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Abstract.

Although current studies into Chinese food supply and quality provide different explanations for the causality of food problems there is limited inquiry into the role of the county state. This is a serious omission because firstly county government performs a key role in providing support for farmers through agricultural extension services and farmers’ co-operatives; and secondly, the county level is central to novel instruments that seek to manage supply chain relationships, such as the implementation of food production standards. We investigate who are the key players involved in standard making and delivery at the county level. We also analyze how and why the local state 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 mountain food production standards. The paper concludes that traditional conceptualisations of the local state do not sufficiently address how bamboo nature, knowledge of standards and state authority co-produce institutional capacity to control food supply and quality in China. By analysing the territorial strategies of a local state, we can identify the (re)production of nature; farmers’ co-operatives and standardisation as major territorial strategies to help Lin’an county enhance its institutional capacity.
Standardsation and the Chinese Local State: an Analysis of Bamboo Shoot Standards in Lin’an

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摘要：
在探讨中国食品供应和质量的文献中，多有涉及我国食品安全的问题，但是对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。本文指出研究县级政府的食品管治角色是不可或缺的，因为一方面，县政府通过农业服务推广和农民专业合作社来引导农民进行粮食生产; 另一方面，县政府以实施食品质量安全生产标准作为新型的治理工具来控制食品生产品质量。因此，本研究以县级为尺度来调查谁是食品质量安生产标准的制订和执行者; 同时亦分析了县政府为何和如何参与食品质量安全生产标准的制订。由此我们以临安竹笋生产行业为例，探讨当地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。相关结论显示: 传统的国家理论未能充分解释地方政府如何有效融合竹笋资源，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。本文则透过区域策略的角度，分析地方政府如何利用天然资源生产，农民专业合作社和食品生产标准来加强临安县於区域上的食品供应和质量安全的治理能力。

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，临安县，中国
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 industrialization and urbanization (Wu and You 2012; Siciliano 2012), 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 (Enticott, 2016; Long and Wood, 2011). 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 (Chan, 2015). To address China’s food quality and supply dilemma, current debates mainly focus on four major themes. First, there are debates on how to resolve the tension between population pressure and resource scarcity. For example, China has to feed its 1.3 billion population and this huge food demand exerts pressure on food production, land capacity, and natural resource extraction (Boland, 2000; Smart and Smart, 2017; Smil, 1997). The rapid pace of agricultural land conversion in China has accentuated Lester Brown’s question, “Who will feed China?” in current debates over ambiguous land property rights and commodification of land which affect China’s food security (Brown, 1995; Lichtenberg and Ding, 2008; Yang and Li, 2000). Second, land tenure problems affect food production quality. For instance, the average size of farmlands in southern parts of China is less than 2 acres; farmers who want to increase their incomes will apply a large amount of fertilisers and pesticides to their land to boost productivity, which causes severe soil contamination, and increases the likelihood of chemical remains in foods (Calvin et al., 2006). Additionally, the farmland household responsibility system mainly granted ‘use rights’ of land and not freehold to farmers. As a consequence, farmers may feel insecure about making a long-term investment on their lands but will engage in short-term profit maximisation activities (Lin, 2009). Third, a national pro-growth agenda can encourage a relaxation of production standards in exchange for economic growth at local levels. Since food industries can provide a decent tax income for rural local governments (Ma and Ortolano, 2000) there is a policy intention to pay more attention to the number of food enterprises and less to the
monitoring and standardizing of food production (Bai, 2007). Fourth, studies contextualise the role of state-market dynamics to increase food production standards. For example, there are studies of how the local state and farmers negotiate on market prices, rules, and production standards in (1) ruminant markets such as beef and sheep meat, and dairy markets; and (2) cash crop markets such as grain and tobacco (Brown et al., 2002 & 2005; Delman, 2003; Longworth and Brown, 1995; Wang, 2009).

Although current studies 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 county state. This is a serious omission because firstly county government performs a key role in providing support for farmers (e.g. agricultural extension services) and secondly, the county level is central to novel instruments that seek to manage supply chain relationships, such as the implementation of food production standards. We need to know more about who are the key players involved in standard making and delivery at the county level. We also need to understand how and why the local state engages in standard setting activities. To begin to investigate these topics, 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 (Brunsson et al., 2012), 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 dynamic relationships between the local state and market and how those are changing over time (Chung, 2004; Xiaoguang. and Heng 2008). 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. A growth in the reach of the local 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 in economic development and policy delivery. For Lin’an a bamboo food
standard has become a form of technical knowledge to serve the local state to extend its spatial control on bamboo shoot production. It acts as a spatial fix (e.g. to control fertilizer usage) to safeguard the quality of the material through the supply chain, from the rural bamboo grower to the urban consumers plate. A standard also shows a policy commitment to protecting the rural environment and promoting food quality (Bloomfield 2012). 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. In this way 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 utilized. In this way, we can show how international environmental neo-liberalism (Bernstein, 2001) interacts with Chinese governmentality (Jeffreys and Sigley 2009, 2014). One consequence is that bamboo standards can be conceived of as a means of putting a ‘green cloak’ over bamboo farmers and the local state. 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 achieve 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 achieve the environmentally-oriented directives of the National Forest Protection Programme (NTFP) and the Slope Land Conservation Scheme (SLCP) (Lin’an Forestry Bureau, 2009). Since the 1980s, the bamboo shoot cultivation area in Lin’an has increased rapidly; bamboo forest coverage grew 92% from 1985 (when it was 2,900 ha) to 2009 (when it was 55,777ha). As a result of its efforts to increase bamboo growing, and so green the landscape, Lin’an state is nationally recognised as a China National Bamboo Homeland (Tang, 2007). When we lift the green cloak through detailed local analysis, however, the interest in standardization 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-recognized 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 nature.

This paper is divided into four further sections. In part two, we analyse how the local state and standards have become interwoven. We examine competing approaches to understanding the local state and how they inadequately conceptualise 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. In part five, we discuss the challenges to implementing standards in the bamboo shoot production industry. Finally, we reflect on the interaction between different levels of government and standard formation and delivery. We conclude that standards provide a valuable way to understand the dynamics of the local state and an important insight into multi-scalar activities. At the macro scale standards help Lin’an state to align with international requirement and increase its territorial reach to expand the global market for its bamboo shoot products. At the meso-scale, bamboo shoot standards help the State Forestry Administration (SFA) to compete with the Ministry of Agriculture to secure more financial resources from the Central State. Whilst at the micro scale, the local state engages with key actors, including farmers’ co-operatives, demonstration households and agricultural extension services to co-produce the knowledge of standards so as to extend its direct and indirect rules over bamboo shoot growers. This enables an ongoing remaking of the local state’s politico-economic territory by expanding its spatial control over bamboo shoot production.

2. Standards and the local state

Commentators have pointed out that, standards are an often little noticed but nevertheless a remarkable feature of contemporary life (Brunsson and Jacobsson 2000; Brunsson et al., 2012; Timmermans and Epstein 2010). 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 (Cashore 2002; Damian and Ilbery, 2006). (The nature of standards is discussed further below). Freidberg (2004),
for example, illustrates 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. 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 (Liu et al., 2013; Mol, 2014; Ortega et al., 2011). The work of Buckingham and her colleagues on bamboo standards (Buckingham et al., 2011; Buckingham et al., 2014; Buckingham and Jepson, 2013 &2014) has been particularly instructive as they have documented the ways in which national and international standards matter for biodiversity. 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 of standards (Bernstein, 2002, Cashore, 2002). This co-produced knowledge enables China’s food products to align themselves with global requirements whilst maintaining China’s ‘state-centric’ governance system (Bloomfield, 2012, Hatanaka and Busch, 2008; Xiaoguang and Heng, 2008, Buckingham and Jepson 2013).

Although current debates on food 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 level (Yeh et al., 2015: 6), and of the role that the local state plays in mobilizing farmers to meet standards. It is important here to problematize the role of the local state: how might standards fit into local economic development activities? 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? What process of negotiation takes place between actors at the local level in the delivery of bamboo shoot standards? More broadly, how does international neo-liberal governance and trade rules impact on an authoritarian domestic pattern of governance?

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 standardization policies and programmes (Lieberthal, 2003; Saich, 2001). Coggins (2000) further suggests that scholars pay attention to the interactions
between the political economy of the bamboo forest and environmental degradation as this will affect the lives of rural people and biodiversity. In this perspective, there are networks among state officials, processors, forestry experts, technicians, research institutions and private agricultural companies, and bamboo shoot farmers who perform collaborative roles, define farming norms and negotiate standards for bamboo shoot production (Giddens, 1984; Sayer 1992). In our empirical material that follows, we detail how these arrangements work in practice for bamboo shoot growers in Lin’an. We argue that the county-state plays a crucial role in increasing farmers’ incentives and productivity through regulation and supporting policies (Brown et al., 2008; Longworth and Brown, 1995, Rozelle, 1994, Oi 1992). 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 safety (Sanders, 2006: 221; Waldron et al. 2006: 288). 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 (2015: 13) has described it, there is the “expectation of [a] uniform acceptance of authority.”

The persistence of state authoritarianism, party-state governance and pro-growth pragmatism are central to interpreting current food systems in China (Cartier, 2015; Lee et al., 2012). There are two major ways to conceptualize the role of the local state in economic development. More specifically, 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 (Oi, 1992; Unger and Chan, 1999; Whiting, 2001). One perspective is promoted by Blecher and Shue (1996 and 2001) who employ the concept of a developmental state to analyse how a local state (county level government) plays direct and indirect roles to “plan, finance, and implement developmental projects” (Blecher, 1991: 268). The developmental state thesis argues that a strong central state creates favourable conditions for processes of economic restructuring in Newly Industrializing Countries (NICs) such as Japan, South Korea, and Singapore. Both Blecher and Shue adopt the developmental state perspective to examine how a local state produces sympathetic economic conditions for the process of transition from a socialist to
a market economy (Alpermann, 2010, Howell, 2006). The role of the local state is to support the activities of companies as best it can, including identifying 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 shoots industry: it is economically and culturally significant. The model may also provide a tentative answer as to why a local state should be involved in delivering on national standards and promoting its own standard. 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 Oi (1992) and Andrew Walder (1995). Both Oi and Walder understand a local state as acting like an entrepreneur. For instance, local state 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 (Li, 2009; Oi, 1992 and 1999). For Oi (1992: 100-01), “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 the local state because officials will wish to expand revenue-generating activities (Oi 1992: 113), especially the “extraction of profits from enterprises” (Oi 1992: 118). 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) (Oi 1992: 118-22). The latter would also include certification and provide an important insight into why the entrepreneurial state would be interested in promoting standardization as it entangles state and nominally private interests as local party cadres; bureaucrats would be using a state supported instrument to endorse their firms to 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. How do state and private actors interact with one another in meeting or marginalizing bamboo standards? 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, like a standard, is that they overemphasise state-driven transformation processes, which result in an unduly static understanding of state-market relations (Cartier, 2015). Instead, Cartier (2015: 22) explores how state power is shaped and reshaped in a dynamic way, in which the local state employs territorial strategies (e.g. direct investment, political negotiations, rearrangement of its administrative organization) to extend its governing capacity and authoritarian power. 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 standardization 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 (Flynn, Chan, Zhu and Yu, 2017). We can also examine interactions with urban areas, because bamboo shoots are a material for urban consumers (see also Vandergeest and Uno 2012: 6). Standards provide one way of bringing together 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 (Cartier 2015: 22).

It is worthwhile explaining in a little more detail what is meant by a standard. According to Brunsson et al. (2012: 615) there are three characteristics of standards. First, a standard is a specific type of rule. “Standards reflect explicitly formulated and explicitly decided rules and thus differ from more implicit social norms. The rule-based character of standards makes them important tools for regulating individual as well as collective behaviour and achieving social order.” Second, standards are voluntary for those who wish to use them. In this sense, the decision to comply with a standard is one for those who wish to use the standard. This means that if a standard is to be effective it must be seen to be legitimate by those who use it and further accentuate the legitimacy of an action. Third, standards are meant to be widely used. For those who formulate standards, the so-called standardisers, are looking to “provide rules for the many... They offer standards - which could be described as pieces of general advice offered to a large number of potential adopters” (Brunsson and Jacobsson 2000: 2). Most standards are intended for use beyond the standardisation formulating body, for example, those relating to quality management which are developed by the International Organization for Standardization (ISO). In short, standards “define normative rules. They prescribe what those who adopt these rules should do and hence enable and restrict behavior” (Brunsson et al. 2012: 616). Standards are often related to more privatised forms of governance. Market and non-market actors “rely increasingly on standards to manage reputations, make claims credible, and rationalise competition, especially when traditional forms of regulation (e.g. governmental) have been politically delegitimised” (Timmermans and Epstein 2010: 77). Standards have come to the fore in food and agricultural policy (see Busch 2000, Henson and Humphrey 2009) where corporate interests have a key role in securing food safety (Marsden et al. 2010). There are three major reasons to maintain food production standards: first, to ensure better quality and safety of foods (Trienekens and Auurbier, 2008; Wang et al., 2008); second, to increase small and medium sized food
producers’ incentives to comply with technological competencies, international standards, and food safety admittance systems (Bai et al., 2007); and third, to develop a new form of regulations and rule set that is both voluntary and involuntary. This is in order to achieve efficient management, quality assurance, promote environmentally friendly production and demonstrate social responsibility (Boström and Klintman, 2006: 165).

Food regulations have been implemented to ensure food safety through a quality assurance approach from global to local contexts. At the global level, the Food and Agricultural Organization (FAO), the World Health Organization (WHO), and the World Trade Organization (WTO) handle food safety issues in relation to food hygiene, pesticide usages, contaminations, and labelling (Luning et al., 2002). Good Agricultural Practices (GAPs), and Hazard Analysis of Critical Control Points (HACCPs), are the most common food production standards in the international market. Entry to the WTO has been an important stimulus for Chinese policy makers and their thinking on standards because they need to ensure that domestic producers and manufacturers are not disadvantaged (see Buckingham et al., 2014). Much less remarked upon, though, has been the proliferation of standards following China’s market reforms, and whose introduction is only of limited relevance to compliance with world trade rules, for instance, because they are targeted at domestic production. For example, in relation to bamboo alone there are at least three national food standards (see Table 1). Moreover, standards have been formulated at both the national and local state level (see Table 1).

The local (i.e. county) level is an important unit of analysis because national agro-forestry policies are operated at this administrative level of government. The task, therefore, is to examine how county government collaborates with farmer’s co-operatives, producers, processors, and forestry experts to negotiate and produce bamboo shoot production standards. Our conceptual framework contributes to the understanding of how the role of the local state interacts with agro-forestry experts, farmers’ co-operatives, farmers, processors, and research institutions to construct particular concepts of standards. These standards involve cultivation experiences (e.g. mandatory training in fertilizer application and pest controls), taste expectations (freshness and texture), presentation (e.g. colour, size, and appearance); local artisan skills (equipment to dig up the shoots and skills to cut off the root parts) and local knowledge.
3. Research focus and methods

Bamboo has enormous cultural significance in China. It is one of the four most admired plants (the others are the plum, orchid and chrysanthemum (Buckingham 2009:4)). Economically, bamboo is also important. It 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 (Buckingham 2009: 4). 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. In addition, as a natural material, bamboo is biodegradable. Whilst these are features that can be attributed to bamboo, they may not necessarily hold true in local contexts. Moreover, bamboo can, like other materials, be the subject of scarcity which can promote ever more intensive production. As Buckingham (2009) has noted growing awareness of the environmental and social problems in bamboo forestry has stimulated interest in forest certification schemes such as that of the Forest Stewardship Council (FSC).

The traditional markets for bamboo products are handicrafts, chopsticks and bamboo shoots (food). Emergent markets, with the greatest added value, include furniture and flooring. Here there is not only a domestic demand but also significant export markets. Our interest is in bamboo shoots as a food because thinking 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 Zhejiang\(^1\) province (see Figure 1) was selected as the geographical focus for the research on the standardization of bamboo shoots because of 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 15\(^{th}\) 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

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\(^1\) 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.
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 Edulis*), *Phyllostachys* (*Ph.*) *Praecox*, and *Phyllostachys* (*Ph.*) *Nuda*. The specialization on three types 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 (Lin’an Forestry Bureau, 1994, p. 27). In Lin’an, like the neighbouring county of Anji, the increasing specialization in bamboo growing has been accompanied by an increase in the area of bamboo forestland with a consequent loss of needle leaf and broadleaf forests (Xu et al. 2011). The tendency to promote the monoculture of bamboo has important implications for biodiversity (Coggins 2000).

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 Yuan (Lin’an Forestry Bureau, 2006). There are around 5,000 traders involved in bamboo shoot transportation and marketing. They bring the fresh shoots to wholesalers in Changzhou, Shanghai, Nanjing, Jiaxing, Shanoxing, Lingbo, Suzhou and Wuxi (Chan, 2015: 283).
Figure 1 Map showing the location of Lin’an County

The population of Lin’an is 525,900. It is one of the most important bamboo shoot production areas in the Province. For instance, the agricultural population makes up 75% of the population; 60% of farmer households work in the bamboo production, processing and marketing sectors (Chan 2015). In 2008, the per capita net income of farmer households was 9,680 Yuan, by the standards of Chinese farmers a high income. Administratively Lin’an is divided into four districts; below them are 22 townships; and finally 662 administrative villages.

Lin’an County covers an area of 3126.8km². Forestland covers 86% of the land area. The total bamboo forest covers 67,000ha (Tang 2007: 1). With its large reserve of bamboo resources Lin’an is nationally recognised as a State Forest City and a China National Bamboo Homeland. Since the implementation of the Forestland Responsibility
System (FRS) in 1983, 66.8% of family plots (zhilushan) and responsibility hills (zerenshan) have been allocated to every farmer household (Chan 2015). Most of the bamboo farmers in Lin’an County work on individual plots.

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, including archival, 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, Lin’an Forestry Bureau, Zhejiang Agricultural and Forestry University (ZAFU), and the Lin’an Modern Technology Company in Lin’an County. Data collection has also been carried out in the neighbouring county, Anji, also noted for its bamboo growing. We have visited firms and their leaders in the main economic sectors (including bamboo growers, process, traders) and had the opportunity to observe farmers and processors in action. We have also tested out the evidence and information given in policy and promotional secondary material with our informants. We have continued to follow policy updates and remain in touch with academics and officials.

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 institutionalize and monitor the processing standards of food products (for examples of other forms of standards and certificates see Hatanaka and Busch 2008, Cashore 2002, and Bloomfield 2012). According to Wang (2012), export-oriented processors have to 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 to fulfil overseas market requirements, and (2) China’s standard for local-led processors and small local processors (see Table 1).

### Table 1 Two Major Levels of Production Standards in Lin’an County

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

The JAS², ISO³, HACCP and CODEX Alimentarius (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 (Lin’an Forestry Bureau – China’s bamboo village report, 2006). HACCP is a systematic preventative approach to regulate and control chemical usage, biological and physical hazards in fresh bamboo shoots’ production and processing (Asia Green Agriculture Corporation, 2010: 14). The JAS standard requires bamboo shoot processors to be in compliance with production standards, processing procedures, import clearance, inspection certificates, containers and packaging (JETRO, 2011: 3-11). There are both Japanese and overseas accreditors who certify the JAS for bamboo shoot processors (JETRO, 2011: 10). To help local-led processors comply with the 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 drew an important distinction between markets:

Mostly, the local-led processing firms can fulfil both national [e.g. hazard-free standards] and international standards [e.g. HACCP] 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 to comply with hygiene and chemical usages standards because most of the small processors are household-based. (Interview with bamboo shoot association chair, P02, 2012).

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² JAS refers to the Japanese Agricultural Standard. This standard represents those imported agro-forestry products which are monitored by the Japanese Government. These imported products are tested and checked to fulfill Japan’s production standard and quality. A JAS mark will be placed on packages if these products are graded by the Japanese Government.
³ 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.
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 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, and 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), the Green Food Production Standard (GFPS), and the Zhejiang Province Forest Food Production Base Standard (ZFFPBS) (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 (Lin, 2001: 12; Wu, 2015: 123)

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 should fulfil hazard free standards, and (3) the production procedures, processing, packaging, storage and transport should reach hazard-free agricultural product standards. The standard is not particularly onerous because according to a Lin’an Forestry Department (aligned to the Provincial government) technician “most of our farmers fulfil the hazard-free standards” (interview, ID: GO 02, 2012).
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. 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” (interview, ID: GO 02, 2012).

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 food 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 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, the Lin’an Forestry Bureau certified the Ph. Praecox Bamboo Shoots Soil Rehabilitation Standards (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 Bloomfield (2012: 404) has noted, measures like standards tend to be popular because “they do no tackle tough issues”.