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Citation for final published version:

Chan, Kin and Flynn, Andrew 2018. Food production standards and the Chinese local state: exploring new patterns of environmental governance in the bamboo shoot industry in Lin'an. *China Quarterly* 235 , pp. 849-875. 10.1017/S0305741018000802

Publishers page: <https://doi.org/10.1017/S0305741018000802>

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Food Production Standards and the Chinese Local State: Exploring New Patterns of Environmental Governance in the Bamboo Shoot Industry in Lin'an

Kin Wing (Ray), Chan* and Andrew Flynn†

Abstract

Although current studies into Chinese food supply and quality provide explanations for the causality of food problems there is limited inquiry into the role of county government. This is a serious omission. Firstly, because county government performs a key role in providing support for farmers through agricultural extension services and farmers' co-operatives; and secondly because county level administrative divisions are central to developing novel instruments to manage supply chain relationships, such as food production standards. We investigate who are the key players involved in standard making and delivery at the county level. We also analyse how and why county government engages in standard setting activities. We use Lin'an's bamboo shoot production industry as a case study to understand how the local state implements hazard-free, green and forest food production standards. The paper concludes that traditional conceptualisations of the local state do not sufficiently address how nature, knowledge of standards and state authority co-produce institutional capacity to control food supply and quality in China. In practice, the local state engages with non-state actors to achieve superficial environmental efforts, such as developing food production standards to throw a 'green cloak' over a productivist model.

Keywords: Chinese local state; environmental governance; food production standards; farmer co-operatives; bamboo shoot production industry; Lin'an

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1. Introduction

Since the market reforms of the late 1970s China's economy and social structure have been transformed. Whilst understandably much attention has been given to industrialisation and urbanisation,¹ the rural transition has also been profound. Rural enterprises have become integrated into global economic networks, which have, in turn, transformed domestic socio-economic landscapes and natural environments.² An increasingly urbanised and affluent Chinese middle class is raising concerns about food quality and supply, ranging from milk powder contaminated with melamine, to recycled oil and toxic chemical usage in the food production system.³ Although current studies⁴ into food supply and quality provide different explanations for the causality of food problems there has so far been limited inquiry into the role of the local state (also referred to as Lin'an County government 临安县政府). This is a serious omission. Firstly, because the local state performs a key role in providing support for farmers (e.g. agricultural extension services); and secondly, the county level administrative division is central to developing novel instruments to manage supply chain relationships (e.g. food production standards). We need to know more about the key players involved in standard making and delivery at county level. We also need to understand how and why the local state engages in standard-setting activities. We use the County of Lin'an and its bamboo shoot production industry as a case study to understand how the local state implements 'hazard-free', 'green' and 'forest food' production standards. The growing importance of standards in public policy is an under-researched area,⁵ especially in China.

A detailed analysis of standards in rural China is important for three reasons. First, it provides a lens through which to understand the dynamics of the relationship between the local state and market and how those are changing over time.⁶ From the perspective of the local state, the imperative is to increase its territorial reach so as to expand domestic and international markets for Lin'an's bamboo shoots. Growth in the reach of the local

¹ Siciliano 2012.

² Ho 2006; Long and Wood 2011; Veeck and Shui 2011.

³ Chan 2015a; Paull, 2008; Pei et al 2011; Shapiro 2012; Wang et al 2008 and Zhang et al. 2005.

⁴ See, for example, Boland 2000; Brown 1995; Calvin et al. 2006; Ma and Ortolano 2000; Yang and Li 2000.

⁵ Brunsson, Rasche and Seidl 2012.

⁶ Chung 2004; Kang and Heng 2008.

state is however, constantly threatened by internal and external pressures. A key internal tension arises from the increased intensification of bamboo growing that has the potential to further exacerbate soil degradation, while an increasingly important external tension is consumer demand for higher food quality, which may be expressed in multiple ways, such as calls for better food safety or a desire for artisanal production. Second, the paper highlights the role of the county level administrative division in economic development and policy delivery. For Lin'an, food standards for bamboo have become a form of technical knowledge to serve the local government as it seeks to extend its spatial control on bamboo shoot production. Standards act as a spatial fix (e.g. to control fertiliser usage) to safeguard the quality of the material through the supply chain, from the rural bamboo grower to the urban consumers plate. The implementation of standards also shows a policy commitment to protecting the rural environment and promoting food quality.⁷ Third, we show the extent to which standards matter in maintaining a competitive advantage for bamboo shoot growers in Lin'an, and thus why state and producer interests are so entangled. Standards are both a means and an end to secure a competitive advantage. Bamboo shoot standards become a territorial strategy for the state to manage nature since they can be used to establish growing practices and to publicly demonstrate how a resource can be utilised. In this way, we can show how international environmental neo-liberalism⁸ interacts with Chinese governmentality.⁹ One consequence is that bamboo standards can be conceived of as a means of putting a 'green cloak' over bamboo farmers and the local government.

We use the term 'green cloak' rather than the more market-oriented 'green wash' because we wish to refer to a specific governance logic of state territorial control over the production of nature. By engaging with non-state actors including experts, academics, and producers to apparently make 'greening' efforts, the local state is able to develop a new set of production standards to legitimise an apparently 'green' productivist model. In this productivist model, Lin'an state uses bamboo shoot cultivation to meet the environmentally-oriented directives of the National Forest Protection Programme (NTFP).¹⁰ Since the 1980s, the bamboo shoot cultivation area in Lin'an has increased

⁷ Bloomfield 2012.

⁸ Bernstein 2001; Marsden et al 2009.

⁹ Jeffreys and Sigley 2009 & 2014.

¹⁰ Lin'an Forestry Bureau 2003.

rapidly; bamboo forest coverage grew 92% from 1985 (when it was 2,900ha) to 2009 (when it was 55,777ha). As a result of its efforts to increase bamboo growth, thus ‘greening’ the landscape, Lin’an County is nationally recognised as China’s National Bamboo Homeland (中国竹子之乡).¹¹ When we lift the ‘green cloak’ through detailed local analysis, however, the interest in standardisation by farmers and the local state becomes more instrumental. There remains a deep-seated tension between exploitative ways of using resources and environmental limits, and these tensions are not fully recognised at the local level. This results in short-term economic gains mattering more than conservation for the local state and producers, and the exploitation of natural resources to the detriment of the environment.

This paper is divided into four further sections. In part two, we analyse the relationships between the local state and food production standards. In part three, we briefly explain our approach to data collection and the reasoning behind our selection of bamboo as a material and Lin’an as a county for research. Sections four and five report on our empirical material to show how Lin’an County implements ‘hazard-free’, ‘green food’ and ‘forest food’ production standards. Finally, we reflect on the interactions between different levels of government and the formation and implementation of food production standards. We conclude that food production standards provide a valuable way to understand the dynamics of the local government and an important insight into multi-scalar activities.

2. Food production standards and the local state

Commentators have pointed out that standards are an often little noticed but nevertheless a remarkable feature of contemporary life.¹² Creating a standard provides an important window through which to examine states or private actors’ authority to influence the quality and credibility of production and/or services.¹³ Standards help regulate individual and collective behaviours.¹⁴ Moreover, as a voluntary policy instrument, standards require a legitimacy to be effective. By analysing food standards we are,

¹¹ Tang 2007.

¹² Brunsson and Jacobsson 2000; Brunsson et al 2012.

¹³ Cashore 2002; Maye and Ilbery 2006.

¹⁴ Brunsson et al 2012: 616.

therefore, able to gain an insight into the evolving relationship between state and society, and state and businesses in rural China. For example, some observers illustrate how the nexus of power-culture embedded in Western food standards becomes a new form of domination to demand notions of ‘goodness’ and safety in imported food.¹⁵ Within the context of Chinese public policy there is a growing interest in food standards, principally arising from a series of high profile food scares.¹⁶ The work of Buckingham and her colleagues on bamboo standards has been particularly instructive as they have documented the ways in which national and international standards matter for biodiversity.¹⁷ Commentators in forest certification also comment on how the Chinese state tactically engages with non-state actors (e.g. academics, forestry experts and producers) and third-party certification bodies (e.g. Forest Stewardship Council) to co-produce knowledge needed to develop standards.¹⁸ This co-produced knowledge enables China’s food products to align themselves with global requirements whilst maintaining China’s ‘state-centric’ governance system.¹⁹

Although current debates on food production standards and forest certification provide insights into how the Chinese state collaborates with non-state actors so as to align with international requirements and maintain state-centric governance, most attention has been on national level activity. Researchers have paid less attention to the ways in which standards may matter at a local level²⁰, and of the role that the local state plays in mobilising farmers to meet standards. It is important here to problematise the role of the local state²¹: Why might a local state develop its own standards? How does the promotion of standards help us to understand the changing role of the local state?

To begin to answer these questions we seek to bring together the social, economic and political structures that enable bamboo shoot related-stakeholders to interact for the implementation of standardisation policies and programmes. Coggins further suggests that scholars pay attention to the interactions between the political economy of the bamboo forest

¹⁵ Freidberg 2004.

¹⁶ Liu et al. 2013; Mol 2014; Ortega et al 2011.

¹⁷ Buckingham et al. 2011; Buckingham et al. 2014; Buckingham and Jepson, 2013 & 2014.

¹⁸ Bernstein 2002; Cashore 2002.

¹⁹ Bloomfield 2012; Hatanaka and Busch 2008; Kang and Heng 2008; Buckingham and Jepson 2013.

²⁰ Bai 2007; Jin et al. 2008.

²¹ Yeh et al. 2013:920.

and environmental degradation as this will affect the lives of rural people and biodiversity.²² Networks among state officials, processors, forestry experts, technicians, research institutions and private agricultural companies as well as bamboo shoot farmers who perform collaborative roles, define farming norms and negotiate standards for bamboo shoot production. In our empirical material that follows, we detail how these arrangements work in practice for bamboo shoot growers in Lin'an. County government plays a crucial role in increasing farmers' incentives and productivity through regulation and supporting policies.²³ To deliver governmental policies on food standards, agricultural extension systems (e.g. agro-forestry experts) and farmers' co-operatives are important information-providers that can diffuse knowledge and ideas of food and environmental quality.²⁴ Even if such knowledge is not deemed appropriate by bamboo-growers for their day-to-day activities, the tendency to comply with rules, regulations and standards prevails, or as Cartier has described it, there is the "expectation of [a] uniform acceptance of authority."²⁵

The persistence of state authoritarianism, party-state governance and pro-growth pragmatism are central to interpreting current food systems in China.²⁶ For our perspective, it is important to understand how the local state makes plans, co-ordinates with different state and non-state actors, and utilises the rights for fiscal autonomy to make profits from food production enterprises.²⁷ There are two major ways to conceptualise the role of the local state in economic development: one perspective is promoted by Blecher and Shue who employ the concept of a developmental state²⁸ to analyse how a local state (i.e. county level government) plays direct and indirect roles to "plan, finance, and implement developmental projects".²⁹ The developmental state thesis argues that a strong central state creates favourable conditions for processes of economic restructuring in Newly Industrialising Countries (NICs) such as Japan, South Korea, and Singapore. The role of the local state is to support the activities of companies as best it can, including identifying

²² Coggins 2000.

²³ Brown *et al.*, 2008; Rozelle, 1994, Oi 1992.

²⁴ Sanders 2006: 221; Waldron *et al.* 2006:288.

²⁵ Cartier 2015:13.

²⁶ Cartier 2015; Lee *et al.*, 2012; Tilt 2010.

²⁷ Oi 1992; Unger and Chan 1999; Whiting 2001.

²⁸ Blecher and Shue 1996 and 2001.

²⁹ Blecher 1991: 268.

those companies or sectors which are most likely to be successful. The developmental state model is helpful in explaining why Lin'an County government will be so supportive of the bamboo shoot industry: it is economically and culturally significant.³⁰ The model may also provide a tentative answer as to why a local state should be involved in delivering on national standards as well as promoting its own standards. This is because the Lin'an bamboo industry is already highly competitive and standards could help to protect its domestic markets from lower quality competitors and assist it in gaining access to international markets. A potential weakness in the argument is that there is little evidence to show that local producers and processors – the entrepreneurs who are to be supported – made any requests for standards to support or enhance their competitive position.

A second perspective is that of the “entrepreneurial state” proposed by Jean Oi³¹ and Andrew Walder³². Both Oi and Walder understand a local state as acting like an entrepreneur. For instance, local government leaders perform the role of a board of directors in a company to make profits from Township Village Enterprises (TVEs), and sell land to maximise extra revenue for local government expenses and retain tax earnings).³³ For Oi³⁴, “local government coordinates economic enterprises in its territories as if it were a diversified business corporation.” In contrast to the developmental state model which locates entrepreneurialism in the local business community, here it is to be equally found in local government because officials will wish to expand revenue-generating activities,³⁵ especially the “extraction of profits from enterprises”.³⁶ To promote successful enterprises, local governments can exercise control over factory management, offer privileged access to resources (e.g. raw materials), provide investment and credit and make available bureaucratic services (e.g. prizes).³⁷ The latter would also include certification and provide an important insight into why the ‘entrepreneurial state’ would be interested in promoting standardisation: by entangling state and nominally private interests,

³⁰ Alpermann 2010.

³¹ Oi 1992.

³² Walder 1995.

³³ Oi 1992 and 1999.

³⁴ Oi 1992: 100-01.

³⁵ Oi 1992: 113.

³⁶ Oi 1992: 118.

³⁷ Oi 1992: 118-22.

bureaucrats would be using a state supported instrument to endorse their firms and give them a competitive advantage. In this model, the local state will be innovating to provide support mechanisms to enable firms to flourish. Oi's work also distinguishes between entrepreneurially economically successful rural areas, such as Lin'an, and those that fall behind. Rather problematic, though, is how the model of the entrepreneurial state can bring together a sectoral – in this case bamboo – with a scalar perspective to suggest a geography of the local state that can offer an understanding of how nationally and locally formulated standards compete with or complement one another in specific places, such as Lin'an. What do national standards mean to producers, processors and bureaucrats at the local level? And how might locally developed standards be scaled up from the county level to the provincial level?

Part of the reason why both the developmental state and entrepreneurial state models fail to sufficiently incorporate the potential significance of a novel policy instrument, such as a standard, is that they overemphasise state-driven transformation processes, which result in an unduly static understanding of state-market relations.³⁸ Instead, Cartier explores how state power is shaped and reshaped in a dynamic way, where the local state employs territorial strategies (e.g. direct investment and rearrangement of its administrative organisation) to extend its governing capacity and authoritarian power.³⁹ By adopting a more dynamic understanding of how a local state extends its control and rule on bamboo shoot standards through localised production networks, we can analyse how a county-level state expands its direct and indirect rules through standardisation processes. Here we can explore *interactions with other rural areas*. For instance, standards can be caught up in competition between rural areas, as local states seek to promote their bamboo shoot industries. Rural areas may also be engaged in exploitative relations with one another. For example, bamboo growers in the neighbouring county of Anji import bamboo supplies from elsewhere. These are then processed to maximize the value added from the cachet of the Anji name.⁴⁰ We can also examine *interactions with urban areas*, because bamboo shoots are a material for urban consumers. Standards provide one way of bringing together

³⁸ Cartier 2015.

³⁹ Cartier 2015: 22.

⁴⁰ Flynn et al., 2017.

through a supply chain (from producer to consumer) knowledge and expectations of a product. Moreover, by exploring how standards operate in practice we can see how the national state intrudes into a rural area, and also how a local state can seek to project itself beyond its rural area. For example, the county-level standard developed in Lin'an has a symbolism that spreads well beyond the community. At a time when changing administrative boundaries is commonplace, to extend or defend a rural economic space can be of paramount importance to local Party actors.⁴¹

3. Research focus and methods

Bamboo has enormous cultural significance in China. It is one of the four⁴² most admired plants.⁴³ Economically, bamboo is one of the fastest-growing forest land uses in China – there are approximately 7 million hectare of bamboo forest – and the industry is estimated to be worth about US\$5.4bn a year.⁴⁴ In many ways bamboo has the features of a classic sustainable material: it is natural, grows rapidly and can do so with limited or no inputs, can be substituted for more environmentally damaging materials (such as plastics, fibers or woods) and can have limited waste.

The traditional markets for bamboo products are handicrafts, chopsticks and bamboo shoots (food). Emergent markets, with the greatest added value, include furniture and flooring.⁴⁵ Here there is not only a domestic demand but also significant export markets. Our interest is in bamboo shoots as a food because thinking here on standards most clearly brings together producers, processors and consumers. As we shall see in the following section, there are international, national and locally developed standards that apply to bamboo shoots. Lin'an County in Zhejiang⁴⁶ province (see Figure 1) was selected as the geographical focus for the research on the standardisation of bamboo shoots because of

⁴¹ Cartier 2015: 22.

⁴² The others are the plum, orchid and chrysanthemum.

⁴³ Buckingham 2009:4.

⁴⁴ Buckingham 2009:4.

⁴⁵ Benton et al. 2011

⁴⁶ Zhejiang province is the largest bamboo production area in China. It is located on the Eastern part of China, adjacent to Shanghai Province. The administrative hierarchy of Zhejiang province is apportioned into 11 prefecture-level cities, 32 districts, 22 county-level cities, 35 counties and 1 autonomous county.

three major factors. First, it is well known for its bamboo knowledge and has a long history of bamboo shoot production, going back to the 15th century. Lin'an County is the biggest bamboo shoot production hub in China. Second, the local state uses bamboo shoot production as a means to provide ecological services (e.g. manage soil erosion by encouraging bamboo planting, see below) and socio-economic functions (e.g. stabilise farmers' livelihoods), which provides a lens to evaluate the steering approaches and policy implementation of production standards. Third, the bamboo shoot production industry is a crucial part of the mountain economy. In Lin'an County around 50% of farmer's incomes is derived from bamboo shoots. Whilst more than 60 types of bamboo are grown within Lin'an County there are three major types of bamboo shoots: Moso *Phyllostachys (Ph.) Edulis* (毛竹笋), *Phyllostachys (Ph.) Praecox* (雷竹笋), and *Phyllostachys (Ph.) Nuda* (石竹笋). The specialisation on three types of bamboo shoot rests on decisions made during the 1980s by the Lin'an Forestry Bureau. It wished to encourage farmers to grow bamboo shoots based on different slope gradients. For instance, on slope gradients lower than 20°, farmers were encouraged to grow *Ph. Praecox* bamboo shoots; where the slope gradient was greater than 20°, farmers were encouraged to grow *Ph. Nuda* bamboo shoots.⁴⁷ In Lin'an, like the neighbouring county of Anji, the increasing specialisation in bamboo growth has been accompanied by an increase in the area of bamboo forestland with a consequent loss of needle leaf and broadleaf forests.⁴⁸ The tendency to promote the monoculture of bamboo has important implications for biodiversity.⁴⁹

Owing to different seasonality, these three major shoot types provide fresh shoots for the wholesale market for a longer time period and also appeal to different users. Moso and *Ph. Praecox* shoots are sold in the fresh shoot market or processed into canned boiled shoots; while *Ph. Nuda* shoots become dried bamboo shoot products. In 2006, the bamboo shoots industry in Lin'an produced 35,000 tons of bamboo shoots and generated an economic value of around 160 million Yuan⁵⁰. There are around 5,000 traders involved in

⁴⁷ Lin'an Forestry Bureau 1994, p. 27

⁴⁸ Xu et al 2012.

⁴⁹ Coggins 2000.

⁵⁰ Lin'an Forestry Bureau 2006.

bamboo shoot transportation and marketing. They bring the fresh shoots to wholesalers in Changzhou, Shanghai, Nanjing, Jiaxing, Shanoxing, Lingbo, Suzhou and Wuxi.⁵¹

Figure 1 Map showing the location of Lin'an County

The empirical base for the analysis in this article has been collected and built up over a period of time using a range of secondary (i.e. archival materials) and primary data collected through interviews and field visits to Lin'an. Empirical research was conducted in 2011 and 2012. During this time in-depth interviews were undertaken with Forestry Bureau officials, farmers' co-operatives, processors, bamboo shoot farmers, forestry technicians and Zhejiang Agricultural and Forestry University researchers. The in-depth interviews were conducted across national, provincial and county levels of forestry officials to understand how standards are delivered and implemented from central to county level. Archival materials in relation to bamboo shoot production standards were obtained from the State Forestry Administration and the International Network for Bamboo and Rattan (INBAR) in Beijing, and Lin'an Forestry Bureau.

4.1 International and Chinese standards for bamboo shoot processing

China became a member of the World Trade Organisation (WTO) in 2001. Like countries in the West caught up in the neo-liberal political economy, the demands of the international market have driven the Ministry of Agriculture to institutionalise and monitor the processing standards of food products.⁵² According to Wang⁵³, export-oriented processors must fulfil food production standards in order to be in compliance with international food safety law. In Lin'an, the Product Quality Monitoring Group (PQMG) in the Lin'an Bamboo Shoot Processing Association (LBSPA) monitor two major standards for bamboo shoot processing: (1) international standard for local-led processors

⁵¹ Chan 2015b: 283.

⁵² For examples of other forms of standards and certificates see Cashore 2002; Bloomfield 2012; Hatanaka and Busch 2008 and Wang 2009.

⁵³ Wang 2012.

to fulfil overseas market requirements, and (2) China’s standard for local-led processors and small local processors (see Table 1).

Table 1 Scales and Production Standards in Lin’an County

Standards	Market segments	Institutional setting	Segment of bamboo shoot product	Production and processing standards
International standard for overseas market	Local-led processors	- Export-oriented - Bamboo shoot products are exported to Japan, USA and Europe	Boiled bamboo shoots	HACCP, ISO9001, Codex Alimentarius Commission Standard, JAS
China’s standard for internal market	Local-led processors	- Internal market - Large-scale production	Boiled, dried, preserved and seasoned shoots	HACCP, ISO9001
	Small local processors	- Internal market - Small scale production	Boiled, dried, preserved and seasoned shoots	Bamboo shoot production mainly to comply with AQSIQ ⁵⁴ system

⁵⁴ AQSIQ is the General Administration for Quality Supervision, Inspection and Quarantine in China. This organization is a ministerial-level body under the State Council of the PRC that is in charge of import-export food safety, certification and standardisation.

4.2 International standards for local-led processors

The JAS⁵⁵, ISO⁵⁶, HACCP⁵⁷ and CODEX Alimentarius⁵⁸ (food safety) standards are crucial for export-oriented processors to follow (see Table 1). In Lin'an, over 10 bamboo shoot processing firms have obtained HACCP certification and ISO9001 certification.⁵⁹ HACCP is a systematic preventative approach to regulate and control chemical usage, biological and physical hazards in fresh bamboo shoots' production and processing.⁶⁰ The JAS standard requires bamboo shoot processors to comply with production standards, processing procedures, import clearance, inspection certificates, containers and packaging.⁶¹ There are both Japanese and overseas accreditors who certify the JAS for bamboo shoot processors.⁶² To help local-led processors meet international standards, the Lin'an Forestry Bureau and the Lin'an Bamboo Shoots Processing Association link them up with 'hazard-free' bamboo shoot producers.

To understand the effectiveness with which the local state regulates processors to comply with both international and national production and processing standards, the chair of the Bamboo Shoot Processing Association distinguished between markets and farmers:

mostly, the local-led processing firms can fulfil both national and international standards because their products have to sell to international markets and they have a stricter food quality control and assurance system. For instance, the Japanese food quality is very strict; if the Japanese customer found a hair in any bamboo shoot products, the whole container has to shift back to China. For the internal market, monitoring is a problem because we cannot safeguard those small processors

⁵⁵ JAS refers to the Japanese Agricultural Standard. This standard appeal to those imported agro-forestry products which are monitored by the Japanese Government. These imported products are tested and checked to fulfil Japan's production standard and quality. A JAS mark will be placed on packages if these products are graded by the Japanese Government.

⁵⁶ ISO refers to the International Organization for Standardization. It is an international standard-setting organization to promote industrial and commercial standards globally. For instance, ISO9001 certification is the criteria for quality management.

⁵⁷ HACCP is Hazard Analysis Critical Control Point and it is a systematic preventive approach to food safety arriving from physical, biological and chemical hazards during food production and processing.

⁵⁸ The Codex Alimentarius Commission (CAC) food standard covers internationally recognised standards, codes of practices, and guidelines relating to food production and safety.

⁵⁹ Lin'an Forestry Bureau 2006.

⁶⁰ Asia Green Agriculture Corporation 2010: 14.

⁶¹ JETRO 2011: 3-11.

⁶² JETRO 2011: 10.

comply with hygiene and chemical usages standards because most of the small processors are household-based.⁶³

A hierarchy of regulatory practice is emerging. Those at the top are producing for and selling to international markets. These firms are supported in their efforts to comply with standards. Beneath them are those firms who can produce for a national market and meet national standards. Beneath these firms are smaller companies who are targeting domestic consumers, are falling outside of the standards, and are beyond both the regulatory and supportive arrangements of the local state. As long as the small, unregulated processing firms stay out of the public gaze they do not undermine the reputation for quality of Lin'an County which depends on the high-profile exporting companies. The County's reputation for quality also, even more significantly, depends upon its bamboo shoot growers, and it is their interaction with standards that we now examine.

5.1 Bamboo shoot production standards

In 2009 a Standing Committee of the National People's Congress enacted the Republic of China's Food Safety Law. To help implement the Law, there are number of further regulations and standards developed at sub-national level. For bamboo shoot growers in Lin'an three are particularly important: the Hazard-Free Production Standard (HFPS) (无公害食品生产标准), the Green Food Production Standard (GFPS) (绿色食品生产标准), and the Zhejiang Province Forest Food Production Base Standard (ZFFPBS) (浙江省森林食品生产标准) (see Table 2). The standards are set and evaluated in a complex manner with responsibilities falling to different government departments. The HFPS and GFPS are the responsibility of the Zhejiang Agricultural Department, and the ZFFPBS is issued by the State Forestry Administration Forestry Products Quality Inspection and Testing Centre (Hangzhou). The competition between departments is typical of Chinese bureaucracy.⁶⁴

The HFPS requires that farmers meet the following criteria: (1) chemical fertilisers should be kept at safe levels; (2) the surrounding areas of the agro-forestry production lands

⁶³ Interview with bamboo shoot association chairperson, P02, 2012.

⁶⁴ Lin 2001: 12; Wu 2015: 123.

should fulfil hazard-free standards, and (3) the production procedures, processing, packaging, storage and transport should reach hazard-free agricultural product standards. The standard does not seem particularly difficult to fulfil because according to a Lin'an Forestry Department (aligned to the Provincial government) technician "most of our farmers fulfil the hazard-free standards".⁶⁵

The Green Food Standard has higher demands on the use and remains of toxic chemical fertilisers. The local state is making considerable efforts to promote the Green Food Standard to distinguish Lin'an products in a competitive market place, but where fertilisers are embedded in local farming practice that is difficult.⁶⁶ As the same official noted: "we are working hard to help farmers to realise the practices of green food production standards. This takes time and financial resources to propel the green food standards because the requirements are hard to reach in farmers' current knowledge and financial resources".⁶⁷

The Forest Food Production Base Standard (FFPBS) is popular in Zhejiang. To differentiate its standard from those of the provincial Agricultural Department (i.e. Hazard-Free and Green Good standards), the Zhejiang Provincial Forestry Department's Forest Food Product Base Standard (ZFFPBS) pays more attention to forest biodiversity, forest coverage, forest structure, soil condition, air quality and water quality. By being able to demonstrate the legitimacy of the ZFFPBS amongst its users, Zhejiang has been able to 'promote' a provincial standard to the national level. The national level Forest Food Standard, like that for Zhejiang, stresses 'forest sustainability'. However, the national level standard is more rigorous as it promotes 'product branding', and emphasises 'organic' or 'natural' production without using any artificial pesticides and fertilisers and where materials are traceable throughout the supply chain from place of production to plate of consumption. Such a stringent form of production is beyond the means of Lin'an bamboo shoot growers which is why the Province is so keen to legitimise its own standard.

Like the Province of Zhejiang, the County of Lin'an has also proved to be innovative. Led by Lin'an forestry experts and technicians, who have considerable

⁶⁵ Interview, ID: GO 02, 2012.

⁶⁶ Zhou and Jin 2007.

⁶⁷ interview, ID: GO 02, 2012.

expertise in bamboo cultivation and processing, standards were developed based on the Ministry of Agriculture's Hazard-Free production and Zhejiang Province's Non-Environmental Pollution Bamboo Shoot (DB33/333/1-2001). In 2009, Lin'an Forestry Bureau certified the *Ph. Praecox* Bamboo Shoots Soil Rehabilitation Standard (DB3301/T199-2011) (see Table 2). This production standard regulates the terminology of forestry management, pests and disease control for bamboo. The purpose of the standard is to encourage soil rehabilitation of the *Ph. Praecox* shoots in degraded soil. However, county-level standards are relatively loose and the certification, traceability, and period of validity of bamboo shoot products are ambiguous. As we shall see in the remainder of the section, the standards do little to challenge the increasing intensification of production and the environmental degradation that results. As Bloomfield⁶⁸ has noted, measures like standards tend to be popular because "they do not tackle tough issues".

⁶⁸ Bloomfield 2012: 404

Table 2. National, provincial and county levels food standards for bamboo shoot growers

Standard	Hazard-free food	Green food	Forest food	Zhejiang province forest food production base standard	Ph. Praecox bamboo shoots soil rehabilitation standard
Year established	2001	1990	2015	2007	2009
Level of governance	National	National	National	Provincial	County
Permits genetically modified organisms	Yes	Yes	No	Yes	Yes
Permits synthetic fertiliser and pesticides	Yes	Yes (only some kinds of chemicals are permitted)	No	Yes (only some kinds of chemicals are permitted)	Yes
Residue testing	Yes	Yes	Yes	Yes	Yes
Certifiers and cost	Ministry of Agriculture Centre for Agri-Food Quality and Safety: no certificate fee	Ministry of Agriculture Centre for Agri-Food Quality and Safety: RMB 10, 000	State Forestry Administration: China Eco Development Association: no certificate fee	State Forestry Administration Forestry Products Quality Inspection and Testing Centre (Hangzhou): no certificate fee	Lin'an Forestry Bureau
Traceability	No	No	Yes	No	No
Period of validity	Three-years	Three Years	Three years	Three Years	N/A

Adapted from Scott *et al.*, 2014: 161, Specification of forest food certification ZLC 003, 2015: 1-20; State Forestry Administration, 2010: 1-20

5.2 From Provincial to Local level: implementing bamboo shoot production standards in Lin'an

Fresh bamboo shoots are a local specialty of food production and one that is increasingly being utilised. For example, farmers and processors make reference to the geographical origin of their bamboo shoots at the head of the 'Lake Tai River' (*Taiwu Yuen Tau* 太湖源头) and *Tian Mu* 天目 Mountain' in Lin'an (see the example of the Kao Yuen Bamboo Shoot Co-operative below). Farmers use these images to conjure up powerful cultural messages for urban consumers: a typical Chinese mountainous climate with clean water. Moreover, growers are associated with traditional artisan skills of cultivation, harvesting and processing that can be dated back to the *Ming* Dynasty 明朝 (15th Century). Through farmers' personal experience, a high quality dried bamboo shoot should be brown and slightly green in colour with a soft texture. Good quality dried bamboo shoots should be uniform in size and without odours and mould. All these specific geographical and socio-cultural contexts construct the "authentic, healthy traditional"⁶⁹ bamboo shoot products from Lin'an.

However, images of high quality products based upon traditional bamboo growing methods and harvesting techniques jar with the reality of intensive growing and threaten to undermine the distinctiveness of the Lin'an industry. Environmental degradation and potential risks to food quality now go hand-in-hand:

owing to applying massive amounts of chemical fertilisers, which increase the accumulation of potassium and phosphate in the soil. Forest degradation [is a risk] because of phosphate content level above the safety level. By increasing the scale of bamboo cultivation ... pest and disease problems [increase]. To tackle this problem, farmers apply more and more pesticides, even some prohibited pesticides (i.e. carbofuran) which induces a food safety problem.⁷⁰

Recognising that a key economic activity could be potentially undermined Lin'an state actively intervened to promote more environmentally friendly bamboo shoot growing practices. There were four major activities. First, prohibiting the use and marketing of carbofuran in Lin'an County in 2000. Second, collecting soil samples to evaluate the

⁶⁹ Ilbery and Kneafsey 2000: 217-218.

⁷⁰ Interview with government official, G01, 2012.

contents of the sulphur, potassium, and phosphate in 60 bamboo shoot cultivation plots in order to calculate the appropriate proportion of fertiliser contents. Fertiliser use and application is an important part of bamboo growing and is discussed further below. Third, drafting County-level Hazard-Free production standards for bamboo shoot cultivation based on those devised at the provincial and national levels. Lin'an Forestry Bureau worked with the Bamboo Shoot Production and Processing Association, bamboo shoot producers, processors, and private technological extension firm, and research institutions (e.g., Zhejiang Agricultural and Forestry University) to co-produce the standards for bamboo shoot production. Fourth, providing training workshops, exhibitions, booklets, and television broadcastings for bamboo shoot producers to learn about Hazard-Free production standards.⁷¹ Below we explore how the local state works with its co-operatives to promote compliance with standards for the competitive advantage of Lin'an's bamboo shoot growers.

5.3 The local state and farmers' co-operatives

Lin'an state extends its direct and indirect rules on promoting Hazard-Free production standards through collaboration with farmers' co-operatives and demonstration households. For direct rules, both Lin'an state and the Forestry Bureau have the authority to control the production of bamboo shoots and the activities of farmers' co-operatives through the Forest Law and Farmers' Co-operative Law.⁷² Additionally, the Forestry Bureau provides technology extension services and monitors the production quality of bamboo shoots from individual farmers and co-operatives. To do so, Lin'an Forestry Bureau established 50 testing points throughout the County to monitor the quality, heavy metal content, and chemical residue of bamboo shoots produced to make sure they meet the hazard-free production standard. The County government and Forestry Bureau also need and use the co-operatives to increase the state's influence on individual farmers' practices.

⁷¹ Lin'an Bamboo information, 2001: 2-3.

⁷²The State Administration for Industry & Commerce of the People's Republic of China (SAFIC) based on the "Farmers' Professional Co-operatives Legal Document", 2006 appeal to individual farmers to initiate the establishment of the co-operatives. There are more than ten thousands farmers' co-operatives in China.

Through partnerships with fertiliser co-operatives, Lin'an Forestry Bureau can, on the one hand, trace the origin of fertilisers and, on the other hand, extend its indirect rule over farmers' fertiliser usage and cultivation procedures by encouraging co-operative members to achieve food production standards. The co-operatives keep good relationships with farmers through various niche services such as soil testing and fertiliser matching, and increasing the market network of bamboo shoots. Informal governance structures such as trust, negotiation, and verbal agreements are common within a co-operative's networks. Farmers' co-operatives also sign bamboo shoot production contracts with individual farmers that protect prices, provide production training and workshops for farmers to maintain Hazard-Free and Zhejiang Forest Food Production Base Standards (see Figure 2). To further understand farmers' co-operatives the Yi Wei Fertiliser 益微化肥合作社 and Kao Yuen Bamboo Shoot Co-operatives 高源竹笋合作社 will be discussed in the following section.

Figure 2 The local state, farmers' co-operatives and food production standards

5.4 Yi Wei Fertiliser Co-operative

The Yi Wei Fertiliser Co-operative was established in 2012, and processes fertilisers for bamboo shoots' producers. Members who buy the co-operative's fertilisers will obtain standardized quality fertiliser and training in its application. The co-operative is small with only 100 members. According to a director of the fertiliser co-operative, it provides three major functions: (1) soil testing and soil condition consultancy services, (2) manufacturing and wholesaling of tailor-made non-toxic fertilisers, and (3) facilitating the County Forestry's Bureau's technological extension services to promote fertiliser which meets the hazard-free and Zhejiang Forest Food Production Base Standard. The director explained:

our co-operative conducts research on the optimum composition of chemical and organic substances in fertiliser to restore degraded soil and meet the Hazard-Free Production Standard... We collaborated with the Zhejiang Agricultural and Forestry University, Lin'an Forestry Bureau, and the Agricultural Bureau's soil testing stations to learn from their techniques to test the soil and learn their knowledge to blend the appropriate proportion of chemical and organic substances.

According to the same director⁷³, farmers repeat use of a fertiliser is based upon their experience. However, many farmers lack knowledge of the fertilisers that they use. As the director explained:

some fertilisers are counterfeit and even toxic. The source of the fertilisers is difficult to trace. However, if farmers purchase fertilisers from our co-operative, at least they could know where it came from.... We will let farmers try our products

⁷³ Interview with co-operative director C01, 2012.

and let them realise the improvement of their plantations. Once farmers see bamboo become greener and healthier, they will come back to buy it.⁷⁴

For the co-operative it is not only establishing a relationship of trust with farmers that matters, because as the director explained, building close relationships with the Forestry Bureau would help to promote their fertilisers to Lin'an farmers:

I have been working in fertiliser manufacture and networking with Lin'an forestry officials for more than five years. Now, I have earned the trust from the Bureau because my fertilisers increase farmers' productivity and ameliorates the toxicity of the soil. Therefore, I could accompany the Bureau's technicians to promote my fertilisers and develop business opportunities.⁷⁵

The relationship between co-operative and state is portrayed as one of mutual benefit: the fertiliser's co-operative needs the government's endorsement and recommendations to promote its products in the market; the fertiliser co-operative helps Lin'an state to make its farmers competitive.

⁷⁴ Interview with co-operative director C01, 2012.

⁷⁵ Interview C01, 2012.

5.5 Kao Yuen Bamboo Shoot Co-operative

In 2009 the Kao Yuen Bamboo Shoot Co-operative was founded. It is a medium-sized co-operative with around 1,300 bamboo shoot-farmer members drawn from across Lin'an County. The members are responsible for about 7,500ha of bamboo land. The Kao Yuen co-operative also directly manages 225ha of land. The co-operative mainly buys bamboo shoots from its members which it then sells on their behalf under the brand name “*Tai Wu Yuen Tau*太湖源头”, named after its location at the head of the *Tai Wu Yuen* River (see above). The co-operative has guided its members to adopt Hazard-Free and Zhejiang Forest Food Production standard from seedling propagation and fertiliser use through to production processes. It does this by providing information on growing techniques.

In addition, there are three other major ways that the co-operative maintains the quality of its members' bamboo shoots. First, the Bamboo Shoot Co-operative collaborates with the Yi Wei Fertiliser Co-operative (see above) by recommending to its members that they use the approved fertilisers from the Yi Wei Fertiliser Co-operative. In return, the fertiliser co-operative provides free soil testing services for the Kao Yuen Bamboo Shoot Co-operative's members. Second, according to a director of the Kao Yuen Bamboo Shoot Co-operative, there are written contracts with its members that are used to maintain the Hazard-Free and Zhejiang Forest Food Production Standard:

Our bamboo shoots products have the brand name “*Tai Wu Yuen Tau*” and farmers sign a contract with the co-operative because we have standardisation in production procedures, fertilisers and pesticide usages. Therefore, the size, weight, width, and quality of our bamboo shoot products are standardised.⁷⁶

Third, establishing links with demonstration households is another way for the co-operative to diffuse the knowledge and practices of production standards. For example, the co-operative will put a sign on a demonstration farm reading “*Ph. Praecox* Shoot Plantation” to signify that plots of land are using Hazard-Free Production standards with the co-operative's guidance. Also on the sign will be the name of the demonstration household, the types and descriptions of soil restoration and the technology adopted (see Figure 3).

⁷⁶ Interview with co-operative director, C02, 2012.

Farmers who are interested in ways of achieving hazard-free production standards can contact the demonstration households or the co-operative to receive a free consultation.

According to one demonstration household:

More than 100 farmers consulted me for my cultivation techniques, farming schedules, and the types of fertilisers which I am using. There are around 30 farmers closely tied with me. Whenever they have problems, they come to my house to have a chat with me”.⁷⁷

The co-operative not only nurtured its own demonstration household farms to display its Hazard-Free Production standard but also employed the networks of the demonstration households to promote their brands and attract interested farmers to join the Bamboo Shoot Co-operative. Like the Yi Wei, the Kao Yuen Co-operative is working at the interface between the state and farmers. As the local state seeks to safeguard the economic interests of its farmers it is increasingly turning towards the use of standards. Standards become a way of differentiating Lin'an products from their competitors. Protection of producers depends upon the local state being able to reassure urban consumers of the quality of products which is where the co-operatives are playing a prominent role because they help to ensure that the requirements of standards are met.

⁷⁷ Interview with demonstration household, DH: 02, 2012.

Figure 3 Sign showing the adoption of hazard-free and Zhejiang forest food production base standard

6 Conclusions

Standards, like other neo-liberal practices, such as auditing and certification,⁷⁸ are becoming more important policy instruments and a means to provide reassurance on quality when trading takes place.⁷⁹ To gain a better insight into what standards mean for Chinese local environmental governance we note two points: even when they have a stated ecological purpose, standards may not produce improvements in the quality of the bamboo growing environment; and, in the Chinese context, the operation of standards is intertwined with the practices of the local state, a markedly different state of affairs from that which may be found elsewhere.⁸⁰ These two points are discussed further below.

Intensification of production can accelerate soil degradation and impair the carrying capacity of the land. For the local state, the increasing tensions between promotion of

⁷⁸ Power 1999.

⁷⁹ Bloomfield 2012, Cashore 2002.

⁸⁰ See, for example, Hatanaka and Busch 2008.

economic growth and avoidance of harmful exploitation of natural resources raise an increasingly pronounced conflict. We share Calvin⁸¹ *et al.*'s and Lin⁸²'s views that both the local state and producers look for short-term economic gains instead of addressing a deep-seated contradiction between resource exploitation and environmental limits (for a similar case relating to aquaculture see Vandergeest and Uno⁸³). Therefore, standardisation is merely a short-term fix to ameliorate environmental degradation. Even if environmental degradation is accelerated, the local state's politico-economic territory is remade. To describe this phenomenon, we use the term 'green cloak' since it suggests a specific governance logic of state territorial control over the production of nature. The local state engages with non-state actors to achieve superficial environmental efforts (e.g. standards) to throw a 'green cloak' over a continuing productivist model. A 'green-cloak' requires state officials, academics, auditing bodies, and experts to co-produce knowledge, such as showing quantitative changes to land surfaces and the number of green infrastructure projects, along with a set of rules to legitimise these green-looking development models.

Our case study also reveals how the nature of the Chinese local state means that it is inextricably intertwined with both the organisation and operation of standards, thus making it significantly different from what is expected though perhaps not realised in liberal democracies.⁸⁴ This is because standards and the production of nature are part of 'territorial strategies'.⁸⁵ The local state expands its territory and maintains its privileged governance through being able to exercise power over multi-layered 'space': the local state is not limited to the physical space over which it can seek to exert control over raw material supplies as it also seeks control over the economic space where it can enhance the competitiveness of the processors through the supply chain; and political space in which it hopes to obtain the attention of the central state to boost its profile and economic opportunities. To be able to achieve this outcome our research has shown how standardisation engages with the local state, farmers' co-operatives, forestry experts,

⁸¹ Calvin *et al.* 2006.

⁸² Lin 2009.

⁸³ Vandergeest and Uno 2012.

⁸⁴ Hatanaka and Busch 2008.

⁸⁵ Cartier 2015.

bamboo shoot processors and extension services to co-produce the knowledge necessary to realise these economic and political ambitions.

At the local level, where so much policy delivery takes place, administrative competition may mean that there is more attention given to securing the ‘legitimacy’ of a standard and less effort to how that standard might help with the delivery of public policy. As we saw in Table 2, national, provincial and county governments are involved in standard setting. One reading of the Table is that national level standards are delivered in a relatively straightforward manner by subnational government. In practice, it is a more complex and dynamic situation with upscaling and downscaling and territorial competition taking place. An upscaling of standards can help the local state to secure administrative resources, inward investment and sympathetic policies.⁸⁶ At a provincial level, the upscaling of the Zhejiang forest food standard into a national forest food standard, involves the transfer of power, creates the potential for economic benefits and the opportunity for promotion among government officials. At the same time, the upscaling and downscaling of standards is taking place in a context of interdepartmental politics (e.g. between the Agriculture and Forestry departments) and this is resulting in a proliferation of standards.

By examining a local state we are able to show how it engages with key actors including farmers’ co-operatives, demonstration households and agricultural extension services to co-produce knowledge needed to develop standards, as well as knowledge about the standards themselves. In our analysis of how standards are used in practice, we can see how they come to control bamboo shoot quality – a productive norm – and so become a governing tool for the local state to extend its direct and indirect rule over bamboo shoot producers. For direct rules, Lin’an state has the authority to control the production of bamboo shoots and the activities of farmers’ co-operatives through the forest law and the farmer’s co-operative law. This is the traditional *modus operandi* of the Chinese state. In its indirect rule, the County government and Forestry Bureau work with co-operatives, research institutions, and demonstration households to increase the state’s influence over individual farmers’ growing practices, and here standards matter. By utilising direct and indirect rules, the local state can use control and co-operation in its links with farmers.

⁸⁶ Cartier 2015.

At present, compliance with standards is confined to a minority of bamboo shoot growers in Lin'an: that is, those who are best able to provide premium products. Lin'an state aims at dispersing standardised bamboo shoot cultivation to a larger number of its farmers by demonstrating the economic value of standard-adoption in growing. The highly networked nature of the Lin'an bamboo-growing community means that much learning is taking place via the co-operatives. The co-operatives become an agency to extend the arm of the local state to ensure the legitimacy of the standards it promotes and to raise the market recognition of Lin'an bamboo shoots. This should increase consumers' confidence in Lin'an products which will, of course, also be of benefit to the bamboo shoot processors. As the local state generates additional economic value from bamboo shoot production and processing, it will also enlarge its economic territory. One challenge for the local state will be that as standards become normalised, then the local state may become less interested in standards promotion and more of an auditor⁸⁷ along the supply chain to ensure compliance with standards. How such neo-liberal tendencies can be managed within the Chinese model of governance also points to the ongoing importance of the study of standards as a window into the dynamic nature of relationships between the state and other actors.

Acknowledgement

This project was generously funded by the Cardiff University President's Research Scholarship between 2011 and 2014. We wish to thank Yu Li, Jin Wei, Zhu Zhao Hua, Wang On Guo, He Jun Chao, Xu Xiu Ying, Zhejiang Agricultural and Forestry University, Lin'an Modern Technology Company and Lin'an Forestry Bureau for assistance with data collection in Lin'an, China. We also thank three anonymous reviewers for providing insightful comments on an earlier draft of this paper.

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⁸⁷ Power 1999.

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摘要: 在探讨中国食品供应和质量的文献中, 多有涉及食品安全问题, 但是关于研究县级政府如何管理和控制食品质量安全的文献却非常有限。本文指出研究县政府的在食品安全质量中的管治角色是不可或缺的, 一方面, 县政府通过农业服务推广和农业合作社来引导农民进行粮食生产; 另一方面, 县政府将实施食品质量安全生产标准作为新型治理工具来控制食品生产质量。因此, 本研究以县级为尺度来讨论食品质量安全生产标准的制订和执行者; 同时亦分析了县政府为何以及如何参与食品质量安全生产标准的制订。本研究以临安县竹笋生产行业为例, 探讨当地县政府如何实施无公害食品、绿色食品和森林食品的生产标准。结论表明: 传统的国家理论未能充分解释地方政府如何有效利用竹笋资源, 食品质量安全标准以及政府权力来构建区域食品供应及质量安全治理体系。本文通过县级政府的区域策略, 分析地方政府如何利用当地森林资源, 农业合作社和食品质量安全生产标准来合理化临安县绿色外观的发展模式。这种模式不但通过地方政府与其他持份者的合作来制订食品生产标准, 而且也让地方政府将食品生产标准作为“绿色外衣”来合理化以经济为主导的发展模式。

关键词: 中国地方政府, 环境管治, 食品质量安全生产标准, 竹笋生产行业, 农业合作社, 中国临安县

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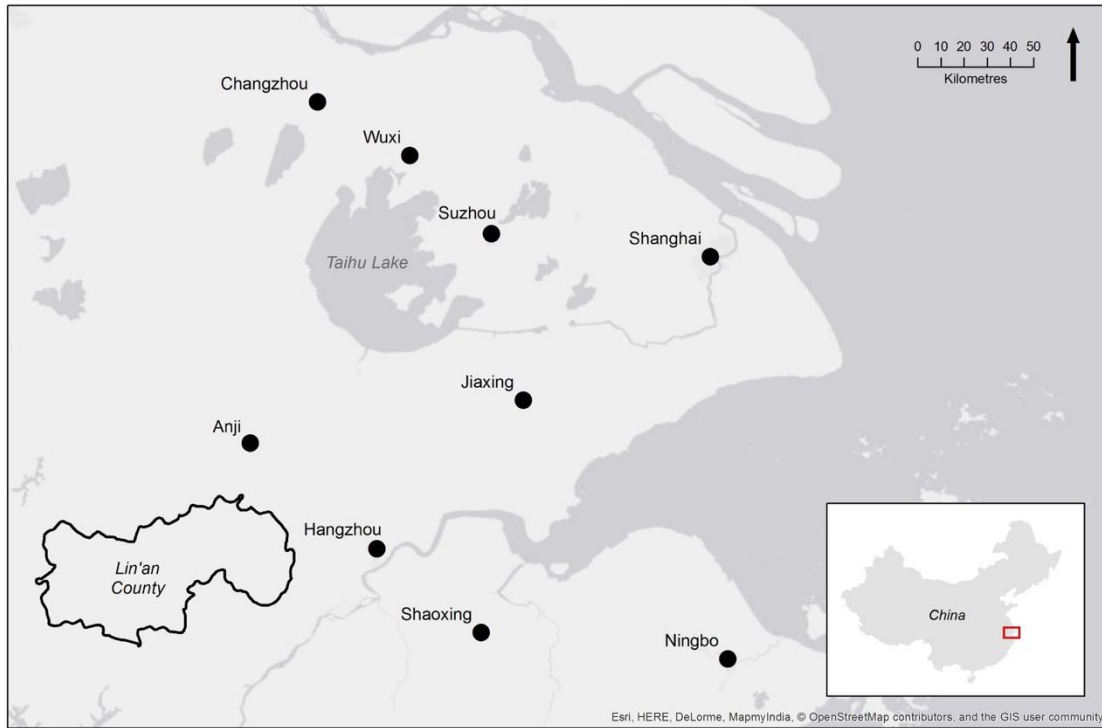
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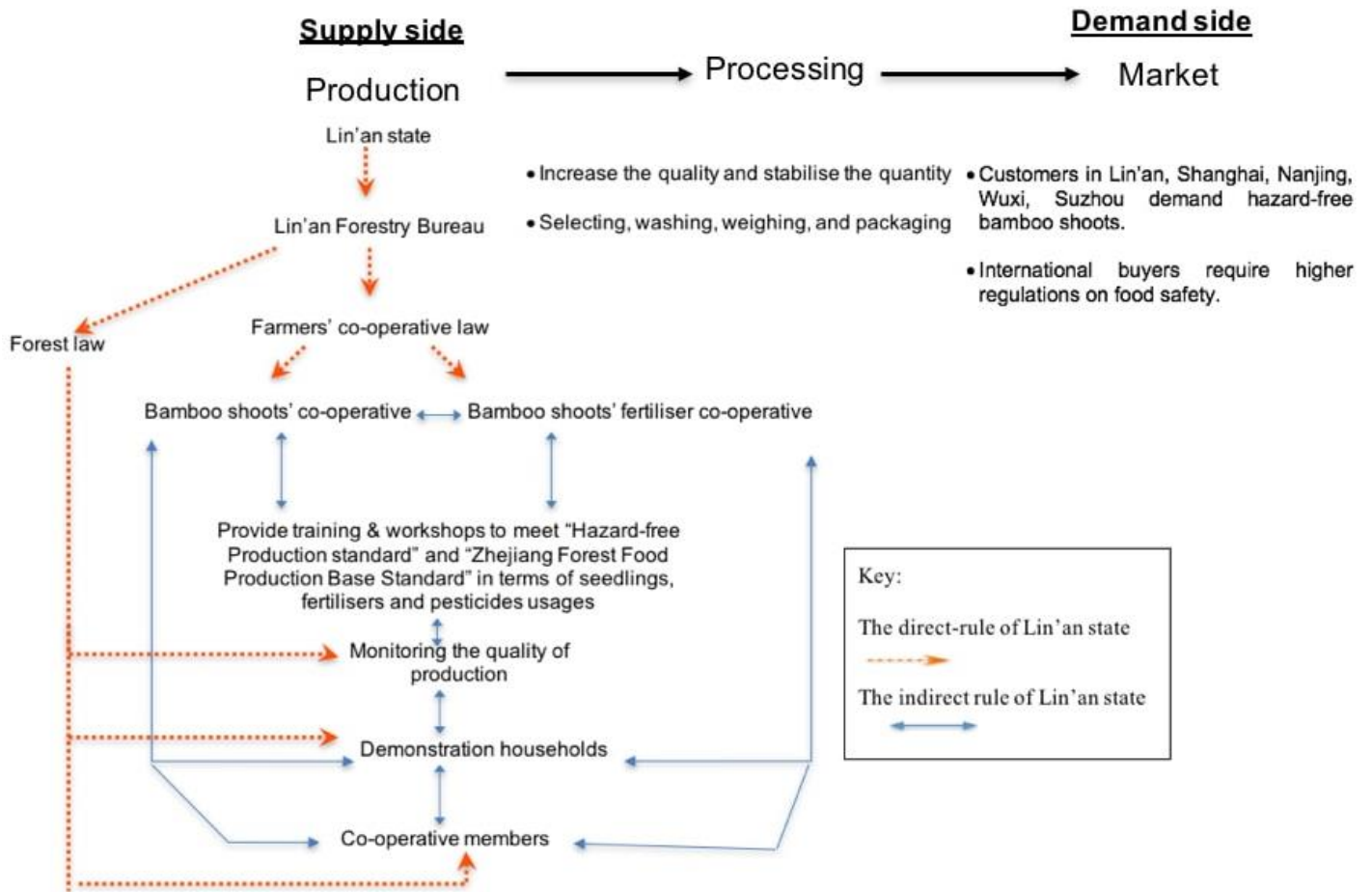
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Figure 1 Map showing the location of Lin'an County



Source: Chan, 2017

Figure 2 The local state, farmers' co-operatives and food production standards



Source: Chan, 2017

Figure 3 Sign showing the adoption of hazard-free and Zhejiang forest food production base standard



Source: Chan, 2017