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CHAPTER 38.

GOVERNANCE OF SUSTAINABLE DEVELOPMENT IN CHINA: A CASE STUDY OF THE BAMBOO SHOOT PRODUCTION IN LIN'AN COUNTY, CHINA

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Bamboo shoot production has presented a shift of human-nature relations under China's modernization. Current research on bamboo shoots in China mainly focuses on the economic values, model simulation, forestry management, taxonomy, and policy implications of the bamboo production in rural areas (Chan, 2012). However, there are lacunae in both literature and approaches to understand China's bamboo production industry in relation to the linkages between governance and sustainable development. This research critically examines the governance of sustainable development of the bamboo production industry by addressing how the local government and bamboo farmers make use of bamboo shoots to achieve sustainable development in Lin'an County, China.

Addressing the governance of sustainable development in the bamboo production industry

Governance is a fundamental concept and theoretical lens to understand how governing institutions govern the bamboo farmers and their economy through direct and indirect rules and internalization of rules and regulations (Pierre and Peters, 2000, p.14). Although the term "governance" is used to understand the role of state and farmers in dealing with environmental problems (Stocker, 1998; Evans, 2012), there is a weak bridging between the theoretical and empirical context of both environmental governance and sustainable development (Jordan, 2008). Particularly, how state and farmers implemented forestland responsibility policies and manage bamboo resources to struggle for sustainable development are ignored. This research would take Jordan's argument further by bridging the theoretical context of both governance and sustainable development to examine the collective actions of local government and farmers in the bamboo shoot production industry.

Current sustainable development debates in China can be summarized into three major facets: the debates on the role of state and local, the centrality of human and nature, the approaches of pro-growth and slow growth to achieve sustainable development. In particular, the debates among ecological modernization (Mol, 1995), steady state economy (Daly, 1992) and eco-Marxism (O'Connor, 1998) to achieve sustainable development are in line with my research enquiries. The ecological modernization stresses increasing production capacity to trickle-down resources to solve environmental problems (Buttel, 2001; Spaargaren & Mol, 2009). However, eco-Marxism

argues that market efficiency cannot solve environmental problems (Harvey, 1996). Steady-state economy emphasizes the strong government role to maintain a proportional growth of economy. There are two major points which should be stressed before searching for sustainable policy options. First, the mentality of “development first and rectifying the environment later” dominated the government policies. Second, local government plays a strong role in regional development. Based on these contexts, this research critically examines how local government and non-state actors manage land and bamboo resources to set priorities on bamboo cutting, and to conduct cross-regional bamboo construction material trading networks in China. To answer this question, this research examines governance at the county level, which is a key level of governance for the practice of sustainable development in China. Data has been collected through surveys, in depth interviews and longitudinal ethnographic observation.

Bamboo shoot production in Lin'an County

China is the largest bamboo product producer and exporter in the world (Marsh and Yang, 2008), while Lin'an is the biggest bamboo shoots' production center, while the total areas of bamboo plantations comprise 65,833 hectares (Zhu and Yang, 2006). According to the Lin'an Forestry Bureau (2008) there are approximately 50,000 bamboo shoot farmers, 4,000 processing workers and 6,000 people participating in bamboo shoot marketing.

Growing bamboo shoot as a spatial fix to capitalise land resources

In the early 1980s, the Forest Land Responsibility System was implemented. The Lin'an state distributed collective-owned lands to individual farmers. Land distribution provided the right of use and right to derive income for individual farmers. This spatial measure not only increased farmers' incentive to invest in the bamboo shoot production but also increased the forest coverage. From 1983 to 2005, the total bamboo shoot forestlands increased from 1,878 hectares to 32,000 hectares (320 km²) respectively (Zhu and Yang, 2006). The total bamboo forests increased around 17 times which was the equivalent to 1/5 the size of greater London (1580km²) in 2005. Growing bamboo shoots alleviated much of the farmers' poverty and greatly improved their living conditions (For instance, the average incomes of bamboo shoot farmers substantially increased: 317%, from 1995 (3,336 Yuan) to 2011 (13,926 Yuan) (Lin'an Forestry Bureau, 2012). The average rural poverty rate decreased from 60% in 1980 to 5% in 2000 (Lin'an Forestry Bureau, 2012). However, Bamboo shoot farmers derived a substantial income from fresh bamboo shoot selling and spent it on building “bamboo shoot houses” (???), this literally means farmers earned the money from bamboo shoot cultivations to build their modern flat-top houses. One bamboo shoot farmer Mr. Liu from the Xiao Gao village described his material accomplishments:

In the 1970s, we used the sand, mud, and some concrete to build the houses. Until 1988, most of the farmers started growing bamboo shoots and get[sic] rich, they could enjoy better livelihood by using bricks to build the modern flat top houses, we called it a bamboo shoot house (Interview with bamboo shoot farmer Xia Gao village F05, 2012).

From the above quotation, this farmer illustrated that growing bamboo shoots not only brought economic prosperity in rural Lin'an but also transformed the farmers' average incomes and improved their housing conditions, and material wellbeing (see Figure 1).



Figure 1 Improvement in Housing Conditions (Source: Author's collection)

Promote early shooting technology to utilize bamboo shoot production capacity

In the mid-1990s, the local government further improved the bamboo shoot productivity by promoting early shooting technology (Xu et al., 2008). The Lin'an Forestry Bureau promoted this technology in three major ways: (1) offered technological trainings and workshops, (2) provided subsidies to encourage farmers to cultivate bamboo on hilly slopes, and (3) established demonstration households in different villages to bamboo cultivation demonstration units to increase bio-diversity in the bamboo plantations. The processes of the early shooting technology included applying plenty of chemical fertilizers, rice chaff, chicken deposits, and sawdust to increase the soil temperature in order to extend the growing seasons during the winter period. This blanket effect produced suitable temperatures and humidity to cultivate bamboo shoots in the winter season. According to Zhu and Yang (2006), with the applications of this early shooting technology, the total bamboo shoots' production increased from 1, 421 tons in 1983 to 107, 150 tons in 2002.

Challenges of sustainable development for this pro-growth model

However, with plethora application of fertilizers, this created a pro-growth model of bamboo cultivation and induced monoculture and pesticides usage problems. According to Zhu and Yang, (2006, pp.28-29), the drop of bamboo shoot production in 2002 from 115, 000 tons to 105,000 tons was related to the manipulation of the growing season of bamboo shoot production which increased the vulnerability of bamboo forestry to climate changes, pests, and diseases. According to a Lin'an Forestry Bureau officer Mr. Lin (pseudonym) commented that, "with using large amounts of fertilizers has caused 70% of the *Ph. Praecox* bamboo shoot lands to be suffered from medium to high degree of degradation" (Interview with Mr. Lin, G02, 2012). The problems of monoculture increased ecological vulnerability and instability in the bamboo production industry. Zhu and Yang (2006, p.29) further argues that "76.7% of the total 20,000 hectare of the shoot type is *Ph. Praecox*" and the occurrence of the bamboo's diseases and pests became an alarming problem. The remedial measure for local farmers to manipulate the bamboo ecosystem is to use pesticides. This not only causes the bio-accumulation of toxins in the food chain but it also causes cyanobacteria bloom when pesticides run-off from the field into the nearby river in Lin'an (Ni et al., 2012).

Conclusion

This research concludes that the local government and non-state actors perceive bamboo resources as commodities during the market reform period. Local government contracted collective forestlands to individual farmers, which implied a change from use value to exchange value of land. The land transformation caused the changes of the human-nature relationships. On the one hand, bamboo shoot farmers perceived bamboo forests as commodities in exchange for monetary and material benefits. On the other hand, the local government used bamboo cultivation as a spatial fix to increase forest coverage and solve rural poverty. Both the local government and farmers have treated the bamboo shoot resources as a growth engine for economic development which is managed and manipulated to boost the economic productivity.

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Acknowledgement

I am grateful for Dr Andrew Flynn's and Dr Yu Li's supervision, Dr Martha Cook's editing and Mr Eric Cheng Siu Kei's comments for this paper. Early version of this paper was presented at the Regional Studies Association: Joint Conference of the South West England and Wales Branches, University of the West of England, Bristol, 29 April 2015.

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