to 4,353 USD) and less level, accounting for 54%. While for those engaged in a Happy Farm House, a family income level of 40,001-50,000 CNY (approximately equal to 5,804-7,256 USD) level, and a level of more than 50,000 CNY (approximately equal to 7,256 USD) were enjoyed by 23% for each level. Whilst an annual income of 20,001-30,000 CNY (approximately equal to 2,903-4,354 USD) was experienced by 18% of Happy Farm House families. It can be seen that engaging in a Happy Farm House can improve family income to some extent. Furthermore, the survey found that the family whose income only relied on the Happy Farm House may have a significant degree of uncertainty because of the different service quality they offered. While those who utilized a Happy Farm House as an additional income had a quite stable income.

	Family annual income (CNY)	Number	Percentage
Farm house family	Less than 20,000	16	16%
	20,001-30,000	18	18%
	30,001-40,000	20	20%
	40,001-50,000	23	23%
	More than 50,000	23	23%

Before operating	Less than 20,000	33	33%
	20,001-30,000	21	21%
	30,001-40,000	20	20%
	40,001-50,000	16	16%
	More than 50,000	10	10%

Table 34: Annual income of those operating a Happy Farm House and before operating. Source: Author (2017).

From the questionnaire statistics of the surveyed operators (table 35), a majority of local operators (accounting for 55%) retained a welcome attitude to the Happy Farm House concept. Moreover, 40% of them especially welcome the Happy Farm House. Only 5% of the operators showed a neutral or negative attitude. From these statistics, it can be seen that local farm house operators have an overwhelmingly affirmative attitude to the development of the Happy Farm House policy.

Attitude	Number	Percentage
Very welcome	40	40%
Welcome	55	55%
Not welcome	5	5%

Table 35: The overall attitude of the operators on Happy Farm House development. Source: Author (2017).

6.6 Critique of different projects and recommendations

As with any new programme or activity, early success can come with some problems and difficulties which must be addressed if the projects are to continue to be successful. Due to the similar way of combining agriculture and other activities, these three types of projects have some common problems but to different extents. This section only discusses the most typical issues.

For example, Agricultural Carnival has the largest number of tourists, therefore improving the infrastructure, public toilet facilities and service level of staff are more pressing for this project than for others. Agricultural Carnival and Modern Agricultural Holiday Resort all have a variety of recreational activities for tourists. However, in the private enterprise context of the Modern Agricultural Holiday Resort, there is a lower consideration for visitor safety. Therefore, private enterprise management needs more focus on safety protection. In addition, a comprehensive public transportation system is needed to support both of these types of project. Accommodation and catering are the main features of both the Modern Agricultural Holiday Resort and

Happy Farm House Tourism. The family-based Happy Farm House Tourism business is weak in professionalism and self-promotion, both need to be improved. These points are discussed in greater detail below.

6.6.1 Improving facilities and services in the Agricultural Carnival

Most visitors to the Carnival Agricultural Park drive there themselves and visit without guides. It is hard for them, and especially for foreign tourists, to find the location of the agricultural park. The location and publicity of billboards could play an important role in increasing the number of tourists. However, there are fewer guide signs in Carnival Agricultural Parks. Road signs are only set at the entrance, there are no signs on the road leading to the Park which otherwise would make it inconvenient for tourists to find the location. In the Carnival Agricultural Park, the tea plantation sightseeing experience area and crop picking experience area are lacking in corresponding identification, signage and guidance which makes it difficult for tourists to understand the division and overall layout of the Park, but also greatly affects the enthusiasm of tourists to play and participate in the leisure activities. Therefore, the organizer should set more guide signs for helping private tourists to better understand the overall layout. The introduction of information cards for each zone or area, explaining the function, would facilitate the tourists to participate in the activities which they are interested in.

There is a need to enhance the internal and external environment of public toilets: first, routine cleaning operations should be improved, and there should be an increase in the number of cleaning operations in peak periods. Second, the number and location of direction plates and signs for toilets should be increased and installed in obvious positions. Third, public toilets should be maintained in a timely manner, for example, install and repair handrails, doors, hooks, and tiles of the toilets which are seriously damaged.

6.6.2 Enhancing the service level of staff in the Agricultural Carnival

According to the survey data, the satisfaction levels of tourists has a significant relationship with the service level of staff in the park. Therefore, improving the service level plays an important role in enhancing tourists' satisfaction. Operators can start with the following two issues. First, strengthen the training of staff in the park. Some staff have not been specially trained. In some cases, conflicts or disagreements between staff and tourists have greatly affected the tourists' satisfaction. Therefore,

service training should be carried out regularly for staff. The contents of training should also include training on how to deal with safety and the management of emergencies, an introduction to the agricultural park and the details of its leisure activities. In addition, the training should cover issues such as enthusiasm, demeanour, proper dress, tourist reception and pick-up.

Second, more guides should be introduced in the park to explain the aims, function, facilities and opportunities it has to offer. According to the research statistics on the number of tourists' visits, tourists visiting the Agricultural Carnival for the first time did not know much about it. And they were also not familiar with the location of the park. Tourists felt that the agricultural park did not set the appropriate guidance to explain. Therefore, the Agricultural Carnival should increase the number of tour guide. These can explain to the tourists about the special recreational activities in the agricultural park, which not only can enhance the image of the service level of the staff, but also increase the tourists' understanding of the Agricultural Carnival, so as to enhance the tourists' revisit rate.

6.6.3 Improve safety protection facilities in Modern Agricultural Holiday Resorts

The Modern Agricultural Holiday Resorts provide a variety of recreational activities for tourists, but the construction of supporting facilities for safety protection was poor and there are some safety risks in some leisure activities. Through the field surveys it was found that there are no safety protection fences in some fishing areas where tourists often walk, which increases the risk of tourists, especially children, falling into the water. There is a certain risk of falling in the vegetables and fruits picking experience zone, and a lack of some safety protection facilities. Operators should pay attention to the improvement of safety protection facilities and could proceed in respect of the following three issues. First, there should be eye-catching safety signs in places where accidents can happen easily or frequently. Second, there should be accident control facilities, such as guard rails and emergency exits. Third, reduce the need for emergency rescue facilities to attend accidents. For example, the Modern Agricultural Holiday Resorts should be equipped with up-to-date and on-site rescue equipment and emergency medical equipment. Operators can consider increasing the construction of escape and evacuation facilities, such as the installation of evacuation shelters, refuges, refuge signs and other safety facilities.

6.6.4 Build a comprehensive public transportation system for Modern Agricultural Holiday Resorts

Modern Agricultural Holiday Resorts should strive to create a safe, smooth and convenient transportation system, make rational planning for the traffic routes, and improve the infrastructure within the Resorts in order to increase more tourists and improve their overall satisfaction. Therefore, the operators can construct a comprehensive public transportation system with regards to the following three issues:

First, they should open a special tourist bus route to facilitate visitors reaching the Resorts. Owing to a clear business season, operators could increase the number of buses during peak seasons and reduce them in the off-season. Second, operators could step up cooperation with local taxi companies to enhance access to the Resorts and solve the difficulty tourists experience in taking taxis including the inconvenience of returning back. Third, as Beijing is a very large city, and difficult to navigate, it would be helpful if there was a city centre information and meeting point, possibly at the central station, where people could arrive to be transferred to the Resort. These can not only enhance the satisfaction of tourists' visits, but also help to increase the number of tourists and enhance the economic benefits of the Modern Agricultural Holiday Resorts.

6.6.5 Improve accommodation facilities

Accommodation is one of the main features of the Resorts and The Folk Custom Villages. Improving and enhancing the accommodation conditions in these projects is an important factor in increasing the number of visitors and their satisfaction.

According to the surveys, most visitors to Modern Agricultural Holiday Resorts or The Folk Custom Villages spent at least one day and one night at the facility. However, the surveys also showed that tourists were not satisfied with the comfort level of the accommodation. Therefore, the following two issues should be addressed. First, the accommodation water supply systems should be improved. Operators should improve the water supply system of the wooden cottages, increase the water quality filtration facilities, and improve the water quality in the rooms. Second, operators should pay attention to the construction of sound insulation facilities, and improve the sound insulation for the cottages that have been put into operation. In order to allow tourists to enjoy a quiet living environment, sound-proof windows can be installed,

and curtains can be used made of sound-absorbing materials. In order to reduce the sound being reflected by the wooden floor, noise insulation panels can be installed and acoustic ceilings can be used for upper and lower floors. In the interior walls, soundproof wallpaper or soundproof splints can be installed.

6.6.6 Improve catering

Catering in both the Modern Agricultural Holiday Resorts and Folk Custom Villages is one of the major sources of income for the projects. However, visitors are dissatisfied with the characteristics and quality of the meals, indicating that there is still much room for improvement in the satisfaction of catering. Increasing tourists' satisfaction with the food and drink can bring more economic benefits to the agricultural park. Some tourists reflect on there not being enough choice and that the food hygiene conditions are poor. Therefore, operators need to strengthen addressing of the food hygiene conditions of catering, possibly by providing training and better equipment, and increase the choice of food available. In particular, they could highlight the characteristics of local food and drink. Second, operators should also standardize the price of catering to improve the satisfaction of tourists when enjoying high-quality farm feasts, so as to shape and enhance the overall image of the Modern Agricultural Holiday Resorts and Folk Custom Villages.

6.6.7 Improve publicity of Folk Custom Villages

It is difficult for those running family-based businesses, such as Happy Farm Houses, to improve publicity by themselves. As the development of Folk Custom Villages usually takes place at a whole village level, the village level government (Cun weihui⁵⁵) could help enhance the image in the following two ways. First, it could develop promotional material to present the image and idea of this form of agricultural tourism in urban areas. For example, Folk Custom Villages could be promoted through a high-quality publicity video, which could be distributed to major travel portals and the media. Operators also can make a village promotional brochure to promote the village as a whole. Second, there is a need to strengthen the construction and management of the Folk Custom Villages' official website. The Internet has been the main way for modern society to obtain information for many years. Operators should make full use of the network platform. The official website should provide comprehensive information on Folk Custom Villages and release and

⁵⁵ Cun weihui (村委会): the name of village level government in China.

update the main dynamic and promotional information of the villages and individual operators' farm houses. The traffic and transport information should be placed in a prominent eye-catching position, releasing traffic conditions of the park, preferably in real time, and guiding visitors to the village. At the same time, the official website should also set up a visitor feedback platform to keep abreast of tourist satisfaction, identify problems reflected by tourists, and form a good interactive exchange with them. Increasing publicity plays an important role in increasing the number and awareness of tourists. Helping more tourists to know and understand this family-based business can enhance the customer base of the project. Therefore, operators of Happy Farm Houses should put the promotion material of the park in an important location.

6.7 The Analysis of connection among three different types of projects

The above sections have demonstrated what visitors using the different types of new urban agriculture feel about their experiences. The new Chinese model of urban agriculture needs to be understood in the context of the government's planned programme of urbanization, concerns about sustainability and the relocation of some polluting industry. Such a programme could have very severe detrimental effects on the rural areas which are overtaken by urban expansion, such as in the case of the growth of Beijing. It could also lead to unsustainable urban areas devoid of nature and distance the population further from their agrarian culture and food. In many cases around the world, a focus on urbanization, urban growth and urban based economic activity, such as that experienced in China, could have resulted in the destruction of rural livelihoods and lifestyles. However, as this chapter has sought to express, the new Chinese model of urban agriculture has gone some way to addressing this.

The government plays a vital role in the new urban agriculture model. In the Agriculture Carnival, the government has full responsibility for profits and losses of the project, paying the wages and welfare. It offers venues, exhibition halls, markets and spaces for marketing and trading, and also provides the job positions for different associations working in different departments in daily work for technology assistance and teaching skills and knowledge. The government is making active use of its credibility to provide a good platform for exchange, interaction and development between producers and consumers. This project helps re-educate the urban citizens' cognitions of urban agriculture and consciousness of consumption for agriculture

activities in urban areas effectively. As the previous chapter clearly demonstrated, this project has had a positive and effective impact on the acceptance level of urban citizens about urban agriculture, and also connected the other two projects and urban citizens successfully (figure 41).

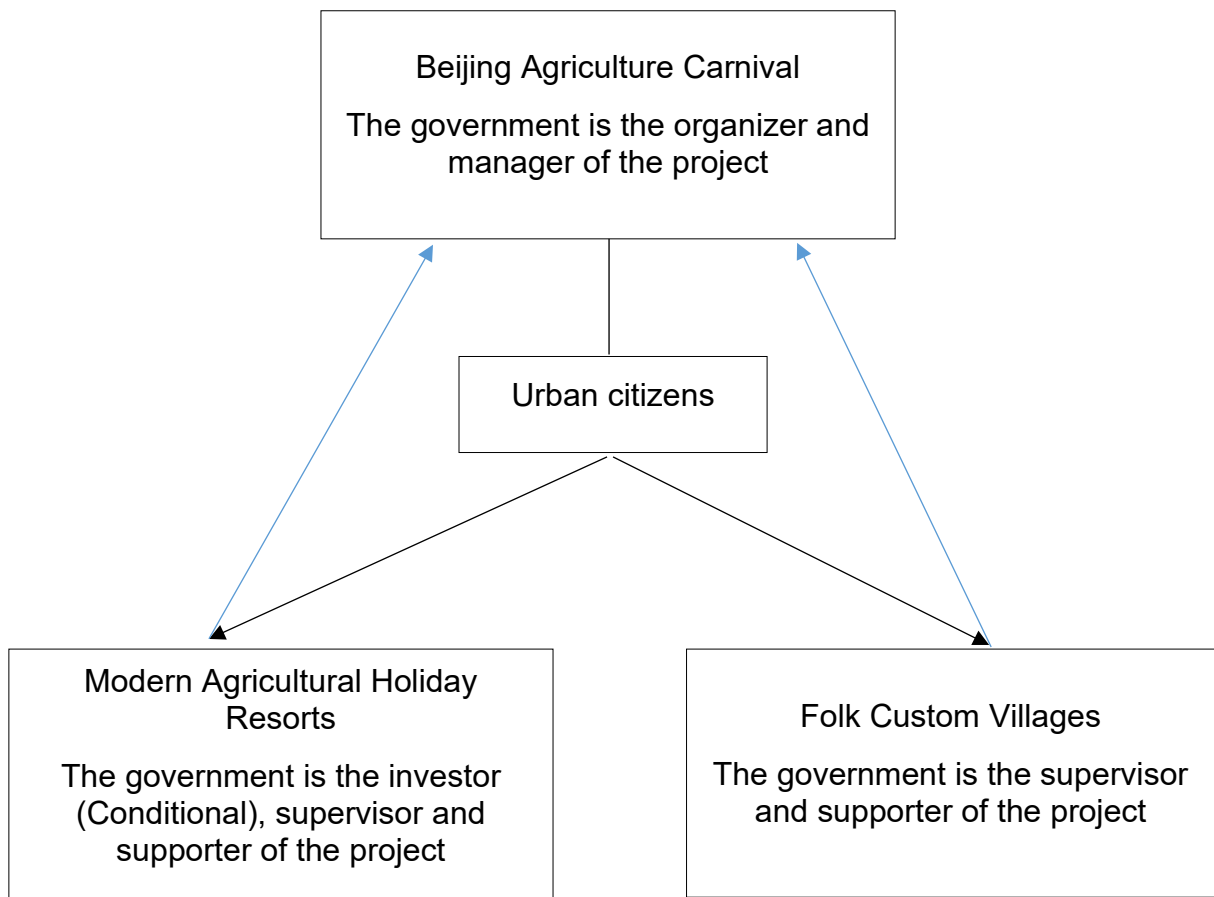


Figure 41: Connections in Chinese new urban agriculture model. Source: Author (2017).

On the basis of the Agricultural Carnival as a first-step marketing promotion of urban agriculture, the government has developed and supported the two other types of projects. However, these are much more based on a private enterprise approach, combining agriculture and tourism. The case study and data survey results illustrate that this model requires three aspects, which are:

1. The combination of agricultural production and tourism services to improve economic sustainability.
 - a. Tourism acts as the economic basis for a project to enable farming communities or private tourism enterprises to make profits.

- b. Agricultural features help tourism to be more attractive.
 - c. Using tourism is an attraction or draw to get preferential policies and financial input for the urban agriculture.
- 2. The upgrading of infrastructure and improvement of environmental sustainability.
 - a. Improving infrastructure to some extent on the basis of the original ones to meet the different requirements for tourism services.
 - b. Creating and maintaining agricultural features is equivalent to protecting and improving the urban environment.
- 3. A willingness to support and promote rural activities and lifestyles to continue, in an active and functioning way, within those areas which have been engulfed by urbanization. This supports social sustainability of these areas.

These three aspects have successfully contributed to agricultural products, tourism services and urban environment according to the needs of the urban residents, and have been integrated with urban life. The experience of Beijing Agricultural Carnival show that although the vast majority of profits come from tickets, tourism services and other non-agricultural activities, its success is mainly due to the quality of carnival itself. Thus, Beijing Agricultural Carnival diversifies and complements typical agricultural projects, adding value to the land.

Balancing these three aspects has a certain degree of complexity. As private enterprises, Modern Agricultural Holiday Resorts cannot be as rich as the Carnival's resources from government. They are also not as easy to get the recognition and trust of urban residents as the government-organized Carnival. However, Modern Agricultural Holiday Resorts can achieve better results with a modern enterprise management system. Figure 42 illustrates the product / customer-oriented management system of the Modern Agricultural Holiday Resort, which is made up of nine major departments. Apart from its operating departments, the agricultural sector also manages crop and animal husbandry and tourism in which fruits and vegetables are picked. The entertainment department is responsible for all recreational activities, including sports, fitness and recreation centres. The catering department is in charge of restaurants and hotels. The service department receives and provides information to visitors. This management structure helps Modern Agricultural Holiday Resorts respond to customer needs flexibly and ensure the further development of the project. It is precisely this point that can help to explicitly establish Modern

Agricultural Holiday Resorts as a more urban industry than traditional agricultural operations.

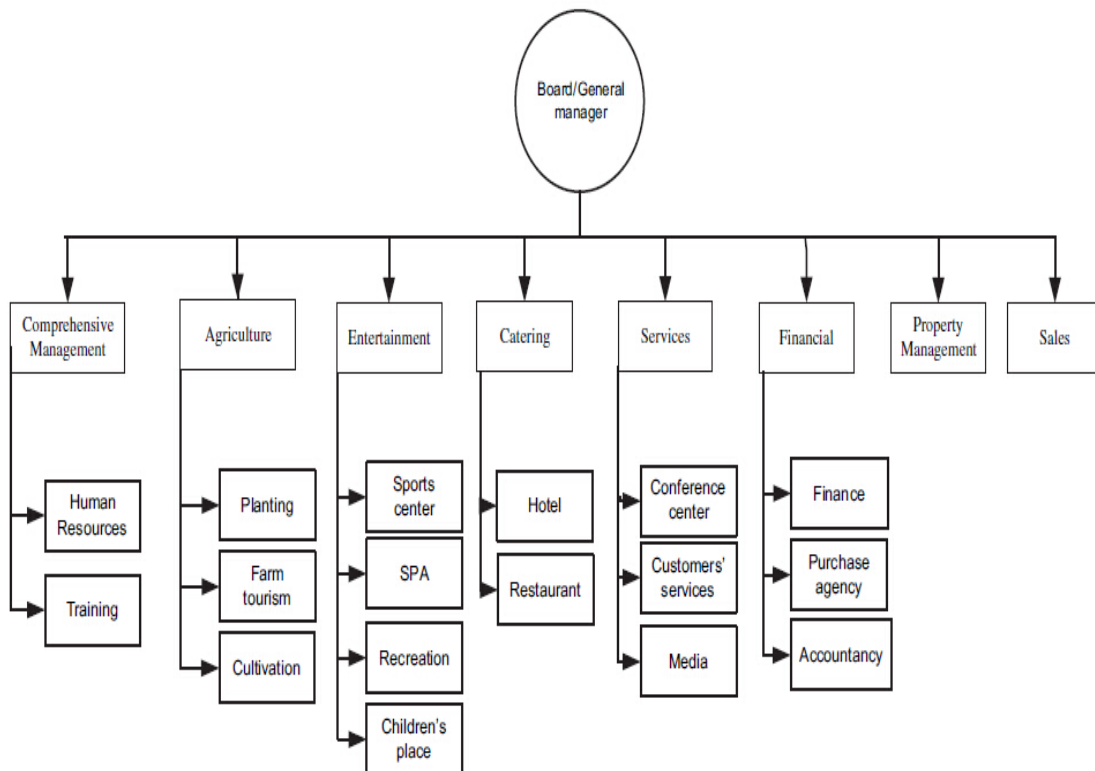


Figure 42: Organizational structure of the Modern Agricultural Holiday Resort. Source: Wenping et al. (2011)

Folk Custom Villages are less organized than the Modern Agricultural Holiday Resorts. This is because of their family-based business model which is generally operated by a couple or two generations, and the employees are mostly their relatives. However, it has a strong benefit in that it can effectively utilize local resources and achieve comprehensive synergy to solve the livelihood issues of farmers who lost their land in the process of urbanization. In this way it tries to continue and preserve traditional Chinese farming culture, but with different features. Finding a balance between tourism projects and local agriculture and culture features is crucial to the development of the Folk Custom Villages. Due to the rapid urbanization of agriculture and the market-driven economy, Folk Custom Villages seem to help maximize the protection of the historical and cultural landscape in the original villages which exist within the greater urban area. As a result, Folk Custom Villages stimulates innovation in Happy Farm House. It also helps with responding quickly to information on hot topics and recent changes in urban agriculture. For

example, potential operators need to develop their own forms or activities, if there are no existing examples based on their characteristics. Or they have to create innovation in their agricultural production and tourism projects in order to have advantages in competing with other operators with similar characteristics.

Specifically, interior design of individual operators is flexible and changeable which can combine the latest ideas quickly, or set up personalized customization and special arrangements for scheduled visitors before they arrive. In addition, mobile payment is more widely used in Folk Custom Villages rather than other projects because the individual operators can effectively respond to new technology and lifestyles.

As explained within this chapter, it is clear that the Chinese Government uses the new urban agriculture model, through three different types of projects, to make people rethink the role of agriculture and help urban agriculture integrate into the city system in a more sustainable way by re-connecting urban life and rural culture.

6.8 Conclusion

This chapter has described the three types of urban agricultural projects promoted by the Chinese Government, as a model of Chinese 'new urban agriculture'. The model is based on the government fully-owned large projects, Modern Agricultural Holiday Resorts and Folk Customs Village. Through exploring these it has become clear that urban agriculture in China, especially these three types of projects being promoted by the government in Beijing, is very different from urban agriculture in other parts of the world. However, in this context, the definitions of both 'urban' and 'agriculture' differ somewhat from those normally used when discussing 'urban agriculture'. Within the Chinese Government's new model of urban agriculture the term 'agriculture' encompasses not only agricultural production but also the traditional lifestyles and cultures of agricultural villages and households.

The concept of 'urban' also has to be considered when looking at urban agriculture in China. This concept encompasses a much wider range of location and spreads further from the heart of the urban area. However, given the rapid expansion of cities in China, what is desakota area one year can very quickly become truly urban area the next. Therefore, a more fluid definition, less prescribed by a more traditional western definition is, perhaps, pragmatic.

The chapter has shown that the new model of urban agriculture in China is very different from the old, traditional urban agriculture. It also highlights that this new model is different from urban agriculture in other countries. Some other governments have encouraged and supported urban agriculture in times of hardship, for example Cuba following the fall of the Soviet Union (see chapter 2). However, virtually nowhere in the world has a government made such a concerted effort to design and develop a formal system of urban agriculture on such a large scale to address such diverse issues.

The projects described above demonstrate the ways in which the Chinese Government is attempting to use urban agriculture to address a number of issues arising out of rapid urbanization and create sustainable solutions. These issues include loss of traditional rural lifestyles and cultural heritage and a need for diverse and appropriate economic development and employment for once rural people. Whilst they all seek to address these issues, they do so in different ways and prioritise different issues over others. Table 36 below summarises the way and values in which the different types of projects work.

Food production is not, and probably should not, be the key element of economic function of this new form of urban agriculture as it is in other developing countries. At the same time, the problems of the urban environment makes urban residents more eager to experience the original rural life and nostalgia. Therefore, the Chinese Government focuses on developing the urban agriculture projects as 'agriculture culture' or 'tourism' consumer products.

Through analysis of the government fully-owned large projects, it is clear to see that this level of project is designed for providing a wide agricultural communicative platform for all participants of urban agriculture by combining the entertainment elements of carnival and agriculture. It helps to cultivate in urban citizens a consciousness of agricultural consumption, intermingling agriculture, culture and tourism.

Based on this created platform, the government has attempted to create a calming social influence by encouraging people to reconnect to agriculture in an urban setting and to view it as a form of leisure pursuit to change people's minds and behaviour e.g. make it an urban hobby. After the formation of new minds and behaviour, the government guides the public to accept and experience the urban agriculture as a

part of 'rural life' for their spare time in the urban area by supporting an agricultural holiday village. Furthermore, the Folk Custom Village is an effective way to solve the livelihood problem of new citizens who were originally farmers who have lost farmland under urbanization. And it helps to re-establish rural experiences and values in the urban area, protecting rural culture in urban areas – agricultural villages.

	Economic Value	Social and Cultural Value	Ecological Value	Other Value
Agriculture Carnival	<ol style="list-style-type: none"> 1. Direct income such as tickets, sales and services etc. 2. Driving the development of the area by carnival-related mixed-use projects such as transport infrastructure, commercial and hospitality etc. 3. Creating business opportunities for different participants. 4. Providing jobs for different levels and professions of candidates. 5. Providing high quality and healthy food. 6. Driving the consumption of the local and surrounding agricultural products. 	<ol style="list-style-type: none"> 1. Providing comprehensive agricultural technology display and communication. 2. Providing a new agricultural way of life and entertainment for urban residents in an exhibition way. 3. Teaching agricultural culture and skills for both urban residents and urban farmers. 4. A template project of modern urban agriculture provided for the other areas of China by Central and Beijing Government. 	<ol style="list-style-type: none"> 1. Improving the environment in surrounding areas by environmental renovation projects such as landscape improvement, wastelands reconstruction and greenhouse area etc. 2. Using high-tech agriculture facilities for energy use and recycling in a sustainable way. 	<ol style="list-style-type: none"> 1. Developing an agricultural lifestyle of urban residents. 2. Increasing confidence in food safety by government credibility.

	Economic Value	Social and Cultural Value	Ecological Value	Other Value
Modern Agricultural Holiday Resorts	<ol style="list-style-type: none"> 1. Direct income such as sales and tourism services etc. 2. Resorts-related projects such as hospitality, entertainment and restaurant etc. 3. Providing jobs for resorts-related candidates, mostly are agricultural and tourism employees. 4. Providing high quality and healthy food. 	<ol style="list-style-type: none"> 1. Providing a new agricultural way of life and entertainment for urban residents in an experience and participatory way with more types of agricultural activities. 2. Providing extra-curricular venues for schools. 	<ol style="list-style-type: none"> 1. Using high-tech agriculture facilities for energy use and recycling in a sustainable way. 2. An effective land use by providing more green spaces for urban residents based on commercial development of urban land. 3. Protecting plants and animals in some resorts. 	<ol style="list-style-type: none"> 1. Including an amusement park in some resorts. 2. Creating an urban agriculture brand.
Folk Village	<ol style="list-style-type: none"> 1. Providing jobs for farmers who lost their land in the process of urbanization, especially left-behind women. 2. Increasing the income of Happy Farm House operators. 3. Driving the development of the village by related projects such as transport infrastructure, commercial and reconstruction etc. 4. Providing self-produced food. 	<ol style="list-style-type: none"> 1. Providing a new agricultural way of life and entertainment for urban residents in an accommodation experience way. 2. Protecting the local culture, folk and historical landscape. 3. Connecting urban and folk culture effectively. 4. Mitigating social issues of left-behind people in the village (elderly, women and children) to a certain extent. 	<ol style="list-style-type: none"> 1. Helping the overall development planning of the village. 2. Protecting the village environment more effectively by folk-targeted infrastructure. 	<ol style="list-style-type: none"> 1. Attracting talent to stay in the village. 2. Helping the growth of left-behind children in the village by communication with tourists from urban areas.

Table 36: Values of different projects. Source: Author (2016).

One of the aims of this study was to understand how this new Chinese urban agriculture differed from that undertaken in other countries. This chapter concludes that the Chinese model is very different. Considering what is happening in China in relation to what was learned about urban agriculture in other countries, three points are raised. First, with the exception of very few other countries, for example Cuba, nowhere else has there been such a strong and concerted government-backed approach to urban agriculture. What the Chinese model shows is a clear framework of descending levels of government involvement and financial support, with different management structures. This ranges from large-scale activity, fully owned, funded and managed by the government, to medium-scale public/private partnerships, to almost entirely private enterprise, enabling individual households to engage and earn a living (see figure 43).

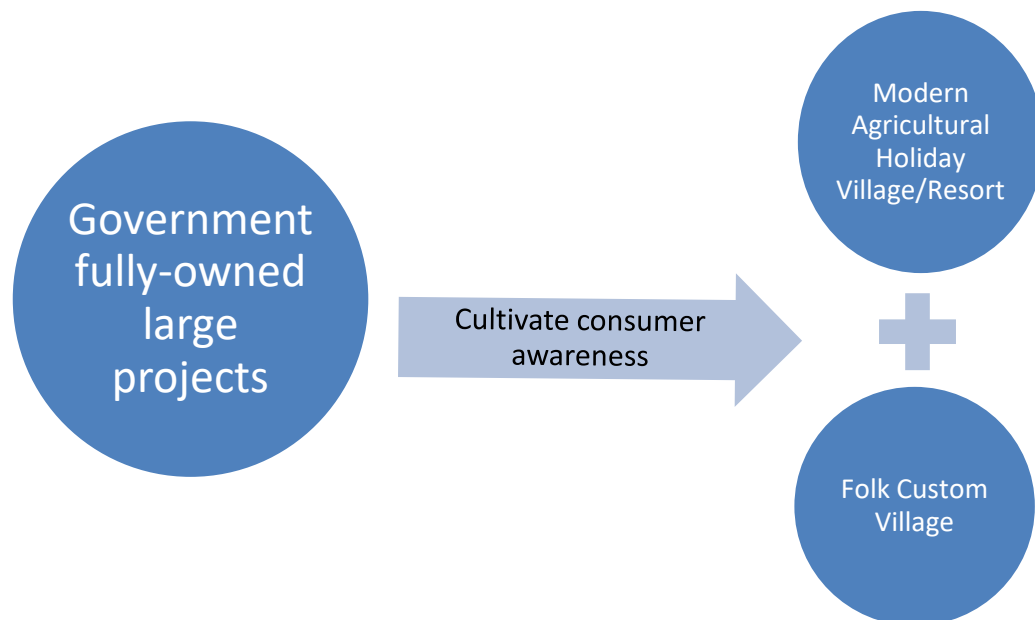


Figure 43: Descending scales of government involvement and management structure. Source: Author (2016).

Second, far from focusing on food production, it seems that the ‘Chinese’ urban agriculture model has a very broad goal of changing attitudes to agriculture and food. Overall, it aims to make people rethink the role of agriculture and see it not simply as something done by others in an urban area just to provide food. This model can help urban agriculture integrate into the city system in a more sustainable way by re-connecting urban life and rural culture. And it may define urban from a new perspective to a certain extent and even lead migrants from urban to rural areas.

Third, the Chinese model has a strong element of sustainable urbanization running through it. It provides a rural style environment and nostalgia to ensure healthy lives for all urban residents at all ages because it is an effective way to maintain green spaces. In order to improve the economic value, the process of sustainable consumption and production needs to develop high tech which means different types of recycling of energy and waste are promoted to reduce expenses. Meanwhile, Chinese new urban agriculture can protect and promote the sustainable use of urban land, for example the Folk Customs Village has a positive effect on cultural heritage protection and the Modern Agricultural Holiday Resorts have built much integrated environmental infrastructure.

The next chapter will discuss in depth the synthesis and evaluation of this model to explore the relationship and connection between these three types of activities, and what this model can offer more broadly to sustainable urbanization.

Chapter 7 Analysis of Urban Agriculture using a framework of Sustainable Development

7.1 Introduction

Drawing on the data and a greater understanding of the projects, presented in chapter 6, this chapter presents a critical analysis of the value of China's new approach to urban agriculture in the context of urbanisation. The chapter uses an analytical framework based on three domains of sustainable development, as discussed in chapter 3. This framework was chosen because China's rapid urbanisation has caused many difficulties with regards to sustainability, in all its forms. The analytical framework seeks to identify the ways in which new urban agriculture in Beijing is contributing to China's attempts to improve sustainability in the context of rapid Urbanization, and the problems this urbanisation has produced, as discussed in chapter 4.

With regards to the analysis and discussion of the new mode of urban agriculture in China, it is found that three different levels of projects are all based on the combination of urban agricultural production and modern tourism. In other words, the urban agricultural resources are transformed into tourism products, and new modes of tourism developed to interest the public in, and attract them to, urban agricultural production and management, agricultural ecological environment, agricultural production activities and so on.

This chapter will use the theoretical framework of the sustainable development to analyse the level, characteristics and functions of the urban agricultural tourism. The framework focuses on three, interlinked, domains of sustainable development - economic, social and environmental, as shown in figure 44.

The chapter begins by reminding the reader of the framework of sustainable development of urban agriculture, and discussing each of the different models of urban agriculture in relation to each domain of sustainable development. It then goes on to highlight the interrelation between the domains and highlights the way in which, what works well within one domain may actually hamper sustainability within another domain. This establishes a base from which to discuss policy and practice options in the following chapter.

7.2 The analytical framework of the sustainability of urban agriculture

The framework of sustainable development of urban agriculture is helpful to analyse the data from the research and identify the mechanism through which urban agricultural tourism can contribute to the overall goals of sustainable development and address some of the problems of China's rapid urbanisation.

The framework model of sustainable development of urban agriculture is a conceptual framework composed of three subsystems: 1 economy; 2 resources and environment; 3 social function and culture. Each subsystem is composed of a series of independent but closely related elements, and there is a complex interaction between the subsystems.

The economy subsystem is the compound economic system of urban agriculture and tourism, and it is the combination of urban agricultural economy and agricultural tourism economic activities. This sub system includes: agricultural tourists, the urban agricultural tourism industry, the attraction and supporting facilities of urban agricultural tourism, the intermediary service and infrastructure of urban agricultural tourism, and other elements. It mainly provides economic supply and demand power for the sustainable development of urban agricultural tourism.

The resource and environment subsystem is a compound system of resources and environment, including cultivated land, forest and fruit crops, forest, nature reserve, ecological demonstration area, urban agricultural demonstration area, urban green space, water, air, noise, pollution and so on. This subsystem provides environmental resources for urban agriculture. It is where we can clearly see the critical link between all subsystems of urban agricultural tourism, because without a stable and sustainable environment, the other subsystems cannot function and the entire urban agricultural tourism project disintegrates.

The social and cultural subsystem is a complex system of social culture, which covers the factors of farmers' employment and income, social welfare, farmers' quality of life, life style, brand image and so on. It mainly provides social impetus for the sustainable development of urban agriculture.

The sustainable development of urban agriculture is the result of the complex dynamic interaction of the above three subsystems, which can be specifically expressed as Figure 44. Among them, the solid-line arrow represents the goal realization and result

of the system, that is, the contribution of the three subsystems to the sustainable development of urban agriculture. The interaction within the economy subsystem is mainly the coordinated development of urban agriculture and agricultural tourism. The interaction between the economy subsystem and resource and environment subsystem originates from the economic environment system, mainly the development and protection of resources by urban agricultural activities. The interaction between the industrial and economic subsystem and the social and cultural subsystem is derived from the economic and social system, mainly the improvement of the social welfare brought by the urban agricultural activities and the improvement of the human quality. The interaction between resource environment subsystem and social culture subsystem originates from social environment system, which explains the indirect relationship between resource environment and social culture.

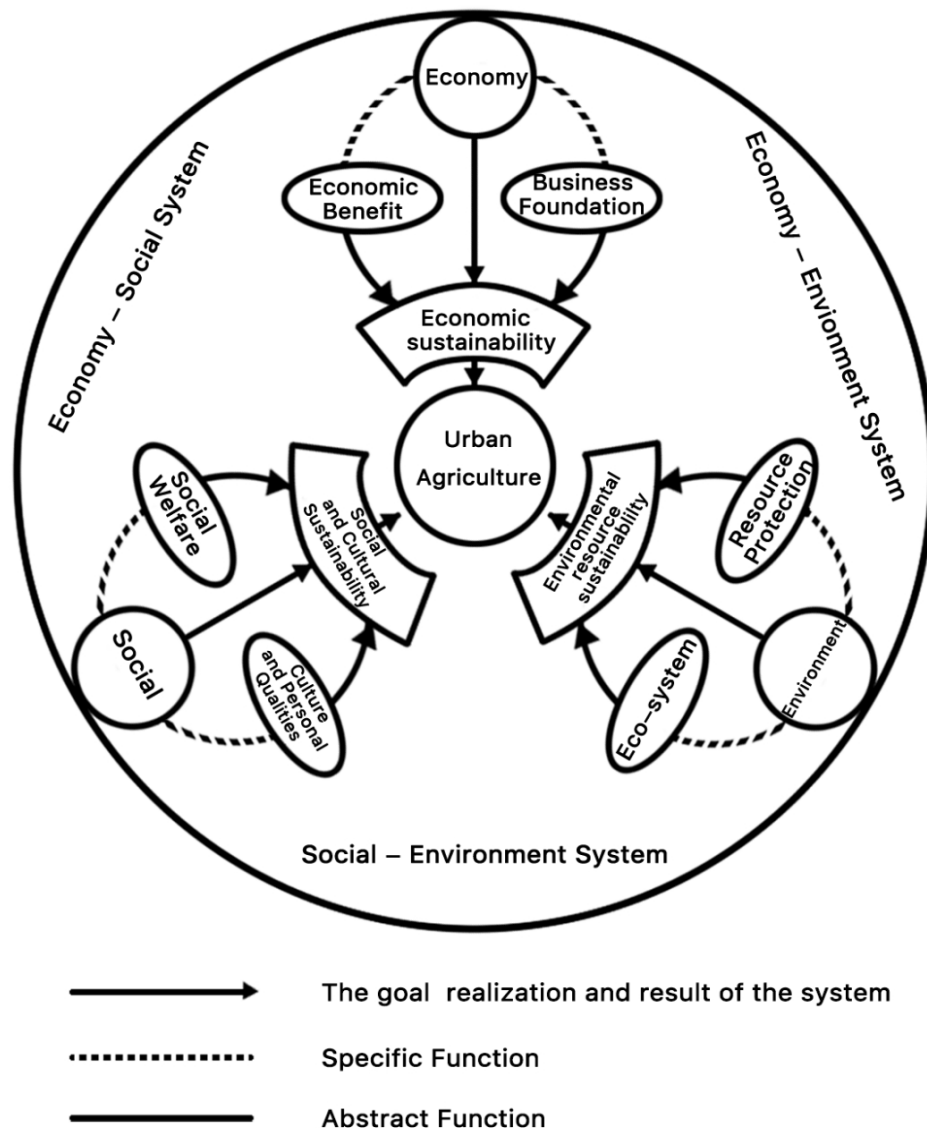


Figure 44: The framework model of the sustainable development of urban agriculture.
Source: Author (2019).

This chapter will now discuss the ways in which each of the subsystems of sustainable urban agriculture can be seen within the different projects studied in this research. It begins by analysing the different project types in relation to the individual 'domains' of sustainability – economic, environmental and socio-cultural. Following that it seeks to identify any synergies or discords between the different domains of sustainability to highlight where the overall urban agriculture programme might add up to more than the sum of its part or where different aspects might actually undermine sustainability.

7.3 Sustainability of projects by domains of sustainability

7.3.1 The economic sustainability of urban agriculture

The analysis begins with a discussion of economic sustainability because China has risen out of poverty and experienced enormous economic growth in recent years. It is now one of the major actors in the global economy. For many years, all other considerations, such as the environment or socio-cultural issues have appeared to be secondary. Therefore, no analysis of any new Government policy or project can overlook the economic drivers for, and implications of, that policy or project.

As discussed earlier in the thesis, small scale tourism has long existed in rural areas and villages. However, the economic sustainability of urban agriculture in China is now embodied in "agriculture-driven tourism" and "promoting agriculture with tourism". Based on the contents of the Chapter 6, it can be seen that the three different types of urban agricultural projects correspond to the urban, peri-urban and rural areas respectively. In promoting urban agriculture across the three types of area the Government effectively promotes the industrialization of agriculture in different forms and varying degrees, making it an economic opportunity for different groups from larger industries and farmers to village collectives and individuals, to engage in. It also promotes the development of the economy by providing a stimulus for necessary catering services, accommodation and transport services and tour guide services for agricultural tourism.

The new approach encourages and connects different industries, which would not have been part of the previous traditional urban agriculture, for example, Beijing

Agriculture Carnival and Xiedao Agricultural Holiday Resort. In doing so the Government is supporting private company operation within urban agriculture. This provides different kinds of job opportunities for different specialties, and also plays a synergistic and integrated role in the human resources of urban, peri-urban and rural areas. These projects will be analysed for their contribution to economic sustainability.

7.3.2 Government owned Agriculture Carnival

The first type of urban agricultural project, the Government owned and managed Carnival, provides a regional communication platform for a broad range of state and private stakeholders within urban agriculture (government, agricultural company, supplier, urban agent, agricultural product distributor, agricultural science and technology company, consumer, etc.), and provides potential opportunities for different forms of cooperation in urban agriculture.

The content of Section 6.3 shows that such projects combine urban agriculture with expositions and recreational carnivals, so that the government-sponsored urban agricultural projects, with the nature of fairs. There are initial signs that the Beijing Agriculture Carnival is having positive effects for economic sustainability.

The carnival has received direct income of 9.6237 million CNY (approximately equal to 1.40 million USD) from the sale of 0.3047 million tickets with another 24.282 million CNY (approximately equal to 3.52 million USD) from the sale of produce (Carnival Report, 2013). In total there have been more than 1 million visitors to the carnival, many of whom can go in for free as they represent different government or official groups.

The 2013 carnival took place in Changping District, a strawberry growing area. The surrounding strawberry picking garden had a record 2.3 million visitors, and achieved strawberry sales revenue of 180 million CNY (approximately equal to 26.12 million USD), with strawberry prices rising 20% over the same period. Changping District relied on the Agricultural Carnival opportunity to drive farmers' income, and the exhibition activities and related projects provided a total of more than 2,000 jobs (Carnival, 2016).

The carnival is beginning to cultivate the agricultural brand, and to display the new approach of modern urban agriculture development. It is being hailed by the media

as “the first brand of urban modern agriculture”. The carnival and the idea of modern urban agriculture has become a unique city card of Beijing. It has brought business opportunities, participating enterprises and signed more than 5,000 contracts with 26 foreign companies, domestic kindergartens, schools, hotels, restaurants, and the community. The total amount of business is close to 2 billion CNY (approximately equal to 290.27 million USD). The carnival has even signed an agreement with the Antarctic Research Station, whereby sprouting vegetables were taken to the Antarctic, enabling scientific staff to consume fresh vegetables (Carnival, 2016).

In addition to promoting the economic benefits of the primary agricultural related industries, it can also promote the development of secondary and tertiary industries, including manufacturing and processing industry, catering industry, entertainment service industry, transportation, real estate and other related industries. For example, the contracts with hotels, restaurants and surrounding communities of nearly 2 billion CNY (approximately equal to 290 million USD) have had a positive impact on the overall economy of the surrounding area where Beijing Agriculture Carnival is located. It is worth noting that the project not only creates many basic job opportunities, such as cleaning, waiters, cashiers, etc., but also creates many jobs related to urban agriculture, including planting, maintenance, park design, and so on. In addition, the biggest difference from other urban agricultural projects is that some of the positions related to the Expo, such as management, planning, activity execution, media promotion, and so on, have been created, as well as opportunities for many volunteers and interns, which can also be regarded as another explanation of economic synergy, that is, the coordination and integration of urban, peri-urban and rural human resources.

However, this economic function is not without its limitations and problems. For example, since Beijing Agriculture Carnival only lasts four months a year, most jobs are temporary. The posts related to the Expo mentioned above are part-time jobs in which the government selects some staff or institutions to form the organizing committee, which results in some instability and short-termism. At the same time, the investment in infrastructure is not utilised fully. The large area of infrastructure in the park will have limited use and significant idle time. Although some venues will be opened to the outside world as conference venues, in the eight months without Beijing Agriculture Carnival, apart from the inability to carry out agricultural activities for four months in winter, the Carnival could still be seen as a waste of resources.

All kinds of other industries based on Beijing Agriculture Carnival, such as hotels, restaurants and so on, also face an eight-month off-season. From this point of view, Beijing Agriculture Carnival only provided four months of "economic prosperity." Even though it can be used as a long-term annual event to recycle the park site, it is not stable, therefore, it does not meet the theoretical framework of sustainable development in this regard. However, because the project is in the capital, Beijing, the attractiveness, appeal, population density and consumption capacity of the project are enough to meet the economic benefits of one year in four months. As a result, on the whole, Beijing Agriculture Carnival has a positive impact on the economy of Beijing urban areas. Nevertheless, if other northern cities in China want to learn from, or hold, such projects, they need to assess whether it has a positive impact on the economy within a limited period of time. In cities in southern China, due to the climate, Agriculture Carnival has long-term conditions for agricultural activities throughout the year. However, it is still necessary to consider how to maintain the operation of an Agriculture Carnival throughout the year and reasonably arrange the agricultural companies and suppliers participating in the exhibition, as the traditional form of the Expo cannot be sustained throughout the year.

Generally, Agriculture Carnivals can reflect the economic sustainability of China's new urban agricultural projects in the urban and peri-urban areas under certain conditions, which is in line with the framework of sustainable development of urban agriculture.

7.3.3 The Agricultural Holiday Resorts

The second category of urban agriculture projects is the Agricultural holiday resorts which were launched through private company investment in urban agricultural tourism. The tourism products included sightseeing, leisure, entertainment, experiences, and holidays etc in order to respond to demand from urban residents for environment and 'countryside' activities. Thus, a series of new urban agricultural tourism project and locations was developed, such as Xiedao Agricultural Holiday Resort discussed in the previous chapter. They have been developed based on urban agricultural resources, which provides a new option for urban residents to take part in weekend vacation and leisure, thus attracting many urban residents to participate in it.

Xiedao Agricultural Holiday Resort, is a combination of resorts and holiday manor based on urban agriculture. Within this resort, 90 % of the land is used for farming and 10 % for tourism and leisure resorts, and the proceeds come mainly from tourists' consumption of accommodation, catering and leisure and entertainment in resorts. By increasing the operating income and profit from leisure tourism and vacation, a new growth point of agricultural tourism economy has been formed.

Through this approach, tourism can effectively help to reduce the intensive degree of land use for agriculture, improve the income generated by the land, reducing the shortcomings of low economic benefit of agricultural land, and acting as an example for land use in further urban development. At the same time, a larger number, and greater diversity, of job opportunities can be provided for the same area of land. These new jobs include service sector and administrative jobs, catering and tourism related activities. However, different from Agriculture Carnival, these jobs are longer-term and more stable. Thus, they offer a degree of financial sustainability.

It should be noted that such projects are aimed at more affluent urban residents, creating a resort for them to use in the city or on the outskirts of the city, yet offering a rural environment. These resorts offer good conditions for entertainment and consumption items, such as high-end hotels, SPA and restaurants etc. In this way, visitors can not only enjoy picking their own produce, experience the process of agricultural activities, but also enjoy a Spa and other services after labour, as a result, they have become a new choice of urban residents for weekend vacation.

Since Beijing has the highest average income per capita and consumption capacity per capita in China, urban residents offer a strong client base for the further development and economic sustainability of Agricultural Holiday Resorts. These consumers with certain spending power can provide a good profit base for the project. Unlike the Agricultural Carnival, which is a Government wholly owned and run project, the Holiday Resorts are a combination of private investment and a certain degree of Government support. This has demonstrated the Governments encouragement of private economic enterprise. It also highlights the Governments encouragement of consumerist activities for the Chinese citizens, which will help sustain a viable and more diverse internal economy. However, when other regions or cities in China want to draw lessons from or invest in such projects, they need to take into account the risk of investment. They must not only assess the population and consumption capacity around the project, but also to have good operational ability

and marketing ability, and strong private companies as investors in order to ensure the service quality of this form of commercial urban agricultural tourism.

Agricultural Holiday Resort can act to bring together diverse partners and activities to form a more sustainable economic enterprises in the agricultural environments within and surrounding cities. Thus, by combining tourism and agriculture, Agricultural Holiday Resort projects in the urban and peri-urban areas are in line with the framework of sustainable development of urban agriculture. However, the project has investment risk, so that it requires careful investment expansion analysis in the early stage and a good fine operation team in the later stage.

7.3.4 Folk Custom Villages

The third type of urban agricultural tourism project, guided and encouraged by the Government, seeks to enhance and diversity traditional agricultural activities of rural residents. It aims to promote unique local rural and agricultural culture and folk culture, and turn entire villages into locations for agricultural and folk tourism.

Known as Folk Customs Village, this type of project combines urban agriculture with some elements of folk tourism. Most of the accommodation and entertainment reservations for folk villages are through travel websites. Visitors make choices based on online introductions and comments. Before departure, through the online instant messaging tool, visitors can contact the owner to get useful tourist information, traffic tips, and introductions of local folk customs. Farmers are busy with daily operations and maintenance, and have no time to go shopping, so they are more likely to do online shopping. In order to facilitate express access, the courier company set up an office in the folk village alone, which promoted the development of the rural logistics industry. In order to improve the quality of travel services, these folk villages have built high-speed broadband, high-definition Internet TV, etc....Some private investors have discovered potential opportunities and will also participate in the operation of folk villages by purchasing or renting houses for renovation, as a farmhouse, or providing living services. Thus, Folk Customs Village can promote the aggregation of various resources such as tourism e-commerce, logistics industry, information industry and investment funds into peri-urban and even rural areas, which is beneficial to improve the investment environment in peri-urban and rural areas.

With the support of these resources, farmers who have lost their land through urban expansion and are unable to carry out traditional agricultural activities, such as food cultivation, can have the opportunity to participate in agricultural folk tourism, thereby reducing livelihood problems and increasing their incomes. For example, according to the report of Yanqing County, the average income of these rural families transformed into folk villages exceeded 200,000 yuan. Thus, it strengthens the urban element of this type of agriculture

For example, because of doing average income of each family in Yanqing County is more than 200,000 CNY. Some villagers have transformed their houses into family hotels with folk characteristics, while providing catering services to earn income. Some villagers provide catering services on a full-time basis and make tofu banquets which are the local characteristics to earn income, while others earn income by selling folk cultural products and handicrafts. It is worth noting that all practitioners are local villagers, who collectively present the village's true rural identity. This ensures that the production and living customs of practitioners can retain and inherit the local rural culture and folk culture.

However, if the village blindly engages in this approach to agricultural tourism, without emphasizing its own unique rural culture and folk culture, allowing outside economic enterprises to direct its rural agricultural, Folk Customs Village, activities, it will more likely fail to produce good results. For example, Lingshui Village in Mentougou District did not pay attention to the early planning and authentic cultural positioning. Many foreign individual investors became involved which led to the excessive modernization and commercialization of the whole village. Without the atmosphere of agricultural culture and folk culture, it is unable to attract tourists. Also, the management was poor as the villagers did not feel a sense of ownership and pride in the project. After the failure of foreign investment, the local villagers had no financial resource to live and had to go out to work, and the villages gradually declined.

In addition to direct economic benefits, Folk Customs Village can also promote the construction of essential basic services such as much needed road construction and transformation, communication infrastructure in peri-urban and rural areas. This also adds to economic sustainability, in that it can help to bring new growth points to the local economy and produce additional construction jobs.

The contribution of this type of Folk Customs Village project may not offer a great deal to China's wider economic goals in a global economy. Nevertheless these projects can be seen as an attempt by the Chinese government to help economic sustainability in a number of ways by diversifying and commercialising small scale rural agriculture and traditional lifestyles to encourage economic sustainability of traditional areas. First, these villages can be helped to integrate into the city in the process of urban and economic expansion. Second, these project work to reduce the phenomenon of agricultural population outflow and village decline. Third, they offer an alternative economic activity for those who have already migrated to the city but may need to return in the event of another recession or economic downturn, such as that experienced in China 2008's Financial Crises for those who have migrated to the city.

7.3.5 Summary to Economic sustainability

The new sustainable development model of urban agriculture in China is embodied in "agriculture-driven tourism" and "promoting agriculture with tourism". The three different types of urban agricultural projects correspond to the urban, peri-urban and rural areas respectively and encompass that area which can be considered as the Desekota. These projects effectively promote the diversification and commercialisation of agriculture to varying degrees but use tourism as their common approach. In promoting diversification through tourism, the projects respond the problem of the economic problems of the diminution of agriculture in China, especially in some metropolitan areas, as noted in the context chapter.

Urban agriculture in this context seeks to sustain the agricultural economy of these areas and also promote the development of a broad range of the necessary additional services and facilities (e.g. catering services, accommodation services and tour guide services for agricultural tourism) thus stimulating additional diverse economic activities. This provides many job opportunities, different from those within traditional forms of urban agriculture, in the areas surrounding Beijing and builds human resource capacity within urban, peri-urban and rural areas.

Nevertheless, we must acknowledge that the longer-term economic sustainability of new urban agriculture cannot be assured. Even the Beijing Agriculture Carnival only provided temporary jobs and only four months of "economic prosperity", despite its impressive ticket sales and other income (see section 6.3). Whilst the other projects

also provide a diverse economic activity with new jobs, many of these jobs are low paid and temporary or insecure. The economic benefits of other projects cannot be assured yet and may not be strong enough to sustain the activities in the end.

Moreover, according to current research results, commercialisation of new urban agriculture has a good development environment and resources in developed cities in China, such as Beijing. However, according to the China Urban Construction Statistical Yearbook, during 2010-2016, 246 of China's 633 cities experienced a decline in population density, and even 180 cities belonged to "shrinking cities", that is, Population growth is negative in more than three years. Due to the migration of young generation, the economic downturn in the city, the government cannot give priority to support, it is difficult to promote new urban agriculture in these cities.

However, the Government of China may have broader economic objective for driving the development of this new form of urban agricultural tourism and these should be considered. China's economic boom has been based largely on industry and manufacturing. This has served the country well in terms of global export income. However, in a globally uncertain market China was caught out during the economic downturn in 2008 China's export income declined and many citizens, who had been encouraged to migrate to urban areas to supply labour for this manufacturing and industry, lost their jobs and were forced to return to their rural homes. This posed a challenge to the dream of a new, prosperous urban lifestyle, which Chinese people had been encouraged to strive for. Through the development of urban agriculture, the Government may be seeking to support its attempts to enculturate the populating into new forms of consumerism which can help to sustain an internal economy, providing consumer services, with resultant jobs, to its own citizens and not simply focussing on the export economy.

Another way the new urban agriculture is supporting the Governments economic objectives is by encouraging development of private enterprise at small and medium scales within the traditionally agricultural, rural and peri-urban, areas particularly. This is seen clearly within the Agricultural Manors projects, which are developed through a combination of government and private investment. It can also be seen in the Folk Customs Villages, which both attract private investment and turn small scale farmers into 'business minded' communities. This further enculturates a very traditional level of Chinese society into commerce and consumerism.

7.4 The resource and environmental sustainability function of urban agriculture

China's rapid economic development has caused many environmental and ecological problems, as discussed in chapter 4. Therefore the protection of urban , peri-urban and rural resources and environment is an important function of urban agriculture. This includes the protection of urban agricultural tourism resources, pollution control and environmental beautification and urban greening. At a macro level, the sustainable development of urban agriculture can protect agricultural and ecological resources by optimizing land and tourism resources, by offering an alternative to polluting industrialisation as a land use, and by realizing the recycling of resources production and use of renewable and clean energy and by introducing sustainable sewage treatment processes

At a smaller, experiential level, urban agriculture improves the rational layout and beautification of pastoral areas, villages and the surrounding environment of tourist destination. Urban agriculture makes full use of urban and peri-urban landscape to construct the public green spaces and the green belt of the ring city, and establishes a harmonious ecological environment between man and nature, the city and the agriculture. This can make the urban and peri-urban landscape, as experienced by the new urban citizen, a more enjoyable and pleasant place to live and visit. The environmental sustainability of the projects will not be analysed from perspective of environmental science, this section will focus on the functionality of these three types of projects in environmental improvement.

7.4.1 The Agricultural Carnivals

The Agricultural Carnivals places strong emphasis on the ecological protection and integration effects of agricultural development. They focus on increasing the greening of the environment, and optimizing the basic functions of the surrounding natural environment in a sustainable way to achieve a return on the capital invested by the Government and private investors. This is important because it highlights that the Government is keen to encourage sustainability, not only within agriculture but also within the growing private enterprise sector in general.

These Carnival projects aimed to achieve low consumption of resources, low emissions of pollutants, and high use of renewable and clean energy through the establishment of "resource-product-reuse-reproduction" mechanism. The two types of projects follow the "3R" principle: Reduce, Reuse, Recycle.

Within the "3Rs." Reducing means using the minimum amount of natural resources, especially those resources which are not easily renewable, for example timber, or which cause pollution, for example plastic. Reuse involves the repeated use of items or parts of items which still have usable aspects, rather than throwing them away, for example, into garbage landfill sites. Recycling means the use of waste, for example, waste water or waste materials such as plastic, as resources, to be treated and reused or to produce different products. Agriculture offers many opportunities to embrace the '3Rs'. There is opportunity to use Renewable resources to take the place of non-renewable resources as much as possible, such as solar energy, wind energy, biological energy. As a result, the production can reasonably rely on the natural ecological cycle, and gradually establish a set of scientific and perfect ecosystem to promote the sustainable development of urban agriculture.

In the early stage of preparation, the Beijing Agricultural Carnival proposed to make the better effective use of resources and protect the environment, so as to achieve the production and consumption of "pollution emission minimization, waste recycling and harmless ", and obtain the maximum economic and environmental benefits at the minimum cost. The measures to ensure this were not to use fossil fuels (coal, natural gas, etc.) as far as possible, but to use geothermal, solar and biogas, material energy cycle, basically achieving zero emission of pollutants.

Taking biogas circulation system as an example, by means of the support from the Government in science, technology and funds, biogas digesters have been built in the Carnival. Raw materials for the digesters are collected in the form of livestock and poultry feces, crop straw, tourists' feces and available organic garbage. The various wastes are subjected to mesophilic fermentation in a methane tank to generate biogas, biogas slurry and biogas residues. The daily production of methane is 500m³, which mainly provides cooking fuel for the Carnival. The biogas slurry and the biogas residue provide an excellent organic fertilizer and an insect-killing bactericide for the planting industry, which saves on the use of chemical fertilizers and pesticides and also provides a sufficient fertilizer source for the production of the organic food. However, whilst the reuse of waste is a good thing, it should be acknowledged that the anaerobic digestion produces several greenhouse gases, particularly carbon dioxide, methane and nitrous oxide. Some purification measures should be taken to reduce these emissions into the air.

Nevertheless, there are other, more positive reuses of waste materials. For example, agricultural products and straw can also be used as feed to develop the aquaculture industry in the Carnival, so achieving the purpose of multi-level utilization of material resources. The Beijing Agriculture Carnival realizes synchronous production of biogas and accumulation of fertilizer, planting of crops and breeding animals by this comprehensive form of utilization that integrates energy, ecology, environmental protection and agricultural production. Therefore, a set of medium-sized ecosystem with large biological population, long food chain structure and faster circulation of energy flow is established in the Carnival. This realizes the energy and resource recycling of the production process. This improves the economic benefit and protects the ecological environment.

At a localised level, the Beijing Agriculture Carnival assumes a certain degree of responsibility for the environment and urban green space. Lots of plants are cultivated and transplanted during the construction process of the projects, which result in visible transformation and improvements of the environment and landscape. The Carnival has sought to leave a legacy of an improved environment, new infrastructure and a development plan for what was previously an undeveloped area. The huge development change between before and after can be seen in figure 45 (the area within the yellow border in the middle of the map). As there is something wrong with the navigation system at Beijing Capital Airport, high - voltage cable conductor were buried underground so that Beijing Agriculture Carnival Island was built on the ruins of buried high-voltage cable conductor. It's been ruins until 1995 after the capital airport was changed the navigation system. There have been obvious environmental benefits. The project not only explored and implemented modern urban agriculture on site but also led to environmental improvement in the surrounding areas. To achieve this goal, the government used the ecological environment and landscape improvement project to improve the whole of Xingshou Zhen's (Town) agricultural environment. Specifically, a lot of wasteland and abandoned land was transformed into arable land, cultivated fields with high-tech agriculture facilities and greenspaces. . For example, the area on the left of the Agriculture Carnival in figure 45 has been transformed into a greenhouse area.



Figure 45: Development of the Agriculture Carnival. Source: Author (2017).

7.4.2 Xiedao Agricultural Holiday Resort

Different from the Beijing Carnival, the Beijing Xiedao Agricultural Holiday Resort invested by the company pays more attention to the recycling of small ecosystems or microecosystems. To do this, it makes use of, and demonstrates, the multi-functional ecological recycling model to realize the recycling of energy and resources.

As shown in section 6.4 the Beijing Xiedao Agricultural Holiday Resort makes extensive use of its natural geo-thermal energy supply for heating. This contributes to sustainability by limiting the use of non-renewable or unclean energy and acts as an example of what can be done in the right locations. Also shown in section 6.4, With regards to the mutual utilization of waste generated in the process of production and processing, these small or microecosystems on the Agricultural Holiday Resort promoted the multi-level utilization and recovery of resources within the system, as well as the recovery system of raw materials. This not only reduces the purchase cost of raw materials, but also saves the cost of disposal of waste materials. As a result, the input of external resources into the system is reduced, the comprehensive benefit of the system is improved, so that the ecological regulation mechanism and self-purification ability of the system are fully utilized, and a benign ecosystem which can discharge and expel the external resources of the system and work towards the ideal state of zero emission is formed.

The Holiday Resort, supported by collaboration between the Government and private investors, can be seen as a demonstration of the role of smaller, public/private urban agricultural tourism enterprises in contributing to sustainability. It highlights that attention to the recycling of small ecosystems or microecosystems can not only be beneficial to the environment but also help to meet the investment purpose of the company to generate economic benefits, it is also conducive to attracting more investment.

However, the key to the viability of such projects lies in secure investment and good management. As these projects are new, and currently supported in part by the Government, there is no way of telling whether their further development will continue to engage with environmental issues as fully as this early Government supported project has done. Left to the demands of private enterprise alone, the investment required to establish some of the technological aspects of the project, such as the geo-thermal energy plant, may not be available.

7.4.3 Folk Customs Villages

Based on the results of the Folk Custom Village analysis, a number of ways in which Villages connect to environmental sustainability and protection can be seen. First, a review of the distribution of the projects shows that most of the folk villages are distributed in the areas where the urban ecosystem and the rural ecosystem intersect. These regions are fragile ecological areas, and protection of the natural environment is relatively weak as shown in figure 46.

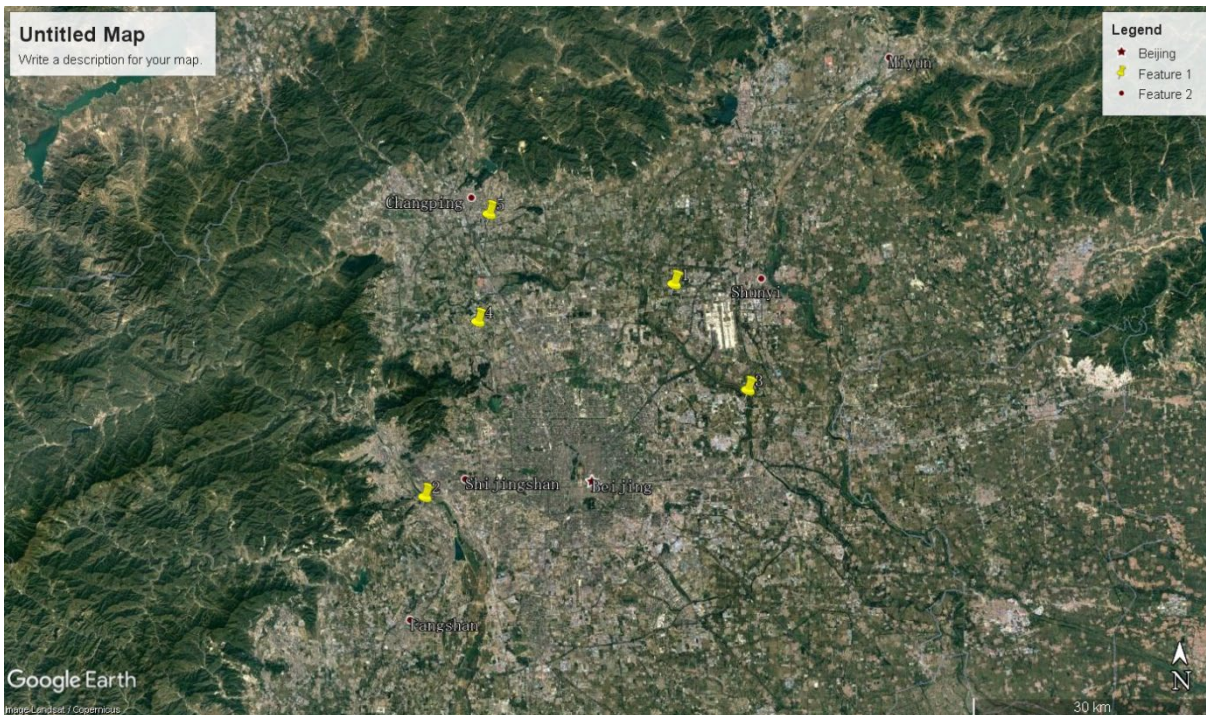


Figure 46: Locations of Folk Custom Village Tourism. Source: Author (2017).

These areas are undergoing rapid change through urbanisation which, in some cases, destroys their traditional built and natural environments. For example, during modernization of the buildings it is easy to destroy the original rural natural landscape and ecological environment. Restoration of the natural environment, during the process of urbanisation, is often not in line with the concept of sustainable development planning.

However, although folk custom villages have economic benefits, the transformation of a village into a Folk Custom Village for tourism can also cause significant environmental harm. For example, in the process of the initial establishment, and in the later stage of the development of the folk village, there are phenomena such as

the change of the original landforms, the transportation of the soil, loss of water and soil, and the destruction of the land surface.

In addition, due to the lack of public transport facilities, tourists can only go to folk villages by private cars, which emit a large amount of exhaust gas into the air. This not only pollutes the local air but also contributes to climate change and global warming. Especially during holidays, when a large number of cars arrive in a short period of time, the air quality in rural areas declines sharply. Also, a substantial number of rural roads are soil roads and gravel roads, and increased traffic not only damages the roads but produces a lot of dust affecting the air quality. During the holidays, many celebration activities may also have an impact on air quality, such as the firing of fireworks and firecrackers.

Only a few villages have good management mechanisms. Therefore, they tend to lack adequate infrastructure for their daily operation. One of the problems that results is poor solid waste management and resulting rubbish and pollution. Tourists leave solid waste, such as plastic bags, food bags and disposable beverage cups, which do not easily degrade. In most folk villages, there are no fixed places where garbage is dumped at some time, so that garbage can be found everywhere on both sides of the road or on the road. Because tourists have a wide range of activities in folk villages, and can roam on the land within and surrounding the village, the villages are filled with the marks of tourists' activities. When tourists arrive in large numbers, they swell the population of the village and can cause damage to the soil or green areas during the tour.

These problems can be managed but there are reasons why they are not being in some villages. Because village operators are mostly local farmers, their education level is low, environmental awareness is not strong. Also, there is potential for some villages to pay too much attention to the short-term economic benefit of tourism. This does bring economic benefits but has many negative effects to the ecological environment, which leads to the waste of resources and the destruction of the environment. This was shown in a concern by one 27 year old woman questioned the parking charges:

“The parking fee is very expensive here. In general, the hotel should be free parking. I stay here for a night for about 1,600 CNY (approximately equal to 232 USD), which is already more expensive

than the five-star hotel in the urban area, but it still needs additional parking fees. I am confused about this situation.”

However, this approach is somewhat self-limiting because without a good local environment and appropriate facilities, including affordable public transport, the folk village has no advantage to attract the tourists, so that the project ends with failure.

Conversely, to focus on environmental protection, but limit the development of folk villages as tourism attractions will deny farmers an improved income. In this scenario, unable to meet their needs, they will abandon tourism as an activity.

However, if farmers can increase their income, and if they are willing to invest part of the income in environmental improvements, the local environment attracts more tourist, who bring funds to reinvest, forming a virtuous circle.

7.4.4 Summary of the environmental sustainability of the projects

High quality natural environments are a decisive factor in attracting tourists.

Therefore, it is important that the legacy of environmental improvements which most of the projects seek to develop, is not a ‘one off’ gift to be left once the project has ended, as in the case of some other urban activities, such as the five types of legacies (sporting, economic, infrastructural, urban and social) of the Sydney 2000 Olympic Games that were distinguished by Cashman (2006). Rather it should be a central and on-going requirement for the urban agriculture projects to be making urban improvements and the urban agriculture symbiotic. However, we have seen that in some projects, particularly the folk custom villages, that the very environment which tourists pay to visit can actually be damaged by their visit. Also, there are questions about the degree to which care will be taken if Agricultural Holiday Resorts are developed as entirely private enterprises and without the oversight of Government remains to be seen. Moreover, the lack of well-planned public transport facilities and infrastructure for all projects is a concern and undermines other attempts by the Government to address serious concerns about environment sustainability.

7.5 Socio-cultural sustainability

The promotion of social welfare and culture in urban and rural areas is a key function of the sustainable development system of urban agriculture. In relation to socio-cultural sustainability, this research mainly focused on the demonstration and

education of agricultural knowledge, science and technology, the display and influence of typical urban agriculture projects, the creation of agricultural entertainment and leisure life style for urban residents, the improvement of farmers' educational level, the protection of agricultural folk cultural heritage,

7.5.1 The agricultural carnivals

The agricultural carnivals addressed several aspects of socio-cultural sustainability, particularly the creation of a new form of leisure lifestyle for urban residents and in engaging urban residents in the concepts of environmental sustainability and healthy eating as part of an urban lifestyle. As has been noted earlier, Chinese urban citizens have become socially and physically disconnected from agriculture, and, as a result, from an understanding of the processes involved in food production and the importance of healthy eating. By using the agricultural carnival to bring together both producers and consumers, the Government did several things. First, it promoted new production technologies to producers, which may help to increase output and thus agricultural economy. However, by using the carnival as a leisure activity for citizens, it not only educated them about agricultural food production but also began to enculturate people into the concept of agriculture as a leisure and tourism activity. The success of the carnival clearly highlighted the people's interest in both agricultural focused leisure activities issues of food production.

For people living in densely populated urban areas of Beijing, the ability to visit a carnival based on agriculture was very uplifting and educational. Older people and children seemed to benefit particularly, as these visitors noted:

One 35 years old mother explained how she knew of the Agriculture Carnival:

“One of my colleagues is also a mother, she told me about the Agriculture Carnival, at first I only watched the news and videos about it with my son, but my son finds it hard to understand some interesting activities and experiments. So I decided to take my son to attend these. He tells me that he has direct feeling about everything after taking part in the activities and experiments. And he understands what is going on.”

A 34 years old female visitor with her parents said:

“Because we were all born in the rural area, we are very pleased to see these things. My parents have nothing to do after their retirement, the activities are very suitable for them, and they also like to participate, so I think these activities are more the better.”

7.5.2 Agricultural holiday resorts

This interest in, and desire to connect with, agriculture as a leisure activity underpins the diversification of urban and peri-urban agricultural land to include tourism activities, especially for the more affluent citizens. Therefore, agricultural holiday resorts address a need to provide a longer rural leisure experience.

Of those who at the Xiedao Agricultural Holiday Resort who responded to questionnaires, 46% were in their first visit to this year. However, 21% have paid two or three visits and 27% over five visits during this year (table 18). This suggests that the rate of revisiting it is relatively high, which likewise suggests visitor satisfaction. One of the main reasons for tourists’ revisiting might be that a Modern Agricultural Holiday Resort is mostly a venue for the recreation of the surrounding area’s residents, especially those people who have already experienced the traditional rural life and agriculture. One 43 years old woman explained:

“The feeling here is very nostalgic for me. My family did the farming work in the rural area when I was a child. We crushed corn with stone mill in my hometown just like here. It makes me feel particularly cordial.”

Another, a 39 years old man, also mentioned feeling that this is a long-lost agriculture culture as:

“This is a long time ago I have seen the Dough figurine (figure 47). At that time I was only three or four years old, I saw it when my mum took me to the market. It’s really hard to see now in daily life. I saw it as if I had returned to my childhood.”



Figure 47: Dough figurine. Source: Author (2016).

Whilst mass urbanisation of the population was desired, indeed essential, in order to support economic growth, that economic growth is not sustainable if the population is not healthy, both physically and mentally. There was clear evidence that the agricultural holiday resorts played a role in sustaining wellbeing, as this man noted:

A 34 years old man has made the Xiedao Agricultural Holiday Resort as a family travel destination for many years, he explained:

“My wife and I work very busily, there is no long vacation for long-distance travel. Our child is also small which is not suitable for long-distance travel. The environment here is very good and I feel particularly relaxed here. And it is very convenient to come here, I think it’s a great choice for family weekend trips.”

However, rapid urbanisation has brought a deeper sense of loss of former lifestyles felt by some people in newly urbanised China. This loss is represented by the comments of one lady, who appreciated the opportunity to have intimate contact with nature which the holiday village gave to her son:

“My child can hardly see the animals in the city, and don’t know what the vegetables and fruits we eat everyday look like in the ground. I am very worried that my child can only learn the nature from the pictures and videos. So I try to take him here. We just went

to the hive house. In there, we watched and interacted with bees closely. We also took a hive to see how the bees live and taste the fresh honey. I think this experience is fantastic."

This educational role of the Xiedao Agricultural Holiday Resort is recognized and strongly supported by the Government and many other organizations, which have established the "Environmental Protection Science and Technology Education Base", "Youth Science Popularization Education Base" and "Sustainable Development Education Base" in Xiedao Agricultural Holiday. As a result, the resort is listed as an out-of-school education base for young people in Chaoyang District. Every year, nearly 40,000 students and parents from more than 40 primary and secondary schools come to Xiedao feeling the local flavor, experiencing farmers' life, practicing agricultural production so as to improve students' knowledge, and strengthen the education of agricultural science popularization knowledge to the urban residents, especially to their children. Very importantly, the resort does not need to be paid by the student family in this kind of parent-child activity, which means that students and families in different classes can participate, which avoids a kind of situation that the inability of poor families to participate in the collective activities of students, and is conducive to the realization of social equity.

7.5.3 Folk Custom Villages

As an important part of urban culture and social life, urban agricultural tourism can not only meet the tourism and leisure needs of urban residents, but also show agricultural culture to urban residents by means of different agricultural landscapes or activities. This is important because, although China's modernization and economic growth have been very successful, this success has been largely dependent on migration of labour from rural to urban areas and, to some degree, at the expense of its agrarian past. It is clear from interviews with visitors to all the different projects that urban Chinese people are very nostalgic for older, traditional ways and lifestyles.

The loss of connection to agriculture is symptomatic of a greater change from the loss of traditional rural lifestyles, which people remain very nostalgic for. However, those lifestyles are under the constant threat of further destruction from urban expansion and changes to agriculture. While many rural people have migrated to the city or been engulfed as the city expanded out to meet them, not all can, or want to, adopt urban lifestyles or urban livelihoods and employment. Moreover, the economic

uncertainties the world faces mean that urban livelihoods for all cannot be guaranteed. For this reason, urban agriculture, in the form of folk custom villages can be seen as contributing to socio-cultural sustainability, by offering a mechanism to sustain traditional rural and agricultural lifestyles in newly urban or peri-urban areas by diversifying rural livelihood and improving incomes.

Importantly, many of the tasks needed for a folk custom village to be successful, also force farmers to improve their educational level and professional literacy, such as learning Putonghua (Standard Mandarin) and computer skills (office series soft wares), improving service awareness and communication skills. To a certain extent, this can prepare them for urban employment should they choose it. It might also work to narrow the socio-cultural gap between urban and rural residents, and be conducive to social cohesion. For example, in the experience of agricultural activities, children and farmers together, sharing skills and breaking down possible occupational and class discrimination.

The folk custom villages also provide a way of sustaining and spreading knowledge about traditional Chinese culture to urban residents who have never known it. Younger generations, raised in urban areas, may know little of their country's history. Offering them the opportunity to see traditional lifestyle and customs continuing alongside newly urbanized living will help them to understand and appreciate how the people and the Nation have progressed in a way that would not be so clear if tradition was confined to museums.

In particular, children are educated in agricultural knowledge, science and technology in order to promote and inherit agricultural and national cultures. Families seemed to appreciate Folk Custom Villages particularly, with 71% of the interview respondents being families with children of school age. One lady noted that her child had little knowledge of traditional customs and enjoyed seeing the village way:

“My family used HuoKang when I was a child in winter, very warm and comfortable. My child has never seen this traditional Chinese bed. We have lived here for 2 days and he actually wanted me to make a HuoKang at home. We all love it rather than heater or air conditioning.”

The agricultural tourism projects in Beijing also act to inform and educate people in other areas. This study noted that a small number of tourists of Beijing Agricultural Carnival and Beijing Xiedao Agricultural Holiday Resort are from other parts of China,

with the purpose of visiting and studying. These agricultural study tourists have taken back new urban information and new ideas to other cities and rural areas, which has a subtle impact on the quality of farmers and local customs and habits. On the basis of showing tourists agricultural culture and science and technology, urban agriculture in Beijing has also provided project cases and good experience for governments, academic institutions and agricultural companies in other parts of China. Beijing Agricultural Carnival has made a positive exploration for China's agriculture and rural development, whose development model has provided valuable experience for agriculture and rural development in other regions, and it has the functions of scientific and technological demonstration and typical driving. However, it must be accepted that other municipalities may not be in a position to support or encourage the development of similar projects in their own regions. Moreover, as has been noted earlier, to be successful in terms of sustainability, many of the project need clear guidelines and frameworks to work within, or they may focus solely on short term economic gain and overlook sustainable goals.

7.5.4 Summary to socio-cultural suitability

The promotion of social welfare and culture in urban, peri-urban and rural areas is a key function of the sustainable development system of urban agriculture. This research mainly includes the demonstration and education of agricultural knowledge and science and technology, the display and influence of typical urban agriculture projects, the creation of agricultural entertainment and leisure life style of urban residents, the improvement of farmers' civilization, the protection of agricultural folk cultural heritage, social cohesion, solidarity as well as social equity. There is an implicit attempt within all these types of project to achieve some of these objectives and to promote social welfare and sustain some knowledge and understanding of China's traditional agrarian past. This is only a minor aim in the Carnival and the Holiday Manors. However, it appears much more important within the Folk Custom Villages. These villages act to sustain a traditional way of life by commercializing it, bringing improved incomes and stability to the villagers and reducing their need to abandon the land and village.

Moreover, the projects recognize the need of the newly urbanized Chinese citizens to engage with rural lifestyles and the open countryside. There is a clear message within the projects about healthy eating and the value of fresh produce to a healthy diet. However, whether there is any conscious objective to contribute to social

sustainability by using the projects to improve urban citizens health and wellbeing is hard to tell. But those interviewed for the study suggest that urban agriculture tourism does, or can, have that effect.

7.6 The sustainability synergy between the projects

According to the background information, although the total amount of land in China is huge, the cultivated area per person is very limited. While in the urbanization process, the demand for land is even greater in urban and desakota (semi-urbanized) areas than in the rural areas. After the arable land is transferred into non-agricultural land, expensive land in urban areas also makes farmers discouraged. Therefore, it can be considered that urban agriculture should be concentrated in the development of desakota areas, as people's leasehold capacity to these places is clearly stronger than that in urban areas, and land use rights are also relatively more secure.

Urban agriculture in desakota areas is currently the main body of urban agriculture in China and an important research object. Urban agriculture in desakota areas of China has its own distinctive features: China's urban administrative areas are consciously expanded, and the main urban area which has a huge hinterland of rural areas is regarded as a food supply and in need of protection. The rural land of desakota areas may turn into construction land at any time. As a land use mixed zone, there are a large number of agricultural sightseeing parks and eco-agricultural parks in desakota areas. Despite the promulgation of China's stringent farmland protection laws and regulations, due to the rapid urban development and many other reasons, agricultural land is continuously being replaced by construction land. As *'Beijing's Overall Land Use Planning (2006-2020)'* shows, from 2005 to 2020, urban development in Beijing will occupy 186 km² of cultivated land. Urban agriculture in the desakota areas is related to agricultural land and cultivated land protection in China. Urban agriculture in these is related to both food safety and sustainable development in urban area, and agriculture and peasants in desakota areas of China's cities. Therefore, the new urban agriculture model is not only related to the development of urban agriculture but also to the sustainability and livability of cities in the future.

The above analysis of the three different types of urban agriculture project, viewed through the three lenses of economic, environmental and social sustainability clearly

highlights that, individually, they all offer something to sustainability. Moreover, there are synergies between the projects which serve to make them stronger together than they would be as isolated individual actions. However, there are significant limitations to sustainability and, in some respects, clashes between the different elements of sustainability.

It is clear that the strongest synergy between the projects relates to economic sustainability. This is a major thread within each type of project, with each acting to improve the local economy, stimulate business enterprise, improve incomes and provide jobs. Together, the projects seek to do this by providing the urban Chinese citizen with a new form of consumerism relating to experiencing agriculture and rural-agricultural lifestyles and environments, through tourism and leisure activities.

It is clear now that in China, there is a potential for the new urban agriculture model to become an important strategy for land use planning, urbanization and sustainable development to a far greater degree than it is in other countries. Creating an urban agro-environment requires planned agricultural production, with a fully considered spatial layout, to reduce pollution, maximise production and to create good, aesthetically pleasing and sustainable landscapes. Agricultural tourism, as it is being developed in China, can act as the framework for much of that planning. Under such circumstances, the urban agriculture has played a significant role in reducing the pollution of agriculture, industry and tourism systems. It achieves the protection of the environment by creating and improving the cycle of energy and resources, thereby achieving the sustainable goals in the process of urbanization.

This model, therefore, sets urban agriculture in an important position, within sustainable urbanization and urban development, as it has such a strong role within each of the elements of sustainable development within any of the models discussed in chapter 3. Figure 48 highlights this using the three overlapping circles model.

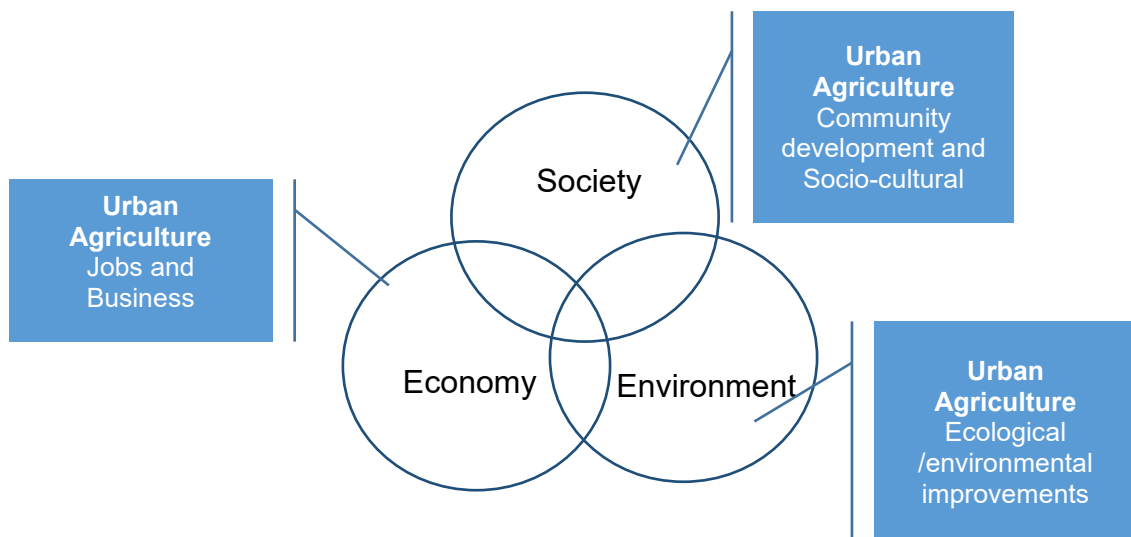


Figure 48: Urban agriculture within current models of sustainable development.
 Source: Author (2018)

There is synergy also between the projects in relation to environmental sustainability, although it is much less strong. All three projects do, in some way, seek to include elements to promote environmental sustainability. However, here there are some problems. Without careful consideration, especially to transport, tourism is very damaging to the environment. Whilst projects like the holiday resorts might try to demonstrate environmentally sustainable practices, the fact that they are only easily reached by private car undermines their efforts. The environmental shortcomings can be seen in other ways too, for example in the dry waste produced by tourists and potential for greenhouse gases from bio-gas generators not to be properly managed. If the projects are to work together as a force for environmental sustainability they will require a clear framework of checks and guidelines to work within. Otherwise they will not only miss an opportunity to help combat climate change but may actually add to it. As the Holiday Resorts and the folk custom village are private enterprise, they are unlikely to develop and adopt strong controls without government intervention.

Finally, there are synergies relating to socio-cultural sustainability running across all the projects. For example, These can be seen in the emphasis that all projects place on engaging tourists in agricultural activities to enhance their knowledge and understanding of both agriculture and China’s traditional rural way of life, especially for the education of youth agricultural knowledge.

There is a sense, throughout the projects, of a conscious effort to allow the new urban Chinese citizens to maintain contact with, and gain an understanding of, the

country's past, while at the same time remaining new urban citizens. This is important with China's rapid urbanization and change because many people, especially older generations, are reluctant to give up their past and their identities as rural people living a slower way of life. If people feel that their traditional ways are being completely destroyed they may lose faith in the new Chinese goals and be unwilling to work to support them.

There is also a thread running through all projects which suggests that urban agriculture tourism can improve people's health and wellbeing but offering opportunities to eat fresh produce and engage with nature even in the built up city spaces. It can be known that this was a specific aim of the Government in establishing the projects and it is reflected in the comments of the visitors in chapter 6.

The value of urban agriculture to existing models of sustainable development is not a new idea. Nevertheless, urban agriculture is seen as an 'add on' or as one of many contributing factors, though often in a minor role. This work, however, considers urban agriculture as being much more significant than is commonly believed. The thesis now suggests that a new model of urban sustainable development could be based upon the use of urban agriculture as a central framework of land use planning.

Current models of sustainable development offer ideas of what it should encompass or seek to achieve. However, they do not necessarily offer practical tools or starting points for the practice of sustainable urban planning. This thesis suggests a new model based on urban agriculture as the starting point, as expressed in figure 49.

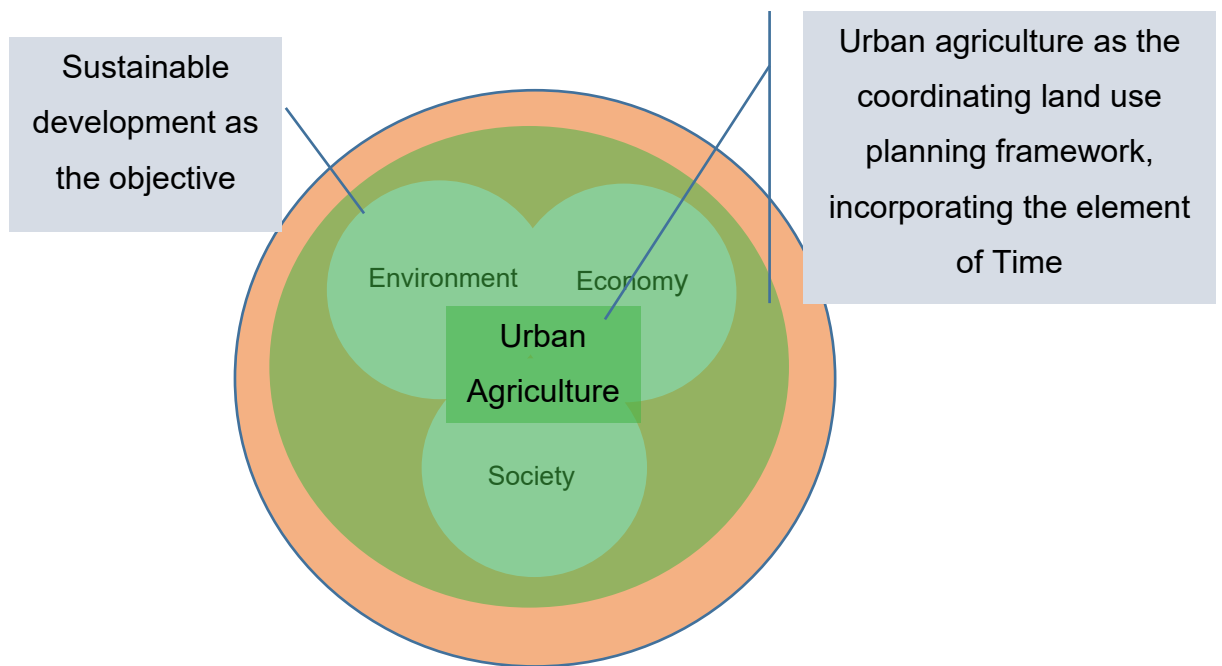


Figure 49: A new model based on urban agriculture as the starting point. Source: Author (2018)

In this model, urban agriculture acts to bring together and balance the three elements of sustainable development – society/ culture, economy and environment. The features of urban agriculture, as they are being practiced in China’s new model (e.g. green infrastructure, smaller scale crop production, agro-tourism, agricultural education and innovation), all contribute to sustainable development and encompass the three elements of sustainable development. Urban agriculture also automatically acts as a ‘time monitor’, because in order to be effective, agriculture is a temporal activity and must, by necessity, look to its own sustainable future.

7.7 Conclusion

This chapter set out to focus on a discussion of the key implications of new urban agriculture for Chinese urbanization from two main viewpoints: how it alleviates the problems associated with rapid Chinese urbanization; and how it works within the economy, environment and society which are the three dimensions of sustainable development. In doing so, another, possibly greater, potential for urban agriculture became evident, that is how it can be set as a central framework of land use planning to achieve sustainable urban development.

Chapters 4 and 6 have shown that, during urban expansion, urban agriculture can help preserve farmland or integrate agricultural features into urban environments.

However, we must acknowledge that the Chinese model of urban agriculture does not offer much increase in food supply. Nevertheless, it does contribute to food *security* through improving economic prospects for peasant and migrant farmers in the urban and peri-urban areas. It also works to improve food health and safety for the middle class and above groups through organic, healthy and specialist foods.

The large-scale development of urban agriculture projects around the city has a positive effect on the protection of urban arable land, as shown in chapters 6 and this chapter. It helps to improve rural, urban and newly agricultural landscapes and reduce agricultural pollution. From the point of view of urban development, agricultural tourism provides a green space for citizens of all walks of life to open up spaces and places of entertainment. As urban agriculture develops, more urban green space will be created and be open to urban residents. In this regard, the economic, social and ecological functions of urban agriculture are continuously integrated and improved.

Tourism promotes agricultural production, because tourists want to pick and buy produce, thus it ensures the retention of cultivated land around cities. As highlighted in chapters 6 and 7, the fieldwork of this thesis shows that the Chinese Government's new model of urban agriculture has created a large number of jobs, both high-paying and lower paying, that contribute to social protection, especially for low-income and migrant populations. Also, it indirectly contribute to other industries to diversify the urban economic structure and create more economic values.

In China, it does this because the new Chinese model did not focus only on food production. As highlighted in chapters 4 and 6, this model was designed from the starting point of agricultural tourism, and so it offers many more opportunities for a diverse range of jobs and conservation of tradition. A particularly important factor is that urban agriculture is helping to maintain and preserve rural cultural traditions, which are important to the rapidly urbanizing population. Agricultural tourism is becoming a widely accessed and enjoyed activity among different social classes. This offers a much broader range of outcomes, including social and cultural, than a focus entirely on food supply would offer. Indeed, it provides a possible solution to the many problems facing rural and urban areas.

However, there are some potential limitations to this form of urban agriculture based on tourism activities. The lack of innovation in agricultural services and projects has

produced a series of similar projects, thus limiting business development. This might lead to a dwindling market as people become bored with the existing projects. Therefore, those involved in the new forms of urban agriculture should be encouraged to stimulate new projects and business ideas.

Alternatively, higher tourism revenue may stimulate the expansion of modern facilities in Fork Custom Villages and in Agricultural Holiday Resorts, to the degree that they completely overtake the rural landscape and it becomes one great holiday park, jeopardising real agriculture. Whilst this is an unlikely scenario, agricultural tourism does need more social support when attracting more and more migrant workers. The growing number of immigrants has brought some issues of integration with local cultures, traditions and communities.

Despite such restrictions, new urban agriculture can actively develop and improve on some of the problems between agriculture and urban development. Different types of project help improve rights and interests of involved participants while balancing the values of economy, environment and society. The multiple functions of urban agriculture are emphasized and combined through agricultural tourism in order to help urban agriculture act as a central role for sustainable development. Therefore, it provides a new perspective on the integration of urban and rural development during the rapid expansion of urbanization in China.

Importantly, during the analysis of the work and the writing of this chapter, the potential role of urban agriculture as a guiding framework for sustainable urbanization and urban development began to emerge. It is important enough to highlight as it does offer a new way of thinking about the relationship between urban agriculture and sustainability, which puts urban agriculture in a much more central position as a land use planning tool. It also offers the potential to redefine what 'urban' means.

As the global population increases, and as global trade becomes increasingly troubled by sanctions, governments and municipalities may have to pay greater mind to their role in feeding their populations, managing local resources and reducing food miles. While the Chinese model of urban agriculture does not, currently, focus on food production, it is setting out a land use which could easily be turned to production. It is also retaining rural and agricultural skills within the urban area. Urban agriculture is introducing innovative ways of growing and of saving local resources. These points offer many possibilities to be explored further.

Chapter 8 Conclusion

8.1 Introduction

This final chapter aims to present the value of the work and its offering to scholarship. It begins by summarising the answers to the sub research questions presented in chapter 1. Section 8.2 connects chapter 6 to a point raised in the chapter 2 to 4, that three different types of urban agriculture projects constitute a complete new Chinese model of urban agriculture. This model indeed contributes in the economic, environmental and societal dimensions. Following that, section 8.3 explores the wider potential of urban agriculture as a framework for sustainable urban development based on the points of chapter 7. The chapter, and the thesis, conclude that, particularly as a scheme of urban sustainable land use, urban agriculture can have a positive impact on planning decision making and urban design. However, it makes clear that Beijing is a very specific form of mega city, with a specific and, to a degree, relatively uncommon layout and structure, including desakota areas and exurban areas. The value of urban agriculture to cities with different structures is unclear. This is especially true of cities without desakota areas.

It is helpful here to reiterate the research questions, which are:

Main Research Question:

What might be the value of the Chinese Government's approach to multifunctional urban agriculture in the context of rapid urbanization in China?

Sub Research Questions:

1. What are the Chinese Government's main objectives in respect of the programme of Multifunctional Urban Agriculture and how is it seeking to achieve these objectives?
2. What factors and drivers are influencing the recent growth of multifunctional urban agriculture activities in China?
3. How is the Chinese model different from urban agriculture in other parts of the world?
4. What are the outcomes in relation to domains of sustainable development, in the context of rapid urbanization?

8.2 Addressing the research questions

8.2.1 Government's programme and objectives of multifunctional urban agriculture

The Chinese Government model of urban agriculture was, from the outset, a multi-faceted, multifunctional activity, and due to this there have been a number of benefits (Fang et al., 2008). Chapter 6 showed the Government also adopted a multi-level approach to its support of urban agriculture. This support ranges from the complete state financial support and management of the large-scale urban agriculture Carnivals, through what is essentially public/private finance of the Agricultural Holiday Resorts, and down to support of private and collective organisation at the level of the Happy Farm House and Folk Customs Villages.

It is clear that a main objective was to stimulate economic activity through urban agriculture, as much as, if not more, than to produce food. It addresses the economic problems associated with the loss of farmland to urbanization as migrant farmers can find new jobs in urban agriculture after they have lost their farmlands during urbanization (Smit *et al.*, 1996b; Mougeot, 2000; De Zeeuw *et al.*, 2006; Mougeot, 2010; De Zeeuw *et al.*, 2011).

Through the government fully-owned large projects such as the Beijing Agricultural Carnival, the government has reintroduced urban people to the values of food, and a new 'urban hobby' was designed and supported by the Chinese Government to help urban residents have new minds and behaviours in experiencing urban agriculture as a part of 'rural' life in urban (Zheng et al., 2013).

There is a very strong element of urban agriculture being used by government as a way of supporting and conserving traditional culture, lifestyles and livelihoods as rural areas are overtaken by urbanization (Yang et al., 2010). The projects in different area offer the greatest potential to reconnect urban life and rural culture by experiencing agricultural activities.

In addition, urban agriculture has been a way for the government to encourage private enterprise and public / private collaboration and partnership as cross functional economic activities (Zhang and Yang, 2014). Benefits are provided to the government, private enterprise and partners in both Modern Agricultural Holiday

Resorts and Folk Custom Villages. Besides, other groups of participants are also benefitted from this positive outcome.

The Chinese Government has supported urban agriculture more fully than many, possibly most, other governments as discussed in this thesis. It was set as a multi-faceted, multifunctional activity and did not focus on food production alone (Yang et al., 2010). Therefore, three different types of urban agriculture projects constitute a complete new Chinese model of urban agriculture. This model indeed contributes to stakeholders in the economic dimension while having a positive impact and outcome on the entire urban community in the environmental and societal dimensions.

This work offers this new information about the Chinese model of urban agriculture in a clear way, which might be valuable to other scholars and which can act as a starting point for further research. In time, it would be valuable for others to undertake a more quantitative, economic evaluation of the projects to offer a sound economic basis for their continuation.

8.2.2 The drivers of growth in multifunctional urban agriculture in China

The latest statistics published by the National Bureau of Statistics⁵⁶ on 10th September 2018 show that the resident population of China's cities has reached 810 million people, which represents an increase of 640 million compared with the end of 1978, as well as an average annual increase of 16.64 million. As a result, the urbanization rate of permanent residents has reached 58.52%. The statistics also mentioned there were 661 cities nationwide in China at the end of 2017, which had an increase of 468 from the end of 1978. Among them, the number of cities with a population of 5 million or more has reached 16. This means the urban population is increasing rapidly and the population agglomeration effect is more obvious.

Corresponding to this change, a report from the Ministry of Housing and Urban-Rural Development of the People's Republic of China (MOHURD)⁵⁷ showed the number of rural towns was 16,711 at the end of 2007, which was 1,015 less than in 2005. Furthermore, the number of rural villages decreased from 3,137,146 in 2005 to 2,647,000 in 2007. Although it was published ten years ago, this last release of the Chinese Government's data on rural construction still indicates China's development

⁵⁶ The statistics were published in Chinese. Available from: http://www.gov.cn/shuju/2018-09/10/content_5320844.htm (Accessed: 19 September 2018).

⁵⁷ The statistics were published in Chinese. Available from: http://www.mohurd.gov.cn/xytj/tjzljxsxytjgb/tjxtjgb/index_2.html (Accessed: 19 September 2018).

has a serious impact on the rural areas. Therefore, the loss of cultivated land is inevitable in China. As shown in table 37, the area of cultivated land was 134,998,700 hectares in 2015, which was 239,900 hectares less than in 2011. This, in turn, exacerbated the pressure on the issues of Chinese supply of agricultural products and the quality safety, and particularly the loss of rural livelihoods.

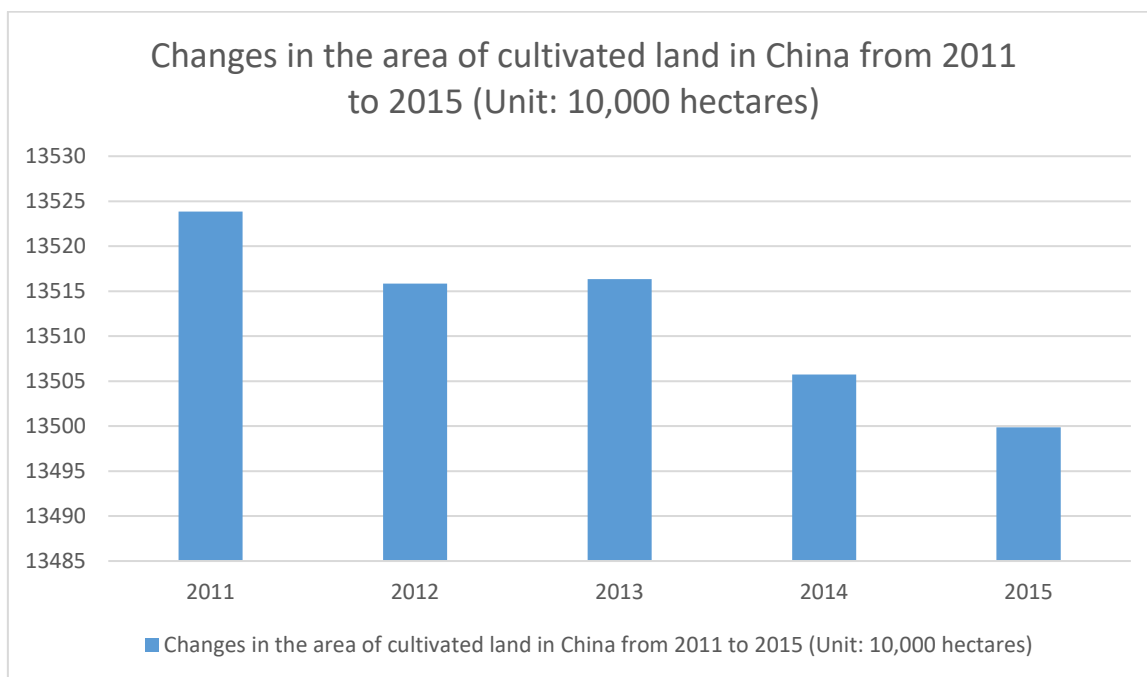


Table 37: Changes in the area of cultivated land in China from 2011 to 2015. Source: Author (2018). Adopted from China Land and Resources Report (2016), see footnote 6.

In addition, the rural population has decreased by 133 million people from 2000 to 2011, which can be seen in the National New Urbanization Plan (2014-2020)⁵⁸. Most of them had to migrate to cities for work. Due to limited skills, they have very few and unstable job opportunities which leads to an insecure urban employment. This phenomenon is more serious in the desakota areas in China.

Thus, it is clear that there are many changes to lifestyles both rural and urban with the urbanization and economic development. The conflict between the urbanization and increasing demand for agricultural development in both rural and urban areas is getting increasingly serious.

⁵⁸ The plan was published in Chinese. Available from: http://ghs.ndrc.gov.cn/zftp/xxczhjs/ghzc/201605/t20160505_800839.html (Accessed: 19 September 2018).

Currently China can rely on its own production and international trade for food imports and, indeed, leases land from other countries to help supply food. Nevertheless, with such rapid urban growth and loss of agricultural land and farming, there is an imperative to put in place new and innovative ways of feeding the population. The importation of so much of China's food supply also contributes to the country's CO₂ emissions through food miles.

China is aware of the implications of this urban growth, increasing demand for food and its massive manufacturing and industrial boom for the environment and for the standard of living in urban areas. The need to address these issues has become a significant problem that is being faced by the Government and society currently. The Government has made concerted efforts to relocate industry away from urban areas and to try to improve the living environment of cities and the quality of life for their residents.

8.2.3 Comparisons with urban agriculture in other countries

However, urban agriculture in China is different from the rest of the world in many ways. As shown in chapter 2, according to the literature review, the historical examples and existing projects of urban agriculture from around the world are strongly production-oriented. This is particularly true in sub-Saharan Africa where urban agriculture helps solve the problem of urban poverty and hunger (Drechsel and Dongus, 2010). Similarly, in Cuba, after the withdrawal of Soviet support, urban agriculture was vital to the subsequent food crisis (Koont, 2009). However, even in the richest country on Earth, the USA, increasing urban poverty is the driving force of urban food production (Brown and Bailkey, 2002; Boody et al., 2005; Lovell, 2010). This has clearly not been the case in China, where different types of project have been designed to be multifunctional, having a wide variety of purposes and values to the economy, environment and society. It has been very much based on tourism and leisure but also includes an educational and demonstration element. However, it does not really fit the western idea of agricultural tourism either, which is seen more as rural activity in the west. Therefore, in China, urban agriculture can be thought of as a hybrid of agricultural tourism and urban.

One important finding from this work is that because of the size and structure of Chinese city regions, such as Beijing, the way the government uses the term 'urban' is different from definitions within the literature. As a result, the 'urban' in urban

agriculture needs a different definition for China and has been given one in this thesis, including three parts: urban (core) area, desakota area and exurban area. This is one of the main ways in which urban agriculture in China is different from the rest of the world.

This new understanding of the differences between urban agriculture in China and the urban agriculture in other countries is an important offering of this work because it highlights that current understanding and ideas, which might inform the practice of urban agriculture or policies supporting it, may not be helpful in the Chinese context. Moreover, as already indicated, the thesis suggests that the difference might also apply in other rapidly expanding countries, thus the work has wider importance.

8.2.4 The outcomes of the new Chinese model of urban agriculture

This thesis has attempted to provide a brief summary of the literature and official statistics from the Chinese Government relating to the new Chinese model of urban agriculture. Based on this, it analysed the data from fieldwork in Beijing to discuss the outcomes of three types of urban agriculture projects in this model. It can be shown that the Chinese model of urban agriculture increased diversity of employment for migrant farmers and for those who might not be able to find work in the city. At the same time, the Chinese Government provides strong support to different participants, for example training farmers and relevant workers in different subjects to help them to carry out urban agricultural work better. It was reported by the Ministry of Agriculture and Rural Affairs of the People's Republic of China⁵⁹ that in 2016, urban agricultural tourism and rural tourism received nearly 2.2 billion visits nationwide in China, with operating income exceeding 440 billion CNY (approximately equal to 64.05 billion USD), which represents an average annual 10% growth rate of both the number of visitors and income. There are 7.9 million employees in this industry including 6.3 million farmers (both urban and rural farmers). As result, it is clear that economic outcomes and livelihoods of different participants are improved, such as with the Happy Farm House households who are now undertaking activities in the Folk Custom Villages.

In addition to the value of the economy, the Chinese model of urban agriculture supports the re-education of urban residents to connect urban life with agricultural

⁵⁹ The statistics were published in Chinese. Available from: http://www.moa.gov.cn/xw/qg/201606/t20160614_5169776.htm (Accessed: 19 September 2018).

lifestyle. This provides access to different types of urban agriculture projects in order to help urban residents have a pastoral experience and relief of urban stress. As analysed and discussed in part 2 of this thesis, not only increasing engagement with the concept of 'fresh' or 'organic' food and a healthy diet, the Chinese model of urban agriculture also contributes conservation of traditional rural lifestyles, even after rural areas are 'consumed' by urban expansion, and the re-engagement of urban people with their rural heritage through agro-tourism. Moreover, it has positive impact on environmental improvements for cities. Different projects in Beijing indicate that actual environmental improvements are provided during or after construction of the projects, such as more green infrastructure and a better environment. The answers from interviews and questionnaires were clear in showing that participating in the urban agriculture projects awakened an awareness of urban environmental sustainability for urban residents, and even stimulated their desire for better nature and environment in the city.

Thus far, the new Chinese model of urban agriculture has addressed the issues mentioned in section 8.2.2 to a certain extent, and has contributed to balancing the values of economic, environmental and societal sustainability during urbanization.

8.3 A broader view

As answers to each of the sub research questions became clearer, through data analysis and writing, a bigger picture began to develop. This bigger picture highlighted that the outcomes, discussed above, fit very closely with the concept of urban sustainable development. This might suggest that urban agriculture, as it is practiced in China, and as the government is promoting and supporting, could become a much more central element of sustainable development than it generally is, by forming the basis of a sustainable land use planning framework.

This new Chinese model of urban agriculture is becoming embedded in the planning process of Chinese cities as a means to support sustainable development – economic, environmental and social. Particularly as a scheme of urban sustainable land use, urban agriculture can have a positive impact on planning decision making and urban design. Because it is underpinned by economic development and livelihood protection, the decision making regarding protecting existing agricultural land in expanding urban areas, and decisions about expanding agriculture in some areas can have an economic validity. These land use planning decisions in favour of

urban agriculture are not only helpful to preserve the farmland and integrate new production functions into urban environments, they also help to justify the social and cultural features, such as urban green space within or near the dense population areas. Such features are often overlooked because they are seen as unnecessary additional expense or not economically valid. For planning design, on the basis of providing certain production benefits, urban agriculture can help balance input and output, recycle waste, reduce energy use and optimize green infrastructure, which is in line with the sustainable development goal. Thus, the multiple functions of new urban agriculture for economic, social and environmental benefits are of great value to the sustainable practices highlighted in the current urban development framework in China, especially in the *desakota* areas' management in the fast-growing cities. However, it must be acknowledged that Beijing is a very specific form of mega city, with a specific and, to a degree, relatively uncommon layout and structure, including *desakota* areas and exurban areas. The value of urban agriculture to cities with different structures is unclear. This is especially true of cities without *desakota* areas.

In summary, this thesis provides a start point for setting urban agriculture as a core role of sustainable development or as a central framework of urban land use planning. The features of urban agriculture, particularly agricultural tourism as practiced in the new Chinese model, has greatly extended the three dimensions of sustainability – economy, environment and society/ culture. In addition, this can be suggested as a potential important strategy for land use, urbanization and sustainable development. It should be the desired outcome with the greatest benefits balancing the economy, environment and society/culture for other cities in the future.

8.4 Suggestions for further research

It was not possible within the limitations of this thesis to take the ideas discussed above to any conclusions, they are, therefore, only presented as a starting point. In order to use and expand on this starting point, more research is needed on the operation and impact of urban agriculture. Future research needs more cases, and these cases may lead to improvement in the theoretical understanding, so as to better guide the development urban agriculture. In addition, the long-term impact of such large-scale agriculture-tourism is important from a policy perspective, such as questions about the land use regulations and the capacity of rural institutions. However, Beijing has provided good examples and experiences for the government in other parts of China to develop the new Chinese model of urban agriculture,

especially the provincial governments. They have the resources and ability to carry out activities like the Beijing Carnival in the provincial capital city, in order to support and promote the development of urban agriculture throughout the entire province.

8.5 Limitations

The new definition of the city in this thesis is based on a typical Chinese city such as Beijing, which is a super huge city, and the urbanization process takes the city centre as the epi-centre for developing the surrounding area. This may have relatively clear boundaries for urban cores areas, desakota areas and exurban areas. However, for other types of cities, for example the multi-centre city, more complex definitions are required.

The process of the data collection was undertaken in summer and autumn, which means it is the most frequent period of agricultural activities. And as indicated in the thesis, the development of urban agriculture in Beijing is the best of China. This may suggest that the results are in an optimal situation and that other cities in China may not be able to achieve this status.

In most cases, projects are positive and have good benefits. The reasons for the failure cases are also limited, such as excessive commercialization or unreasonable governments' planning. The key point is the role of the Chinese Government in the new Chinese model of urban agriculture is vital to both the various different projects and other stakeholders. And the power of the government is different. The impact of government's power needs to be seriously considered in other cases.

Appendix 1. Interview sheet sample

Interview sheet for staff members (representing government officials and academic researchers) in the Beijing Agricultural Carnival.

Background information:

Date:

Location:

Position:

Length of experience:

Personal information: age, gender, occupation and hometown etc.

General interview questions:

1. Were you involved in the development of the urban agriculture project or any of the individual projects? E.g. government officials, academic advisor or other?
2. What are the government's objectives in establishing urban agriculture?
3. What are your perceptions and understanding of:
 - a. How the projects were initiated or established?
 - b. How they are being managed currently?
 - c. How successful in meeting the original objectives they are?

For government officials:

1. There is a statement in a government report that "urban agriculture should have a noticeable improvement". What is "noticeable improvement" and what are the government's measures?
2. About the urban agriculture published data on value:
 - a. How is data collected?
 - b. How are value calculations undertaken?
 - c. How accurate is the data?
 - d. What is it used for?

3. Do you think that your presence as a controller in Beijing impacts the surrounding urban agriculture system?
4. What types of policies and funding support the urban agriculture projects?
5. Is marketing integral to the production operation, or do you consider it a separate part of the operation with its own people and management system?

For academic researchers:

1. What are the findings from your research about:
 - a. Advantage and disadvantage of resources and features in different regions of Beijing for urban agriculture development.
 - b. Understanding and suggestions for development of urban agriculture projects.
 - c. Balance among economy, ecology and society of urban agriculture.
2. Do you do any type of outreach to the surrounding community?
3. What do you do, if anything, to educate workers and volunteers about urban agriculture?
4. Thinking ahead 20 years, what kind of future do you see for urban agriculture in Beijing? Why?
5. Do you see a potential to help sustainable development in the surrounding area?
Y/N
(If yes)
6. What would be needed to do this?

Interview sheet for exhibitors in the Beijing Agricultural Carnival.

Background information:

Date:

Location:

Position:

Length of experience:

Personal information: age, gender, occupation and hometown etc.

Interview questions:

1. Where does your urban agriculture project's idea come from?
2. How many employees are involved? Are these volunteers or paid employees?
Full-time or part-time?
3. What is the produce used for (sale, experiencing etc.)?
4. What advantages do you see from your work, for yourself and for others?
5. Is it easy to have the needed support such as materials support (seeds, water, fertilizer or fodder), policy support and market support?
6. How do you obtain your knowledge?
7. How do you sell your products? How do you control quality?
8. Does your project achieve a profit or loss, from the beginning or since when?
9. Does your project achieve the desired objectives (both yours and the government's)? If not, why?
10. What is your feeling after taking part in the Beijing Agricultural Carnival?
11. Are you satisfied with the current condition of urban agriculture in China? If not, what do you think should be improved in the future?

Interview sheet for managers and workers in the Beijing Xiedao Agricultural Holiday Resort.

Background information:

Date:

Location:

Position:

Length of experience:

Personal information: age, gender, occupation and hometown etc.

Interview questions:

1. What is the business model of your project? Where does this idea come from?

2. Is the business part of your operation a sole proprietorship, partnership or corporation?
3. What are your main goals for this project?
4. Do you have a business plan and/or strategic plan for your position or whole project?
5. How many employees are involved in this project? Are these volunteers or paid employees? Full-time or part-time?
6. What advantages do you see from your work, for yourself and for others?
7. Is it easy to have the needed support such as materials support (seeds, water, fertilizer or fodder), policy support, and market support?
8. How do you obtain your knowledge?
9. How do you sell your products? How do you control quality?
10. Does this project achieve a profit or loss, from the beginning or since when?
11. Does this project achieve the desired objectives? If not, why?
12. What is your feeling after working in this project?
13. Are you satisfied with the current condition of urban agriculture? If not, what do you think should be improved in the future?
14. How would you describe the county or city government's attitude toward agriculture in your project?
15. Are there any types of information or assistance that are not available that would be useful to you?
16. Do you work with other producers (or gardens or food projects) in the area? Y/N
(If yes)
17. What types of activities do you work on together?
(If no)
18. Do you think that working with other producers/projects would help your operation achieve its goals? What have been some things that have kept you from working with other producers/projects?

Appendix 2. Questionnaire sample

Questionnaire for visitors in the Beijing Agriculture Carnival.

Background information:

Date:

Location:

Position:

Length of experience:

Personal information: age, gender, education, occupation and hometown (local or not) etc.

Questions:

1. Have you ever been to the Beijing Agriculture Carnival before?

A. Yes B. No

(If yes)

2. What do you think of this year, compared with last year?

A. Higher technological content B. More creative C. Stronger participating experience

D. More interesting E. Not as good as last year

3. What is the main reason for you to come to the Beijing Agriculture Carnival?

A. Recreational and sightseeing B. Know about agriculture C. Pick vegetables and fruits D. Other reason _____

4. Will you go to the specialty exhibition to buy specialty products?

A. Yes B. No

5. Will you go to any project (exhibitor?) you know from the Beijing Agriculture Carnival?

A. Yes B. No

6. Will you try to pick agricultural products (or buy) by yourself or buy them in the supermarket after your visit?

A. Pick agricultural products by myself B. Buy agricultural products in the supermarket

7. How did you learn about the Beijing Agriculture Carnival?

A. By word of mouth B. Internet (social media) C. TV programmes D. Newspaper E. Radio programmes

8. With whom are you visiting?

A. With family (husband or wife, children) B. Friends C. Group D. Single

9. How long will you spend in visiting?

A. Less than 2 hours B. 2-4 hours C. 4-6 hours D. More than 6 hours

10. How could the Beijing Agriculture Carnival be improved?

A. Traffic B. Food and beverage C. More professional activities D. Creative design

E. Others____

11. Do you expect that the Beijing Agriculture Carnival will be held next year?

A. Yes B. No C. Neutral

Questionnaire for visitors in the Beijing Xiedao Agricultural Holiday Resort.

Background information:

Date:

Location:

Position:

Length of experience:

Personal information: age, gender, education, occupation and hometown (local or not) etc.

Questions:

1. How often have you been here during this year?

A. 1 B. 2-3 C. 4-5 D. More than 5

2. With whom are you visiting?

A. With family (children or adult relatives) B. Friends C. Group D. Single

3. How did you travel here?

A. Private vehicle B. Official vehicle C. Bus D. Taxi E. Other

4. How did you learn about Beijing Xiedao Agricultural Holiday Resort (Multi)?

A. TV advertisement B. Internet advertisement C. Print media D. Word of mouth publicity E. Other

5. What types of activities are you interested in (Multi)?

A. Sightseeing B. Catering C. Agricultural products D. Agricultural education E. Experiencing farming F. Other

6. Which consumption do you think is reasonable in the Resort?

A. Catering consumption B. Agricultural products C. Agricultural education D. Entertainment E. Transportation F. Service charge G. Other H. All is reasonable

7. How is your satisfaction with the following factors? Very satisfied, satisfied, neutral, unsatisfied and very unsatisfied are assigned the scores of 5, 4, 3, 2 and 1 respectively.

The Factor		5	4	3	2	1
Convenience in travelling	Convenient traffic					
	Convenient parking					
	Acquisition of tourism-related information					
Reputation of Xiedao Holiday Village Resort	High popularity					
	High reputation					
Environment of Xiedao Holiday Village Resort	Comfortable environment inside the Xiedao Holiday Village Resort					
	Beautiful scenery					
	Infrastructure perfect					
	Favourable ambient environment					
Activities that can be involved in	Distinctive					
	Diversity					
	Interesting					
	Educational					
Service	Service staff's appearance and behaviours					
	Service staff's attitude					
	Service staff's strong ability in handling problems					
Price perception	High cost of various consumption					
	Reasonableness of total expense					

Questionnaire for visitors in the Folk Custom Village.

Background information:

Date:

Location:

Position:

Length of experience:

Personal information: age, gender, education, occupation and hometown (local or not) etc.

Questions:

1. How often have you been here during this year?

A. 1 B. 2-3 C. 4-5 D. More than 5

2. With whom are you visiting?

A. With family (children or adult relatives) B. Friends C. Group D. Single

3. How did you travel here?

A. Private vehicles B. Official vehicles C. Bus D. Taxi E. Other

4. How did you learn about this Folk Custom Village (Multi)?

A. TV advertisement B. Internet advertisement C. Print media D. Word of mouth publicity E. Other

5. What types of activities are you interested in (Multi)?

A. Sightseeing B. Catering C. Agricultural products D. Accommodation E. Experiencing farming F. Other

6. Which consumption do you think is reasonable in the Village?

A. Catering consumption B. Agricultural products C. Accommodation D. Entertainment E. Transportation F. Service charge G. Other H. All is reasonable

7. The official statistics suggests that the average expense of taking a trip to the village is 363 CNY. What do you think about that?

A. This price is acceptable B. A little expensive and unreasonable C. No idea

Questionnaire for households (operators and relevant employees) in the Folk Custom Village.

Background information:

Date:

Location:

Position:

Length of experience:

Personal information: age, gender, education, occupation and hometown (local or not) etc.

Questions:

1. What is your family situation?

A. Family with three members (the operator couple with one child) B. The operator living with parents C. Couples D. Other

2. How many family members are involved in the Happy Farm House operation?

A. 1 B. 2 C. 3 D. More than 3

3. How long have you participated in a Happy Farm House?

A. More than 3 years B. 2-3 years C. 1 year or less

4. Which leisure project activity are you engaged in?

A. Catering B. Accommodation C. Recreation D. Leisure goods E. Other

5. Which agriculture project are you engaged in?

A. Provision of agricultural and by-product products B. Rental industry C. Sale of daily necessities

6. What is your family annual income through operating the Happy Farm House?
What was it before?

Family annual income		
Farm house family	Less than 20000	
	20001-30000	

	30001-40000	
	40001-50000	
	More than 50000	
Before operating	Less than 20000	
	20001-30000	
	30001-40000	
	40001-50000	
	More than 50000	

7. What is your attitude to the Happy Farm House?

A. Very welcome B. Welcome C. Not welcome

Examples of questions in brief and unstructured interview for visitors in urban agriculture projects.

1. How do you know about the urban agriculture? When did you start to use it?
2. How often do you use urban agriculture?
3. Is it convenient for you to get access to it?
4. How much time do you spend on doing activities in urban agriculture each occasion and how frequent? What kinds of activities?
5. What are the most important reasons for you to use urban agriculture?
6. What advantages do you see from urban agriculture, for yourself and for others?
7. What is your feeling after using urban agriculture? Can you give me some examples?
8. How do you obtain the knowledge if you want to grow something?
9. Do you think urban agriculture projects can help solve the problems of the city such as environment issues? If not, why?
10. Are you satisfied with the current condition of urban agriculture? If not, what do you think should be improved in the future?

Examples of questions in brief and unstructured interview for households (operators and relevant employees) in the Folk Custom Village.

1. What are the most important reasons for you to operate a Happy Farm House or other project in the Folk Custom Village?

2. How many hours a week are you working on the project?
3. What kinds of work do you have in the project?
4. How many people are involved? Are these volunteers or paid employees? Full-time or part-time? Relatives or not?
5. What advantages do you see from your work, for yourself and for others?
6. Is it easy to find the needed materials such as seeds, water, fertilizer or fodder?
7. How do you obtain the knowledge?
8. How do you sell products in your project? How do you control quality?
9. How much does it cost? Is it cheaper than the market?
10. Are you a member of an organization or association of operators or farmers? If yes, does it help your project?
11. Are you satisfied with the current condition of urban agriculture? If not, what do you think should be improved in the future?

Appendix 3. Likert Scale Data

Convenient traffic	Convenient parking	Acquisition of tourism-related information	High popularity	High reputation	Comfortable environment inside the Xiedao Holiday Village Resort	Beautiful scenery
4	5	4	4	3	5	5
5	4	3	5	5	2	4
5	4	5	4	5	4	4
3	3	3	3	4	4	3
1	2	4	3	2	3	5
5	4	2	2	5	5	4
4	5	3	5	4	4	4
2	2	4	4	4	2	2
4	1	5	4	4	1	5
3	5	1	3	1	5	3
1	4	2	1	5	4	3
5	3	5	4	2	4	4
2	2	4	5	2	3	5
2	3	3	1	4	3	4
1	3	3	4	3	3	3
4	4	4	5	5	5	5
4	3	5	5	1	2	4
5	5	5	4	5	3	5
5	3	4	3	3	4	2
3	4	4	5	2	3	1
1	4	4	4	4	5	5
1	4	1	2	3	5	4
2	2	2	2	5	3	3
2	2	2	2	2	4	5

4	1	4	4	1	2	2
3	5	4	4	3	4	3
3	3	3	4	4	4	4
3	2	3	5	5	5	4
4	4	5	3	2	3	5
5	5	5	3	4	3	5
2	1	5	2	5	5	3
1	3	2	4	3	4	3
5	2	2	3	5	3	5
4	5	3	5	4	4	5
2	5	3	5	3	3	5
3	5	4	4	4	2	5
1	4	4	4	3	5	4
5	3	1	3	3	4	4
2	3	5	5	3	2	3
2	3	4	2	5	4	3
4	4	3	3	2	4	5
4	2	4	4	2	5	4
4	1	3	4	4	4	3
3	5	2	2	1	4	4
3	3	2	3	5	3	4
3	3	4	5	2	3	5
1	2	1	4	2	2	2
5	2	5	5	4	4	4
2	3	5	2	4	3	3
4	4	3	4	3	5	4
5	4	3	4	3	2	5
2	4	4	4	5	2	4
4	3	2	3	5	4	3

3	3	3	2	5	5	2
3	4	4	5	1	3	3
4	5	2	5	4	5	3
5	2	1	3	3	5	4
2	5	5	2	4	4	5
1	5	4	4	2	5	2
5	2	3	4	5	5	2
5	4	3	3	4	4	4
5	5	4	2	3	4	4
2	3	4	4	3	3	4
2	1	2	1	5	3	5
4	2	2	5	2	4	5
3	4	5	5	4	3	4
3	5	1	5	3	5	5
2	3	4	4	4	4	4
4	2	3	3	3	3	3
5	4	3	4	5	5	2
3	1	4	3	2	4	1
2	4	5	2	4	3	5
2	3	2	2	5	2	4
4	3	1	5	3	4	3
5	3	5	5	2	3	5
4	2	4	1	5	2	2
2	4	3	3	5	4	4
5	5	2	4	4	3	3
3	5	4	4	3	5	4
3	5	4	3	2	3	2
2	4	3	2	4	5	4
4	5	3	3	3	3	3

5	4	5	5	5	4	5
4	5	5	2	5	5	2
3	3	2	5	4	3	4
2	1	3	5	3	4	5
3	4	4	2	2	4	3
4	4	1	5	4	5	4
2	3	2	5	3	4	4
4	2	4	3	5	2	4
3	5	3	3	4	3	5
3	3	5	2	3	4	5
5	5	2	2	3	5	4
3	4	5	2	4	5	3
2	5	3	2	4	3	2
5	2	5	5	5	4	2
4	4	4	4	4	5	3
2	4	2	3	3	4	4
3	5	5	4	2	2	3
3	3	3	5	2	4	4

Infrastructure perfect	Favourable ambient environment	Distinctive	Diversity	Interesting	Educational	Service staff's appearance and behaviours
4	4	4	5	4	4	2
3	4	3	4	3	3	3
2	5	3	4	5	5	4
4	4	4	3	4	3	2
4	4	5	5	2	3	4

4	3	2	3	2	4	2
4	3	4	2	4	1	3
3	3	3	3	3	2	2
3	5	4	1	5	2	4
4	5	2	4	4	3	3
3	4	4	3	2	3	1
4	3	3	5	4	3	3
3	2	2	4	5	2	2
4	4	4	3	3	4	4
3	3	3	3	1	4	3
4	5	3	3	2	3	2
2	4	2	4	5	2	3
4	2	4	4	4	4	4
5	4	4	1	3	3	4
2	3	3	2	3	3	3
4	4	3	4	2	2	2
5	3	4	5	4	4	4
5	5	1	1	3	4	3
5	2	3	2	3	5	3
1	4	4	4	5	4	2
4	3	4	3	4	2	4
3	3	3	3	4	2	4
3	4	4	2	4	3	3
3	1	3	4	5	4	4
2	5	3	3	2	3	3
4	4	3	3	5	5	4
3	3	4	3	4	5	4
4	3	5	2	3	4	2
3	3	2	2	1	3	1

2	2	5	4	5	3	4
4	4	4	3	2	2	4
1	5	4	3	4	4	2
3	1	4	2	5	3	3
3	1	3	4	4	2	3
4	4	3	2	3	5	1
3	5	2	3	3	4	3
2	4	2	4	4	1	4
3	5	4	4	5	3	2
3	4	3	3	2	4	2
4	3	4	2	5	5	4
2	4	3	3	3	2	3
3	5	2	4	4	4	4
2	5	4	5	2	2	1
4	4	5	2	1	4	3
3	3	3	5	4	3	2
2	3	1	3	3	3	4
4	3	4	3	3	4	4
1	3	3	5	4	4	3
3	4	2	2	4	2	5
2	4	4	5	3	5	3
4	2	5	5	2	4	1
3	4	3	3	2	4	4
4	3	2	4	4	5	2
3	4	4	5	5	4	5
2	4	3	2	3	3	4
1	2	2	4	3	3	2
5	3	1	3	2	3	4
4	3	4	2	4	4	4

3	2	3	3	5	5	3
4	4	2	4	1	2	2
1	3	4	3	3	1	2
2	4	3	2	2	4	5
1	3	1	4	5	4	2
3	4	4	3	4	2	4
3	4	2	4	3	4	3
1	3	1	5	5	3	4
2	2	3	2	2	4	2
4	1	4	2	2	4	4
3	4	3	4	1	3	4
1	4	4	4	2	3	3
3	3	3	3	2	4	3
2	4	3	3	4	3	4
4	4	4	4	4	2	4
3	5	2	2	4	3	3
3	3	3	4	3	4	3
4	5	1	5	3	4	5
4	4	4	3	4	2	2
2	2	3	5	2	2	4
4	3	3	3	2	1	3
4	4	2	4	4	2	2
5	3	2	2	5	4	4
1	3	3	3	1	3	4
3	5	2	3	3	2	3
4	2	1	4	4	4	5
2	5	4	5	3	3	2
4	1	3	3	2	3	3
3	5	1	4	4	1	4

3	4	3	4	4	4	3
2	3	3	3	2	2	3
4	5	4	4	3	4	4
4	2	2	3	4	3	2
4	4	3	4	4	2	4
2	3	2	3	2	4	2
1	5	4	2	4	3	3
4	4	3	4	2	4	5

Service staff's attitude	Service staff's strong ability in handling problems	High cost of various consumption	Reasonableness of total expense
4	4	4	4
4	3	2	2
2	4	4	3
4	2	3	5
3	2	5	2
3	4	2	4
2	3	4	3
4	4	3	3
5	2	3	5
3	2	4	3
2	4	4	4
3	3	4	3
4	4	5	4
4	3	2	4
3	3	3	4
2	5	3	5
5	2	3	5

5	1	5	4
4	3	2	2
3	4	1	4
4	4	2	3
3	5	5	3
3	2	4	1
4	1	3	5
4	5	3	4
3	4	5	2
2	3	2	3
5	3	3	5
4	4	3	4
3	5	4	4
4	2	3	3
3	1	2	2
2	4	5	4
4	3	3	5
3	5	3	3
3	2	2	2
3	4	4	4
4	4	5	5
3	3	1	4
2	3	2	3
4	3	4	3
3	3	5	3
5	2	3	4
4	4	1	2
2	5	2	2
1	3	4	4

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4	4	3	3
3	5	2	3
4	1	4	4
2	3	5	4
1	2	3	4
4	4	3	2
3	3	4	4
4	4	2	3
5	3	3	5
2	2	5	2
2	2	4	1
3	1	3	3
4	3	2	4
4	4	2	2
3	4	2	4
3	4	3	4
4	3	4	3
4	5	4	4
3	2	4	3
2	3	4	5
4	4	3	2
3	5	5	3
4	2	2	4
3	3	4	5
4	2	3	2
3	4	2	4
2	3	1	3
4	4	4	4

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4	3	4	5
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3	5	2	4
2	2	5	3
2	1	4	3
4	3	4	3
3	5	3	4
4	2	3	5
3	4	5	2
5	5	4	4
2	3	2	4
4	1	4	3
4	4	5	3
3	2	3	4
3	4	4	4
2	2	2	4
3	4	4	2
3	2	3	5
2	4	5	4
4	3	4	3
3	4	3	4
2	2	3	2
1	5	4	4
4	2	5	4

Appendix 4. Participant Information Sheet

Invitation and Brief Summary

You are being invited to take part in a research study. Before you decide whether or not you wish to take part it is important that you understand why the research is being done and what it will involve. Please read this information carefully and discuss it with others if you wish. Take time to decide whether or not you wish to take part. If you do decide to take part, you will be asked to sign a consent form. However, you are free to withdraw at any time, without giving any reason and without any penalty or loss of benefits

Who will conduct the research?

Mr Ang Li

PhD candidate

School of Architecture, Planning and Landscape

Newcastle University, UK

Title of the Research

The value of the Chinese Government's approach to multi-functional urban agriculture in the context of urbanization in China

What is the purpose of the research?

This research aims to examine the potential of multifunctional urban agriculture to change the nature of Chinese cities and to rebalance the urban/rural dichotomy. It seeks also to highlight and understand the ways in which the very specific context of China might influence how urban agriculture is understood and accommodated within a modernising China.

What does taking part involve?

This research will be conducted in form of semi-structured face to face interview, which might take around 20 minutes. If you agree to take part in it, your conversation with the researcher will be audio-recorded. If you do not want to be audio-recorded, the researcher will only take notes. There are no known risks or disadvantages of taking part, your name will not be mentioned in the research. Your other identifiers for

example age and gender will be used to analysis. You can ask a copy of record or transcript to ensure that the interview is not been misrepresented.

What happens if I do not want to take part or if I change my mind?

You can withdraw at any time without giving a reason and there will be no adverse consequences if you do so. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form.

Contact information

Researcher	Supervisor	University
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Appendix 5. A list of interviewees with interview dates

Beijing Agricultural Carnival	Interviewees	Job/Title	Date
10 staff members (representing government officials and academic researchers)	Mr.Chen Qingjiang	the industrial office of Changping District Agricultural Service Centre	23/08/2016
	Ms.Liu Fang,	Officer of Culture and Tourism Bureau of Chaoyang District of Beijing	25/08/2016
	Ms.Gao Aihua,	Officer of Ecological Environment Bureau of Chaoyang District of Beijing	26/08/2016
	Mr.Niu Youcheng,	Beijing Chaoyang Standing Committee	29/08/2016
	Mr.Liu Jun	Officer of Beijing Agricultural Carnival Organizing Committee	30/08/2016
	Ms.Li Lan	Officer of Beijing Agricultural Carnival Organizing Committee	30/08/2016
	Mr.Bao Lei	Researcher of Beijing Chaoyang Municipal Commission of Planning and Natural Resources	01/09/2016
	Mr.Shi Yang	Researcher of Beijing Chaoyang Municipal Commission of Planning and Natural Resources	01/09/2016
	Ms.Li Yuexi	Officer of Beijing Agricultural Carnival Investment Management Co., Ltd.	02/09/2016
	Ms.Wang Jing	Officer of Beijing Agricultural Carnival Investment Management Co., Ltd.	02/09/2016

Beijing Agricultural Carnival	Interviewees	Job/Title	Date
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10 exhibitors	Mr.Liu Xing	Sweet potato exhibitor	05/09/2016
	Mr.Wang Zhi	Corn exhibitor	05/09/2016
	Mr.Zhao Yaoyuan	Strawberry exhibitor	05/09/2016
	Ms.Liu Yanye	Agricultural landscape exhibitor	06/09/2016
	Ms.Yu Huibao	Modern agriculture exhibitor	06/09/2016
	Mr.Tang Jianfeng	Agricultural technology company exhibitor	06/09/2016
	Ms.Sun Xiaoxu	Farmhouse exhibitor	07/09/2016
	Ms.Yang Yang	Agricultural Resort exhibitor	07/09/2016
	Mr.Xu Shengming	Agricultural Planting Center exhibitor	07/09/2016
	Ms.Wu Xiaohui	Agricultural Planting Center exhibitor	07/09/2016

Beijing Xiedao Agricultural Resort	Interviewees	Job/Title	Date
3 managers and 7 workers	Ms.Cai Wenjie	Manager of the accommodation zone	19/09/2016
	Mr.Dong Yungang	Manager of the entertainment zone	20/09/2016
	Mr.Fu Xu	Manager of the catering zone	21/09/2016
	Ms.Qian Wenhong	Worker of the accommodation zone	19/09/2016
	Ms.Shi Ruochen	Worker of the entertainment zone	20/09/2016
	Mr.Kuang Weiping	Worker of the catering zone	21/09/2016
	Mr.Liao Zhengbo	Worker of the planting zone	22/09/2016
	Mr.Li Shucheng	Worker of the planting zone	22/09/2016
	Mr.Ao min	Worker of the breeding zone	23/09/2016
	Mr.He Kairui	Worker of the breeding zone	23/09/2016

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