**China's changing food system: top-down and bottom-up forces in food system transformations**

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**Abstract**

In the past few decades, dramatic changes in China's food system have generated economic, social and environmental consequences that jeopardise its sustainability. Both the Chinese state and civil society have responded to these challenges, with diverse initiatives. This special issue is the first to employ a broad "food system" lens to examine some of the critical changes in China's land use, food production and consumption, and the responses of various actors to food system challenges. It sheds light on the top-down and bottom-up forces that shape and politicise the food system transformation.

**Keywords:** food system, sustainability, top-down, bottom-up, China

## Key shifts in China's food system

There is a widespread consensus that our contemporary food system is under great pressure and is not sustainable socially, economically, or environmentally (IPES-Food 2016; UNCTAD 2013; Godfray et al. 2010; Weis 2010; FAO 2011; IAASTD 2008; Satterthwaite, McGranahan and Tacoli 2010). Food systems in China, as elsewhere, face challenges to become more resilient (Zhang 2018). On the one hand, although China is categorised as "moderately low" in terms of food insecurity in FAO's Hunger Map in 2015, and just 9.7 per cent of its population (133.4 million) is undernourished (FAO et al. 2017; Zhou 2015), hunger still prevails among its poor. On the other hand, obesity and diet-related health epidemics such as diabetes and hypertension are rising significantly (Chen et al. 2017; He et al. 2014; Yu et al. 2012; Cui and Dibley 2012). At least 32 billion USD worth of food is thrown away annually in China (Zhou 2013), which generates tremendous environmental, economic and managerial costs (Liu 2014; Liu, Liu, and Cheng 2013). Problems within the agricultural system are also urgent as the depletion of soil and water resources has been jeopardising both the quality and quantity of the country's food supply (Wang et al. 2017; Lu et al. 2015). Along with the widening income gap between cities and the countryside, Chinese farmers are struggling to make a decent living from farming their small plots (Su et al. 2015; Huang, Wang, and Qiu 2012; Oxfam Hong Kong 2015). As a result, rural-urban migration left millions of children, women and elderly alone in rural communities, leading to a range of negative consequences (Ye et al. 2013). As Renmin University professor Wen Tiejun has consistently emphasised, the Chinese countryside suffers from a loss of farm labour, the stagnation of rural livelihoods and the deterioration and devaluation of rural culture

(Wen 2009).

These multidimensional challenges are closely associated with various changes in China's agro-food system over the past few decades. A 2015 special issue of the *Journal of Agrarian Change* on "Agrarian Change in China" discussed the dynamics, policy environment and political economy of agricultural capitalisation in recent years. The agrarian changes are characterised by rapid industrialisation, capitalisation and commercialisation of the agriculture sector (Zhang and Donaldson 2013; Zhang, Oya, and Ye 2015). The engagement of industrial and commercial capital from above and the proliferation of tenant farming from below explain the differentiation of rural classes alongside the emergence of novel farming "subjects" (Yan and Chen 2015). The grain self-sufficiency policy and the recent reform of the rural *hukou* (household registration) system are also found to have marginalised peasant farming and encouraged the rise of agrarian capitalism in China (Andreas and Zhan 2016; Zhan 2017). Similar trends are observed in the development of the so-called "dragon-head enterprises" (Chinese agribusinesses)[1] in the livestock industry (Schneider 2017; Zhang 2018).

The changes in the agro-food system go far beyond the agriculture sector and rural spaces. The supermarketisation of food retail, dietary changes and rampant food safety crises, to mention just a few of the trends, have attracted much scholarly attention (Garnett and Wilkes 2014; Scott et al. 2018). Traditional food outlets face increasing competition from new food retailing formats (Hu et al. 2004). The overconsumption of vegetable oil and meat and the decreasing consumption of coarse grains are associated with the growth of diet-related non-communicable diseases (Zhang, Oya, and Ye 2015; Chang et al. 2018). On a more positive note, perceived food safety risks are fueling a rebuilding of relationships between people, food and place through the pursuit of new food sources and food practices (Klein 2013; Si 2017).

Despite the rapid evolution of China's food system and the urgency of coping with these critical challenges, state-led developmental approaches (advancing an agri-industrial development model) to revitalise the countryside and boost sustainable rural development have failed to address these social and cultural concerns effectively (Si and Scott 2016). This opens up spaces for various non-state actors to gain influence over food production and consumption, such as the significant roles of civil society organisations, alternative food initiatives, farmers and consumers in promoting sustainable food production and ethical consumption (Scott et al. 2014; Schumilas and Scott 2016; Leggett 2017). The coexistence of top-down and bottom-up forces in China's food system transformations demands more integrated analyses of key changes underway in its agro-food sector, including, but are not limited to, the following themes:

1. The policy and practice around the protection of China's agricultural land and national food security;
2. The marginalisation of small-scale farmers (and their knowledge) through the vertical integration and modernisation of agricultural production;

3. Diverse responses to heightened food safety anxiety and an increasingly disembedded food system; and
4. Emerging "alternative food systems" and "alternative food networks" in China, such as organic food and agriculture, ecological farmers' markets, community supported agriculture (CSA) farms and grassroots organisations promoting environmental and social values for a more sustainable food system.

Moreover, the challenges faced by China's food system have recently become even more complex, with the escalating trade war between China and the United States and the potential restructuring of the global food trade order (Perraton 2018). The tension of a trade war is not only reshaping global market for food commodities (Terazono 2018) but may also perpetuate further environmental destruction in South America, where China's demands for soy have been increasing (Bois 2018). Such tension may also result in higher prices for pork and other foods in China's domestic market, affecting daily food consumption in the country (Ma 2018). Through this process, the changing politics in the international arena are intertwined with domestic food production and consumption.

This special issue, co-edited by Steffanie Scott, Zhenzhong Si and Matthew Gaudreau, grew out of two conference sessions held in 2016.[2] The issue aims to demonstrate the role of China's political economy – a developed rural land rental market, agrarian transformation toward agro-industrialisation and vertical integration, the growth of China's domestic organic market and an emerging civil society – in shaping opportunities and constraints for developing a more sustainable, resilient food system.

**A food systems approach**

Articles in this special issue collectively investigate the complex transitions and nexus between land, food production and consumption. They help to explain the complexity and diversity of China's rapidly changing food sector and its divergent socioeconomic context. These are key elements of a food systems approach, which can be defined as "a holistic approach to describing and analysing food systems [that] allows the direct linking of ecosystem services to a critical part of human well-being (i.e., food security)" (Ericksen et al. 2010, 40).

A food systems approach includes consideration of the entire food supply chain, from food production (and production inputs), to processing, distribution, consumption and waste disposal. Thus, it is more than merely a food production focus (Si and Scott 2016; Ericksen 2008; Foran et al. 2014). The articles in this special issue analyse, for example, seeds, virtual water embedded in food trade, tea production and markets and support to develop organic agriculture. Further along the supply chain, we have analyses of food supply in cities, food provisioning channels between farmers and their social networks, and the role of CSA in food consumption and in addressing food safety concerns.

A food systems approach likewise includes attention to biophysical as well as

socioeconomic drivers and outcomes. This is reflected in the articles here, for example, that demonstrate the water footprint of food imports to China, the development of organic farming and the socioeconomic factors affecting food provisioning.

A systems analysis of food issues also reveals the roles of multiple stakeholders (or actors) in shaping changes. For example, one article in this collection analyses the role of local government as a catalyst for establishing organic agriculture at a county scale, connecting farmers and buyers. Another article touches on issues of social class by examining anti-corruption policies which affected local tea production and farmer livelihoods. Several articles explore producer–consumer networks, and others document civil society initiatives around the development of a food sovereignty movement in China.

Finally, food systems approaches underscore dynamics at multiple scales, from local to national to global, and the potential system interactions across these scales. Articles in this special issue examine food issues affecting China at the global scale (food trade), as well as national, in terms of food policy and social movements for food sovereignty. Several other contributions examine the local scale, for example, food distribution networks or local government policies for organic agriculture. Highlighting the cross-scale interactions, Huang's article (2018) examines the impacts of a national policy change on local tea markets.

Broadly speaking, food can be seen as a "nexus issue" that connects to many other concerns and challenges. In this special issue, for instance, issues of water security are underscored through Xu et al.'s analysis of food trade. Moreover, Huang's article reveals much about dynamics of social class. In this way, food is an entry point to approach sustainable development beyond food issues per se. An example is the nexus across water, energy, land and food (Ringler, Bhaduri and Lawford 2013): this nexus demands consideration of both biophysical and socioeconomic elements, and such an integrated approach can lead to potential synergies. The UN Sustainable Development Goals (SDGs), for example, represent an opportunity for the implementation of this nexus thinking (Ringler, Bhaduri and Lawford 2013; FAO 2018).

## Overview of the special issue

In the following sections, we present the eight articles in this special issue in terms of those that relate to food production and others that address food provisioning. We then discuss the ways in which the articles reflect top-down and bottom-up approaches to food system change. Finally, we identify some key challenges and opportunities facing China's food system.

### *Transformations in food production*

Four articles in this special issue examine critical changes in China's food production – across multiple scales, using diverse research methods. Both Gaudreau (2018) and Xu et al. (2018) focus on national food security policies: one article approaches this issue

through the lens of food sovereignty discourses; the other through the lens of farmland protection and food imports. Matthew Gaudreau's analysis of discourses around food security and food sovereignty used by both the state and social groups reveals the nuances of food sovereignty activists' struggle for discursive power. The article argues that, although discursive space still exists for a local food movement as long as the movement's activities could be framed as aligning with state policies, the state policies could also restrict food sovereignty practices that promote local solutions to problems of an industrialised food system. With a careful calculation, Zhiying Xu et al. and co-authors found that the conversion of farmland to non-farming usage in China between 1987 and 2013 has resulted in a ten-fold increase of "virtual farmland" imports embedded in food imports. This in turn has stimulated further loss of farmland, creating a vicious cycle that transfers the pressure of land resource scarcity to other countries. Both Gaudreau and Xu et al.'s articles highlight the significance of state orientation (in policies and discourses) in shaping food system transformations.

The other two articles about food production are Huaqing Huang's (2018) case study of tea production and Yuhui Qiao et al.'s (2018) analysis of organic agriculture development in a Chinese county. These articles are particularly interesting because they both document how Chinese farmers are responding and adapting to food system changes, although with very different approaches. Huang's study of tea production in a village in Fujian province unveils the challenges facing middle farmers in competing with dragon-head enterprises. Huang points out that rural class differentiation between small farmers, middle farmers and dragon-head enterprises is expanding as the recent spike in the price of tea has squeezed the profits of middle farmers. The article also shows how the changing political environment has shaped the power dynamics between these rural classes as reflected in tea production. Qiao and co-authors depict the changing roles of local governments in facilitating the development of organic agriculture in the case of Wanzai county in Jiangxi province. The authors find that organic agriculture development in Wanzai county underwent several stages. As external capital became involved in contracting with farmers for organic food production and processing, the local government transitioned from being an initiator to a mediator.

As these articles demonstrate, the transformations in food production and the broad agrarian changes associated with it in China are shaped by the collaborations, competitions and conflicts among some key stakeholders, including the state, the private sector, farmers and social organisations. These interactions are taking shape at various scales and across scales. Huang's study demonstrates, for example, that the central government's enforcement of the Eight-point Regulation that aims to discipline party members and officials dramatically transformed the environment of competition between middle farmers and tea production enterprises at the local level, rendering middle farmers disadvantaged. Gaudreau's study of People's Food Sovereignty, a grassroots organisation that promotes food sovereignty at the individual and local level, also exemplifies how the organization has been struggling to align their food sovereignty arguments with national food security orientations.

***Changes and innovations within food provisioning***

There is no doubt that food system studies transcend the scope of agrarian research. Beyond agriculture, farmers and food production, issues of food provisioning and consumption are particularly relevant to the current sentiments around food safety in China. As many have pointed out, food safety problems constitute an important force that transformed China into a "risk society" (Yan 2012; Si, Regnier-Davies and Scott 2018). The other four articles in this issue collectively sketch out changes and innovations within the food supply chain, particularly in response to the mounting food safety crisis. Among these articles, Si, Scott and McCordic (2018) is different from the other three, with its specific focus on urban residents' use of various food sources. The article finds that the expansion of supermarkets has not challenged the dominance of traditional food outlets (that is, wet markets) in fresh produce and meat retailing. Other diverse food sources beyond food outlets such as urban agriculture also play critical roles in enhancing urban food security and addressing food safety challenges.

In contrast to Si, Scott and McCordic's (2018) study of conventional food outlets, the other three articles investigate alternative food innovations and responses to food safety crises from diverse analytical perspectives. Chen and Tan (2018) focus on community supported agriculture, an alternative food network that has emerged across China in the past decade or so. This study examines how WeChat, a commonly used social media app on mobile phones in China, is used to foster producer–consumer connections. Zhang and Qi (2018) also investigate cases of socially embedded food provisioning in which producers and consumers collaborate to overcome food safety challenges. These initiatives, referred to as "self-protection movements" in the article, are ecological farmers' cooperatives and alternative food distribution channels. Yet, bottom-up responses are not only about consumer access to safe and quality food, but also about peasant farmers' responses, as both producers and consumers, in food production and provisioning, as shown in Lin et al. (2018). Lin and co-authors examine how peasant farmers facing food safety challenges produce two different types of food accessible for different groups of people, which is what they call "one family, two systems". They found that peasant farmers produce conventionally grown food for outsiders (that is, consumers in the market) and ecologically grown food, with reduced usage of chemicals, for insiders (that is, family members). The access to ecologically grown food is determined by peasants' perceptions of obligations toward others.

**Top-down and bottom-up forces in China's food system transformations**

A common theme that emerges from these articles is the complex relations between different actors, as reflected in both top-down and bottom-up forces. Indeed, this is a major finding of our research on transformations in China's food system, despite the common perception of China's strong state and weak civil society (Scott et al. 2018). While the top-down forces are mirrored in the state's interventions in food production, supply, distribution and consumption, the bottom-up forces offer creative social innovations and grassroots initiatives in food production and provisioning. Although it is

difficult to separate the state from society in many cases, the dichotomy allows an understanding and contrast of the various roles of the state and civil society actors. This in turn feeds into the politicisation of the developmental trajectory of China's food sector. Moreover, as these articles exemplify, the impacts of the top-down and bottom-up initiatives are unfolding across various segments of the food system. They are collectively shaping the innovations beyond food production and reconfiguring the food system as a whole. This special issue thus calls for a more holistic perspective in both research and policy making to understand the challenges facing our food system and also explore potential solutions.

**Contributions of this special issue**

The eight articles in this collection make critical contributions to the scholarship of agrifood studies, particularly the political economy of food production and consumption. There has been little research to date on the important issue of the relationship between "virtual land imports" and land conversion (Xu et al. 2018), food sovereignty discourses (Gaudreau 2018), competing relationships between rural social classes (Huang 2018), changing roles of local government in greening food production (Qiao et al. 2018), consumer channels of food access beyond food retail outlets (Si, Scott and McCordic 2018), the role of social media platforms in community supported agriculture development (Chen and Tan 2018) and the "self-protection" movements (of informal economies of clean food) among farmers and consumers (Zhang and Qi 2018; Lin et al. 2018).

We see important resonances among the articles in this special issue. For instance, several articles reveal strategies for community building through alternative food networks (Lin et al.; Chen and Tan; Zhang and Qi). These cases offer lessons for each other. They also exemplify social innovations in food provisioning schemes in terms of social media technologies and community building. These analyses complement the study by Qiao et al. that documents the experience of designating an "organic county". This governance innovation illustrated in Qiao et al.'s article involves different actors from the previous articles but all of them reveal strategies to provide clean food. Accessing clean food has always been a key priority of grassroots initiatives promoting food sovereignty in China. Gaudreau's article contrasts these grassroots movements with state-led food sovereignty strategies for national food self-sufficiency. Avoiding over-reliance on food imports is a key element of this vision of the Chinese state. Xu et al.'s analysis of food imports and the water embedded within them further fleshes out this picture of national food security. These topics greatly enrich our knowledge of recent dynamics in China's food system, forging a solid base for further studies in this broad research field.

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[1] "Dragon-head enterprise" is a special designation by the Chinese government for companies that meet certain thresholds for investment, turnover, profits, market share, taxes paid, growth rates, and so on. Agricultural dragon-head enterprises are considered by the Chinese government to be one of the major approaches for agriculture modernisation and thus have received tremendous governmental support. See Huang 2018 (this issue).
[2] The XIV World Congress of Rural Sociology, Toronto, 10-14 August 2016; and the 33rd International Geographical Congress, Beijing, 21-25 August 2016.