The State as a High Modernist Planner: Planning of Food System Transitions in Nanjing, China

by

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The following served on the Examining Committee for this thesis. The decision of the Examining Committee is by majority vote.

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Author's Declaration

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Statement of Contributions

I, as the first author of all three manuscripts (Chapter 4, 5, and 6), hereby state the roles of all authors in three manuscripts.

Manuscript 1 (Chapter 4) is co-authored with Zhenzhong Si. I solely conducted the fieldwork and data collection, and data analysis for this manuscript. Zhenzhong Si was involved in the stage of writing, whereby he provided comments for the outline and for the first draft of the finished paper and proofread it. This manuscript has been published as a discussion paper for the Hungry Cities Partnership. Chapter 3 includes my minor revisions on the published paper.

Manuscript 2 (Chapter 5) is authored by me and revised based on advice from supervisor Dr. Steffanie Scott.

Manuscript 3 (Chapter 6) is co-authored with Danshu Qi, Zhenzhong Si, and Steffanie Scott. I was the lead author of and solely drafted this chapter. Danshu Qi and I conducted part of the fieldwork as a team, and Danshu Qi set up some of the semi-structured interviews with ecological farmers. During fieldwork, Danshu Qi and I discussed research

observations, reflections, and methodology. Zhenzhong Si and Steffanie Scott provided suggestions for revisions.

I wrote as the sole author all other parts of the thesis apart from the abovementioned three chapters. Under the guidance of my advisor, I designed the thesis research and led the arrangement of fieldwork. During fieldwork, I undertook research site visits, semi-structured interviews, policy review, and online research. After data collection, I processed and coded data digitally, conceived, outlined, wrote, and revised the three manuscript chapters and the rest of the thesis.

Abstract

Food system planning is a nascent concept in both food studies and planning studies. Recent food planning studies point out that food issues have been mostly left out in modern planning practices and research, despite the fact that food makes up a critical aspect of urban development, economic growth, and public health. Only in the last two decades have scholars begun to advocate for the inclusion of food, and very little research attention has been paid to the theories and practices of food system planning in China. Zhong et al. (2021) bring to light the subject of food system planning in the Chinese context. They showcase the assets Chinese cities have for conducting food system planning with an example of food security planning in Nanjing. However, municipal governments' focus on food system planning goes beyond food security and is entangled with the goal to modernize the cities. This thesis inspects this entanglement by revealing the pursuit of modernization among Nanjing's food system planning practices.

Drawing on James Scott's concept of high modernism, I argue that the local governments in Nanjing's regional food systems could be characterized as high modernist planners. In the high modernist approach, the design and the implementation of food system planning prioritizes industrial standardization, visual order, and technological progress over diverse traditions, functional order, and social innovations. The outcomes of such planning,

however, are often at odds with the intended food security and sustainability goals due to a disconnect with the needs of food producers, vendors, and consumers.

This thesis consists of three case studies on food system planning in Nanjing, China. Case study one (Chapter 4) reveals the recent rise of new retail businesses and the government support that fueled their growth. The rapid growth of new retail businesses, however, undermined the stability of the local food supply and food security. This finding shows the danger of pursuing high-modernist models in the remaking of food retail environment. Case study two (Chapter 5) focuses on the government planned transformation of the wet markets. This chapter finds that the high-modernist transformation measures, albeit intended to improve wet market appearances and functions, have negatively impacted the livelihoods of vendors and failed to make any actual contributions to food security/food safety goals. Case study three (Chapter 6) examines the evolution of the authorities' approach to agricultural modernization, I argue that large agribusinesses maintain advantages in accessing government support because they fit with the high-modernist vision of modern agriculture. At the same time, a diverse group of new farmers independent from government planning attempt to address food safety and sustainability concerns in a less modern-looking fashion.

This research adopts a qualitative approach in data collection and processing. Data applied in this thesis consist of semi-structured interviews, food policy documents and social media posts. Qualitative data are analyzed through thematic analysis and a two-step coding process. Overall, this thesis proposes using the concept of high-modernism to interpret the governance logic within China's food system planning. Specifically, China's food system planning prioritizes the techno-scientific logic that focuses on infrastructure and technology development and the aesthetic logic that focuses on replacing traditional, "backward" appearing food activities with modern, orderly businesses that appeal to developmentalist aesthetics. The high-modernist planning has two most evident flaws: fixation with technological progress leads to the oversight of grassroots social innovations; fixation with middle-class optics lead to a disconnect with the needs of marginalized communities. Adopting the lens of high modernism leads to a better understanding of the priorities, rationale, and pitfalls of government planning in China's food system transitions. Research findings of and proposed concepts in the thesis have implications for food security and sustainability policies in Nanjing and other Chinese cities with comparable socio-economic parameters.

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Chapter 1

Introduction

1.1 Research questions

At the outset of the 1978 economic reforms, China dialed back its centralized economic planning and social engineering and instead embraced marketization and privatization. These forces have radically liberalized China's food systems by enabling capital into agriculture (Zhang and Donaldson, 2008; Zhang et al., 2015; Yan and Chen, 2015), advancing the role of domestic agribusinesses in rural development (Schneider, 2017), and engaging with the global food trade. Food systems are a widely recognized concept in the English language literature of food studies but remains a nascent addition to food studies within China. By the term food systems, I refer to the broad range of actors and activities related to food production, aggregation, processing, distribution, consumption, waste management, research and development, and the natural and social environment they interact with (FAO, 2018). The High Level Panel of Experts on Food Security and Nutrition offers an updated definition of food systems: "food systems encompass the various elements and activities that relate to the production, processing, distribution, preparation and consumption of food, as well as the output of these activities including socioeconomic and environmental outcomes" (HLPE, 2020: XV). The Panel lays out six indicators of sustainable food systems: productive and prosperous, equitable and inclusive, empowering and respectful, resilient, healthy and nutritious, and regenerative (HLPE, 2020: XV). The phrase of food system transition is

applied in this thesis to refer to significant changes taking place in the profile of food actors, activities, or the social and economic environment they are embedded in.

One of the most important transitions of China's food systems is the de-collectivization of food production and the adoption of modern farming techniques, technologies, and market mechanics. Prior to the 1978 economic reforms, China's centralized agricultural planning and the People's Communes system led to multiple food crises, such as the 1959-1961 famine during which millions starved. The de-collectivization of food production and commercialization of food circulation following the 1978 economic reforms have fundamentally shifted the mechanics of China's food systems. Over four decades of reforms and development greatly boosted China's food production, market connectivity, and re-motivated farmers to engage with food production. These factors combined with the economic revitalization in cities and rural areas contributed to the improvement of food availability, food access, and nutrition status in China. For example, the prevalence of undernourishment in China has been dropping, from over 10% around 2000 to less than 2.5% around 2019 (FAO, 2021). Additionally, food availability in China has stabilized. The state maintains a high self-sufficiency rate over food staples. It is committed to securing domestic supply of staple grains (rice and wheat) and to be mostly self-sufficient in cereals (rice, wheat and corn) (State Council, 2014). A 2019 analysis suggests that China maintains close to 100% self-sufficiency rate over staple grains and 98% over cereals (Yang et al., 2019).

China's fast progress from food shortage to self-sufficiency is not trivial, especially considering that this country is home to approximately 19% of the world's population but only has six percent of the world's freshwater and nine percent of the world's arable land (FAO, 2011). This progress despite resource constraints led to discussions of a "Chinese agricultural miracle" (Schumilas, 2014; Janaiah et al., 2002). However, this miracle is accompanied by drawbacks and challenges. More specifically, the processes of marketization and industrialization, which I synthesize as forces of simple modernization (based on Beck, 1992), are responsible for some of China's most pressing food challenges today. Two of those challenges are closely analyzed in this thesis: rampant food safety crises (Yan, 2012; Yan, 2015; Si et al., 2018a; Augustin-Jean and Poulain, 2018) and agricultural pollution (Schumilas, 2014; Lu et al., 2015; Wang et al., 2017). The government has been apt to act on the challenges through planning further transition of the food systems. The strong influence of the government and its firm will to improve the food systems are one of the characteristics that set China apart from many other countries, regarding the food system transitions. This thesis focuses on three specific cases of government planning and interventions in the food systems–the government support of ecological agriculture, government-led modernization of traditional food retail outlets (wet markets), and its support of new retail businesses.

In the global scale, the corporate food regime and food movements are conceptualized as two opposing forces shaping the evolution of global food system (Holt-Giménez and Shattuck, 2011). China, however, has been considered as a challenge to the

corporate food regime because China's growing state-owned enterprises are weakening the hegemony of transnational corporations; the Chinese state is securing overseas land investment and trade deals (McMichael, 2020; Belesky and Lawrence, 2019) and extending control over international grain and seed markets (Gaudreau, 2019) beyond the dominance of the corporate food regime. These studies have advanced two arguments: 1) the major social, economic, and policy trends in the global food systems do not fully resemble those in China; 2) the development of "China's food regime" may destabilize the global food regime. *These studies focus on China's outward influence but do not elaborate on the social, economic, and policy trends internal to China's domestic food systems. I argue that our comprehension of China's dynamic role in the global food regime will not be complete without understanding the characteristics of China's domestic food system transitions. Much of these characteristics are determined by the government, since the government is deeply and meaningfully involved in planning and stimulating the transitions. A gap exists in the food system transition studies: how can we characterize the government's impact on food system transitions within China?*

The Chinese government plays a paramount role in steering changes in China's food systems. *However, few have conceptualized the Chinese government's approach to governing such transitions*. Zhong et al. (2021), Si and Scott (2019), and Scott et al. (2018) laid a foundation to analyze the transitions in China's food production, retailing and consumption from the food systems perspective and to distinguish the transitions between state-led and civil society-led. Si and Scott (2019) adopt a top-down versus bottom-up

framing to understand the dual food system transitions in China. Top-down forces refer to state interventions, and bottom-up forces describe the emerging civil society initiatives in food production and provisioning (Si and Scott, 2019). Top-down state interventions prioritize technologically intensive "ecological" agriculture (Scott et al., 2014). Bottom-up forces in China include farming and marketing innovations mirroring AFNs in the Western context, but unlike the community empowerment focused AFNs in the West, bottom-up innovations in China are oriented towards customers' concerns about health and food safety (Scott et al., 2018). The top-down and bottom-up framing accentuates two transition pathways in China's food system. However, the phrase "top-down" is not informative other than hinting that this pathway is led by the state. It does not point out the characteristics of state-led transitions. Nor does the top-down and bottom-up framing illustrate the position of the private sector or its relationship with the state. Considering this, I ask what analytical framing of China's food system transition pathways can highlight their characteristics and actor relations. In summary, this thesis addresses three key research questions.

1. How can we best conceptualize the government's approach to governing food system transitions in China?
2. Which actors are involved in and which are left out of the state's vision? How and why?
3. What are the implications of the government's approach and the actor relations?

Answering these questions will enrich our knowledge about the drivers, orientations, and implications of China's food system transitions with respect to its blend of a modern market economy, rich food history and traditions, shifting state-society relations and new food challenges.

1.2 Argument

In the year of 2018, the city of Nanjing will strive to achieve 1.23 million (82000 hectares) total sown area with vegetable crops, and a total vegetable harvest of 2.843 million tons. The city will coordinate appropriate spatial organization of wet markets, boost fresh food supermarkets, community vegetable stores and fresh food e-commerce in order to build a reasonably designed, fully functioning, orderly "Vegetable Basket Project" retailing network. Each neighbourhood will have at ***least four*** *"Vegetable Basket Project" retailing nodes.*

–2018 Pronouncement of Vegetable Basket Project Implementation Plan in Nanjing (my translation)

The policy excerpt above illustrates a detailed regional-level food system plan in Nanjing. This plan covers a wide range of goals to be fulfilled in Nanjing's food systems, from the quantity of vegetable production to the spatial density of food retailing outlets. The plan was adapted based on the national Vegetable Basket Project, which is one example of comprehensive food system planning exercised by the Chinese government. The government

designs and enacts food system plans at different levels, such as the Nanjing Municipal Modern Agriculture Development Plan (pertaining to agricultural development) at the municipal level and the No. 1 Central Document (pertaining to agriculture and rural development) at the national level. In China, such food system plans are part and parcel of the state's planning of national economy and societal development, which has been a tradition in modern China and is periodically renewed by the state every five years. Because of the five-year period, the designation "five-year plans" is used for the national economic and societal planning. They were initially launched in 1953 and ever since have been issued every five years, except for a hiatus between 1963 and 1966 (due to recovery from the Great Chinese Famine). This thesis research was conducted during China's 13th five-year plan, of which the principal goal is to fully achieve a moderately prosperous society[1].

Food system planning, as part of China's macro-level government administrative ordering of society, is one of the most important drivers of food system transitions in China. I use the concept of authoritarian high modernism to characterize the Chinese government's approach to food system planning (Scott, 1998). Specifically, authoritarian high modernism (later "high modernism") was employed by James C. Scott to refer to a certain fashion of

[1] To achieve a moderately prosperous society, the state is committed to seven objectives in China: strong economic growth, technology innovations, consumption-driven development, improved quality of life, civilized society, environment protection, maturity of governance (Xinhuanet, 2016). These objectives are assessed by specific criteria, such as GDP per capita, disposable incomes among urban and rural households, and statistics of post-secondary education. Assessment criteria directly linked to the food systems are the rural poverty level and the Engel's coefficient.

state-led development in the 20th century, which was preoccupied with reordering society and nature in order to achieve modernity and technological advancement. Scott names four characteristics of high-modernist planning: administrative ordering of society and nature by the state; state's absolute confidence in science and technology as a means to improve human life; strong will of the state to implement large-scale interventions of society and nature; weak civil society that cannot overturn the state interventions. As this thesis will explain, these four characteristics precisely capture the Chinese government's approach to food system planning.

My conceptual argument is that *viewing the state's role in China's food system transitions as a high modernist planner captures the characteristics of and actor relations in food system transitions in China*. The state planning prioritizes technological upgrade (high-modernist logic), visual order, standardization (high-modernist aesthetics) in its interventions in the food systems. The state planning tends to involve large-scale food businesses, more than small independent actors, through formal government support and designation. Usually excluded from state planning, small-scale independent actors obtain little formal government support or acknowledgement. However, some of these actors instead build informal collaborative relations with local governments.

This thesis demonstrates that the ideology of high modernism manifests itself in China's state-planned food system transition by examining three case studies. I find that large

agribusinesses in Nanjing are eligible for abundant government support in land access, infrastructure, processing facilities, and farm tools, because they conform to the image of modern, large-scale, technologically advanced farms. Small-scale farmers describe themselves as the "forgotten corner" and feel left out by the government. Visual order and appeal are important goals in the state-planned development. Small-scale farmers practicing permaculture and polyculture are criticized by local officials for their "messy" farm landscape. In a parallel way, the state attempts to modernize and upgrade the retail sector through promoting new retail businesses (NRBs) that integrate modern technologies, management, and infrastructure. The government also aims to re-invent the traditional food markets–wet markets by improving their appearance, infrastructure, and implementing new management rules to standardize the operation in the wet markets. The state interventions are comprehensive, capital-intensive and fast. For example, the 2018 Vegetable Basket Project implementation plan in Nanjing emphasizes the development of modern and vertically integrated food production and retail. A local food business was enrolled in the plan and expanded to 238 stores in a span of three years with government funding (see Chapter 4 for details). Research findings in Chapters 4, 5, and 6 suggest that the high modernist approach, efficiency and scale notwithstanding, fails to effectively address concerns about food safety, environmental pollution, and social inequality, but reinforces the dominance of large food businesses and homogenizes the traditionally diverse food retail sector.

I substantiate my arguments with evidence from three case studies at the forefront of Nanjing's food system transitions–new retail business, new farmers, and the remaking of wet markets. Table 1 below concisely illustrates how case studies in Chapter 4 and Chapter 5 support my conceptual and empirical arguments on the food retailing end. Chapter 4 analyzes the partnership between the local government and the emerging retail format that has been commonly referred to as New Retail Businesses (NRBs). This partnership was intended to help fulfill the government-led Vegetable Basket Project (VBP) in Nanjing. More specifically, NRBs were enrolled in the partnership because they contributed to the goals in the VBP, such as technological innovations, infrastructure upgrade, management standardization, supply chain vertical integration and high spatial density of food retail outlets. From the technocentric focus to product standardization, the NRB-VBP partnership embodied the characteristics of high modernism. Fieldwork findings suggest that the NRB-VBP partnership has not been as effective, however, in resolving food safety and environmental concerns. Rather, the growth of a local NRB has imposed new challenges in the food system in Nanjing, such as the investmentization of food consumption and financial schemes that turn everyday grocery shopping into risky gambles, the increased generation of plastic waste with excessive food packaging, and the marketing pressure posed to small local ecological farms.

Chapter 5 studies the local government planning and interventions in the evolution of wet markets in the city of Nanjing. Borrowing the analytical lens of high-modernism (Scott, 1998) and aesthetic governmentality (Ghurtner, 2010), I delineate the rationale and epistemology of government's upgrade plans for wet markets in Nanjing, China. Through policy analysis and interviews with key stakeholders in wet markets, I capture the connection between the logic of wet market governance and that of governing Nanjing as a modern, world-class city. Building on Pow (2018)'s analysis of the making of eco-cities in China, I characterize the governance of wet markets in Nanjing through two governmental logics: the techno-scientific logic and the aesthetic logic. Based on policy analysis, I explain how it is equally important, if not more, to the municipal government that the wet markets conform to the aesthetic codes of a world-class modern metropolis as they serve as the backbone of the city's food retail network. In Nanjing and several other cities in China, the official discourse has portrayed wet markets as dirty, messy, and backward, thus unharmonious with the city's modern aspirations. For example, the local Bureau of Commerce stated that wet markets represented the city's class and image and their dirty, messy, backward status must be changed (Xiao, 2004). Overhauling the dirty, messy, backward wet markets was a key task to Nanjing's municipal People's Congress (Liu, 2013). In the eyes of the local governments, a facelift is necessary and has been included in the agenda of wet market upgrading projects. In the Chinese language literature of public management, the backwardness of wet markets has been seen as a liability modern city building and urban management. Wei et al. (2019: 48) argue that the dirty, messy, backward wet markets are an obstacle to making civilized

cities and "modern cities have ever-changing roads, bridges, and transports, accompanied by row-upon-row high-rises. Beside them, traditional wet markets have outdated and shabby infrastructure. Inside them dirty liquid flows, producing foul smells. From any perspective, it is mind-boggling to see them together [in the same city]."

Adopting the high-modernism framework provides us with a new perspective to understand China's position in the global food regime and food system transitions. The existing critical food studies have emphasized one aspect of China's influence by theorizing the overseas investment and commerce by China's state-owned enterprises in competition to the transnational food corporations (McMichael, 2020; Belesky and Lawrence, 2019). The high-modernist dynamics I identify within China's domestic food systems remind us that China's global influence is beyond the often-discussed land agreements and trade engagement. Food studies can pay more attention to China's tendency to disseminate modern agricultural technologies and to construct model farms in the efforts of South-South cooperation (see Lawther, 2016 on Sino-African agricultural demonstrations). Additionally, the high-modernist characteristics are not limited to food system planning in China. For example, Huggins (2013) identifies the high-modernist dynamics in Rwanda's agricultural reform. Findings in this thesis on the manifestation of and the drawbacks of high-modernist food planning in China may inform comparative studies with high-modernist practices in other geo-political contexts.

Empirically, this chapter contributes to understanding of wet market governance by reviewing the characteristics and impact of the wet market upgrading program. Existing studies have touched on the important trends and structural changes of wet market development in Chinese cities (Hu et al., 2004; Zhang and Pan, 2013). However, existing studies have not sufficiently addressed one of the most important recent government interventions–the wet market upgrading plan. This chapter examines the upgrading from the government perspective through policy review and from an individual perspective through interviews with wet market vendors, managers, and consumers. Drawing on these data, this chapter contrasts the micro-level lived experience with the macro-level government vision.

Table 1 Research findings in Chapter 4 and Chapter 5

	Chapter 4	Chapter 5
The role of the government	Providing designation and financial support	Providing upgrading guidelines and financial support based on assessment criteria
Priorities of government planning	Quantity of stores Visual order Digitalization Vertical integration	Infrastructure upgrade Visual order Traceability Safety monitoring
Stakeholder relations	NRB-VBP partnership	Subsidy provider and receiver
Impact on food systems	Compounding food challenges by creating new food risks	Improving wet market infrastructure but aggravating costs and pressure to market vendors with limited contribution to food safety

Table 2 below illustrates the connections between research findings in Chapter 6 and my overall thesis arguments. Chapter 6 analyzes state-planned and civil society organized

transitions in rural food production from conventional farming towards ecological farming. State-planned transition typically involves large "ecological" agribusinesses and professional farmers' cooperatives. These large agribusinesses have obtained government support in infrastructure, machinery, and tourism facilities. My research findings suggest that government support in the state-planned transition concentrates on the large agribusinesses, and the support has barely spilled over to adjacent small farms. The concentration of government support appears to reinforce inequalities between large agribusinesses and small-scale farms. Apart from the state-planned agricultural transition, a group of small-to-medium scale farmers are practicing ecological farming. Some of these farmers are new farmers with no pre-established knowledge or practice in farming. Most new farmers prioritize health and ecological values in ecological farming such as protecting agricultural biodiversity. Unlike the state planning that concentrates on large agribusinesses and demonstration projects, new farmers are spatially scattered and experimenting with a diverse host of farming approaches: permaculture, biodynamic farming, natural farming, traditional Chinese farming. Some of them built informal connections with local governments, which promoted their marketing with institutional procurement. Unfamiliar with the social customs and culture in rural areas, new farmers from urban backgrounds initially encountered challenges and conflict with local conventional farmers (Qi et al., 2021). After a few years' acclimatization, some new farmers built mutual aid relationships with local conventional farmers and shared their knowledge about ecological farming. Compared to the state-planned pathway, new farmers in the unplanned pathway have a deeper engagement with conventional farmers.

Table 2 Research findings in Chapter 6

	Chapter 6	
The role of the government	Mapping out the grand plans of regional agricultural transition and providing support and guidance on transition towards ecological farming	
	The government	Small-scale independent farmers
Priorities in ecological farming	Food quality improvement Added value in food products Increasing the prevalence of certified food Reducing environmental pollution	Food safety Ecosystem balance Personal and household health
Stakeholder relations	Formal partnership between government and agribusinesses	Informal network between government and new farmers
Impact on food systems	Scaling up ecological farming Strengthening the dominance of large ecological farms and agribusinesses	Scaling out ecological farming Engaging small-scale conventional farmers

There are three advantages of viewing the government as a high-modernist planner of China's food system transitions, as a characterization of the top-down transition in China's food systems. First, it indicates the plan-centered administrative feature in the top-down food system transitions. Reflecting on the term "top-down", I emphasize that in China the implementation of high-modernist plans is not a smooth, linear process as the term may suggest. Ideally, the central government designs and publishes comprehensive plans to guide transitions across the country. The regional governments accordingly publish implementation plans that outline detailed policy measures to fulfill the goals set by the central government. These plans are then distributed to lower-tier governments. In reality, discrepancies exist between the priorities and the motives of the central government and those of the regional

governments. Such discrepancies have sometimes distorted the implementation of the high-modernist plans and failed to attend to the actual needs of actors on the ground. Section 7.2.1. further discusses this observation.

A second advantage of this framing is that it pinpoints that the alternativeness of bottom-up food actions results from their exclusion from government planning. Being excluded from government plans could lead to either absence of formal government support or worse, repression. As Scott et al. (2018) have shown, much less government support is available for organic agriculture in China compared to growing "green" and "hazard-free" foods. This lack of support occurs because organic agriculture is considered to produce lower yields and thus is relegated to a marginal status in state planning. Unlike the farming of "green" foods, organic agriculture has not been mentioned in the state food system transition plans (exact plans will be introduced in the methods section). The comprehensive concept of sustainable agriculture is reduced to a technicality of using organic fertilizers and pest management tools, which have been produced by industrial animal farms and rejected by most organic farmers I interviewed.

Third, this framing contextualizes food actions in China by considering its history of planned economy and agricultural collectives such as "people's communes". The social engineering philosophy during China's planned economy still manifests itself in the present-

day food system planning with a modern twist of liberalized markets and advanced technologies.

Overall, the government planning of food system transitions simultaneously produces solutions and contradictions to food challenges in China. The planned actions demonstrate the determination and efficiency of the state to reconfigure the food systems and to improve food safety and environmental sustainability. However, the planned transition pathway values uniformity over diversity and prioritizes funding technological innovations over social initiatives such as the small ecological farms established by new farmers. Further, it fuels the growth and power of large food businesses, which may undermine the viability of grassroots food activities.

1.3 Thesis structure

This thesis consists of seven chapters: an introduction chapter, an research approach chapter, a methods chapter, three manuscript chapters, and a concluding chapter. In each manuscript chapter, I present detailed, case-based analysis to back up my thesis argument. Motivated by two main research questions, each manuscript investigates a set of case-specific questions which are outlined below.

Manuscript 1 (Chapter 4):

- How does the state plan to transition the urban food retail sector and why?

- How are new retail businesses involved in such planning?
- How does state planning affect new retail businesses and food security, food safety, and sustainability?

Manuscript 2 (Chapter 5):

- How does the state plan to transition the wet markets and why?
- How are wet markets involved in the government's upgrading plan?
- How does the state planning affect food security, food safety, and the livelihoods of vendors at wet markets?

Manuscript 3 (Chapter 6):

- How does the state plan to transition food production and why?
- How are various groups of ecological farmers involved in such planning?
- How does the (lack of) involvement in the state planning affect new farmers and the development of ecological agriculture?

In Chapter 2, I outline the key concepts that form the backbone of my research and explain how they are employed for building a conceptual framework for my data analysis. In Chapter 3, I provide an overview of the research data, and introduce the methods of acquiring and analyzing them while reflecting on my positionality as a researcher.

Chapter 4, my first manuscript, is entitled “Food Retailing Transitions and New Retail Businesses (NRBs) in Nanjing, China”. This chapter focuses on how China’s food retailing sector is transitioning in a digitalizing consumer society with widespread food safety anxiety. At the forefront of this transition lies an innovative form of food retailing–New Retail Businesses. Based on field research and interviews with key stakeholders in Nanjing, this study outlines distinctive features of New Retail Businesses in contrast to the conventional food system. It also points out that New Retail Businesses have shared goals with the Vegetable Basket Project, China’s grand plan for an urban food retailing system. The municipal government of Nanjing and its subordinate departments propel the growth of a local New Retail Business to implement the Vegetable Basket Project. Equipped with an integrated ecological food supply chain and omnichannel retail logistics, New Retail Businesses present a promising solution to China’s food safety and sustainability challenges. New Retail Businesses appear to be accelerating the greening of urban food systems, backed by government funding. However, four contradictions are identified in this hybrid public private transition approach: investmentization of consumption, supply chain external dependency, over-packaging of “ecological” foods, and marginalizing of small ecological farms. This study details these contradictions and analyzes their implications for food security, food safety, and environmental sustainability in Nanjing.

Chapter 5, the second manuscript, is entitled “High-modernist Planning of Wet Market Upgrading in Nanjing, China: Characteristics and Drawbacks”. This chapter is an attempt to

characterize the approach taken by the Nanjing government to transform the backbone of its urban food system-the wet market, towards the objective of modernization. I propose the analytical lens of high-modernism to understand the governmental logic underlying the measures of the wet market upgrading plan. This analytical lens helps understand the motives of the upgrading and the priorities in the current upgrading plan, while applying the critical framework to evaluate the strengths and weaknesses of the upgrading plan. The high-modernist tendencies have manifested in the modernization of both the technologies, infrastructure and the visual codes of the wet markets. The high-modernist renovation has improved the appearances of wet markets, although these improvements may not undergird the services of wet markets, nor do they contribute to the economic viability of vendors at the markets. Changes happening at wet markets are not just in the wet markets, the same patterns are seen in the transformations of the retail section, as the government led rise of the new retail businesses, as well as the transformation in the agricultural sector, as my other chapters have described in detail. The orientation and quest for modernization has driven the wet markets to evolve in this direction, which could be used to understand and to critique the food governance in the Chinese context.

In Chapter 6, I present my third manuscript, “Scaling Out Organic Farming: Prospects and Challenges Facing New Farmers in Nanjing, China”. This manuscript compares the pioneering ecological initiatives led by small-scale new farmers and the state-led development of ecological agribusinesses. In contrast to the profit-oriented large

agribusinesses, most new farmers are motivated by food safety and environmental concerns. I examine the involvement of small-scale conventional farmers in the planned and unplanned transitions in food production. I argue that small-scale new farmers engaged with conventional small-scale farmers in more inclusive growth than large-scale agribusinesses. I provide examples of mutual-aid relationships built between new farmers and conventional farmers. Unlike state-planned ecological agriculture, small-scale new farmers are mostly neglected by local governments and self-funded all initial farm investments. This lack of public subsidies obstructs the development and scaling out of small-scale ecological farming. Some new farmers attempted to build informal relations with the local government to gain support in land access and marketing while others decided not to involve the government because they hoped to maintain their agency in farm management.

In Chapter 7, I conclude by outlining research findings while highlighting the empirical and conceptual contributions to the existing literature and advancing some understudied yet promising spaces for further research. Overall, this thesis proposes using the concept of high-modernism to interpret the governance logic within China' food system planning. Specifically, China's food system planning prioritizes the techno-scientific logic that focuses on infrastructure and technology development and the aesthetic logic that focuses on replacing traditional, "backward" appearing food activities with modern, orderly businesses that appeal to developmentalist aesthetics. The high-modernist planning has two most evident flaws: fixation with technological progress leads to the oversight of grassroots

social innovations; fixation with middle-class optics leads to a disconnect with the needs of marginalized communities. Adopting the lens of high modernism leads to a better understanding of the priorities, rationale, and pitfalls of government planning in China's food system transitions. Research findings of and proposed concepts in the thesis have implications for food security and sustainability policies in Nanjing and other Chinese cities with comparable socio-economic parameters.

Chapter 2

Research approach

This thesis research draws on four conceptual domains: food system planning, political economy of food regime/movements, modernization theories, and alternative food networks. In the subsections below, I explain why these concepts are selected and how I integrate them in order to inform my research design and analysis.

2.1 Food system planning

This section lays down the theoretical foundations for analyzing the Chinese state's role in China's food system transitions. First, I synthesize the emerging academic discussions on food system planning and highlight the recent trend of integrating the factor of food into the realm of urban planning. Second, I point out that the Chinese government is proactively involved in food system planning at multiple levels. The state actively intervenes food system development despite that the market mechanism plays an important role in China's food system. The priorities and implications of China's food plans have not been systematically studied. Zhong et al. (2021) analyze the food security planning, however, the government's engagement with the food systems is beyond the scope of food security. Understanding food system planning will help capture the drivers and characteristics of China's food system transitions. Third, I compare and contrast between the actor relations in China's food system planning and those in international food governance.

2.1.1 Food system planning as an emerging field

Internationally, the concept of food system planning is relatively new to scholars in the field of planning and to the practice among professional planners (Pothukuchi and Kaufman 1999, 2000; Morgan 2009, 2013; Vitiello and Brinkley 2014). The initial inclusion of food systems in planning scholarship was by Pothukuchi and Kaufman (1999) in their advocacy for bringing food issues to the field of urban planning. Urban planning consists of setting goals for public interest and of designing and reorganizing land use and built environment to achieve the goals. Goals for urban planning are broad, ranging from economic growth, affordable housing, good public transit, to environmental conservation. Considering the comprehensive goals of planning, researchers and professionals in urban planning should take account of a wide range of public issues such as transportation, housing, water and electricity infrastructure, and the living environment of residents. Pothukuchi and Kaufman (1999, 2000) found that the food issues, as an essential part of urban life, had been mostly omitted by urban planning professionals and scholars of planning. More specifically, they found that by 2000, no research articles from major planning journals discussed food system issues and most of the 22 planning agencies they surveyed in the US were not meaningfully involved in community food activities (Pothukuchi and Kaufman, 2000). Without treating food system issues as part of their work, urban planners missed opportunities to strengthen urban food systems and the well-being of urban residents. For example, with little intervention from urban planners and government agency, supermarket development in the US has focused on suburbs and stayed away from inner city neighbourhoods. Low-income

residents in these neighbourhoods have to spend long time travelling to supermarkets or to pay high prices for groceries in convenience stores, which limit their economic and physical access to fresh and nutritious foods (Pothukuchi, 2005). Absence of community food compost planning increases the amount of food waste dumped into landfills rather than being reused (Pothukuchi and Kaufman, 2000). Given these implications, Pothukuchi and Kaufman (2000) argue that food issues should to be considered by planners when they design urban land use and built environment, and that planners could improve public health and sustainability of local communities by integrating food concerns into the agenda of community engagement.

Following this ground-breaking critique, other scholars have voiced support and designed tools for incorporating food issues into the field of planning (Morgan 2009, 2013; Freedgood et al., 2011; Viljoen and Wiskerke, 2012; Vitiello and Brinkley 2014). In the same vein, planning organizations including the American Planning Association (2007) started to drawn connections between food system planning and other planning concerns such as economic resilience, social equality, public health and cultural diversity.

In the official planners' guide, the American Planning Association broadly defines community and regional food system planning as an aspect of urban planning about "concerns with improving a community's food system" (Raja et al., 2008: 3).

I shall highlight my interpretation of food system planning to clarify what I mean by food system planning in the Chinese context in the rest of the thesis. Based on the definition by Raja et al. (2008), I argue that food system planning entails two steps: *1) setting goals for food system development with a clear timeline and 2) designing instruments to reach the goals*. Goals of food system development in China include securing national food supply, improving community access to healthy food, reducing undernourishment and overnourishment, enhancing resilience and diversity of local food systems. The government usually announces to the public a timeline to achieve milestones regarding these goals. To reach such goals, instruments are suggested by the government in the forms of policy changes, economic interventions, social reorganization, and changing the built environment. In an example of land use change, the government could build an inventory of vacant urban public land and coordinate community garden projects to use the vacant land. As an example of economic intervention, planners in Rochester, NY worked with the local community to introduce a grocery chain into a fresh food deprived neighbourhood (Pothukuchi, 2005).

The American Planning Association (2007) outlines two goals for food system planning, namely building strong, sustainable and self-reliant community food systems and shifting the interactions between the industrial food system and communities to strengthen communities. The Association also suggests seven way for planners to reach these goals, as I mention below.

- *Supporting a comprehensive food planning process at community and regional levels*
- *Strengthening the local and regional economy by promoting community and regional food systems*
- *Supporting food systems that improve the health of the region's residents.*
- *Supporting food systems that are ecologically sustainable*
- *Supporting food systems that are socially equitable and just*
- *Supporting food systems that preserve and sustain diverse traditional food cultures of Native American and other ethnic minority communities*
- *Supporting the development of state and federal legislation that facilitates community and regional food planning, including addressing existing barriers*

These seven principles point planners to various avenues for integrating community food security and health goals into the conventional work of land use planning, transportation planning and economic development planning. Overall, the rising acknowledgement and advocacy of food planning as an important consideration for planners, as Freedgood et al. (2011) argue, enables food activists, academics, and practitioners to strengthen community and regional food systems.

2.1.2 Food system planning in China

There has been inadequate academic discussion about food system planning in China, and few extant discussions in the Chinese language literature have focused on the international experience (Liu et al., 2013; Yi, 2012) instead of documenting the processes of food system planning in China, despite that the government extensively exercises food planning. Zhong et al. (2021) build the foundation of food system planning discussions in China by reviewing the food security planning practices in Nanjing, China. In this thesis, I argue that the food system planning practices in China are beyond food security planning and are entangled with urban planning and China's "city beautiful" campaigns.

Based on my research observations, I argue that despite the lack of theoretical discussions and lack of codification of food system in China's planning profession, China has been practicing food system planning, and the Chinese state has been acting as a food system planner. To put this argument into perspective, below I briefly review the history of and recent trends in food system planning in China.

In China, food planning has been practiced throughout the country's contemporary history. From the People's Communes in the 20th century to the Vegetable Basket Project to the present day, the Chinese state has been an active planner for its food system, urban and rural alike. As I mentioned in the last subsection, food system planning consists of two steps: setting the goals of food system development with a clear timeline and designing instruments

to reach these goals. The state undertakes both steps. Take People's Communes for example. People's Communes were designed as an instrument to collectivize farm production, improve irrigation and mechanization, raise agricultural productivity, and ultimately, to support industrialization in China. The plan of People's Communes was brought into being at the outset of Great Leap Forward in 1958, whereby Chairman Mao raised a mission for China's steel output to surpass that of the UK in 15 years, and that of the US in 50 years (Liu, 2010).

To support industrialization and steel production in cities, food output at People's Communes was heavily taxed to feed the urban population. This means that farmers at People's Communes had to submit their farm harvest to the local authorities, which then transferred portions of the harvest to cities and lastly decided how the remaining harvest was distributed among the farmers. At the same time, part of the rural manpower and collective assets of People's Communes was redirected to produce steel in backyard furnaces, in order to increase total steel output. People's Communes were an extreme case of total planning of food production and consumption in Chinese history. Individuals at People's Communes had to live and work as prescribed by the collective plan and the leader's will. Farmers had to give up all private land, farm tools, and cookware. The People's Commune system was a major setback to China's rural production, food security, and national economy. Collapse of food production led to the starvation of an estimated 17-30 million people. Forced land collectivization and free public kitchens reduced farmers' motivation to work; redirection of manpower and resources to backyard steel production from farming lowered farm output;

Communes distributed most agricultural harvests for the collective and reserved insufficient food to farmers (Liu, 2010).

At the present day, the government in China does not take sweeping control over food production, circulation, and consumption of individuals to the extent of People's Communes. Instead the market mechanism plays an increasingly important role while civil society organizations initiate alternative food activities and relations (Scott et al., 2018). Nevertheless, as we shall see below, the state still designs and enacts plans for China's food system development. Unlike the community and regional food planning in the US that focus on addressing food issues at the community level, China's food planning focuses on national, provincial and municipal levels. National food system planning serves the priorities of national economic growth and societal development. For example, the Chinese state is committed to fully achieve a moderately prosperous Chinese society by the end of 2020. China's 2020 No. 1 Central Document (a roadmap for agricultural and rural development published by the central government annually) prioritizes rural poverty eradication to facilitate with the fulfillment of a moderately prosperous society.

Cases studies in this thesis investigate food plans related to new retail businesses, wet market upgrading, and ecological agriculture, and I examine the local implementation of these food plans in the Greater Nanjing Region. Below I review the goals and implementation of specific food system plans in each case study.

Chapter 4 and Chapter 5 analyze the government-planned food retail transition in Nanjing. To understand the characteristics of the state plans, I analyzed the content of Nanjing Vegetable Basket Project Work Agenda (from 2008 to 2018) together with the interview data with the coordinator of Vegetable Basket Project (VBP) implementation team in Nanjing. VBP was initially launched by the central government in 1989 to stabilize the non-grain food supply in Chinese cities (Tuan and Ke, 1999; Zhong et al., 2019). VBP initially focused on infrastructure enhancement in order to increase agricultural productivity and ease the shortage of non-grain foods such as vegetables, eggs, meat, and fish in urban areas. Over the years, VBP has extended to be more comprehensive. Today, VBP tackles issues of food safety, food access, and modernization of food retail. Table below reviews the municipal VBP plans for food retail transitions and highlights the shifting goals and objectives of retail transitions in Nanjing.

Table 3 below summarizes the goals and objectives of food retail planning of Vegetable Basket Project in Nanjing. In the 2008-2012 plan, the municipal government aimed to make the food markets appear more orderly by renovating wet markets in order to create a clean, modern physical environment akin to supermarkets. During fieldwork, I found that wet market vendors held mixed views on the renovation. On the one hand, they were content with the improvement of physical environment, e.g. clean floor and air conditioning. On the other hand, they were unhappy about the post-renovation rent increase and new

management rules. Vendors had to arrange their vegetables in the way the manager required to appear orderly, and at some markets, vendors had to wear uniforms and to pay for the uniforms themselves.

Table 3 Goals and objectives of food retail planning of Vegetable Basket Project in Nanjing

Year(s) of plan	Goals	Objectives
Nanjing VBP Development Plan (2008-2012)	-Make food markets more orderly	-Speed up the upgrade and supermarketization of wet markets
Nanjing new VBP report (2013-2017)	-Connecting local production to direct market	-Encourage direct sales from farms to supermarkets -Reduce rent and parking fees for local vegetable vendors at *Zhongcai* wholesale market
Nanjing VBP work agenda (2017)	-Promote reasonable spatial organization of food retail -Upgrade food markets and encourage retail innovations	-Ensure each neighbourhood (*shequ*) has 4 VBP retail stores on average -Encourage food market to sell online and integrate online/offline retail
Nanjing VBP work agenda (2018)	-Promote reasonable spatial organization of food retail -Encourage retail innovations	-Ensure each neighbourhood has 4 VBP retail stores on average -Guide food market to adopt "internet +" technologies, and to integrate online/offline retail

Between 2013 and 2017, the VBP plan focused on marketing for local vegetable production and supporting local vegetable sales at wholesale markets. In 2017 and 2018, the focus of VBP plans shifted to spatial organization of retail stores and technological innovations. Both plans designed a quantitative goal to build at least four VBP retail stores in

each neighbourhood (*shequ*[2]) in Nanjing. The plans encouraged food retailers to explore the online market and to integrate the online/offline food market. The recent goals of VBP plans explain the rapid development of new food retail actors in Nanjing between 2016 and 2019. Chapter 4 analyzes in detail how the VBP plans stimulate the growth of New Retail Businesses which are characterized by their online/offline retail integration.

Chapter 5 introduces the wet market upgrading plan, which is part and parcel of the VBP. This chapter reviews the evolution of the government's approach to intervening wet markets from supermarket substitution to upgrading wet markets and turning them into supermarket-like modern markets. In this chapter, details of the latest government plan for wet market upgrading are summarized, and the effects are analyzed with reference to the feedback by wet market managers, vendors, and consumers.

Chapter 6 contrasts the characteristics of and actor relations in government-planned and grassroots transitions in food production. Multiple agricultural policies outline the state's plans for agricultural development. The No. 1 Central Document is a yearly agricultural development and rural development plan published by the central government every year. Chapter 6 reviews the shifting focus of No. 1 Central Document between 2000 and 2020 (see

[2] *Shequ* is an administrative unit in China. The administrators of *Shequ* are called neighbourhood committee (*juweihui*), which is at the lowest level of governments in urban China. The size of *shequ* varies between cities and within a city. The number of households administered by one *shequ* could range from hundreds to tens of thousands. The city of Nanjing consists of 944 *shequ* according to the 2017 Brochure of Administrative Divisions of Town/Township in China.

Chapter 6 for more details). The focus of No. 1 Central Document has shifted from boosting productivity to improving food quality, shifting the production structure, alleviating rural poverty, and protecting environment. In 2015, the Ministry of Agriculture published the National Agriculture Sustainable Development Plan (2015-2030). This Plan outlines two goals and five objectives for developing sustainable agriculture in China, as Table 4 shows below. The objectives of sustainable agriculture development highlight infrastructure improvement, technological innovations, agricultural inputs control but omit the role of farmers. The Plan does not touch on how farmers will be engaged or what types of farmers will be engaged. How are large agribusinesses and small-scale farmers positioned in the state-planned agricultural sustainable development? Chapter 6 addresses this question.

Table 4 Goals and objectives of National Agriculture Sustainable Development Plan

Goals	Objectives
By 2020, sustainable agriculture development achieves incremental progress. Agricultural productivity steadily increase, agricultural product quality improves, and agricultural resources are used efficiently.	1. Leverage technological innovations to increase capacity of food production 2. Improve water-use efficiency and enlarge areas of water-saving irrigation 3. Conserve arable land and ensure total arable land maintains above 120 million hectares. 4. Address environmental pollution and achieve zero growth in chemical inputs by 2020 5. Strengthen ecological function of forestry
By 2030, sustainable agriculture development achieves significant progress. Food supply stabilizes. Agriculture is resource-efficient and environmentally friendly. Farmers are prosperous. Countryside is scenic.	

Apart from the central government, municipal government of Nanjing plans for agricultural development. Table 5 and Table 6 below respectively outline the goals and objectives of the municipal government's plans for food production. Two plans share common objectives in improving infrastructure and promoting smart agriculture that uses modern data management technologies and connects to e-commerce platforms. In order to improve food quality and food safety standards, Nanjing plans to substitute chemical inputs with green and organic inputs. As we shall examine in Chapter 6, these technocentric goals of sustainable agriculture development augment the dominance of large-scale agribusinesses, because large-scale agribusiness are the main beneficiaries of government support in technology innovations and infrastructure improvement.

Table 5 Goals and objectives of food production planning of Vegetable Basket Project in Nanjing

Year(s) of plan	Goals	Objectives
Nanjing VBP Development Plan (2008-2012)	-Standardize food production -Increase local vegetable supply -Improve food safety	-Build 4666 hectares of high-standard[3] modern vegetable production center by 2012 -Reinforce safety testing on farm
Nanjing new VBP report (2013-2017)	-Increase local vegetable supply -Improve food safety	-Invest 10 million CAD a year to build 13333 hectares of standardized vegetable production center (*shucai jidi*) by 2017

[3] High standard farmland is defined as flattened, consolidated, weather-resistant, well-irrigated and mechanized farmland (State Council, 2019).

		-Equip vegetable production center with safety testing machines
Nanjing VBP work agenda (2017)	-Increase local vegetable supply -Improve local vegetable quality	-Stabilize 97333 hectares of vegetable sown area -Accelerate the certification of hazard-free, green, and organic food
Nanjing VBP work agenda (2018)	-Improve local vegetable quality	-Accelerate infrastructure upgrade to enable smart and modern VBP production

Table 6 Goals and objectives of Modern Agriculture Development Plan in Nanjing

Overall goal	
By 2020, Nanjing will mostly achieve agricultural modernization by comprehensively improving agricultural production, industrial structure, agricultural technologies and machines, agricultural sustainability, food quality and safety.	
Specific goals	Objectives
Smart agriculture	Introduce modern data-based management and e-commerce to agriculture
Facility agriculture	Upgrade agricultural infrastructure including greenhouses and polytunnels
Processing agriculture	Extend food supply chain and incubate agribusinesses for food processing
Tourism agriculture	Promote agricultural tourism
Ecological agriculture	Achieve zero growth in the use of chemical pesticides and fertilizer
Biological agriculture	Use biological technology as a driver for technological innovations in agriculture

2.1.3 Food system planning and high modernism

I argue that the current approach to food system planning taken by the Chinese state is congruent with the ethos of what James C. Scott (1998) calls “authoritarian high modernism”. In Scott’s (1998: 89-90) own words, high modernism is defined as below.

It is best conceived as a strong (one might even say muscle-bound) version of the beliefs in scientific and technical progress that were associated with industrialization in Western Europe and in North America from roughly 1830 until World War I. At its center was a supreme self-confidence about continued linear progress, the development of scientific and technical knowledge, the expansion of production, the rational design of social order, the growing satisfaction of human needs, and, not least, an increasing control over nature (including human nature) commensurate with scientific understanding of natural laws.

In my interpretation, high modernism is a strong belief that technological progress and rational design of social order and visual order could bring about economic prosperity and societal development. Table 7 below summarizes the goals, objectives, and omission of high modernist plans. The goals of a high modernist planner are to achieve economic prosperity and social order. The instruments a high modernist planner employs are technological advancement and administrative power.

Scott explains why numerous high modernist plans failed: "designed or planned social order is necessarily schematic; it always ignores essential features of any real, functioning social order" (Scott, 1998: 6). In my view, Scott's explanation highlights the disconnect between the state's technocentric interventions based on radical simplifications and the complex lifeworld reality lived by citizens. The high modernist plans lack the consideration of local knowledge and fails to examine society from a human scale, although

local knowledge is key to understanding how actually society functions. Table 7 below summarizes the features of high modernism. Authoritarian high modernism describes a situation where a strong state imposes the high modernist ideology on a weak society.

Table 7 Goals, instruments, and omission of high modernist plans

Goals	Instruments	Omission
Development and prosperity	Technological advancement	Local knowledge/experience
Social and visual order	Administrative power	Human-scale perspective

We shall examine why I identify the Chinese state as a high modernist planner for food system development. In the previous subsection, I reviewed the goals of China's food system planning for food production and retailing. These goals (listed in Table 8 below) resonate with the high-modernism agenda, because they not only emphasize economic progress (see text in bold), but also emphasize social and visual order (see italicized text).

Table 8 Goals of the food system plans I study

Plans	Goals
Nanjing VBP Development Plan (2008-2012)	-*Make food markets more orderly*
Nanjing VBP work agenda (2017)	-*Promote reasonable spatial organization* of food retail
Nanjing VBP work agenda (2018)	-*Promote reasonable spatial organization* of food retail
Nanjing modern agriculture development plan (for 13th five-year plan)	-By 2020, Nanjing will mostly achieve agricultural modernization by **comprehensively improving agricultural production**, industrial structure, agricultural technologies and machines, agricultural sustainability, food quality and safety.

National sustainable agriculture development plan (2015-2030)	-By 2030, sustainable agriculture development achieves significant progress. **Food supply stabilizes.** Agriculture is resource-efficient and environmentally friendly. Farmers are prosperous. *Countryside is scenic.*
No.1 Central Document (2020)	-**Eradicate rural poverty. Achieve a moderately prosperous society. Income per capita in 2020 will rise by at least a hundred percent from that in 2010.**

The Chinese state's food system plans rely on the instrument of technological advancement. By coding the food system plans, I find that technological measures are frequently mentioned. For food production, technological measures include infrastructure improvement and agricultural input substitution. Infrastructure improvement concerns irrigation, greenhouse, automated farm management, and roads to farms. Input substitution entails the replacement of chemical fertilizers with government designated organic fertilizers, and replacement of chemical pesticides with biopesticides and pest traps. In food retailing, technological advancement concerns the adoption of e-commerce and cold chain logistics. Local knowledge is not acknowledged in state plans. Furthermore, state plans fail to adequately take account of how farmers, market vendors, and consumers perceive and experience the state-planned transitions.

Additionally, the Chinese state designs plans on the grand scale rather than the human scale: state plans prescribe changes in land use, physical structure, urban landscape, and other grand scale systems, often with little regard to the role of individuals. In Chapters 4, 5, and 6,

I analyze the perception of individuals in the implementation of high-modernist plans and identify the implications of the omission of local knowledge and human-scale perspective in the state's food system plans.

While highlighting the relevance of the high-modernism framework to the dynamics in China, I hereby clarify that the actor relations in China are more nuanced than what Scott (1998) summarized as strong state imposing its vision on weak society. As case studies in this thesis demonstrate, in the implementation of high-modernist plans, the government builds partnerships with private businesses. Therefore, the relations between the state and non-state actors are sometimes based on mutual dependency rather than domination and control. Furthermore, while in Scott (1998)'s original framing, the high-modernist state is often treated as an entity, I highlight that in China, the state consists of a complex bureaucratic system and the implementation of high-modernist plans is affected by the discrepancies between the central and local governments. I will discuss this further in Section 7.2.1.

2.2 Political economy of government-planned food system transitions in China

In this section, I discuss the concepts I draw on to analyze the political and economic forces shaping the transitions in China's food system. I first compare my framing of the state-planned versus non-state transitions with the food regime/food movement framework. Then I

analyze concepts about actor relations and adopt them to conceptualize how different actors interact, negotiate, and collaborate in the implementation of state-planned transitions. Following that, I review concepts of modernization in order to highlight the priorities of state planning and situate my discussions on state-planned transition in the historical process of modernization. Additionally, I review concepts about non-state food transitions, namely AFNs and identify the nuances of AFN development in the Chinese context.

2.2.1 Compared to the food regime/food movement framing

My conceptualization of the political economy of China's food system transitions is inspired by the food regime/food movement framework (Holt-Giménez, 2017; Holt-Giménez and Shattuck, 2011). The corporate food regime and food movements are conceptualized as two opposing forces shaping the evolution of the global food system. Holt-Giménez and Shattuck (2011) identify four major trends in the food regime and global food movements, namely neoliberal, reformist, progressive, and radical (summarized in Table 9 below).

Table 9 A summary of the food regime/food movements framework based on (Holt-Giménez and Shattuck, 2011)

Food trends	Neoliberal food regime	Reformist food regime	Progressive food movement	Radical food movement
Discourse	Food enterprise	Food security	Food justice	Food sovereignty
Main institutions (examples)	World Bank WTO Transnational corporations	FAO Most food banks and food aid programs	CSAs Fair Trade and Slow Food chapters	Via Campesina and other farmer rights-based movements

Orientation	Global market	Development	Empowerment	Entitlement

Before I elaborate on these four trends and their relations to my framing of state-planned versus unplanned food system transitions in China, I first briefly review the conceptual premise of these four trends. One essential piece of this conceptual premise is food regime. Food regime is a comprehensive world-historical framing of different phases of global food system development and their relations with the global expansion of capitalism.

The concept of food regime was coined by Friedmann (1987) and expanded by Friedmann and McMichael (1989) and McMichael (2009). The theoretical model of food regime divides modern food history into three phases according to the dominant political economy of food production and consumption. The first food regime (1870-1930s) centered on the export of cheap food from colonial states to Europe, which underpinned its industrialization (Friedmann and McMichael, 1989). The second food regime (1950s-1970s) is marked by export of food surplus from the US to countries in the Global South (McMichael, 2009) and of the US industrial farming model (Holt-Giménez and Shattuck, 2011). The third and current food regime is described by McMichael (2009) as the corporate food regime (from 1980s to the present). In the corporate food regime, the global production and distribution of food is dominated by transnational food businesses. The growth of transnational food businesses was fueled by WTO trading and investment protocols,

Structural Adjustment programs, and the deregulation of food production, market, trade, and finance internationally (McMichael, 2020; Holt-Giménez, 2017).

The corporate food regime highlights the extant hegemony of transnational food businesses in global food production and circulation, although the overall structure of this food regime is not static but evolving. China is one of the destabilizing factors to the corporate food regime. Recent studies have discussed the growing influence of Southern states in the global food economy, and some of them analyze how China's growing participation in international food trade and development stimulates a restructuring of global food regime (McMichael, 2020; Belesky and Lawrence, 2019). Empirical examples were given to demonstrate China's growing power in the global food economy: China National Cereals Oils and Foodstuffs Corporation (COFCO) has replaced Bunge in the list of the world's top four grain trading companies (Belesky and Lawrence, 2019). Additionally, China is not only Africa's largest trading partner, but also the largest investor in Africa's resources and infrastructure, outnumbering the magnitude of US aid (McMichael, 2020). China's state-owned enterprises are encouraged and financially supported by the central government to invest overseas. In 2011, China's state-owned agribusiness Beidahuang Group leased over 500, 000 acres of farmland in Argentina to directly export soy to China. Bilateral trade agreements and overseas land investment by China circumvent WTO trade rules and thus shake some of the foundations of corporate food regime.

Considering these factors, the corporate food regime may be in a transition. However, so far, the global impact of China's state-owned food businesses and overseas investments have yet to outweigh the US-centered corporate food regime. Therefore, McMichael (2020) argues that it is still too early to "define a future food regime trajectory" (pp. 140) and it is unknown whether China will rise to the centre in the upcoming food regime. In the remainder of the thesis, when I discuss food regime, I refer to the extant corporate food regime rather than any projection of future food regime, unless specified otherwise.

Within the corporate food regime, Holt-Giménez and Shattuck (2011) highlight two trends, namely neoliberal and reformist. The neoliberal trend manifests itself in the forces and policies that privatize state-own food enterprises and weaken marketing boards as well as breaking down trade barriers. One representative neoliberal institution is the WTO. The reformist trend is exemplified by organizations and programs that address the social and environmental consequences of the neoliberal force but only at a superficial level. For example, corporate-funded food banks and organics from large retail brands fit in this category. They only address the symptoms of the corporate food regime but fail to deal with the cause. Below I discuss how prevalent the neoliberal and reformist trends are in China's food system and how they are related to China's state-planned food system transition.

The neoliberal trend is relevant to but not dominant in China's food system. On the one hand, liberalization is a feature in China's food system because China has lowered

international food trade barriers and enabled foreign direct investment in its domestic food processing after joining WTO. For example, ADM, Bunge, Cargill, and Louis Dreyfus own 70% of China's soybean processing capacity (Yan et al., 2016). On the other hand, neoliberal forces are subsidiary to state control. As Gaudreau (2019) argues, China's strategic industries including grain and seed industries serve the interests of the state and not the other way around. On the same footing, Schneider (2017) argues that the role of transnational food corporations is strictly regulated and controlled by the Chinese state. In 2021, the central government has launched cautionary measures against the unprecedented growth of online food platforms and the investment of tech giants in the grocery retail sector, in order to prevent corporate consolidation and to protect the traditional small-scale food retailers. Additionally, China's state-owned food enterprises play a key role in leading and intervening the food market for national food security and other goals of state plans (Gaudreau, 2019). Overall, the state exercises power over state-owned enterprises and transnational corporations to fulfill its political goals instead of being captured by corporations. Therefore, I argue that neoliberal is not the most appropriate term to conceptualize China's planned food system transitions.

Instead of neoliberal regime, the state interventions in the food system resemble the qualities of a reformist regime. The state devises food policies to ensure grain self-sufficiency, to alleviate rural poverty, and to tackle food safety crises and ecological degradation. Chapter 4 examines the role of the government program Vegetable Basket

Project in promoting safe and ecologically produced food. Chapter 5 discusses how the municipal government of Nanjing responds to food safety crises with technological upgrades and monitoring. Chapter 6 discusses how the state plans for large-scale agribusiness to scale out ecological farming and to reduce the environmental impact of agriculture. These efforts demonstrate that, to some extent, the state's food system planning values social harmony and environmental integrity instead of simply focusing on capital accumulation. Considering these efforts, I argue that China's state-planned food system transitions are more similar to the reformist trend than the neoliberal trend as defined by Holt-Giménez and Shattuck (2011). However, the trends in China's food system transitions are not identical to the reformist trend in the international context. The reformist trend addresses the repercussions of the corporate food regime and preserves its dominance while the state-led food system transitions in China are not under the control of the corporate food regime.

Holt-Giménez and Shattuck (2011) classify food movements into two categories: progressive and radical. They differentiate these two trends by their response to the dominant socio-political structure underlying the industrial food system. Progressive food movements, as they argue, operate within the market and political infrastructure of the corporate food regime despite the fact that they strive to create alternative ways of food production and consumption. CSAs were referred to as an example. Radical movements, on the other hand, directly oppose the corporate food regime by demanding structural reforms (e.g. protesting

against WTO) and reclaiming entitlement to land and seeds. Via Campesina was referred to as an example.

I argue that China's grassroots food transition resembles the progressive more than the radical trend. Chapter 6 spotlights a group of small-scale organic farmers who have few interactions with the local government and strive to sustain their farms through alternative food markets. In both cases, the grassroots food actors are outside the state's food system planning. Their activities play an important role in provisioning food or providing employment and livelihoods. On these aspects, they resonate with the international progressive food movements. They are different from the radical movements because they do not attempt to subvert the dominant food system or push for structural reforms.

Radical food movements, and in general, radical social/environmental movements are not common in contemporary China. As studies argue, environmental organizations in China are mostly depoliticized and they strive to build a collaborative rather than adversarial relationship with the government (Zhang and Barr, 2013). In the same vein, Ho and Edmonds (2007) find that environmental organizations in China mostly carry out their agenda through self-censorship and avoid confrontations with the state. In some cases, activists build informal connections with the government officials in order to gain the government's support of their agenda. Therefore, they argue that China's environmental activism is embedded in China's establishment regime (Ho and Edmonds, 2007).

Overall, China's planned food system transitions resonate with the features of reformist regime and the non-state innovations and improvisations resonate with the progressive movement. To analyze China's food system transformations, I argue it is more appropriate to use state planned versus non-state framing because it highlights the central position of the state in steering and planning China's food system transitions and the marginal position of non-state food actors working outside these lines.

2.2.2 Actor relations in China's food system transformations

It is important to discuss actor relations in China's food system transitions because these relations explain why the government's food system plans are implemented in the way they have been. From multi-stakeholderism (McKeon, 2017; Gleckman, 2016) to polycentric governance (Andrée et al., 2019), stakeholder relations in food system transitions have been extensively examined by critical food studies. I argue that stakeholder relations in China's food systems are different from those cited above, owing to the discrepancies between China's political system and that of liberal democracies. Before I elaborate on these differences, I first briefly review how multi-stakeholderism and polycentric governance are used by scholars to conceptualize stakeholder relations in global food governance.

The term of multi-stakeholderism denotes that multiple stakeholders should be considered and involved in the process of policy making and policy implementation. It gained currency in the business world in the 1960s and in recent years this term was adopted by governmental organizations including the United Nations and World Economic Forum (McKeon, 2017). The term became widely circulated in the governance arena when transnational corporations gained more influence on global food governance. Multi-stakeholderism has since been used to frame corporations not as the "governed" but as a stakeholder that takes part in the governance, thus reserving corporations a seat at the table of decision-making. Some international organizations adopt multi-stakeholderism as a governance mechanism to potentially replace the mechanism of intergovernmental decision-making (Gleckman, 2016).

By advancing the narratives of multi-stakeholderism, large food corporations seek to spin public opinion to their favour and to gain legitimacy for influencing international governance organizations. As McKeon articulates (2017), "the corporate sector seeks to portray itself as the most genuinely interested and best placed to find solutions" (pp. 383), although research on corporate influence suggests otherwise. For example, research suggests that corporations are only keen to invest in cost-saving development programs such as energy efficiency but uninterested in engaging deeper social and environmental tasks such as biodiversity conservation (Clapp and Thistlethwaite, 2012). The bottom line of corporate actors is profitability. Social and environmental responsibility is secondary.

In my interpretation, the narrative of multi-stakeholderism normalizes corporate dominance and infiltration on international food organizations, which ought to serve public interest before private profits. The danger with the popularity of multi-stakeholderism is that this language conveys a presumption that all stakeholders are equally considered and valued in the process of governance, while in reality power imbalance persists in decision-making in the global food system. More specifically, within the multi-stakeholderism structure, corporations play a central role (Gleckman, 2016) while civil society organizations are marginalized. Andrée (et al., 2019) argue that multi-stakeholderism has the weakest engagement of civil society actors in contrast to co-governance and polycentric governance (all three governance modalities sit on their conceptualized governance engagement continuum).

A major difference sets apart multi-stakeholderism and the actor relations in China's food system transitions. In China, the state is at the central of the decision-making process for food system development. As argued in the previous subsection, transnational corporations play a less significant role in China's food system than in the international context, and leading agribusinesses in China such as COFCO are state-owned. However, to fully uncover the stakeholder relations in China, the abstract concept of state needs to be unpacked into specific government bodies. In China, the state comprises of a hierarchy of government bodies. Ranking from the highest level to the lowest level, the state is made of central government, provincial government, municipal government, district/county

government, street/town/township government, neighbourhood/village government. For brevity's sake, in this thesis I refer to all lower level governments as local government when discussing the relations between central and local governments.

In China, tensions exist between the central government's demand for institutional uniformity and local governments' demand for flexibility to deal with specific issues in their administration (Zhou, 2017). As Zhou analyzed, the central government's demand for institutional uniformity to reinforce absolute control over regional and local governments, and this force of centralization undermines the flexibility and effectiveness of local governance. Even if the central plans are rigid and ill-fit in the local context, local governments must prioritize their resources to fulfill them while attempting to address the needs of local communities. To fulfill the plans, local governments collaborate with the private sector (see VBP-NRB partnership in Chapter 4) and coordinate with non-state actors (see informal relations between local government and wet market managers in Chapter 5). More specifically, the local government enrolls stakeholders through two types of partnerships: setting up formal partnerships with stakeholders compatible with food system plans and building informal relationships with those incompatible. I propose to describe these relationships as *government-centered partnerships*, because the government is at the center of decision-making for the goals and rules of these partnerships. I clarify that the government-centered partnerships describe the dominant relationships but do not encompass all relationships in China's food system transitions. In chapter 6, ecological new farmers built

collaborative relationships with adjacent conventional farmers without involving the local government. By using the term of government-centered partnerships, my intention is to differentiate the dominant stakeholder relations in China and multi-stakeholderism in the international context.

The former type of government-centered partnership I study is the public-private partnership between the local government departments and new retail businesses in Nanjing. In Chapter 4 with the example of New Retail Businesses, food practices and supply chain building are tailored to meet the government's quantitative indicators, including the total production area, number of certifications, spatial density of food outlets. These numbers help the local government showcase their implementation of the directives from the upper leadership.

The latter type of partnership appears obscure because it is masked by informality. Rules and norms are set "behind the scenes". The local government uses its practical knowledge to informally collaborate with the community by localized rules. Overall, I propose the term of government-centered partnerships to capture the formal and informal partnerships formed between local Chinese government and business/civil society actors in the implementation of China's food system plans.

2.2.3 Modernization as a priority in government planning

China's course of agri-food modernization reveals the epistemology throughout the state planning of food system transitions. In the 20th century, the rationality of food system planning, as part of national economic planning, rests on *a priori* presumptions about modern ideals and imagined social progress through technological advancement and infrastructure improvement. The underlying logic of such planning is precisely characterized by Scott's (1998) term "authoritarian high modernism", which I reviewed in subsection 2.1.3. In the two subsections below, I review the relations between high-modernism, and classical and recent modernization theories to provide a broader conceptual background for discussions on modernization in this thesis. Here I clarify that the term of modernization could be interpreted as advancements at a material level (e.g. infrastructure upgrade) and as a comprehensive process beyond physical changes. In this thesis, when I discuss high-modernism, the modernization theories, and the government-planned modernization of food systems in China, I refer to the comprehensive modernization process. This process involves the pursuit of ethical progress, economic prosperity, and modern aesthetics, in addition to the adoption of new technologies and infrastructure.

2.2.3.1 Reviewing modernization theories

The first surge of academic discussions on modernization was during 1950s-1960s, setting up the foundation of classical modernization theories (He, 2012). Studies from different fields propose different approaches to theorize modernization, although two processes are agreed

by scholars from different fields as pillars of classical modernization: 1)profound social and economic restructuring following industrialization in high income countries, and 2)development measures taken by low-to-middle income countries to emulate and catch up with high income countries (He, 2012). Classical modernization theories posit a linear process of development and assume that it takes a traditional society several phases to modernize. For example, Rostow (1960) classifies societies into five stages by the degree of their development and modernization occurs when a country evolves from the first stage (traditional society) to fifth stage (industrialized with technological maturity and high mass consumption). This theory is modelled after the industrialization pathway of the developed states and portrays this pathway as the only viable way for low-to-middle income countries to develop. With little focus on the social and environmental ramifications of industrialization, the classic modernization theory has little applicability for today's development strategies facing climate change, rising income inequality, and other socio-ecological challenges.

The classical modernization studies were accompanied by more critical development studies, such as world-systems theory and dependency theory. Dependency theory describes the international political economy as "a situation in which the economy of a certain group of countries is conditioned by the development and expansion of another economy, to which their own is subjected" (Santos, 1971, pp. 226). Dependency theory negates the assumption of classical modernization studies that low-income countries have equal opportunities as high-income countries to modernize and develop by pointing out that the international

division of labour locks low-income countries in the lower end of the global value chain. Low-income countries are in a peripheral position and their economic growth are dependent on external forces such as multinational corporations and global financial market, which represent the interests of the high-income (core) countries (Ferraro, 2008). In other words, the development strategies of peripheral countries are not entirely to themselves but dependent on the international supply chain that is mostly determined by core countries. Emulating the modernization strategies of the developed states will not necessarily lead to prosperity of countries lagging. Rather, further integration with global supply chain may intensify inequalities between core and periphery states. Therefore, dependency theorists advise for economic self-reliance (Ferraro, 2008). World-systems theory analyzes the core-periphery relations in a historical context to explain inequality between countries/regions in international development (Wallerstein, 1974).

Unlike the classical modernization theories that takes individual states as the unit of analysis, world-systems theory treats the world social system as the unit of analysis. World-systems theory extends the core-periphery relations into three categories: core, periphery, and semi-periphery. It points out that modernization is a global process, and the modernization of core states happened by exploiting periphery and semi-periphery states through unequal exchange and division of labour. Both dependency theory and world-systems theory highlight inequality between states in the international process of modernization and development and illustrate the "externalities" of modernization. On the other hand,

modernization is a dynamic process and has the potential to evolve. To mitigate the "externalities" of modernization, scholars have envisioned new ways of modernization, advancing new concepts such as second modernization and reflexive modernization, which I discuss below.

Both second modernization and reflexive modernization theories propose a division between classical modernization and a new wave of modernization process. Second modernization theory is coined by He (2012), the founder and head of the China Centre for Modernization Research. He's theory divides modern history into first modernization (1760s-1970s) and second modernization (1970s-2100). Second modernization is marked by the transition from industrial society to knowledge society and the transition from material civilization to ecological civilization. By knowledge society, He (2012) refers to the dominance of knowledge-related employment in a society's workforce. Another condition of second modernization is the greening of the economy, marked by the rise of sustainable production and consumption. According to He, first modernization and second modernization could happen concurrently within one country with spatial variance of development. The *China Modernization 2019 Report* (published by China Centre for Modernization Research, Chinese Academy of Sciences and authored by He, 2019) illustrates the co-existence of these two modernization processes in China. However, the abstract conceptualization of China's path to second modernization focuses on economic and technological progress and downplays political reforms and changes of environmental governance (Zhang et al., 2007).

Reflexive modernization theory classifies the history of modernization into simple modernization and reflexive modernization (Beck, 1992; Ekberg, 2007; Giddens, 1999). The reflexive element is the acknowledgement of the side effects (risks) of technological development and industrialization, such as environmental degradation and disasters resulting from mismanagement of technology (e.g. the Chernobyl fallout). Society in reflexive modernization focuses on managing risks and prioritizes risk minimalization over profit maximization (Beck, 1992).

Based on findings of this thesis research, I argue that China's food system has not fully embarked on a process of reflexive modernization. As I elaborate in Chapter 4, the state-planned food retail transition supports the growth of new retail businesses. The expansion of new retail businesses exposes urban residents in Nanjing to new risks in food consumption such as the "investmentization" of food purchase. By investing their grocery funds in the new retail business, customers brought financial risks into day-to-day food consumption. The inadequate regulation of finance activities by new retail businesses reflects that China's food system development has yet to embark on reflexive modernization.

High modernism and other modernization theories are concerned about societal progress and economic development modelled after the success of Western countries. Features of high modernism such as the uncritical application of technological advancement

imply its overlap with the classical modernization ideology. One distinction between them is that high modernism focuses on centralized planning and design, while classical modernization theory emphasizes economic restructuring such as promoting manufacturing and establishing liberal markets. Classical modernization theory prescribes one recipe for all developing states, while high modernism takes many forms, depending on the ambition and vision of the high modernist leader. A high modernist leader may or may not agree with the classical modernization theory but attempts to model its development after the mature stage of the classical modernization theory.

Theories of second modernization and reflexive modernization reflect the risks of high modernism. Particularly reflexive modernization highlights the social and ecological risks in the progression of science and technology and the adopting of technological advances to modify nature and society (Giddens, 1999). High-modernism ideology presumes linear progress and it associates modernization with positive outcomes. Reflexive modernization, however, denies linear progress and associates modernization with both opportunities and risks. In the agri-food sector, the industrialization and modernization of the food system are associated with food safety risks and environmental risks. Chapter 4 explains why high-modernist urban retail planning fails to effectively address such risks.

High modernism was originally applied on the scale of a country, region, or city (Scott, 1998) and thus not comparable to dependency/world-systems theories that focus on

the global or international scale. The economic and political underpinnings of China's high modernist food system are different from those of the global food system, which I analyzed in section 2.2.1. The next subsection below reviews the modernization process of China's agri-food sector.

2.2.3.2 Modernization in China's agri-food sector

This subsection illustrates the history of modernization in China's agri-food sector by explaining the major trends of agri-food modernization since the 1950s. These trends are summarized below in Table 10, and the remainder of this subsection elaborates on the summary in the table.

Table 10 Trends of agri-food modernization in China

Time period	1950s-1970s	1970s-1990s	1990s-2000s	2000s-present
Major goals of modernization	Food security			Food security Food safety Environmental sustainability Social harmony
Major means of modernization	Collectivization	Decollectivization	Corporatization	Promoting smart, ecological agribusinesses

Source: the author, drawing on Scott, 1998; Zhang et al., 2007; Zhang et al., 2015; Schneider, 2017; Day and Schneider, 2018

After the 1950s and before the 1970s economic reforms, China set up a series of modernization plans for industrialization and economic development. China's then President Mao interpreted modernization as building blocks of socialism. Based on Mao's idea, in 1964 Zhou Enlai (China's then premier) put forward a pronouncement of Four Modernizations at the third National People's Congress: agricultural modernization, industrial modernization, national defense modernization, and modernization of science and technology. Agricultural modernization was seen by the state as the motor of industrial modernization. Mao as the central planner of Great Leap Forward and People's Communes wishfully thought agricultural collectivization could promptly improve grain productivity and free up resources for industrial development (Li and Yang, 2005). The countryside would sell cheap food to the cities, and the cities would sell expensive manufactured products to the countryside. This way cities would accumulate capital through the price differences between agricultural and manufactured products. The way cities accumulated capital by exploiting the countryside resemble the relationship between core and periphery countries in dependency theory.

After the implementation of modernization plans, some economic achievements were made. Meisner (1999) defined the period between the 1950s and 1970s as the foundations of industrial revolution in China, whereby industrial outputs embarked on an average annual growth rate of 11.3% from 1952 to 1977. Yet side effects of the central agriculture planning overshadowed the industrial progress. After launching the Great Leap Forward and forming

People's Communes in 1958, Chinese peasants had to submit their land to the collective, namely Communes, production brigades and production teams. Collective harvest was in part taxed and in part re-distributed to peasants in an egalitarian fashion. Unconditionally equal distribution of gains and collective canteens lowered individual incentives to contribute to collective production. Excessive taxation depleted resources of many rural communes, and centrally planned diversion of farm works to manufacturing reduced labour in collective farms. National grain output decreased by 15% in 1959, and another 16% in 1960 and 1961. Shortfalls in grain productivity led to the Great Famine between 1959 and 1961 (Li and Yang, 2005). The calamities of Great Leap Forward were particularly large because the movement strived for a fast and widespread change. When it failed, a failure of such great speed and scale was especially consequential. The failure warns us the danger of high-modernist planning when it is carried out rapidly and in large-scale. Chapter 4 introduces the consequences of fast and widespread expansion of a new retail food business that is in the state-planned transition.

Following the outset of decollectivization, agricultural productivity gradually recovered in the second period (1970s-1990s). On the one hand, introduction of the Household Responsibility System re-incentivized peasants to work on their farmland. The establishment of the Household Responsibility System implies the replacement of the collective farms and People's Communes. The Household Responsibility System contracted out collective land to individual farming households and allowed farming households to trade

their post-tax crop output on the market (Lin, 1988). Through quantitative analysis of historical data, Lin (1988) argues that collective farming was inefficient because labour supervision in collective farms was inefficient and hard to implement, and that the Household Responsibility System re-incentivized peasants to engage with farm work because they no longer worked for the farming collective but for their own interest. The Household Responsibility System emerged out of grassroots improvisation of peasants, initially against the government will. After witnessing its contribution to yield increase, the central government gave the not-so-socialist practice greenlight (Lin, 1988). The failure of People's Communes and the success of Household Responsibility System exemplify the limits of high-modernist planning and the advantages of unplanned improvisation.

Since late 1990s, the Ministry of Agriculture has been focusing on agribusiness as the motor of agricultural modernization and development (Schneider, 2017). "To support industrialization is to support agriculture, to support enterprises is to support farmers" (RCRE 2010: 6). This declaration made by China's Ministry of Agriculture clearly shows the state's devotion to developing agricultural enterprises. In part, the state support for agribusiness results from the backlashes against decollectivization. Zhang and Donaldson (2008) outlined the disadvantages of decollectivization: loss of the economy of scale and slowed adoption of new farming technologies. The rationale is that agribusinesses could consolidate the scattered farmland from individual farmers and thus improve productivity and speed up the modernization of China's agriculture. The central leadership of China

explicitly stated the goals of agricultural modernization in 1998–to transition traditional, small-scale, extensive farming into modern, large-scale, intensive, and standardized farming (Zhang and Donaldson, 2008). In achieving these goals, the state prioritizes the formation and development of large-scale agribusinesses. By 2013, with the incentives of government support toward agribusinesses and large capital, *over a quarter of China's farmland has been contracted out*, increasingly to large-scale agribusinesses (Schneider, 2017).

During the process of modernization, food safety scandals have broken out and the awareness of environmental protection has grown within China. Due to the widespread food safety scares, scholars have adopted the concept of risk society to characterize China's society (Veeck et al., 2008; Zhang and Zhao, nd; Yan, 2012; Yan, 2015; Klein, 2013; Si et al., 2018a; Augustin-Jean and Poulain, 2018), emblematic of the process of reflexive modernization (Beck, 1992; Giddens, 1999; Ekberg, 2007). Chapter 4 explains why I argue reflexive modernization has not taken the place for simple modernization in China's food retail sector. Nevertheless, since the middle of 2000s, China's No. 1 Central Documents start to highlight the goals of quality control and environmental protection. The new policies highlight the role of ecological agribusinesses in leading the quality improvement and environmental improvement of agriculture. Chapter 6 investigates the role of ecological

dragon-head enterprises[4] in scaling out ecological farming practices. The policy reforms I study in this thesis reflect the new goals of China's agricultural modernization.

This thesis documents the pitfalls of China's current agri-food modernization approach. These shortcomings demonstrate the need of institutional reforms for diversifying the approach to agri-food modernization and for supporting the plurality in unplanned grassroots innovations.

2.2.4 Summary

This section has reviewed key concepts that inform my approach to the research question– how to understand the characteristics of and stakeholder relations in China's dual food system transitions. I started by reviewing the recently emerging concept of food system planning. In North America, the concept of food system planning begun to gain currency in the planning literature and profession only since the 2000s (Pothukuchi and Kaufman, 2000). However, I point out that in China, the state has been acting as a food system planner since the 1950s by steering the orientations of food system development in macro and micro levels. From centrally controlled collective economy to today's market food economy, the Chinese

[4]Dragon in Han Chinese culture symbolizes power and vigour, and the head of the dragon leads the rest of its body. Therefore, dragon head enterprises are powerful enterprises that lead the development of small-scale actors.

state is significantly involved in China's food system transitions. The state's recent food plans are motivated to address China's food challenges and achieve China's development milestones. I conceptualize the state-led food system transitions as high-modernist planned transitions. I incorporated the concept of high modernism because this concept helps explain the patterns and motives of the state's food planning. As the following chapters point out, China's planned food transitions embody the characteristics of high-modernist planning. In addition to the high-modernist planned food transitions, certain food transitions take place outside the plans. These unplanned economies emerge out of the needs and wants of local communities. This thesis closely discusses new farmers. The contrast between planned and unplanned food system transitions captures the main food transition dynamics in China. I argue the planned/unplanned framing explains the dialectical process within China's food system transitions better than the food regime/food movement framework (Holt-Giménez and Shattuck, 2011), because it highlights the central role of the state rather than corporates. To understand the relations between the planned and unplanned food activities, I propose to the phrase of government-centered partnerships, where planned actors build formal partnerships with the government through certificates and programs, and unplanned actors build informal social networks with government officials. Another advantage of adopting high modernism to examine the patterns in China's food system transitions is that it situates the current dynamics in China's historical context of modernization. The limits and costs of high modernist planning indicate that a different course of modernization is needed if China is to

meaningfully address existing and emerging food challenges. The next chapter reviews the research methods I employ to operationalize concepts in this chapter.

Chapter 3 Research methodology

3.1 Data collection overview

This research adopts a qualitative approach to data collection, coding, analysis, and presentation. In the stage of data collection, I combined semi-structured interviews, evaluative site visits, policy reviews, and aggregated publicly available social media posts pertinent to my case studies. With consent from respondents, some of the interviews were recorded. I translated and transcribed interview recordings and uploaded the data onto NVivo. Interviews that were not recorded were manually typed in by field notes and uploaded onto NVivo. On NVivo, all qualitative data were then integrated into three files, namely interview analysis, policy analysis, and social media analysis. The notes taken during site visits were integrated with the interview file and used to complement the observations and reflections of interviews. Subsection 3.4.2 introduces my coding scheme on NVivo and how the coded data are applied to answer my research questions.

In addition to the qualitative data, I collected available GPS coordinates information of all storefronts of the new retail business CloudKitchen (details in Chapter 4). The GPS coordinates were used in ArcGIS Pro software to generate two maps that reflect the spatial distribution and density of CloudKitchen's retail stores in the city of Nanjing. The map visually reflects the rapid expansion of CloudKitchen's retail stores.

As an overview of research timeline, I conducted in total 20.5 weeks of fieldwork throughout this thesis project. More specifically, fieldwork took place in three years: 2016 (8 weeks), 2017 (10 weeks), and 2019 (2.5 weeks). In 2016, I conducted most interviews together with my colleague Danshu Qi with ecological farmers, government officials, and civil society organizations related to ecological agriculture. During 2017, during fieldwork I focused on observing the wet market upgrading project unfolding at different wet markets and on interviewing wet market vendors and consumers. During 2019, during fieldwork I focused on mapping the emerging new retail businesses and on interviewing staff, managers, and farmers on their perceptions on new retailing and its impact on food systems.

In this thesis, my data analysis is based on 89 semi-structured interviews (our research team conducted over 89 interviews but this thesis analyzes just the 89 relevant data) with farmers, wet market vendors, wet market managers, retail staff and managers, organic food consumers, government officials of various administrative levels, university professors, and civil society organizations such as food magazine editors. All 89 interviews were governed by the ethics clearance issued by the University of Waterloo ethics office. To avoid the identification of any individual respondent, in this thesis all names of individuals are pseudonyms. I intended to maintain the anonymity of respondents so that they did not have to refrain from expressing their honest opinions of the government plans. Names of the businesses, organizations, and locations presented in this thesis are real names learned during the fieldwork.

Details on how research data are retrieved, coded, and interpreted are detailed in the methods section of each manuscript chapter. In the subsections below, I focus on explaining the rationale of selecting the above research methods and their strengths and constrains.

3.1.1 Semi-structured interviewing

In my fieldwork, semi-structured interviewing was the major means of data collection. In the pilot stage of the research with ecological farmers, surveys were handed out to respondents to collect basic information with multiple choice questions. However, after a few attempts I found that most respondents displayed low willingness to fill my surveys by hand. Respondents commented that filling surveys would interrupt the flow of conversations and create social distance between researcher and respondent. Some respondents declined the survey and instead requested that all survey questions be verbally communicated. At that point, I decided to instead rely on the interviews only. Having learned the low willingness among respondents to fill surveys, I decided to stop surveys and to integrate survey questions into interviews. Nonetheless, I am aware that my research would benefit from triangulation between interview data and survey data. If I were able to collect data by surveying a large sample of respondents, it would strengthen the robustness and representativeness of my findings. However, due to time constraints of each field trip, it was not feasible to conduct surveys in a statistically meaningful size, and I relied on interviewing as the main data collection method.

I selected semi-structured interviewing because it is the most appropriate interviewing method for my research context, compared to other interview formats. On the continuum between unstructured interviewing and structured interviewing (Dunn, 2000), semi-structured interviewing allows more flexibility than the structured interviewing. The flexibility in interviews was important to my research because sometimes respondents brought up valuable and salient insights beyond the scope of my prepared interview guides, and I would follow-up with impromptu questions rather than only sticking with the original questions. On the other hand, I found semi-structuring interviewing to be more feasible and reliable than unstructured interviewing, especially because the interview guides were useful reference points for me to reorient conversations once they deviate from the research themes.

3.1.2 Evaluative site visits

Visiting respondents' activity space before approaching them for interviews was a critical step for me to determine the optimal time and occasion for interviews. When time permitted, I would conduct non-obtrusive observation prior to the commencement of respondent recruitment and interviewing. For example, I paid visits to wet markets and new retail businesses to familiarize myself with the environment to determine when they were least busy and more likely to accept an interview request. During the non-obtrusive observation, I would pay close attention to all actors in the scene and attempt to understand the relations between the potential respondent group and other actors. During the site visits to retail stores

(see details in Chapter 4), I collected and compared information of food prices and food varieties between different retail businesses. These data were collected by observation and note taking instead of conversations. Seeing with my own eyes helped me compare and contrast the visual order between food spaces that were planned and those that were unplanned. Furthermore, site visits were beneficial to my "settling in" phase of the fieldwork, during which I became familiar with local dialect and food lexicon spoken by local respondents in Greater Nanjing Region.

3.1.3 Policy review

Policy review consists of coding of the most relevant policies regarding the planning and organization of food practices in response to the modernized food challenges. Three sets of food policies are reviewed for this thesis, respectively pertaining to the Vegetable Basket Project, agricultural development, and city appearance management. Some of these policies have a long history. I analyze the policy history not by developing a laundry list of what happened in the past, but by synthesizing the trends in historical policies to understand the context for recent policy changes. In Table 11 below, I list the recent policies that reflect the characteristics of state-planned food system transition in Nanjing and are coded on NVivo.

Table 11 Policies coded during research analysis

Policy name	Issued by	Year(s) published

Nanjing 2018 Vegetable Basket Project Work Agenda	Nanjing Municipal Government	2018
Nanjing 2017 Vegetable Basket Project Work Agenda	Nanjing Municipal Government	2017
Nanjing New Vegetable Basket Project Report (2013-2017)	Nanjing Municipal Government	2013-2017
Nanjing Vegetable Basket Project Development Plan (2008-2012)	Nanjing Municipal Government	2008-2012
National Sustainable Agriculture Development Plan (2015-2030)	Ministry of Agriculture	2015
Nanjing Modern Agriculture Development Plan (for 13th five-year plan)	Nanjing Municipal Government	2015
No. 1 Central Document	Central Committee of the Communist Party of China	1999-2020

3.1.4 Social media (*Weibo*) review

Review of online discourse entailed sources of information from business websites, news media, and public information posted on China's twitter-like social media platform, *Weibo*. The business websites I accessed are the official websites of ecological farms and new retail businesses. I "datamined" news coverages on the businesses I studied in the Chinese language media in order to verify respondents' statements about these businesses. On *Weibo*, I accessed and reviewed all public posts with the hashtag 云厨一站 (CloudKitchen) in order

to follow up on the recent scandal. In total, 47 Weibo posts and 580 discussion comments embedded in these posts were analyzed.

3.2 Data analysis methods

3.2.1 Fieldnotes, translation, and transcribing

With the consent of respondents, I retained the audio-recording of interviews. If respondents declined the request to record the interview, I would only take notes. After the interview was completed, I would do an oral briefing to my recorder on key takeaways. The audio files were then transcribed and integrated with my field notes.

3.2.2 Coding scheme

My coding scheme follows the guideline of two-step coding (opening coding and focused coding) by (Hsiung, 2010). The purpose of the two-step coding is to organize and analyze the qualitative data in order to capture themes and narratives that shed light on the research questions. Opening coding is the first step of the two-step coding process. In this step, the researcher closely reads the transcript and code any word, phrase, and sentence that are relevant to the research questions. Based on the codes, themes and analytical categories are identified. Themes are not based on just one respondent's data but synthesized from patterns in the whole data. Coded data can then be reorganized by the themes.

The second step of the coding process is focused coding. During focused coding, the researcher re-codes the transcripts organized by themes, and uncovers variations and interconnections within coded data. Analytical categories are generated so that the researcher can compare and contrast the variations within data of respondents from different categories. Such categories can be gender, class, ethnicity, income levels, or other social and economic feature. Variations and interconnections can reflect the heterogeneity of respondents' experience and enrich the understanding of the research topics.

Examples below demonstrate how I employed the two-step coding process to analyze the research data in order to analyze my research questions. During the process of open coding, I closely read interview transcripts, policy text, and *Weibo* posts, and coded any information relevant to my research question by marking relevant information as new "nodes" in Nvivo. The coded data below is from a new farmer operating in small scale and on scattered pieces of land. She informally leased the land pieces based on oral agreements with local farmers. Her total leased land added up to only 40 mu (less than 3 hectares). I asked respondent how her relations with the local government affect her farming. She responded below during an interview.

Interviewer: does the government currently have any programs for small farms like yours?

Respondent: No. I don't know about them. They probably don't know about us either. We are on our own. I know a guy working at Lishui land service department. I consulted

them about land transfer, they told me to call the Economic Management Office. I called the Office, but they told me to call a different government department...Therefore, I think I still need to find an acquaintance and use personal network (to formally transfer land).

I coded the above text with a node named "a small-scale new farmer felt marginalized by government and considered using personal network to transfer land".

After performing open coding on a group of interviews, I found that government relation was an important theme because different stakeholders expressed very different opinions about government relation. For example, Laofang Grape Farm was a large grape farming complex and was awarded the title of dragon-head enterprise by the local municipal government. It was part of the local government's plan for agricultural development and vertical integration. When asked about the government relation, the staff at Laofang mentioned that the government greatly supported them by advertising their farm, encouraging tourism through a grape festival, and subsidizing greenhouses and agrochemical inputs. The stark contrast between the above two respondents' answers under the theme of government relation warrants further analysis. Therefore, in focused coding, I paid close attention to variation of government relations in the coded data.

During the process of focused coding, I re-organized the NVivo nodes built by open coding. First, I created parent nodes based on key themes identified during open coding.

Second, I dragged and dropped the nodes I created into the catalogue of parent nodes. These moved nodes then became child nodes. When clicking on one specific parent node, all its child notes unfold, and they display information about the same theme but from different transcripts. This reorganization allows me to easily capture the variation and interconnections of comparable information between different transcripts. For example, I created a parent node called *government support*. The abovementioned child nodes about government support are moved into this parent node. I compared all child nodes about *government support* to analyze the variation and interconnectedness between the response from different research participants.

The two-step coding was pivotal to my approach to the research questions. Parent nodes helped me narrow down a group of analytical themes. Child nodes helped me elicit the differences between data between different analytical categories. These nodes helped me link the concept of high modernist planning with the prevailing patterns in China's food system transitions. More specifically, under the parent node *technological advancement*, I found that the state-planned transitions focused on technical innovations, including new fertilizers, new infrastructure, and new farm tools. Non-state farming initiatives exercised social innovations such as CSA models and partnership building with adjacent conventional farmers. Through the parent node *social and visual order*, I found that the government encourages visual order and punishes disorderly activities in food systems. From example, the new retail businesses had renovated storefronts, implemented supermarket-like layouts and packaged all foods

individually. They used standardized, clean appearance to symbolize modernity and visual order, and they were rewarded by government support. In contrast, the pre-upgrading traditional wet markets in Chapter 5 were less visually impressive and were deemed "backwards" by the government, and thus were subject to renovations and remaking.

Coding was performed on the original data in the Chinese language. Despite my effort in capturing the nuances between two languages during translation, I found it challenging to retain the subtleties and undertones conveyed by the syntax of respondents' original wording. Therefore, to integrate the subtleties into analysis, I use the original Chinese language data in the process of coding and translated them into English when presenting them in the thesis. To show the voice of respondents, I translated respondents' verbatim quotes as best I could, with the intention of retaining the original meaning and tones of their speeches.

3.2.3 Map generation via ArcGIS Pro

The ArcGIS Pro software is used to process the geographical information and to generate digital maps for Chapter 4. In a spreadsheet I organized the addresses of the store locations and vendor locations, and then I used the online Gaode Map toolkit to convert the addresses into coordinates. The coordinates are then inputted into the ArcGIS and converted into a shapefile. The shapefile is combined with the municipal and district map data to export as figures such as Figure 2 Distribution of CloudKitchen stores in Nanjing (city scale) and

Figure 3 Distribution of CloudKitchen stores in central Nanjing (zoomed in) in this thesis, which give a visual impression of the rapid expansion and spatial prevalence of the storefronts of new retail business in Nanjing.

3.3 Ensuring rigour throughout research

"Without rigour, research is worthless, becomes fiction, and loses its utility" (Morse et al., 2002: 14). In this section, I introduce the recipe for strengthening rigour in my research. Research rigour comprises of four pillars: credibility, dependability, transferability and confirmability (Lincoln and Guba, 1985). Below I first briefly explain these pillars, followed by a description of measures I took to implement them in my research. Credibility describes the confidence of researchers in the truthfulness of research data and interpretations. Transferability refers to the applicability of research findings and conclusions in a comparable but different research setting. Confirmability is to assess whether research data derive from the voice of respondents and free from the subjective assumptions and biases of the researcher. Dependability describes the independence of data from the role of researcher so that data could be replicated by a different researcher following the exact same research procedure. In a qualitative research, confirmability and dependability overlap and both premise on the (relative) independence between the subjective knowledge of researchers and knowledge acquired from respondent statements. Because these two parameters are intertwined, I review them in one sub-section, and since they are linked to the positionality of a researcher, I also review that factor in the same section.

3.3.1 Credibility

Researchers have identified measures to improve the credibility of qualitative research. For example, Shenton (2004) argues that a researcher could develop familiarity with the culture of respondents to reduce miscommunication resulting from cultural differences. Born and raised in China, I was entrenched in the Chinese language and culture and I did not encounter much cultural shock in the way that a researcher doing cross-cultural communication would. However, cultural differences exist across regions of China and between rural and urban areas. With different respondent groups, the appropriate topics for ice-breaking varied. Unless I gained contact of a respondent through someone else's introducing, I would spend time before recruiting a respondent observing the interactions and exchanges within respondent groups to gain a sense of the common conversation topics. These observations helped me devise my ice-breaking strategies on the first contract of potential respondents.

Another strategy to enhance credibility is through triangulation of data analysis through peer debriefing (Shenton, 2004; Lincoln and Guba, 1985). For example, for the case of ecological farmers, I conducted most interviews in collaboration with my colleague Danshu Qi on the case of ecological farmers. Following the interviews, we usually exchanged our thoughts and interpretations of respondent feedback and attempted to pool opinions and discussed differences in our interpretations. This process also helped us overcome some misunderstanding of respondents' words.

3.3.2 Transferability

One way to ensure the applicability of research findings into other contexts is through comparing the data with relevant research in other settings to determine the similarities. As Shenton (2004) argues, comparing and contrasting conclusions with research applying similar methods but different environments is a good way to examine transferability. In my analysis of new farmers, I compare my findings with research in Nanjing, around other Chinese cities, and regions in the global context.

Another measure to improve transferability is thick description (Lincoln and Guba, 1985). This method compels researchers to establish a full and comprehensive account of the research context, which adds to the possibility for readers to apply conclusions in other environments (Shenton, 2004). As advised by the method of thick description, I endeavour to provide information on the number of respondents, the geographical and cultural features of the research site, methods of data collection, number of length of data collection, and data processing methods. Through fleshing out these procedural details, I aim to reduce obscurity in research process and to increase the transparency of contextual conditions of my research.

3.3.3 Dependability, confirmability, and researcher positionality

Dependent on specific timing and environment where the research took place, it is unlikely to guarantee that results of qualitative research can be duplicated if a different researcher followed the same formula to study the same respondent group. Social structures are fluid

and the life of respondents is evolving, so some differences in research results are inevitable. Regarding confirmability, the relations between the researcher and respondents, more particularly, the power dynamics unavoidably affect the "truth" heard by the researcher.

As Miles and Huberman (1994) argue, the first step of addressing confirmability is to acknowledge the positionality of researchers and the next step is to address potential limits brought by the research's positionality. In this section I reflect on my positionality and identify the limits in data collection due to the interpersonal dynamics between the researcher and the respondents.

My positionality as a researcher is complicated. I was not seen much as an outsider, but I was not entirely relatable in the eyes of an insider. As I mentioned before I did not face the culture shock, but differences in education and age, and the fact that I was conducting the research as a student studying in Canada increased the social distance between myself and some respondents.

Similar to what Zhao (2017) articulated by in-betweenness, I identified that the line between insider and outsider especially obscure for returning researchers. My fieldwork took place in Nanjing, a Chinese city 1,000 kilometers away from my hometown. Although Nanjing has historically been China's melting pot with a good portion of internal migrants, local Nanjing residents could detect my outsiderness through my lacking knowledge of local dialects and

street names. Just as in other Chinese cities, being an out-of-towner (*Waidiren*) is an important identity marker. During the interactions with locals, I was regularly asked where I was from. However, with my respondents the identity as an out-of-towner resonated better than as a student studying abroad (*Liuxuesheng*), as I will explain below.

When I introduced myself to respondents, I informed them of my affiliation with a Canadian university and I soon realized that this information led to confusion and occasional alienation. To raise some examples, in the beginning of one interview with a wet market vendor, my respondent explicitly said “your father must be very well-off” after telling him I was a student from a Canadian university. I realized that the fact of me studying abroad could have been interpreted as a class marker that highlights the differences between the respondent and me. During another interview, my respondent recalled his own experience of studying abroad in Australia. Just as I expected to hear empathetic anecdotes about living abroad, the conversation took a surprising turn. My respondent belittled the value of studying abroad but claimed that studious students ended up in the mediocre state and clever students like him who paid other hard-working students to get the work done achieved more success. Other such examples helped me realize that my experience overseas was susceptible to evoking misconceptions of my identity, especially the image of a rich, opportunistic “second generation" (*Fuerdai*). This stereotype depicts privileged socio-economic status associated with poor academic performance and subpar work ethic. Perceived as the privileged Other, I discerned that some respondents were less open to sharing their lifeworld experiences.

During self-introduction, I also mentioned that I was collaborating with Nanjing University, and most respondents found this affiliation more relatable than with a Canadian university.

Besides the outsider-insiderness, the other factor affecting my positionality is gender. However, I did not sense that my gender led to fundamental difference in the interactions with respondent. Even so, gender did affect respondents' perception of me as a researcher because respondents sometimes expressed gender assumptions. For example, during one interview, a male organic food retail staff agreed about me conducting interviews with consumers coming in his store, but he strongly advised me to only recruit female consumers for interviews. In his rationale, female consumers have more patience than male counterparts and thus are of low risk to invite for interviews. Although this example only indirectly reflects one respondent's assumptions based on gender roles, these gender-based assumptions could have affected the stories and opinions shared by respondents overall.

3.4 Justification for studying the peri-urban Nanjing region

I selected Nanjing as the site for fieldwork primarily for two reasons. First, the development of the ecological sector in medium-sized cities in China is less studied than the metropolis at the forefront of development such as Beijing and Shanghai. Existing studies in Beijing and Shanghai provide important insights into the pioneering developments of the ecological food sector in China (Cody, 2019; Ding et al., 2018), but I argue that due to the geopolitical particularity of Beijing and Shanghai and their much-above-the-average extent of

globalization and unique geopolitical status, their cases may not resemble with other Chinese cities. Nanjing, however, has economic conditions and urbanization status comparable to more Chinese cities, and findings in Nanjing are more representative.

The second reason for selecting Nanjing can be attributed to its vibrant innovations across the food supply chain. China's first organic food development and certification agency, Organic Food Development and Certification Center (OFDC), was founded in Nanjing in 1994. OFDC not only was involved in designing the national organic standards, but was also responsible for certifying organic farms and providing consulting services. Diverse groups of organic farms and new food retail businesses have emerged in the past decade, and policy innovations happened in Nanjing such as the upgrading programs for wet markets. The city has also deployed one of the most comprehensive plans in China to achieve urban food security and food safety (Si et al., 2016). These policy innovations and grassroots improvisations in Nanjing provide rich information on the latest trends in the state-planned versus non-state food system transitions. Collaborative relationships between my research team and Nanjing University have enabled knowledge exchange with the local researchers.

3.5 Summary

This chapter has reviewed the key methods that informed the design and operation of my thesis research and my articulation of research findings. Based on analysis of research data, I propose to understand the patterns in China's dual food system transitions by two transition

pathways: the government-planned transition pathway and the non-state transition pathway. I distinguished this framing of dual pathways with the food regime/food movements framing (Holt-Giménez and Shattuck, 2011) by pointing out that in China the Chinese state is at the center of decision-making of the transition pathways. Unlike the corporate food regime, overall food businesses in China serve the state. I propose to adopt and adapt the concept of high modernism (Scott, 1998) to understand the fashion and focus of the state-planned transition pathway, because this pathway prioritizes technocentric solutions to social problems and emphasizes speed, scale, visual order and uniformity. Empirical observations in Chapters 4, 5 and Chapter 6 explain how these priorities are implemented by government support of new retail businesses, wet market upgrading and ecological dragon-head enterprises. Chapters 4, 5 and 6 also highlight the implications of the government's high-modernist planning and explain how the outcomes deviated from the original plan. Chapter 6 showcases the social improvisations of small-scale new farmers. Empirical findings show that although these unplanned food activities lack technological advancement, speed, scale, and visual order, they make it up by directly addressing the needs and wants of citizens in a functional order. To stress the centrality of the state in China's food system transitions, I conceptualize the stakeholder relations in China's food system as government-centered partnerships. Chapter 4 illustrates the partnership between the local government and a large new retail business. Chapter 5 unveils the importance of private relationships between wet market managers and local government officials. Chapter 6 compares the availability of government support to dragon-head enterprises and small-scale new farmers. Overall, large

food businesses are more likely to build formal partnerships with the government and obtaining official recognition and designation, while some grassroots initiatives benefit from personal connections with local government officials.

Chapter 4 Government Planned Food Retail Transition and New Retail Businesses (NRBs) in Nanjing, China

4.1 Introduction

In China, a recent flood of financial investment from tech/internet giants into the fresh food sector has caught the attention of the public, the state, and business analysts. The COVID-19 pandemic and quarantine measures further enable the e-commerce platforms to gain a foothold in the fresh food sector. Based on a survey of 5013 consumers by Mckinsey, 74% of Chinese consumers visited online grocery channels more frequently at the onset of the pandemic and 55% are likely to continue buying more food online after the pandemic subsides (Zipser and Poh, 2020). This analysis also shows that online food sales in China had monthly growth rates consistently above 25% between April 2019 and September 2020. The growing prevalence of online platforms in the fresh food sector indicates behaviour changes among grocery shoppers and potential transformation of China's food retail sector.

Alongside the entrance of e-commerce platforms into the fresh food sector, a new food retailing format known as New Retail Businesses (NRBs) has emerged in major cities in China. The innovative features of NRBs include the integration of online and offline food sales channels (Shi et al, 2019, Wang and Ng, 2018) and the provision of dining-in services (Zhang and Wei, 2018). The existing studies on NRBs in China have focused on how NRBs' technological and commercial innovations affect consumer perceptions of and the business

efficiency of this new retail format. As of this writing, there has been little scholarly work on the economic and political forces underpinning NRB development, let alone the broader implications for food security, food safety, and the sustainability of local food systems. This thesis chapter attempts to address this knowledge gap in the literature by documenting and analyzing the development of one dominant NRB in the city of Nanjing and by revealing the government planning and support underpinning this NRB's development. **With this case study, this chapter also highlights the impact of NRBs on the fresh food sector, food security, food safety, and the sustainability of the local food systems.**

In Nanjing, the official government support to NRBs is channeled through a partnership based on the Vegetable Basket Project (hereinafter "VBP-NRB partnership"). The Vegetable Basket Project (VBP) is a central food system planning policy in China (Zhong et al, 2019), its implementation at the municipal level provides financial support for the expansion of retail stores of some NRBs. VBP is implemented in a top-down manner and holds the mayors of 36 enlisted cities accountable for urban food governance. Mayors are evaluated by a set of performance indicators from food security, food safety, to greening in production and consumption. This chapter highlights the comprehensive food retail planning in China and critically assesses its merits and disadvantages in addressing China's most pressing food challenges in combination with the NRBs, by reviewing the policy framework, political process, and performance indicators of VBP.

Various studies have shown that food is an invisible element in traditional urban planning in the Global North, leading to a growing emphasis on the importance of food system planning (Morgan 2009, 2013, Pothukuchi and Kaufman 1999, 2000, Vitiello and Brinkley 2014). By contrast, food provisioning in urban China has a tradition of being centrally planned and managed, and this legacy continues to steer food system development (Zhang and Pan 2013). Researchers have recently highlighted the continuing role of public interventions in governing food security and food access in Chinese cities (Lang and Miao, 2013, Zhong et al., 2019). Particularly, Zhong et al. (2019) examine the "public-private hybrid food provisioning system" which contributes to achieving close to zero hunger in Nanjing, a city with a population of over 8 million. **However, questions remain regarding how municipal food planning affects food safety and food system sustainability, particularly with the advent of NRBs.**

This chapter examines the joint role of NRB and VBP in shifting the food retail environment in Nanjing using the analytical lens of high-modernism. The concept of high-modernism characterizes the local government's approach to reshape the food retail environment. More specifically, the local government intends to promote food retail formats that integrate online sales channels, adopt standardized management, and maintain modern appearance, which align with the government's aspiration of making an innovative and beautiful city (see 2018-2035 Master Plan of Nanjing).

This chapter examines how the NRB-VBP partnership is steering a retail sector transition at a municipal level to address the needs and challenges in the local food system. In particular, this chapter analyzes the impact of this partnership on the status of food safety, food access, environmental sustainability, and the development of the local ecological food sector. Food safety has been a prevalent challenge across the country. In Nanjing, a survey of 1,170 households found that over three quarters of residents worry daily about health risks in food such as input residues, adulteration, and counterfeit foods (Si et al., 2018a). Food access has been a longstanding priority in the city's food planning, as the VBP prescribes a requirement of the spatial density and distribution of fresh food retail outlets in the city. NRBs are included in the VBP's work plan to fulfill this requirement. Additionally, NRBs have the potential to make ecological foods affordable and accessible. However, as this chapter reveals, this potential is undermined by contradictions between the ecological claims and actual practices among NRBs. This chapter argues that the NRBs studied are mostly a disruptive force to the local retail environment and have only superficially addressed the local needs of food safety and food access. Instead, they posed new challenges to the sustainability and stability of the local food system by causing the investmentization of everyday grocery consumption, creating a false impression of food safety guarantee, worsened the pressure of municipal waste management, and undermined the independent small-scale ecological sector. The local government's high-modernist governance approach indirectly compounds these challenges.

The remainder of this chapter is organized as follows. First, it introduces the research design and methods. The following section describes the etymology of New Retail Businesses in China and compares NRBs to conventional food retail actors. Then the Vegetable Basket Project and its role in the development of NRBs is examined. The penultimate section analyzes the pros and cons of NRB-VBP joint efforts in a transitioning food retail sector. Finally, key research findings and avenues of further research are identified.

4.2 Research approach

This chapter centres on three research questions. The main analytical question is (a) how effective are NRBs in addressing the needs of food security, food safety, and local environmental sustainability? The secondary analytical question is (b) how is the government's high-modernist planning impacting the development of NRBs? The third research question sets up the context for the first two questions–(c) how to characterize NRBs in contrast to the conventional food retailing sector?

To address these questions, four NRBs were studied during fieldwork in the city of Nanjing: two large chains (CloudKitchen and Hema) and two smaller businesses (VillageMarket and Joynow). I conducted non-participant observations within sampled NRB stores to identify the features of food packaging, pricing, and green advertising. I conducted semi-structured interviews with key stakeholders working for the local government's VBP and staff working

at the four NRBs. To examine the effects of NRBs on food security, safety, and system sustainability, I compared the actual practices of NRBs with their advertising claims and analyzed consumer opinions of NRBs through online public posts on *Weibo (*a widely used social media platform, the Chinese equivalent of Twitter). The NRB advertising claims were extracted from their marketing taglines and promotional materials.

Field research data was first collected in November 2017 and primarily between April and May 2019. Interviews at CloudKitchen were conducted with five retail staff, one production manager, and one procurement manager with his assistant. Three sales staff at VillageMarket and one at Joynow, were also interviewed. I had informal discussions with retail staff at Hema. To draw comparisons between NRBs and organic businesses, 11 sales staff and a marketing manager at local organic enterprise, Planck, were interviewed. To understand the political support underpinning the growth of NRBs, the chief coordinator for the implementation of the Vegetable Basket Project in Nanjing, which supports the growth of enrolled NRBs, was interviewed. To investigate connections between NRBs and local ecological farms, four local organic farmers were interviewed about their interpretation of NRB models and inclination to collaborate. Two were small-scale organic farms and two were large certified organic enterprises. For the online research on NRB business development and consumer *weibo* analysis, the following were scanned: four NRBs' websites, their WeChat (most used communication mobile app in China) public profiles, and their self-developed mobile apps where applicable. *Weibo* "tweets" hashtagged under NRB

names were scanned for information about consumer perceptions of NRBs. *Weibo* analysis particularly focuses on CloudKitchen because of its recent investment scheme controversy. As of August 2019, in total I analyzed 47 *Weibo* posts and 580 discussion comments embedded in these posts.

4.3 Etymology of "New Retail" in China

In China, the phrase New Retail was coined in 2016 by Ma Yun (also known as Jack Ma), the founder of e-commerce giant Alibaba (Wang and Ng, 2018; Zhang and Wei, 2018). During a public speech, Ma Yun introduced the concept as an innovative business prototype: New Retail is new because it erases the boundary between online stores and brick-and-mortar stores, and positions physical stores as delivery hubs for online orders (Aliyun, 2017). Through stimulating online food shopping, Alibaba aims to reanimate the recent sluggish growth in its e-commerce during 2010s (Wang and Ng, 2018). The Alibaba Group is one of the world's largest retailer, e-commerce, and internet companies. Subsidiary platforms of Alibaba such as Taobao and Tmall provide one of the largest online marketplaces in China that sells goods of all types. Alibaba's entrance into the fresh food sector is marked by its creation of the new retail chain Hema (Hema Xiansheng in Chinese, which directly translates as hippo fresh food). High-end fresh food is the main feature of Hema, while it also shelves other fast-moving consumer goods.

Alibaba's competitors promptly launched their own counterparts to Hema. At the beginning of 2017, China's fifth largest supermarket chain Yonghui (YH Group) launched an NRB SuperSpecies, under the banner of Smart Retail. In 2018, Alibaba's e-commerce rival Jingdong (JD) piloted its project 7Fresh in Beijing, touting its invention of "borderless retail" which mirrors Hema's philosophy of online/offline integration. These NRBs spread across the country in similar fashion. First, they established roots in China's first-tier cities[5], and then gradually replicated in less affluent cities. Overall, these competing retail businesses embody similar concepts and business practices, albeit giving nuanced names to their business models. They have usually been discussed and contrasted as variants of NRBs among business reports (e.g. EqualOcean, 2019 and Econsultancy, 2019).

Behind the competition between different NRB chains is the rivalry between China's two largest internet giants–Alibaba and Tencent, as several media analysis points out (Forbes, 2018; 36Kr, 2018; KrASIA, 2019). Tencent is one of the world's largest social media, e-commerce and investment companies. It mainly provides internet-based services such as communication, entertainment, and technologies. Tencent's investment in new retail businesses indicates its recent entrance into the fresh food sector. Because the founders of both internet conglomerates are surnamed Ma, meaning horse in Chinese, this rivalry has

[5] Unofficially but commonly done, mainland Chinese cities are hierarchically classified into different tiers. First-tier cities are the largest and most economically developed cities in China. Usually, they refer to Beijing, Shanghai, Guangzhou, and Shenzhen.

been dubbed a two-horse race (Fortune, 2018). As noted above, Alibaba is the parent company of Hema. Tencent holds significant stakes in Hema's competitors–Superspecies and 7Fresh. Therefore, the NRBs have been divided by media into the Alibaba circle or Tencent circle (Figure 1). There is shared trade and logistical collaboration between businesses within the same circle, but rarely across the two circles.

Figure 1 Shareholding relations between NRBs and parent companies

Source: made by author

As the concept of NRBs has gained traction, regional food companies have begun to associate themselves with it for marketing purposes. In the city of Nanjing, local food retail chains have strategically adopted the title of New Retail in their branding. For example, the largest Nanjing-based new retail business, CloudKitchen, was initially named Babuluo E-commerce Company. In 2017, it updated this name to CloudKitchen New Retail Company.

The NRB concept also caught the attention of a host of English-language business analytics including the Harvard Business Review (2018) and consulting firms such as Bain and Company (2018) and Oliver Wyman (2018). These reports depict Alibaba's NRB debut as a world-wide pioneer, foreshadowing the future of food retail in a globalized digital economy. Studies of the "Amanzonification" of the food economy reveals parallel innovations led by Amazon (McKee, 2018), although Alibaba has some advantages in fresh food marketing over Amazon. To name one of them, many of China's 800 million mobile internet users use Alibaba's e-payment and online shopping services. It remains to be seen whether China's NRB model will extend beyond China as Alibaba and other transnational internet corporations expands its global services and as the world embraces mobile apps and delivery in grocery shopping.

4.4 Characterizing NRBs

This section describes the features of NRBs which distinguish them from conventional retail businesses. Based on the geographical distribution of storefronts, I categorize NRBs in China

into two subgroups: national NRBs and local NRBs. NRBs in each group share more similarities than they do with the other group. National NRBs are dispersed across the country rather than agglomerated in any one city. Examples are Hema, Superspecies and 7Fresh. In contrast, local NRBs are mostly located in one city (Nanjing in this chapter), with a small number of branches in other adjacent cities. In this chapter, examples are CloudKitchen, VillageMarket, and Joynow.

4.4.1 National NRB: example of Hema

Hema shelves fast-moving commodities in addition to fresh foods and packaged foods. Regarding fresh food, Hema sells various types of food with different grades. For example, for certain vegetables, it provides fresh foods with no certifications, certified for export to Hong Kong (with extra requirements on quality control and management standardization), and certified organics. One of the distinguishing features of Hema is its seafood kitchen where customers could order living seafood in fish tanks and have it cooked in store. Some of the seafood are imported and expensive, targeting middle class consumers.

Vegetables at Hema are sold in various categories including Best Deal, Daily Fresh, Hong Kong export or Organics. Its line of Daily Fresh claims to supply food even fresher than at wet markets. As of May 2019, in total 43 varieties of leafy greens, legumes, tubers, mushrooms and fungus fell into this category. As the name suggests, Daily Fresh claims that its foods are shelved the same day they are harvested. Also, they only stay on the shelf for

one day before being disposed as garbage (no compost programs). In contrast, the majority of wet market vendors procure food from wholesale markets and cannot guarantee that their foods are harvested the same day. Usually unsold food is stored in the fridge/on stall and sold with a discount or consumed by the vendors themselves before they go bad. The Daily Fresh mechanism of food handling may guarantee the freshness of food but also creates more food waste than wet markets do.

Organic foods at Hema in Nanjing are sourced from a local organic enterprise called Backto Farm. Similar to other certified organic foods on the market, they are consistently and significantly more expensive than non-organic foods. They are also certified with the most-strict standards of food production in China and are associated with good quality and low health risk.

The Best Deal line provides more affordable foods. Three vegetables below the average price levels of wet markets are in the Best Deal category (as shown in Table 12).

Table 12 Vegetable price comparison as of May 2019

	Produce price at different retail outlets (Chinese Yuan per 500 grams)

Produce	Market average (12 wet markets)	CloudKitchen	Hema	Hema Organic
Shanghai Bok Choy	2.4	2.9	1.4	23.0
Carrots	2.8	3.4	2.4	23.5
Broccoli	6.1	9.0	6.6	n/a
Crown Daisy	4.7	4.8	8.0	23.0
Green Chili Peppers	4.5	4.7	12.0	25.6
Celery	4.0	4.8	3.8	n/a
Romaine Lettuce	2.7	4.9	8.0	19.7
Chives	2.8	n/a	19.7	25.6
Edible Amaranth	3.2	5.8	7.0	23.0
Tomatoes	4.1	7.8	5.6	25.4

Colour coding indicates the price difference in contrast to the average level among 12 selected wet markets. The average level was monitored and published online by Nanjing Bureau of Commodity Price.

Green indicates lower than market average

Orange indicates higher than market average and the price difference is below 100%

Dark Red indicates higher and the price difference is between 100% and 500%

Sharp red indicates higher and the price difference is above 500%

Another distinguishing feature is the unit-based standardization of food assortment and quality control. At Hema, every vegetable is individually in plastic wraps and is priced by unit rather than by weight in order to demonstrate the standardization in goods management. For instance, during fieldwork I observed that two Daikon radishes were individually wrapped in plastic, and marked at the same price in spite of different weights. The sales staff explained that despite the variation in weight, no vegetables weighed less than what was on the label, so consumers suffered no loss. The standardization of food sales it meant to facilitate with fast delivery for online sales (one-hour delivery promise). Once an online order is made by the customer, one staff at Hema is assigned to manually pick the items included in the order. Having all food items packaged and priced by standardized units enables the staff to expedite the process of order preparation.

Overall, the national NRBs have abundant investor funds from China's largest tech giants and prioritize logistics innovations, high-end food marketing, and standardization for fast online delivery. They mainly target middle class customers who value convenience, novelty, and standardization in food packaging and sales.

4.4.2 Local NRBs

Local NRBs are similar to national NRBs in terms of their unit-based standardization and online-offline integration, and the local NRBs in Nanjing have new features such as community-based store planning, integrated supply chains, and affordable ecological foods. Ecological foods in China are officially certified by three progressively strict standards– hazard-free, ecological and organic. Local NRBs I studied carry hazard-free foods. CloudKitchen sells food of all three standards. As existing research argues (Scott et al., 2014), hazard-free food standards barely abide to any ecological standards in the international parameters, although certain highly toxic chemical inputs are forbidden in the cultivation of hazard-free foods. However, some NRBs misleadingly market their hazard-free foods as safe and ecological.

The fast growth of local NRBs in Nanjing is enabled by their relatively small-sized corner store model. A standard CloudKitchen chain store is around 100 square metres (Jiangsu Department of Commerce 2018), although most stores are below the standard size, and many are smaller than 50 square meters. VillageMarket and Joynow own similarly sized storefronts. Smaller size means smaller costs such as rent and employment. At local NRBs, only one or two employees tend the store. In contrast, each Hema storefront is between 5,000 and 10,000 square metres. Two of the Hema stores researched both have over 30 employees who were tending the shelves, ushering customers, cooking in the kitchen, and sorting items for online orders for delivery. The stark contrast in store size and number of employees

between local and national NRBs indicates that national NRBs commit larger initial investment and maintenance costs to each storefront.

CloudKitchen is the largest NRB in Nanjing, and its staggering growth occurred during a very short timeframe. In only three years from April 2016 to May 2019, CloudKitchen built 238 stores. The majority of the stores are clustered within the central urban districts (Figures 2 and 3). On its website, CloudKitchen claims that it serves 300,000 households and 800,000 members with further growth anticipated. The procurement manager at CloudKitchen mentioned that the company aims to expand further to 300 stores within the city, and to 1,000 stores in the greater-Nanjing region, stretching into adjacent cities such as Changzhou. Overall, the business model of CloudKitchen prioritizes speed and scale, both premised on continuous expansion of investment. To maintain the inflow of capital, CloudKitchen seeks investments from its parent company, government departments, and consumers. Growth in quantity of stores and scale of production also attracts consumer investment and government interest, leading to further expansion.

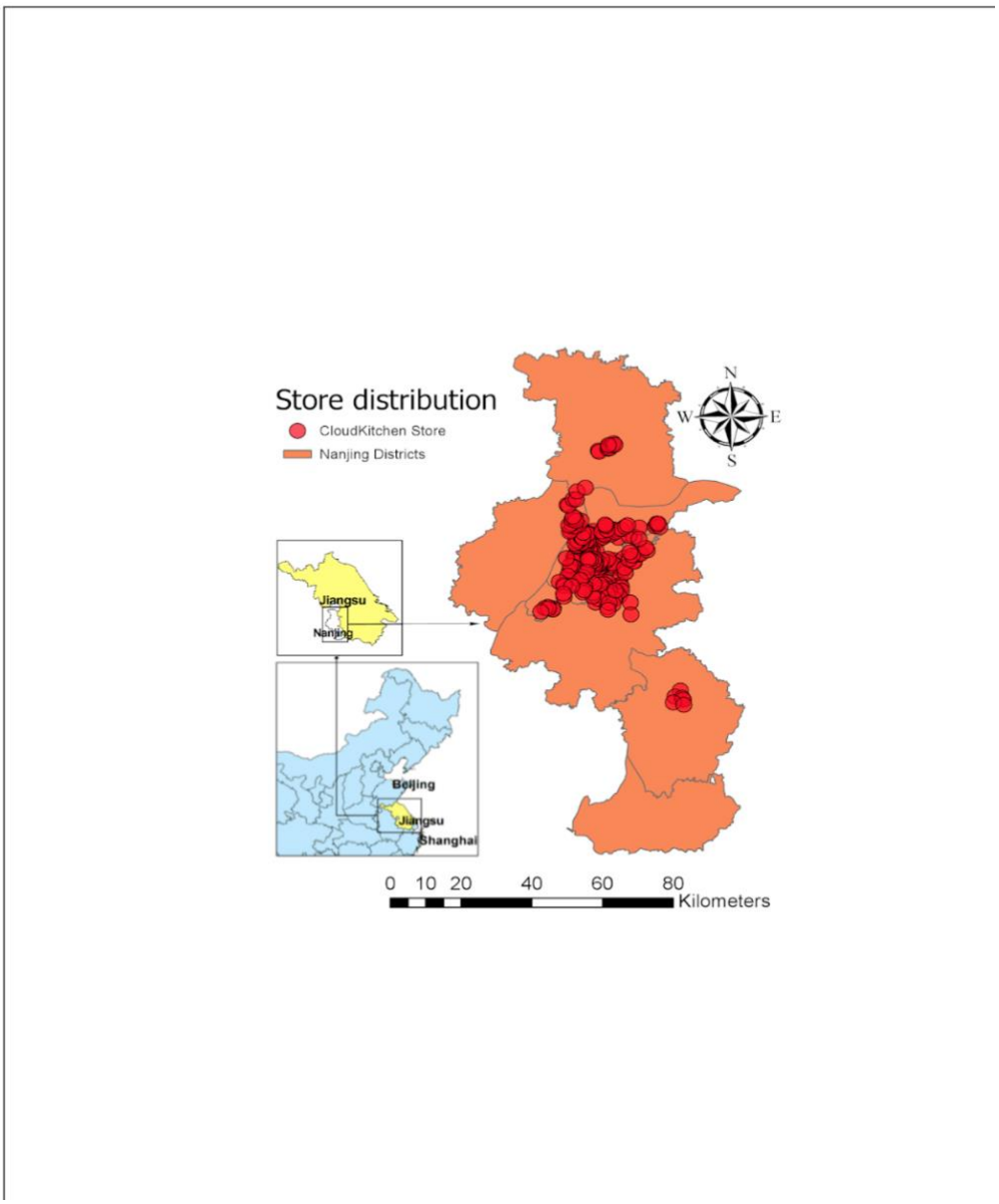

Figure 2 Distribution of CloudKitchen stores in Nanjing (city scale)

Source: author

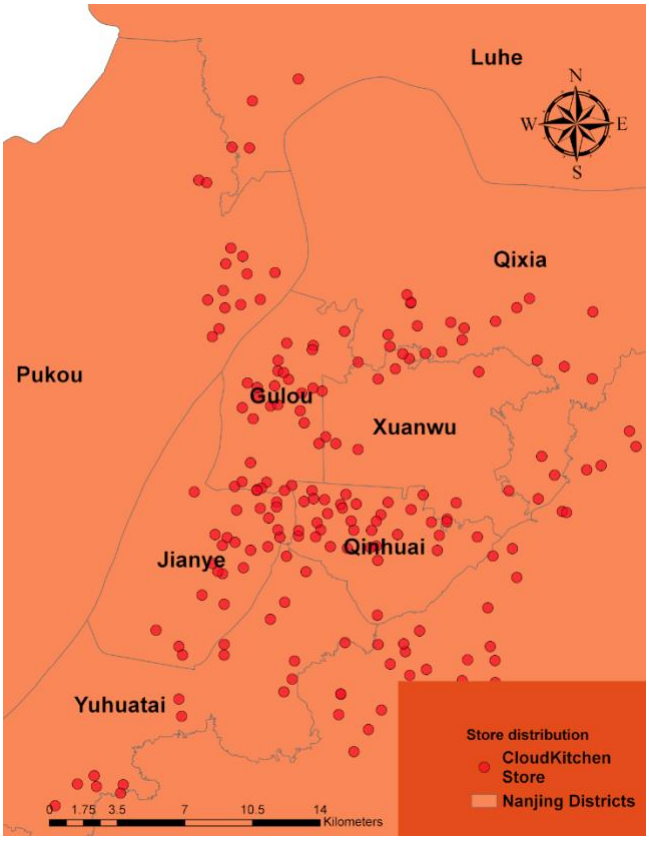

Figure 3 Distribution of CloudKitchen stores in central Nanjing (zoomed in)

Source: author

Local NRBs can be seen as corner stores not only because of their small size, but also because they are located in residential neighbourhoods. Local NRBs maintain and expand their customer base by building relationships with customers inside certain neighbourhoods. For example, CloudKitchen store managers create chat groups on WeChat and invite customers to join. Special sales and promo codes are first published within such WeChat

groups. Customers can also request that store managers reserve orders for pick-up. Moreover, customers are invited by staff to sign up for special memberships, and the business regularly organizes free outings for members at its production centres. Local NRBs therefore cultivate a loyal consumer base with exclusive membership benefits and direct in-person communication with store staff.

Another feature of local NRBs is that they purport to provide affordable ecological vegetables. In their marketing campaigns, they tout their self-operated food supply chain as the reason for affordability. CloudKitchen, for example, declares on its website that vegetables are freshly shipped to stores within six hours of harvest at its two production centres. It profiles one of its production centres as environmentally conscious, safe, and green. Only organic and non-toxic pesticides are used, and weeds are pulled out by hand. Another local chain, Joynow, makes similar marketing claims that its vegetables are sourced from certified hazard-free farmers' cooperatives and large farms in nearby Jurong city. VillageMarket's official vegetable production centres are in Mingguang, Anhui Province, and are described as "from the wilderness" and "no contamination." Table 13 shows the diverse narratives adopted by local NRBs. They therefore appear to be addressing safety risks by building their own food supply chains. And they undercut organic farmers, thus forming an affordable alternative to organics. With hazard-free certifications, local NRBs deliver eco-themed narratives to convince consumers of the superior quality over conventional foods.

Table 13 Food quality and ecological features as described by NRB marketing campaigns

NRBs	CloudKitchen	VillageMarket	Joynow
Variety of ecological foods	Hazard-free food Organic foods	Self-claimed ecological food	Hazard-free food
Discourse on ecological foods (keywords)	"Hazard free" "Cleaner" "Direct from production centre"	"From the wilderness" "No contamination"	"Green" "Hazard free" "No contamination"

4.5 Vegetable Basket Project

Local NRBs have various innovative features including building their own food supply chains, management standardization, diversified food categories and quality levels, and omnichannel food provision system. This section argues that the boom in local NRBs in Nanjing is linked to local government efforts to manage food security, food safety, and to modernize the local food environment. This chapter shows how the Vegetable Basket Project (VBP) has animated and accelerated CloudKitchen's growth. I explicitly focus on the case of CloudKitchen because its market expansion has outpaced that of other NRBs in Nanjing and it has an official partnership with the VBP. CloudKitchen's extensive involvement in VBP was emphasized by both its sales staff, procurement manager, and VBP's official chief coordinator. To contextualize VBP's influence on CloudKitchen, a brief overview of this project is necessary and provided below.

VBP was initially launched by the central government in 1989 to stabilize the non-grain food supply in Chinese cities (Tuan and Ke, 1999; Zhong et al., 2019). It initially concentrated on infrastructure enhancement and its objective was to increase yields and ease the shortage of non-grain foods such as vegetables, meat, and fish in cities. Over three decades, the policy objectives evolved beyond the productivity imperative and expanded to risk monitoring and food safety enhancement. In 2017, the state council outlined five evaluation parameters to assess the implementation of VBP among 36 listed Chinese cities. From then on, an evaluation score is assigned to each city every two years. Mayors of participating cities are held accountable for their city's score and the score is translated into a four-grade rating: excellent, good, fair, or fail. Cities that fail are required to carry out a self-improvement plan. On the flip side, mayors garnering two excellent ratings are publicly praised and acknowledged. Given the explicit impact on a mayor's political performance, it stands to reason that municipal governments are politically motivated to fulfill the five parameters and obtain a high rating.

The five parameters are each assigned a weight in the rating rubric: production capacity (24%), safety control (24%), adaptability (24%), circulation capacity (20%), and citizen satisfaction (8%). In the city of Nanjing, the VBP is implemented through a localized "hybrid public private model" which has made Nanjing a city close to "zero hunger" (Zhong et al., 2019). The 2018 VBP implementation mandate from the Nanjing mayor's office

breaks down the mission into 14 tasks for subsidiary government departments. These tasks demand the transformation of multiple food retailing entities such as wet markets (Zhong et al., 2019).

Figure 4 below synthesizes relevant content in the document and outlines CloudKitchen's role in contributing to the implementation of VBP. The chief coordinator for the implementation of VBP in Nanjing said that CloudKitchen gained more attention than other NRBs from local government as it was a local company and because of its sheer size and highest amount of retail stores. In addition, he indicated that CloudKitchen's staggering growth is actually fueled by government subsidies, and as a business grows it can qualify for even larger subsidies. A chain like CloudKitchen with more stores and operating such a large scale would inevitably attract attention from multiple government departments.

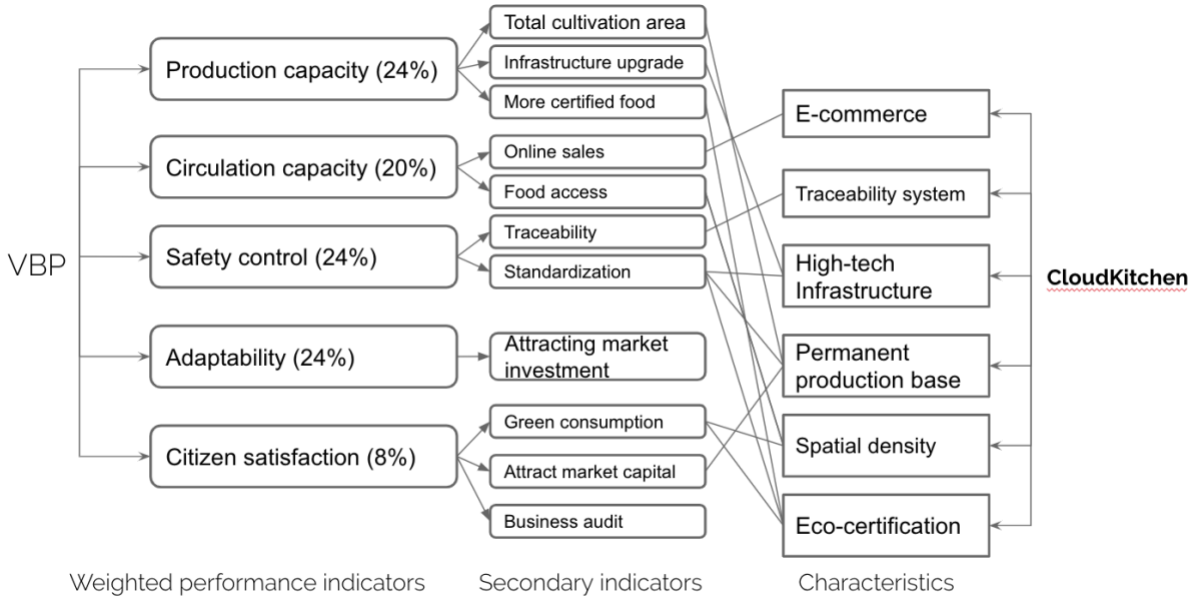

Figure 4 VBP performance indicators and alignment with CloudKitchen

Source: Author

The procurement manager for CloudKitchen helped quantify the government support that the company was receiving. He indicated that whenever CloudKitchen opens a new location the company receives a government subsidy of 100,000 y*uan (*approx. CAD 20,000*)*. In addition, CloudKitchen's 800-hectare production complex, Babuluo, has received support in infrastructure funding (covering 50% expenses) for large-scale modern farming. Its central kitchens and food processing workshops were also built with public funds, although the exact amount of public funding was not disclosed. In addition to monetary subsidies, the local government department provides in-kind support. The production

manager at Babuluo stated that the rapid expansion of CloudKitchen had “earned respect” from local government.

Babuluo is both a designated production complex for CloudKitchen and an ecotourism site with facilities including hotels, restaurants, water golf, and hot air balloon fields serving CloudKitchen customers and other tourists. In late August 2018, a nation-wide agricultural land audit action was launched, for farmland conservation, to demolish unregistered non-agricultural structures on farmland. This action initially was put forward to remove residential structures illegally built on arable land (see Govcn, 2018). Since then, farmers across the country, including some ecological farmers in Nanjing, reported that their agrotourism facilities and buildings were demolished at their own expense. Yet, Babuluo managed to keep all its recreation infrastructure intact including its hotels and restaurants, because local officials assisted them in altering the registry of their tourism land from agricultural use to commercial use. This is but one example of how CloudKitchen benefits from in-kind support from governments.

CloudKitchen is expected to return the favour to the government. The procurement manager noted that to help the Nanjing government meet the VBP criteria of fresh food outlet density and the promotion of certified foods, CloudKitchen cooperates to hit various benchmarks. The benchmarks include the total number of stores, varieties in food certifications, and quality requirements. Despite being somewhat invisible to the public, the

liaison between CloudKitchen and the municipal government marks a novel approach to food planning in retailing and consumption. The emphasis of the VBP is access to fresh food outlets, technological upgrading, and promotion of safe and ecological food. CloudKitchen assists with all these goals by combining e-commerce services with a physical store network, building a high-tech large-scale permanent vegetable production base, and supplying certified foods.

At least on the surface, this partnership between CloudKichen and the municipal government contributes to food access, food safety, and sustainable transitions of local food production in Nanjing. Through regulatory reform and corporate innovations, the NRB-VBP partnership has the potential to make food more accessible, healthier, and sustainable for all. However, in spite of its promise, this NRB-VBP partnership is not without its contradictions. In its implementation, long-term food planning goals are compromised in favour of short-term profitability and capital accumulation. Thus, NRBs may not effectively address food safety concerns but instead exposing consumers to more problems in food purchasing.

4.6 Contradictions in NRB-VBP partnership

Using the example of CloudKitchen, this section divides the contradictions into four categories: investmentization of food consumption, over-packaged ecological food, supply chain external dependency and undermining local ecological sector.

4.6.1 Investmentization of food consumption

At local NRBs, customers are invited to sign up for memberships. Members are encouraged by the staff to make investments in the stores by two ways: making deposits as store credits and/or making financial investment. Before I elaborate on these two investment programs, I discuss the relations between the term of investmentization with the broader concept of financialization, which has been extensively studied in the agri-food literature (Clapp and Isakson, 2018). Financialization refers to a process in which financial actors and financially driven motivations have taken a larger role in society, across all sectors in the economy (Clapp and Isakson, 2018: 2). The term I adopt in this chapter, investmentization, is one aspect of financialization. The existing studies point out that one approach to examine financialization is to investigate its infiltration on everyday life (Langley, 2008; Clapp and Isakson, 2018). In the food retail sector, this infiltration manifests as financial products advertised by retailers and their financial partners such as credit cards and loyalty programs to consumers. In this chapter, I use the term investmentization to specify that what I discuss relates to this consumer investment aspect of financialization. This term highlights a new trend of increasing consumer investment in day-to-day grocery shopping in China, which to date has received little attention in the existing literature. Unlike the finance services provided by Western food retailers, new retail businesses' investment programs in China are not linked to the large international credit card companies Visa or Mastercard. Instead, the investment programs are offered under the own brands of the new retail businesses in the form of membership cards. Additionally, the benefits and return on investment of such

programs are higher compared to the loyalty programs and credit card products offered by large food retailers in the Western countries. Therefore, consumers participate in these investment programs to make an investment rather than to obtain credit and food access. Details of the investment programs at NRBs are given below.

First, consumers can make deposits in their prepaid member cards. The NRBs periodically offer rewards based on the total amount of deposits. In order to incentivize customers to make larger deposits, the value of the rewards offered by NRBs are proportional to the volume of deposits made by customers. Rewards are given as credits on prepaid cards and are allocated in installments. Table 14 shows the reward protocol at three local NRBs. Customers also garner other benefits by making deposits. For example, complimentary group tours are organized by the three local NRBs. These tours take consumer groups to visit the production centres with pick-your-own-food activities, entertainment programs and workshops. At Babuluo (CloudKitchen's production centre), customers who have made deposits at CloudKitchen can access hotel and restaurant services with a notable discount.

CloudKitchen	VillageMarket	Joynow
Deposit 10,000 for 3,000 bonus credits (1,000 credit immediately, 1,000 next year, 1,000 the year after next)	Deposit 500 for 50 bonus credits	Deposit 1,000 to get 120 back, with two coupons for agro-tourism worth of 68 each

Deposit 5,000 for 2,000 bonus credits (320 immediately, the remainder is redeemable at 70 per month for 24 months)	Deposit 1,000 for 100 bonus credits	
Deposit 3,000 for 800 bonus credits (200 immediately, the remainder is redeemable at 50 per month for 12 months)	2,000 for 400 bonus credits	
Deposit 1,000 for 150 bonus credits (30 immediately, the remainder is redeemable at 20 per month for 6 months)	9,000 for 3,000 deposited in installments	

Table 14 Rewards for prepaid grocery cards at local NRBs

Source: Author.

This deposit scheme reflects the investmentization of food consumption, because consumers make deposits upfront, not for short-term consumption but for financial rewards in long-term installments. This model is not an NRB invention, but it has been a common practice in China among hair salons and fitness centres. However, it is a rare practice in the fresh food sector. The deposits made by customers enable the growth and expansion of NRBs, and enrolling customers as long-term members help NRBs stabilize the logistics management. This model has similarities with CSAs, although the difference is that most CSAs in Nanjing pool member deposits in order to sustain at their current scale, while NRBs attract the membership investments in order to keep expanding.

Second, according to *Weibo* posts and comments, Cloudkitchen implemented an investment scheme apart from the deposit program for day-to-day grocery shopping. It is an underground and possibly illicit channel for capital investment with unusually high return on investment (annual interest above 10%). As a food business, CloudKitchen does not have the legal permission to sell finance products to its food shoppers, yet it has been selling unregulated finance products to its customers. Based on my analysis of *Weibo* posts made by CloudKitchen customers, customers have been invited to its Babuluo production center and to attend promotion meetings about its finance products. After attending the meetings, some customers (mostly elderly customers) invested more than 100, 000 *yuan* in CloudKitchen for a promised 13.5% annual interest rate. No legal contracts were signed between CloudKitchen and customers and no public information was available about this investment program. Instead of formal contracts, CloudKitchen gave investing customers gift cards and a hand-written receipt. The finance product was mostly advertised to elderly customers and rarely mentioned to young customers. During fieldwork, no retail staff mentioned about the finance program to me, and when asked about this program, the staff and managers said I should instead consult their finance departments. Based on *Weibo* interactions, some elderly customers invested their retirement savings into CloudKitchen and did not inform their family about the investment until CloudKitchen encountered a financial crisis.

The investmentization of consumption has several drawbacks. First, consumer deposits run the risk of depreciation in value in the event of store-wide food price hikes.

Local NRBs do not guarantee that food prices will follow the indices of general inflation. If local NRBs decide to raise their prices faster than the general food market, consumer deposits shrink in value. Second, a related and perhaps more severe financial risk, is for consumers to lose their deposits altogether. No insurance or exit planning has been built into deposits or capital investments.

In August 2019, the financial struggles and impending collapse of CloudKitchen spread angst among invested consumers. *Weibo* tweets and media reports revealed that CloudKitchen was troubled by a cash flow crisis. CloudKitchen employees reported on *weibo* that their salary payments had been stalled for months. In addition, numerous physical CloudKitchen stores shut down. Those that remained open only had a limited supply of food that sold out immediately upon delivery; CloudKitchen announced to consumers that their membership credits were frozen for three months and any purchases at stores during those three months had to be paid in cash.

Operation failures in the NRB model are already starting to surface, and consumers are beginning to realize that they risk losing their deposit and investments (which can amount to hundreds of thousands of *yuan*). Respondents at both the production centres and headquarters declined to comment on the investment scheme. CloudKitchen's procurement manager did mention that CloudKitchen was running at a deficit and all investments are "like a gamble". If the business is a gamble, then the risk of gambling is clearly shouldered by

invested customers.

In September 2019, news report (Lingshouqianyan, 2019) suggests that CloudKitchen might have been acquired by a dragon-head dairy enterprise based in Nanjing. However, the majority of the retail stores of CloudKitchen have been shut down, and CloudKitchen has yet to fully refund the financial investments made by customers.

4.6.2 Over packaging the ecological food

Across the board, unit-based standardization is the default fashion to display and deliver food in NRBs. Each vegetable and fruit are individually packaged so they could be sold as a "stock keeping unit." The standardization process involves the use of excessive packaging. To keep food wrapped in uniform styles, with tags and QR codes attached, clear plastic bags or plastic mesh bags are used, even on foods like bananas, apples, and squash that are not individually wrapped at supermarkets or other outlets. Si et al. (2015) find that consumers of ecological food are less concerned about environmental impacts than about health benefits. To a certain extent, this explains the over-packaging of ecological foods at NRBs. With little consumer backlash, NRBs are not inclined to reduce plastic packaging.

Waste management protocols at some NRBs contradict the ecological philosophy of minimizing food waste. At CloudKitchen, for example, old vegetables will go on sale at reduced prices, but unsold vegetables eventually end up in dumpsters still wrapped in plastic.

According to one respondent, dumping expired produce made the most economic sense, and it was too costly to retrieve expired vegetables from 238 shops to centrally compost them. News reports indicated that Hema also dumps fresh food on a “large scale”, prompting public outrage (Guancha, 2019). This is different from practices at wet markets, which have agreements with waste management companies to handle food waste. Wet market vendors also take unsold food home, which further reduces food waste.

4.6.3 Supply chain external dependency

Despite NRB efforts to establish their own private food monitoring system, loopholes exist. In 2018, for example, one media outlet revealed a “labelgate” scandal at a Hema chain in Shanghai (Techfood, 2018). Staff intentionally attached mismatching labels and QR codes to “expired” carrots. Original labels were torn off, and new labels attached which indicated a new expiration date. This example shows how one small manual misconduct can corrupt the credibility of Hema’s hightech-backed supply chain and traceability system.

Similar drawbacks are found in CloudKitchen’s self-managed food supply chain. CloudKitchen’s traceability is based on its food supply chain including two production bases, six central kitchens, and over 200 cold-chain transportation trucks. During interviews, CloudKitchen’s sales staff claimed that all vegetables are freshly picked from their production centres. However, CloudKitchen’s production centres are unable to supply sufficient vegetables and fruits to all of its rapidly expanding number of stores. The

production manager at its largest production centre, Babuluo, said that none of the food harvested at that centre was delivered to retail stores, but rather catered to visitors and on-site restaurants.

CloudKitchen's procurement manager informed that 70% of the company's second largest production centre (the 100-hectare site, *Runkang*) was left fallow due to rising labour costs. Consequently, the major source of produce for stores is actually not their own production centres but external producers or wholesale markets. Importantly, externally procured food does not carry the same guaranteed the ecological standards that the company advertises. The manager further disclosed that when it comes to selecting external produce sources, price and quantity outweigh other factors such as quality or environmental integrity.

Another source of external procurement is a local organic food enterprise, Backto Farm. However, only one CloudKitchen store in Nanjing stocked any organically certified food. CloudKitchen initially sold Backto Farm organic produce at 10 of their stores, but most stores discontinued this produce due to a lack of demand. The one store remained in order for CloudKitchen to claim to government that they do carry certified organic foods, and that one store could serve as the "model NRB store" when superior officials visit Nanjing to inspect the implementation of VBP.

4.6.4 Undermining the local ecological food sector

Organic farmers whom I interviewed were very critical of NRBs. A Shanghai-based organic business leader, Mr Xiang, openly denounced Hema for its slogan of "making organics cheaper", telling us that it will only drive honest organic farms out of business. In his words, "Hema's low price strategy will not only destroy new retail, but will also destroy the organic sector", because authentic enterprises cannot tolerate prices that are lower than production costs. He also believed that households that consumed organic foods were not price sensitive, and as an organic enterprise, they needed to maintain a high price to ensure revenues and good service. One Nanjing-based certified organic farmer with a large-scale farm had a business negotiation with Hema, and yet refused to accept Hema's proposal. In his account, Hema proposed to take the majority of profit by reselling his organic products, leaving him with thin margins. In a meeting, a sales representative from Hema said to him: "To work with us, you will have to realize one thing: (in terms of dividing revenues) we shall eat the meat, and you will only get the broth."

The perception of power imbalance is consistent with the views of sales managers at several other local organic farms. Manager of one of the largest local organic farms Planck said "if we work with Hema, we essentially are becoming their employees," indicating that working with Hema would not only squeeze their profit, but also undermine their autonomy. They also take issue with the standardization feature of NRBs. Hema demands a stable supply of standardized food units, and its fixation on standardization contradicts organic

farmers' fundamental principle of producing seasonal and natural foods.

4.7 Conclusion

This chapter has investigated the latest trend in state-planned food retail sector transition in Nanjing and found that the food retail transition plans were implemented by the government by a formal partnership with new retail businesses (NRBs). In this partnership, the government supports the growth of NRBs by funding their processing facilities and retail stores. In return, NRBs rapidly expand the number of their retail stores to help fulfill the food retail outlet density goal in the government's Vegetable Basket Project (VBP). NRBs are strongly supported by the government rather than other retail outlets because they match the profile of a modern high-tech retail sector prescribed by VBP.

The NRB-VBP partnership reflects the government's high-modernist approach to food retail development, as the partnership augments the role of high-tech, visually modern, and standardization of food processing and management in the local retail sector. More specifically, the local government support for NRBs demonstrates three characteristics of high-modernism in food planning: the prioritization of techno-scientific innovations, the preference of modern aesthetics, and the tendency to build a "model" (miniaturization by Scott, 1998). CloudKitchen and other NRBs represent a new format of food retailing that integrates online services and internet technologies into the otherwise brick-and-mortar food retail sector. NRBs attempt to manage food production, processing, and retail through

streamlining and managing fresh food as stock keeping units. In addition, NRBs have the appearance of clean, modern food retail stores that match with the Nanjing's aspiration to make a beautiful city. As mentioned earlier, one CloudKitchen store kept selling organic foods even though organic foods were not viable in their business. The rationale was that CloudKitchen had to maintain a model store that demonstrates the implementation of VBP and having certified organics at store is part of its full implementation, even though it was only one special case. Overall, high-modernism manifests in the local government's support of these features in NRBs as an effort to modernize the food retail sector. As the next chapter will address, this high-modernist approach has influenced the government's policies for wet market upgrading and management.

The NRB-VBP partnership has not effectively addressed the local food security, food safety, or environmental concerns but undermined the goals of stabilizing urban food supply and further marginalized the small-scale ecological farmers. More specifically, the partnership between CloudKitchen and Nanjing government is flawed by four contradictions: the investmentization of consumption, supply chain external dependency, undermining local ecological sector and over-packaging. CloudKitchen enrolled some of its customers in underregulated investment programs and caused economic loss to numerous households among its 300, 000 membership customers. The business purports to sell ecologically produced food from its vertically integrated supply chain but turns out to rely on external conventional food supply chain. Regarding environmental impact, it has not attempted to

minimize the food waste or plastic waste from over-packaging. Considering these implications, I argue that more stringent regulations are in need to counter the investmentization of food consumption, deception in food marketing, and abuse of plastic packaging among NRBs.

The rise of NRBs is linked to China's booming digital economy and food e-commerce. In contrast to supermarkets, NRBs feature omnichannel shopping, free delivery, and unit-based standardization in packaging and shelving. These features appeal to China's tech savvy and time-crunched millennial eaters. While China's embrace of digitalization and standardization in the fresh food sector is not unique, the speed and scale of these transformations are unparalleled. A key question for further research is whether New Retail will supplant traditional wet markets and become the dominant retailing format of fresh foods in China. Since January 2020, due to the COVID-19 outbreak food purchase in Chinese cities has been increasingly moving online because some urban residents are concerned about virus transmission at physical markets. This further rise of online purchase may boost the development of NRBs and compound the digital transition of China's food retail sector.

Chapter 5 High-modernist planning of wet market upgrading in Nanjing, China: characteristics and drawbacks

5.1 Introduction

Governance of food security has been extensively studied at the national (Lin, 2017) and international scales (McKeon, 2015), although limited research has been conducted at municipal levels, particularly for cities in the Global South including China (Zhong et al., 2019). As the primary source of fresh foods for urban residents in China (Si et al., 2019), wet markets play a pivotal role in urban food security. Therefore, governance of wet markets is a critical aspect of food security governance, yet only a handful of studies (Zhong et al., 2021; Zhong et al., 2019; Zhang and Pan, 2013) have provided in-depth analysis of governance measures of wet markets in China.

Conceptually, these pioneering studies have laid an important foundation for interpreting government involvement in wet markets by highlighting the public-private hybridity of wet market ownership and management (Zhong et al., 2019) and by stressing the decisive influence of government on market viability (Zhang and Pan, 2013). Existing studies have discussed the government strategies of managing wet markets in Nanjing. For example, Ning (2021) focuses on smart wet market management by data and information technologies. Wei et al. (2019) summarizes the latest wet market management and upgrading strategies in Nanjing as precision management, highlighting the employment of digital data and

standardization. However, what has yet to be discussed in detail are logic behind and the impact of the persistent and yet constantly evolving measures for upgrading wet markets. In other words, why does the local government adopt the current approach to upgrade wet markets and what are its social and economic impact? To address this gap, this chapter provides a close examination of the characteristics and epistemological basis of the municipal governance of wet markets based on fieldwork in Nanjing, China.

Borrowing the analytical lens of high-modernism (Scott, 1998) and aesthetic governmentality (Ghurtner, 2010), I delineate the rationale and epistemology of wet market governance in Nanjing, China. The analytical lens of high-modernism has been applied by Scott to decipher governance at different scales: from forest management, to city design, to state building. In this chapter, I apply this analytical lens to the analysis of government planning of wet market upgrading within the city of Nanjing. I believe that this lens uncovers the governmental logic behind the upgrading plans and adds clarity to the underlying logic of food planning in China.

Through policy analysis and interviews with key stakeholders in wet markets, I capture the connection between the logic of wet market governance and that of governing Nanjing as a high modernist city. Building on Pow (2018)'s analysis of the making of eco-cities in China, I characterize the governance of wet markets in Nanjing through two governmental logics: the techno-scientific logic and the aesthetic logic. It is essential to discuss the aesthetic logic,

because the high-modernist plans are often oriented towards the planner's visualization of a modern city/market. Based on policy analysis, I explain how it is equally important, if not more, to the municipal government in Nanjing that the wet markets conform to the aesthetic codes of a world-class modern metropolis as they support food security and food safety. In Nanjing and several other cities in China, the official discourse has portrayed wet markets as dirty, messy, and backward, thus unharmonious with the city's modern aspirations. In the eyes of the municipal governments, a facelift is necessary and has been included in the agenda of wet market upgrading projects.

Empirically, this chapter contributes to understanding of wet market governance by reviewing the characteristics and impact of the wet market upgrading program. Existing studies have touched on the important trends and structural changes of wet market development in Chinese cities (Hu et al., 2004; Zhang and Pan, 2013). However, existing studies have not sufficiently addressed on one of the most important recent government interventions–the wet market upgrading plan. This chapter intends to address this gap by providing an overview of the history, development, characteristics of wet market upgrading plans in Nanjing. More specifically, this chapter examines the upgrading from the government perspective through policy review and from the individual perspective through interviews with wet market vendors, managers, and consumers. Drawing on these data, this chapter contrasts the micro-level lived experience with the macro-level government vision.

The rest of this chapter is organized as follows. Section 5.2 introduces the methods of data collection and analysis. Section 5.3 reviews the historical evolution of the wet market upgrading plan and contextualizes the upgrading plan with the overall orientation of urban planning in Nanjing. Section 5.4 dissects the governmental logic underlying the policy documents regarding wet market upgrading by applying the analytical lens of high-modernism. Section 5.5 presents case studies of different wet markets to support the argument that high-modernism manifests in the wet market upgrading plan. Section 5.6 uncovers the lived experience of the upgrading process by analyzing the opinions of vendors, customers, and wet market managers. Based on the analysis, I identify the strengths and drawbacks of the current approach to the wet market upgrading plan. To conclude, section 5.7 recaps the research findings, highlights the policy implications of research findings and outlines areas for further research.

Overall, this chapter contributes to the understanding of urban food retail governance in Chinese cities by applying the analytical lens of high-modernism to characterize the government interventions in wet market development. The application of high-modernism as an analytical lens situates the food governance analysis in the context of modern city-making in China, which addresses the existing knowledge gap on urban food retail governance in the Global South.

5.2 Methods

This section summarizes the methods of data collection and analysis. I begin with an overview of the data collection methods, followed by a brief introduction of the process of data analysis. Data collected and applied in this research are qualitative data and were gathered through a policy scan, interviews, non-obtrusive observation and participant observation. Data analysis comprised open coding and focused coding and the results are applied to conceptualize the government planning of wet market upgrade and to show the implications on food security, food safety, and wet market vendor livelihoods.

5.2.1 Data collection

5.2.1.1 Fieldwork

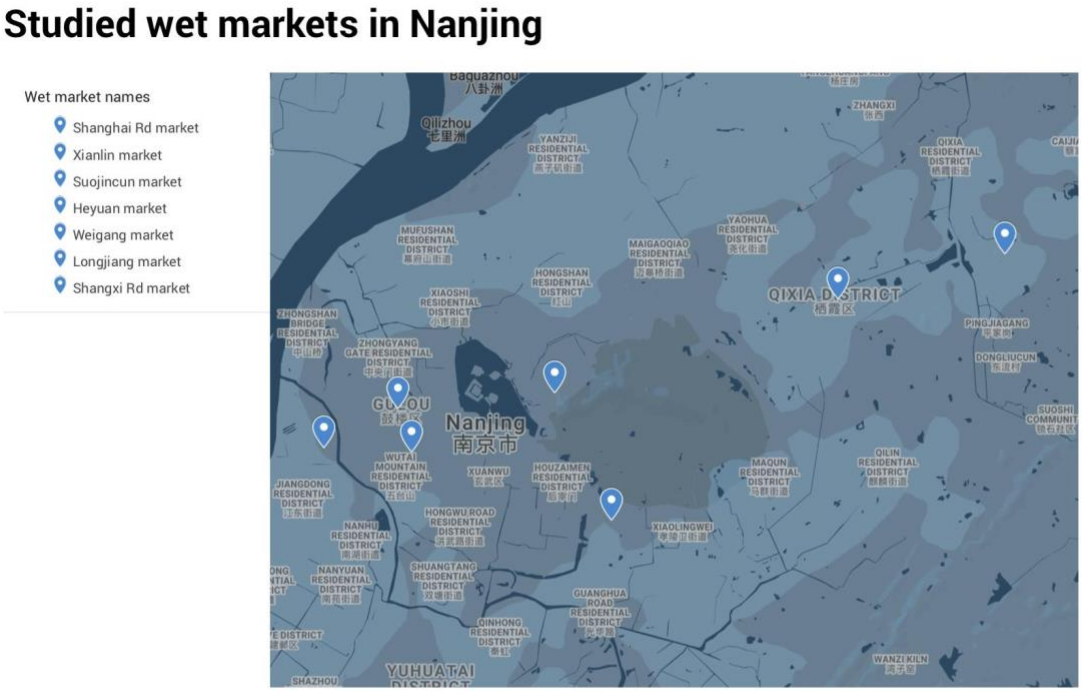

Figure 5 Wet markets visited during fieldwork in Nanjing (generated through Google Maps)

Figure 5 above shows the geographical layout of seven wet markets I studied during fieldwork in Nanjing. These seven wet markets were chosen not because of their locations or proximity. Instead, I selected the seven wet markets because they have undergone a varying extent of upgrading, from conducting the bare minimum to having done enough to be raised

by the local government as an example to other markets. In other words, some of the seven wet markets were among the oldest wet markets in Nanjing and made little progress in "upgrade", while other of the seven wet markets were among the most recently built and most "upgraded". I was also conducting interviews on organic food consumption with consumers at Planck food retail stores, and some of the Planck retail stores were located in these wet markets. That was another reason for visiting these wet markets. During visits to each wet market, I observed and compared the outer and inner appearances of the markets and observed the organization of food by vendors and the process of food safety testing at the built-in food safety testing labs. Accompanying a market vendor, I visited the largest wholesale market in Nanjing, Zhongcai. During the visit, I observed the vendor's travel between wet markets and wholesale markets and the process of food procurement at the wholesale market.

Six wet market managers at five of the abovementioned wet markets participated in the interviews, in addition to 12 stands of vendors in the wet markets and two affordable food stores. These interviews focused on the managers' and vendors' perceptions on the content and impact of the wet market upgrading.

Inside some of these wet markets, I visited the organic food shops from Nanjing's largest organic farm Planck. At the organic food stores, I interviewed 13 retail staff and 17 consumers about their perceptions of the food safety monitoring at wet markets, which is one

of the pillars of the upgrading. On the one hand, opinions from the retail staff and consumers at Planck do not represent the opinion of an average consumer in Nanjing, because they favour organic foods to the conventional food at wet markets and are able to access organic foods. On the other hand, these consumers are highly aware of food safety risks and provide critical opinions on the food safety testing procedure at wet markets.

Additionally, I interviewed the leader of the Nanjing Vegetable Basket Project, who summarized the priorities and rationale for the wet market upgrading plan from the government perspective and shared his personal concerns about its implementation.

5.2.1.2 Policy scan

In order to capture the priorities and performance indicators of the wet market upgrading plan, I have reviewed policies included in Table 15 below. The first four policies elaborate on the details, standards, and financing for the wet market upgrading process in Nanjing, and the policies of Vegetable Basket Projects highlight the goals of wet market upgrading as part of the government's transformation of the urban food system. The Master Plan of Nanjing is reviewed to contextualize the overarching orientation of government-planned urban food system transformation in Nanjing, which includes the prescribed changes of wet market.

Table 15 Policies analyzed in this research. Translated by the author.

Policy title	Published by	Year enacted

Nanjing Wet Market Upgrading and Delicate Management Action Plan	Municipal Government of Nanjing	2017
Nanjing Wet Market Upgrading Standards and Evaluation Protocol	Nanjing Bureau of Commerce	2017
Interpretation of Nanjing Wet Market Upgrading and Delicate Management Action Plan	Nanjing Bureau of Commerce	2017
Nanjing Wet Market Upgrading Fund Management Protocol	Nanjing Bureau of Finance and Bureau of Commerce	2018
Nanjing 2018 Vegetable Basket Project Action Plan	Nanjing Municipal Government	2018
Nanjing 2017 Vegetable Basket Project Action Plan	Nanjing Municipal Government	2017
Master Plan of Nanjing (2018-2035)	Nanjing Municipal Bureau of Planning and Natural Resources	2018
Protocols for Awarding National Civilized Cities, Civilized Townships, Civilized Villages and Civilized Institutes	Central Commission for Guiding Cultural and Ethical Progress	2003
Nanjing Work Plan for Food Safety and Achieving National Food Safety Model City	Municipal Government of Nanjing	2017 & 2018

5.2.2 Data analysis

In this research, thematic analysis was applied to interpret the qualitative data retrieved from policy scan and informant interviews. Themes are determined through a two-step coding

process (Hsiung, 2010). The first step is open-coding, where I went through all the raw data and coded any information relevant to my research questions. I then reviewed the codes, and categorized them by common themes, such as “impact of market upgrading on food safety”, “impact of wet market upgrading on ways of operation”, and “impact of wet market upgrading on economic viability”.

These themes were the foundation for second-round coding, which was focused coding. During focused coding, I compared and contrasted the primary codes within one theme to capture their interconnectedness and variation. Focused coding helped uncover the complexity in the interpretation of the wet market upgrading process by presenting different perspectives at different scales.

Table 16 below is an example of three codes annotated during open coding of different actors’ perception of the impact of market upgrading on food safety monitoring. In general, actors expressed doubt over the authenticity and efficacy of food safety monitoring at the wet markets, despite the upgrading of testing kits and devices. The doubts are expressed from different perspectives and in real life situations. They explain how the technical solution of safety monitoring overlooks the conflict of interest in its implementation and fails to integrate into the daily routine of consumers. Codes reflecting the food safety monitoring at wet markets are interconnected to other social and management issues which are beyond the

reach of a simple technical fix. In the following sections, examples are used in detailed analysis to support the arguments I make.

Table 16 Example of open coding of research data on actor perceptions of the impact of wet market upgrading on food safety.

	Wet market manager X	Planck staff Y	Consumer Z
Data coded under the theme of "impact of wet market upgrading on food safety"	The safety monitoring is just a formality. No consumers actually bring the food they purchased for testing. After all, one test run takes half an hour. Consumers don't have time for that.	It's a lie! The safety testing is only a pretence. Every morning, the vendors decide what food they submit for testing. So of course they only choose what will pass the test.	I don't believe the safety test. Think about it. If the management is strict with the vendors, vendors could cease the contracts. Then the market will have trouble with business.

5.3 Policy analysis–how the municipality plans to upgrade wet markets

5.3.1 Contextualizing wet market development by Nanjing's urban planning

Discourses of urban planning build the context for the government interventions in the food system. These discourses reflect the vision held by the local governments for the city's long-term development, to which the plans for wet market transformation are made congruent. Specifically, the aspirations for technological supremacy and modern visuals in urban planning provide clues to explain the direction of wet market upgrading. Pertinent to urban development and city transformation, three sets of government policies are analyzed in this

subsection: the Master Plan of Nanjing, policies for building a “civilized city”, and policies for qualifying Nanjing as a designated food safety model city.

The Master Plan of Nanjing lays out the blueprint for urban development from 2018 to 2035. This long-term oriented plan corresponds with the macro-scale plan for national development. As Figure 6 below shows, China is committed to achieve a moderately prosperous society by 2020 and to mostly fulfill socialist modernization by 2035. According to the official definition published on Xinhuanet (Ma, 2021), the fulfillment of socialist modernization indicates modernization in five dimensions: modernization of populations, common prosperity, material and ethical advancement, harmonious man-nature relations, and peaceful development. By 2050, China aims to transition into a prosperous country that has fully achieved socialist modernization. In harmony with these national development goals, the Master Plan of Nanjing aims to transition the city of Nanjing to be renowned for technological innovations and a beautiful provincial capital.

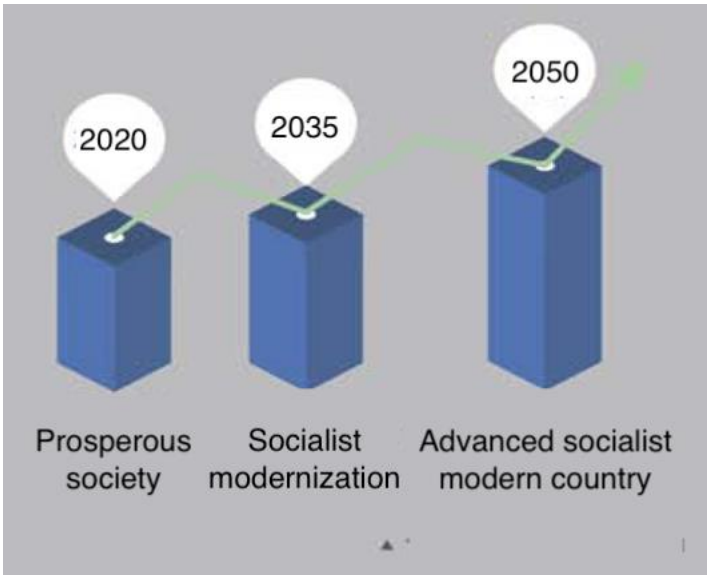

Figure 6 China's planned milestones of development between 2020 to 2050. Translated based on the Nanjing Master Plan.

The three milestones in the Nanjing Master Plan correspond with the timeline in the national development plan. By 2020, the city will make significant progress in achieving this goal. By 2035, the city will make further progress towards the goal and become a major beautiful and technologically innovative city. By 2050, Nanjing will become a worldly city known for innovations and beauty. Within the Master Plan, the goals of innovation and beauty have been explained by specific objectives. For example, to become a city of innovations, the Master Plan prescribes that Nanjing builds top-notch universities, research institutes and enterprises. To make Nanjing a beautiful city, the Master Plan requires the city to improve urban landscape, local ecosystems and environmental conservation.

The Master Plan did not address any specific aspects on food systems. However, aside from the Master Plan, Nanjing has set up multiple plans to transform the city in order to acquire official designations. The designations are awarded by the national government on the basis of qualifications. These designations are of political importance and thus warrant investment from municipal governments. Two designations relevant to the wet market upgrading are discussed in this chapter: the "Civilized City" (*Wenming Chengshi*) and model food safety city. I will elaborate on each of the two designations below.

Since 2005, Civilized Cities are designated by the General Office from the Central Commission for Guiding Cultural and Ethical Progress. According to the Central Commission, Civilized Cities designations are granted to cities with comprehensively high levels of cultural and ethical progress (assessed by corruption control, orderly landscape, and law-abiding citizens), and gaining this title is the highest honour for a city. In 2008, Nanjing was granted the title of Civilized City for the first time, and mostly maintained this title in the following assessments in three year intervals[6]. The assessment criteria for civilized cities emphasizes good infrastructure and appearances. Two aspects of the criteria are of particular relevance to wet markets: first, under the clause of public security and the sub-clause of food and drug safety administration, wet markets are forbidden from selling expired food, fortified food, or spoiled food. Food safety incidents should be handled in a timely manner with zero

[6] Between 2013 and 2015, Nanjing was disqualified as a Civilized City due to law-breaking by high-ranking politicians of the municipal government office.

cover-ups. The passing rate of food safety testing should be above 98%. Second, under the clause of urban management and public service and the sub-clause of precise urban management, public sites including wet markets should maintain a sanitary environment. Following these clauses, the city of Nanjing mobilizes resources to reinforce food safety testing and purge any unpleasant sights in and near wet markets.

The third official discourse about urban planning that is also relevant to wet market transformation is Nanjing's commitment to become a model city for food safety. So far, only 15 cities have earned this title, and Nanjing is not among them. However, in 2015, Nanjing was enlisted by the Food Safety Committee of State Council as a candidate city to become a food safety model city. Therefore, it was paramount for the municipal government of Nanjing to improve the status of food safety in the city.

In the 2017 document, "Nanjing Work Plan for Food Safety and Achieving National Food Safety Model City", the following work plans have been laid out for wet markets. The plans prioritize improvement of the standardization of four types of food retail outlets (wet markets, supermarkets, wholesale markets, and convenience stores). One of the key priorities is to construct food safety testing labs. By the end of 2017, the plan aimed to set up food safety rapid testing labs within 80 large wet markets. In the 2018 document, "Nanjing Work Plan for Food Safety and Achieving National Food Safety Model City", the same priorities

were prescribed. The Plan aimed to set up food safety rapid testing labs within 100 wet markets by the end of the 2018.

Table 17 below summarizes the government policies and discourses about urban planning that contextualize government-led wet market transformations.

	Master Plan	Civilized City	Exemplary food safe city
Priorities	Technological innovations Aesthetics	Food safety under control Sanitary wet markets	Standardize the governance of food safety in food retail outlets
Implications for wet market upgrading plan	Prioritize technological solutions to food challenges at wet markets Maintaining orderly appearances for wet markets	Tightening control of food safety at wet markets Building good appearances for wet markets	Set up food safety rapid testing labs inside wet markets

Table 17 Connection between urban planning policies and wet market transformation

5.3.2 Overview of the government plans for wet market upgrading

Since wet markets are paramount to food security in Nanjing, the municipal government in Nanjing takes an active part in managing wet markets. For example, the government mandates the quantity and spatial distribution of wet markets through crawling peg policy

(Zhong et al., 2019). This policy ensures that newly developed neighbourhoods will be equipped with wet markets and have sufficient access to fresh food. In addition, the municipal government has been actively involved in the transformation of existing wet markets. During the last two decades, the government planning of wet market upgrading can be categorized into two phases: substitution and upgrading.

5.3.2.1 Phase one: substitution by supermarkets (*nonggaichao*)

In 2002, a government campaign took place among numerous Chinese cities transforming wet markets into fresh food supermarkets. This movement was short lived in the majority of partaking cities (Zhang and Pan, 2013). Only successful in two cities–Fuzhou and Shenzhen—this movement ceased in all other cities including Nanjing by 2004 (Huang, 2005). As Huang clarified, this transformation (*Nonggaichao* in Chinese) aimed to convert the shabby, outdated wet markets into reasonably located, well-equipped, orderly managed wet markets that provide standardized services and trustworthy food, just as supermarkets do. To achieve this goal, cities attempted to introduce a centralized cashier and management system of supermarkets into wet markets while refurbishing them with clean infrastructure and modern management. Additionally, the municipal government explicitly encouraged new wet markets to be built like supermarkets (Huang, 2005).

This substitution movement folded due to its lack of commercial viability. As Zhang and Pan (2013) demonstrated, the supermarkets converted from wet markets could not compete with traditional wet markets in price or freshness. Neither could they compete with large chain supermarkets in food quality and variety of products. Following the failures in this substitution project, cities turned to a different approach to transform wet markets.

5.3.2.2 Phase two: upgrading (*tidang shengji*)

Since 2007, the municipal government of Nanjing has launched new action plans to transform wet markets. This new approach is officially named upscaling and upgrading (*tidang shengji* in Chinese). The priorities of wet market upgrading plans can be summarized by three areas of foci: appearance & infrastructure, food safety management, and quality of service. Table 18 below summarizes how these areas of foci are included in the latest relevant policy documents.

Table 18 Priorities of wet market upgrading plan.

Title	Appearance & infrastructure	Safety	Service
Vegetable Basket Project 2017	Informatization of food markets	Completion of food safety rapid test centres at 80 wet markets	Customization of services
Vegetable Basket Project 2018	Application of "internet plus" technologies (internet services)	Completion of food safety rapid test centres at 100 wet markets	Integration of online and offline services

Wet market upgrade action plan 2017-2019	Infrastructure renovation	Equip markets with food safety rapid test facilities and promote traceability systems	Implemention of precise management of markets Integration of "internet plus" services (encouraging stores to integrate online services) Development of community commerce (setting up businesses centering and around communities)

One way to summarize the government vision of appearance and infrastructure enhancement is the official discourse of transforming wet markets from "dirty, messy, backward" markets into markets that have "fine infrastructure, comprehensive functions, good order, clean front and inside, well-established rules, and decent management" (Municipal Government of Nanjing, 2017). Inside the plan, equally important to improve its function and service is to enhance the appearance and to align with the city's modern image. As the Bureau of Commerce of Nanjing (2017) narrated, "wet markets are a window into the image of a city's civilization and services. Overall, the wet markets are not advanced enough, its environment is not as good, and not standardized enough."

The Nanjing government has put in significant effort in improving food safety across the food supply chain. As mentioned in section 1, this tightened food safety control is demanded by the government to acquire the title of food safety model city. At wet markets, the most

noticeable measure is the setting up of food safety rapid testing labs inside wet markets. These labs are designed to monitor food safety at wet markets, encourage vendors to procure food from safe sources, and to allow customers to test the food.

To improve the service at wet markets, the upgrading plan has emphasized the strengthening of online services, such as online ordering and delivery, as well as precise management of vendors, in order to standardize the services and products at wet markets so that consumers could expect consistent services at the wet markets.

The above mentioned working priorities can be further unpacked into specific tasks through examining the assessment criteria. Table 19 outlines the criteria used by the Bureau of Commerce of Nanjing (2017) to assess the progress of upgrading at wet markets. A good assessment rating is necessary for any wet market in need of financial subsidies from the government, so wet markets are incentivized to accomplish the tasks listed in the criteria.

Table 19 Assessment criteria for wet market upgrading progress.

Appearance and infrastructure	
Architecture	● Stability of establishment ● Lighting ● Ventilation ● Signs and walls painting ● Floor hardening ● Water and sewage

Spatial divisions	● Dividing zones by food types ● Separating aquatic products from others ● Separating live animal trading
Facilities	● Fire protection ● Public toilet
Boothes	● Standard design ● Refrigeration ● Electric scales
Information infrastructure	● WiFi
Waste Management	● Standard trash cans and waste sorting
Parking management	● Areas for parking and (un)loading
Safety	
● Equip food safety rapid testing labs and ensure they are in proper use	
Service	
● Promote online sales services, online purchasing and e-payment at wet markets	
● Promote centralized payment (not implemented at wet markets)	
● Invite branded enterprises into wet markets to increase standardization of products	
● Train professional management teams	
● Establish services such as repair, shipping and receiving, and breakfast/fast food services	

Since 2007, the municipal government has set up financial support for the upscaling and upgrading of wet markets. Table 20 below summarizes the total amount of financial support. By 2020, according to this news report (Zhang and Tang, 2020), 86% of wet markets in Nanjing have been enrolled in the government's upgrading program.

Table 20 Overview of financial support for wet market upgrading between 2007 and 2020. Summarized based on Zhong et al., 2019 and Nanjing 2018 Vegetable Basket Project Action Plan.

Years	**Number of markets supported**	**Total amount of support (measurements in USD)**
2007-2008	**133**	**6.1 million**
2009-2012	**40**	**7.6 million**
2013-2014	**120**	**9.7 million**
2017-2020	**300 (86% of wet markets have been upgraded by 2020)** (Zhang and Tang, 2020s)	**Data Unavailable**

With thorough involvement of the government, the wet market upgrading program has significantly been transforming the wet markets in the city of Nanjing. Thus it is important to understand the priorities and implications of this transformation. The case study below introduces the process of upgrading at the model wet market in contrast to other wet markets, through which I highlight the priorities of the wet market upgrading program.

5.4 Case study: contrasting the model market with less modified markets

The market at Xianlin showcases the characteristics of the upgrading plan. It is located in Xianlin subdistrict, part of Qixia district in Nanjing. The property of this market belongs to the Xianlin subdistrict government office, and the market management is designated to Jiangsu Lvheng Property Management Company. Xianlin wet market consists of three floors including a basement. The majority of food vendors are located on the ground floor. Few clothing and convenience stores are located on the second floor. The market is occupied by 150 units of vendors. Among them, 140 vendors sell food items, including fresh vegetables, fruits, meats, eggs, tofu products, aquatic products, franchise prepared food, dried foods, tea, oil, and grains.

Xianlin wet market has received extensive financial support from the local governments to implement the upgrading program, and has been treated as a model market. The major upgrade of Xianlin market happened in 2013. Infrastructure including the floor, ceiling, and vendors' stands were renovated and central air conditioning was installed. With a modern food safety rapid testing lab built, Xianlin market represents one of the most complete wet market upgrading projects.

A few factors explain why Xianlin market was selected as the model. First, Xianlin sub-district has been rated as a national civilized sub-district. This title grants Xianlin sub-district attention from superior government departments for applying funds to upgrade the wet market. Second, according to the manager of this market, Xianlin sub-district has explicitly stated that Xianlin wet market is built as a model market and to represent the implementation of wet market upgrading in Xianlin sub-district. Available funds of the sub-district government were prioritized for the Xianlin market. Third, the property of Xianlin market is publicly owned, and is directly governed by the local government in a precise style of governance called “grid management”. The local government could implement to the full extent the ideals of modern wet market upgrading.

5.4.1 Contrasting the appearances of Xianlin market and other markets

Figures below contrast Xianlin market with a different wet market that has yet to be upgraded. The differences in the extent of upgrading between two markets are both visual and technological. The upgraded wet market has hardened and flattened the floor, replaced brick booths with stainless steel, and installed central air conditioning. Foods are displayed in a uniform way to ensure a standardized and orderly appearance of the market. For example, vegetables are organized in brackets, and they are positioned in a way to ensure that they do not stretch over the edge of the booths. All vendor booths are enumerated and symmetrically organized. At the front of each booth, an operating certificate and a price list are displayed.

In contrast, vegetables at the Shanxi market are organized in vendors' own ways, and some of the vegetables clearly extend over the edges of the booths. The booths are not spatially symmetrically organized but arranged in a way where vendors found economic success. Vendors used spare space to set up temporary stands or to store extras.

Figure 7 Inside the Shanxi Road wet market. Source: from the author.

Figure 8 Inside the Xianlin wet market. Source: from the author.

5.4.2 Food safety rapid testing labs

Figures below contrast the food safety rapid testing labs at Weigang market (Figure 9 & Figure 10) and Xianlin market (Figure 11& Figure 12). Weigang market relied on pesticide detection cards that only test residues of organophosphorus and carbamate compounds which are found in pesticides. Xianlin market has equipped machines to deliver the results and could test not only pesticide residues but also formaldehyde in aquatic products, nitrate in processed meats, and rongalite in tofu products. Test results are saved in the machines and could be uploaded into the government database as a food safety testing record. Xianlin wet market was the first wet market in Nanjing to build the modern food safety rapid testing lab. At the newly constructed safety testing lab, at least 15 fresh food items were sampled each

day to be tested. Test results are published on a large LED screen, right to the entrance of the wet market (shown below).

Figure 9 Photo one of the food safety testing lab at Weigang market. Source: from the author.

Photos of the food safety testing lab at Weigang market. Source: from the author.

Figure 10 Photo two of the food safety testing lab at Weigang market. Source: from the author.

Photos of the food safety testing lab at Weigang market. Source: from the author.

Figure 11 Photo one of the food safety testing lab in Xianlin market and the digital display of testing results on a screen.

Figure 12 Photo two of the food safety testing lab in Xianlin market and the digital display of testing results on a screen.

5.4.3 Financial subsidies

Financial support for upgrading is distributed by the government to wet markets based on an evaluation of the market's implementation. Financial support for upgrading is distributed by the government to wet markets based on an evaluation of the market's implementation. This means that wet market management had to rely on their savings to conduct the upgrading before they could receive financial compensation from the governments. It has been revealed through interviews that the fund distribution is hardly even between wet markets. Instead, the financial support has a tendency to accumulate within only a few markets.

According to the manager of Nanjing VBP, the official process of financial support distribution for wet market upgrading is the following: first, the wet market manager will commission a third-party enterprise to design layout for wet market upgrading. This draft layout shall be submitted with a budget plan to the sub-district governments and then to the bureau of commerce of the district, and eventually to the bureau of commerce in the city.

After the submission is assessed and approved, the wet market could implement the renovation accordingly. At this stage, the financial support from different government departments could amass to 35% of total estimated costs. Upon completion, the sub-district, district, and municipal governments, together with the bureau of finance will audit the execution of the upgrade. After one year, a second round of auditing will be conducted, the government could release additional financial support. Officially, the maximum level of

financial support from governments could cover 70% of the costs incurred during upgrading at a market. The financial support provided by the government for upgrading is conditional. According to the Nanjing Wet Market Upgrading Special Funds Management Protocol, all upgrading programs between 2017-2019 could receive subsidies up to 70% of the costs incurred during upgrading. The subsidies will be sourced half from the municipal government and the other half from the district government.

Although the procedure above appears effective and fair, two factors undermine the efficacy and fairness of fund distribution. First, according to the VBP project leader, although the official policy mandates that the rent for vendors will not increase throughout upgrading, the rent eventually rises following the upgrading. The government's financial support did not cover all of the fees incurred during upgrading, and some wet market management chose to offset the upgrading costs by increasing the rents. The project leader reasoned that the rent was supposed to rise, because the working environment for vendors and their business will improve. However, as I discuss in Section 5.6, the upgrade does not necessarily improve the business or financial well-being of vendors at all wet markets. On the contrary, the rent increase could undermine the economic viability of vendors. If the financial support leads to rent increase and food price inflation, it will defeat the purpose of upgrading the wet markets as a public service.

Second, based on the feedback from wet market managers, not all wet markets could receive full financial support (70% of the upgrading cost), if any support at all. Some wet markets are undersupported, while there is redundancy in support for other markets. For example, one wet market manager commented that not all government support could actualize, as shown below.

> *The government sometimes does not keep to its promise. We have not received any subsidy from the government, despite that our rapid testing lab was built 5 to 6 years ago. There's another wet market, near Ninggong Xinyu, their manager heard that the government would provide 200, 000 support for their renovation, so they spent 400, 000 for renovation. However, they received no subsidy after completing the renovation.*

Third, some of the financial support leads to redundancy and waste of public funds. For example, in 2016, Xianlin market received a full set of equipment for testing food safety from the district government. The equipment has comprehensive functions and can test both meat and vegetables. Because Xianlin market has been regarded by the local sub-district government as a paragon for food safety testing, it received another set of safety testing equipment in 2019 from Nanjing bureau of commerce. Since then, the previous equipment has been set aside and left unused, although it was still in good condition. The new equipment is perceived as redundant by the food safety testing staff, who lamented that she

spent substantial time learning to operate the old equipment. When she finally became familiar and comfortable using it, the new equipment arrived and she had to start over. She pointed out that *[the old machines] could run any tests, not just pesticides but also lean pork powder and hormones. The two machines cost 120,000 [CAD 24,000] in total. Now they have gone to waste.* The old testing machines were still in the lab, although she could no longer use them and had to follow the upgrading rules to use the new machines.

Notably, the new equipment did not offer any advantage over the old equipment. Arguably, the equipment was a waste of public funds. The new equipment could have been more useful if sent to wet markets that have not been so well-equipped with safety testing.

Additionally, in the distribution of financial support, building a good relation with the local government plays an important role. One wet market manager highlighted that building good relations (*guanxi*) with local government officials was the key to access support. The quote below from this manager shows that relationship-building is important to accessing government support.

> *Building good relations with the government is necessary for getting subsidized. To be honest, without relationship building, no support can be gained...The revenues of our company include the support from the government. Last year, our market lost a lot of money, so I reported our loss to the sub-district government. The sub-district*

government cared about us as a public service unit, and channeled subsidy. However, the subsidy wasn't given through the wet market program, but from other programs, such as engineering subsidy. Roughly they could offer over 100 types of subsidies, but you can't see these subsidies.

Judging from the above comments, it is clear that some of the available subsidies are not published, and remain only known by those who have built a close relationship with the local officials. The lack of fairness in the distribution of financial support could be seen as governed by favouritism.

The following section reviews and analyzes the perceptions of wet market upgrading by vendors and consumers based on their everyday experience at wet markets.

5.5 Vendor, manager, and consumer perceptions on the upgrading process

This section uncovers how food vendors and managers at wet markets and consumers evaluate the impact of wet market upgrading from an everyday perspective. During data analysis, I identified three commonly mentioned themes in the interview data pertaining to changes brought by upgrading: economic viability, new rules of vending and the skepticism towards safety testing. Overall, respondents have addressed both merits and drawbacks of the

upgrading project. The merits are focused on the improvement of the working environment. Drawbacks include unwanted rules, rent increases, and inefficiency in safety testing.

5.5.1 On economic viability

During interviews, both vendors and the Nanjing VBP manager mentioned that the upgrading program has raised rental fees of booths. Upgrading of wet markets entails costs for market renovation, purchasing equipment, and tightening management, and some of the costs are offloaded to vendors in the form of rent increases, which may be reflected on food prices as vendors raise the price to offset higher rent. As a manager from Weigang wet market mentioned in the interview that because of the renovations during upgrading, the rent for vendors must be raised. The increase in booth rental fees added to the economic pressure for wet market vendors. One vendor at Xianlin market lamented that she wished the upgrading never took place, despite the improvement to the work environment. She mentioned that the upgrading led to an increase in rent and fees to pay to the management, but she was afraid of raising food prices in the face of price competition with other vendors in the market. Instead, she had to sacrifice some of her revenue to offset the rent hike.

5.5.2 New rules imposed on vendors

During interviews, some vendors mentioned that the upgrading project has proposed new rules on their modes of operation at the markets. However, vendors did not wish to comply with all of them. Some of the new rules are only implemented during government inspection.

At Xianlin market, to showcase the transparency of information and management precision, certain certificates are displayed at the front of each booth: a certificate of operation, health certificate, and food prices. However, during fieldwork I noticed that the information displayed at Xianlin market was from the year before, and was thus outdated. The food prices on the board were only for display, and did not reflect the prices at sale. When asked about this, vendors mentioned that they thought the wet market management was responsible for updating the information, and the information display was obsolete for them. They did not care about the certificates or the displayed prices. Since bargaining is common in wet markets between vendors and consumers, consumers still would ask about food prices from vendors rather than looking at the price information. It was only for the wet market management to show that it had a proper information display.

Vendors at Xianlin market also had to purchase uniforms, and to wear the uniforms in the present of the wet market management teams. They took off the uniforms when the management team was no longer inspecting them. A fine would be issued if vendors were

found by the management to not wear the uniform. One vendor considered this to be a burden because it added to the pressures and stresses in their already busy work life.

As part of the upgrading project, wet market vendors are requested to keep invoices of each of their food purchases (from wholesale market, farmers' cooperatives, or other sources), and keep them at the wet market management in order to improve traceability of food at market. The invoice management, however, has not been fully implemented. Vendors mentioned that many sellers at wholesale markets do not provide invoices. They also mentioned that they usually did not keep or submit invoices, unless there was inspection from the municipal government.

Overall, the upgrading program sets out to standardize the modes of operation at wet markets, by requiring official information display, uniform wearing, and invoice tracking. However, these new requirements are not fully implemented, but mostly stayed only as a way to show the wet market's orderly appearance.

5.5.3 Skepticism of food safety testing

Vendors and managers commented that the implementation of food safety measures at wet markets follow a campaign-style enforcement. The enforcement is strongest immediately following major food safety outbreaks. In response to the outbreaks, a campaign would be

released by the local government to tighten food safety control and to mitigate food safety risks. Special funds and resources are mobilized. However, when the campaign comes to an end, the enforcement of food safety control may weaken. The rules and procedures established during the campaign remain nothing more than a formality to the actors involved.

As the wet market manager at Shanghai Road wet market mentioned, in the last decade, food safety testing has loosened up. According to their memory, around 2012, when Nanjing was hosting the Youth Olympics and the scandal of ractopamine (an illegal food additive for promoting leanness in meat) was exposed nationwide. There was a crackdown on unsafe food, and each district government established a work team to inspect food at wet markets. Special funds were established to support the food safety testing at wet markets. However, after the crackdown, the frequency of food safety scandals has decreased, and so did the special fund for food safety monitoring.

Some doubts have been raised on the accuracy and truthfulness of the food safety testing. For example, the staff at Planck organic food store at Jiangxi Rd wet market shared that

> *To be blunt, every morning, I see the market manager samples food from vendors and then they test the [food samples] at a service desk. I sometimes joke with them by calling them out as being only for show. They would laugh and say they had no other*

choice, they were required by their superiors [to perform the tests]. I don't think the food safety testing is reliable. Everyone including the management knows that.

During interviews, the wet market managers responsible for safety testing at two wet markets commented on the drawbacks of safety testing procedures. One manager commented that the testing was a mere formality. No customers had brought their food in for testing. Afterall, each test takes 30 minutes to finish, the customers do not have the time to spare. Also, after identifying safety risks in food, he would usually just notify the vendors and request them to buy a different food source. They did not want to ruffle the feathers of vendors, because it would not be easy to contract new vendors if they were to leave.

The other manager mentioned that she regarded the testing to be of little use. First of all, the market she works in was a private market and a relatively small market. They did not receive extensive financial support in the safety testing labs from the government. The government subsidized a set of equipment to them, but it has limited functions, could only test vegetables but not meat or fungus. She commented that the rapid testing was not very rigorous, since almost all samples tested safe.

5.5.4 Consumer perceptions on food safety

Five consumers I interviewed raised concerns about safety of food at wet markets. These consumers primarily buy food at an organic food store. Therefore, their views on the food at wet markets may not be representative of an average consumer in Nanjing. Nevertheless, the distrust towards food at wet markets is one of the motivations for them to buy organic food and these consumers have critical attitudes toward food safety. All five consumers intentionally avoided buying food from wet markets given their mistrust. One consumer mentioned that she was living with five chronic illnesses and was especially careful of her diet. She felt that if she ate anything from the wet market, she would suffer from digestion problems because of the contamination and additives in wet market foods. One consumer commented that she had little faith in food safety supervision in China in general, whereas two consumers gave specific rationales for mistrust. Among them, one said that she believed that the safety testing at the wet market she visits only conducts the testing as a pretence. The other consumer reasoned that the wet market management would not strictly enforce the testing rules on vendors because they would like to maintain good businesses and avoid losing the vendors. Overall, consumers have reasoned why they had little faith in the food safety of food at wet markets, despite the presence of food safety testing labs.

5.6 Discussion and conclusions

5.6.1 High modernism in wet market upgrading program

The term high modernism has been deployed by Scott (1998) to characterize a governmental approach to ordering and administration of nature and society. In the face of complex social and economic challenges to modernization and development, this approach relies on a combination of elite aesthetic epistemology with technical fixes. In my interpretation, high-modernism is expressed through investment in socio-technical advancement and pursuit of a visual codification of modernization. My rationale is threefold for characterizing the wet market upgrading plans in Nanjing as high-modernist planning. First, the government plans of upgrading wet markets clearly demonstrate an aspiration to modernize the wet market system and to reconstruct wet markets as icons of a modern city. The pursuit of moderness is explicitly verbalized in the government policies. For example, the Bureau of Commerce stated that "upgrading wet markets is necessary for the city's urbanization, for the commerce's urbanization, and for the improvement of resident livelihoods" (Bureau of Commerce of Nanjing, 2017).

Second, the government's implementation of the upgrading plans is highly technocentric. The policy documents demonstrate absolute faith in the application of new technologies for the advancement of wet markets. From installing new apparatus to promoting "internet plus" services, the upgrading plans strongly incentivize wet markets to

equip up-to-date technologies. Food safety rapid testing labs are installed as an effort to ease consumers' food safety anxiety. Smart wet markets are a frequently used narrative in policy documents, which imply that wet markets integrate internet services and internet of things technologies. These narratives demonstrate that modern high-tech wet markets are in the government's vision of the future of wet markets.

Third, the wet market upgrading plan is a domain of aesthetic governance and judgement. Aside from the additions of modern technologies, the upgrading attempts to create modern appearances of wet markets, in line with what has been described as "world-class urban aesthetics" (Pow, 2018: 874). The official visual codification of modern markets advances a negation of traditional markets as "dirty, messy, and backward". The visual codes entail the appearances of market and delicate management of actors within the market. Vendors are asked to organize and manage their booths in a consistent and unified way so as to make the market appear orderly. Formal certificates (such as business license) and invoices are required of vendors. The upgrading serves the government's purpose to create a clear, orderly, and simple view of the actors and actions for the markets to the eyes of the authorities. This visual codification is in line with Scott's characterization of high modernist planning where "only someone outside and above the display can fully appreciate it as a totality" (Scott, 1998: 254).

5.6.2 Drawbacks of high-modernist planning

Scott (1998) critiqued the high-modernist thinking and planning by illuminating that the high-modernist planner may attempt to re-order nature and society based on a pseudo-scientific oversimplification of the complex, organically occurring economies and activities. According to Scott, the naturally formed organizations, communities, and economies are loaded with "thick" meanings and activities, but the high-modernist planner could only grasp the "thin", schematic aspects. Due to this discrepancy, the high-modernist plan may go astray in its implementation and prove inefficient or even counterproductive. The same could be said about the wet market upgrading plan in Nanjing. In this section, I identify three drawbacks of high-modernist planning: the emphasis on visual order, the technocentric reductionist approach to complex social challenges, and the unequal distribution of government support (as a result of miniaturization).

The government's pursuit of a modern appearance for wet markets re-positions them towards middle class consumerism rather than an inclusive public service. Much of the upgrading plan derives from an aspiration towards transforming wet markets as spectacles in a modern metropolis. Some of the modern infrastructure, technologies, and market designs are for their own sake rather than to improve the actual service of the wet markets. Some of the designs and organization at the wet markets are on display for authorities, rather than for consumers or vendors. While the infrastructure upgrade has enhanced the appearance of the wet markets, much more could have been done to improve the working environment for vendors

at the markets. For example, most of the wet markets I visited in Nanjing lacked equipment for resting, although vendors had the habit of taking a short rest in the early afternoon when few consumers visited. I observed at Heyuan market that vendors slept by sitting on the chairs while resting their heads on their booths. Others squeezed themselves into the tight space underneath their booths where they made a temporary bed.

The second drawback of high-modernist planning is to apply technocentric reductionist solutions to complex challenges in the food system, such as the widespread food safety anxiety. To address the widespread food safety anxiety, the government has designed to set up the rapid food safety testing labs. These testing labs are being installed before some of the social problems are addressed (and these problems need to be addressed in order for these testing labs to be useful). Missing was the consideration of how the testing would be accurately and effectively implemented. Missing as well were considerations of building consumer awareness and trust in the safety testing to incentivize usage of the service. As I introduce in section 6, these services are underutilized, and consumers have expressed doubt on the trustworthiness of the testing labs. If the purpose of the wet market upgrading is to better serve consumers and vendors, these questions must be addressed and examined.

Another drawback of the high-modernist planning is the tendency of miniaturization. Scott (1998) used this term to describe the tendency of the high-modernist government to make a model city, village, or district that they have the resources and administrative power to

transform as per their ideals. By concentrating the resources on the “miniature”, the government is able to execute its planning, demonstrate its administrative power, and to showcase its success. In the example of wet market upgrading in Nanjing, the allocation of resources is not evenly split among all wet markets. Rather, I identified the concentration of resources at certain model markets.

5.6.3 Policy implications of everyday perceptions of wet market upgrading

One weakness of high-modernist planning, as Scott (1998) articulates, lies in the approach to “thick”, complex eco-social systems with “thin”, schematic plans. The wet market upgrading plan aligns with the parameters of modern city making. However, despite the technological advancement and visual facelift, the upgrade does not necessarily improve the service of the wet markets to vendors or consumers, as the respondents have indicated.

To ensure that the upgrading of wet markets will improve the working conditions of vendors and the services to consumers, perhaps, the plans could incorporate an everyday, agent-based perspective. Based on the feedback from respondents, the following factors may be considered by the government for the upgrading in the future. First, the mechanism of financial support distribution could be modified so as to ensure that the cost of upgrading does not threaten the viability of vendors or the markets. Some wet markets have not obtained financial support after implementing the measures of upgrading, and had to resort to rent increases in order to maintain financial balance. Second, the upgrading has imposed

rules irrelevant to the actual operations within the markets. These rules may have little to no relevance to the operations of wet markets. These management principles mimic the standardized corporate management in the supermarkets, which constrains vendors' autonomy. In practice, these rules are often bypassed through agreement between vendors and management. Third, consumers have voiced skepticism over the authenticity of the food safety testing results, due to the conflict of interest between the wet market management and vendors in the safety testing. It may be worth considering third-party inspection to ensure the authenticity of the testing results.

5.6.4 Areas for further research

5.6.4.1 Regarding food governance

This chapter is an attempt to characterize the approach taken by the Nanjing government to transform the backbone of its urban food system–the wet market–towards the objective of modernization. I propose the analytical lens of high-modernism to understand the governmental logic underlying the measures of the wet market upgrading plan. This analytical lens helps understand the motives of the upgrading and the priorities in the current upgrading plan, while applying the critical framework to evaluate the strengths and weaknesses of the upgrading plan. The high-modernist tendencies have manifested in the modernization of both the technologies, infrastructure and the visual codes of the wet markets. The high-modernist renovation has improved the appearances of wet markets,

although these improvements may not undergird the services of wet markets, nor do they contribute to the economic viability of vendors at the markets.

Changes happening at wet markets are not just in the wet markets, the same patterns are seen on the transformations of the retail section, as the government led rise of the new retail businesses, as well as the transformation in the agricultural sector, as my other chapters have described in detail. The orientation and quest for modernization has driven the wet markets to evolve in this direction, which could be used to understand and to critique the food governance in the Chinese context.

Further research could interrogate the similarities and distinctions between the state-led transformation of the retail sector in China and the food retail transformation in other cities in the Global South. The government and multinational supermarket chains play an important role in shifting the urban food retail landscape. Is the quest for modernization weakening the resilience of the traditional food markets in the face of rising competition from transnational food retail chains and supermarkets?

5.6.4.2 Regarding food security

Further research could usefully measure the economic impact of the wet market upgrading project and Vegetable Basket Project on food price stability and wet market vendor viability.

Vendors participating in this research have mentioned in common the economic stress imposed by the upgrading and the new rules to follow. Further research through surveys could gather quantitatively robust samples to verify the impact of the wet market upgrading plan on the livelihood of vendors and the economic viability. The results will help reveal the long term impact of the upgrading plan on the conditions of the vendors.

5.6.4.3 Regarding food safety

Further research is needed on consumer trust and awareness about food safety measures at wet markets. Some questions remain outstanding. How is the public made aware of the food safety testing lab? To what extent do consumers at the wet markets understand and trust the safety testing techniques and procedures? How often and how common do vendors utilize the food safety testing services at wet markets? If consumers utilize services at wet markets, what do they perceive as the advantages and the weaknesses of the services at wet markets? Does safety testing boost consumer confidence in the food bought at wet markets? Considering that Si et al. (2018) found that consumers in Nanjing regarded the food safety monitoring and regulation as lacking, does the implementation of food safety testing address this concern? The top concerns were overuse of agrochemicals and environmental pollutants (Si et al., 2018a), and the safety testing labs in theory could screen and intercept food with overuse of agrochemicals and environmental pollutants, if they are done with proper techniques and random sampling. However, current testing services have to be adjusted to

make them of actual use to consumers rather than being a display of modern technologies and delicate management.

Chapter 6

Independent New Farmers and High-modernist Planning of Sustainable Agricultural Modernization

6.1 Introduction

Modernization was the Holy Grail of China's state-building in the 20th century (Yan, 2012). Agricultural modernization has been and still is the central agenda for China's agricultural and rural development. The process of agricultural modernization improved crop productivity and food sufficiency in China but a plethora of challenges confronts China's agriculture after decades of agricultural modernization--soil degradation, water contamination, and agricultural biodiversity loss, to name a few. These environmental challenges are compounded by a looming succession crisis of farmers due to persistent outflow of rural youth into urban areas and barriers to returning migrants (Zhu, 2018). During the last decade, to address these challenges, the Chinese government has taken a new approach to agricultural modernization by integrating social and environmental sustainability as key strategies. More specifically, the new approach has become more inclusive than before to farmers of different scales and has put more emphasis than before on reducing the environmental impact of agriculture.

Zhang and Donaldson (2008) provide a clear summary of the history of agricultural development in modern China by dividing it into four key stages: land reform and division,

land collectivization through people's commune system, land de-collectivization through Household Responsibility System, and finally land consolidation through the rise of agrarian capitalism and large agribusinesses. Zhang et al. (2015) conceptualize this last stage of agricultural development (since mid-2000s) in China as agricultural modernization through the lead of agribusinesses. Building on Zhang et al. (2015)'s conceptualization and my research observations, I argue that agricultural modernization in China is transitioning towards a new phase. The agenda of this phase of "agricultural modernization 2.0" is to create models of environmentally sustainable modern agriculture that are viable to "appropriately scaled (*Shidu Guimo*)" farms rather than limited to agribusinesses.

The dynamics of agrarian capitalism and the dominance of dragon-head enterprises are still relevant in the state planned process of agricultural modernization (Zhang and Donaldson, 2008), although the state has expanded its focus to include medium sized farms since mid-2010s. In 2015, China's Central Conference on Rural Work announced the concept of agricultural supply-side reform. One key objective of the supply-side reform is to enable what has been conceptualized as New Farming Subjects, meaning that the state will no longer only prioritize large agribusinesses to lead agricultural modernization, but will also enable and support large farms, family farms, and farmers' cooperatives (Xu et al., 2020). In other words, the government's vision of modern agriculture used to focus on large agribusinesses and expected agribusinesses to overtake small-scale farms and become the dominant form of producer in the future. However, the announcement of supply-side reform

and subsequent policies signaled that the state planned to highlight the roles of medium sized farmers and farmers' cooperatives in the blueprint of agricultural modernization. This indicates that the medium sized farmers are not to be replaced or to be treated as an appendage to large agribusinesses, but to become a major force of agricultural modernization.

The second characteristic of "agricultural modernization 2.0" is the prioritization of environmental sustainability. With the release of National Sustainable Agriculture Development Plan (2015-2030) and the central government's emphasis on cultivating ecological civilization, policy documents and agricultural development plans have included more than ever guidelines and rules about reducing the environmental impact of agriculture. For example, over the past five years, the central government has aggressively tackled the overuse of chemical inputs, burning of rice stubble, mishandling of animal manure and other critical environmental issues related to farming.

This chapter argues that the state's approach to agricultural modernization has become increasingly inclusive and environmentally aware, but the high-modernist style of implementation undermines its efficacy. The government approach to agricultural modernization is deeply influenced by its high-modernist appreciation of technological advancement and modern aesthetics. Technological advancement is regarded by the government as a tool to improve productivity and to boost rural development. The

government's preference of modern aesthetics manifests during the interviews with farmers and in the government's support for large on-farm infrastructure as visual optics to showcase progress and development.

Zhang et al. (2015) explain the government's plan to deploy agricultural modernization in order to revitalize agricultural and rural development: "modernized agriculture then raises labour productivity, provides market opportunities for agricultural producers and transforms them from 'backward', 'unproductive' peasants into market-integrated, technology-savvy and productive modern farmers" (305). Apart from the economic and productivity concerns, I argue that the government's plan to reposition farmer and agriculture from backward into modern and technology-savvy convey its aesthetic appraisal and its intent to create the modern citizens and modern farmers.

So far, there is limited update on the most recent government planning of agricultural modernization in China and within the existing literature, few studies have addressed the underlying governmental logic behind the plans of agricultural modernization. This chapter aims to address these knowledge gaps by a) providing an overview of recent trends in government planning for agricultural modernization, b) providing an interpretation of the governmental logic underlying the government plans and raising the interpretation of high-modernism, and c) analyzing the implications of the plans on food sustainability and farmers based on fieldwork observations and stakeholder interviews.

In sum, this chapter contributes to the literature on China's agricultural modernization by a)arguing that the government is incorporating new values in its agricultural modernization programs and b) by demonstrating that aesthetic values and optics are a very important and insufficiently discussed aspect of the government's food planning in China. **The implications of this aesthetic judgement are that a) it will reinforce rural inequality, despite the new agenda of agricultural modernization intends to include appropriately scaled farms; b) it will undermine the inclusivity of independent small-to-medium sized ecological farms in the government's planning of agricultural modernization and the government's standardization and codification of ecological farming will limit the diverse expressions of ecological farming.**

This chapter will introduce a group of new farmers in Nanjing. This group of farmers have taken on ecological farming practices to reduce the environmental impact of agriculture and to ease the food safety concerns, but not all of them gained any attention from the local government. The innovative farming and marketing practices of new farmers have been discussed as alternative food networks (see Si et al., 2018b; Scott et al., 2018; Si et al., 2015; Schumilas 2014) and new agricultural geographies (Ding et al., 2018). These studies have provided a detailed account of the characteristics of these alternative food economies, yet less attention is paid to their interactions with the local government and their role in the government's planning of agricultural modernization. Research has pointed out the lack of government involvement in grassroots ecological farming initiatives (Si et al., 2015; Scott et

al., 2014), yet an explanation of this lack of government attention has not been given. This chapter advances the interpretation of the high-modernist nature of government planning to explain the lack of engagement of new farmers in government plans of agricultural modernization.

The rest of this chapter is organized as follows. Section 6.2 provides an overview of the research methods and research data. Section 6.3 summarizes the government planning of agricultural modernization in Nanjing, based on policy analysis and highlights the recent evolution of agricultural development plans. It also applies the concept of high modernism to interpret the government planning. Section 6.4 illustrates the strengths and weaknesses of the high-modernist plans through specific cases of agribusinesses and farmers' cooperatives that are involved in the state plans. Section 6.5 introduces the grassroots innovations of new farmers and their interpretations of the government vision of agricultural development and their relations with the local government. Section 6.6 concludes by highlighting the contributions of this chapter and avenues for further research on government planning of agricultural development and sustainability in China.

6.2 Data overview

The main methods of data collection are fieldwork, non-obtrusive observation, participant observation, and semi-structured interviews. In the span of 18 weeks (16 weeks in 2016, and two weeks in 2017), our research team conducted interviews with in total 29 farming units.

Among the 29 farming units, six were led by female leaders, 20 led by male leaders, and the remaining three by married couples. By size and business type, farming units can be categorized into three groups:

1) large agribusiness. This group consists of large-scale farms that operate on land larger than 66 hectares (more than 1, 000 mu[7]), and has formal registration at the Ministry of Commerce as agribusiness. Eight of the farming units I interviewed are large agribusinesses.

2) the small and medium-sized farms. These farms have a range of land size from less than 2 hectares to 66 hectares. Some of them were not registered as an enterprise, and only informally leased land from conventional farmers based on oral agreements. 16 of the farming units I interviewed are small and medium-sized farmers.

3) farmers cooperatives. Farmers cooperatives work through farmers pooling land and/or other resources together for collective investment and marketing. Five of the farming units are members of three farmers' cooperatives. It is important to note that farmers cooperatives in China are different from the international counterpart, because in China farmers' cooperatives are found to be mostly fake cooperatives (Yan and Chen, 2015). Some only exist on paper, and others are dominated by large farms or agribusinesses only to obtain government subsidies and they fail to involve other members in the cooperatives in production or revenue distribution. The three farmers cooperatives I interviewed were functioning cooperatives rather than only existing on paper.

[7] Mu is the most commonly used measuring unit for land area in China. In transition, one hectare equals to 15 mus.

In addition to farming units, interviews involved one organic food magazine editor, one government official at Jiangsu Agricultural Committee, one organic food sales veteran, and a manager in charge of institutional procurement of organic foods at a state-owned enterprise in Nanjing.

6.3 High-modernism in state-planned agricultural modernization

This subsection begins by introducing the background and history of state-planned agricultural modernization in China, followed by an explanation of the manifestation of high-modernism in the state plans. China's agricultural development plan has a longstanding focus on modernization. It is argued that since the economic reform and trade liberalization in the 1970s, modernization has been treated by the Chinese state as a Holy Grail for economic development and nation-building (Yan, 2012; Kipnis, 2012), and agricultural modernization was regarded by the state as one of the four pillars of modernization.

Agricultural modernization is highlighted in most key government policies about agricultural and rural development. Each year, the central government of China releases a Number One document that outlines the action plans for agricultural and rural development as action plans for regional governments. Table 21 Key themes in No. 1 Central Documents between 1999 and 2020 below summarizes the policy headlines in the Number One document from 2000 to 2020. The state agenda of agricultural modernization has been

comprehensive and ever-changing. One long-lasting focus of agricultural modernization is to boost productivity, and the state aims to achieve that through adopting new farming technologies, machinery, hybrid seeds, chemical inputs, and modern infrastructure.

Over the past two decades, mechanization and infrastructure upgrade have been a priority in China's agricultural modernization plan, and China has made significant progress in mechanization and building modern farming infrastructure. According to the Ministry of Agriculture and Rural Affairs (2019), China has reached 70% in comprehensive mechanization 8 by 2019, almost doubled from 1999 (38%) (Jiao and Dong, 2018). The levels of comprehensive mechanization for rice, wheat, and maize production have exceeded 80%. The area of modern agricultural infrastructure has been expanding. For example, between 2017 and 2020, the total area of protected horticulture has doubled; by 2017, it covers 85% of world total area of protected horticulture (Jiang and Zhang, 2009; Sun et al., 2019). The state continues to support mechanization and recently focuses on research and development for machines and infrastructure for mountainous regions, animal agriculture, and aquaculture.

[8] According to the Yearbook of China's Agricultural Machine Industry, comprehensive mechanization is calculated by the weighted sum of mechanization rate in plowing (40%), seed drilling (30%), and harvesting (30%).

Two other recent trends in the agricultural modernization planning are the investment in information technologies and attracting talents to agriculture. Recently, the state has been promoting the integration of internet of things and big data technologies to upgrade the food supply chain. It also encourages and sponsors young talents with post-secondary education to agricultural entrepreneurship in order to stimulate technological innovations in agriculture.

The state has funded campaigns to promote scientific fertilization in order to reduce the application of chemical fertilizers. Specific measures include the promotion of soil-testing based fertilization, foliage and deep soil fertilization, and the adoption of organic fertilizers. Regarding genetic engineering technologies, the state remains vigilant on its commercialization, but lists genetic engineering as one of the priority areas for technological research and development.

Table 21 Key themes in No. 1 Central Documents between 1999 and 2020

Year(s)	Policy headlines
2000-2015	• Scaling up farm production via cultivating dragon-head enterprises • Modernizing agricultural technologies and infrastructure and building modern agriculture complexes (synthesized based on Zhang et al., 2015; Lin and Zhang, 2004)
2016	Accelerating agricultural modernization by improving efficiency and competitiveness of food production
2017	Deepening supply-side structural reform to enrich the added value in the food supply chain and adjust the proportion of grain production

2018	Promoting rural revitalization
2019	Resolving the "San Nong" challenges ("San Nong", or Three Rural Issues refer to the challenges facing rural production, population, and space)
2020	Eradicating poverty and comprehensively build a moderately prosperous society

Source: adapted from China Ministry of Agriculture website http://www.moa.gov.cn/ztzl/jj2019zyyhwj/.

In 2017, the top priority of the Number One document made a shift from productivity toward rural development. Between 2018 and 2020, the policy headline explicitly stresses the urgency to address rural challenges and eradicate rural poverty. This urgency relates to the state's commitment to build a moderately prosperous society by 2020[9], and eradication of extreme poverty[10] is the baseline for building a moderately prosperous society.

The recent emphasis on poverty reduction is linked to the promotion of ecological agriculture and food safety. As Deng and Xiao (2015) point out, 95% of extreme poverty happens in ecologically fragile areas, and conservation measures are integrated into the poverty alleviation strategies, forming the government's innovative approach of "ecological poverty alleviation".

[9] In 2002, the state set a goal to fully achieve a moderately prosperous society by 2020. This goal is reinstated under the current leadership in 2016.
[10] Extreme poverty in China is officially defined by any individual earning less than 2300 *Yuan* a year.

This approach includes measures such as introducing ecological farming to and relocating populations in mountainous poverty-stricken areas, also known as "going down the hill" poverty alleviation (Deng and Xiao, 2015). Successful implementation of this measure has two caveats: populations after relocation will be able to sustain their livelihoods independently and will not fall back into poverty; the ecologically vulnerable areas will be well attended, rather than being abandoned or used for commercial production. These caveats notwithstanding, the central government's food system planning is re-orienting toward poverty alleviation and ecological conservation. The Number One documents from 2016 to 2019 have all listed green and sustainable agriculture as the second or third policy goal. In 2015, China's State Council also published the National Sustainable Agriculture Development Plan (2015-2030) to lay out its plan for improving sustainability in agricultural practices in China. As the state repositions small and medium sized farms as a major force rather than a complimentary force of agricultural modernization, the new approach to agricultural modernization has the potential to engage and benefit small and medium sized farmers more than before.

Agribusinesses play an important role in fulfilling the state's vision in agricultural modernization. Since the 1990s, the process of corporatization accelerated as the state supported and courage the formation of large agribusinesses (Schneider, 2017; Zhang and Donaldson, 2008) to consolidate the farming sector (Zhang et al., 2015). By corporatization, I

refer to the growth of agribusinesses and increasing land transfer from household farms to agribusinesses in China. The state assists agribusinesses in land access by mediating land transfer and provides financial support for corporate investment in large-scale infrastructure. By 2013, the land-use right of over 22.6 million hectares of collectively owned farmland has been transferred to enterprises (Schneider, 2017). This transfer involves more than a quarter of China's total farmland (Ye, 2015), and agribusinesses are increasingly involved in such transfer (Schneider, 2017). Among agribusinesses, dragon head enterprises especially earned support from the government in financing.

Dragon head enterprises are regarded by the state as the agents for radiation-driven development[11] and a path to agricultural modernization (Ruan et al., 2017). Dragon in Han Chinese culture symbolizes power and vigour, and head of the dragon leads the rest of its body. Therefore, the phrase dragon head implies powerful enterprises that lead the development of small-scale actors. In the case of agriculture, dragon head enterprises are large-scale, capital-intensive agribusinesses that are funded by the government to modernize agriculture and to allegedly drive the development of small-scale farmers by facilitating with the processing and circulation of agricultural products. To become a dragon-head enterprise,

[11] This phrase implies that government support toward large agribusiness will "radiate" to small-scale farmers and benefit them. For the sake of brevity, the rest of this chapter refers to this effect as the radiation effect.

a company needs to meet certain financial and operational criteria. For example, the Nanjing municipal government define dragon-head enterprises as enterprises mainly operating in agricultural production, processing, circulation, agritourism and e-commerce. Eligible companies must earn an annual income above eight million *yuan* (approx. 1.5 million CAD) and their net assets must exceed 1.5 million CAD. The criteria of dragon-head enterprises increase as the level of the government that designates them.

Starting from late 1990s, the Chinese state allocated significant funds in national agricultural development plans to support the growth of dragon head enterprises (Lin and Zhang, 2004; Zhang and Donaldson, 2008). The means of support include tax reduction, export tax rebates, infrastructure subsidies, land use subsidies, and subsidies for initial public offering. To qualify for the support, agribusinesses have to reach certain scale and levels of revenues and register as a dragon head enterprise. The standards of qualification are different between nation-level, province-level and city-level dragon head enterprises. Higher standard requires larger scale of production and warrants larger government support. Thanks to the abundant government support, agribusinesses are incentivized to scale up in order to qualify as dragon head enterprises. By 2014, over 120, 000 agribusinesses have been registered as dragon head enterprises (Ruan et al., 2017). Among these, 110, 000 have been designated by the national government as dragon head enterprises (Schneider, 2017).

Theoretically, large agribusinesses contribute to poverty alleviation and sustainability through spillover effects. The official policy documents describe this effect as the "radiation-driven effect" (*Fushe Daidong Zuoyong*). Radiation effect implies that dragon head enterprises and farmers' cooperatives will empower farmers, advance their agricultural production, improve their farming techniques and access to markets, and thus increase their incomes. More precisely, they are assumed to provide the following services to farmers (Ruan et al., 2017; Schneider, 2017; Lin and Zhang, 2004).

- Training farmers new techniques and the use of new technologies such as the adoption of fertilization and irrigation equipment
- Diversifying on-farm economic activities including *ecological* tourism
- Build market connections for farmers to access local-regional markets
- Providing employment for farmers
- Catalyzing standardized food production

Ruan et al. (2017) find that the delivery of some of the above services is ineffective and the most effective delivery is providing employment for farmers. However, this process usually involves expropriating land from a group of farmers for the agribusiness. Farmers who lost their land became farm workers and wage dependent. It is not conclusive whether

transitioning from self-reliant farmers into landless farm workers improves their livelihoods in the long run.

Overall, agricultural modernization has been a long-standing development goal in China since the economic reform in the 1970s. The government agenda of agricultural modernization has been evolving over the past five decades. The long-standing core principles have remained–to increase productivity and to adopt modern technologies. In the last two decades, poverty alleviation and environmental conservation have become key foci of agricultural modernization. The supply-side restructuring emphasizes improving the quality of production, not just quantity. Consistently, large agribusinesses have been employed as the main leverage to achieve agricultural modernization, and the state has been generously supporting agribusinesses to maximize their radiation effect and to drive the modernization of adjacent small-scale farms. In addition to agribusinesses, the state has been cultivating modern agriculture by building modern agriculture demonstration centres. To incorporate the values of poverty alleviation and environmental conservation, large agribusinesses are encouraged to practice ecological farming and to acquire various certificates for ecological farming.

This chapter argues that throughout the government agenda of agricultural modernization, the concept of high-modernism captures the governmental logic underlying

the modernization plans and practices. High-modernism manifests in government plans by three aspects: the government's investment in technological supremacy, the quest for modern aesthetics, and the tendency of miniaturization (setting up a perfect model for display). To be more specific, the features of high-modernist planning include the blind faith in technological solutions to complex social challenges, the imposition of modern visual codes, and the tendency to build model projects to demonstrate the feasibility of high-modernist plans. Throughout the process of agricultural modernization in China, the government has heavily subsidized modern infrastructure construction, machinery, and inputs especially for large agribusinesses. For example, large agribusinesses have benefited from adopting greenhouses, water-saving irrigation systems, tillers, seeders, harvesters, weed removers, and subsidized organic fertilizers. The adoption of modern technologies and infrastructure is regarded by the government as a necessary means to increase productivity. Modern aesthetics are socially constructed by the government as the display of visual order and technological advancement at farms. The miniaturization is shown by the government's tendency to concentrate support on large agribusinesses and agricultural complexes and relying on them to drive the development of nearby farms.

The high-modernist approach affects both the design and the implementation of the agricultural modernization plans, and undermine the efficacy of the agricultural modernization 2.0 agenda. In the following section below, I will employ examples to explain how the high-modernist approach determines the implementation of agricultural

modernization and analyzes the strengths and weaknesses of this approach. In particular, I will explain how the high-modernist approach to agricultural modernization affects the fulfillment of poverty alleviation, inclusivity and sustainability goals. In addition, I will investigate the radiation effect of large agribusinesses on adjacent small-scale farms.

6.4 Strengths and weaknesses of high-modernist planning

In this section, I will introduce specific examples to demonstrate the strengths and weakness of the government's high-modernist approach to agricultural modernization. The examples include a farmers' cooperative at Ding village and two large agribusinesses, Babuluo and Desa. These farming organizations match the government's high-modernist planning of agricultural development and gained government recognition as model projects. All three organizations have claimed to contribute to ecological farming and some of them publicly include poverty alleviation as part of their achievements. In the following analysis, I will first introduce the background of each organization, and then explain why these organizations fit in with the government's model of high-modernist agricultural development and how the government's high-modernist planning shapes their farming practices. This is followed by an analysis of the impact of the high-modernist development on these model organizations on adjacent farms and the environment, based on fieldwork and semi-structured interviews.

6.4.1 Farmers' cooperative at Ding village

Ding village is located in Maoshan county, Jurong city, which is adjacent to Nanjing. Within Ding village, a farmers' cooperative focusing on grape farming has enrolled over 1600 households and extended to a total of 1200 hectares of vineyards. This cooperative is led by a large agribusiness called Laofang. As other households in the cooperative, Laofang specializes in grape production and its grapes are certified green. As of 2017, Laofang's vineyard was over 133 hectares. Laofang and the cooperative have won numerous titles from the government and approved as a model for agricultural development. To name a few, Laofang has been designated by local governments as the agricultural technology demonstration centre, the national agricultural standardization zone, and a Jiangsu famous brand. The cooperative has been designated as the "10, 000 mu grape production demonstration centre", touting its large scale and standardized streamline grape production methods.

The multiple designations of Ding village result from its adoption of the government's high-modernist values and aesthetics in agricultural development. Specifically, Laofang has prioritized technological advancement in its production. With assistance of the local government, Laofang has adopted some of the latest technologies and techniques of grape production (see Figure 13). The figure below shows one of the production sites at Laofang has been designated as a pilot site for nationally significant agricultural technology

promotion service. Similar to this site, numerous greenhouses at Laofang have been experimenting with the advanced farming technologies that the government tries to promote. In addition, Laofang has equipped modern machineries such as irrigation system, mechanical weed control and pesticide application.

Figure 13 A pilot site at Laofang to demonstrate the integration of fruit and vegetable production technologies that enhance quality and efficiency.

Source: the author.

The physical layout and landscaping (see Figure 14) of Laofang appeal to the local government's modern aesthetics. Ding village is not only an important demonstration site for modern grape farming, but also an important demonstration site for agritourism. To create an

impression of a modern, well-maintained, prosperous village, Laofang has constructed impressive landscape with traditional decoration of its main office and tourist centres. To accommodate tourists (including authorities and tour groups from large companies), Laofang has set up a conference hall, an auditorium, and a chess room for entertainment. Laofang represents the image of modern, advanced agriculture combined with modern processing and agrotourism services, which have been promoted by governments of various levels.

Figure 14 Mapping of the spatial distribution of industries in Jurong city (left), mapping of Ding village modern agriculture industrial park (middle) and the landscape of Laofang's grape culture square (right).

Source: the author.

Being designated as model farmers' cooperative and demonstration centres by the government leads to abundant financial support from the government to Ding village,

although I found that the financial support had mostly concentrated on Laofang. Based on interview data with from their staff, the local government subsidized the construction of the large-scale infrastructure, from arrays of greenhouses to the conference hall. Based on interview information, sales at Ding village met with challenges around 2015. The local governments started a yearly grape festival to market grapes at Ding village through attracting tourists. At its peak, the grape festival brought over 100,000 visitors a day to Laofang. Group purchases and tourism incomes are the majority of incomes to Laofang, where 80% of orders are made by groups rather than individual customers.

Such support from the government had yet to equally benefit other farms in Ding village. The financial support towards infrastructure concentrates on large farms such as Laofang and rarely distributes to small farming households. While Laofang was able to sell its grapes and grape-based products through pre-packaged gift boxes and deliveries, small farmers in the cooperatives were mostly selling their grapes in the corner of street right in front of their homes. During fieldwork, Laofang received numbers of buses of visitors, while smaller farm households rarely saw any customers. The prices of grapes from small farm were only a fraction (3-4 *yuan* per kilogram) of Laofang's (20-30 *yuan* per kilogram). When asked about the lack of marketing support for members, the marketing staff commented "The cooperative does not administer marketing. Farmers take care of their own sales…we're not

running a charity". It was evident that other farm members of the cooperative did not equally benefit from the modern transition and the financial support from the government.

6.4.2 Religious farming community at Desa village

Desa village is located in Maoshan County, Jurong City. The name of the village, Desa, derives from the ancient city Tirzah, as mentioned in the Bible. Based on the interview data, founders and most employees of Desa farm are Christians. The enclosed Desa Tofu village stretches over 200 hectares of land. The majority of the land was dedicated to tourism with flower gardens, tofu-themed souvenir shops and hotels. A small portion of the land was farmland. Large-scale commercial farming was organized by a company called Xiaokang Ecological Agriculture Company, while some of the villagers were growing food on their own land.

Desa village and Ding village together were on one of the selected paths of "rural tourism and poverty alleviation learning experience", designated by the National Cultural and Tourism Ministry. Being designated as a tourism site, Desa village has committed to substantial renovations and landscaping. The renovation adopts traditional architecture (Figure 15) to symbolize simple lifestyle and harmonious relationship with nature.

Figure 15 Front gate of the renovated Desa village.

Source: the author.

According to the marketing staff, the local government was fully supportive of the modern transition of the village. To enable its transition, the government had claimed 200 hectares of farmland from farmers, and the landless farmers had to relocate to the nearby Zhenjiang city. The space freed up was then allocated to the tourism management company to set up the sightseeing and accommodation sites for tourists. The staff proudly mentioned that Desa Village had plans to further expand. Its new project aimed to establish nursing homes, forest park, international conference hall, and more hotels, and the local government had agreed to render another 1000 hectares' land available for this plan. Although Desa was not a site to demonstrate modern agricultural technologies, it certainly meets the criteria for

building modern tourism-centred villages that appealed to the government's aesthetic standards and rural development goals.

Regarding the effect of the modern transition of Desa village on indigenous residents, the construction of Desa Tofu Village had led to the displacement to some of them. Regarding the dissemination of ecological farming knowledge and practices, there was miscommunication between the management and the farming community. The farming community was building trust with visiting consumers through religious faith. Some of them mentioned during interviews that the vegetables at Desa were safe and trustworthy, as they emphasized that their vegetables were grown with good faith and were "God's vegetables". Additionally, the marketing staff said that all food was grown by the organic standard. However, the vice chief manager of Xiaokang Ecological Agriculture Company informed that his company did not get certified as organic and was using chemical fertilizers and pesticides. He believed that the production method was environmentally friendly because their production manager consulted a professor from Nanjing Agricultural University about ecological farming methods and put the methods in practice. The discrepancy on the production methods between the manager and staff demonstrates that the information about ecological/organic farming was not effectively circulated within Desa Village, let alone outside the village. In fact, Desa Village was a stand-alone business with little involvement with adjacent farms, let alone sharing the production techniques or marketing channels.

In sum, Desa village underwent a transition from a farming village to a modern tourist centre. It was selected to be on the recommended paths for "rural tourism and poverty alleviation learning experience". The local government had coordinated land transfer to enable the establishment of the tourist sites that demonstrate the government's visual codification of a modern, prosperous and ecological village. Despite the success in tourism, it was questionable whether Desa had meaningful positive impact on the livelihoods of the indigenous residents or the local environment. The most noticeable "radiation effect" of the tourism management enterprise in Desa Village was the expropriation of hectares of farmland and displacement of adjacent farmers. Dissemination of ecological farming methods and market opportunities was minimal. Relocated farmers could not economically benefit from the agribusiness' ecotourism investment in the Desa Village after they moved away. After its transition to a modern tourist centre, Desa Village is hardly a farming village, but a corporate-centred tourist hub that retains a façade of a traditional village for the purpose of rural tourism.

6.4.3 Babuluo Eco Valley

Babuluo Eco Valley is a large agricultural complex that combines farming, food processing, and agrotourism facilities. Babuluo is located in the Zhu county, Liuhe district of Nanjing city. In total, Babuluo covers 800 hectares of land and despite its claims as an agricultural centre, the majority of its acreage is dedicated to tourism. Babuluo has been

designated by the local government as a model project of modern, advanced, and ecological agriculture. For example, Babuluo has been rated as a priority agricultural project by the Jiangsu provincial government and its parent organization was rated as the most investment-worthy enterprise at the 2019 Jiangsu Top Enterprise Summit. On its promotion materials, Babuluo claims to "combine ecological agriculture with ecotourism, and combine modern technological agriculture with e-commerce platforms. These features resonate with the state's agricultural policy that encourages modern, smart, ecological agriculture." Indeed, through investing in modern agriculture, improving infrastructure, integrating with online retail, and combining farming with processing and agritourism, Babuluo appeals to the ideals of agricultural modernization from the government's perspective.

As the model project, Babuluo gains abundant support from the government. To name a few examples, when starting out, Babuluo acquired most of land (608 hectares) through government-assisted land transfer from the local villagers. The inputs and infrastructure on Babuluo are financially subsidized by the government, covering at least 50 percent of the total costs. Local governments also support the construction of the food processing workshops and the spread of the retail stores, as specified in Chapter 4. Clearly, the government support focuses on adoption of modern technologies, the replication of modern infrastructure, and the extension of agricultural services to nature-themed tourism. These

focuses are in line with the government's high-modernist visualization of the advanced and sustainable agriculture and rural development.

Inefficiencies of the government financial support, however, are identified in the operation of Babuluo during fieldwork. For instance, in Chapter 4, I mentioned that 70% of the government-funded greenhouses at Babuluo were not being used, because the labour cost and maintenance cost of using them were too high. The underuse of farm infrastructure is not only a waste of public funding but also of farmland. Furthermore, in order to acquire the subsidies, the agribusiness has to adopt practices despite knowing that they are redundant or unfit with their farm. For example, government subsidy for green prevention and control[12] is only given after completing on-farm implementation, which means that farmers must adopt all required measures in order to access the subsidy. However, not all green prevention and control tools answer to farmers' needs. This discrepancy between the subsidy package and farm needs reflects a problem with the planned development and the tendency of standardization. For example, the production manager at *Babuluo* commented below.

[12] Green prevention and control are a key technical approach in National Sustainable Agriculture Development Plan. They indicate using environmentally friendly techniques to prevent and control crop diseases and pests. Principles of green prevention and control are similar to what is known as integrated pest management in North America.

The total value of subsidy for green prevention and control is 320,000 yuan [approx. 62,000 CAD], and applicants must meet all requirements to obtain the subsidy...Why would I need to buy so many light traps? To use them as streetlamps? It's frustrating. Although everyone knows it's useless, you have to buy and install the light traps (in order to access the funds).

The support of Babuluo on ecological farming barely trickles down to nearby small-scale farms. After their farmland being transferred, some of the original dwellers on the land were hired by Babuluo as farm workers. When asked whether farm workers would go through training to acquire an understanding of the principles of ecological farming, the production manager said no. He explained that farm workers did not need to understand why they were doing the tasks because they would not be able to replicate the modern way of farming. A small plot of land within their resettlement housing area is left for the original dwellers to grow food for home consumption, and during interviews they mentioned that they no longer farm for a living, and instead took seasonal farm work and other short-term employment.

Overall, the government support concentrates on a certain archetype of agricultural modernization, which combines modern infrastructure and technologies, food processing, and agritourism. The main beneficiaries of this support are large agribusinesses. Although the

government-supported agribusinesses practice ecological farming to some degree, their farming techniques and tourism benefits are not shared among nearby farms. Rather, the most prominent radiation effect tends to be employment of farmers as farm workers, after expropriating their land. This indicates that the current trend agricultural modernization deepens the concentration of means of production from disparate small-scale farms into the largest model agribusinesses, while small-scale farmers are left without access to the knowledge of ecological farming or the market for eco-tourism. This trend has been conceptualized by Zhang and Donaldson (2008) as agricultural modernization with agrarian capitalism, where small-scale farmers are proletarianized and have to become wage labourers. The following section will introduce a different model of agricultural modernization with improved inclusivity of small-scale and medium sized farms in the transition towards ecological farming and ecotourism. **Compared to the three agribusinesses above, this model below has better implementation of the agenda of agricultural modernization 2.0, which is to support new farming subjects and to protect arable land.**

6.4.4 Farmers' cooperative at Dai village

Discussions in this subsection are based on the analysis of interview data with three organic farmers and two local village officials at Dai Village in *Tianwang* town[13]. In the rest of this

[13] *Tianwang* town is located approximately 70 kilometers away from downtown Nanjing. It is a town within the administration of Jurong city and has a population approximately of 60, 000 as of this writing.

subsection, I will first introduce the background information about Dai Village, and then summarize how a transition took place from conventional farming to organic farming. Following that, I will analyze the local government's involvement in the evolution of farming models and economic development of the village and highlight the impact on farmers' livelihoods and the local environment conservation.

Dai village underwent a thorough transition from conventional farming to organic farming and installed modern farming infrastructure while adopting new farming techniques and marketing channels. Its organic production focuses on rice, vegetables, fruits (predominately peaches and strawberries), and poultry. The transition started with the uptake of organic farming by just a handful of farms, which later evolved into an organic farmers' cooperative joined by 812 member households (all households that practiced farming).

A key catalyst for this transition was Mr. Zhao Yafu. At the beginning of the transition, Mr. Zhao was a retired but influential government official and an agricultural expert. During his work at Dai village, he was dedicated to the teaching of organic farming techniques and improving farmers' livelihoods. Not only did he introduce organic farming, including concepts, practices, and marketing channels to the villagers, he also served as a long-term consultant for the farmers' cooperative on farming techniques and marketing.

Dai village farmers' cooperative was founded in 2006 and under direct leadership of the village government. According to the head of village government at the time of the interviews, Dai village used to be one of the poorest villages in peri-Nanjing region with resource constraints. Its extreme poverty and environmental degradation caught the attention of Mr. Zhao, who introduced organic farming and marketing to alleviate poverty and to ease the resource constraints. After nearly 20 years of organic farming, Dai village has significantly alleviated poverty. Its per capita income is 25% higher than the average of Jurong city, meaning that it now is one of better off villages in the jurisdiction (Sohu, 2019).

The adoption of organic farming was a slow process at the beginning. Although Zhao was a high-ranking government official and a seasoned farming expert, he had to earn the trust of farmers at the village through years of relationship building. Initially, organic farming was distrusted and misunderstood by conventional farmers in the village. As an example, the following is the description of a family at Dai village of their mistrust in organic farming. In this family, both the father, referred as Deng, and the son, referred as Deng junior, participated in organic farming. Deng described his suspicion in organic farming at the outset of Zhao's arrival and training: *when he (Zhao) first came to teach us about the concepts of organic farming, none of us (in the village) really believed it. I also didn't believe it, but I kept an eye on it.*

Through providing hands-on teaching of organic techniques and reliable sales channels with significant price premiums, Zhao gradually convinced some of the farmers including Deng's family to adopt organic farming practices. Trust was gradually built upon the economic viability of organic farming, as Deng Junior recollected below.

> *Zhao thought that the best way (to promote organic farming) was to invite farmers to take land, and he could be their technical consultant. However, conventional farmers were not willing to take the risk…So he first invited the peasants to be wage workers on his (contracted) farmland…In 2003, although the harvest was not great, the organic peaches were sold at a great price, at 8 yuan/500 grams. At that time, the regular peaches at our farm could only sell at 0.33 yuan/500 grams. That was a huge difference (over 20 times greater). Some peasants were enticed, like my father. Then they actually started to commit themselves to following Mr. Zhao. That's why since 2004, my father started to lease land to practice organic peach farming.*

Zhao provided training for organic farming, translated values of organic farming to align with the interest of conventional farmers, and leveraged his networks and resources to facilitate with marketing opportunities. As Deng Junior mentioned, Zhao helped sell the farm harvests to government agencies in private connections: *in the very beginning, most of our peaches went to the government. The government departments could just buy our peaches to*

distribute them to their employees…most government departments came to us because of the reputation of Mr. Zhao.

Deng told us the same story. In his words, *Zhao "led" them and connected them with people who could help.* The idea of organic farming was feasible and practical, and it disseminated across farms in the village.

The transition led by Zhao had positive "radiation effect" on the majority of households in the village. By joining the farmers' cooperative, farmers will be offered the organic inputs and training. More importantly, the farmers' cooperative sells organic foods on behalf of its member households to ensure that ecologically grown food sells at ecological price, which would improve farmers' income. The farmers' cooperative collects a portion of revenues as collective funds to invest in collective infrastructure such as the rice processing equipment. Some farmers lease their land to the cooperative, after which they will receive a land transfer reimbursement. Their land transfer is considered as a share at the cooperative, thus they receive interest each year from the cooperative. Zhao also intentionally restricts the scale of farms to prevent farm consolidation. For example, each rice farmer cannot contract over 3.3 hectares of land (Sohu, 2019).

After founding the farmers' cooperative and the village-wide adoption of organic farming, Dai village has officially earned the title of a nationally recognized model farmers'

cooperative and a model rural human resource cultivation base. These titles have enabled Dai village to qualify for additional government funding, while steering the direction of government investment at the village. The official recognition of Dai village has allowed abundant funds for investment in infrastructure and machinery, although some of the farmers in interviews have expressed dissatisfaction towards the allocation of the official government funding. For example, Deng has commented below on the government's generous funding of greenhouses while stating that what his farm needed was financial support on human labour: *you know, the government just likes to give good promises, such as the greenhouse, you know, there are so many greenhouses in the village. Whenever someone comes to visit, they would show them the organic greenhouses.*

The farmer is aware that the infrastructure subsidies are generously offered by the government because infrastructure is easily visible and could be visually impressive to the officials that visit the village for evaluation. Deng also commented on the disparity of official government support between old farmers and young farmers especially college students. College students who decided to commit to a plot of land in the cooperative earned a start-up fund, covering infrastructure and costs of human labour because they fit in with the role of modern entrepreneurial farmers, and Dai village aims to keep its status as the model rural human resource cultivation centre. Deng complained that they did not have access to the benefits the local government provided to the college students. The preferential treatment of college students indicates the local government's will to attract young talents, but it also

reflects the local government's aesthetic preference of having modern entrepreneurial farmers in the model village than the "backward" peasant farmers.

In sum, a transition towards organic farming at Dai village has improved the local environment, improved livelihoods, and disseminated knowledge about organic farming. The organic cooperative was successfully founded and earned trust of the villagers because of the reliable marketing channels and training by Zhao. Initially, most of the marketing support and farm training were informal and based on Zhao's private government networks. A distinction can be made between this farmers' cooperative and Ding village is that this cooperative not only serves the interest of the few large actors but attempts to be inclusive of all members in the cooperative. The indispensable role of Zhao and his internal government networks shows that government support, when used properly and with the intention to include small-scale farmers and address farmers' needs, can simultaneously encourage ecological production while improving farmers' livelihoods. It was also important to note that after earning the official titles, the development and official support from the government focused on infrastructure investment and constructing convincing visuals of a modern, model village. This focus, however, has met with criticism among the farmers.

Table 22 Contrast the formal and informal support of ecological agricultural modernization.

Formal support	**Informal support**

• Infrastructure subsidies (partially covering construction costs of infrastructure, machinery, and processing workshops for large-scale farms) • Land transfer (amass land plots from individual households and lease to large agribusinesses) • Tourism support (advertising through festivals and official tourism routes) • Special incubation funds (allocated to entrepreneurial farmers and skilled labour including college students)	• Marketing (institutional procurement and recommendation through private social networks) • Technical support (informal hands-on teaching of organic farming techniques)

Table 22 above contrasts the forms of formal and informal government support for different types of modern ecological farms. Formal support is exclusively allocated to large-scale agribusinesses. I identified the tendency for the government to support the construction of large-scale farming infrastructure, agritourism facilities, and processing workshops. The rationale underlying this tendency is that the installment of modern farming infrastructure and application of new technologies are a convincing way to implement the government-planned agricultural modernization. Land transfer is commonly facilitated by the local government upon the initial entrance of the agribusiness into the village because the transaction costs of land transfer would otherwise be substantial. The formal support from government on tourism at the large agribusinesses stimulates local economy, elevates sales on farm and deepens the integration between farming and tourism. Overall, the government's formal support for agricultural modernization displays a tendency to concentrate on large

agribusinesses. The formal support barely trickles down from the large agribusinesses to nearby small-scale farms, due to the lack of cooperation between them. However, small-scale farms could benefit from the informal support from the government including technical training and market opportunities via the private social networks of government officials.

6.5 Independent ecological farming outside high-modernist planning

Small-scale conventional farmers[14] make up the majority (98%) of the farming population in China (National Bureau of Statistics of China, 2017). It goes without saying that the adoption of ecological farming among small-scale farmers is an integral part to sustainable transformation of agriculture in China. However, as this section will elaborate on, small-scale farmers in China receive much less support from the government than large-scale agribusinesses throughout the government coordinated agricultural modernization process. One of the reasons underlying weak government support is the misalignment between small-scale farms and government's high-modernist planning of modern agriculture. The rest of this section draws on fieldwork examples of small-scale ecological farms to explain their disconnect with the government's vision of modern ecological agriculture, and the implications for their farming practices and viability.

[14]According to the benchmark, smallholding horticulture farmers operate on a piece of land under 100 mu for one-harvest crop, and under 50 mu for dual or multi-harvest crop.

Before I elaborate on the relationship between small-scale farmers and the local governments, I first summarize the background of these farmers (predominately new farmers) and their incentives of ecological farming to contextualize their farming practices. The background information is necessary to the understand the interactions between these farmers, the government and neighbouring conventional farms. Of 29 farming units, 16 of them operate on small to medium scale (total acreage below 66 hectares).

Most of these small and medium-sized farmers were new farmers who had no pre-existing experience in farming. To name a few pre-farming occupations, these farmers had worked as a software programmer, researcher, journalist, magazine designer, and international trader. Despite diversity in their previous occupations, new farmers have two common features. First, most of them were unfamiliar with the social rules of rural society. Unfamiliarity with local dialects and social customs and social exclusion from the rural communities were common self-identified challenges by new farmers. Second, new farmers held a few common reasons for becoming a farmer. Eight new farmers explicitly stated that they acted on their food safety concerns and wanted to grow trustworthy food for themselves and their family. This common incentive mirrors findings from studies on China's booming organic sector in other cities (Scott et al., 2018; Si et al., 2015). As an example, Ms. Hao below shared her personal motives of becoming a rice farm.

The main reason why I started organic farming was fear of chemicals in food...I visited several farms to see how farmers grow rice and vegetables and I was appalled...I made up my mind to grow safe food with no chemicals...I call my vegetables the "clean freak" [jie pi] vegetables because they are pure and clean.

Another important motive is that farmers value the positive effect of organic farming on the environment. In the quote below, Mr. Zhu recollects his personal opinion of organic farming.

When I first invested in this farm and started my farm business, I knew nothing about organic farming. Even though I did manage to get organic certification...it was only until recently after I've moved to live on the farm that I started to learn about organic agriculture more deeply and begun to appreciate its (environmental) value.

Food safety and human health concerns as the initial driver of development for organic agriculture in China are different from initial driver of organic movement in the European context. In the European context, the foundational organic movements by Rudolf Steiner's biodynamic farming teaching and the Soil Association emphasized the contribution of organic agriculture to soil, plant, and animal health, equally as, if not more, to human health. In contrast, when organic agriculture first took shape in China, the environmental benefits of organic agriculture gained overall less attention among farmers and consumers

than its health and safety benefits. In Nanjing, the majority of small-scale ecological farmers who participated in my research have expressed personal and family health as the priority in organic farming. Although growing healthy and high-quality food is part of the government's agenda in agricultural modernization, the fashion of growing organic food by the small-scale farmers did not align with the government's high-modernist planning. The section below reviews the small-scale farmers' interpretation of why they did not fit in with the government's vision of modern ecological agriculture and of which the impact on them and the food system.

6.5.1 Limited government support to small-scale ecological farmers

Small and medium sized ecological farmers are largely neglected by local governments and only receive miniscule public support in contrast to large agribusinesses. The prevailing association between ecological farming and large-scale production and corporate ownership impedes the inclusion of small-scale farms in the government planning of ecological agricultural modernization. I interviewed one professor from Nanjing Agricultural University who specializes in organic agriculture and agricultural planning. He is influential in China's organic sector and participated in the decision-making for the first national organic standard in China and was invited to multiple government-organized workshops to train conventional farmers for ecological farming. From his perspective, China's organic farming must be developed by large agribusinesses. He asserts that AFNs and small organic farms are marginal and only a "wallflower". At the workshops, he

discouraged local conventional farmers to attempt organic farming and stressed that they lack resources and skills to become organic farmers and concluded that organic farming is only suitable for large enterprises with resources to build high-tech infrastructure.

Additionally, small and medium-sized farms face a dilemma regarding government support: In order to attract attention from the government, farms need to scale up production and install visually impressive structures and keep a tidy standardized appearance. However, in order to scale up production and increase farm investment, small ecological farms would usually need government support in land access and financing. As a small-scale organic farmer commented, government support could only be icing on the cake. If they were already successful and well-known in the local food system, then government support would follow. However, if the small farms were struggling and not growing, they remained unnoticed to the local government.

Operating in large scale is a necessary but not sufficient condition for obtaining government funding. Farmers were also advised to specialize their food production and present an orderly appearance to visitors. The underlying rationale is that funded farms are regarded by the government as models to other farms and thus should display a modern and orderly spectacle. For example, an organic blueberry farmer said that he intentionally kept some of the weeds in the blueberry fields. Aside from biodiversity purposes, the farmer

believed that pests would eat the roots of his blueberry trees if he killed all weeds and the weeds provided protection for his blueberry trees. However, the local government officials were unhappy with his farm arrangement, commenting that his farm was not well-managed, and weeds were all over the place. The farmer decided not to change his farm management philosophy just to gain approval from local government officials.

For ecological farmers that prioritize crop biodiversity, farm specialization would not fit with their production plans. Farmer of a small organic field, James, told me that among all his organic crops, carrots are the most popular among customers and brought him most revenue. He could increase his revenues just by switching other crop production to carrots, but he refrained from doing so because he believed monocropping to be unsustainable. This commitment to agricultural sustainability defies the top-down planning of China's specialized and standardized ecological farming. This commitment resembles how Guthman (2014: 60) described Californian organic farmers: "weighing their political goals against livelihoods". In James' case, he finally begun to earn revenues in 2019 after seven years' loss. Despite the consecutive economic loss, he upheld his ecological farming principles and decided not to change them for the government or consumers.

6.5.2 Farmer to farmer knowledge transfer about ecological farming

Some of the small-scale organic farmers have developed an informal knowledge transfer relationship between themselves and conventional farmers. Through this relationship, new

farmers obtain knowledge of field management, and conventional farmers obtain the knowledge of ecological farming and market opportunities. These relationships formed gradually, organically and informally between farmers. They are decentralized and independent from the government.

Some of the new farmers I interviewed were keen to propagate their farming philosophies and knowledge among conventional farmers. For example, an organic farmer Mr. Zhu figuratively said: "*I hope that us organic farmers can raise a big flag for other farmers. After we succeed, we can be local guides, and lead the (conventional) farmers to conduct organic production.*" Similarly, a small-scale permaculture farmer James said: "*I hope that my organic farming model could be replicated. That way more soil can be improved, and the environment can be restored.*" Organic farmer Ms. Hao said: "If I could motivate others to practice ecological farming, I think that counts as merit-making[15]."

Most new farmers I interviewed had the will to share their ecological farming skills and techniques. One of them was considering opening a farming class just to teach organic farming. Some of them successfully motivated conventional farmers to engage with ecological farming. Two examples below showcase this success.

[15] The Buddhist belief of doing good deeds will result in good rewards

James founded his permaculture farm in the year of 2012 on a small piece of land about 3.3 hectares (50 *mu*). In 2018, after six years of deficit, James' farm finally started to turn a small profit. On his farm, James prioritizes biodiversity and closed-loop nutrient cycling, insisting that inputs must be produced and processed on farm as much as possible. James increased farm biodiversity through intercropping and combining cropping with animal husbandry. Ducks swam in rice fields, right next to a chicken coop constructed from reeds, adjacent to a small plot of land intercropping approximately 50 types of vegetables. Among the diverse produce he has on farm, his organic rice first claimed market success through online sales in 2016. Later his successful organic rice sales gained attention from a conventional farmer. The local conventional farmer was in his 50s and had a conventional rice field of approximately 100 *mu*. James led the local farmer to experiment with organic rice farming on one *mu* of his own organic rice fields. In James' words, "*on my land, he grows rice organically. He used to only earn 200 yuan per year on one Mu of rice field, now he can earn 1000 yuan per year*". A collaboration has been established between James and the local conventional farmer, and he has successfully taught his collaborator the techniques and methods of organic rice farming. If they could find a larger market for their organic rice, then the conventional farmer could implement organic farming methods on his farmland and even involve other conventional farmers. It remains to be seen whether James and the local farmer could expand their collaboration with more farmers in the same region.

In another example, new farmer Ms. Hao established a collaboration with a female local farmer. They were not neighbours, and Hao got to know the conventional farmer by chance in a radio broadcast. The local farmer was practicing *de facto* ecological farming with minimal agrochemical use, though was not aware of the concept of ecological farming. Hao introduced the concept of organic farming and offered to help her with marketing her products after she adopted the organic methods and stopped using any agrochemicals at all. Hao also introduced some of her friends to visit the local farmer's farm, which creates tourism incomes for the local farmer. In exchange, the local farmer offered Hao her knowledge and experience in farming and helps her attend the farm when she could. Hao's influence was beyond just one local farmer. As of August 2016, another local farmer expressed interest in learning about organic farming, although unfortunately their farmland was expropriated by the local government before making the transition.

These examples prove that new farmers have the capacity to spread the concepts and practices of ecological farming among local conventional farmers. However, there are more intricacies to be discussed about the relations between new farmers and conventional farmers. In addition to mutual-learning and collaborations, I also found incidents of conflicts and tensions between new farmers and conventional farmers. I turn to these aspects of farmer to farmer relationships in the next section of existing barriers and challenges to scaling out ecological farming in Nanjing.

6.5.3 Challenges facing small-scale ecological farmers

Seven of 12 new farmers said that they experienced conflict with the local farmers and villagers, especially when they first arrived at the village. They perceived that their organic farming practices and principles were not appreciated by the local farmers who were used to conventional farming. They perceived tensions between themselves and the local rural community and elaborated on how they felt rejected and excluded. More specifically, they described incidents where local farmers near their farms stole their crops, vandalized their farms by throwing chemical-filled plastic bags in their organic fields and cut off their access to local water tanks during drought. These conflicts added to the mental stress of new farmers and increased their operation costs because they had to hire security guards to fend off their gardens from sabotage.

I argue that knowledge differences between new farmers and conventional farmers and the rural/urban divide in China can explain these tensions and conflict. Existing studies have shed light on the barriers in knowledge exchange in the farming sector between conventional farmers and farmers practicing different types of sustainable agriculture. For example, a study by Ingram (2018) raises a few factors that constrain knowledge exchange between permaculture farmer groups and conventional farmers, such as value differences and mutual misunderstanding.

New farmers in Nanjing also elaborated on their perceived knowledge gaps between

themselves and conventional farmers. They lamented the difficulty in communicating and justifying their concepts, values, and practices of organic farming to conventional farmers and farm workers. They commented that some conventional farmers were attuned to chemical-based farming and could not easily accept the organic way. To some extent, miscommunication undermined collaboration between new farmers and conventional farmers. One female new farmer Ms. Bo explained,

> *We (the rural conventional farmers and new farmers) live in two worlds…We uphold conflicting ideas, such as how to understand farming…We are totally different, and have been troubled by this issue for so many years...They believe agricultural production to be only commercial. Even for self-consumption, they think chemicals are acceptable. Once we asked our hired farm workers not to use chemicals in seedlings, he said how could seedlings grow without chemicals? And if crops wouldn't grow, he would feel responsible. I responded that I wouldn't blame him if nothing grew. But he still thought he had the responsibility (to use agrochemicals).*

In addition to the knowledge differences, some new farmers commented on rural/urban divide as a source of conflict. The rural/urban divide has two interrelated aspects: new farmers are urban newcomers to the countryside and thus are outsiders to the close-knit rural community; their "outsiderness" is amplified by social class differences. For example, the organic pear farmer Mr. Li said: *they (rural conventional farmers) think that new farmers*

like us are rich urban people who will cause trouble to the village, so they want to cause trouble for us...they know we are farming organically and intentionally leave bags of chemicals in our organic fields.

This was echoed in the comment from new farmer Zhu who spoke of his experience: *people surrounding me weren't really any good people...in the rural environment, villagers would come to scam me, and local "mafia" might come to scare me....I had to hire bodyguards to defend my farm produce from thieves.*

Unfamiliarity with local social norms caused tensions between new farmers and local farmers. Take the example of new farmer Mr. Min. Min was unwittingly embroiled in local conflict for laying off one of his employees and hiring another from the same community. The laid-off employee and the newly hired employee had pre-existing conflict, and the replacement was interpreted as an insult, and the laid-off employee kept returning Min's farm to argue with him.

After new farmers settled in the rural environment and learned to build mutual trust with local farmers, their tensions with the conventional farmers gradually eased off. However, positive relations were necessary but not sufficient to convince conventional farmers to adopt organic farming. New farmers first have to be commercially successful in order to showcase their commercial success and engage more conventional farmers.

I identified a few common economic challenges to new farmers: requirement of large initial investment, increasing labour costs, unpredictable weather, lack of government support, and lack of proper insurance. A female ecological farmer, Peng commented: *it's so common for new farmers to land in deficit. Personally I'm losing money as well. Think about it, we've only been running this farm for two years. Normally, people say that agriculture will start to create revenues after three to five years.*

6.6 Conclusion

This chapter has traced the recent trends in state-planned agricultural modernization and unplanned development of small-scale ecological farms. The state-planned agricultural development has shifted its focus from agricultural modernization and yield increase to poverty alleviation and ecological restoration. This reorientation of government food plans implies that the government is committed to addressing the social and ecological repercussions of past agricultural modernization. Given the interconnectedness between the social and ecological goals, the state food plans have recently adopted the "ecological poverty alleviation" campaign to leverage ecological farming projects to improve farm incomes and to alleviate rural poverty. This reorientation foresees progress in rural development and agricultural sustainability.

Through three cases of large agribusinesses, this chapter explains that large agribusinesses still significantly benefit from the government's agricultural modernization 2.0 plan. Not only can large agribusinesses contribute private capital into the construction of visually impressive agricultural complexes, adopt state-of-art technologies, they are expected to act as a model of agricultural modernization. As a model, the government support of large agribusinesses is expected to drive the growth and development of adjacent farms through the effect officially phrased as "radiation-driven development". The radiation effect pivots on a theoretical logic akin to that of the trickle-down economics, that is, assuming supporting the actors at the top will eventually benefit the actors in the bottom. Yet rising water does not lift all boats, as I identified through fieldwork that large agribusinesses rarely collaborate with nearby farms. The most noticeable and widespread effect of large agribusinesses on nearby farms has been land expropriation and proletarianization of farmers. Even in collective organizations such as professional farmers' cooperatives, the largest farm businesses are the main beneficiary of local government support. At Ding village, for example, the largest farm has received government funding for machinery, greenhouses, and tourism facilities. It also receives multiple tourist buses per day during the government promoted grape festival, while other small farms in the same village had few visitors. The concentration of government support on large-scale businesses may aggravate rather than reduce social inequality in rural areas.

In contrast to large agribusinesses, this chapter showcases that independent farmers and farmer-focused cooperatives such as Dai village have the potential to disseminate the knowledge and practices of ecological agriculture to farmers in adjacent areas, achieving the government goals of cultivating new farming subjects and promote ecological farming. Some of them successfully introduced market channels to conventional farmers in transition to ecological farming. Their success showcases the potential of involving small-scale conventional farmers in ecological farming rather than submitting their farmland to large enterprises. Comparing to the large agribusinesses, small and medium-sized farms receive little attention and support from local governments. In their view, the lack of attention to them is due to factors such as their modest scale, "messy" landscape, and lack of specialization. To small-scale organic farmers, natural landscape and multi-cropping are central to their sustainability principles, but to the local government, these qualities defy the grand agricultural plans that stress visual grandeur, order, and uniformity. Some of the organic farmers are encouraged by local government officials to "tidy up" their landscape so that they will be considered for government support. This incident indicates organic farmers have a trade-off between sticking with their individuality and specific principles and conforming to the mainstream high modernist farm model. Yet the high modernist model cannot be easily emulated by small-scale organic farms, and certainly not by most small-scale conventional farmers. In contrast, the diverse farming models created by small-scale organic farmers in Nanjing require less land and infrastructure investment. The ways of small-scaling organic farming have been tested by farmers and adjusted to the local

environment. Some of the new organic farmers have built collaborative relationships with conventional farmers. The unplanned ecological farming farms slowly but gradually cultivate a transition toward sustainability, diversity and inclusive growth in China's food production.

Chapter 7

Concluding remarks

7.1 Recapitulation

This thesis has provided three case studies to address my research questions: a) how can we best conceptualize the government's approach to governing food system transitions in China? b) Which actors are involved in and which are left out of the state's vision? How and why? and c) what are the implications of the government's approach and the actor relations?

To answer the first question, I proposed to analyze the state's approach to planning and governing food system transitions through the concept of high modernism. This concept highlights that the state prioritizes technological advancement and modern aesthetics in its process of re-ordering nature and society. Characteristics of high-modernism manifest themselves in the state-planned food system transitions. These characteristics are reflected by state approaches to food system development: funding modern new retail chains (Chapter 4), funding and mandating wet markets to upgrade their infrastructure, appearance, and management (Chapter 5), and prioritizing visually impressive projects in agricultural development (Chapter 6). In contrast to the state-planned food system transition, spontaneous food activities have emerged out of the needs of local communities, such as the innovative farming experiments made by new farmers in Chapter 6. Outside state plans, these activities are usually not registered or acknowledged by the local governments.

The concept of high-modernism provides a new perspective to understand the political economy of China's food system transition. In Chapter 3, I discussed its relation to the conceptualization of international political economy of food through a food regime/food movements framework (Holt-Giménez, 2017; Holt-Giménez and Shattuck, 2011; McMichael, 2009). The overall approach of China's state-planned transition resonates with reformist food regime (Holt-Giménez and Shattuck, 2011), which addresses food challenges while maintaining the established food system. Its reformist inclination is reflected in case studies. For example, in Chapter 4, I analyzed the reformist goals of VBP (Vegetable Basket Project) such as food security, food safety, food access and environmental sustainability. VBP commands government interventions in the retail sector in order to fulfill these goals. The reformist nature of state-planned food system is also reflected by government subsidies for wet market renovation and food safety testing in Chapter 5, and by the government subsidies for productive ecological farms in Chapter 6. These subsidies are intended to strengthen China's food security, alleviate food safety crisis, boost rural development, and to reduce the negative environmental impact of agriculture.

The difference between China's high-modernist food planning and the reformist food regime in the international context is that both multinational and domestic food corporations in China are under state control and not the other way around (Gaudreau, 2019). The grain sector and the seed sector are dominated by state-owned enterprises (Gaudreau, 2019). The

food processing sector in China is almost entirely state-owned (Schneider and Sharma, 2014).

Based on my research findings I argue that under the leadership of the state, large food businesses receive more state support than small businesses or civil society organizations in the food system. Large private food businesses, in particular, play an important role in carrying out the state's food plans and are more likely than small scale farmers/vendors to gain government support such as infrastructure investment. CloudKitchen in Chapter 4 gained government support whenever it opened a new retail store. Laofang farm in Chapter 6 received hundreds of thousands of visitors and tourists thanks to government advertising. Just as several small ecological farmers mentioned, the larger the farm, the more likely for it to be acknowledged and supported by the government. The government bias toward large scale food businesses accentuates power imbalance between small and large private food actors. I will come back to this point when I discuss the impact of high modernism in China in the next section.

Grassroots food activities share some characteristics with progressive food movements (Holt-Giménez and Shattuck, 2011): they propose new food practices and relations without challenging the extant food regime. Ecological new farmers in Chapter 6 do not directly challenge the established food retail and production sector. Rather, they strive to persist as an alternative to the conventional ways of farming and marketing and address the

food safety crisis and to reduce the ecological footprint of farming. What distinguishes grassroots food activities in China and progressive food movements in the international context is that the grassroots food activities in China face more regulatory barriers (e.g. difficulty in land access and acquiring organic certifications) and relatively late development of environmentalism. However, these actors could establish private relations with the local government officials to circumvent the official rules in the rigid implementation of high-modernist planning. For example, new farmers in Chapter 6 mentioned that knowing the right person at the local government could help them access financial supports, arrange to lease land, and build structures on their farm that otherwise would not be allowed. These examples show that one drawback of high-modernist planning is the regimentation in the implementation of its plans, although this drawback could be mitigated through network building outside the official planning.

So far, I have reviewed the characteristics of state-planned transitions in China's food system. The state-planned transition is characterized by the state's *reformist, high-modernist* plans. The spontaneous transition is characterized by *progressive, non-confrontational* alternative food networks. I shall proceed to examine the second part of the first research question: how to understand the stakeholder relations in China's food system transitions, in particular the relationships between the governments and other actors.

Based on empirical findings, this thesis proposes a term to characterize the main stakeholder relations in China's food system transitions: government-centered partnerships. Chapter 2 reviewed pertinent concepts in the international context, namely multi-stakeholderism, co-governance, and polycentric governance. In Chapter 2, I explained why applying these concepts in the Chinese context are not very appropriate. My reasoning is that in China the government is the most powerful actor in multi-lateral relationships and the government is at the center of decision-making for transitions in food system. The central role of the state is not reflected in the framing of multi-stakeholderism.

To explicitly reflect the central position of the government, I propose to describe the stakeholder relationships as government-centered partnerships. The word partnership is used to describe cooperative relationship between the government and other stakeholders. Chapter 4 introduced the formal VBP-NRB partnership and explained how this partnership drove fast expansion of NRB retail stores. Chapter 5 introduced the relations between the local government and wet market managers and explained how these relations affected the allocation of government subsidies for the wet market upgrading program. Chapter 6 details how the relationships between large agribusinesses with the local government have contributed to the infrastructure construction and ecotourism. Government-centered partnerships are an entry point to investigate the underlying political, economic, and cultural processes shaping food system transitions in China.

We now turn to the empirical question of how high-modernist planning and government relations affect the food system, particularly food security, food access, food safety, vendor livelihoods and environmental sustainability. I first point out the strengths of food system planning and then analyze the limits and costs of it. High-modernist planning is intended for social progress and economic development. It legitimizes and normalizes strong public control over private food businesses, which in a way benefits the food systems, particularly urban food provisioning. China's high modernist food planning emphasizes technological innovations and infrastructure improvement. The merit of focusing on the "hardware" improvement is that the state is capable of promptly mobilizing resources to change the physical structure of food system. Take wet markets as an example. Since the late 2000s, the government of Nanjing clarified in its policies that wet markets should be administered to prioritize public interest over private profit, and the government has been supporting wet markets as a public welfare-oriented infrastructure (Zhong et al., 2019). Government actions following these policies include upgrading wet market facilities and increasing public ownership (Zhong et al., 2019). During fieldwork, I found that various wet markets in Nanjing have been refurbished in order to improve the shopping environment for customers and work environment for vendors. To improve food safety and public trust in wet markets, some of the wet markets in Nanjing have been equipped with a food safety testing lab. Despite somewhat unreliable results, the testing labs provide a means for the state to monitor food safety. In the example of agriculture, the state has been promoting manufactured organic fertilizers to mitigate the overuse of agrochemicals. Despite some

doubt over the quality of fertilizers, the fertilizers could be widely distributed to numerous scattered small farms. Overall, high-modernist food system planning is well-intended and efficient in delivering technical fixes.

The limit of high-modernist planning is that some of its outcomes undermine the initial goals. Chapter 4 reveals that the Vegetable Basket Project was intended to strengthen urban food security, mitigate food safety anxiety, and accelerate the greening of food production. However, these tasks were delegated to an opportunistic local food business that strategically leveraged government support for its expansion in retail and agritourism. The rise of this local food business led to unintended consequences including the investmentization of everyday food consumption, false advertising, food waste and overpackaging. These practices undermine the food security, food safety, and sustainability goals of VBP. Chapter 5 reveals the unequal distribution of subsidies towards wet market undertaking the upgrade program and explains the critiques made by vendors about the rent increase and redundant management rules. Chapter 6 addresses how government-funded large agribusinesses fail to effectively deliver the goals of inclusive growth (radiation-driven development) among surrounding farms. The failure directly results from misconduct of food businesses, but it also reflects a structural problem of the state-planned food system transitions: the absence of transparency in government-business relationships and the lack of third-party agencies to hold corporations accountable. Another limit of the government food planning is that it dismisses small-scale food initiatives born out of community needs and

wants. When the state strives to manufacture visual order to fulfill a modernist imagery, it comes at the expense of the functionality of food initiatives such as the experiments by new farmers. The spontaneous experiments by new farmers are dispersed and insignificant in scale, compared to the planned transition. However, they directly and effectively contribute to the government's new goals in agricultural modernization, despite lacking government funding. The spontaneous food activities may lack a simplified visual order but thrive in complex and ever-changing food systems.

This thesis research has focused on the implications of food system transitions internal to China. Cases studies in Chapter 4, 5, and 6 elaborate on changes in food production and retailing in the greater Nanjing area. Some of the observations and discussions of these case studies are transferrable to other Chinese cities. Perhaps they provide useful references for researchers interested in analyzing the food system transitions led by China overseas. As discussed in Chapter 2, an increasing number of international agricultural development projects directly or indirectly (through state-supported enterprises) involve the Chinese state. These projects catalyze the shift of the corporate food regime and *may* prefigure a new food regime, although its form and trajectory are not yet discernable (McMichael, 2020). In order to approach the complex dynamics of regime shift and to accurately assess China's role in it, it is necessary to understand the underlying logic of China's state-led food projects. The analytical lens of viewing the Chinese state as a high-

modernist food system planner may provide an entry point for researchers to study the logic and implications of China-led food projects in the global food system.

The rest of this chapter consists of three subsections. They are not a reiteration of detailed findings and analysis, but a step further to engage with the broader conceptual discussions on food system transitions through the lens of high-modernism. The last two subsections introduce policy implications of my thesis findings and point out avenues for future research.

7.2 Revisiting high modernism

The ideology of high modernism is everywhere evident in the government planning of food system transitions and in the execution of such plans. Although Scott (1998) briefly mentioned China for its high-modernist approach to 20th century state-building, he did not discuss in detail the influence of high modernist ideology on development and governance in the 21st century China. Based on three case studies in this thesis, this subsection provides an in-depth analysis of the expression of high modernism in food system transitions in modern China and highlights the nuances of high modernism in China considering the complex bureaucratic system and the relationships between governments and non-government actors.

7.2.1 High modernism and the bureaucratic system in China

As I discussed in Section 2.1.3, one instrument the state relies on for implementing high modernist plan is administrative power. I used the phrase administrative power as a

simplified version of China's bureaucratic system. In this subsection, I discuss in detail the complex role of China's bureaucracy in the implementation of high modernist plans. Scott (1998) argued that the high modernist ideology became most destructive when adopted by a strong state to engineer society that is too weak to resist. What Scott did not take account of is the multi-layered bureaucratic components of the state power in China, which could be analyzed as hierarchical bureaucracy. From top to bottom, the bureaucratic system is comprised of the central government, provincial government, municipal government, district government (equal to county government in rural areas), and sub-district government (equal to town and township government in rural areas). Different levels of the governments may not be on the same page in the design and implementation of food plans. Discrepancies exist between the central government and local government (Zhou, 2017). The central government designs the high modernist plans with rigid quantitative goals, while the local government navigates these goals with flexibility and discretion. Due to these central-local relations, discrepancies are created between the implementation and the original plans. The discrepancies are a predicament to full implementation of the central government's plans but at the same time can be an asset for supporting local development and social progress. This thesis points out that the local government is a buffer between high modernist planning and self-organization of society.

Discrepancies can be a predicament when the local government focuses on fast and large-scale projects to showcase their implementation of plans by quantitative indicators

rather than focusing the actual effects. Chapter 4 exemplifies how the local government supported the growth of CloudKitchen, even though the growth of CloudKitchen undermined food security and financial security for invested consumers. Its deception on food sources and practices of excessive food packaging contradicted the food safety and sustainability goals of the Vegetable Basket Project. In Chapter 5, I explained how the private relationships between government officials and wet market managers largely determine whether the wet markets will qualify for the government subsidies to wet market upgrading. The focus of local governments on building aesthetically modern and well-managed wet markets have led to some of the funding being used for redundant infrastructure and services at wet markets.

On the other hand, Chapter 6 explains how some independent new farmers were able to utilize relations with local government officials to their advantages and to support their sustainable farming model, even though it circumvents some of the formal rules set up by the central government such as land transfer and land use. In this sense, the flexibility of local government's discretional power could mitigate the negative impact of rigid high-modernist planning. However, when it comes to the beneficial relationships between local governments and farmers/market managers, the line between networking and corruption is blurred.

7.2.2 High-modernism and large food businesses in China

Scott (1998) analyzed high modernism in planned economies and mentioned China's planned economy as an example. This thesis analyzes the expression of high modernism in China's market economy. From technological demonstration sites to agri-tourism centres, large-scale food businesses have been employed as an instrument by the government to fulfill and to demonstrate its food system plans. High-modernist plans favour large-scale, formal agribusiness and marginalizes small-scale, informal actors in the unplanned transition. Large-scale agribusinesses are favoured because they are capable of implementing the government prescribed capital-intensive transformations and of displaying landscape change and infrastructure upgrade. In contrast, most small-scale organic farmers are either financially incapable of or uninterested in fulfilling the government's vision of modern, standardized ecological agriculture.

The state's bias toward large-scale businesses has proved counterproductive. For example, a new retail business described in Chapter 4 deceives consumers about the quality of their food and defaults on consumer investment, undermining the food safety traceability goal of the Vegetable Basket Project. In another example, in Chapter 6, the local government expects the large commercial farms to invigorate economic development of adjacent farms through spillover effect, but research findings suggest that the most noteworthy effect of expanding large commercial farms is the proletarianization of nearby farmers. Minimal efforts have been taken by the leading agribusinesses to create entrepreneurial opportunities

for adjacent small-scale farms, apart from hiring them as farm workers. Collaboration in sales and marketing has sometimes been established, but only with other large farms.

The danger of the synergies between the high modernist state and the private sector is that the negative effects of corporate growth are not immediately evident but are masked by the visual grandeur and pretense. When such effects finally surface, food businesses involved in the planning may be "too big to fail" as they have become the building blocks of the food systems. To bail out such large businesses by the governments would be a waste of public funds and is unfair to self-reliant small businesses.

7.3 Policy implications

This subsection proposes a set of policy recommendations for food system planning in the Chinese context. The policy recommendations are based on my findings about the drawbacks of the implementation of food system plans. These policy recommendations point out what can be adjusted of the state plans to build a more just, safe and sustainable food system.

- ***Reinforcing audit mechanisms in new food retail businesses to mitigate the risk in the underground investmentization programs.*** Chapter 4 revealed the investment schemes adopted by some food retail businesses to accumulate capital, which increased consumers' financial risk in day-to-day food consumption. The financial collapse of the new retail businesses disrupted the financial stability and possibly

food security of households involved. The investment schemes of new retail businesses were in a grey area of law. Some of the investments made by individual customers were above 100, 000 *Yuan* (approx. 19,400 CAD), far exceeding the normal cost of any normal grocery membership card. Investments promised unusually high interest rates and were made without formal legal contracts, leaving the customers vulnerable and with little room for legal recourse. The fact that some of the new retail businesses were part of the government's Vegetable Basket Program granted them more credibility to customers, which may have aggravated the scale of the crisis. To prevent a similar crisis from repeating, the local government could tighten its regulations of the new retail food businesses and audit their financial products and deposit membership programs.

- ***Incorporating the opinions of wet market vendors and consumers in the implementation of wet market upgrading programs***. Chapter 5 explained how wet market vendors and consumers perceived some of the upgrading measures as redundant, counter-productive, and aggravating the pressure of their day-to-day operation. The infrastructure upgrades inevitably increased the maintenance and management costs of the wet markets, leading to the rent increases for vendors. New management rules such as uniform and food display requires add extra mental tasks to vendors. Food safety testing labs and price labels are underutilized by consumers, and mostly only function as a visual display to meet inspection from upper level

governments. Instead of only focusing on technological and infrastructure improvement, the wet market upgrading plans can improve food safety guarantee through encouraging vendors to connect to trusted local farmers. The government can also protect vendors' livelihoods and the economic sustainability of wet markets by regulating rent increases at the upgraded wet markets and can offset the pressure of rent increases through proper subsidies.

- ***Evaluating the efficacy of government support in agriculture including subsidies for infrastructure, machinery, farm tools, and fertilizers.*** Chapter 4 and Chapter 6 highlighted the underuse of government supported tools and infrastructure in case studies. At Babuluo, the majority of heavily invested smart greenhouses were abandoned because of high operation cost. Government subsidized organic fertilizers were not accepted among organic farmers because they were produced from manure from industrial livestock farms. Light traps were installed on farms although the farm manager regarded them as useless. The underutilization of government support limits the support to farmers and wastes public fund. These side effects could be mitigated if government support were customized to the needs of each specific farm rather than be implemented in the same fashion everywhere. Diversifying the means of government support based on farmers' needs will also help. Currently the technical support is mostly targeting large-scale industrial farms, while little machinery support is available for small-scale organic farmers. Government-initiated research and

development for small farm machinery such as rice transplanter and weed cutter could benefit small-scale ecological farmers by alleviating their labour shortage, which was one of the most mentioned challenges.

- ***Leveraging public procurement to support ecological farming***. Selling their crops are a challenge facing most small-scale ecological farms I studied. Public procurement started the initial momentum of ecological farming at Dai village. At the outset of China's national anti-corruption campaign in 2013, public procurement for organic food downscaled. This reduction has posed challenges to some organic farmers who have been forced to find new marketing channels. However, procuring organic food for university and corporate canteens and as end-of-year rewards to employees are likely not key sources of corruption and thus need not be forbidden. Government procurement could be a strong driving force of ecological farming and rural development. Rather than discouraging public procurement of ecological food, the procurement could be made transparent to the public and conducted with bidding to reduce corruption.
- ***Supporting the leadership of new farmers in rural development and ecological farming.*** Chapter 6 depicted a group of self-taught new farmers and their positive spillover effect to adjacent conventional farmers by teaching them skills of ecological farming and connecting them with market opportunities. New farmers spent years settling in the natural and social environment around their farm and have tailored

their farming techniques and marketing strategies to that environment. Their models take many forms and reflect the diversity in China' grassroots ecological food movement. Rewarding such practices, respecting this diversity, and promoting their models may nourish inclusive growth and environmental sustainability in rural China.

7.4 Future research

Globalization is a force of homogenization and the expansion of corporate food regime is rendering the global food system increasingly uniform. Southern food systems face a common threat of being made into an appendage of the Northern industrial model, to the detriment of local agri-food diversity and food sovereignty. Some critical food scholars, practitioners, and activists look for stronger regulations to counterbalance food corporations' influence. To examine the possibilities of food system transitions where corporate dominance is not so prominent, China presents an interesting case. In China's party-state system, the state plans domestic agri-food development while relegating transnational corporations to secondary status (Schneider, 2017). In this vein, China's state-controlled food system is poised to prioritize public interest before corporate interest and has the potential to directly tackle domestic food challenges including those created through decades of modernization.

However, despite relegating food corporations to a secondary position, the state planning displays a tendency of becoming another force of homogenization and inequality, while marginalizing local, traditional, and independent small-scale food actors. On the one

hand, the Chinese state has rightly limited the influence of transnational corporations in China's food system (Gaudreau, 2019; Schneider, 2017). On the other hand, my research identifies that China's food planning has propelled the growth of domestic food enterprise, e.g. CloudKitchen in Chapter 4 and corporate-like professional farmer's cooperatives in Chapter 6. Food corporations, especially those financially capable and of large scale, are more likely to receive government attention and support. As a result, large food corporations gain further growth and dominance in production and on the market. As mentioned in Chapter 4, small organic farms lamented about the entrance of large capital into the ecological food sector and their imminent threat to undercut small players. The bias towards large-scale food corporations in state planning has generated contradictions to its goals in stabilizing food security, improving food safety, and protecting the environment.

In theory, strong state control could prevent corporate capture and to ensure that food policies serve the interest of the public before corporations. However, when strong state planning is implemented through partnerships with large corporations with little transparency or accountability, public investment could be appropriated for private gains. If this trend continues without effective oversight of corporate influence, then the same capitalist forces that failed small-scale farmers and vulnerable groups in neoliberal context could generate instability to China's food systems.

Much more could be done by state planning to reinforce equity and environmental protection in the food system. The COVID-19 pandemic has unprecedented impact on the recent transitions in China's food production and retail. Given the scope of my research, this thesis can only shed light on some aspects of this paradox. To fully understand it and to devise solutions accordingly, more research is warranted. I outline some areas of the much-needed research below.

- It is worth studying the shifting norms in food consumption in the rise of the membership economy and investmentization. New entrants to the food retailing market, particularly new retail businesses, popularize a new consumption model based on upfront customer payment and long-term investment. This model has successfully attracted hundreds of thousands of customers and is changing the relationship between consumers and retailers. When consumers become invested members, the stability of their food consumption becomes dependent on the stability of food corporations. This dependency augments corporate control of the local food market while putting consumers' food security at risk. Follow-up research is necessary to find out how local governments and consumers react to this innovative consumption scheme, after its negative impact is exposed. It is also worth examining whether consumers and local government stakeholders will become more skeptical of new retailing outlets and thus resist or reverse this trend of new food retail.

- Partnerships between local governments and large-scale food businesses have been identified in the cases of rural dragon-head enterprises and urban new retail businesses. The transparency and legality of some of these partnerships are questionable. This thesis has exposed some of the drawbacks that these partnerships suffer, but it remains unknown whether local governments are aware of the drawbacks and how they overhaul the food businesses. More research is needed to investigate local governments' response to partnership failures and to clarify the relations between government and businesses in order to distinguish between partnership and collusion.

- Not all participants in alternative food initiatives are economically privileged, and AFNs started by urban entrepreneurs have enrolled under-privileged social groups. The new farmers enrolled in my field research represent a profile of well-educated and financially established urbanites, but the beneficiaries of their entrepreneurship are not limited to rich consumers. Through years of interactions with the rural community, new farmers successfully convinced some conventional farmers to practice ecological farming by selling their products through the marketing channels of the ecological farmer entrepreneur. Their ecological foods are sold at prices much higher than before and their livelihoods have improved. Further research could examine the benefits of AFNs to marginalized small-scale conventional farmers.

These benefits can strengthen the academic advocacy by academics for stronger public support for AFNs.

These suggested areas for further research are a starting point to converge discussions on food system planning, food governance, modernization theories, and alternative food movements within China and beyond.

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