“The Green Leap Forward”:
Environmentalization and Rural–Urban Transformation in Contemporary China

by

Jia Ching Chen

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Abstract

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This dissertation documents the processes and outcomes of Chinese government efforts to address national environmental problems through master planned "green development" projects. These large-scale spatial planning projects include eco-city and eco-industrial parks, and integrate goals for industrial, urban and rural development. Such efforts explicitly attempt to simultaneously "green" the economy, society and space; that is, to reduce the negative environmental impact of economic growth, to produce the social norms to support optimized use of resources, and to construct the human-ecological places where an "ecological civilization" can flourish. I find that the ideology of green development, taken from international and national sources, is projected onto local processes of place making. This process works to construct environmental resources at trans-local scales, and to justify rural dispossession as environmentally rational. I then document how national environmental governance agendas target rural society and space as backward and as the necessary site for intervention. I argue that green development in China extends practices of rural dispossession and deepens patterns of urban–rural inequality. Furthermore, I demonstrate that these patterns present significant negative environmental externalities as local governments transform rural landscapes to provide cheap land and financing for projects of China's "Green Leap Forward."

To explore the policies, institutions and practices that make up these processes, this dissertation focuses on Yixing, a third-tier city in Jiangsu province, where the construction of eco-city, solar and other 'green' industry projects have been yoked as the engines for rural transformation. To begin, I describe the national and regional contexts of environmental industry construction and eco-city planning. I document the growth of solar manufacturing, eco-city construction and linked projects for agricultural modernization and ecological conservation that have required the enclosure of over 330 square-kilometers of rural land and the displacement of over 55,000 residents since 2006.

The local government expects to displace another 50,000 residents in master planned rural–urban transformation by 2020.

I further document how these primarily state-led processes of dispossession and development planning refigure rural state–society and social–environmental relationships in the rapid construction of "new" ecologically rational city-regions. I argue that these processes are fundamentally linked to a revaluation of rural environmental resources and forms of agrarian transition that entail dispossession and the elimination of the land ownership system, which is bifurcated between state-urban and collective-rural structures. I analyze three processes through which this strategy unfolds. First, I examine the construction of a model of green development based on master-planned eco-urbanization and rural environmental governance at regional and national scales. I document and analyze the institutionalization of green development in the national policies of the Chinese government, the practices of municipal agencies, and in the approaches of transnational experts and businesses operating in China. I demonstrate that this model envisions a reallocation of rural land resources for master planned urban expansion. As its primary rationale, the model seeks to address the historical environmental failures of China's present model of industrial modernization and is predicated on restructuring municipal authority over rural land use.

Second, I document how these changes shape agrarian transition by revaluing rural land as an environmental resource. I examine the environmental justification of rural dispossession and the dissolution of collective land tenure rights as economically and environmentally untenable. I argue that as rural livelihoods come to be designated as environmentally irrational and rural land is made into an object of planning, environmental value is paradoxically abstracted and divided from actual landscapes. I demonstrate that rural cash assets as well as land are enclosed into green development and contribute to circuits of accumulation based on "exporting sustainability." I show how the processes of eviction and resettlement re-inscribe historical urban-rural inequalities into a new geography of peri-urban segregation and class differentiation.

Third, I argue that environmentalization in China is fundamentally tied to structural changes in territorial-administrative authority. Through an examination of local governmental practices in planning and land management, I document the construction of spatial uniformity and land resources at the national scale. I argue that in deploying a national land-use quota system, local governments fundamentally reshape the land management regime so that instead of managing the land itself, abstracted quanta of land are the objects that are being governed. This leads to negative social–environmental consequences that manifest in specific localities, and that undermine goals of sustainability at all scales. As a case study, I examine the rapid state-facilitated construction of the solar photovoltaics industry in Yixing through subsidies in land, infrastructure and finance capital. Such practices link rural dispossession in China to the global green economy. Additionally, large-scale and rapid construction on greenfield sites produces direct and indirect land-use change impacts on the carbon efficiency of solar photovoltaics manufactured in Yixing and elsewhere.

This work is dedicated to the memories of Stephanie Yuen Kim and Jeremy Paster,
who continue to inspire me,

and

to my parents,
whose love and support have made inspiration possible.

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List of Abbreviations

ACCA21	Administrative Center for China's Agenda 21
BLR	Bureau of Land and Resources
CER	Certified Emission Reduction
CDM	Clean Development Mechanism (under the Kyoto Protocol)
CPC	Communist Party of China
CSIP	China-Singapore Industrial Park
JBLR	Jiangsu Ministry of Land and Resources (provincial level branch of the Ministry of Land and Resources)
MEP	Ministry of Environmental Protection
MLR	Ministry of Land and Resources
MMTCOe	Millions of metric tons of carbon dioxide equivalent
MOHURD	Ministry of Housing and Urban-Rural Development
MOST	Ministry of Science and Technology
NDRC	National Development and Reform Commission
NPC	National People's Congress
PV	Solar Photovoltaic
TVE	Township and village enterprise
UNFCCC	United Nations Framework Convention on Climate Change
WBLR	Wuxi Bureau of Land and Resources (prefecture-municipal level branch of the Ministry of Land and Resources)
WCED	United Nations World Commission on Environment and Development (the Brundtland Commission)
YBLR	Yixing Bureau of Land and Resources (county-municipal level branch of the Ministry of Land and Resources)
YIPEST	China Yixing Industrial Park for Environmental Science and Technology; "the Park"
YXEDZ	China Yixing Economic and Technological Development Zone; "the Zone"

List of Chinese Terms

Pinyin	Simplified Chinese	English
aizheng cun	癌症村	cancer village
anzhi fang	安置房	resettlement housing
baohu gengdi zhibiao	保护耕地指标	cropland protection quota
buchong gengdi zhibiao	补充耕地指标	cropland replacement quota
chaiqian	拆迁	demolition and relocation
cheng xiang yitihua	城乡一体化	urban–rural integration
chengzhenhua	城镇化	urbanization
dibao	低保	minimum livelihood guarantee
ditan fazhan	低碳发展	low carbon development
gengdi	耕地	cropland
gengdi baohu	耕地保护	cropland protection
gengdi hongxian	耕地红线	cropland protection redline
gongdi zongliang	供地总量	total land supply
guihua yongdi fanwei	规划用地范围	land use planning boundary
guodu fei	过渡费	transition expense compensation
hexie shehui	和谐社会	harmonious development
huanbao	环保	ecological protection
hukou	户口	household registration system (or status)
jianshe yongdi	建设用地	construction land
jiben guoce	基本国策	basic state policy
jiben nongtian	基本农田	prime farmland
jiben nongtian zhibiao	基本农田指标	prime farmland quota
jiti chanquan	集体产权	collective property rights
kaifaqu	开发区	development zone
kechixu fazhan	可持续发展	sustainable development
ke chuang xin cheng	可创新城	Scientific Innovation New City

kexue fazhan guan	科学发展观	Scientific Development Concept
laobaixing	老百姓	“old hundred surnames,” meaning ‘common folk’
liangshi anquan	粮食安全	grain security
liudong nongtian	流动农田	circulating farmland
lüse fazhan	绿色发展	green development
nong yongdi	农用地	agricultural land use
nongdi	农地	agricultural land
nongmin	农民	peasants
nongtian	农田	agricultural fields
paichu jigou	派出机构	dispatched government agency
san jizhong	三集中	“Three Consolidations”: consolidation of (1) rural populations into urbanized settlements, (2) rural industries into industrial zones and (3) cities, and farmland into larger scale holdings
shehuizhuyi xin nongcun	社会主义新农村	New Socialist Countryside
shengtai chengshi	生态城市	eco-city
shengtai jianshe	生态建设	ecological construction
shengtai wenming	生态文明	ecological civilization
wei liyong di	未利用地	yet to be used land
wu ge tongchou	五个统筹	"Five Balances": balancing (1) urban and rural development, (2) coastal and interior development, (3) the economic and the social, (4) harmonious development of humans and nature, and (5) domestic development and openness to the outside world
xiang chaquan	乡产权	township/rural property rights (also xiao chanquan, "small property rights")
yi piao foujue zhibiao	一票否决指标	veto target
yi zhang bai zhi	一张白纸	“a sheet of white paper”
zhibiao	指标	quota or target

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INTRODUCTION
The Global Green Energy Economy at China's Rural–Urban Interface

China is changing from the factory of the world to the clean-tech laboratory of the world. It has the unique ability to pit low-cost capital with large-scale experiments to find models that work. China has designated and invested in pilot cities for electric vehicles, smart grids, LED lighting, rural biomass and low-carbon communities. They're able to quickly throw spaghetti on the wall to see what clean-tech models stick, and then have the political will to scale them quickly across the country. This allows China to create jobs and learn quickly.

—Peggy Liu, 2010[1]

[In] that picture that lacks all spatial coherence, is a precise region whose name alone constitutes for the West a vast reservoir of utopias. In our dreamworld, is not China precisely this privileged site of space? In our traditional imagery, the Chinese culture is the most meticulous, the most rigidly ordered, the one most deaf to temporal events, most attached to the pure delineation of space; we think of it as a civilization of dikes and dams beneath the eternal face of the sky; we see it, spread and frozen, over the entire surface of a continent surrounded by walls.

—Michel Foucault, 1970[2]

A resident of one of the few villages that remained in the Yixing Economic Development Zone in April 2010. The billboard depicts the "green" city center planned for the site of Meijia and Huajia villages, demolished in 2007-2008. The farmland beyond still nominally belongs to the former village residents.

[1] Liu is Chairperson of the Joint US-China Collaboration on Clean Energy (JUCCCE). Quoted in Friedman (2010a), and frequently paraphrased as a sound bite in Liu's own writing and speaking (e.g., Liu 2010a).

[2] Foucault, Michel. 1994 [1970]. *The Order of Things*. New York: Vintage, p. xix.

Preface

This dissertation is a critical examination of China's contemporary "Green Leap Forward." I highlight this now cliché shorthand for China's rapid ascent in global renewable energy markets and proliferation of models of eco-city development in order to call attention to two important dynamics in its frequent usage. First, the "Green Leap Forward" is empirically a transnational phenomenon, shaped by global markets and policy agendas, transnational NGOs, think tanks and experts. China watchers, environmentalists, pundits and "green economy" bulls rarely acknowledge this fact. Second, such actors use the phrase to reference the historical Great Leap Forward and to evoke China's authoritarian state. In this construction, state capacity and China's rapidly expanding economy are described as complementary means for achieving "sustainability," especially in relationship to the linked issues of anthropogenic climate change and energy consumption. However, such off-handed allusion to the Great Leap Forward simultaneously—and quite ironically—ignores the explicit ways that China's environmentalization targets rural space and society. In other words, the sheer optimism and arrogance of the phrase blithely disregards the fact that the Great Leap Forward was one of worst catastrophes of state planning in world history, resulting in an estimated 36 million deaths by starvation.[3] In this dissertation, I highlight this dynamic as critical to understanding the intersecting roles of markets, dispossession and environmental governance in China's development and the global 'green' capitalism more broadly.

In this uncritical paradigm, the "Green Leap Forward" is almost exclusively used to denote a vision of Chinese environmentalization that is consonant with global norms of 'sustainable development.'[4] Such norms, as exemplified by the UN World Commission on Environment and Development Brundtland Report and ecological modernization theory, posit: (1) the possibility of "green capitalism" and the "win-win" mutual compatibility of continuous economic growth and environmental protection; (2) scientific positivism and opportunities for linear progress afforded by increasing scientific knowledge and technological solutions; (3) a just distribution of "sustainability" that includes efficient economic and environmental fairness. In this dissertation, I argue such assumptions work to paradoxically deepen social and environmental inequalities in the name of sustainability at national and global scales.

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[3] 36 million deaths are estimated by Yang (2012). Other estimates range from 30 to 45 million deaths (Scott 2012). For recent accounts of the Great Leap Forward campaign (which began in the winter of 1957) and the resulting Great Famine of 1958-1962, see Dikötter (2010); Yang (2012). A volume of translated archival documents on the famine also was recently published by Dikötter's collaborator, Zhou (2012).

[4] In Chinese, the interrelated discourses on the global environment, national pollution problems, and economic development use the term "green" to indicate "environmentally friendly" or a similar sense given by the common usage of "sustainable" in English. The literal translation of "sustainable" is typically used in the phrase "sustainable development" (*ke chixu fazhan*) as an explicit translation of the global discourse emerging in the 1980s. Both terms are frequently used in conjunction with the dominant rhetorics on national development: "relative prosperity" (*xiaokang*), "harmonious society" (*hexie shehui*) and "scientific development" (*kexue fazhan*). In this dissertation, this usage is mirrored, and these terms are taken as social phenomena for analysis. Terms appear in quotations to refer to specific cited usages, or in single quotes for discussions of the terms themselves.

Along with its glib usage by pundits like Thomas Friedman and many others, "the Green Leap" discourse is also broadly indicative of the attitudes of policy makers and experts working through the cultural politics of the global green economy. Emblematic of this approach is the website *The Green Leap Forward* (greenleapforward.com). The site, founded in 2007 by the well-known China analyst Julian Wong, aggregates news, publishes expert commentary and serves as a social networking hub for transnational actors in China's "environment and energy space."[5] In his brief introduction to the work of the site, Wong highlights the "… play on the phrase 'Great Leap Forward' [as] an economic and social plan … which aimed to use China's vast population to rapidly transform mainland China from a primarily agrarian economy dominated by peasant farmers into a modern, industrialized communist society." Wong then goes on to argue:

> *By contrast, the Green Leap Forward, is a term that symbolizes an emerging movement that results from the convergence of smart policy, sustainable finance and green design and technologies and that has the promise of steering China's red-hot economy onto a more ecologically and socially sustainable path. Unlike its predecessor, the Green Leap Forward is as much a bottom-up revolution as it is a top-down one and in this age of increasing global interconnectedness, is a movement that will have an impact beyond its borders.*

Seeking to answer "[w]hether the Green Leap Forward is a myth or reality," Wong is among the most clear-eyed and best informed of a wide range of international experts, policy consultants, and journalists working in China's 'energy and environment space.' However, an integral piece of the context of his inquiry is the role that such actors play in creating both the myths and realities in question. I argue here, that in order to understand the significance of the Green Leap Forward as a part of proposed solutions to global environmental issues at the intersection of energy and climate change, it must be also be analyzed in this context of changing international perceptions and values. Furthermore, Wong's contrasting characterization of the Great Leap as a top-down plan and the Green Leap "as much a bottom-up revolution" obscures the links between state and other institutions in a false dichotomy. Taking a relational approach, I argue that the transnational "movement" of the Green Leap is shaped by these links and institutionalized in ways that undercut its normative goals and "impact."

In order to examine the myths, realities—and their interrelations—in China's environmental turn in the making, this dissertation analyzes the context, planning and immediate effects of a state designated model of green development in the Yixing city-region of Jiangsu province. There, a confluence of rapid industrial growth, urbanization, rural developmental transformation, global markets and mandates for renewable energy and a local drive to be green and modern have shaped multiple environmental projects.

[5] The spatial metaphor is utilized frequently to discuss the intersecting domains of policy change, research, entrepreneurial opportunities and technological development in of China's environmentalization. See e.g., (China Economic Review 2010).

As my primary site for studying the global political ecology of the green economy, Yixing provides a view into how processes constructed at international and national scales intersect with local processes of development and place making. In Yixing, the local government planned and constructed a solar photovoltaic industry as a means of simultaneously achieving environmentalization (in the institutionalization of the national energy portfolio, and transforming local industrial structure), economic growth (primarily through EU subsidy-supported markets for solar panels) and eco-urbanization.

This is an evolving and rapidly changing terrain of relationships. During the course of researching and writing this dissertation, the national policy context, the discourse and practices on sustainable development, and the intersecting goals of environmental protection, energy supply, economic development, industrial restructuring and agrarian transition in China have proliferated rapidly.[6] Indeed, preferential tax and finance policies for promoting "new energy industries" have traveled to every province in the country and autonomous regions.[7] Many of these efforts are linked to specific development zones, such as those in Yixing, through preferential land use and financing policies, and serve to drive urban expansion as well as industrial development. Table 1.1 outlines key national policies that affect urban–rural spatial development.

Domestic and international awareness of China's industrial and development driven pollution problems continues to rise. During January 2013, I joined Beijing residents as they began to wear facemasks and respirators in an effort to minimize inhalation of record amounts of dangerous PM2.5 air pollution. One resident said to me, "Beijing is not suitable for human inhabitation." Despite the frequency and severity of poor air quality days in Beijing over the past decade, the phenomenon of wearing masks and filters is quite new and points to new awareness and concern over the environmental health impacts of China's development. In this regard, the perception of protective masks as a personal health *necessity* and as a new *industry* highlight China's ongoing adaptation to environmental problems in cultural and economic domains. Over the past year, this sentiment has become widespread as the air quality crisis has persisted and forced the new Xi-Li administration to increase state attention to the environmental question and its impacts on individuals and the economy. In 2007, a joint report by the State Environmental Protection Administration and the World Bank reported that the economic cost of air pollution in premature deaths and health care costs in 2003 was conservatively estimated at 157.3 billion CNY.[8] A recent study estimates that air pollution in 2005 cost

[6] See e.g. (NPC 2005, 2011; State Council 2012a, c).

[7] "New energy" (*xin nengyuan*) is a more expansive category and more commonly used in policy discourse than "renewable energy" (*kezaisheng nengyuan*) or "sustainable energy" (*kechixu nengyuan*). While primarily referring to relatively "new" technologies for solar, wind, wave, tidal and small hydro power generation, it also includes nuclear fusion and may also refer to any non-traditional fossil fuel technology such as "clean coal" and carbon capture and sequestration technologies. In sometimes referring to sources such as natural gas, large hydroelectric, and nuclear power, the term is close in usage to "alternative energy" and emphasizes the industrial and environmental contradictions in China's present energy mix with its reliance on coal and oil, reported by the US EIA at 70 and 19 percent respectively (EIA 2013).

[8] Approximately USD 19 billion; see World Bank and SEPA (2007)

the Chinese economy $112 billion in lost labor and healthcare costs, roughly five times higher than it was in 1975.[9]

Reshaping the energy mix through the expansion of renewable energy is seen as an increasing imperative as environmental health emerges as the primary domestic political contradiction of China's development path.[10] At the same time, policy makers have keyed in on the smog issue as bolstering the mandate for the national policy of state-led "human centered" urbanization (*yi ren wei ben de chengzhenhua*) that was a major point of the policy platform outlined by the new administration at the Third Plenum of the Eighteenth Party Congress in 2013. This program builds upon multiple central government initiatives of the past decade to tie rural transformation to environmentalized development goals. In this broader context, the recently articulated "Chinese Dream"—Xi Jinping's encapsulation of the rising Chinese ethos of individual advancement—can be interpreted as pivoting on the same fulcrum as the ongoing approach to the environment question: a tenuous balance of state-planned nation building, individual freedoms and market-entrepreneurial action.

The progression in central government policy discourse on development and the environment in the past decade has moved toward an all-encompassing articulation of "constructing an ecological civilization" (*jianshe shengtai wenming*) or simply ecological construction" (*shengtai jianshe*). This suggests a comparison to the European advent of ecological modernization theory in the early 1980s as a mode of development linking economic growth to environmental protection.[1] In general, the language of intergenerational responsibility, applying environmental restraints to development and scientific means of more holistic planning echo the global norms of sustainable development set forth in the WCED Brundtland Report. The language of ecological construction thus serves as a framework for bridging China's approach to environmental problems and global norms. In the policymaking world between local governments and China's central leadership, the passage to a green economy entails the construction of an environmental problem, and new norms and forms of social life. Such views are evident in the Rostowian progression conceived in rapidly proliferating discourse on ecological modernization in China.

This dissertation explores how, as these new resource geographies are proposed as solutions to myriad national and international environmental problems, there is an

[9] (Matus et al. 2012)

[10] Coal-fired power plants produce an estimated 10 percent of national PM 2.5 pollution and that share will continue to rise as an estimated 443 coal-fired plants are slated for construction in 2013 (Ye 2012). The Ministry of Environmental Protection has introduced more stringent air pollution control standards for coal-fired power, chemical and petrochemical, cement, iron and nonferrous metals industries. Some plants have simply been shut down as escalating costs of capping sulfur dioxide and nitrogen oxides pollutants since 2011 have contributed to sharp declines in revenues in the thermal power plant sector (Fang 2011). With caps applied to forty-seven municipalities this year, nonconforming enterprises will be shut down in 2015 (Fang 2013). This fits into a broad strategy to allow the fossil fuel sector to slowly internalize environmental costs to make the so-called new energy industries and so-called renewables more competitive in the Chinese electricity markets.

increasing salience of the rural–urban interface as a space for state planning and intervention. In conducting fieldwork in Yixing and other cities in China, I was often struck by the speed and intensity of the immediate processes of dispossession and demolition at the heart of China's green development. However, nostalgia is not my goal. Rather, the point here is to analyze what—socially and materially—is being produced, and how these changes are represented and perceived by different people. To see how emerging social-environmental relationships are both old and new within uneven development, dispossession, authoritarian high modernism, state planning, developmentalism, Daoist notions of human-nature relationships, four-decades mature solar technology and other geographies, which I will elaborate below.

In the sections below, this introduction provides an overview of the relevant contexts for the analyses and empirics that follow in the remaining chapters.

Chinese Urban and Economic Growth as a Global Problem

By now, many people familiar with the problem of global climate change mitigation have heard a series of facts. First, since 2007 China has been the leading national emitter of greenhouse gases (GHGs) (EIA 2009). Second, China's economic growth is spurred by rapid expansion in both production and consumption, and these lead to further increases in carbon and other GHG emissions.[11] Third, China's cities are growing at an unprecedented rate; its urban population is projected to surpass its rural in habitants by 2015 and exceed one billion by 2030 (CSUS 2009). China's urban floor space will increase an estimated 84 percent between 2010 and 2030 (Woetzel et al. 2009), an area equivalent to the construction of 22 Empire State Buildings/day.[12]

Referring to these facts, many expert observers conclude that, in terms of addressing global climate change, "everything is won or lost in China."[13] An analogously

[11] (Woetzel et al. 2009; Feng, Hubacek, and Guan 2009)

[12] Commenting on the official report of urbanization projections, Ministry of Housing and Urban-Rural Development (MOHURD) officials said that China "will become an urban society" (*jinru chengshi shehui*). According to the MOHURD policy discourse, the pursuit of this goal calls for the reversal of urbanization dynamics created by export-oriented development (*waixiang xing jingji*), and the further advancement of a model based on cities as "the new space of development" that "actively make use of external needs and conditions" (*jiji liyong waixu de xin xingshi xia, jin yi bu tuozhan xin de fazhan kongjian*) (Ruan 2010).

[13] (Lovins 2008, 2008b). This calculation is echoed by many including Tim Flannery, a leading climate scientist and 2007 Australian of the Year, who blamed Chinese and Indian economic expansion for accelerated greenhouse gas levels, stating that "the metabolism of that economy is now on a collision course, clearly, with the metabolism of our planet" (Perry 2007). Nick Clegg, the Deputy Prime Minister of the UK, and other European leaders blaming the perceived failure of the Rio+20 Summit and the weakness of its Sustainable Development Goals and "The Future We Want" documents on China and other "developing" countries' continued dependence on coal. Clegg stated, "The political significance of Rio is that the G77 nations are antagonistic to our European ideas on the green economy… We could probably have a perfectly formed text with a lot of precision if we kicked out large parts of the developing world but that is unacceptable" (Gray 2012). Prominent China scholar and Director of the Center on U.S.-China Relations at the Asia Society, Orville Schell writes, "there is no more important issue to future generations

expanding field of transnational green development expertise, advocacy, and corporate activity attends this problematization of Chinese urbanization and development. The urgency of action and its potential are further bolstered by China's rapid ascendance as the world's leading producer of solar photovoltaics, wind turbines and carbon credits (see Figures 1.1, 1.2 and 1.3 which show the exponential growth of China's solar PV manufacturing sector and the corresponding drop in global markets for PV. Figure 1.4 illustrates China's dominance in producing certified carbon emissions reductions under the Kyoto Protocol Clean Development Mechanism. Table 1.2 tracks the increase of official goals for solar PV power generation. Table 1.3 compares China's wind power generation with other leading countries.).[14] Such representations are typified by the epigraph to this chapter by Peggy Liu. In a widely circulated presentation (and related print and web materials derived from the same text), Liu argues: "A new form of partnership with China will see low cost sustainable solutions that can be deployed at scale around the world."[15] The notions of "partnership," economic development and technological progress operating in the Green Leap discourse evident here belie the geographic, material and social reality that will be explored in this dissertation: that—far from being an *other* utopia—China's environmentalization is already shaped by and is shaping such "partnerships" and the political economy of global environmental governance. In order to examine the political ecology of China's "clean-tech laboratory," this dissertation traces these processes to sites within the Yixing city-region as observed through ethnographic fieldwork, surveys, and archival research.

Beginning in the early-2000s, China pioneered efforts in master planned "eco-city" and "eco-industry" planning and construction.[16] Among such efforts was the internationally lauded plan for Dongtan Eco-City by Arup, the most renowned engineering firm in the world, for the Shanghai government. Led by Arup Director Peter Head and his department of Integrated Urbanism, the plan envisioned a carbon-neutral society of 80,000 living in harmony with migratory flocks of the endangered black-faced spoonbill (see Figure 1.5). While the 2007 plan failed to be financed and never broke ground, Arup and Head continue to garner global acclaim—and revenue—for their expertise in eco-city design. Arguing for the expansion of eco-city construction in China

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than climate change and no more important country in the effort to control greenhouse gas emissions than China"(Schell 2013).

[14] It should be noted that China's rapid growth in these sectors cannot be attributed solely to export-oriented manufacturing of commodity products. China is currently the leading investor in and the fifth largest producer of patented intellectual property in the renewable energy sector (Lewis 2013).

[15] (Liu 2010a)

[16] I use the term "eco-city" to translate several overlapping terms in the Yixing green development discourse including "ecological city" (*shengtai cheng*, *shengtai chengshi*), "green city" (*lüse chengshi*), "ecological environmental city" (*shengtai huanbao chengshi*) and "environmental city" (*huanbao chengshi*). I will differentiate other terms with more specific claims, e.g. "low carbon city" (*ditan chengshi*), distinct referents, e.g. "sustainable development city" (*kechixu fazhan chengshi*), or as context demands. Likewise, I use "eco-industry" to refer to the literally translated "ecological industry" (*shengtai chanye*) as well as related terms such as "environmental protection industry" (*huanbao chanye*), "cleaner production industries" (*qingjie shengchan chanye*), "green industry" (*lüse chanye*), and others.

and elsewhere as a solution to the environmental consequences of typical patterns of urbanization, Peter Head states: "the rapid economic development of China, with over 800 million people living in cities by 2020—60% of its population—has alarmed many. *There would be insufficient resources if every Chinese wanted to live the same high and inefficient standard as an American*."[17] Here, I call attention to the striking paradoxes of what might be called a "differential universalism": a simultaneous call to global solidarity predicated on the recognition of an emergent national threat/opportunity.[18]

While planning initiatives may be overhyped to serve as city and corporate marketing programs, labeling such efforts as mere "myths" that are distinct from "reality" would ignore the productive political role that such discourses play in changing policies, practices of planning and material outcomes. Here, I argue that Wong's category of Green Leap myths would be better understood in a classical sense: as vital to lived experience and sense making. Despite flawed and controversial implementation of lauded projects such as William McDonough's debacle in Huangbaiyu, such efforts are being backed by China's central government policies.[19] This rapidly expanding regime of green development includes systems of standards, pilot programs, new legislation and the official development policies set forth by the Eleventh and Twelfth Five-Year Plans (2006-2010 and 2011-2015, commonly referred to as the "11-5" and "12-5" plans). The 11-5 Plan set targets for energy intensity—the amount of energy used per unit of GDP and renewable energy generation, and introduced a new vocabulary of environmental governance into China's official development lexicon. The 12-5 Plan includes new benchmarks for reducing the carbon intensity of GDP and introduces "low-carbon" (*di tan*) and "green development" (*lüse fazhan*) as fundamental concepts in official development discourse (NPC 2011).

Increasingly, experts and boosters point to China's combined economic power and political system as the largest—and perhaps most important—venue for the development of "a clean energy future."[20] This phrase is also indicative of how the point-of-consumption benefits of various "clean energy" technologies are used to justify the uneven geographies of the costs of such technologies. In the China case, such narratives of innovation and global market efficiency in allocating comparative advantage for global environmental benefit seek to cover over the complexities behind such assumptions with universalized metrics of carbon dioxide emissions at the point of consumption. The epigraph by Peggy Liu captures how such a politics of the global green economy colors this view of China's exceptionalism and role. Thomas Friedman attributes the pithy lines

[17] (Head and Lam 2011) emphasis added.

[18] Another cliché of the Green Leap Forward discourse is reference to the Chinese word for "crisis," and its literal composition as "threat" and "opportunity." In this, the Green Leap bulls join legions of management-speak gurus and corporate students of Sun Zi's *Art of War*.

[19] For the definitive social science account of Huangbaiyu and its intersections with international cultures and political economies of eco-urbanization, see the work of Shannon May (2008, 2011).

[20] This phrase is use frequently to denote—especially—forms of non-fossil fuel energy generation that have 'zero emissions' (see e.g.,Finamore 2011; Friedman 2010a).

to Liu as given in an interview.[21] However, as many such memes about China and its environmentalization circulate, the quotation's provenance is actually more obscure and simultaneously more pre-packaged. The same exact language is used by Liu in many of her online profiles and were also recited during a TEDx talk in 2010.[22] In this, Friedman and Liu are prominent partners in creating a distinct image of China as *the* cutting edge of the global green economy. Table 1.4 shows the results of a survey of post-2008 recession stimulus policies conducted by the HSBC bank. The survey found that the investment into green development by the Chinese government far outstripped the spending in any other country, nearly doubling the U.S. earmark.

This representation argues several things. First, it seeks to highlight that China's green status has been established through policy means that are in contradistinction with those of the West—especially with those of the United States. That is, China has "unique"—and distinctly *other*— political and socioeconomic attributes that enable these results. As in Foucault's description of Orientalist imaginaries, this future "dreamworld" is predicated on what makes China wholly other—its authoritarian-modernist state power and its faceless masses of laboring bodies. Vukovich convincingly argues that Sinological Orientalism casts China as in the throes of *becoming-sameness* vis-à-vis the liberal capitalist democracies of West.[23] Building on Said's work in *Orientalism,* Vukovich defines this as an epistemic strategy of "positional superiority" (Said 1994 [1978]: 7) that paradoxically constructs China's ongoing historical condition of *essential difference* within a contemporary "sameness structured by a hierarchical difference [with the West]" (Vukovich 2012: 3). Vukovich argues that in this Sinological Orientalism, the main 'obstacle' characteristic of this difference is the party-state. In this light, China's persistent otherness is seen as an abhorrent counterfactual to Western liberalism and as a critical component in the universal project of sustainable development.[24]

In processes of sustainable development knowledge production, this positional superiority has the similar effects to the universalist and global market capitalist teleology encapsulated by Fukuyama's "end of history." In this regard, Liu is not merely a booster, but reflects a market environmentalist approach that is growing in China. Linking policy learning and consulting with international experts in the full gamut of environmental disciplines to institutions like the National Academy for Mayors. In this sense, Liu is modeling China's "Green Leap Forward"—*performing* green for an international audience of NGOs, markets, policymakers, academics and others. In this role at the JUCCCE Clean Energy Forum in 2010, Liu posed for photographers, gave an interview

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[21] (Friedman 2010a)

[22] For example, see Liu's profile at the Celebrity Speakers Associates. The TEDx talk Liu gave in Christchurch on Nov. 8, 2010 is available at http://www.youtube.com/watch?v=_yP9IRbxtEw.

[23] (Vukovich 2012)

[24] This positional superiority also clearly has roots in Cold War-era area studies social science. As Tani Barlow (1993) and others point out, experts in area studies were implicated in U.S.-led anti-communism and concepts of modernization that sought to denigrate China's revolutionary project (see also,Vukovich 2010).

for a documentary about her work, and received the Hillary Laureate for "… helping Chinese society to move in the direction of sustainable development."[25]

The work of JUCCCE also includes a series of workshops on sustainable urban development conducted through the National Academy for Mayors in China, a government institution that provides policy training and resources to high level city and provincial officials under the Ministry of Housing and Urban–Rural Development. Other programs offered by the Academy's partners include energy efficiency and demand side management policies led by the China offices of the National Resource Defense Council (NRDC), with support from Pacific Gas & Electric, in conjunction with the National Institute of Standardization. These events are key sites in which advocates, experts in industrial processes, economic planners, and central government officials are producing policy models and the science of sustainable development.

The Contradictions of Chinese Environmentalization

As urbanization and industrialization continue to spread through China's countryside, the central state has officially declared the construction of eco-industrial zones and eco-cities as primary strategies for accelerating the transformation of industrial structure and the prevailing model of economic development, and for attaining the goal of an "environmentally, economically and socially harmonious society" (NPC 2005, 2011). These strategies are examples of China's ongoing environmentalization, which in Buttel's (1992: 2) words denotes "concrete processes by which green concerns and environmental considerations are brought to bear in political and economic decisions… [and] in institutional practices." As green development has emerged as a prominent form of state-led environmentalization in China, I use Buttel's term to also connote the ways in which the values and norms of green development are institutionalized.

I examine the confluence of urban and industrial forms of environmentalization or "greening." The greening of urbanization includes emerging practices that account for environmental concerns in the ways that cities are designed, built, and occupied. A simultaneous process of the "urbanization of greening" can be observed in discourses and projects that explicitly tie urban form to an environmental rationality, which conversely casts rural space and society as environmentally and developmentally backward. Examples include high profile "eco-cities" and "eco-villages," which embody new norms that represent environmental rationality more broadly. In terms of industrial development, greening has been most prominent in the expansion of new energy (*xin nengyuan*) industries as vehicles of economic growth.[26] These prominent aspects of China's

[25] R.K. Pachauri, the Intergovernmental Panel on Climate Change (IPCC) since 2002, in his simulcast award speech to the 2010 JUCCCE Forum. The award is given by the Hillary Institute of International Leadership, established by famed mountaineer Sir Edmund Hillary to promote global leaders in critical areas identified by the organization. In 2012, Liu was subsequently awarded the Hilary Step, the premier prize given by the Institute, to support her "China Dream" project.

[26] New energy industries are not necessarily green. Rather, the term refers to any energy technology outside of conventional coal-fired electricity generation, including nuclear, large hydroelectric, and the development of carbon capture and sequestration technologies for fossil fuel sources.

environmentalization intersect decisively in Jiangsu province, where renewable energy industries are planned in tandem with new city construction. This model exemplifies the tandem approach to greening/urbanization set forth in the 12-5 Plan when it calls for the construction of "innovation-oriented cities… to enhance sustainable development" as the platform for regional development, with particular reference to the Yangtze River Delta and Jiangsu province (NPC 2011: Ch. 18, Sec. 4).

Green development projects across the countryside in Jiangsu, designated an "ecological province" by the central state, are exemplars of the sites of friction arising from China's environmentalization. Over the past decade, growing awareness and social mobilization over environmental degradation have made environmental protection increasingly important to state legitimacy (Ho 2006; Jahiel 1998; Vermeer 1998; Tilt 2007). In response, recent state discourses of "scientific" and "harmonious" development integrate concepts of the environment and sustainability (Fang 2003; Fan 2006; NDRC 2006).[27] In Jiangsu's rural townships and smaller cities, "green development" has become a central theme in strategies for economic growth, and the province has ascended as one of the fastest growing centers of solar panel production in the world. However, new eco-industrialization projects proceed through the forceful transformation of rural areas, and frequently through the deployment of special economic zones (SEZs) to attract investment and incubate new private enterprises.[28] As a result, these projects entail changes to tenure rights, livelihoods, social values and entitlements, as land is designated as "urban" and enclosed under direct state control.

The processes of constructing Yixing as a model of green development are embedded in the production of green development ideology and its particular social relationships. It is important to distinguish the landscapes of green development from a more general process of urban-rural integration. To a large extent, the central government discourse on these policies seeks to bring them into close alignment—as a single process of spatial coherence for environmental governance and development. As these policies have been developed over the past decade, their representations in official discourse, specific cultural norms and social practices are still in a process of emergence and coalescence. In other terms, there is not yet a hegemony of green development ideology. This presents important political problems to local governments, especially in justifying dispossession under the green banners of eco-industrialization and eco-urbanization.

Rather, the process of dispossession for green development is presently centered on securing *compliance* through coercive means rather than consent to its broad social-

[27] These discourses emerged during the Third Pleum of the 16th Party Congress at the close of Jiang Zemin's administration in 2003, and became prominent figures in the 11-5 and 12-5 Plans under Hu Jintao (Fewsmith 2004a).

[28] Here, I employ a broad definition of SEZs to include a generalized range of forms in China and elsewhere (e.g. economic development and free trade zones) that utilize state authority to create exceptions to territorial sovereignty as a way of negotiating relations with transnational capital (Ong 2006; Sassen 2006).

cultural project.[29] As I will discuss further below, this is frequently evidenced by the fact that many villagers are only vaguely aware of the projects that necessitate their eviction. State violence in the actual eviction is also frequently preceded by tactics in notification and compensation that place families in a defensive position. This results in experiences of extreme insecurity even before the final eviction date is settled. Deficient compensation goes further to extend a sense of precariousness across a long transition period. Often, evicted villagers wait over two years before securing access to permanent resettlement housing. Such precariousness works to slowly press evictees into a new social fabric through a slow violence of being "settled."

These dynamics reveal conflicts between the different geographic scales of sustainability objectives, and contradictions between the global green economy and local social and environmental outcomes. In its official discourse on development, China's central government foregrounds concepts of "contradiction" and "integration" in addressing such tensions in its historic process of development and potential pathways to improvement. The main identified contradictions in China's current development pathway are encapsulated in the Five Balances, described as holistic efforts to alleviate imbalances in: the urban and rural, export driven economics, the coast and the interior, social equity and the environment. "Contradiction" in this discourse is understood in a Maoist/Marxist dialectical sense to mean that processes of change (especially economic growth) produce and are produced by opposing forces and effects. Increasingly, environmental pollution and degradation are identified as a "primary contradiction" that marks the turning point to a second phase of modernization. This theorization further mirrors ideas from ecological modernization theory, as well as neo-Marxian analysis of the environmental "second contradiction" of capital.[30] In the development ideology discourse, such as the working group and plenary statements of the Central Committee, the Five Balances are discussed in relationship to the pursuit of sustainable development through the means of the Scientific Development Concept. These formulations of balance/contradiction are rooted in Deng's reformulation of post-Mao Chinese Marxism as "scientific," especially in the Four Modernizations (of agriculture, industry, science and technology, and national defense).

My discussion of urban-rural integration in environmental policy has to be taken in this context of official development discourse. In the following chapter, I highlight how the scientific ideas and practices of "integration" are constructed and enrolled in policy making processes. Chapter 3 outlines current policies rural-urban integration and environmentalization as a process of integrating (in a supposedly balanced fashion) environmental goals with economic goals. This analysis builds to a broader interpretation of contemporary efforts by the Chinese state to exert direct planning authority over rural space and to construct a new national legibility in a more homogenous space and population.

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[29] For a detailed theorization of the politics of dispossession and the concept of compliance, see (Levien 2013b).

[30] See O'Connor (1991); O'Connor (1994)

Refiguring the Rural

From its roots in a peasant revolution through the Great Leap Forward, rural society has continuously been a key site of socialist construction in the PRC.[31] It is with the advent of China's urban revolution that the rural has once again emerged as a fundamental problem of development and social mobilization. However, in the conjunctural moment of late socialism—characterized by the entrenchment of the market economy and the retrenchment of socialist entitlements—the rural is no longer an engine of change, but a targeted object for rectification and improvement. Rural society is frequently characterized as "backward" (*luohou*), and urban China as inherently "modern" (*xiandai*).[32] Scholars influencing the overarching conception of development in China have promoted ideas from world modernization theory, notably by Rostow. Notably, the hierarchical conception of developmental progression through stages of "primitive," "agrarian," "industrial," and "knowledge" based societies has materialized in support for theoretical research on Chinese conditions and pathways to its "second modernization."[33] The cultural value of modernity as inherently "progressive" is ascribed to the process of modernization, wherein rural transformation is assumed to result in greater equity through increases in the efficiency of production and resource utilization measured in terms of economic growth. This conceptualization of a developmental "stairway" of human civilization informed official modernization policy under President Jiang Zemin and Premier Zhu Rongji, who spurred research leading to model experimental zones for the promotion of sustainable development, innovation systems, and a knowledge-based economy.[34]

Since the founding of the PRC, the categories of rural space and society have deeply structured rural residents' relationship to the state. With China's contemporary environmental turn, researchers and news media have paid a great deal of attention to spectacular projects of urban environmental problems and innovations. Much of this attention continues to view rural space as a negative space—the inevitable object of encroachment and abandonment—into which China's "urban revolution" inexorably unfolds. As evidence against this view, on January 19, 2014, the Central Committee and the State Council issued the first central government policy statement of the year. Commonly referred to as "the No. 1 Central Document," the statement is issued each year constitutes an important marker of public policy discourse. The 2014 installment was the eleventh consecutive No. 1 Central Document to focus on rural reforms (see Table 2.3).[35]

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[31] From the founding of the PRC state in 1949, the agrarian question has featured largely in official state theories of socialist construction. The agrarian question, as articulated most prominently by Karl Kautsky (1988 [1899]), sought to define the relationship between non-industrial, non-urban productive forces, the penetration of capital, and the revolution. For a review, see Henry Bernstein, "Agrarian Questions Then and Now," Journal of Peasant Studies 24, no. 1/2 (1996).

[32] (Zhang 2006)

[33] (He 2007b)

[34] (Niulaoshuaiye 2011)

[35] (Xinhua 2014)

I argue that the imperative of green development emerges within the context of rural transformation and changing notions of what constitutes correct and "harmonious" social-environmental relations. If we take for granted that cities have historically been founded for different locational advantages, grow through the slow accumulation of various types of surplus and subsequently birth new forms of sociality, then these examples of master planned green developments circumvent the processes of accretion and change for the amplification of a single agenda. In the case of green development, this is an agenda that has broad international support and a mandate underscored by the politics of crisis. At its largest horizons, green development *qua* ecologically sustainable development purports to remake the environmental bases of production and, therefore, of accumulation. The usual sites and forms of creative destruction also trace new circuits of ecological capital, entrenching old inequalities in new sites of segregation. Farm fields are plowed for forests of carbon credits. Given this context, one might better say that local struggles for equitable forms of urban-rural development *reemerge* from the dialectical contradictions of such an attempt to totalize a new urban sociality.[36]

An important question that comes up regarding the "non-implementation" of these plans, then, is the work that is actually being accomplished. In the Yixing case, "plans" are unsurprisingly vehicles for collecting and redistributing resources. However, it would be a mistake to simply dismiss the plans themselves as thin veils for business as usual—a "light green" wash over an otherwise "brown" model of development.[37] Here, I argue that green development planning and policy is shaping material conditions of social–environmental relations as an explicit project of an anthropocene ecological modernism. However, in the attempts to plan for and implement these goals, securing land through rural dispossession is always temporally removed from subsequent accumulation and development. In some instances, the original plans are never implemented. The environmental logic of dispossession still holds because the project of integrating urban-environmental with agrarian transition in Yixing proceeds under a totalizing logic that constructs its rationale at a spatio-temporal scale that is removed from the immediate process of dispossession itself. This logic is a tabula rasa approach to both biophysical space and social-environmental relations. The zero point for the authority of total planning is already justified as necessary to environmental modernization regardless of particular project outcomes.

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[36] The concept of "contradiction" in the official discourse on Chinese development is rooted in Marxian materialist dialectics and the notion of history as being produced by opposing social forces. "Contradiction" continues to be an idea for describing social experience and ideology in China. This is evidenced in the common expression for "contradiction," the word *maodun*, which refers to a Chinese proverb but also to Mao Zedong's *On Contradiction* (*Maodun Lun,* literally translated as "theory of contradiction"). In Mao Zedong Thought, the contradictory forces characterize the development of all things including life, and thus extend beyond the dialectics of class difference.

[37] Different "shades" of green have been used to describe the range of environmental politics from "light" (as incremental) to "deep" (as radical), particularly in relationship to the role of markets and capital. See, for example, Lucardie, Voerman, and van Schuur (1993) on the case in the Netherlands, and Bess (2003) on France. on France.

Urban-Rural Integration

Facing polarizing economic inequality between rural and urban populations and increasing protests against illegal land seizures, the question looms: can China's top-down program of ecological modernization win the acquiescence of rural residents to dispossession? Here, I argue that the policies introduced under the Eleventh Five-Year Plan under the rubric of "constructing the New Socialist Countryside" serve simultaneous goals of state territorial integration and the establishment a new political relationship between the state and dispossessed rural populations.[38] The state's new urbanization strategies are intervening in decades of "bottom up" growth in towns and patterns of collective industrial enterprises that did not lead to rural proletarianization, but contributed to increased migration to the major cities and industrial centers.

The roots of the contemporary policy rubric of urban-rural integration (*cheng xiang yitihua*) reach to the early reform period with efforts to promote urban growth pole strategies and comprehensive planning of rural areas through incorporation into urban jurisdictions.[39] At the turn of the millennium, Chinese development policy has paid greater attention to dismantling structural inequalities faced by the rural population. The primary axis of this policy agenda turns on spatial planning and asserting the authority of localities to shape land use and the fundamental geography of population distribution. Beginning with the Tenth Five-Year Plan differing national and local development goals have intersected in various policies promoting "urbanization" in a variety of social–spatial contexts including urban district expansion, rural township incorporation, and village-to-township construction.[40] The contemporary policy rubric of urban-rural integration is aimed at coordinating development and balancing intra-regional disparities. The discourse is rife with lists describing the necessary steps for "shattering the urban-rural dual structure" (*dapo chengxiang eryuan jiegou*). In the Third Plenum of the Eighteenth central party, the first comprehensive policy statement of the new central leadership under Xi Jinping and Li Keqiang, the integration of urban and rural space through planning is a pivotal aspect in addressing several dimensions of development.[41]

As outlined in recent policy, this integration of urban and rural development consists of reforms to rural collective property, unification of government between urban and rural areas with simplification of village governance, the unification of social welfare systems including medical insurance, the rural pension and the minimum livelihood guarantee (*dibao*), and integrated spatial planning of land use and urbanization under city governments. In this latter point, integration is exercised in terms of the Three Consolidations (*san jizhong*): rural populations into urbanized settlements, rural

[38] Hsing (2010) for discussion of contemporary processes of state territorialization

[39] (Hsing 2010) p. 94-95; and (Chien 2010) p. 133-4

[40] (Zhou 2001)

[41] The first third plenary session of a CPC Congress under a new Central Committee leadership is a critical moment in setting a national policy agenda and articulation of development goals and ideology. See, for example, (Fewsmith 2004b) regarding the Hu-Wen Third Plenum of the 16th CPC Congress.

industries into industrial zones and cities, and farmland into larger-scale holdings. These policies are discussed in further detail in Chapter 6.

Global Resource Geography: Scale, Place and Production

It is a basic methodological argument of this dissertation that the analysis of environmental problems, transformation and governance is fundamentally a question of geography: of spatial relationships and processes whose observation reveals the imbrication and co-constitution of local, national and global dynamics. This builds on the basic insight that environmental resources are not merely extracted or valued in-situ. "Resource" must therefore be understood as a social process—*to* resource—as well as a physical entity. As such, resources must be constructed through a host of social and physical infrastructures. Management efforts aimed at creating sustainability of any particular resource likewise require the construction of geographic scales of measurement and the particular places that are critical to its political economy.

This approach to analyzing the global political economy of sustainable development reveals the degree to which sustainability science and planning have incorporated paradoxical assumptions regarding social–spatial relationships regarding the geography of resourcing processes and their nexuses with production. Greater attention to urban processes and relationships to "ecology" have in practice contributed to the reification of complex processes and geographies into single-factor metrics such as "emissions" in political economies of energy and climate change mitigation. For example, the focus on greenhouse gas emissions as measured at points of consumption and generation contributes to the concepts of "renewable" energy such as wind and solar. However, by foregrounding the thermodynamics of generation fuel and capacity, such an approach tends to obscure the relationships of *any* form of supply to an overall question of demand. That is, by failing to address fundamental questions of consumption, the conception of a "portfolio" as an aggregate of capacities hides the intra-portfolio relationships that impact demand as well as supply. Here, Germany's increased investment into coal generation to cope with the intermittency of its world-leading portfolio share of solar and wind generation capacity is a clear example. Renewables have been implemented to take the place of non-renewable sources to meet a given amount of demand. However, with demand increasing regardless of the composition of the generation portfolio, the problems of still air and cloudy days are expeditiously handled by constructing new coal fired thermal power plants.

Apart from longstanding critiques of the applied concepts of sustainable development, a political ecology approach to resource geography calls our attention to interdisciplinary questions of product lifecycles, global supply chains, and the social and ecological costs embedded in resource production. This dissertation also examines the technical, political and cultural processes of constructing resources themselves, and how dominant metrics of green development shape not only how we understand concepts like "renewable energy" and "sustainability" but also how such constructions contain ideological justifications for what is measured and what is not. In Foucault's terms, such rationalities act as "a grid of legibility" as means of "decipherment of social

relationships."[42] Michael Watts has long called attention to the artificial and artifactual dimensions of "natural and political economy" —that the social and natural are both irreducible to one another and in the production of contested resource geographies—the construction of social-ecological forms of value—social domains cannot be understood apart from the natural artifactual channels.[43]

Taken together, these concerns highlight the need for studies of the industrial geography of resource extraction to be complemented with an examination of how such processes shape specific places and populations. The production of particular forms of urbanism associated, for example, with the geophysical conditions of extraction and production of oil or coal have contributed to the boom-and-bust dynamics of company-owned oil cities and coal towns in the later 19th to early 20th centuries. Such resourcing processes must also be examined for their geographic impacts beyond these points of extraction and production. As Timothy Mitchell has recently argued, in addition to enabling the extension of industrial processes and urban development, cheap and portable fossil energy sources were fundamental to the character of what he terms our "carbon democracy." Such perspectives point to questions about the relationship between particular resource economies, their labor regimes and the concomitant urban forms and environments that are co-produced by the intersection of these processes. Recent scholarship on Middle Eastern "oil cities" and China's coal frontiers highlight similar questions while examining the dialectic between China's urban revolution and resource economies.[44]

This dissertation examines such place-based impacts in relation to the construction of the global renewable energy industry. I focus especially on the role of the key sector of solar photovoltaics in the place making and sustainable development model of Yixing in relationship to national goals for the sector's development. Policy studies have shown that such renewable portfolio standard (RPS) approaches tend to limit sector development to the size of the provided quota.[45] However, China's renewables sectors and RPS "ceilings" have continued to rise even in the face of trade wars. I argue here that a critical factor is the way that a particular political economy of energy and geography of green development intersect to link local development to industrial policy, climate policy, and rural development. However, the economic and environmental benefits have not been unequivocal. This central-local dynamic in resourcing renewables led to an exponential growth in the industry that was enabled by rural land enclosure. This process contributed to a high level of oversupply. The resulting rapidly falling PV module prices on the global market beginning in 2008, reached record low prices in 2011.[46] Many smaller

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[42] (Foucault 2008: 243)

[43] In this sense, political ecology begins to approach Latour's (1998) gloss as "a new way to handle all the objects of human and non-human collective life."

[44] On oil cities, see Fuccaro (2013); Damluji (2013). On the "boomtown urbanism" of China's coal frontier, see Woodworth (2012).

[45] Fouquet and Johansson (2008)

[46] For a brief overview on the oversupply and price drop, see Englander, Mehta, and Bradford (2009).

module producers in the Taihu region shut down or were acquired in government consolidations.

Structure of the Dissertation

In Chapter 2, I introduce the Yixing case and its projects of green development within the context of urban-rural integration. I lay out the themes of analysis in relation to the empirics of the case to frame the more in-depth discussions that follow in the subsequent chapters.

In Chapter 3, I will provide an overview of the succession of greening processes in the Yixing region. The chapter introduces the history of the Yixing case in the context of national policies of green development. I argue that Yixing represents both an exceptional case as the site of the China's first national environmental industry zone, and a process of making a "commonplace" model of green development in China. This commonplace green development centers on linked national policy assumptions that urbanization is inextricable from modernization and economic development, and the expansion and long-term economic viability of markets for commodities that are linked to environmental governance (e.g., carbon credits, solar panel installations, etc.).

Chapter 4 introduces specific projects of Yixing's model of green development. The chapter focuses on describing the solar and eco-industry construction the Yixing Economic Development Zone and the Scientific Innovation New City eco-city project. The chapter places these projects within the context of master planned urban-rural integration policies and documents the emergence of direct state planning of rural space and society in contemporary China.

Chapter 5 analyzes the administrative enclosure process in the creation of the green development zones in Yixing. I argue that Yixing local authorities' administrative restructuring to manage green development projects and their implementation of quota systems under national policies on the key aspects of land resource governance (arable and cultivated land conversion; maintenance of land supply; agricultural production) work as: (1) a form of enclosure in the classical sense of creating new legal structures to protect exclusive forms of access and use; (2) the initial sociopolitical means of deploying dispossession as an "extra-economic" form accumulation alongside market logics for the valuation and circulation of environmentalized commodities [discussed in Ch.4]; (3) a process of state-territorialization in producing administratively homogenous space for projects of environmental governance and capital accumulation; and (4) a process of making land a resource that is divisible not only in itself, but distinct from the environmentalized resources and services contained on and within it.

Following the analysis of national policy implementation, Chapter 6 examines the practices of local administrators and Chinese and international planners that actively produce links between environmental governance and spatial planning. The chapter focuses on the production of ecological values in processes of assessment, mapping, and representation. I argue that the technical and discursive practices work to (1) successfully

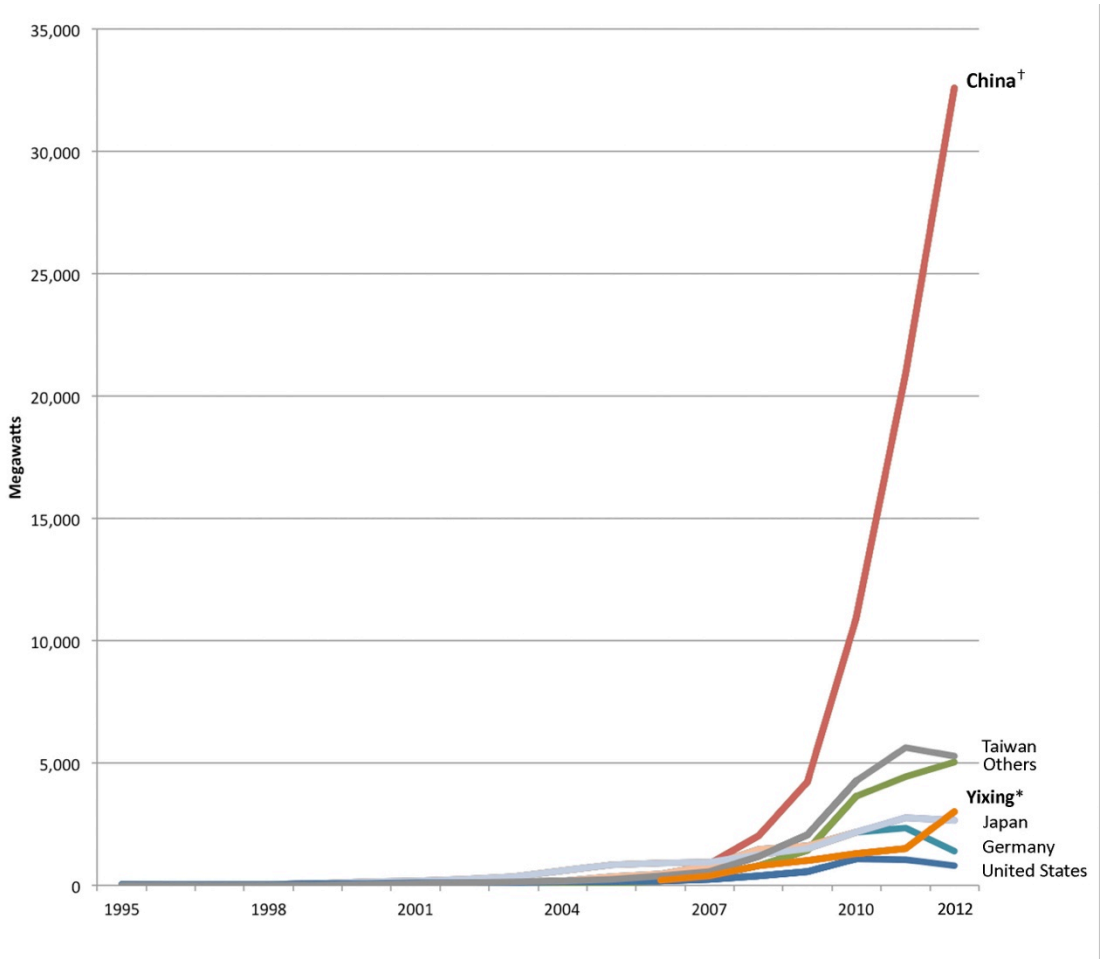
construct rural livelihoods as environmentally backward in order to divorce them from land resources; (2) produce clear systems of legibility and aestheticized distinctions between human and natural environments; and (3) integrate ecological protection and ecological value as aesthetic (rather than scientific) practices deployed by urban planners and designers independent of biology and other ecological science.

In the concluding chapter, I briefly analyze the political economy of rural dispossession in Yixing's projects of green development within the context of global markets for solar PV. The existing scholarship on rural dispossession in China has demonstrated that these processes deepen social inequality and repress village mobilization and resistance. I argue that the administrative restructuring described in Chapter 5, and processes of notification, eviction, compensation and relocation work to (1) enclose villagers' assets of cash and property into a mortgaging system to finance the construction of resettlement housing; (2) produce an expanded informal labor economy that is deployed through subcontracting to build green development infrastructure; and (3) re-inscribe urban-rural social inequality into a new form of peri-urban segregation. I include analysis of the cultural politics of greening that links environmental values to concepts of personal development in social development planning for agrarian transition.

The conclusions draw on these social and environmental contradictions of green development to broach broader arguments and areas of inquiry for future research: (1) China's "global urbanism" of eco-cities and eco-industrialization that is co-constituted by local processes in cases like Yixing and by global circulations of expertise in sustainability science and planning; (2) a cultural project of greening in China that re-inscribes social relations of inequality according to forms of environmental governance and rationalized calculation; (3) the simultaneous processes of domestic rural land enclosure and "land grabs" in Asia, Africa and Latin America as fundamental to understanding the geography of the global food and energy economies; and (4) the traveling of China's urban planning practices and economies in conjunction with its international development aid and negotiation of environmental resource concessions in Asia, Africa and Latin America.

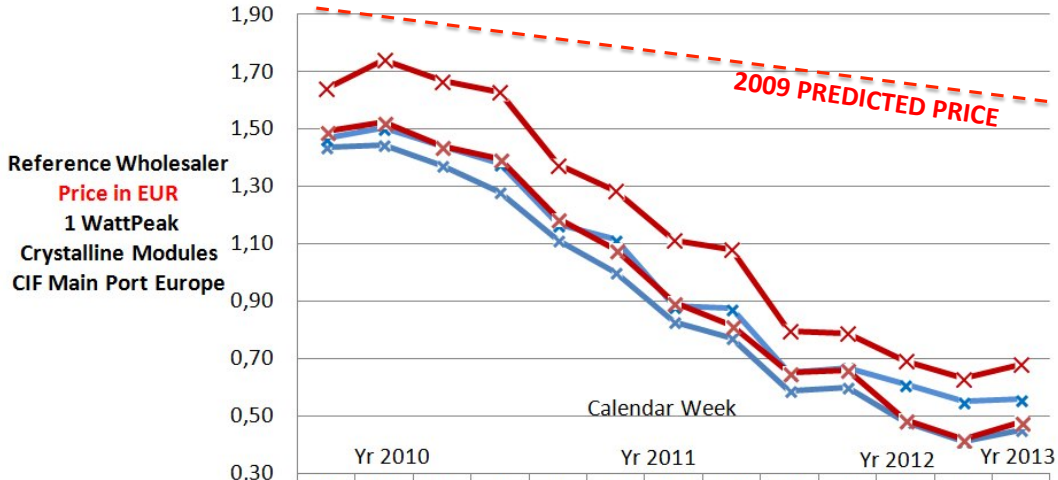
Chapter 1 Figures

Figure 1.1 Annual Production of Solar Photovoltaics by Country



China's estimated production of solar cells and panels in 2012 exceeded 21 GW. This graph shows an estimated production capacity of 32.6 GW, or an overcapacity of approximately 55 percent. Yixing produced almost no equipment in 2006, and leapt to 3 GW, over 6 percent of global capacity in 2012.
Source: Compiled by the Earth Policy Institute.
† China 2012 production capacity estimated by IMS Research, reported by PV Market Research.
* Yixing 2012 production capacity reported by YXEDZ Administration

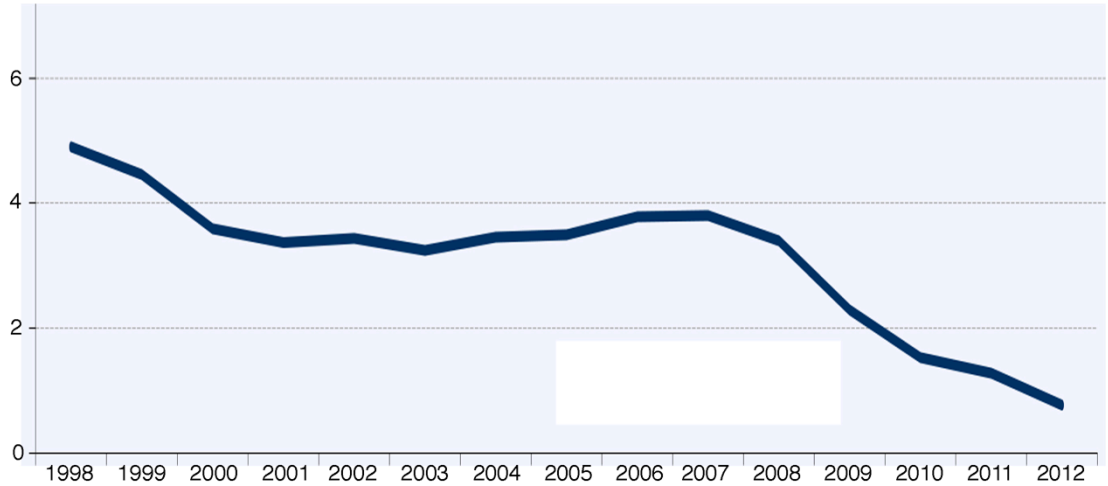
Figure 1.2 Global Solar PV Price Crashed Due to Oversupply



	36	42	51	2	14	17	32	38	50	2	32	3	11
Min Price Non Bankable, EUR/W	1,44	1,44	1,37	1,28	1,11	1,00	0,83	0,77	0,59	0,60	0,48	0,41	0,45
Max Price Non Bankable, EUR/W	1,47	1,50	1,44	1,38	1,17	1,11	0,88	0,87	0,65	0,67	0,61	0,55	0,56
Min Price Bankable, EUR/W	1,49	1,53	1,44	1,40	1,19	1,08	0,90	0,81	0,65	0,66	0,49	0,42	0,48
Max Price Bankable, EUR/W	1,64	1,74	1,67	1,63	1,38	1,28	1,11	1,08	0,80	0,79	0,69	0,63	0,68

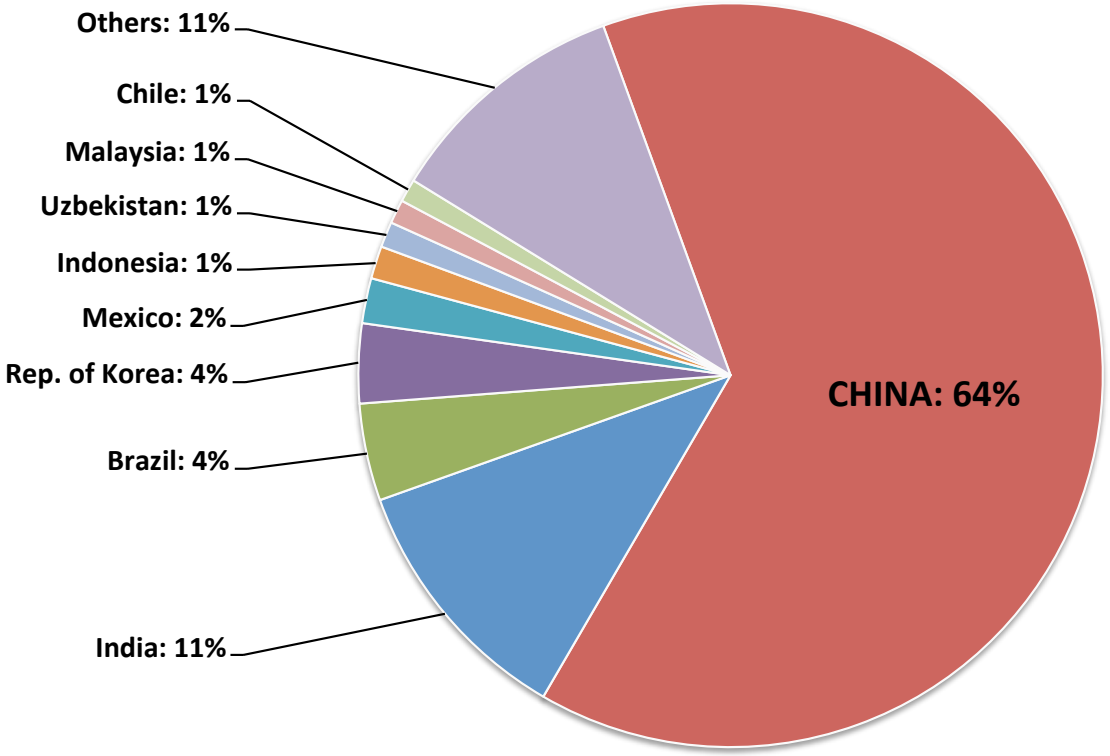
This chart shows the recorded global commodity market spot prices for crystalline photovoltaic solar panels from the last quarter of 2010 through 2013. The dotted line shows the predicted trend line from 2009. The actual price drop was a 34 percent annualized decrease versus the historic 7 percent.
Source: http://www.europe-solar.de/

Figure 1.3 PV Module Price Trend in USD per Watt$_{peak}$



This second chart shows the overall global module price index for photovoltaic modules from 1998 to 2012. Price is per watt peak, normalized to 2012 USD
Source: National Renewable Energy Laboratory, Department of Energy

Figure 1.4 China Dominates Global Carbon Credit Markets



This pie chart shows the registered certified emissions reductions under the UN Framework Convention on Climate Change in 2012.

Source: http://cdm.unfccc.int/Statistics/Registration/AmountOfReductRegisteredProjPieChart.html

Figure 1.5 Presentation Renderings of Arup's Designs for Dongtan Eco-City

Water has become central to the aesthetic of China's eco-urbanization projects. This is evident in the greater Yangzi River Delta sites of Dongtan and Yixing as well as in the world's largest eco-city project, the 30 sq-km Sino-Singapore Tianjin Eco-City.

Source: Neil Kirkpatrick, Arup; posted at http://www.ibi-nightingale.com

Chapter 1 Tables

Table 1.1 National Policies Affecting Rural–Urban Spatial Development

	KEY YEAR	POLICY	GOALS	KEY DOCUMENTS
PRIMARY	2006	Constructing a New Socialist Countryside	• Consolidating villages into housing • Create more rural waged labor through mechanization and transition from agrarian livelihoods • Expand social security with medical insurance, rural pensions and minimum living allowances • Connect villages with improved infrastructure	• Eleventh Five-Year Plan • Twelfth Five-Year Plan
	2006	Urban-Rural Integration	• Unification of social service provision at municipal levels • Integrated urban-rural land market • Unified urban-rural labor market • Expansion of rural property rights • Increase urbanization rate • Increase rural incomes and consumption • Reducing the "peasant burden"	• Tenth Five Year Plan (2001) • Eleventh Five-Year Plan (2006) • Twelfth Five-Year Plan (2011)
	2008	National Farmland "Redline"	• National rationalization of farmland conversion • Eliminating illegal farmland conversion by local authorities • National grain security	• National Land Use Master Plan (2006-2020) • Basic State Policy of Farmland Protection • Land Management Law (1998)
SECONDARY	1997	Rural energy and resource conservation	• Promote renewable energy sources (methane, biomass, small hydro, solar and wind) • Agricultural industry technological upgrading	• Article 59, Energy Conservation Law (1997, rev. 2007) • Basic State Policy of Resource Conservation
	1993	Rural Tax and Fee Reforms	• Reducing fiscal burdens on farmers through local level reforms • Address the Three Rural Problems	
	2006	Abolition of the Agricultural Tax	• Reducing fiscal burdens on farmers through local level reforms • Address the Three Rural Problems	

Table 1.2 Increasing Solar Photovoltaic Renewable Portfolio Standard Goals

Year Set	Solar PV Goal (GW)	Target Year	Key Policy Response Conditions & Goals
2007	10	2020	• "Green GDP" (reducing carbon intensity of GDP) • International 1% solar goal
2009	20	2020	• China becomes lead emitter of GHGs in 2007
2012	21	2015	• Provide a market for devalued PV panel commodities following global market oversupply
	>30 [estimated]	2020	• Absorb losses and stabilize financial outcomes of oversupply
2013	35	2015	• Long-term sustainability of PV industry • Building 100 distributed solar model zones, 1000 PV model townships and villages
China's installed capacity of PV solar power generation in 2012 was approximately 7 GW. Sources: People's Daily, various issues.			

Table 1.3 Wind Power Generation: Installed Capacity in Leading Countries (2012)

COUNTRY	2012
China	75.3
United States	60.0
Germany	31.3
Spain	22.8
India	18.4
United Kingdom	8.8
Italy	8.1
France	7.6
Canada	6.2
Portugal	4.5

China leads in cumulative capacity and generation of wind power. It is expected to continue to increase as the largest market for installation of new capacity through 2030, when it is projected to exceed 400 GW in nameplate capacity. All figures rounded to the nearest tenth (100 MW).

Source: Global Wind Energy Council, Global Wind Report: Annual Market Update 2012.

Table 1.4: Green Bail-Out Stimulus Packages*

Country/Region	Total Stimulus (USD billions)	Green Earmark	Green Percentage
China	586.1	221.3†	38
US	972.0	112.3	12
South Korea	38.1	30.7	81
EU	38.8	22.8	59
Germany	104.8	13.8	13
Japan	485.9	12.4	3
France	33.7	7.1	21
Canada	31.8	2.6	8
Australia	26.7	2.5	9
UK	30.4	2.1	7
Italy	103.5	1.3	1

* In 2009 USD. Includes investment in transport, construction, infrastructure, energy, and jobs

† The HSBC estimate does not include an additional CNY 400-500 billion (USD 57-71 billion) added in 2009 for rail infrastructure.

Source: HSBC data quoted in Bernard et al. (2009)

CHAPTER 2
Refiguring the Rural: Dimensions Of Green Development in Yixing

> *The [environmental] optimization of land use structure requires the closure and relocation of Taihu shoreline towns and a considerable number of enterprises and villages, which will transform farmers' traditional cultivation customs. This will be done.*
>
> ——Yixing "12-5" Master Land Use Plan[47]

> *Yixing's Qiting subdistrict has a rainbow-shaped bridge called Tangtian Bridge. Next to the bridge is a completely new residential development called Dongjiao Gardens. The people call it "the evicted households' new paradise."*
>
> ——Wuxi Daily[48]

Perched on upended cinder blocks at the entrance to the Dongjiao Gardens relocation settlement, the Zhao brothers greet me from their usual spot on the edge of the entry drive near the complex perimeter wall. Twenty feet behind the septuagenarians, a teal Kobelco backhoe shovels in an oscillating pirouette, removing the dark earth hillock from beneath itself.[49] Beyond the excavator, the shoulders of Qingyuan Boulevard unfold behind crews of migrant workers, a level line for the flattening horizon. Across Qingyuan, the shovels have filled a paddy with the rubble of Tangtian village and the itinerant workers have pitched green canvas tents against the coming winter. Told from this uneasy vantage point, the story of the Zhao brothers' displacement from their village and resettlement at Dongjiao decodes the churning landscape of Yixing's countryside. In doing so it reveals processes of social and environmental transformation that are typically elided by the terms of "green development" and "eco-urbanization" under which economic growth in the region has been promoted (see Figure 2.1). One of the most striking features of those transformational processes pertains to the ways that the underpinning ideology of green development casts rural space and society as backward. As this chapter will show, eco-urbanization in Yixing extends practices of rural dispossession and deepens patterns of urban-rural inequality by framing (and refiguring) the rural as a necessary object of reconstruction.

Like other cities in the Yangzi delta region, Yixing changed rapidly as urbanization and industrialization accelerated through the Chinese countryside.[50] Unlike the rest of its neighbors, however, Yixing has been a site of multiple waves of environmental development policy attention and is a centrally designated "Sustainable

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[47] Yixing BLR (2010b: 15)

[48] Wuxi Daily (2011)

[49] Kobelco equipment is pervasive in demolition sites across the country. In 2010, prominent billboards advertised the exact tractor used by Beijing Construction and the Yixing Demolition and Relocation Company. Almost shockingly, the advertisements proclaim "a green future is deepest in my heart" alongside picture a child drawing a natural landscape with the incongruous presence of the backhoe (see Figure 2.6). In 2010, the company and its parent, the Kobe Steel Group, announced a major joint venture with Sichuan Chengdu Chenggong Construction Machinery to build massive crawler cranes with capacity to lift up to 250 metric tons (551,156 lbs.) with 91-meter long truss booms.

[50] I will discuss this process further in the following chapter.

Development Experimental Area." In 1993, the Yixing Industrial Park for Environmental Science & Technology was designated as the research and development center for China's Rio Declaration Agenda 21 Program for environmental protection. By 1998, Yixing generated 18 percent of the national total value added in the environmental industry.[51] In 2006, the National Yixing Economic and Technological Development Zone (hereafter, "the Zone") was founded. [52]

The Zone was created to focus on "greentech" and "cleantech" industries, especially solar photovoltaics and optoelectronics. These green industry projects formed the economic motor for what is conceived of in Yixing's master plan as a larger project of eco-urbanization and rural resource integration. This regional vision was prominently articulated by a national Party Central Committee member, Li Yuanchao, who proposed constructing Yixing as a national model "eco-city" (*shengtai chengshi*) extending from the western shore of Taihu Lake across Yixing's chain of lakes. In 2008, to achieve this vision and bring forth a model solution for industrial upgrading, urbanization, environmental protection and rural development the Zone's planning authority was extended to 98.3 square-kilometers. In order to link Yixing's urban core to Taihu Lake, the Zhao's homes and hundreds of villages were enclosed and subsequently marked for demolition.

These recent enclosures are certainly not without precedent. The Zone itself was first established by incorporating village construction lands and township level industrial parks that had been part of the wave of rural industrialization that crashed over the Taihu basin region beginning in 1978.[53] Without effective regulation of farmland loss, China was faced with the problem of maintaining urban economic growth while simultaneously preserving farmland as a pillar of social stability and food security. In order to address this dilemma, from the late 1990s and early 2000s onwards the central government adopted a multi-pronged approach to farmland preservation and land management. Understood as an explicit effort to address the social, economic and environmental contradictions of the prevailing model of development, the objective was to rationalize land use at a national scale and to promote the integration of modernized agriculture with new city construction. Land was then conceived as a resource to be managed according to two regulatory axes; first, its use and purpose would have to abide by a nationwide quantification and rationalization of "total land supply" for development (*gongdi zongliang*); and second, rural land was seen as an explicitly environmental resource to be protected and efficiently used.[54]

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[51] Zhang (2002: 62)

[52] The Zone was founded under Yixing municipal authority in April 2006. It was promoted to provincial level status in July of the same year, and was designated a national level economic and technological development zone in March 2013 by the State Council.

[53] See Bramall (2007)

[54] For examples in national policy, see the opening paragraphs of the National Land Use Master Plan (see e.g. MLR 1997, 2008a; YBLR 2010) and the 1998 revision of the Land Management Law, which refers to land management in the context of ecological protection and improvement, and the "ecological

In the present conjuncture of planned rural transformation and eco-urbanization, the category of farmland (*gengdi*) becomes critical to both of these regulatory axes. Although the state's environmental valuation of rural land includes place specific uses such as wildlife habitat and ecological preservation, it is the tension between the historical emphasis on maximizing grain production and the current dominance of land-development as a source of local government revenue that makes farmland a type of sociospatial Möbius strip: a single-boundary object with multiple contradictory dimensions. The intensity of the contradictions contained within it is evidenced by the political justification given to dispossession as necessary for environmental governance and for urban-industrial modernization.

This chapter puts rural land at center stage in examining green development and the construction of environmental value in China. With over 300 square kilometers of rural land enclosed since 2006, green development and eco-urbanization in Yixing lie explicitly at the intersection of national land management policies and processes of urban and industrial expansion at the local level. The National Farmland Preservation Policy and the National Land Use Master Plan are, in this particular case, immediately relevant given that they constitute the regulatory framework that shapes practices of urban-rural integration and ecological resource planning.

I then analyze multiple dimensions of green development in Yixing's "urban–rural integration master planning" (*chengxiang yitihua zongti guihua*). Looking at the constellation of issues emerging out of a project for a new city center, this analytical effort begins by considering the experiences of social-environmental dislocation that green development entails. In the following two sections, I provide an examination of quota allocation mechanisms for governing and rationalizing rural land and document how environmental values are constructed and circulated through the institution of this system. A detailed account and analysis of the government practices in these processes will be the subject of Chapter 5. The fourth section of this chapter provides an analysis of how urban villagers are themselves refigured in the process of eco-urbanization.

The land regulation regime has been critiqued as riddled with opportunities for arbitrage (cf. Ho and Lin 2003) and institutional failure (cf. Lichtenberg and Ding 2008). However, this dominant understanding implies a one-way hierarchical relationship that is 'gamed' or 'negotiated' by local authorities. In my analysis, the central policy construction of ecological quotas and their implementation at the local level are productive of social-environmental relations in refigured "rural" and "urban" spaces.[55] I

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environment" of agricultural production. These broadened environmental resource concepts are reflected in the 1998 merger of Ministry of Geology and Mining, State Administration of National Land, State Administration of National Oceans, and State Bureau of Surveying and Mapping to form the Ministry of Land and Resources. See also, the inclusion of land in "environmental resources" in regulations under the Ministry of Environmental Protection, e.g. in 2009 guidelines for environmental impact assessment in land use planning.

[55] For application of a broad array of such ecological quotas (*shengtai zhibiao*) as integral to sustainable development and urbanization in Yixing, see e.g. (ESTP 2012).

argue that the local implementation of such policies through various quota systems and their associated practices of measurement and accounting construct the substantive material bases of the objects to be governed. Paradoxically, in order to "preserve" its environmentalized value, rural land is constructed as a fungible quantity, divided from its place-specific ecological attributes. Conceptualized as an exchangeable "resource", rural land can be instilled with different functions (grain basket, construction land) and attributes (inhabited, marginal, urban) that are equally divisible and locatable as objects. Thus, environmental resources and services (such as those associated with a wetland) are themselves not taken as intrinsic to a particular quantum of land, but as discrete forms of designated, designed and constructed environments (these latter practices are examined in Chapter 6). In short, rural land is stripped of its previous social-environmental relations, and fundamental categories of rural sociality—farmers, agrarian production, and villages—are refigured in the process.

Experiences of Green Development

The Zhaos were evicted from their natal Fenzhuang village, three kilometers to the northeast, in 2008. For more than two years, they rented temporary housing in a village to the east, just beyond the maw of Qingyuan's eastward extension to Taihu Lake. At the time I interviewed them in April 2011, they had been resettled in Dongjiao Gardens for about eight months. Despite the official narrative of the "Dongjiao paradise" described in this chapter's epigraph, the Zhaos and their neighbors experienced years of uncertainty and insecurity as a result of their displacement. "We still aren't used to this place," the elder Zhao Ge commented. "What is there to be accustomed to? This place will never be complete," raising his chin to the backhoe, Zhao Di finished his statement with an *ahh* that mixed a tone of resignation with a hint of the interrogative. They explained this experience of dislocation in two ways.

First, their resettlement had been fraught with delays, broken promises and financial difficulties. Although regulations stipulate that resettlement housing for people displaced as a result of land expropriation should be completed before eviction occurs, this has yet to happen in Yixing's eco-urbanization. Rather, the dispossessed receive a cash payment for "transition expenses" (*guodu fei*) that is supposed to cover moving and rent costs. Like most in Yixing, the Zhaos' lump sum *payouts* were calculated on an eighteen-month waiting period and payment for the additional six months of delay were not settled until after they moved to Dongjiao. Moreover, the 450 RMB (65 USD) per month that the Zhaos received did not cover a typical rental in the area, which averaged 500 RMB (72 USD) per month by 2009 and 650 RMB (94 USD) by the end of 2010.[56] Once they received ownership of their apartments, there were further costs as the units were delivered as bare concrete boxes. There were no windows or finishes, and only utility stubs. These shortfalls and increased living costs for electricity, cooking fuel, water and food meant that during the entire period of "transition," the Zhaos had to spend

[56] Unless otherwise noted, approximate dollar estimates given at the 2008 average exchange rate, 1 RMB = .1439 USD.

their savings and take up landscaping piecework "greening" the roadsides in the Zone for 50 RMB per day.[57] The point here is not merely to convey that the Zhaos and their fellow evictees met hardships and exploitive conditions. Rather, the objective is to show how these conditions are features of the social-environmental processes of refiguring the rural in the project of eco-urbanization. In addition to the dynamics of enclosure in the classical sense of dispossession from land and livelihoods, the "compensation" scheme also serves to *enclose* cash savings that were originally intended only for retirement and emergencies. In this regard, the cash savings of many rural households is *re-commodified* as capital for circulation in this system of real estate financing.

This leads to the second aspect of the Zhaos' experience of 'incompleteness': the literal unmaking of their social-environmental world in the transformation of the rural landscape. Zhao Di's remarks referred not only to the under-construction environs of Dongjiao Gardens, but to the larger eco-city project and the encompassing special economic zone. While they had been evicted over two years prior, their land had yet to be scheduled for development. In fact, the Zhaos and their neighbors frequently returned to their former village. Peddling an hour, they went back to the site of Fenzhuang once or twice a week to tend the vegetable gardens on which they still depended for subsistence. In the evening, they would tricycle a small harvest back to last the days until they returned. The brothers complained that their vegetables were not as they had been before their eviction. "They don't taste good, they're yellow and they rot quickly." They attributed this degradation of their food to the intermittent care, but emphasized changes to the soil and water resulting from the demolition of the village and ongoing construction projects.

I met other former residents of Fenzhuang who did not experience similar crop damage. Through discussions with evicted residents and observation of villages undergoing demolition, I found that such effects were unevenly distributed as the direct results of changes to the village landscape. Citing how cadres and some families benefited from the process of village eviction and demolition, the Zhaos and other villagers were clear in identifying these evolving landscapes as manifestations of a process of development that was socially uneven and politically determined. For example, the processes of eviction, demolition, compensation and resettlement are not uniform across all household cases. In anticipation of eviction, some families were allowed to establish separate householder registrations for each member of the family. This enabled each to collect transition and relocation compensation. Other village residents secured permission to expand the area to their homes in order to maximize compensation paid by the area of living space in each home. Village cadres and those close to them were able to negotiate their compensation packages in advance of the notice given to other villagers. By the time the demolition and eviction company was dispatched to deliver notice and document property for compensation to the majority of residents like the Zhaos, many well-connected households had already signed their papers and

[57] In May 2013, Yixing was named a National Greening Model City for its afforestation work, including a 1,333 hectare "green screen" on the shore of Taihu lake (Min 2008).

received their settlements. This dynamic was common in other cases. For example, in Shangtang village, the village head had purchased a new home closer to the center more than nine months before the common notification process began.[58] This meant that the Zhaos and other less politically connected villagers had comparatively little time to find transitional housing and otherwise prepare for eviction.

The timing of resettlement relative to eviction is also critical to the experience and long-term outcomes of individual households. With months of advanced mobility, some families actually profited directly from their neighbors and evictees from other villages by becoming rentiers. These differences in experience have significant direct impacts on household level outcomes in relation to the village landscape as some households benefitted from the process of demolition itself. During the course of the demolition process, subcontractors for Beijing Construction used the property of the first homes to be destroyed for staging.[59] For example, subcontractors used partially demolished village space to cast concrete and process quicklime for road cement. In the process, many irrigation ditches were filled, while others were polluted with alkaline silt and the debris of 'land development.' In this way, the transforming rural landscape became a medium through which the uneven effects of its political economy were *made and distributed as environmental*. Here, I mean to call attention to how social inequalities were unevenly reproduced in the physical environment, and how this process likewise continued to reshape differences in social and environmental experience.

These experiences of refiguring the rural demonstrate that eco-urbanization in Yixing is not merely a question of physical environments, but that rural residents endure and take part in a years-long process of becoming urban and becoming green. The Zhaos' story presents basic empirical questions about the temporality of change and development in the region. Why was the land requisitioned at that particular time? To answer this, it is important to call attention to the multiple dimensions of rural transformation that were underway. I have briefly touched on dimensions evident in the landscape, including the changes to livelihoods and subsistence. Less visible, however, are state mechanisms for governing rural land and constructing its environmental value, and relationships to official goals of modernization and progress.

The official categories of rural land and rural society have been fundamental to state-society relationships ever since the revolution. Historically, the primary axis of this relationship centered on questions of production and national development. In policy, the urban-rural divide was made evident with the household registration system, which tied

[58] (Interview 20101020_STG.1, 20101020_STG.2, 20101020_STG.4)

[59] This work took place under the management of Beijing Construction, a major state-owned enterprise. The Zone signed a build-transfer contract with Beijing Construction to complete all of the major infrastructure and much of the architectural construction within the Zone. This financing model is increasingly common in China and directly links local state-led rural land dispossession and speculative urbanization to large construction-finance institutions with strong ties at the central government level. As such projects are increasingly embedded in the portfolios of large banks, this dynamic raises important questions about the valuation of land development projects and the stability of China's financial system.

people to their places of birth and restricted migration from the countryside to cities, and the constitutional definitions of socialist ownership of all land, under which urban land is controlled by the state, and rural land is held directly by collectives. In recent times, a new system has emerged to refigure rural land allocation according to new environmentalized rationales. This system and its social–environmental effects are the focus of remaining sections.

The Quota System and Consolidation of Village Lands

The emergent model of eco-urbanization in China is centered on urban-rural integration with ostensible improvements to infrastructure and the human environment.[60] Yixing's eco-city project is only one piece of a larger master plan that includes two national state-level special economic zones that target the development of environmental industries, the establishment of environmental buffers, and the promotion of intensive non-village agriculture. In order to move such disparate objectives forward, local authorities receive quotas for converting rural land for use as construction land by the national government. Given that the vast majority of land in region was primarily designated as rural land held by collectives, the Yixing government has, under the emergent model of green development in China, always had to requisition village construction land and farmland to meet its non-rural land use needs.[61] As conversion of farmland is more strictly regulated, and must conform to farmland preservation regulations, official permission for conversion is increasingly difficult to obtain. Under law, "replacement farmland" must be constructed before conversion of existing farmland takes place. This leads authorities to rely on the "consolidation" of villages into new settlements as a means to control the total land supply within their jurisdictions under an green development rationale.

The most direct path for local authorities to achieve such rationalization entails taking over village-held construction lands and resettling residents into dense housing districts like Dongjiao Gardens. The practices entailed in the take over and conversion process will be discussed further in Chapter 5. The objective of this process is to allow construction projects to proceed elsewhere. In Yixing, like elsewhere, such transfers of village construction land and their subsequent consolidation for producing farmland quota do not follow an observable geographic arithmetic. Shang Qi, a staff member in the subdistrict office of the Yixing Bureau of Land and Resources (BLR) who is responsible

[60] These physical aspects are frequently conflated under the concepts of eco-city construction in China. A prominent example here is the Shanghai 2010 World Exposition slogan: "Better City, Better Life." There are also distinct cultural terms associated with greening such as "ecological civilization" (*shengtai wenming*) and "ecological living" (*shengtai shenghuo*). These ideas are highly aestheticized and are used to refer to cultural values of environmental consciousness as well as to refer to an improved quality of life.

[61] According to the Yixing 2006-2020 Land Use Master Plan, the total land area in Yixing in 2005 was 217,742.82 ha, of which 55 percent was classified as agricultural land. Of 30,831.90 ha of construction land, nearly 60 percent was held by village collectives, 32 percent was in townships, and less than 8 percent was classified as urban land under the direct planning authority of the municipal government. The plan has the goal of reducing village construction land by half by 2020 (Yixing BLR 2010a).

for handling many of the Zone's land use requisitions, explained that even intra-locally a unit of farmland converted to other use cannot always be tied to a specific corresponding unit of replacement farmland. Even to local BLR functionaries like Shang, the practice of balancing quota allocations is an opaque matter. This is due to the fact that while localities strive to maintain a net-zero loss in farmland, the province does not equally allocate construction land and farmland protection quotas to ensure "dynamic balance" over a given planning period.

In a place like Yixing, where demand for construction land is high, local staff facilitate the process not only through the transfers of village construction land mentioned above, but also by maintaining an under-reported positive balance of quota.[62] That is, the local BLR maintains a surplus of replacement farmland that is produced through village demolition and that is not immediately reported in official documents at higher levels of the ministry. To illustrate this to me, Shang handwrote a ledger for ongoing replacement farmland quota production in seventeen villages. These quota are also 'produced' by utilizing "consolidated" village lands, available for reallocation following eviction and demolition. In the car park outside the offices, beneath a billboard that read, "use land frugally and intensively, hold fast to the farmland redline," Shang showed me that the total 'production' exceeded the official current tally for those villages by 261.62 hectares. In four other land consolidation projects for completion in 2012, Shang expected to tally 783.56 hectares of village farmland and 376.05 hectares of village construction land. Such 'surplus' land allowed the municipal BLR to confirm that construction land quota was on hand. More importantly, this practice of accounting for "replacement" farmland allows the BLR to facilitate project approval where farmland conversion is occurring. Shang described this as "circulating farmland" (*liudong nongtian*), calling into sharp relief the notion that land could "travel," and its environmentalized value as represented by the quota system could be made fungible.

As I left the BLR compound, I pondered the red character slogan painted on the wall: "All people participate in founding the ecological city."[63] What types of "participation" are elicited by Yixing's green development? Elsewhere in the Zone, dozens of construction projects were in varying stages of being imagined, planned, approved and built. Among these were three solar photovoltaic cell and panel manufactories that had just been sited on village lands enclosed in 2006-2007 (see Figure 3). The Zhaos, their village cadre leaders, and workers recently hired into new green industries all have divergent experiences of participation. Read with an imperative overtone, the slogan calls attention to the differential treatment and outcomes experienced by "all people." Moreover, this generalized process of "founding the ecological city" papers over the fact that such differently situated social actors and processes also produce a range of long-term effects. These are social–environmental fissures in the foundations of the ecological city that are visible in the landscape, and have material effects that have

[62] Interview (20101111_BLR.1)

[63] *Quanmin canyu chuangjian shengtai shi*

not yet been understood and accounted for in relationship to goals of sustainable development.

To return to the issue of farmland, while the delicate geography of "dynamic balance" is not clearly mapped, its uneven spatio-temporality is quite observable in the enclosed but undeveloped village lands piled with rubble and the proliferation of approved but unconstructed projects on fallowed fields that are made equivalent by the operation of the quota allocation system (see Figures 2.2, 2.3).

Constructing Environmental Values for Rural Land Quotas

How do such practices of village land consolidation gain political viability at a time when there is increasing conflict and central government concern over land dispossession in rural China? It is my broader argument here that in facing its environmental crises, China's land regime has sought to maintain local level economic growth and competition while balancing agricultural land loss by constructing rural land as a national-scale environmental resource. This is accomplished in part by giving localities de facto authority to reorganize agricultural production and to sever existing rural social-environmental relationships. In this sense, the refiguring of the rural and the environmentalization of agricultural production is a condition of China's postsocialist political economy.

The quota systems for arable land, prime farmland protection and replacement arable land, serve here as a clear examples: the ultimate object of central policy on farmland protection is not any given site of farming, but a national aggregate indicator of capacity.[64] This emphasis on a single metric has roots in Mao era efforts to expand farmland through massive landscape transformation projects during the infamous Great Leap Forward. But the reliance on arable land *area* as the definitive indicator of production capacity has a more recent history embedded in the neo-Malthusian imagination. Calculations of population growth and strains on economic production have been debated in China since the late-1950s.[65] With the publication of *Who Will Feed China? A Wake-up Call for a Small Planet*, Lester Brown (1995) renewed international concern over global "carrying capacity" and called attention to China's rapid loss of farmland.[66] The Chinese central government responded by initiating a land survey that was completed in 1996, and revamping the fragmented land regulation system. The 1998 Land Administration Law produces centrally legible and allocable national land resources. This universalizing grid would also ostensibly protect villages from illegal

[64] Arable land and prime farmland protection quotas: *gengdi baohu yu jiben nongtian baohu zhibiao*; arable land (cropland) replacement quota: *buchong gengdi zhibiao*.

[65] For a definite history of China's ideological battles over Malthusianism and population science, see (Greenhalgh 2008).

[66] Expression of carrying capacity as a function of land area is now prominent in the concept of "ecological footprints" (Wackernagel and Rees 1996). For recent critique of the difficulties in reducing social-environmental relationships to a land-use metric, see (Van den Bergh and Grazi 2013).

dispossession by local level governments by requiring approved plans for farmland protection and conversion.

The limits set on conversion of farmland to other uses have been tied to calculations of grain production and food security since the 1997 to 1999 national moratorium on farmland conversion.[67] In 2006 this calculation was prominently codified in the national minimum "redline" of 120 million hectares of total arable land. The national land regime's main policy instrument for maintaining this threshold is the centralized and hierarchical distribution of quotas for planned farmland conversion, preservation and construction, briefly described above and elaborated in Chapter 5. Quotas are allocated by the Ministry of Land and Resources downward to provincial bureaus, which subsequently distribute targets for *producing* quotas of farmland to municipalities.

Quotas for farmland conversion are then distributed according to yearly plans, but must be cleared on a project-level basis by the municipality and passed up to provincial authorities for balancing at a net-zero loss. Complicating matters, the Land Administration Law divides farmland into two general categories of "prime" and non-prime.[68] Each jurisdiction must protect a minimum of 80 percent of its total arable land as designated prime farmland (*jiben nongtian*). By law, prime farmland must be delineated for protection in land use master plans and physically marked so that the public can readily identify the plots. Prime farmland is productive, well-irrigated cultivated land for crops and vegetables, and cannot be converted to other uses, not even aquaculture or orchards.[69] However, because exceptions are allowed in the law for key infrastructural projects, local governments began to devise methods for maintaining an amount of farmland that could be designated as prime to balance conversions. According to law, this practice requires the "construction," designation and protection in plans of additional prime farmland.

Within the provincial context, the Yixing region has the lowest per capita level of farmland at .031 hectares per person compared to a provincial average of .064.[70] Yet, Yixing is the main site for the maintenance of prime farmland quota in the western Taihu basin. The Wuxi Prefectural Bureau of Land and Resources calls Yixing the "primary battleground" for the protection of prime farmland and for the construction of replacement farmland (Wuxi BLR 2011). Sun Dian, the director of the bureau's

[67] Further national environmental rationale is also clearly evident in "grain for green" programs that remove farmland and rangeland from production for erosion control and anti-desertification. Grain for green afforestation projects are increasingly monetized, including via global carbon credit markets. From 2006 to 2013, China registered five afforestation projects that will produce 8.8 MMTCOe in CDM certified emissions reductions by 2041.

[68] The term for "prime farmland" is also frequently translated as "basic farmland." In the MLR translation of the 1999 law, the term is translated as "capital farmland."

[69] The Land Administration Law further stipulates that state requisitions of any prime farmland, arable land over 35 hectares, or any land over 70 hectares also require approval by the State Council.

[70] Jiangsu People's Government (2009).

agricultural land planning and protection department, emphasizes that the location of prime farmland should be maintained, its quantity should not be diminished and its quality should be raised. These points all reflect basic policy on farmland protection at the national level. However, the eco-city planning efforts at urban-rural integration have aimed to justify rural land consolidation and prime farmland reorganization by furthering policies to improve agricultural land quality and efficiency of land use.

In order to skirt the policies on prime farmland protection, the Zone has created projects for constructing "high standard prime farmland." Developed with engineered soils, the newly produced farmland has a status equivalent to prime farmland and can therefore be used to justify the "relocation" and "consolidation" (*jizhong*) of actual prime farmland, which by law is protected from conversion to other uses. Sun states further that the construction of such high standard farmland is aimed at intensifying production and generating economies of scale. He rhetorically emphasizes the notion that the farmland can be "moved and assembled" ("*ba nonyongdi jizhong*") (Wuxi BLR 2011). Moreover, Sun's discourse on land use efficiency and productivity discursively links arable land to the health and prosperity of future generations and the problem of "grain security" (*liangshi anquan*).

The operation of these movements for the purpose of balancing quotas, however, means that actual agricultural productivity becomes secondary to the availability of a plot of land for use in "construction" of quotas. For example, Yixing's original high standard prime farmland project was subsequently canceled when local government appointments shifted in 2012. While it has since been replaced with a planned project in conjunction with the Wuxi government, the temporal dislocation calls into question what is being "replaced" (*buchong*). This highlights the fact that replacement prime farmland may be fallowed or even low-grade land that has merely been designated as "prime." As a nationally scaled quantity, rural land is stripped of specific locational attributes apart from its jurisdiction. This means that features such as cropland productivity or irrigation are discounted. Stripped of its place-specific attributes (e.g. history of cultivation, productivity, market or another infrastructures, etc.), land is reduced to a fungible quantity and its environmental value recorded on paper for exchange through the quota system.

This provides us with a new perspective on green development. Yixing's process of eco-urbanization has relied upon an explicit "greening" of rural land that simultaneously upholds goals of agricultural production while denigrating smallholder production and livelihoods as environmentally inefficient. "Rural land" is refigured as a resource category, requiring active, direct state-led governance. As the producer of the largest share of the Jiangsu provincial replacement farmland quota in 2010 (Wuxi BLR 2011), Yixing is pivotal to the implementation of the Jiangsu provincial quota system and the ultimate accounting in the balance sheets of the central Ministry of Land and Resources. But the work of the Yixing local BLR in balancing land use conversion requisitions, consolidation and replacement projects is not limited to fulfilling its quota obligations. Rather, the BLR helps to create environmentalized policy justifications for

requisitioning village construction land and for the conversion of prime farmland to other uses that extends the local governmental role far beyond rote implementation of central policy. This means that the work of municipalities in developing the quota system for managing land supply shapes the substantive basis of what central land policy is actually governing.[71] It also allows us to understand how quotas for rural land use and farmland conversion enmesh land into an ecological game of net sums.

Observing the politics of land administration, both village residents and government officials readily identified how the work of the Yixing BLR plays two separate roles at the intersection of horizontal–municipal and vertical–ministerial agendas.[72] At the local level, the BLR accounts for land resources and quotas, facilitating project approval for land conversion. Under the centralized bureaucracy, the BLR ensures that replacement farmland quota obligations are met and that protected prime farmland is not converted to other uses. Rural residents frequently attribute the failure of the government to enforce regulations on illegal farmland conversion to corruption. Villagers spoke daily about how a good deal of land churning is enabled by collusion between township, subdistrict and village officials with local bureaus of the Ministry of Land and Resources (MLR), who frequently adapt implementation rules to the specific needs and conditions of local government development projects. For instance, the BLR and the Yixing municipal authorities failed to notify village collectives of protected prime farmland locations and to clearly mark their boundaries. Although local governments in the high-growth Yangzi delta region have procedures for securing exemptions to prime farmland protection, such a lack of public information reduces the chances of organized opposition to prime farmland conversion by local collectives. Without such basic

[71] Wang et al. (2010: 457) cite Jiangsu and Shanghai as the originators of rural land consolidation policies in the late 1990s that enabled local governments to exceed allocated quotas for construction land. Although the 1998 Land Administration Law includes broad provisions for converting farmland outside of approved master plans (see Article 58), and encourages rationalization for efficient village land use (see Article 41), these practices still require notification to the State Council. Wang and Bai (2011) cite a 2006 pilot provision by the MLR to allow intra-jurisdiction rural land consolidation to be "transferred" to offset urban demand for construction land quota in Jiangsu, Shandong, Tianjin, Hubei and Sichuan. This pilot program was extended to the rest of the country in 2008 (MLR 2008b).

[72] China's bureaucratic matrix is organized around vertical central government ministries known as "strips" (*tiao*, e.g. the Ministry for Environmental Protection, the Ministry for Land and Resources, etc.) and horizontal territorial jurisdictions known as "blocks" (*kuai*, e.g. provinces and municipalities). Theoretically, provincial and local level bureaus report to their respective ministerial hierarchies, while territorial blocks are administered by the people's government of that jurisdiction. The system is further complicated by the embedded structures of the Communist Party. As a result, ministry bureaus do not have binding authority over the regional governments within corresponding hierarchical levels (Lieberthal 2003).

Local governments must also conform to the policies of larger subsuming governments. For instance, Yixing, a county-level city, falls under the jurisdiction of the Wuxi prefecture level municipality, which is under Jiangsu province. Local units, such as Yixing's government and its separate SEZs, operate with a great deal of autonomy in pursuing various results-oriented policy goals ranging from GDP growth to farmland preservation.

information, villagers are unable to mobilize the full weight of the law to protect their prime farmland tenures.

Local officials themselves frequently comment, *shang you zhengce, xia you duice:* "above, there is policy; below, there are strategies." For instance, in order to "relocate" and "improve" prime farmland, the Yixing government devised a project to construct "high standard prime farmland" in conjunction with an "ecological withdrawal of farmland." The high standard farmland project was to draw large capital investments to construct model demonstration fields for intensive "modern" cultivation methods. Such scientific research applications fall within the designation of prime farmland and led to quick approval. Furthermore, the scheme was approved for implementation in large part because the prime farmland to be "withdrawn" had a nationally recognized environmental function. Over 800 hectares of village agricultural land, the holdings of over 2500 households, were converted as part of a project to construct a 2,667 hectare buffer and "ecological lifestyle" park between the Zone and Taihu Lake (Liu 2010; Min 2008b). The lake ecological zone project, supported by Premier Wen Jiabao, is planned to ring the lake with 200 to 1000 meters of "recovered" forests, grasslands and wetlands, with a stated policy goal of constructing a model eco-tourism industry.[73] In other cases, conversion quota held by Jiangsu provincial government was allocated to the Zone in order to facilitate joint venture projects. In one instance, this strategy enabled the Zone to provide guarantees regarding land allocation and construction timelines to a German technology company invested in the construction of a next-generation solar manufacturing facility.[74] Land subsidies, facilitated project approval and the longer term infrastructure development presented by the eco-city model also won the establishment a national solar photovoltaic (PV) manufacturing and research base for Guodian, one of the five national state-owned utilities.[75]

Whither Paradise? The Social and Economic Outcomes of Dispossession and Relocation

When construction and resettlement are completed, Dongjiao Gardens will house about 15,000 dispossessed residents from seven villages within the Zone. Almost all of them had resided within the 22 square-kilometers requisitioned for the first phase of the Zone's eco-city project, dubbed the Scientific Innovation New City (*ke chuang xin cheng*).[76] Regardless of official representations such as those in the chapter epigraph, the Zhaos will experience this new "paradise" as remote and incomplete in physical and

[73] (Wuxi Municipal Party Committee 2009)

[74] (Interview 20100521_YXZ.1)

[75] Through 2012, the three successive phases of the Guodian projects have brought over 12 billion CNY (1.8 billion USD) of investment to the Zone. The combined manufacturing capacity of the Guodian projects reached 800 megawatts of PV cells and modules in 2012, an increase of 60 percent over 2011 that brought the Zone's total manufacturing capacity to over 3 gigawatts—about 10 percent of the 2012 national total.

[76] The project name plays on the use of the character for "new" (*xin*) in joining "creation and innovation" (*chuangxin*) to "new city" (*xin cheng*).

cultural terms. Dongjiao sits miles beyond the eastern fringe of the urban core and currently comprises an isolated grid of residential blocks with almost no planned services. Approximately 35,000 more dispossessed will be housed in three other resettlement districts in the Zone. These projects transpose previous patterns of urban-rural inequality into new spaces of peri-urban segregation.

With the loss of access to land and livelihoods, villagers are forced into a new more proximate and yet more explicitly marginalized relationship with the city. In some cases, dispossessed villagers are commonly referred to as a new "underclass" with "three withouts": without land, without work, and without social benefits. [77] Moreover, a class of "four withouts" is also emerging as some villagers lose the permanent housing that was a supposed entitlement of collective property. Because the compensation system requires dispossessed families to pay for the difference between the "market prices" of their demolished homes and their relocation housing, many families are frequently impoverished in the process. Poor families are frequently unable to pay the fees, and they lose the "compensation" for their demolished homes in the process, as the money is tied to a compulsory mortgage system for the relocation housing. Thus, some families are left with no option other than to attempt to sell the property through a broker. However, as no market exists for the resettlement housing apart from renting to recently displaced families, this is generally unsuccessful. Many families are forced to purchase a home further outside of the city. Others may move in with relatives as circumstances allow.

In discussing the green development rationales of improved living standards, new industries, jobs, grain security and environmental protection, the Zhaos and other older villagers display a remarkably sanguine view of social progress in spite of a perceived inevitability of dispossession and potential hardships for "us common folk." Although they have virtually no chance of securing permanent employment in the Zone (even in services, much less in one of the new "greentech" industries), they expect that their children will do better. Nonetheless, in describing the actual processes of eviction, compensation and resettlement, many expressed outrage over the violation of their property, rights and dignity, and incredulity over the exclusion of farmers from "professional agriculture" as production is reconfigured around large scale, high yield cultivation methods.

As we made our way to site of Sizhuang village where Mrs. Yang, the Zhaos' neighbor in Dongjiao Gardens, returns every other day, she recounted that she was notified of eviction only a month before the harvest season of 2008. Mrs. Yang explained:

> We tried to appeal to the leaders to delay the demolition a few weeks… They won't listen to reason... Our village chief is a good person, but the cadre at the head of Xuewei [the administrative village]—he doesn't know us and we don't know him… Even before we signed the papers [for

[77] Solinger (2006)

> settling compensation], we were told that they had already contracted our farmland to a woman from Zhejiang.

For leasing her household's farmland, the Yang family receives 400 CNY (58 USD) per year from the Yixing government, and 250 CNY (36 USD) from the contract farmer. However, like many households in the region, they still produced primarily for subsistence. Zhang Ting, the contract farmer, leased paddy fields to grow wheat and rice from three villages totaling over 8 hectares (roughly the holdings of 60 families). In 2010, her market price and contracted procurement price by the State Grain Reserve rose about 30 percent over the previous year. Because of her economies of scale and the spike in prices, she earned 61 percent more per unit area compared to the villagers who harvested in 2008 to 2009.

Retreading her two-year path through decorative landscaping of flowerbeds and pre-grown trees that fringe the rubble of her village, we passed beneath a billboard that proclaims: "New Talent, New Industry, a New City." Yang set a tattered plastic bag with a small trowel and a clipper on the edge of her vegetable patch. Beyond a mound of broken weeded bricks, she pointed and blinked at what appears almost as a mirage: a bright green-yellow field of mature rice. "Mrs. Zhang will be coming to harvest very soon. She owns tractors and will bring five or six workers to finish it very quickly."

Chapter 2 Figures

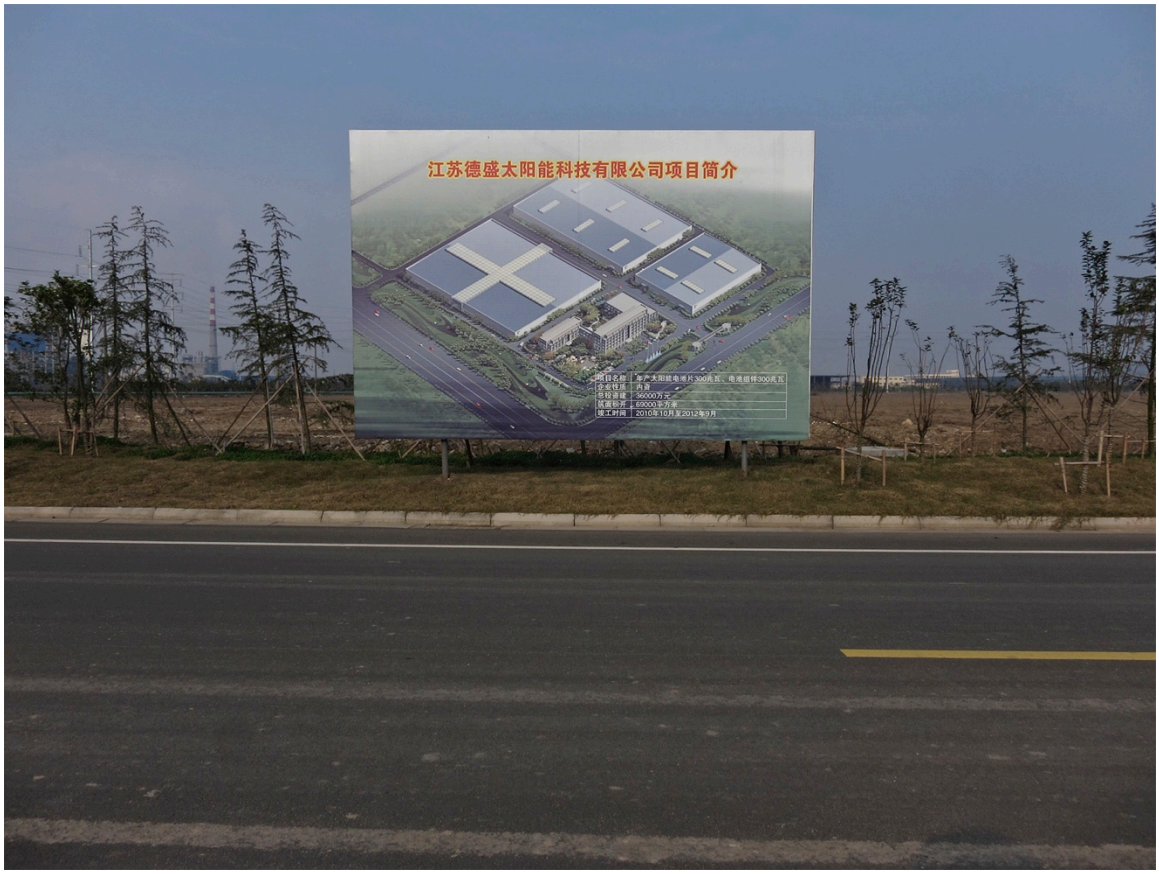
Figure 2.1 The Zhao brothers' view at the entrance to Dongjiao Gardens

Source: Jia-Ching Chen, 2011

Figure 2.2 The site of Sizhuang village

Sizhuang village, in the eastern district of the Zone, was demolished in 2008 to make way for Dongjiu Boulevard, which runs along the western edge of the Dongjiao Gardens resettlement estate. A pile of trash and leftover rubble from the village remains. This 2010 billboard reads: “Build talented heights, construct technological heights, lead industrial heights.”
Source: Jia-Ching Chen, 2010

Figure 2.3 The site of the Desheng Solar Technology Company.



One of three adjacent solar technology projects approved for construction in 2010. Altogether, the projects were granted 13.5 hectares of village land cleared in 2006-2007 and totaled 1.12 billion CNY (approx. 165.42 million USD in 2010) in investment. Originally slated for completion in 2012, only the building pictured at the upper corner of this rendering was constructed as of January 2013.
Source: Jia-Ching Chen, 2010

Figure 2.4 Fallowed "Farmland"

Over 3 hectares of farmland fallowed since 2007 because irrigation was cut off for infrastructure construction. The area is still held by the village collective and it is still classified as "prime farmland" as it had not been converted to another use as of 2013.
Source: Jia-Ching Chen, 2011

Figure 2.5 Rice Fields in the Zone

These rice fields belonged to residents of Shangtang village. The photograph was taken in September, 2010, just two weeks before the first round of demolitions began in the village. Most villagers were unable to reap this last harvest and were forced to sell the grain only month later.

Source: Jia-Ching Chen, 2010

Figure 2.6 Kobelco "Green Future" Advertisement

This Kobelco advertisement was common throughout Shanghai and Beijing, as well as in Yixing in 2010 and 2011. The caption reads, "a green future is deepest in my heart." This image of a child drawing an idealized natural landscape with the presence of the backhoe suggests a cultural narrative of creative destruction to achieve the "green future," or—at least—that it must be constructed. This photograph was taken in the Shanghai subway system.

Source: Jia-Ching Chen, 2010

CHAPTER 3
Commonplace Greening in Rural China: Yixing in National and Regional Contexts

> *Upon completion of this project, Yixing will comprise the "Five Centers" of the national environmental industry, and will become the window open to the world, a pilot area for deepening reforms, a model zone for technological and economic integration, a pioneer area for introducing new high technologies, and a new city of modern socialist civilization with first class management and an exquisitely beautiful environment.*
>
> — The Priority Programme for China's Agenda 21[78]

Yixing is a site of what I call "commonplace greening" in China. Its projects are not internationally known and reported. Yixing does not grab headlines. Rather, it is a site where multiple catchphrases of green development have attained authority in local government processes of development planning. It is a place where it has become common sense to join eco-city construction to the pursuit of rapidly expanding markets in environmental commodities. In this sense, Yixing is not a "model" in the sense of a leading example. Instead, it provides a paradigmatic standard, or a devised display of what is understood to be "correct." The processes of constructing Yixing as a model of commonplace greening are thus embedded in the production of green development ideology and the particular social relationships thereby enacted across urban, regional and national scales.

As discussed in the previous chapter, local authorities and politics shape processes of rural transformation in such a way that no single case is representative across China. Nonetheless, I argue that green development in Yixing unfolds as a state-designated space of policy modeling. That is, green development has emerged in Yixing within the context of multiple national mandates on industrial restructuring, rural development, energy resources and environmental governance. Yixing's green development also integrates global markets and national policies for renewable energy. Between 2007 and 2011, the Zone rapidly constructed approximately 5 percent of the global manufacturing capacity for photovoltaic solar panels. Moreover, Yixing enrolls both provincial and national political support as a model of green development by conforming to new forms of administrative standards and territorial definition, such as its designation as a National Model Experimental Sustainable Development Zone in 2009 (see Table 3.1).

Yet, even as Yixing is an undoubtedly important site of provincial and central government initiatives in green development, I would like to focus here on how the initial *local* government decision to pursue green development strategies is telling of the importance of green development as an idea. Moreover, I contend that the "mobile" aspects of policy emerging out of the different national mandates are predicated on representing the rural as a necessary site of urban environmental intervention. This argument was introduced in the previous chapter. I extend it here to highlight how green

[78] ACCA21 1993. The Construction and Management of the Yixing Industrial Park for Environmental Science and Technology (宜兴环保科技工业园的建设与管理). Beijing: State Science and Technology Commission, PRC, http://www.acca21.org.cn/pc3-5.html.

development ideology prioritizes concepts and practices rural environmental change that evidence *transformation* and *rupture.* This approach to completely reimagining rural society and space according to a green development ideology precludes policies for integral and continuous improvement that could be more amenable to maintaining the occupancy and tenure of existing residents. Put simply, greening is not compatible with existing forms of rural space and society.

With this in mind, this chapter introduces the main empirical case of this dissertation and argues its significance within local, national and global contexts. It analyzes the making of commonplace greening as a dynamic relationship between (1) the production of social norms and values in making the meaning of greening into common sense; (2) the instantiation of green capitalism within nationally and globally scaled projects of energy production and environmental governance; and (3) the construction of green urbanism—as *the* form of modernity—in the building of Yixing as a place that embodies such commonsense values and their economic expression. Different aspects of these processes and their outcomes will be explored in further detail in the subsequent chapters.

Narrating Contemporary Green Development in Yixing

Contemporary Yixing grew from a historic water town on the western shore of Taihu Lake (see Figures 3.1, 3.2). Some of its townships were established more than 2700 years ago. In fact, the Taihu (also commonly referred to as Lake Tai) region, has been one of the most densely populated regions of the world for over 1000 years.[79] In his history of environmental change in China, Elvin (2004) demonstrates how the larger Yangzi delta has been the site of intensive engineering and management since the late Tang and early Song dynasties (ca. 900 CE), when levees, seawalls, and wetland drainage transformed the landscape for the purpose of extending human settlements and agricultural land.

Nowadays, in contemporary Yixing, picturesque rural villages are still laced by small streams, ponds and irrigation canals that feed some of China's most productive farmland. The urban core, now centered on a shopping and leisure development district, fills an area between two lakes and is traversed by a grid of canals that are currently used to move industrial freight and raw materials to feed the local construction boom. Administratively, Yixing is a county-level city in the Wuxi prefecture of Jiangsu province, consisting of an urban core of 66 sq-km within a total administrative area of over 2000 sq-km (Figure 3.2).[80] During the past decade it became the eleventh largest city in Jiangsu with a total population of 1.27 million permanent residents, of which

[79] The basin extends south to Hangzhou Bay, the mouth of the Qiantang River and the Shaoxing plain.

[80] According to the Jiangsu Statistical Bureau, the total administrative area of Yixing in 2010 is 1996.6 sq-km, revised from an earlier measurement of 2038.7 sq-km in 1999. In the Yixing Land Use Master Plan 2006-2020, the Yixing BLR (2010a) uses a 2002 measurement of 2177.43 sq-km. A portion of the discrepancy is in the alteration in the amount of Taihu lake surface counted in Yixing's jurisdiction. According to the Land Use Plan, approximately 1570 sq-km of the total area is land.

about 570,000 are members of registered urban households. According to the 2011-2013 National Bureau of Statistics' "100 Strong Counties" rankings list, Yixing is ranked the fifth most economically competitive county-level city in the country.[81]

On paper Yixing may seem like any number of small cities in the Yangzi delta region. Over the past thirty years these "third tier" cities resorted to township and village industrial subcontracting networks to fuel the rapid economic growth of both the Shanghai metropolitan region and the industrial cities of neighboring Jiangsu and Zhejiang provinces.[82] Just like Yixing itself, many of its neighbors have been attempting to make their own stakes in the global green economy through the provision of incentives to targeted industries, especially in solar photovoltaics and the broader fields of optoelectronics and "new energy" industries (Table 3.1).[83] Nonetheless, as we will see below, Yixing is exceptional as a site of multiple waves of green development. These have been closely tied to central government initiatives, to China's overall participation in global environmental norms and to its emerging position within global markets for green commodities.

In fact, Yixing is at once a typical Yangzi delta locale and a city uniquely endowed with a particular cultural heritage. This legacy has made its rise as a national center of environmentalization a type of teleological certainty. These counterpoints of Yixing's cultural "uniqueness" and its commonplace regional rural attributes highlight the perception of historical agency. In place marketing and investment guide materials, the local government highlights the historical roles of "scholars" and "mandarins" as leading Yixing through ideals and values. The discourse argues that the contemporary mandarins are socially responsive state actors hewing to a tradition of environmental thought. This construction of culture as a way in which the relationship to the environment has been valued, elevated, understood and represented in discourse and practices is central to how local state authorities have conceived of the larger project of greening not simply as one of industrial transformation, but of place making and cultural production.

Yixing's status as China's "hometown of environmental protection" (*huanbao zhi xiang*) is narrated as the culmination of key interventions into the cultural-environmental milieu. Thus, cultural politics and social mobilization are seen as a necessary frontier of transformation in order to move from the environmentalization of industry to the production of a new sociality and Yixing as its natal place. Yet, as I will show in the

[81] Jiangsu has the second largest provincial economy after Guangdong. In 2012, Jiangsu's GDP was over US$865 billion and had maintained a growth rate over 10 percent. In 2013, Jiangsu had 27 of the top 100 county-level economies, the most of any province.

[82] Bramall (2007). For a detailed account of the spatial character of the Shanghai, Jiangsu and Zhejiang subcontracting networks, see Buck (2002). Buck (2002: 3) cites Fei Xiaotong's (1986) seminal work in which he argues, "… the rural industries in southern Jiangsu have in fact formed a component part of the industrial system in cities. Neither can do without the other. The close relationship between the two is a natural result of the development of the regional economy."

[83] As previously noted, new energy industries are not necessarily synonymous with "renewable energy."

sections that follow, this birthplace—both in terms of its cultural understanding and its material endowments of place—have been constructed in a confluence of regional, national, and local policies and actions, as well as social and environmental transformations.[84]

According to the narrative told by the Zone leadership committee, Yixing's path to green development emerged as a natural consequence of its geographic and cultural endowments. The committee and local government officials argue that these cultural endowments are evidenced in a legacy of traditional Chinese arts, in poetry, calligraphy painting and especially in its tea culture, that demonstrate "forward" (*xiangqian*) ways of thinking about the human environment as an interaction between culture, social organization and the physical environment.[85] In this origin story of Yixing's green development success, these diverse and ephemeral elements of culture are raised alongside a narrative of Rostowian modernization in which Yixing has moved from an absolute reliance on extracting local natural resources to a knowledge economy focused on environmental concerns and technologies.

In one interview with Shi Yanwei, one of the Zone directors, he drew a diagram of Yixing's development trajectory, listing: "stone quarrying; purple sands; water pollution control equipment; new energy; new materials; [and] knowledge." He drew braces around stone quarrying and purple sands in the list, explaining, "as production and people modernize, they rely less upon their immediate environment for resources." He continued, "their labor, skills, and knowledge become increasingly important and then these things shape the places they live in."[86] In continued conversation about the Zone's efforts at master planned green development, I highlighted the contrast between Shi's description of these supposedly sequential processes and the temporal implosion of the Zone's rapid processes of dispossession and development. However, the Zone leadership sees no contradiction in these efforts per se. Rather, contradictions of rural transformation are seen as the peculiar burden and peril of local level government officials. These officials assert that the resolution of social contradictions is predicated on the overall success to generate development measured quantitatively in GDP growth and qualitatively in social acquiescence.[87]

The "Taihu Paradox": Rural Industrialization and Environmental Pollution

The emergence of green development ideology in Yixing is enmeshed in multiple contradictory and paradoxical movements. Before its ascent as a model of local and regional scale green development, Yixing was considered a case study in rural

[84] The role of these intertwined discourses of cultural heritage, leadership and values in shaping the green development will be examined in Chapter 4.

[85] (YXEDZ 2007, 2009)

[86] (Interview 20100521_YXZ.1)

[87] (Interview 20100907_YXZ.1, 20130112_YXZ.1)

industrialization. Describing it in opposition to the "Wenzhou model" of private entrepreneur-led growth in Zhejiang province, Fei depicts the “Sunan model” of rural industry in the southern Jiangsu as a cluster of collectively owned and state-run township and rural enterprises (TVEs).[88] Likewise, Bramall highlights the under-reported role of local government-owned manufacturing, which according to his numbers accounted for nearly 12 percent of rural industrial employment in 1996.[89] But the central government was never oblivious to this. In fact, during the early reform period the central government leadership held forward the success of these county owned enterprises (COEs) and TVEs as a model for decentralized development and urbanization. In 1992, the National Bureau of Statistics under Jiang Zemin promoted growth and inter-local competition through the inauguration of an annual ranking of county-level government economic performance, called the “100 Strong Counties Rankings” (*bai qiang xian pingbi*). Wuxi, then a county-level unit neighboring Yixing, placed first in the inaugural competition.[90] Yixing and its neighboring counties in the Taihu region rose quickly in the ranks, consistently entering the top-10 list of over 2800 county-level administrations.

This dominance of the Taihu region was a reflection of its early rural industrialization during the Maoist period. Focused on the key “five small industries” of cement, chemical fertilizer, iron and steel, machinery, and power,[91] heavy investment was in part enabled by a chronic under-regulation of environmental pollution.[92] Intended to provide benchmark comparisons throughout the country, the Taihu model of extensive industrialization relied on environmental regulation that was sufficiently frail to make household piecework and small-scale industrial production networks profitable.[93] This resulted in a high degree of agricultural land conversion,[94] which in turn led to higher intensity application of chemical fertilizers. In addition to the pollution produced by the petrochemical and textile industries, the high nitrogen and phosphorous agricultural runoff decimated fish populations and fouled rural and urban drinking water supplies in the Taihu basin.[95] By the 1990s, the Taihu Lake region was plagued by annual water

[88] “Sunan” refers to southern Jiangsu province. Fei Xiaotong (1986) identified the “Sunan model” as the “orthodox” model of post-Mao development and transition. The Sunan model consisted of collectively owned town and village enterprises as a primary engine for growth and industrialization. TVEs mobilized rural labor in industrial networks to distribute labor-intensive industries, while enabling economic growth and investment in major cities such as Shanghai. Fei described this model in distinction from the "Wenzhou model" of private entrepreneur-led growth in Zhejiang province.

[89] Bramall (2007: 61)

[90] NBS (2009)

[91] Bramall (2007); See Buck (2002) for an exploration of the importance of urban-rural links through industrial networks between Shanghai and the surrounding provinces.

[92] Chen (2009) [interview citation]; Zhang (2002).

[93] NBS 2009; Another factor was the extension of urban-rural industrial subcontracting networks seeking to reduce labor and other costs and pollution in Shanghai (see Buck 2002).

[94] The National Bureau of Statistics calculated that the top 10 counties lost 66 percent of their arable land by 2007.

crises resulting from cyanobacteria (blue-green algae) blooms and subsequent accumulation of cyanotoxins and microcystins that required entire water treatment systems to be shutdown. In July 1990, a large bloom led to a drinking water shortage and also affected the production schedules of 116 factories, resulting in direct economic losses of 130 million RMB.[96]

The fundamental contradiction between GDP-centric development policy and social and environmental protections persisted throughout the 1990s and into the new century. In 2007, record level contamination led to the "Wuxi drinking water crisis" with a blue-green algae bloom referred to as "sudden natural disaster" (*tu fa ziran zaihai*).[97] In April, local media reported that water supplies for over 80,000 residents were contaminated. By June, the bloom covered 800 sq-km of western Taihu.[98] The crisis and its contradiction between GDP-centric development policy and social and environmental protections became conspicuous and were subsequently highlighted by commentators, who condemned the rankings policy for promoting a GDP-centered approach to local government development policy.[99]

Most prominently, the editors of *Decision Making* (*Juece*) dubbed the contradictions made evident by the environmental crisis the "Taihu Paradox" (*Taihu beilun*), and argued that it "… crushes the model of 'the GDP victor is absolved from all responsibility', and [this reality] is a necessary factor in the reconsideration of the 100 Strong Counties Rankings."[100] In the academic community, similar concerns were expressed. Du Zhixiong of the Chinese Academy of Social Sciences noted that by focusing on GDP growth of only a small portion of the counties across the country, the rankings justify and reinforce the dominant paradigm of the overall model of growth-centered development.[101] In the face of this severe criticism, Premier Wen Jiabao cancelled the annual rankings process.[102]

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[95] Annually, 131,000 metric tons of carbon-dioxide, 31,000 tons of nitrogen, and 1,800 tons of phosphorous compounds were discharged directly into the lake and its river systems. Zhang (2002)

[96] (Liu 1997; Zhang 2002). Though far outside the bounds of this dissertation, I believe this history merits investigation as an undoubtedly rich story of human-algal relationships. The Taihu cyanobacteria blooms have shaped public policy discourse and debate on industrial pollution. The evolution of the colony is also likely affected by the changing seasonal loads (Paerl et al. 2011) and particular sources of nitrogen and phosphorous (personal communication with algae biologist, Dr. Robin Kodner). Utilizing the blooms as a source of biogas energy or as an "ecological service" in carbon sequestration has also been explored.

[97] (Zhang et al. 2010).

[98] Zhang (2007)

[99] Wang (2007)

[100] (Mu 2007). *Juece* is a high-circulation journal based in Hefei, Anhui Province that has become influential among policy makers. 当"太湖悖论"最终粉碎这种"GDP 胜利者不受谴责"的模式之后，对百强县的反思就成为一种必然。

[101] (Shenzhen Evening News 2007)

[102] In 1994, Wen Jiabao (then a central leader of agricultural, finance, and environmental policy) produced a commemorative work of calligraphy that emphasizes what he saw as the spirit of the Yangzi region. Its

Building China's "Hometown of Environmental Protection"

Yixing's claim as China's "hometown of environmental protection" is based on its long history in the field of wastewater handling and pollution control. The initial push in this direction took place in the early 1980s, when a small cohort of foreign-educated entrepreneurs returned to the city and identified the local environmental crisis described above as a major economic opportunity. In face of increasing deterioration, they sought and found the means to establish pollution control industries in both Gaocheng and Qiting. Taking advantage of the existing rural production networks by using collective land assets, while at the same time avoiding environmental and labor regulations, these new companies were able to adapt Yixing's machine tools industry facilities and build sufficient human capacity to produce piping and wastewater-handling components that could retrofit existing industrial systems. Slowly transforming the TVE model of production, they constituted a first wave of green development in Yixing, establishing it as the country's first environmental industry cluster by the end of the 1980s.

Gains from rural production networks were maximized in part—paradoxically—by avoiding environmental and labor regulations and by exploiting collective land assets. The State Statistics Bureau, SEPA and the Ministry of Agriculture conducted two national surveys of pollution from township and village industries in 1989 and 1996.[103] The second survey was aimed at setting baselines for pollution reduction. The surveys found that a majority of TVE polluters were collectively owned and that TVEs were much less likely to treat waste or to pay discharge fees compared to enterprises registered at county or higher levels.[104] Following this, in 1992 the State Council established the country's first and only nationally designated environmental industrial park, the Yixing Industrial Park for Environmental Science and Technology (YIPEST, or "the Park") under the State Science and Technology Commission.[105] The State Council also designated the Park as a "national high technology development zone", as part of broader efforts by the central government to expand environmental industries to coincide with the UN Conference on Environment and Development (UNCED, the Rio Earth Summit). After adopting the Rio Declaration, in 1993, central authorities cited Yixing as the country's earliest "base" (*jidi*) for environmental industry development and made the

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main inscription, taken from a classical poem, reads, "a thousand sails unexpectedly unfurl, one hundred boats vie in the current." 望浩浩长江，激浪翻滚，千帆竞发，百舸争流. City economic competitiveness rankings are prevalent in investment guides and city marketing materials. Forbes China (福布斯) has been publishing its own rankings lists since 2010. Jiangsu dominates the lists across categories each year. In the 2010 Innovative Competitive Cities list, Yixing was ranked at 20, last among six county-level cities who made the top-25 list. In 2011, Forbes China ranked Yixing 16th in its Top 25 Innovative Cities in China list, surpassing Tianjin (no. 22) and Taicang (no. 21), Yangzhou (no. 24), and Changzhou (no. 25), three prominent competitors in the green development space in Jiangsu (see http://www.forbeschina.com/review/list/001475.shtml).

[103] Zhang (2002: 56-59)

[104] ibid.

[105] State Council, Executive Meeting 207 on 9 Nov. 1992, Official Authorization for the Establishment of the China Yixing Industrial Park for Environmental Science and Technology.

Park a pillar of its Agenda 21 Program.[106] By the time China signed onto the Kyoto Protocol in 1998, the Taihu region generated 35 percent of the national total value added in the environmental industry, and 18 percent was attributable to Yixing.[107] Having gained status as a county-level city with administrative authority over 31 towns and 13 townships in 1996,[108] Yixing's authorities were by then exercising greater autonomy over land use and development planning.

During this same period, local environmental awareness rose as the air and water pollution from unregulated township and village enterprises and several large petrochemical factories in Qiting accrued to devastating effect. Like in many other cities around China, blue skies became rare and acid rain increasingly prevalent. The widely dispersed pattern of township and village industries in the Taihu region exacerbated both human and environmental impacts. Because the land surrounding villages in the region is characterized by converted wetlands, the location of polluting village industries frequently affected clean water sources. For example, Figure 3.3 shows a chemical plant that is located on the primary irrigation canal in Shengtian village. Across the region, local fisheries were poisoned by effluent waters that residents described as having "a different color everyday—red, bright blue, yellow, brown and green."[109] In interviews, village residents frequently expressed fear and concern about local environmental conditions in relationship to human health. In particular, water pollution from the chemical and textile industries led to frequently visible contamination of local drinking, irrigation and fishing waters. Several residents also mentioned reports of "cancer villages" (*aizheng cun*) in the region that were caused by chemical contamination of ground water and soils. Incidence was so acute that three villages in the Zhoutie township area in the east district of the Zone were subsequently documented as part of the outbreak of cancer villages that had developed in several coastal provinces.[110] Moreover, the reality of increasing environmental protests meant that public awareness of the development–environment contradiction was widespread.[111] In 2006, the number of recorded pollution-related protests rose 29 percent to 60,000 incidents nationwide.[112]

Integrating Local Environments into Economic Development Strategies

China's current environmental protection apparatus was established in 1979 with the trial implementation of the Environmental Protection Law (EPL). Regulatory reform

[106] See the Priority Programme, Section 3-5: Construction and Management of China Yixing Industrial Park for Environmental Science and Technology (ACCA21 1993). The Commission was succeeded by the Ministry of Science and Technology in 1998. China was the first country to produce a national Agenda 21 program (Zhang and Wen 2008).

[107] (Zhang 2002: 62)

[108] Bramall 2007

[109] (Interview 20101018_STG.1)

[110] (Yu 2007)

[111] (Jing 2000)

[112] (Stern 2010: 86)

continued during the 1980s, with the introduction of a spate of legislation including the Marine Environmental Protection Law and an environmental protection amendment to the constitution in 1982, the Water Pollution Prevention and Control Law and the Forest Law in 1984, the Grassland Law in 1985 and the Air Pollution Prevention and Control Law in 1987. In the early 1990s, after decades establishing itself as "the world's factory", when China's coastal region experienced the emergence of environmental crises, these were exacerbated by local breakdowns in the environmental regulatory system.[113]

Jahiel (1997) has demonstrated the decisive role of local authorities in shaping the implementation of environmental regulations and their connection to development policy. During the reform period under Deng Xiaoping, economic incentive-based approaches to pollution reduction began to emerge. The earliest example such market-oriented policies was the water pollution discharge fee system, which was first implemented in 1979 and then adopted in 1982. Along with fiscal decentralization, Jahiel argues, the devolution of regulatory authority to local governments introduced a structural "contradictory impact" to environmental reform. As local administrations lost central government fiscal support for maintaining their bureaucracies, the disincentive to enforce environmental regulations that might hinder revenue growth based on local enterprises increased considerably. Moreover, as discussed earlier, the plural organization of administrative authority, known as the *tiao–kuai* system, further exacerbates breakdowns in regulatory implementation and clarity, producing multiple lines of authority and frequently contradictory policy goals.[114]

Nonetheless, moves toward environmental improvement have taken place. When during the 1990s public anxieties over pollution and environmental health issues became widespread and rural protests intensified,[115] the central government concern over social stability contributed to a second wave of state-led greening. Development strategies began to slowly integrate goals for the protection of the human environment and investment into environmental pollution control alone increased over fivefold during the 1990s (Figure 3.4). While conditions began to see some improvement, under-regulated rural industries continued to proliferate, in part due to the transformation of central-local government relationships through decentralization.[116]

In terms of the environmentalization process, one aspect of decentralization reforms was critical: the reduction of the state-owned sector through large-scale privatization. This meant that a major source of planned economy livelihoods and social security was lost, and subsequently had to be replaced by locally driven economic

[113] (Shi and Zhang 2006; Jahiel 1998)

[114] For example, see Lieberthal (1997). See note 72 above.

[115] (Jing 2000; Hung 2007; Day 2008)

[116] The difficulty in regulating smaller enterprises in dispersed industrial networks contributed further justification to the privatization of small and medium state-owned enterprises beginning the late 1990s under the "grasp the large, let go of the small" restructuring policy.

activity.[117] In 1980, the state sector consisting of state-owned, state-controlled, and collectively owned enterprises (SOEs and COEs) accounted for over 99 percent of industrial output. By 1990, that share had dropped to just over 90 percent.[118] Throughout the 1990s, economic stagnation in the state sector helped to justify the massive wave of privatization that followed and in 2010 the state sector share of industrial output had fallen below 40 percent, and under 17 percent for SOEs.[119] Because the county-owned sector among small and medium sized enterprises in the Yixing region was dominant, the costs of environmental regulation to the local government presented a further difficulty that limited the results of environmental regulatory reform, which continues to be plagued by "exhortational" language and a lack of clear standards of local enforcement.[120]

Integrating Global Environmental Norms and Markets into Development Policy

China's national policy framework for environmental protection and sustainable development has closely tracked the history of global norms (as well as flows of aid) in these fields. Following the 1972 United Nations Conference on the Human Environment (UNHCE) in Stockholm, Prime Minister Zhou Enlai convened the Environmental Protection Leadership Group and the First National Environmental Protection Conference in 1973.[121] Ten years later, in 1983, with the convening of the Second National Environmental Protection Conference and participation in the UN World Commission on Environment and Development (WCED, commonly referred to as the Brundtland Commission), the State Council established environmental protection as one of two basic state policies (*jiben guoce*).[122] Following the 1992 UN Conference on Environment and Development (UNCED, the Rio Earth Summit), China began integrating concepts of sustainable development into its environmental and development policies. In 1996, sustainable development made its way into the Ninth Five-Year Plan to become an

[117] The urban state-owned enterprise sector provided life-long employment and social benefits referred to as the "iron rice bowl" (*tie fanwan*). The transformation of these socialist production structures has had numerous political implications for municipal governments in terms of land use planning and territorial state power. See Hsing (2006) and Bray (2005) for authoritative accounts of these dynamics.

[118] PRC Industrial Census (1995)

[119] (National Statistics Bureau 2010)

[120] (Beyer 2006) for a discussion of language in PRC environmental law that serves to blunt effective enforcement in favor of flexible implementation guidelines.

[121] (Jahiel 1997; Wu 2009; Schroeder 2008)

[122] The population problematic engaged by the one-child policy was itself a construction of environmental and resource questions exemplified by the work of Ehrlich (1968), the Club of Rome (1972) and others. For the Chinese, the work of these neo-Malthusians represented a reactionary ideological position assuming static relations between productive capacity and population growth that stood in stark contrast to the state developmentalism of Mao Zedong Thought. For an account of the science and politics of the making of the one-child policy, see the exhaustive account by Greenhalgh (2008).

integrated principle of development strategy alongside the reiteration of scientific technological development.[123]

In order to expand policy links between environmental regulation and industrial restructuring, the National Environmental Protection Agency was promoted to the ministry level directly under the State Council and renamed the State Environmental Protection Agency (SEPA) in 1998. This change came as a part of a major reshuffle of the central government apparatus in an effort to strengthen regulatory efficacy by cleaving off enterprise development and business operations, particularly in the environmental and energy sectors (Wu 2003).[124] However, the resulting structure continued to fragment regulatory agendas in these fields. For example, the new structure placed energy conservation policy in the hands of the State Economic and Trade Commission (SETC, the predecessor to the NDRC, the National Development and Reform Commission), and hampered efforts at implementing pollution prevention and cleaner production.[125] Despite an expansion of SEPA's regulatory powers and mandate in the reorganization of the agency as the Ministry of Environmental Protection in 2008, the Ministry continues to split important areas of environmental governance with the NRDC.

This is not simply a reflection of economic development at the expense of the environment. Rather, the rise of the NDRC in combining roles of leadership in economic planning, energy policy, and climate change policy in part reflects the nature of China's negotiation of global environmental norms, and the integration of environmental governance into its overall project of modernization.[126] China's participation in the production of such norms has played an important role in shaping how questions of development are balanced with international environmental protection responsibilities. In general, China sought to protect its status as a "developing country" in international forums such as the UNFCCC, and has played a leadership role in shaping the interests of the G77 at the UN Climate Change Conferences. A key outcome of its position as a non-Annex I country is its ongoing deployment of a GDP carbon intensity target rather than an absolute cap on its emissions. Another is China's ability to continue to leverage Annex I country contributions to technology transfer and investment in China's green economy through the Clean Development Mechanism.

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[123] Zhang and Wen (2008)

[124] The restructuring of central bureaucracies not only reflects changes in policy priorities, but during the reform era was also the result of intra-state competition over the institutionalization of reform agendas (cf. Shirk 1993: 107-15). The National Environmental Protection Agency was formed when the Ministry of Urban and Rural Construction and Environmental Protection was abolished in 1988. That same year, the State Planning Commission (SPC) took over the State Economic Commission, and reasserted a planned socialist market agenda. In 1998, the year that SEPA was created, the State Development Planning Commission (SDPC) In 2003, merged with the State Council Office for Restructuring the Economic System

[125] (Mol and Carter 2006)

[126] (Carter and Mol 2006); (Zhang, Mol, and Sonnenfeld 2007)

This integration includes concepts such as cleaner production and energy efficiency practices that are aimed at preventing rather than simply treating pollution as efforts to "leapfrog" previous models of industrial development and their concomitant environmental impacts.[127] Moreover, later green development policies make explicit reference to global environmental goals and emerging markets related to climate change mitigation.[128] I argue that this process of integrating environmental governance into processes of national modernization constitutes state efforts to address the environmental contradictions of capitalist production while maintaining conditions driven by market incentives at the local level.

International norms and aid have significantly shaped policy in China. From 1984 to 1999, the country borrowed approximately USD 7 billion for energy-related projects from the World Bank (more than any other borrowing country), and USD 90 million from the Global Environmental Facility (Martinot 2001). A major aspect of this environmentalization strategy is China's integration of climate governance with industrial restructuring initiatives. A prominent policy instrument in this integration is China's implementation of the Kyoto Protocol Clean Development Mechanism (CDM) under the United Nations Framework Convention on Climate Change (UNFCCC). Classified as a non-Annex I "developing country," China is eligible to receive funding from Annex I "developed countries" through such sources such as the Global Environmental Facility (GEF) in order to implement emissions reduction projects. After these projects are certified, the Certified Emissions Reductions (CERs or "carbon credits") are counted towards compliance with the emissions reduction goals of investing Annex I countries. Reflecting how these efforts continually shape both industrial structure and environmental policy, China has from the outset specified that such cooperation is most importantly a conduit of technology transfer through which developing countries can implement a low carbon development model.[129] China has implemented well over half of all CDM projects, and was projected to register over 64 percent of the annual carbon credits traded under the scheme through 2012.[130]

The 2005 passage of the Renewable Energy Law with specific targets for the implementation of non-fossil energy sources spurred the expansion of second wave strategies in Yixing. Furthermore, it served as a major impetus for the establishment of the Yixing Economic Development Zone with its focus on new energy industries in 2006. A major success of the Zone was the 2009 establishment of the solar photovoltaic (PV) manufacturing and research base for Guodian, one of the five primary state-owned utilities. After a successful joint venture in 2007 with a total investment of 234 million CNY (35 million USD), Guodian established a wholly owned subsidiary in the Zone, investing three-year 8 billion CNY (1.18 billion USD) to construct its solar research and

[127] For a western academic analysis of "leapfrogging" development in China, see (Liu, Mol, and Chen 2006; Mol and Ying 2006).

[128] (cf. Zang 2009)

[129] (Zang 2009)

[130] (UNFCCC 2012a)

manufacturing base. Guodian invested a further 2 billion CNY (295 million USD) in 2010 to build a wind turbine industry in the Zone.[131] The successive phases of the Guodian Solar project through 2012 have brought over 12 billion CNY (1.8 billion USD) and have occupied over 95 hectares of converted village land.[132] The Guodian wind energy enterprise reported 220 million CNY (32.4 million USD) in taxable revenues in 2012. The combined solar projects reached a manufacturing capacity of 800 megawatts of PV cells and modules in 2012, up 60 percent from 2011 and brought the Zone's total capacity to over 2 gigawatts. This massive output of solar generation equipment has helped to maximize the implementation of solar through subsidies for renewable energy sources in Europe and U.S., and has brought Yixing's transformation into the direct political economy of China's national renewable energy portfolio. Guodian has numerous solar farm projects including two that have been certified as CDM projects.[133]

Constructing an Urban "Ecological Society"

An explicitly urban-centered strategy of green development is emerging as an integrated and comprehensive approach to "sustainable development" (*kechixu fazhan*) in China.[134] At the conclusion of the 2004 Economic Work Conference, central party leaders announced a new overall development policy that culminated in the Eleventh Five-Year Plan (2006-2010). As the first "green" five-year plan, the 11-5 Plan represented a significant reorientation of China's development goals and principles. The plan set forth only two quantifiable targets: a doubling of year 2000 GDP; and a 20% reduction in GDP energy intensity from 2005 levels. This has been notable in the rise of new characterizations of socialist construction. Since 2005, the terms "harmony" (*hexie*) and "harmonious society" (*hexie shehui*) denote the official goals of Chinese socialism, making explicit reference to ameliorating the uneven social, economic and environmental outcomes of the past decades of growth. Emphasizing social stability, much of the general policy concern on the environmental side addresses questions of the human environment and environmental quality.

The 11-5 Plan established the contemporary policy orientations and rhetoric on environmentalization. The core approach to development and environment revolves around the Scientific Development Concept, which is a "summation of the 'comprehensive, coordinated, and sustainable development'" principles introduced during the Third Plenum of the 16th Party Congress, as the means to achieve a Harmonious Society.[135] These pillars of "Hu Jintao Thought" purport to address the main contradictions in China's development path at the current historical conjuncture through the implementation of the "Five Balances" (*wu ge tongchou*)—the comprehensive,

[131] USD at 2009 average rate of 6.8 CNY. Total investment was originally reported as 9 billion CNY by Xinhua News (2009).

[132] USD at 2012 average rate of 6.7 CNY. (Geng 2013)

[133] UNFCCC (2012b)

[134] (NPC 2005)

[135] (Fewsmith 2004a: 1)

people centered, and sustainable coordination of: 1) urban and rural development, 2) regional (coastal and interior) development, 3) the economic and the social, 4) harmonious development of humans and nature, and 5) domestic development and openness to the outside world.[136] The outlined principles of the new development model also emphasize "the building of a conservation-minded society in an effort to solve the contradictions of energy resources."[137] As introduced in the first chapter, the Five Balances represent and incorporate a critique of the dominant pattern of development in China. The "integrations" that would ameliorate these contradictions represent China's definition of "sustainable development." In pursuit of such balance, the state is engaged in a 'scientific' integration of national social-environmental space.[138]

Following the goals set forward by the Scientific Development Concept, this model of greening aims to develop an "ecological society" (*shengtai shehui*) powered by a knowledge and innovation economy that positions China as the global leader of "low carbon development."[139] While carrying forward the industrial development of earlier periods, this approach to green development makes explicit reference to the environmental significance of the ways that Chinese people live, their forms of urbanism, and cultural values. As environmentalization strategies become unequivocally linked to urbanization, green development discourse and practices in planning and design attempt to simultaneously address the problems of greening society: culture, space, and economy. A prominent aspect of this new model of development is the manner in which it targets rural China as a site of transformation.

It is important to emphasize here that rural space continues to be an equally important site of development. However, the relationship between rural society and rural space and resources is seen as problematic. The application of the concept of scientific integration to this problem is evident in the spread of master planned urban-rural integration (*cheng xiang yitihua*).[140] Under this rubric, local governments are expanding

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[136] Fang (2003). Translated literally, *wu ge tongchou* is closer to "five systemic plans." However, like many of China's stock abbreviations for major policies, the phrase is difficult to translate out of context. First introduced by Hu Jintao in 2002 and adopted by the Party during the Third Plenum of the 16th Party Congress at the end of 2003, the phrase has been variously translated as "five areas of development," "five overall plans," "five pairs of coordination," and by the People's Daily as "the five balances." Each of the five balances is presented as a contradiction present in contemporary China and thus a necessary component of addressing social disparities and reaching society-wide "overall development."

[137] (People's Daily Online 2004). People's Daily is a conduit of authoritative discourse controlled by the Central Committee of the Chinese Communist Party. Policy statements and the opinions of central government leaders are frequently first reported in its pages. Its various websites in English and Chinese are, therefore, considered archival sources.

[138] Adding to his enumerated technocratic discourse in his final Party Congress as president, Hu also described the simultaneous and comprehensive pursuit of economic, political, cultural, social and ecological progress as the "joining five figures into one" (*wu wei yiti*).

[139] (NDRC 2006)

[140] Under the State Council Decision on the Reform of the Investment System, implementation of the Urban–Rural Planning Law through the maintenance of land use master plans is highlighted as a key to the

their direct planning authority over the rural hinterlands within their jurisdictional boundaries. This rural land, as mentioned earlier, is held directly by collectives. The state conducts direct allocation of land for non-agricultural purposes only in urban areas at the county level and higher. In urban-rural integration planning, a major objective is the consolidation of village land resources for rational centralized reallocation for urban development, higher intensity agriculture, and environmental governance. In this regard, rural space is presumptive urban space, under the direct governmental control of the local state.

In its construction of rural land as a national resource, rural land under direct state administration can be thought of as an infrastructural foundation for green development. Within spatially "integrated" urban-rural regions, rationally allocated farmland addresses the national policy for grain security and for transforming the structure of the rural political economy. Acting upon space and the environment is in many ways seen as a basic state function.[141] Graham and Marvin describe the modernist "infrastructural ideal" as a unitary and total (nation-scaled) network producing "coherent urban relations" among the urban totality of people, institutions, places, and the environment.[142]

State Designations of Green Development

With increasing central government policy support given to shaping environmentalized development, there is a notable increase in the deployment of state designations for projects of green development. These designations confer status and prestige to broader projects of urban-rural integration beyond standard economic metrics. Several central government agencies, including the Ministry of Environmental Protection (MEP) and the Ministry of Science and Technology (MOST) issue periodic lists of locales that meet specific green development criteria. These designations serve minimally as place marketing publicity, and the leaders of recognized locales may be tapped for promotion. As a result some projects might be initiated regardless of their potential to deliver real environmental and social impact simply because they may help a politician to earn a promotion. In Yixing, the founding director of the Zone was promoted to lead the expansion and a new eco-city project in the YIPEST Park in 2012. This promotion occurred despite the fact that his transfer led directly to the collapse of several Zone projects that depended on his personal relationships. One of these key projects was an effort to establish the first four-year university campus in Yixing. Another was a high standard farmland construction project. Additionally, state designations are conferred as recognition of existing potential and achievement in local green development and to increase investment and policy support for specific programmatic goals. Thus the designation of Yixing as a National Ecological City in 2011 signals its relative progress

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environmental governance of development projects. Environmental impact assessments including land resources management and energy intensity and energy efficiency are now stipulated.

[141] E.g. (Scott 1998; Holston 1989; Rabinow 1989)

[142] (Graham and Marvin 2001, 43)

toward meeting the policy objectives, while also increasing central-local ties that may lead to breakthrough projects like the Guodian solar industry base.

These designations are also a part of the construction of a national policy agenda and discourse for green development. For example, the Ministry of Environmental Protection program for National Ecological Model Zones "makes the principles of ecological economics the guide for realizing overall social-economic development and healthy sustainable development."[143] Another program led by MOST to build Sustainable Development Pilot Zones (SDZs) began in 1986 following the UN WCED process and publication of the Brundtland Report. The SDZ designation is a mandate to comprehensively expand planning scope and physical area as a means to sustainable development. In the 2007 plan for the program, Article 2 states, "the designation of a SDZ requires strategic adjustment to spatial layout and development using sustainable development techniques to realize a more scientific model of sustainable development with multiple representative forms of strategic transformation."[144]

These designations serve to link local development to national funding programs such as the Ministry of Science and Technology 863 Program for High Technology Development.[145] In the selection criteria for the MOST 2013 863 Plan, preference is given to state designated SDZs and national level SEZs.[146] There are 18 central government managed SOEs in Yixing. An important example in Yixing is the presence of Guodian Solar. A state-owned utility, Guodian has 21 projects under the 863 Program. The presence of nationally backed technology development programs and procurement for the larger Guodian Group provided stability to Guodian Solar and the market in Yixing during the 2008-2011 global oversupply crisis in the solar photovoltaic industry. This national backing allowed Guodian to acquire in 2009 Jintech Solar, an Yixing incorporated enterprise with 500 megawatts of annual solar panel production capacity, thus preventing a major bankruptcy with the assistance of the Zone administration.[147]

Urban Ecological Modernization

In its pursuit of official status as an SDZ, the Zone developed the Technological Innovation New City project. As a master planned eco-city centered on emerging environmental industries, the New City represents the quintessential strategy of third

[143] MEP (2000). National Ecological Model Zones Construction Plan Summary (1996-2050) [全国生态示范区建设规划纲要 1996～2050 年]
http://www.mep.gov.cn/ztbd/rdzl/stwm/sfcj/ghzb/201209/t20120920_236525.htm

[144] MOST (2007) p.

[145] (MOST 2013) specifies preferential investment into state-designated SDZs. The State High Technology Development Program, the 863 Program was initiated with the support of Deng Xiaoping in March 1986.

[146]国家科技计划（863 计划、支撑计划）2013 年备选项目征集要求

[147] The high level of oversupply led to rapidly falling PV module prices on the global market beginning in 2008, reaching record low prices in 2011 (Englander, Mehta, and Bradford 2009). Many smaller module producers in the Taihu region shut down or were acquired in government consolidations.

wave green development and modernization. The New City project exemplifies the 12-5 Plan's call for the construction of "innovation-oriented cities… to enhance sustainable development" as the platform for regional development, with particular reference to the roll of Jiangsu province (NPC 2011). According to the China Center for Modernization Research of the Chinese Academy of Sciences, such projects effect a simultaneous transformation of rural space, culture and economy.[148] This strategy is described as a "canal" approach to "catching up" that bypasses intermediary rungs of development to attain ecological modernization.[149] Taken from the center's report on ecological modernization, Figure 3.5 diagrams this adaptation of ecological modernization theory. The center argues that this pathway of "integrated ecological modernization" is comprised of coordinated advances in "green urbanization" and "green industrialization."[150] He Chuanqi, the head of the center, argues that such strategies exemplify an integrated approach to creating "ecological balance" in a positive-sum relationship with development.[151] I argue here that such theoretical approaches are a part of political processes that reify "ecological balance" by asserting its existence, without necessarily altering social-environmental relationships. Moreover, the canal approach is characteristic of developmentalist and revolutionary thinking that posit non-linear pathways to modernization in contrast to the mechanistic linear processes in Rostowian modernization theory.

Based on the European experience of environmentalization, the idea of ecological modernization refers to a restructuring of capitalist political economy with regard to environmental agendas (Dryzek 1997).[152] In his analysis of the discourse of ecological modernization, Hajer (1995:65) defines the "credible and attractive story-lines" of ecological modernization as "the regulation of the environmental problem appears as a positive-sum game; pollution is a matter of inefficiency; nature has a balance that should

[148] (He 2007b, a)

[149] ibid.

[150] (He 2007a: 87; 2007b: 215). Although the work of He Chuanqi follows the analysis of western theorists in describing ecological modernization as an "inexorable global tide" (*bu ke nizhuan de shijie chaoliu*) and "historical necessity" (*lishi biran*) (2007a: Ch.3, Sec.1), his policy prescriptions recall contemporary invocations of Mao Zedong Thought in his approach to the "historical contradictions" and "opportunities" that reveal a distinctive pathway for Chinese development.

[151] He (2007b, a)

[152] Harvey (1996) traces the ideological roots of ecological modernization back to Gifford Pinchot (a forester and governor of Pennsylvania in the 1920s and 30s) and his influence on the American conservation movement. The terms and formalization of ecological modernization theory are attributed to German social scientists Joseph Huber and Martin Jänicke, and the politics of the German Green Party (Fisher and Freudenburg 2001; Buttel 2000). The theory rose out of observations of the interaction between German environmental policy and industrial activity by Huber and Jänicke. The political interpretation of their observations of a "restructuring" of the economy around environmental concerns were debated within what was characterized as a "fundamentalist-realist split" in Green Party ideology regarding the paradox of environmentally constrained growth (Buttel 2000). Eventually, the Party consolidated a position against the "anti-modernist" views of Rudolf Bahro (Cohen 2006; Buttel 2000), who took the "fundamentalist" position against a reconciliation of capital and ecological integrity.

be respected; anticipation is better than cure; and sustainable development is the alternative to the previous path of defiling growth." Ecological modernization is thus both a normative framework for resolving the environmental protection-economic development contradiction, and an interpretive schema for assessing societal progress towards resolving that conundrum. As a normative framework, ecological modernization seeks to create market mechanisms to foster technological progress and regulatory frameworks that properly incentivize ecological protection. This general idea is at the heart of such notions as "green industry," and argues that economic development and environmental protection are not only compatible, they are mutually reinforcing.

Under the 11-5 and 12-5 plans, policies addressing uneven urban–rural development have emerged under the banner of "constructing the new socialist countryside" (*jianshe shehuizhuyi xin nongcun*). New Socialist Countryside policies purportedly address the rural–urban income gap by modernizing agricultural practices and improving infrastructure. These policies come in response to steadily increasing social unrest among rural residents and migrant workers, and are in part responding to the critiques put forward by the Chinese New Left, particularly those associated with Wen Tiejun and the New Rural Reconstruction Movement (Day 2008). In 2006, Yixing developed its current policy of urban–rural integrated development under this general mandate to restructure agriculture as a means of social and economic development, and adopted slogans like "without industry, no wealth; without agriculture, no stability" and "industry nourishes agriculture, the city supports the countryside" (Liu 2010a).

In practice, however, the policies that are meant to ameliorate disparities through rural economic development and the modernization of Yixing's agriculture have unfolded through highly uneven processes. For example, agricultural upgrading programs promoting professionalization and scaling up of production have meant that some rural residents no longer have choice in continuing to farm. The reallocation of farmland for industrialized production also contributes to differentiated social spaces as farmers are dispossessed of land and resettled in concentrated peri-urban developments. These programs have not clearly benefited many rural residents. In the areas of the immediate periphery outside of the urban core, agricultural land has been eliminated with the justification that providing a new industrial base in the Zone will raise rural incomes while simultaneously improving communication and transportation infrastructure for farther outlying areas, which are planned to be new sites of high-efficiency industrial agricultural run by private enterprises. Such justifications are made highly visible and in explicit terms of social–spatial transformation in pervasive public media such as billboards and poster campaigns, and in official statements of project aims and progress in television, internet and print media. Following village evictions, billboards are erected over the demolition sites with images and slogans promoting the comprehensively transformational projects. One such billboard is pictured on the first page of this dissertation. After the 2008 demolition of Siqian village for the initial phase of the New City project, a billboard rose over the rubble touting, "new talent, new industry, new city" on one side, and "Yixing Solar Valley: construct a new energy industry base on the west banks of Taihu" on the other. I will detail this case in the following chapter, which

introduces the planning and construction of the Zone and the New City as primary sites of investigation in this dissertation.

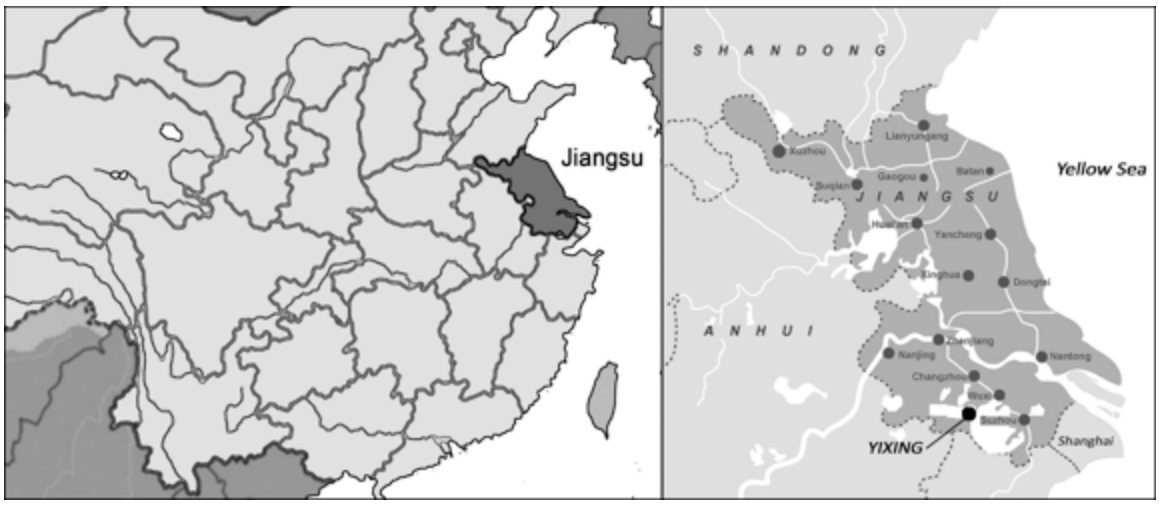
Conclusion

In Yixing's vision of ecological modernization, social and ecological harmony are the products of a spatially rationalized environment that serves simultaneously to foster social development, environmental improvement and as a platform for engaging the global green economy. To prove the virtue of their model of green development beyond a basic narrative of remedying contradictions between economic growth and the environment, Yixing's leaders are constructing new cultural values to bolster these utopian visions and aspirations.

However, as the following chapters will demonstrate, the reality of implementing this vision is much more complicated. I draw upon the materials in this chapter to begin the argument that this green development ideology justifies rural dispossession as environmentally rational and socially progressive. While a view that "the ends justify the means" may ultimately be a question of politics, the ends produced by Yixing's green development are fraught with negative social and impacts that undermine its stated goals. In the chapters to follow, I will examine this process of justification in land management and planning, and analyze how dispossession plays an important role in securing consent to the social-environmental relationships entailed by green development ideology.

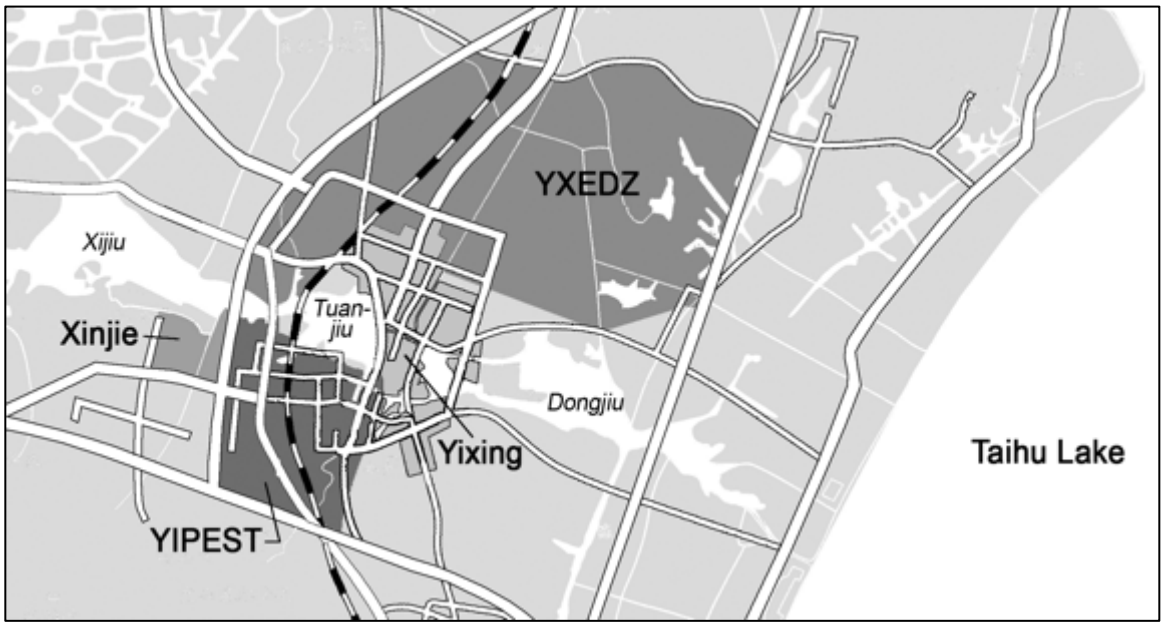
Chapter 3 Figures

Figure 3.1 Locations of Jiangsu Province and Yixing City



Source: Jia Ching Chen, 2012

Figure 3.2: Yixing City-Region and Major Green Development Zones



This map shows the central area of the Yixing city-region with its major green development zones. YXEDZ, YIPEST and the area of Xinjie annexed by the Park are all shaded in darker grey.

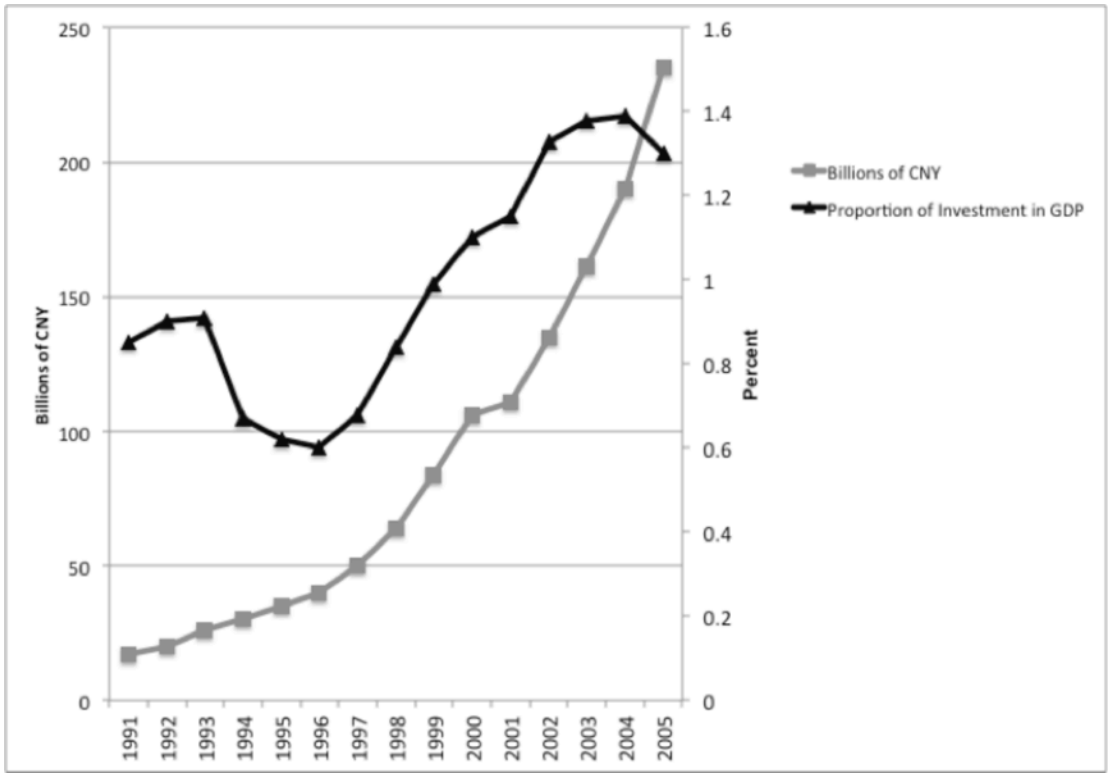
Source: Jia Ching Chen, 2012

Figure 3.3 A Chemical Plant on the Edge of Farmers' Fields in Shengtian Village

A wall delineates the 1992 enclosure of village land under the Qiting town authority to create a chemicals industrial zone. Directly adjacent to the village are industrial dye, food, and wastewater treatment chemicals factories. An animal shelter patched with an old fertilizer bag calls attention to the linked processes of agricultural land loss, input-intensive industrialized farming and environmental degradation.

Source: Jia Ching Chen, 2010

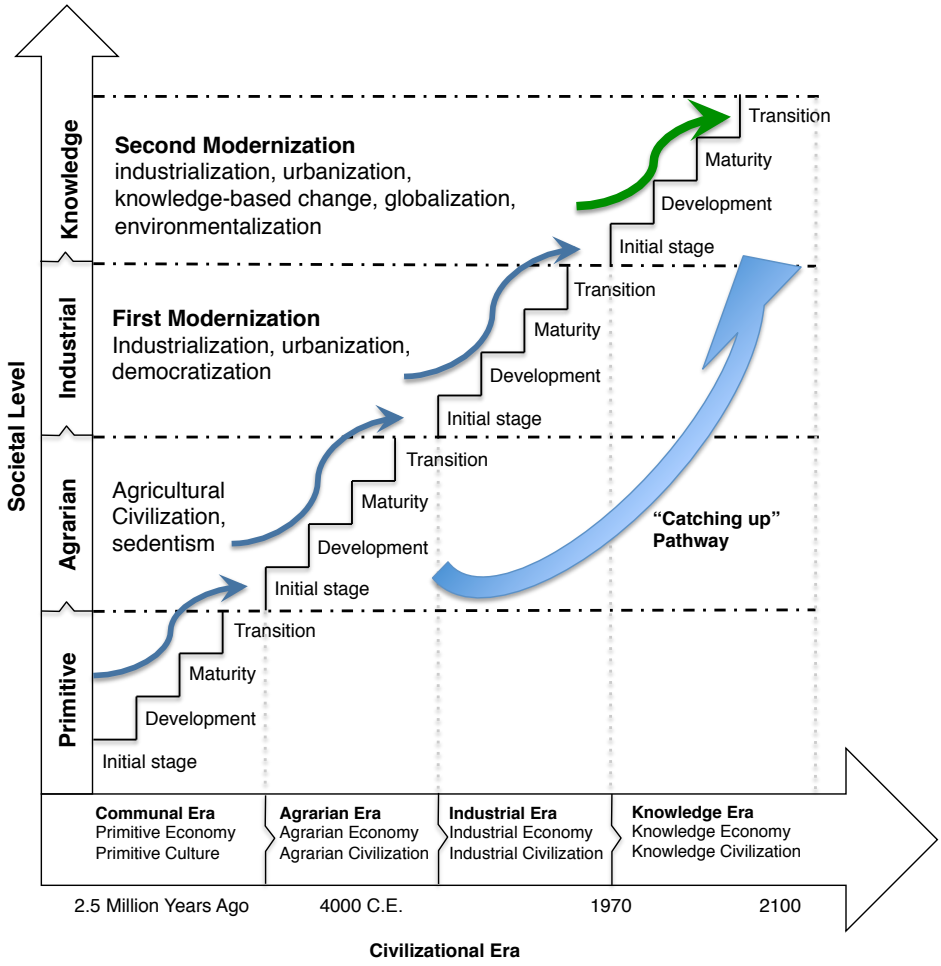
Figure 3.4 Annual Investments in Pollution Control (1991-2005)



The graph shows the steady increase of investments into pollution control in China. From 1991-2005, the absolute annual investment increased by over fourteen-fold, and investment as a percentage of GDP increased by over 60 percent.

Source: NEPA and SEPA data, adapted from Zhang and Wen (2008)

Figure 3.5: "The Canal Approach to Ecological and Second Modernization"



The "canal" or "catching up" pathway is shown as the arrow arcing across the four stages of societal progress and historical development is described as a shorter path to "ecological modernization" reminiscent of the Great Leap Forward. This theory of development ascribes to the linearity of modernization theory while putting forward a developmentalist idea of historical transcendence. Source: Translated and redrawn from He (2007a).

Chapter 3 Tables

Table 3.1: Green Development Zones in the Lower Yangzi Basin				
SEZ	**LOCALE**	**AREA (ha)**	**YEAR EST.**	**"GREEN" INDUSTRIES**
Yixing Economic Development Zone	Yixing, Jiangsu Province	9830	2006	Photovoltaics; new energy; optoelectronics; smart grid technology & cables; pollution control
Yixing Industrial Park for Environmental Science and Technology	Yixing, Jiangsu Province	8300	1992	Pollution control; energy efficiency; new energy
Xuzhou New Energy Specialization Industrial Park	Xuzhou, Jiansu Province	1030	2012	
Sino-Singapore Wuxi Solar Park	Wuxi, Jiangsu Province	440		Photovoltaics
Jintan Photovoltaic Industrial Park	Jintan, Jiangsu Province	700		Photovoltaics
Jinxi Industrial Park	Jinhua, Zhejiang Province	17100		New energy; new materials; software & electronics
Nantong Economic & Technological Development Area	Nantong, Jiangsu Province	14698		Energy efficiency; pollution control; biomedicine; integrated circuit electronics & networks
Yancheng LED & Photovoltaic Industry Park	Yancheng, Jiangsu Province	1120		Optoelectronics; photovoltaics
Taixing Economic Development Zone	Taixing, Jiangsu	1800		New energy; new materials
Wuhan Optics Valley	Wuhan, Hubei Province	500		Photovoltaics; optoelectronics
China-Singapore Suzhou Industrial Park	Suzhou, Jiangsu Province	8000		New energy; environmental protection
Source: http://www.acca21.org. cn Compiled by Jia-Ching Chen, 2012.				

Table 3.2: Consecutive Central Government No. 1 Documents on Rural Reform		
Year	**Title**	**Promoted Themes and Measures**
2004	Promoting Increases to Farmers' Incomes	• Farmer's incomes are economically and politically significant • Adjusting agricultural structure • Increasing jobs for farmers • Enhancing rural investment, deepening rural reforms, and advancing agriculture-related science and technology.
2005	Strengthening Rural Work and Improving the Overall Production Capacity of Agriculture	• Farmers' and local governments' initiatives for increasing grain production through financial, governmental and technological support
2006	Advance the Construction of a New Socialist Countryside*	• Constructing a New Socialist Countryside is the foremost task facing China in the 2006-2010 five-year period • Coordinating the development of urban and rural areas • Developing modern agriculture, boosting farmers' incomes, enhancing rural infrastructure, promoting social causes in rural areas and deepening rural reforms
2007	Positively Develop Modern Agriculture and Steadily Advance Construction of a New Socialist Countryside*	• Modernization of agricultural equipment, science and technology, industrial systems, management and development • Ideas should be nurtured to improve the quality, economic returns and competitiveness of agriculture
2008	Conscientiously Strengthen the Foundation of Agricultural Construction to Further Advance Agricultural Development and Income Increases for Farmers	• Rapid development of an enduring mechanism for consolidating the foundation of agriculture • More efforts to guarantee grain product safety • Balancing supply and demand, and the production of various grain products
2009	Promote Stable Agricultural Development and Sustainable Income Increases for Farmers	• Measures to avoid declining grain production and to ensure the steady expansion of agriculture and rural stability
2010	Increase Coordinated Urban and Rural Development and Further Cement the Foundation of Agricultural Rural Development	• More investment, subsidies, fiscal and policy supports for rural areas • Improvement of the livelihoods of rural residents
2011	Accelerate Water Conservation Reforms and Development	• Make irrigation water conservation a foundation of rural infrastructure • Targeted improvement of agricultural water conservation infrastructure • Double annual spending on water conservation over 10 years
2012	Accelerate Agricultural Scientific and Technological Innovation to Continuously Strengthen the Security of Agricultural Commodities Supply	• Promote simultaneous industrialization, urbanization and agricultural modernization • Policies to strengthen agriculture, benefit farmers, and enrich rural areas • Stabilize livelihoods and increase yields to raise incomes • Maintain the social harmony and stability in rural areas
2013	Acceleration of the Development of Modern Agriculture Further Strengthens the Vitality of Rural Development	• Ensure grain security and supplies of major farm commodities as the top priority in developing modern agriculture • Policies to speed up the transfer of rural land and offer more subsidies to family farms and farmer's cooperatives to develop large-scale farming
2014	Comprehensive Deepening of Village Reform and the Acceleration of Agricultural Modernization	• Improve the mechanisms for safeguarding food security • Strengthen agricultural support systems • Promote financial support for rural areas • Establish agricultural sustainable development mechanisms • Balance rural and urban development • Deepen rural land system reforms • Accelerate agrarian transition and urbanization of rural residents
Source: Xinhua News Agency; People's Daily; compiled by the author. * "New socialist countryside" is the translation of *shehuizhuyi xin nongcun* that appears in official translations and central government-controlled outlets such as Xinhua and People's Daily. A literal translation renders "socialist new countryside," placing clear greater emphasis on the venue for socialist construction (the countryside) over a new form of socialist political economy that is equally implied by the official translation.		

CHAPTER 4
Modeling Green Development in Yixing

> *This is a city of thousands of years of civilization and hundreds of years of prosperity; a city that gave birth to China's earliest ceramic culture; a city abundant in scenic landscapes, scholars, and the creation of miracles of riches. She walks leisurely toward you from the depths of 5000 years of history. Near Shanghai, Nanjing and Yuhang, at the crossroads of Jiangsu, Zhejiang and Anhui provinces, she is famous as the National Hygienic City, National Model City for Environmental Protection, National Garden City and as China's Exemplary Tourist City, all along a bright pearl on the western shores of Taihu lake.*
>
> —Yixing Economic Development Zone Investment Guide[153]

> *... industry and the city have grown together as a unified process of geographic development. Industry does not locate in the city, it helps create the city. Urban expansion is based on the ability of industrialization and capital accumulation to create places at the same time as making commodities, building factories, raising up a labour force, and introducing new technologies.*
>
> —Richard Walker and Robert Lewis[154]

When I arrived in Yixing in April 2010, Han Yongquan, an employee of the Zone administration, picked me up at the Pudong International Airport in Shanghai. Right away, he reminded me that he had been my airport driver in 2008 when I had last visited Yixing. During the three-hour trip, he also reminded me also that we had visited his village, Siqian, just as it was undergoing demolition for the construction of a new road in the Zone. That day had been a very poignant moment for me in shaping my understanding of Yixing and its model of green development.

On the one hand, Han expressed resignation and sadness over the demolition of his natal home and the displacement of his parents. On the other hand, he said that were it not for that process, he would not have an opportunity for a regular job in a government unit, or the opportunity to meet people like myself. Without much education, he would likely be doing labor in a local factory or migrating for work in construction or even demolishing villages. Now, on my second visit, Han pointed out the remains of Siqian village as we passed on our way to the new glass buildings that housed several departments of the Zone administration. The rubble of Siqian and the adjacent fields were grown over by two and a half years' of grasses. A stone footbridge, erected during the Qing Dynasty, was the only structure remaining on the site.

This lag between demolition and construction is not uncommon in China. It is especially common when demolition is part and parcel of rural land enclosure and conversion processes. During what has been described as a "fever" of development zone enclosures that took place in rural areas across China in the 1990s, researchers found that

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[153] YXEDZ, Jiangsu Yixing Economic Development Zone. 2009. Investment Guide [*Yixing Jingji Kaifaqu Touzi Zhinan*]. Yixing: YXEDZ Administration.

[154] Walker, Richard A., and Robert D. Lewis. 2001. Beyond the Crabgrass Frontier: Industry and the Spread of North American Cities, 1850-1950. Journal of Historical Geography 27 (1):3-19.

less than 20% of enclosed land was eventually developed.[155] One of the serious implications is that local authorities used the mandate of zone-based development plans to build their territorial authority.[156] In the case of the Yixing Zone, the lag is more reflective of an overall conception of master planning and implementation of eco-urbanization, described to me by the Planning Director, Qi Fei, as a "white sheet of paper" (*yi zhang baizhi*) or *tabula rasa* approach.[157]

What Qi described in this manner is not simply an approach to spatial and physical planning. As is the case in historical examples of total planning, such an approach to planning entails changes to people's lives as the *tabula rasa* is made politically viable as well as physically realized. In Yixing, the "white sheet of paper" requires the management of administrative structures for villagers, the relocation of populations, and massive social transformations to livelihoods, service provision, and a host of cultural shifts attendant with urbanization. Qi made his comments in a discussion of differences between the Zone and the earlier industrial zones established in Yixing since the early 1990s. Describing the construction of the Park, Qi emphasized that although it was a national level project with significant political support, it was not master planned. Rather, it incorporated industrial development through a project-by-project approach. As such, YIPEST and the previous industrial parks that had been incorporated into the Zone were piecemeal in their ability to create infrastructure and failed to produce a coherent urban fabric, which Qi and other leaders now underscore as the true marker of successful development.

This chapter examines Yixing's particular model of green development, which purports to link industrial innovation, environmental protection, rural transformation and urbanization. Yixing is modeling green development in two senses. First, in the manner that local authorities expound: they were able to expand and deepen various environmentalization strategies, transitioning from an export-oriented manufacturing model to one that encompasses high-end services, innovation and vertical integration and eco-urbanization. Second, as introduced in the previous chapter, Yixing is making commonplace the underlying notion of green development and its ideological links to rural transformation. Instantiating national policy agendas and building consent to the social-environmental transformations entailed by urban-rural integration and the means of dispossession and forced relocation.

Building on the earlier discussion of the remaking of rural space and society through projects of integration, this chapter examines the processes of administrative redistricting (*xingzheng quhua*) and intersecting projects of urban-rural master planning in the Yixing Economic Development Zone.

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[155] See Cartier (2001); and Ren (2003).

[156] cf., Hsing 2010

[157] Qi said, "The development zone's piece [of land] was just like a piece of white paper" (Kaifaqu na kuai yuan jiu xiang yi zhang bai zhi) (Interview 20110413_HKY.1).

Master Planned Urban-Rural Integration

In the construction of Yixing's model of green development, state-directed spatial planning of rural land resources is pivotal. Since 2003, the Yixing government has reorganized rural towns, township and village administrations in order to facilitate the consolidation and state-rationalization of rural land under its master plan. Since 2006, these activities have increased pace and scope to integrate a comprehensive array of land uses into urbanization planning.

Yixing has received numerous citations from the central government for its plans and progress under official rubrics for ecological protection and sustainable development (see Table 4.1). Its designation as a National Sustainable Development Experimental Zone in 2009 recognized its strategic incorporation of projects of industrial development in key industries (especially environmental protection industries, solar energy, batteries for electric vehicles, and optical electronics), high standard modern agricultural land, ecological set asides, and village land consolidation. These projects are predicated on large scale enclosure of village land for direct land use allocation under the Yixing municipal authority. The Yixing master plan's "conservative and intensive land use" (*jieyue jieyue yong di*) entails the planned dispossession and resettlement of 100,000 village residents between 2010 and 2020.[158] As a consequence, the making of Yixing's green development extends state practices of rural dispossession and deepens patterns of urban-rural inequality. These inequalities may vary over time. In my survey of residents in Dongjiao relocation communities, over 70 percent were economically less secure in terms of savings and cash flow after more than two years from the date of eviction. In Guanghui and Benma communities, I found that over 60 percent of residents continued to experience economic difficulties in making choices about purchasing food after more than five years from their date of eviction. Moreover, the use of dispossession for environmental governance and capital accumulation produces significant contradictions to both goals, which I will discuss in the following chapters.

In this regard, it is important to recognize that the social-environmental category of "rural China" is being refigured and not abolished. Rather, the process of green development emphasizes the importance of the "countryside" (*xiang* and *xiangcun*) in direct relationship to a national process of urbanization. This emphasis is apparent in the approach of Yixing's master planned urban-rural integration in which villages (*nongcun*) are held rhetorically distinct in policies for residential densification. In this "integration," the rural enters into a circular and paradoxical relationship with the urban: the countryside must be planned in order to protect it from the encroachment the city.

As the countryside becomes presumptive urban space, so its residents must also be urbanized. This practice of improving housing conditions and eliminating smallholder production falls under the national policy banner of "building a new socialist countryside" introduced by the 11-5 Plan in 2006. As the question of agricultural

[158] Yixing BLR (2010a). This figure is over 23 percent of the 2010 registered village population, which does not account for migrant residents with household registration status in other locales.

production is transformed from one of livelihoods into one of environmental governance, the "villager" is pressed into a more proximate relationship with the city. Even though final conversion of collective land tenure to direct state administration may take several years, the displaced villager's historical relationship to farmland and subsistence production is immediately severed.

Rural Administrative Structure and Presumptive Urban Space

Between 1978-1988, the gross value of Yixing's industrial output increased by 28 percent per annum.[159] This rapid economic growth led to the administrative promotion of Yixing to the status of county-level city in 1988. During the 1980s, administrative restructuring around urban designations increased as an indicator of developmental status and efforts to shift from governing rural and areas separately (*chengxiang fenzhi*) to a system that brings them together in a single jurisdiction (*chengxiang hezhi*).[160] The hierarchies of "city" designations in China are somewhat confusing, as they contain nested administrative boundaries and large rural hinterlands. In this case, Yixing is within the jurisdiction of Wuxi, a prefecture-level city itself composed of a 282 sq-km urban core (*shiqu*) known as Wuxi city, and nine county-level divisions totaling another 4,500 sq-km. Two of these divisions are county-level cities: Yixing and Changzhou.

In 1983, national administrative restructuring attempted to facilitate consolidated municipal authority over rural areas and to address the growing problem of urban-rural uneven development by more closely aligning county level administrations with a superseding city government under the policy of "cities governing counties" (*shi guan xian*).[161] Very little scholarship has analyzed the county-level system. Many scholars assume that county-level governments are simply subordinate to the prefectures or provincial-level administrations above them, with little administrative autonomy or even capacity.[162] In Yixing, this is clearly not the case. At the provincial level, county-level cities were proliferating in the 1980s as important layer of government in Jiangsu and Zhejiang—China's two leading provincial economies. In Jiangsu, the rapid economic growth and migration occurring at county and township levels led to the frequent promotion of high-population, high-growth counties to city government status. This trend represented the rising autonomy of economically strong counties like Yixing.[163] I argue this trend was also a result of the need for city administrators that are "close to the countryside," to paraphrase Director Shi of the Zone leadership committee.

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[159] Yixing's output increased 7.6 percent annually 1962-70, and 18.4 percent 1970-78. For the entire Sunan region, the average annual growth rates were 9.1, 17.7, and 28.6 over the same periods. Figures given at 1980 prices (Bramall 2007, 20)

[160] Lam (2010)

[161] Chung and Lam (2004)

[162] e.g. Chien (2010: 136) states: "…county-level districts have limited legal powers, specified by the PRC constitution and relevant laws, but a more important limitation is that their personnel have a limited range of economic and political competences."

[163] Chien (2010) county level promotions to "city" designation are densest in Jiangsu and Zhejiang.

Similarly, economically successful county-level cities contained rapidly growing subdistricts and townships. As in the case of Yixing, may subdistrict level governments participated in the development zone fever. Of those few that actually utilized their enclosed land holdings, a few were economically successful. This led to greater autonomy in resource planning, and flexibility in seeking outside investment. As mentioned, Qiting subdistrict's earlier industrial park structures enabled the founding and expansion of the Zone, which enjoys the same level of autonomy as the Yixing municipal government in managing its resources. Such units are structured as dispatched government agencies (*paichu jigou)* and are able to create non-subordinate sub-municipal plans. Table 4.2 lists several land enclosures for green development projects under the autonomous planning authorities of the Park and the Zone. Such a structure enables such agencies to act entrepreneurially and to act upon mixed orientations to economic development mandates, including efforts to establish growth through growth poles, industrial clusters, and commodity housing land marketization. Such dynamics vary widely and generate new intra-city-regional growth dynamics. In Yixing, this assemblage of speculative and developmental practices is driving rapid changes to municipal planning. Yixing's SEZs are initiating urbanization projects of major scale totaling over 20 percent of Yixing's 1570 sq-km of land area (see Table 4.2).[164]

Formally, the Yixing government must conform its plans to the prefecture level plans promulgated by Wuxi, and Yixing is allocated quotas for land management (I discuss this system in the following chapter in detail). However, under its designation as a city, Yixing enjoys near complete autonomy as a city government. This reflects a policy to expand the capacities and authority of count level cities.[165] In Yixing, this expansion of the scope of state power at the county level took place through and alongside transformations to sub-county municipal administrative jurisdictions. For example, the administration of the Qiting rural town was incorporated into the municipal government by converting Qiting into an urban subdistrict in 2006. Subsequently, based on his track record in managing a township level industrial park in Qiting, Zhu Xufeng the party chairman in the subdistrict became the head of the Zone planning authority. The immediate promotion of the Zone to provincial level status and later to national level status meant that increased preferential policies and land leasing authority made the Zone and Yixing's overall local government more autonomous. This also had the effect of expanding the authority of municipal leaders rather than promoting them to higher ranks in the administrative hierarchy above the county level.

It is important to note here that these adjustments to the national administrative hierarchy were responding to the 'bottom-up' process of industrialization and urbanization driven by county-owned and rural collective-owned enterprises. Moreover, the fundamental drivers of this dynamic growth were linked to the restrictions imposed on rural-urban mobility by the household registration system (commonly referred to as

[164] By comparison, Los Angeles is 1214 sq-km and San Francisco is 121 sq-km—77 and 8 percent of Yixing's land area, respectively.

[165] 强县扩权

the hukou system). The rise of the TVEs of the 1980s were fueled by a massive surplus rural labor force. During this period, Fei Xiaotong describes the Jiangsu farmers who "were known as 'peasant workers'. They live in the countryside, work in the small factories run by production brigades in normal times, look after household sideline occupations in their spare time and do farm work during the busy season."[166] Bramall further demonstrates that in Jiangsu's rural industrialization model, the rural-urban segmentation of labor resulting from the *hukou* system meant that even during periods of relative mobility, the rural poor could not obtain jobs due to perceived cultural deficiencies in labor discipline.[167]

Responding to the pressure created by the dynamism of the rural industrial economy, rural surplus labor and the increasing "floating population" of migrant workers, China's Action Plan for Human Settlements (1996-2010) states "…at the heart [of the urbanization question] is how to handle surplus laborers while appropriately distributing the country's non-agricultural population."[168] This overall dynamic further motivated a promotion of county level autonomy, especially in places where economic growth was strong. Under the policy of "Strengthening the Power of Strong Counties (*qiang xian kua quan*), counties gained expanded authority in areas critical to expanding rural economic growth and managing urbanization, most notably land-use planning and allocation, infrastructure construction, and expanded fiscal powers.[169]

In 2008, for instance, the Yixing government conducted a two-day work meeting on urban and rural development. The meeting focused on region-wide spatial planning for urban-rural integration. Yixing Party Secretary Jiang Hongliang called for "scientific planning" from "yet higher levels and broader fields of view" to provide a spatial structure for the goals of sustainable development, improvement of living conditions and an environment for innovation.[170]

The Yixing Economic Development Zone

In the early 1990s, the Yixing city government established the Zhuqiao Industrial Park immediately to the north of the city center in the Yicheng subdistrict.[171] The Zhuqiao park originally consisted of 2.7 sq-km and was expanded successively until its planning area reached 18.8 sq-km in the 2003 master plan. During the same period, chemical, materials and environmental control industries grew in Qiting town, in

[166] Fei (1986: 50)

[167] Bramall (2007: 158-60)

[168] Cited by Zhang (2002: 40)

[169] This policy was pioneered in experiments by the Zhejiang provincial government in 1992 (Chien 2010: 142-143).

[170] Yixing Urban Planning Bureau (2008b)

[171] Yicheng Jiedao. The term *jiedao* is frequently translated as "street office" or "street level office." I translate it here as "subdistrict," as this is the common translation of the *jiedao* level in municipal bureaucratic structure.

Yixing's northern district. By 2002, the Qiting administration had assembled a 5.5 sq-km contiguous area of construction land from Qiting and Houting administrative villages to establish the Qiting Chemical Industry Park. When the park EIA was approved by the Jiangsu Bureau of Environmental Protection in 2003, the park was already occupied by some 400 enterprises with an annual GDP of 1.2 billion yuan.

In 2006, the YXEDZ was founded as a dispatch agency to transform this overall industrial structure and to drive its environmentalization beyond the piecemeal process begun by the YIPEST in 1992. The Zone enclosed the heavily polluting township driven industrial growth in the area in the Qiting subdistrict, just to the north of the urban core.[172] The initial Zone leadership committee was composed entirely of Yixing native bureaucrats. These leaders were dispatched to take up the project mandates and to pursue broader city-regional planning goals with entrepreneurial zeal. As a dispatched unit with provincial-level (and later national state-level) status, the Zone is in a grey space within the administrative hierarchy. By achieving higher-level status, the Zone was able to secure foreign investment directly through its own administrative structure and to act as a district-level agency in governing the local population. While required to conform to the broad outlines of the Yixing master plans, the Zone has autonomy in planning and utilizing the land resources within its administrative boundary. As discussed in earlier chapters, the Zone leadership produced plans very quickly and began to plan for the eviction and resettlement of tens of thousands of residents within months of being established.

The Zone administration plays three broad roles. First, it plans and implements an industrial structure for the long-term economic growth of the Zone. This involves attracting investment and establishing enterprises within the Zone as well as attempting to scientifically determine and construct an industrial structure that will achieve its green development goals. Second, the administration plans and implements both industrial and urban infrastructure. Third, the Zone functions in parallel with the Qiting subdistrict level government within Yixing city, administering a jurisdiction of over 100 square-kilometers and accounting for social development.

Under Zhu Xufeng, the green development vision took shape and the Zone leadership committee sought to transform the industrial development zone into a new city project. Inspired by the rapid expansion of the solar industry in Jiangsu, the Zone commissioned a study by industrial ecology planners from Tsinghua University in order to propose a new industrial structure and to begin to outline spatial planning and infrastructural requirements.[173] Early in the conceptual and master planning process, the lead director of the zone was dissatisfied with the work of the local Yixing Institute of

[172] The Yicheng subdistrict covers the entire central urban core.

[173] For its industrial infrastructure provision, the Zone has a standard of "9 connections, 1 level" (*jiu tong yi ping*) meaning electricity (high & low current), water supply, waste water & drainage, phone, broadband, cable TV, natural gas, steam heat, roads and leveled ground.

Planning.[174] The Zone subsequently sought out collaboration with NITA, a Dutch planning firm, and Shi Kuang, a designer famous for his master plan of the China-Singapore Suzhou Industrial Park and in his role as Chief Architect at CCDI, the firm behind the Beijing Olympics Water Cube. Having described the original plans as "very ugly," the management committee of the Yixing Zone placed a high degree of importance on aesthetic markers that distinguished the new plan from the industrial districts that preceded the Zone. For its urban spaces, the Zone is pursuing an aesthetic vision of a parkway garden city along the shores and waterways west of Taihu with world-class shopping and entertainment facilities.

In April of 2006, the Yixing Economic Development Zone was initially established under municipal authority through the joining of these two local-level industrial parks. The two parks were enclosed and combined with the approximately 25 sq-km of land under Qiting's administration. In July 2006, the Zone was promoted to provincial level status and the planning area was extended to cover an additional 30 sq-km of collective lands from seventeen surrounding administrative villages, growing to a total of 68.6 sq-km. At the time, these seventeen administrative villages encompassed over 200 natural villages. As initial construction in the Qiting area began, enclosure entailed the displacement and relocation of thousands of villagers. By the end of 2007, 17,000 people from eight villages had been displaced and resettled in Guanghui Community, the first of the Zone's four multi-phase resettlement housing estates. Over the course of its piecemeal construction between 2006 and 2013, the Zone displaced and resettled approximately 55,000 rural residents. Approximately 25,000 more will be resettled in these four developments. As natural village demolitions proceeded, these administrative villages were reorganized, their numbers reduced to fourteen by 2007 and twelve by 2012. This meant that ties between natural villages and their governing administrative villages changed rapidly and severed pre-existing social networks. Moreover, as natural villages are demolished, their committees are dissolved and administrative villages become bureaucratic conduits for organizing the dissolution of peasant life.

The initial Zone enclosures entailed the displacement and relocation of thousands of villagers that were further justified by wetlands restoration and construction and a greenbelt on the western shore of Taihu.[175] These efforts extend beyond "city branding" or "green washing" and link development planning to larger state projects of environmentalization. Through its status as a National Sustainable Development Experimental Zone, Yixing receives expanded regional planning authority from the provincial administration and is able to receive priority status for its land resource quota management. This regional vision was prominently articulated by a national Party Central Committee member, Li Yuanchao, who proposed to construct a model ecological "water

[174] Interview 2010

[175] (Rong 2011; Zhang et al. 2010)

city" extending from the western shore of Taihu across Yixing's chain of lakes (see Figure 3.2).[176]

The Scientific Innovation New City

The discursive and technical practices of planning and design have been enlisted by municipal governments to attempt to simultaneously address the various aspects of greening the economy, space and society. In its pursuit of such urban–ecological greening strategies, Yixing has deployed the disciplines of urban and industrial development planning to conceptualize a master planned eco-city project within the Zone, with the ambition of constructing a "high-tech, low-carbon model community."[177] As introduced in Chapter 2, the New City project occupies a 22 sq-km swath of village land and wetlands in the eastern district of the Zone.[178]

As exemplified by its name, the New City project is frequently represented as an independent urban agglomeration within the Zone. In this regard, it is viewed as a complete whole in the tradition of modernist "total planning."[179] However, in reality it is linked through land use planning mechanisms to the hundreds of square kilometers of village land that were undergoing "consolidation" for requisition and transfer to state planning authority under the Zone and the municipal government. In the context of the master plan, the New City project is conceived as an anchor in Yixing's model eco-city plans. In the detailed control plan, the project is described as an "ideal ecological home" for Yixing's growth, producing "effective improvements to the region's ecological environment."[180] The New City plays a key role in Yixing's urbanization master plan, extending the urban core eastward to the shore of Taihu Lake and forming a node in its "cruciform ecological structure."[181]

Though formal annexation of the land into the planning authority of the Zone did not take place until 2009, conceptual planning began in 2007. The project master planning concluded with a Zone leadership committee approved draft in November 2008. The initial phase of the project, which commenced in 2009, occupies 10.3 sq-km, with a planned 450,000 sq-m of newly constructed residential floor area accompanying 480,000 sq-m of new business and commercial space. According to the plan, by 2020 the New City will serve as Yixing's urban center with a planned population of 150,000. New urban residents of the New City will occupy housing distinctly separate from the

[176] Xu and Ling (2010)

[177] YXEDZ Cmte (2010a)

[178] The project name plays on the use of the character for "new" (*xin*) in joining "creation and innovation" (*chuangxin*) to "new city" (*xin cheng*). The emphasis on newness and its paradoxical conflation with environmental protection will be elaborated below.

[179] For discussions of total planning in Brazil, see Caldeira and Holston (2005); Holston (1989). On authoritarian high modernism, see Scott (1998).

[180] YXEDZ Planning (2008: 11, 41)

[181] YXEDZ Planning (2008: 19-22)

relocation settlements provided for the approximately 55,000 villagers and migrant workers displaced by the development thus far. The market is strictly segmented. With the proper educational, income and employment credentials, the new urban elite can apply to reside in social class-segregated housing for professionals dubbed "Talent Apartments" (*rencai gongyu*).[182] Figure 4.1 pictures a billboard advertising a Zone-financed development of talent apartments in the New City.

In order to justify the conversion of collectively held croplands, orchards and horticultural land, woods, grasslands, waterways, and village construction land, planners must conform village enclosures to larger environmental management goals and policies at higher levels of government. In parallel with policies for economic growth and development, such policies have been conveyed hierarchically through quotas (*zhibiao*). Over the past two five-year plans, ecological quotas (*shengtai zhibiao*) have been developed for a range of environmental and infrastructural goals including wastewater treatment, and afforested green space. In May 2013, at the Sixth Collective Study Session of the CPC Politburo, Xi Jinping advocated the establishment of "ecological redlines" (*shengtai hongxian*) as a policy translation of an imperative, structural limit to development for the assurance of "ecological security" (*shengtai anquan*) and the recovery and growth of ecological service functions (*shengtai fuwu gongneng*). These policies represent further elaborations in authoritative state discourse of the previous Hu-Wen agenda on national ecological governance.

In Yixing, the enclosure of rural land is further justified under the policy of "returning farmland to forest" (*tuigeng huanlin*). In one 2009 "grain to green" project, over 530 hectares of village agricultural land, the holdings of over 2500 households, were converted as part of a 1333 hectare green belt between the Zone and Taihu Lake.[183] Under the rubrics of "ecological withdrawal of agriculture" and afforestation, such land use decisions are the drivers for the majority of agricultural land losses nationally.[184] Some such "grain for green" projects have received certified carbon credits. However, such crediting schemes do not account for extended land-use change impacts such as pressures on remaining farmlands or indirect pressures to clear land (in the Amazon, for example) to meet food market demands.[185] In the Yixing project, the reallocation of land resources and populations is linked to policies to restructure agriculture as "pollution

[182] These dynamics social class making and an emerging geography of peri-urban segregation intersect with the processes of rural dispossession introduced in Chapter 2.

[183] Liu (2010b); Min (2008). The lake ecological zone project, supported by Premier Wen Jiabao, will ring the lake with 200 to 1000 meters of "recovered" forests, grasslands, wetlands, and lake with a stated policy goal of constructing model eco-tourism industry (Wuxi Municipal Party Committee 2009).

[184] Tian (2007)

[185] On land use change pressures resulting from biofuels agriculture, see Fargione et al. (2008) and Searchinger et al. (2008). For information on CERs for "grain for green" and afforestation projects, see UNFCCC (2012b)

free, organic… modern ecological agriculture" with goals to increase efficiency, and generate climate mitigation outcomes.[186]

In 2008, Han accompanied me to visit Siqian residents before and after the demolition of their village. Aside from vaguely understanding the Zone's expansion, villagers did not know what specific projects had required their eviction. Regarding the billboard, I asked about the message of transformation and the villagers' ongoing role in it. Wry comments were made: "Apart from the words on the signs, this isn't our talent, industry or city… We've only been taught what the slogans mean." The sense of exclusion grew from early on in the eviction notification process. Although their fields were not being bulldozed and they were not receiving compensation for the land itself, they were required to vacate the village before the fall harvest. Evicted residents returned on bicycles, some from an hour away. They trod new paths through the decorative landscaping fringing the rubble of their village to tend crops and harvest vegetables for their families.

Relocated beyond the fringe of Yixing's urban core, the evictees have been moved in waves to new resettlement estates. As described in Chapter 2, the primary resettlement estate for residents in the New City project area of the Zone is Dongjiao Gardens, which has been built in three separate phases. The first two phases were completed in 2010 and 2012. The third phase has been delayed past its original delivery date and is now estimated to be finished nearly two years late in May 2015. This will leave some residents in temporary housing for nearly four years. From this perspective, the processes of designating and modeling green development in Yixing recall the inherent tensions in the slogans introduced in Chapter 2, which called for "all people [to] participate in founding the ecological city."

[186] Min (2008)

Chapter 4 Figures

Figure 4.1: A billboard depicting a New City development of "Talent Apartments"

This billboard for "Talent Apartments" (*rencai gongyu*) is on Qingyuan Boulevard across from the main entrance to Dongjiao Gardens. Talent apartments are marketed to young professionals that are the idealized new urban elite in Yixing's ecological society. The market is strictly segmented and requires application with proof of education level and employment.

Source: Jia Ching Chen, 2010

Chapter 4 Tables

Table 4.1 State Designations for Green Development in Yixing		
YEAR	**DESIGNATION**	**AGENCY**
2005	National Garden City (国家园林城市)	Ministry of Urban-Rural Development
2006	National Environmental Protection Model City (国家环境保护模范城市)	State Environmental Protection Agency*
2006	State Ecological Model Zone (全国生态示范区)	State Environmental Protection Agency*
2008	Jiangsu Provincial Sustainable Development Experimental Zone	Jiangsu Department of Science and Technology
2009	National Model Experimental Sustainable Development Zone ()	Ministry of Science and Technology
2011	National (State) Ecological City (国家生态市)	Ministry of Environmental Protection
Sources: Ministry of Environmental Protection; Ministry of Urban-Rural Development; Jiangsu Xinhuanet; People's Daily * The State Environmental Protection Agency was restructured as the Ministry of Environmental Protection in 2008.		

Table 4.2: Yixing Municipality Environmentalized Land Enclosures			
Name	**Year**	**Project Type/Justification**	**Area (km^2)**
National Yixing Industrial Park for Environmental Science and Technology (YIPEST)	1992	National R&D, Economic Development Zone	4
YIPEST	1993	Park Expansion	11
Jiangsu Yixing Economic Development Zone (YXEDZ)	2006	Provincial Economic Development Zone; National Solar and New Energy Development Land Base	54
Jiangsu Yixing Economic Development Zone (YXEDZ)	2006	Integrated Green Urban and Industrial Development; Ecological Preservation	30
Taihu Greenbelt	2007	Ecological Preservation	133
Scientific Innovation New City (under YXEDZ authority	2009	Eco-city with "Green Solar Valley" R&D and Manufacturing Base	22
Environmental Science and Technology New City (under YIPEST planning authority)	2011	Eco-city and Park-District Integration; Environmental Industry R&D	87
Gaocheng New Town (under YIPEST planning authority)	2012	"World class city" urban–rural integration of the YIPEST eco-industrial zone	110
TOTAL			**331**

Sources: hky.gov.cn, yxedz.com, js.xinhua.net; compiled by the author.

CHAPTER 5
Dividing Environments: Land Enclosures and the Construction of Environmental Resources in China

> *The difficulty of balancing land use and ecological security is great. The intensity of land use in Yixing is very high and ecological environmental protection is already extremely urgent. The environmental problem of Taihu lake water pollution and the structure of land use are closely related. The optimization of land use structure requires the closure and relocation of Taihu shoreline towns (subdistricts) and a considerable number of enterprises and villages, which will transform farmers' traditional cultivation customs. This will be done. This involves many contradictions and problems, the correct management of the relationship between land utilization and ecological protection is an extreme challenge.*
>
> ——Yixing "12-5" Master Land Use Plan[187]

As urbanization and industrialization continue to spread through the countryside, China faces the problem of simultaneously maintaining urban economic growth while preserving farmland as a pillar of social stability and food security. In order to address this dilemma, the central government has taken a multi-pronged approach to farmland preservation and land management that seeks to order and govern land-use at a national scale and to promote the integration of modernized agriculture with new city construction as an explicit effort to simultaneously address the social, economic and environmental contradictions of the prevailing model of development. The national quantification and rationalization of land "supply" for development and as an explicitly environmental "resource" has emerged in the conjuncture of the late-reform period valorization of the private sector economy and increasing global concern over China's population and food demand.

The enclosure of rural land for green development projects necessitates a refiguring of land tenure and property relations specified under the constitution in order to transform ownership of rural land by village collectives into urban land under direct state control. While the processes of national land resource construction and accounting are foundational aspects of enclosure in the classical sense of creating new legal structures to protect exclusive forms of access and use, I argue in this chapter that these practices are also the initial sociopolitical means of deploying dispossession as an "extra-economic" form of accumulation alongside market logics for the valuation and circulation of environmentalized commodities in the case of green development explored below.[188] These enclosures simultaneously comprise an important dynamic of "green

[187] (Yixing BLR 2010b: 15)

[188] On classical enclosure, I refer to Thompson (1975). Glassman (2006) more clearly articulates questions of state violence and coercion in his language of "extra-economic" means, extending beyond the finance

grabs" as an "expropriation of land or resources for environmental purposes," and a systematic means of shaping environmental governance as a mode of state-facilitated capital accumulation.[189]

Over the past decade, environmental governance mandates have set the stage for the present wave of "green grabs" in China, linking new enclosures to the development of a national renewable energy portfolio, and ecological service and preservation zones. Exemplary of this approach is the official declaration of master planned eco-industrial zones and eco-cities as primary strategies for attaining the goal of an environmentally, economically and socially "harmonious society."[190] In this chapter, I demonstrate how the promotion of "green development" acts upon rural land in China to: (1) reconstruct it as a national environmental resource; (2) link it to novel processes of accumulation; (3) circulate it through quota systems that enable its redefinition as the basis of urban-industrial and ecological values; and (4) successfully divorce it from village livelihoods in a process of dispossession and enclosure. This chapter analyzes these processes of green development at the intersection of national farmland management policies, and local practices of land management for ecological preservation, eco-city and eco-industry projects in Yixing, located in the Taihu basin of Jiangsu province (see Figures 3.1 and 3.2).

Between 2006 and 2011, these projects enclosed over 330 square kilometers of rural land (see Table 5.1) and displaced over 50,000 village residents in order to provide construction land for the municipality's Sustainable Development Demonstration Zone, designated under the Ministry of Science and Technology, with its ecological corridors and economic development zone focused on the solar energy industry as the core of a "low carbon development" model.[191] Critics may readily analyze such projects as efforts to "green wash" processes of enclosure and urbanization, and to compete for investment in the strategic energy sector. However, following Harvey (1996) and Buttel's (1992) conceptualization of environmentalization as a structural transition, I argue here that as the Yixing case links global markets for "sustainable" energy, national policies for climate change mitigation and environmental governance, and economic development projects to rural transformation, it illuminates the quintessential strategy, ideology and broader social–environmental contradictions of what might be called China's "Green Leap Forward." Moreover, I argue that it is this overall integrated conception of green development—and not its individual constituent functions such as ecological preservation or the production of solar panels—that constructs rural land as an environmental resource.

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capital focus of Harvey (2003a). For a recent empirically grounded extension of this discussion, see Levien (2013a, 2013b, 2013c)

[189] Corson and MacDonald (2012), p. 263.

[190] For example, NDRC (2012); and NPC (2011)

[191] Chen (2012)

Recent scholarship shows that such land enclosures are increasingly integrated with processes of environmentalization in the production of new forms of resource valuation and circulation.[192] In line with the recent literature on "green grabs," this chapter examines rural land enclosure for environmentalized development goals as a "new appropriation of nature."[193] Drawing from conceptual and theoretical approaches to the political economy of dispossession as an ongoing dynamic of extra-economic means of coercive accumulation, the chapter outlines linked processes of the enclosure, commodification and market valuation of what the MLR refers to as "ecological land resources."[194] I argue that this appropriation is enabled by central government policies in which rural transformation is regarded as a necessary function of overall socioeconomic development and environmental protection.[195] This linkage casts rural village livelihoods as backward on numerous fronts, the most contentious being the so-called efficient and ecological use of land. Examining policy and practice at the intersection of economic growth and environmental governance agendas reveals "green developmentalism… [A] mutually constituted complex of institutions, discourses and practices" that manage systems for circulating "natural capital" and enable the long-term means of accumulation in the face of environmental degradation and resource depletion.[196] Insofar as these political economies are integral to global environmental discourses, governance practices and markets, I argue that they are constitutive of a broader pattern of what I term, "sustainability by dispossession."

The chapter begins with a critical examination of the political ecology of the Yixing region within the context of China's ideologies of environmental resource governance. Following this, I analyze recent archival and fieldwork data on the planning, enclosure and dispossession for green development in Yixing to outline the construction of rural land as a fungible nationally scaled "resource" through the central government policies for renewable energy development, rural development, and land management policies, including ecological preservation schemes, farmland conversion and arable land reclamation quotas.

From Agrarian to Environmental Questions

The close of the twentieth century has brought a renewed salience to agrarian questions through transformations to global agricultural commodities production and trade.[197] Within this context, the objective of this section is to examine how green development ideology removes the problem of agrarian livelihoods (as one of politics in Bernstein's 1996 formulation) from the historic articulation of the agrarian question in

[192] For example, Heynen and Robbins (2005); Peluso and Lund (2011).

[193] Fairhead, Leach, and Scoones (2012)

[194] MLR (2008a)

[195] MLR (2004, 2012a, 2012b); State Council (2012b)

[196] McAfee (1999), p. 134.

[197] Watts (1996); McMichael (2005); (Bernstein 2010)

Chinese socialism and rearticulates the question of agricultural production as an "environmental question" centered on the enclosure and conveyance of rural land resources.[198] The simultaneously political–economic and ecological argument of green development in Yixing thus refigures state–society relations around an axis of environmental resource management, dismantling collective land tenure as the basis of rural livelihood. As in the industrial capitalist "revolutionizing of agriculture" analyzed by Kautsky, this transformation is driven largely by phenomena and forces outside of agricultural production.[199] Principally speaking, these include energy, climate and carbon governance mandates and markets whose dialectical interaction with agriculture contribute to a deepening of the environmental "second contradiction" of capitalist production in the neoliberal era.[200]

Central government policies promoting green development enter official discourses and longstanding ideologies that root problems of environmental resources and national development in a series of agrarian questions linking the construction of socialist modernity to the transformation of rural space and society. From the Maoist revolution and the Great Leap Forward through the present, official ideology has underscored the ability to overcome limits in natural resources through social mobilization and technological advancement. This aspect of state ideology is especially prominent in relation to questions of agricultural production and population growth.[201]

In its earlier articulation, the agrarian question in China was directed at producing massive surpluses as the basis for capital accumulation for national industrial modernization. Shapiro argues that this ideology was epitomized by Mao's use of the Confucian proverb "people are masters of their fates" (*rén dìng shèng tīan*) as a slogan meaning "people must conquer nature."[202] The disastrous results of the Great Leap campaigns to remake the countryside through massive land reclamation projects are a prominent historical referent. Under the banner of "learning from Dazhai," mountains were terraced and wetlands and lakes were filled to construct arable land. Millions of hectares were transformed, but little usable farmland resulted as projects ignored local topography and climate, causing massive erosion, soil degradation, and desertification.[203]

Despite these failures, reclamation of slopes, grasslands and wetlands continued as the primary response to cultivated land loss under various policy and physical pressures resulting from rural industrialization, urbanization, disasters and agricultural restructuring.[204] Development pressures mounted under the 1988 amendments to the

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[198] Bernstein (1996)

[199] Kautsky (1988 [1899]: 297)

[200] O'Connor (1994)

[201] Shapiro (2001); Greenhalgh (2008)

[202] Shapiro (2001: 9)

[203] Smil (1984)

[204] E.g., MLR (1997, 1999, 2008a)

Constitution, which established a land leasehold system along with official recognition of the private sector economy.[205] This led to a dual system including planned land allocation and a leasehold market. This bifurcation became a major cause of unregulated land development, real estate speculation and arbitrage.[206]

In the context of fiscal decentralization and the approval for the Shenzhen special economic zone model of foreign investment and rapid export-oriented growth following Deng Xiaoping's 1992 Southern Tour, local governments initiated massive rural land enclosure projects to fuel rentier accumulation.[207] Even as this "development zone fever" of the 1990s left 85 percent of enclosed land undeveloped, cascading spatial restructuring fed an urban revolution with real estate development and local government-controlled land rents forming a major engine of economic growth.[208] Jiangsu recorded a net loss of approximately 1,800 square kilometers of cultivated land for construction land from 1988 to 1995, the third largest provincial loss in the country (State Land Administration 1996). This loss occurred despite reclamation efforts totaling more than 700 square kilometers. Furthermore, this total was more than 100 square kilometers short of the legally required "replacement" for farmland that had been converted for construction projects.

The problem of China's continual loss of cultivated lands to development was widely publicized in Lester Brown's controversial book *Who Will Feed China? Wake-up Call for a Small Planet*. Brown argued that as China's food production declined, its increasing imports would create a global environmental and economic crisis. Although Brown's calculations of land loss and arable land stocks were contested and his approach critiqued as neo-Malthusian, the central government took notice of the question of food security as a major problem of social stability.[209] Increased government attention to the a question of land resources, including a national land survey completed in 1996, led to new policies aimed at stemming the ongoing loss of approximately 6400 square kilometers of cultivated land annually (1996-2008 average; NBS 2011; see also Figure 5.1). A national moratorium on land conversion was put in place from May 1997 through 1998 during which new reclamation policies were developed and the first National Land Use Master Plan was put in place. Covering 1997-2010, the plan set a minimum cultivated land area at 129.33 million hectares for the year 2000, and 128.01 million hectares, including 108.56 million hectares designated as protected prime farmland, for 2010.

After nearly two decades of policy action, China has continued to lose scarce farmland to urban and industrial uses at an annual rate of thousands of square-

[205] Before the changes, Article 10 of the Constitution previously stated: "No organization or individual may appropriate, buy, sell or lease land, or unlawfully transfer land in other ways." It was amended to include the clause: "The right to the use of the land may be transferred in accordance with the law."

[206] Huang and Yang (1996); Lin and Ho (2005)

[207] Fan (1997); Ren (2003); Smith (2000); Hsing (2010)

[208] Hsing 2010; see also, Lefebvre (2003 [1970])

[209] Lin and Ho (2003, 2005); Smil (1995)

kilometers.[210] In official numbers, continued losses over the past decade are heavily obscured by "land consolidation, reclamation and replacement farmland construction" under policies requiring one-to-one replacement for farmland converted for construction.[211]

Scaling Land, Resources, and Ecological Services

The preceding discussion illustrates how state environmentalization functions as a mode of "fixing, dividing, and recording" practices that work to classify rural land and people as objects "in a field of exteriority."[212] Foucault describes such discursive practices as establishing relations between "institutions, economic and social processes, behavioral patterns, systems of norms, techniques, types of classification, modes of characterization…" that enable a fixed and divided object to be defined in its "difference" and "irreducibility…"[213] In this sense, land is conceptualized as a fungible "resource" that can be instilled with different, necessary functions (grain basket, construction land) and attributes (inhabited, marginal, urban) that are equally divisible and locatable as objects. Thus, environmental resources and services (such as those associated with a wetland) are themselves not taken as intrinsic to a particular quantum of land.

Here, Robertson's (2011: 388) analysis of the construction of ecosystem services as fungible commodities is useful in highlighting the practices of scientific and governmental assessment and measurement that enable the negotiation of commodified values and the "construction of abstract spaces, the definition of boundaries between types of things that allow nature to be segregated out in a typology." In Yixing, local officials and planners utilize an expansive notion of "ecological services" rendered through an aestheticized approach to producing environments in which such "services" and "ecologies" are sited, designed, represented and constructed as the mastery of nature. This varied discursive classification further works to "separate natural history from social history," to render rural land as a form of capital in various circuits of accumulation corresponding to constructed scales of environmental resources and services that explicitly maintain "land" as the origin of an intrinsic, non-economic use-value upon which environmentalized values can be established and commodified. [214]

In this multivalent role, land supply is made legible by the metrics and spreadsheets of the quota management system.[215] Land quota becomes what Geoffrey Bowker (2005) describes as the "coinage" or "degree zero" metric that "… constitutes the least possible information that can be shared about events and objects while still maintaining

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[210] China's arable land is considered scarce in comparison to regional and world averages, with about .1 hectare per capita, approximately 40% of the world average (World Bank 2012).

[211] MLR (1999, 2007, 2008a)

[212] Foucault (1977: 305); and Foucault (1972: 50), respectively.

[213] Foucault (1972: 49-50)

[214] The quotation is from Williams' classic essay on "Ideas of Nature" (1980: 76).

[215] cf. Scott's (1998) discussion of state systems of legibility

a viable discourse around them." That is, the numbers utilized in land management practice come not only to represent a particular quantum of land, but also an inherent environmental value that is paradoxically *not place-specific*. Having been land supply is thus divided from an actual place or "piece of land." The importance of abstraction in linking concrete social and economic processes to forms of market exchange is highlighted by David Harvey (1996) in *Justice, Nature and the Geography of Difference.* In it, Harvey (1996) further stresses the importance of a static Cartesian–Newtonian grid of space and time necessary for the monetized valuation of nature. This grid of intelligibility—or mode of seeing—in Scott's (1998) analysis is also vital to understanding the role of the state and projects of state craft in conceptualizing modernity and development.

The need for national-scale management of environmental resources produces the need for the land supply metric. The definition of particular metrics for environmental outcomes that require land are increasingly framed against a common land area metric. For example, the standards for the establishment of a designated eco-industrial park measure the concentration of investment in particular environmental industries in a given park as a factor of area. Ecological city standards measure the density of area designated as green space and plantings as a ratio of the total area of the site. Together with the abstraction of land through the quota allocation system, such standards constitute a regime of environmentalized land management that produces a form of value that can be maximized through physical intervention upon land. Here, I argue that this co-constitution of land value and environmental values makes them abstractly fungible and linked by the aggregate land supply metric as the fundamental basis—Bowker's "degree zero"—for environmental value (see Table 5.2).

Complementing Foucault's approach to discourse analysis, the concept of sociospatial scale enables analysis of the relationships between environmental processes and politics. That each of these "divided environments" is constructed at nested and imbricated scales can be understood through what Sayre identifies as a dialectic between epistemological and ontological "moments" of scale.[216] The dominant epistemological scale of the land resource is composed of the techniques through which it is accounted for and conveyed for development. Sociospatial processes such as cultivation, land reclamation, pollution, environmental illness and ecological service construction that produce objective effects and relationships are ontological moments of scale.

The state politics of this scalar dialectic enable the use of land management quota systems for environmental governance while simultaneously constructing rural livelihoods and their displacement as insignificant within the large spatiotemporal scale of a national ecological modernity. These scalar politics make "sense" of ecological destruction at a given locale for the epistemological assumption of ecological coherence at the national system wide level. This epistemological coherence, mobilizing the dividing practices of assessment and measurement, is dialectically entwined with the construction of fungible rural land resources as the ontological basis of ecological value.

[216] (Sayre 2005)

The great majority of rural land enclosures during the "development zone fever" of the 1990s failed to successfully generate investment and rentier accumulation. Leaving land undeveloped and "baking under the sun" (Hsing 2010: 99), the socioenvironmental contradictions of the enclosures prompted re-regulation and governance of rural land under an emergent bundle of environmental questions. New environmental values for land linked to macro level planning of its basis for climate, energy and agricultural resources have provided multiscalar and translocal accumulation strategies for continued enclosure. Thus, the "strident" (MLR 1999) regulation of rural land resources has paradoxically created a system under which there are more diverse economic and policy incentives for enclosure and displacement.

Environmentalizing Development Goals In Yixing

Although the massive conversion of wetlands during the 1970s slowed, the Taihu basin and the greater Yangzi delta region have consistently reclaimed wetlands in order to offset farmland loss in conflicting efforts to expand rural industrialization, construct urban modernity and maintain agricultural outputs (see Figure 5.2).[217] During the 1980s, major social and environmental contradictions emerged in the region as the result of rural industrialization through township and village enterprises (TVEs).[218] Bramall (2007) demonstrates that assumptions about the successful economic growth, efficiency and equity outcomes do not hold in some of the most prominent cases of the "Sunan model" (including Yixing) that emphasized mobilizing rural collectives for local state-controlled enterprises.[219] Because of the massive state subsidies and capital extraction from agriculture, rural industry in Sunan became an "encumbrance" that "absorbed scarce capital and labor" in a path-dependent model of uneven growth.[220]

Although Yixing and its neighbors were counted among the top economies at the county level, unregulated TVE industrial and agribusiness development had direct and indirect environmental impacts leading to large and cyclical economic losses.[221] Between 1978 and 1990, output in the region's TVE sector topped 28 percent of total GDP.[222] This growth continued through the 1990s, accompanied by the annual discharge of one billion tons of untreated or improperly treated wastewater into Taihu's wetlands and rivers.[223] As chemicals, including arsenic and mercury, contaminated groundwater and soils, negative health impacts became evident as several villages in Yixing's jurisdiction developed a high incidence of cancer.

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[217] see Smil (1993); and Cartier (2001); for a recent policy statement on land remediation, see State Council (2012b)

[218] Rozelle (1994); Zhang (2003)

[219] For a brief mention of the Sunan model, see note 88 on p.53.

[220] Bramall (2007: 39)

[221] Ge (1992)

[222] Bramall (2007: 29)

[223] Zhang (2002)

These spread of cancer clusters in several coastal provinces were subsequently documented as "cancer villages" (*aizheng cun*) with official data in 2007.[224] With rural industrialization absorbing land and labor resources, higher-intensity agriculture demanded the increased application of chemical fertilizers and pesticides which further degraded local wetlands, rivers and lake systems, resulting in hypertrophication and toxic algal blooms that contributed to the higher cancer rates.[225] The blooms also caused drinking water crises and production shutdowns with hundreds of millions of yuan in annual direct economic losses.[226] As discussed in Chapter 3, the "Taihu paradox" was held up as illustrative of the costs of GDP-centric development policies.[227]

As the environmental health consequences of pollution became acute, foreign-educated engineers in Yixing seized upon manufacturing water treatment equipment as an economic opportunity. Local officials supported the efforts with joint venture incubation arrangements and land allocations that underwrote the establishment of independent private enterprises. As a base industry, pollution control had a strong industrial clustering effect, requiring the adaptation of machine, pipe, filter, pump and other manufacturing industries.[228] By the time China signed the Kyoto Protocol in 1998, Yixing generated 18 percent of the national total value added in the environmental industry.[229] In 1992, Yixing established the country's first nationally designated environmental industries research and manufacturing park, the Yixing Industrial Park for Environmental Science and Technology. The designation came as a part of broader efforts by the central government to expand environmental industries following the United Nations (UN) Conference on Environment and Development (the Rio Earth Summit). With its adoption of the Rio Declaration, the Park became a pillar of China's Agenda 21 Program in 1993.[230]

Central government policies for a wide range of environmentalized development goals have provided Yixing with multiple opportunities to construct its model of an "ecological and harmonious society."[231] The 2005 passage of the Renewable Energy Law, with specific targets for the implementation of non-fossil energy sources, spurred the expansion of investment into environmental industries and served as a major impetus for the establishment of the Yixing Economic Development Zone in 2006. In 2010 through 2012, as China's solar industry went through a massive value collapse and major restructuring in the face of overproduction crises and trade disputes with the U.S. and E.U. over illegal subsidies, national quotas for renewable energy production and

[224] Yu (2007)

[225] Wu et al. (1999); Chen et al. (2002)

[226] Ge (1992); Zhang (2002)

[227] Mu (2007)

[228] Interview (20071028_YXZ.3, 20100521_YXZ.1); Wuxi Annual Review (2011)

[229] Zhang (2002)

[230] Zhang and Wen (2008)

[231] YXEDZ Planning (2008: 41)

implementation have increased. In 2012, the central government announced investment in solar power during the Twelfth Five-Year Plan (2011-2015) would total CNY 250 billion (USD 36.8 billion) to produce 21 gigawatts of generation capacity.[232]

After its successful joint venture in 2007 with Guodian, the Zone administration won a major contract to site the utility's national solar photovoltaic (PV) manufacturing and research base. Through 2012, the successive phases of the Guodian projects have brought over 12 billion CNY (1.8 billion USD) to the Zone. The combined manufacturing capacity of the Guodian projects will reach 800 megawatts of PV cells and modules in 2012, up 60 percent from 2011 and bringing the Zone's total capacity to over 3 gigawatts—about 10 percent of China's 2012 national total (see Figure 1.1). This massive output of solar generation equipment has helped to maximize the implementation European country subsidies for renewable energy sources, and has brought Yixing's transformation into the direct political economy of China's national renewable energy portfolio. Guodian has numerous solar farm projects including two that have been certified as Kyoto Protocol Clean Development Mechanism projects worth an estimated 10 million USD in certified emissions reductions (UNFCCC 2012).[233]

The 2009 Taihu greenbelt project utilized the framework of the "ecological grain for green" policies best known for the construction of the "Great Green Wall" anti-desertification project. Over 800 hectares of village agricultural land, the holdings of over 2,500 households, were converted as part of a 2,667 hectare buffer and "ecological lifestyle" park between the Zone and Taihu Lake. Under the slogan of "returning fields, pens and ponds to forests, lakes and wetlands," the "Protecting Mother Lake" project includes the "green screen" along the lake mentioned above.[234] In this project, the reallocation of land resources and populations links with local policies to restructure agriculture with "pollution free, organic… modern ecological agriculture" with goals to increase efficiency, and generate climate mitigation outcomes.[235] Although praised as a new agricultural "green economy to enrich the people," the projects consist primarily of specialty horticultural agribusiness. [236] Thus, despite ongoing concerns and policies promoting grain production and food security, model "ecological cultivation" is a fundamental aspect of China's environmentalized agrarian transition.

Assessment, Marking and Banking: The Construction of Land Resources In Yixing

In 2008, the National Land Use Master Plan was revised to set a 120.33 million hectare "redline" as the minimum threshold for cultivated land protection through 2020. Although the plans include explicit language that protects prime farmland from

[232] MOST (2012)

[233] 2011 EU price of USD 16.4 per ton of CO2 equivalent

[234] Min (2008)

[235] ibid., n.p.

[236] ibid., n.p.

conversion (104 million hectares under the 2008 revision), rural residents often do not know that a given area of farmland is designated as protected. Notwithstanding the increase in disputes over land enclosure nationally, villagers in Yixing frequently do not believe that they have the political right, privilege or ability to oppose enclosures and dispossession. Furthermore, a good deal of land churning through dispossession and reclassification of land uses is enabled by collusion from local bureaus of the Ministry of Land and Resources (MLR), who frequently adapt implementation rules to the specific needs and conditions of local government development projects.

In this section, I demonstrate how administrative practices of *assessment* in written plans and quota production and conversion processes, and topological *marking* of physical features and relationships on land and in BLR maps and accounting spreadsheets are key processes in the construction of land resources. As the redline is maintained through quota systems for conversion, preservation and reclamation through piecemeal accounting at project, subdistrict, municipal, provincial and national levels, errors and structural opportunities for arbitrage abound.[237]

Conversion of rural land must conform to a series of requirements including local land use master plans and the local administration of the national land management policies. In order to maintain a putative net-zero loss of cultivated land in the face of rapid urban and industrial development, the Jiangsu provincial Bureau of Land and Resources (BLR) coordinates provincial level quotas of land conversion and massive "land reclamation" projects to add arable land to the national balance sheets. For the purposes of regulating land supply, the 1998 Land Administration Law classifies all land as agricultural land, construction land, or unused land. Under the PRC constitution, ownership is bifurcated into ownership of all urban land by the whole people under the state, and the direct ownership of rural land by village collectives. In order to convert rural land to other non-agricultural uses, local governments must first transfer collectively owned village land to direct government control as state-owned urban land. Local authorities must also clear land use changes through the MLR.

Since its founding in 2006, the Yixing Economic Development Zone has enclosed over 100 square kilometers of rural land. The enclosure process proceeded in several parallel tracks. Conversion to non-agricultural uses proceeded piecemeal in order to coordinate village demolition, resident relocation, with infrastructure construction, investment and enterprise development. Reclamation and consolidation land can be "banked" and quota can be exchanged with other government units.[238] Such practices by provincial level bureaus under the MLR have been documented (Wang et al. 2010). However, the overlapping environmental transformations to rural society and the local

[237] Interview (20101111_QTB.1); Chen (2013). For diagrammatic accounts of arbitrage stemming from the dual-track land conveyance system, see also Lin and Ho (2005); Lin (2009).

[238] Interview (20101111_BLR.1, 20101122_BLR.1). For an important policy statement on land consolidation that has led to quota banking, see MLR (1999). On intra-provincial land development quota trading schemes in Zhejiang, see Wang et al. (2010).

state itself have not been adequately examined. For example, in one of the few accounts of the operation of land management quotas at the provincial level, Wang et al. (2010) do not account for the politics and collusion interfering with stated centralized government policy goals. Rather, they interpret the functioning of Zhejiang's farmland conversion policies as a type of entrepreneurial action by the provincial government exploiting "an opening in central government's policy" (2010: 459). This interpretation of "implementation" or negotiation of the central policy by provincial level governments ignores the complex bureaucratic matrix of territorial governance and central policy vectors. I argue that the environmentalized policy goals are substantively reoriented, rather than are simply gamed by, local officials who are exercising (and producing) state-territorial authority.[239]

Yixing municipal level authorities (including the local Bureau of Land and Resources) did not clearly map prime farmland as delineated in township level rural areas under its jurisdiction. Rather, large swaths of rural land were designated as within the "planning area" (*guihua qu*) of the urban core.[240] The Yixing Bureau of Land and Resources does not merely act as a quota bank, but produces the accounting that enables an abstracted transaction of the environmentalized land resource. This includes the technical practices of "fixing" and "dividing" prime farmland during the enclosure process, and the internally reconciling the amounts that are marked as cultivated land versus other village uses.

Such practices of accounting are comparable to prevalent efforts to scientifically measure environmental benefits in many sectors. Such forms of measurement practices are now a major branch of sustainability science- and policy-making. For example, demand side energy management policies and engineering are predicated on ways to measure and verify discrete industrial practices for energy efficiency. This is presently an increasingly global area of planning practice and the tools developed are understood to be universal. Nonetheless, international experts and collaborating organizations recognize the particularities of the Chinese context, especially regarding questions of how market signals can operate to incentivize new practices in industrial processes, and ultimately to alter demand and supply of energy. A major problem of creating market signals through energy efficiency programs is a reliable method for verification of energy efficiency savings—a method for defining *unused* energy as a discrete and measurable object. This is a difficult problem for measurement as the engineer must "account for something that is not produced, and why."[241]

In 2005, Yixing took six months to map its cultivated land and to delineate prime farmland protection zones. The Yixing BLR mapped approximately 60,500 hectares of prime farmland in 1,385 zones.[242] This effort was widely publicized as a model village

[239] For a discussion of local state-territorial authority, see Hsing (2010: 7-14).

[240] Yixing People's Government (2003)

[241] NRDC and CNIS (2010)

[242] Wuxi People's Government (2011)

responsibility system for enforcing prime farmland protection according to land use master plans. However, according to villagers, not all of the protection zones were publicly marked. Ironically, one of the villages undergoing demolition at the time was named Shengtian, after Mao's famous slogan, mentioned above. I interviewed Tang, one of the last residents to be relocated from the village in 2010, nearly four years after administrative enclosure of the village under the YXEDZ planning authority. Even the first time I met Tang, he spoke frankly about the village demolition and the land dispossession process. Sporting a t-shirt depicting the US Central Intelligence Agency logo with simulated paint-ball splatters, Tang detailed the uneven and lengthy process of evicting and demolishing Shengtian over the previous years. Initially, in 2006 and 2007, a corridor of village enterprise land, irrigated fields and aquaculture ponds were bulldozed for the northward extension of Jingyi North Road and the northern edge of the Zone planning boundary.

When I asked Tang about the origin of the village name, Shengtian, and its relation to the Great Leap mantra of "people must conquer nature," he replied "eviction isn't a mobilization campaign"[243] and wryly repeated "*rén dìng shēng tían*," altering the tones, writing his cross-dialect pun out for me with a gestural flourish: "from people's asses, fields are born."[244] Tang was referring to the process of quota banking through the production "fields"—a municipal governmental practice that was pioneered in Jiangsu, spread to Zhejiang and is now considered standard practice throughout the coastal provinces and rapidly urbanizing areas of the interior.[245]

The Yixing BLR expanded implementation of land exchange policies to promote village land consolidation and arable land reclamation under central policy (see MLR 1999). These policies and the vision of a "new socialist countryside" under the past two five-year plans promote the relocation of village households into more concentrated settlements to enable the efficient allocation of land and higher-intensity agricultural practices. Such practices of land-use "rationalization" and "consolidation" are used by local governments to produce land conversion quota as freely available "land resources."[246]

The process begins as local authorities first enclose a rural area under administrative planning authority. This 'administrative enclosure' enables the integration of rural lands into a municipal government's spatially specific land utilization plans. Next, local authorities begin to re-order and "rationalize" land resources by relocating villagers, consolidating village construction land and moving residents to peri-urban resettlement colonies. Because such consolidation does not require actual land use conversion to proceed, authorities can construct rural land resources for future use and

[243] *chaiqian hai bushi yundong*. 人腚生田

[244] Interview (20100515_STN.1)

[245] Interview (20101111_BLR.1). On the Zhejiang land use rights trading scheme, see Wang et al. (2010).

[246] Interview (20101111_BLR.1)

circulation to other projects through quota banking. Finally, on a project-by-project basis, the development authorities coordinate with the BLR to process banked conversion quota for new non-rural construction uses. (See Figures 5.3 and 5.4 for a diagram of this quota banking process.)

As rural lands are brought under direct municipal planning authority, the process is used to generate flexibility in how subsequent plans are created and implemented. This flexibility stems from its territorial authority to designate and re-designate rural land uses and village tenure rights under the constitutional state power to dispossess property for public purposes. how a, regardless of when (or whether) such purposes materialize. This flexibility is in part an aspect of the regulatory regime and the constitutional bifurcation of the land ownership system. Although, rural and suburban lands (including townships and villages bordering the urban core) must conform to and uphold municipal government land utilization plans. There had previously not been statutory planning under the municipal authority in rural areas. This generated are significant gaps in regulatory enforcement for land management, including for farmland protection and lawful approval of conversion of land for construction purposes (including for housing and land for collectively owned enterprises).

With the green development mandate of municipal and provincial authorities, the Zone planning and investment bureaus coordinated with the BLR to enclose large amounts of rural land including so-called protected prime farmland. In 2005, the Zone development authority was created under the jurisdiction of the Yixing municipal government under the administrative structure of the Qiting district. Through successive administrative incorporations between 2006 and 2010, the Zone administrative authority expanded to over 100 sq-km, including annexes of adjacent district lands (see Figures 5.5 and 5.6 for maps of rural land change in the Zone over this period). The administrative enclosure of such a large area of land served as a method to bank quota as well. Because village construction land and farmland can be consolidated through dispossession for quota production and official land use conversions take place only when needed, the Zone and the local BLR are able create and maintain surpluses in all areas of quota management: farmland replacement, construction land requisitions, and farmland protection.

This process itself facilitated a large-scale restructuring of suburban and rural townships into reclassified urban subdistricts of Qiting to the north of the urban core and Xinzhuang to the northeast, directly bordering Qiting. The previous strengths of the Qiting administration in maintaining social stability, managing farmland conversion and urbanized villages during the growth of the chemical industry parks within its jurisdiction led to the promotion of key portions of its bureaucratic structure to the founding leadership committee of the Yixing Economic Development Zone.[247]

Even cursory examination of the geography of the redistricting process under the Zone jurisdiction reveals contradictory approaches to prime farmland preservation (see

[247] (Interview 20130112_YXZ.1, 20100521_YXZ.1, 20100813_YXZ.1)

Figure 5.6). Approximately 8 sq-km of farmland from Xinzhuang subdistrict to the east, a block of marked prime farmland extending southeast into Xinzhuang became a forms the eastern edge of the Zone. On the western side of Qiting's boundary, the zone further annexed a 6 sq-km area of farmland of which 2 sq-km was designated prime farmland from Gaocheng township. These annexations from rural township to urban subdistrict enabled administrative enclosure of farmland. Subsequently, conversion of protected prime farmland was enabled through the planning of "concentration zones" justified by arbitrary proximities to the urban core. Adoption of concentration zones to replace prime farmland depends on the qualification of such 'replacement' farmland to meet a certification as 'high standard farmland' (*gao biaozhun nongtian*), which is by definition a "modern" high-intensity industrialized agricultural model in distinction with small-holder village agriculture (e.g. Zhao 2012; Wang 2012).

In April of 2006, the Yixing Economic Development Zone (YXEDZ or "the Zone") was founded under Yixing municipal authority. The Zone enclosed 68 square-kilometers of land, including seventeen rural administrative village and community (*shequ*) jurisdictions.[248] This area of land had been assembled through successive rounds of administrative restructuring (*xingzheng quhua*). This shuffling culminated in the incorporation of Qiting and Xinzhuang (towns to the north and east, respectively, of Yixing's urban core) as subdistrict level street office administrations under the Yixing city government in 2007. Within the administrative hierarchy, this represented a horizontal move, but the restructuring incorporated the territory into the statutory urban planning structure of the municipal government. This change also enables greater flexibility in developing private enterprises. Whereas rural and suburban districts can only convert designated agricultural land and unused lands for collective enterprises and village housing, enterprises built through private investment must be developed under the direct jurisdiction of municipal governments.

Through the implementation of land exchange and quota banking procedures, the rural construction land and regular farmland (including orchards, aquaculture, horticulture, and cropland) jurisdiction have been consolidated under an overall accounting of land resources within the Zone. This has enabled the Zone to undertake piecemeal conversion of the land for construction. Utilizing ecological services and protections exceptions negotiated with the BLR, Zone planners are able to offset quotas for farmland replacement through the designed incorporation of these divided environments.

[248] *Shequ* ("community") are heterogeneous administrative units associated with the lowest levels of state governance, i.e. towns and townships in rural settings and the street administrative office (*jiedao banshichu*) in urban areas. In Yixing, the term is generally used to identify rural administrative-territorial units below the township/subdistrict level. The residents of an Yixing *shequ* 'community' are governed by a residents' committee, and have been fully dispossessed of their farmland. However, they remain rural residents in the household registration system (commonly referred to as the *hukou* system).

Dispossession as a Means of Production

Since 2006, Yixing's various green development projects have required the enclosure of over 330 square kilometers of rural land—over five times the land area of Manhattan—and the forceful eviction of over 100,000 villagers by 2020. These enclosures, wrought partly in the name of rural development, have resulted in greater social inequality. The failures of such efforts at rural development are stark. One National Statistics Bureau survey found that nearly half of dispossessed villagers are impoverished by eviction and relocation processes.[249] As villagers are dispossessed of their land and livelihoods, transformations to social–environmental relations, cultural values, and the places people live present new terrains of politics and social division.

In Yixing's eco-urbanization, relocation communities are spatially and socially segregated from the rapidly expanding urban core and new city developments for which residents were displaced. As villages are divided for phased demolition, village committees are dissolved and their authority is subsumed under larger administrative village structures and the privately owned demolition company. Social cohesion is lost as residents are scattered to find rental housing and transitional livelihoods. During this transitional period, villagers are not technically classified as urban residents and must maintain their rural household status until local authorities implement the separate compensation process for agricultural land. Depending on the rate of investment, financing, and construction, or the use of quota banking schemes, this process may take years. With the loss of access to land and livelihood, villagers are forced into a new more proximate, but more explicitly marginalized relationship with the city. In extreme cases, dispossessed villagers are referred to as a new "underclass" with "three withouts" — without land, work, and social benefits. As discussed in Chapter 2, there is a class of "four withouts" emerging in Yixing as some villagers lose permanent housing tenure.

Many families are forced to purchase or rent a home further outside of the city. However, because they are unable to relocate household registration, they cannot receive new rural land rights. The degree to which socioeconomic outcomes are differentiated and uneven is startling. Byres's (1977) analytic of rural class formation in the relations of agricultural production is useful here in conceptualizing the differentiated state–society relationships in Yixing's green development model of agrarian transition. Intra-village class formation is very often aligned to proximities to state power through the structures of the party and village leadership committee. Allegations of corruption and disputes over uneven compensation are frequent.[250]

Here, it is not my sole intent to highlight the social injustice of uneven development per se. Rather, following diverse analyses of agrarian transition, these processes of dispossession, class formation, expansion of unabsorbed labor and informal sectors of the economy should be understood as both resulting from and enabling

[249] Hsing (2010: 209, n.18)

[250] see also Hsing (2010: ch. 7)

structural changes; in this case, of state territorialization for green development.[251] In Yixing's political economy of displacement and land conversion for urbanization, enclosure enables a transfer of previously non-commodified rural assets into processes of development. Though the net amounts of these assets may appear to be very small, they are significant in important ways. The cash amount of post-eviction livelihood shortfalls is equal, on average, to over CNY 1,800 (192 USD) annually. This is a significant amount for a rural household. For retirees who depend mainly on subsistence farming, cash income may be as little as CNY 60-100 (6-11 USD) per month. However, simply multiplying this amount across displaced households does not give an appropriate picture of its net economic significance. In addition to discounting (the future value of money, interest and inflation as well as opportunity costs), this shortfall also produces a "multiplier effect" in the local economy by increasing the supply of cheap and flexible labor. That said, this process is not centered on proletarianization as in classic analyses of primitive accumulation, nor of "primitive socialist accumulation."[252]

It is important to understand that this labor is both fully incorporated into the local economy at the same time that it is irregular in character. Employers hire workers from job to job, and do not pay payroll taxes and other fees. Wage rates are reflective of the rural rather than the urban economy. The ability of the green development process to utilize such labor flows underwrites the cost of the overall transformation and externalizes these costs by placing socioeconomic burdens on individual households. These dynamics outline a circuit of accumulation through the extra-economic means of state violence as a process of exporting sustainability. The extent to which the state relies upon enclosure as a "spatial fix" to construct new territories for the production and absorption of environmentalized forms of capital surpluses reflects the primacy of land resources as a source of revenue and state authority.[253]

However, I argue that patterns of dispossession for urban-spatial accumulation strategies cannot fully explain the forms of "circulation" of rural land examined above. Rather, such forms of accumulation (and sometimes their failure) demonstrate that the local political economic transformations of green development take place as a part of broader processes of social–environmental transformation mediated at national and global scales. In the case of Yixing, rural land enclosure has played a functionally multivalent and multiscalar role in producing local land rents, meeting national renewable energy targets, balancing national land resource quotas, and serving the sustainable development objectives represented by Euro-American markets for solar energy and certified emissions reductions.

The proliferation of green development demonstrates a dialectical reshaping of state–society relationships that can be understood in two ways. First, as Buttel argues,

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[251] On such structural changes in agrarian transitions, see e.g., Muldavin (1997); Byres (2004); Levien (2012).

[252] Byres (1986), p. 15.

[253] Hsing (2010)

environmentalization proceeds in relationship to structural transitions. In the U.S. case, the move to neoliberal social and economic policies with the decline of Fordism shaped the politics and ethical claims of scientized sustainable development discourse, which was "crucial in leading to the substitution of environmental for social justice discourse."[254] Buttel's analysis is consonant with China's current emphasis on scientific sustainable development in the context of the gutting of rural collective property rights and social welfare entitlements. In the context of this neoliberal environmentalization, the restructuring of property extends beyond the establishment of leasehold and other private forms of holding and rent seeking. Land resources and enclosure itself are also greened in integrated schema linking carbon credit afforestation projects to greenbelt tourism parks, and new ecological industries and spaces to the embodiment of new talents and urban civilities. These practices demonstrate an emphasis on environmental rationalities that systematically produce and address rural land and people as objects and subjects of governmental action under ideologies of "authoritarian high modernism."[255]

The process of constructing new environmentalized forms of value for rural land lays bare the remaking of "social relations between things" inherent to the production of commodities.[256] I argue that this analysis of ecological values in a multifunctional process yields an understanding of the Yixing "green grab" as a scalar politic that constructs displacement and rural transformation as "environmentally rational," even as capital accumulation is not spatially or temporally immediate and negative impacts are observable across various social and ecological systems.

[254] Buttel (1992: 16)

[255] Scott (1998)

[256] Marx (1976 [1867])

Chapter 5 Figures

Figure 5.1: Recent National Cultivated Land Losses and Replacement Offsets 2001-2008 (1000 hectares)

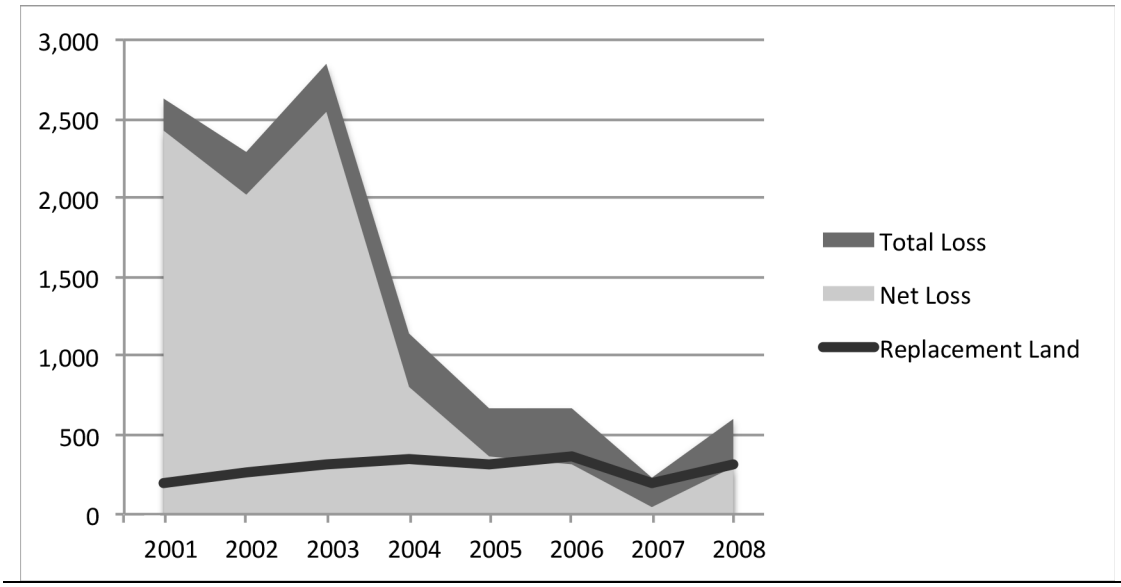
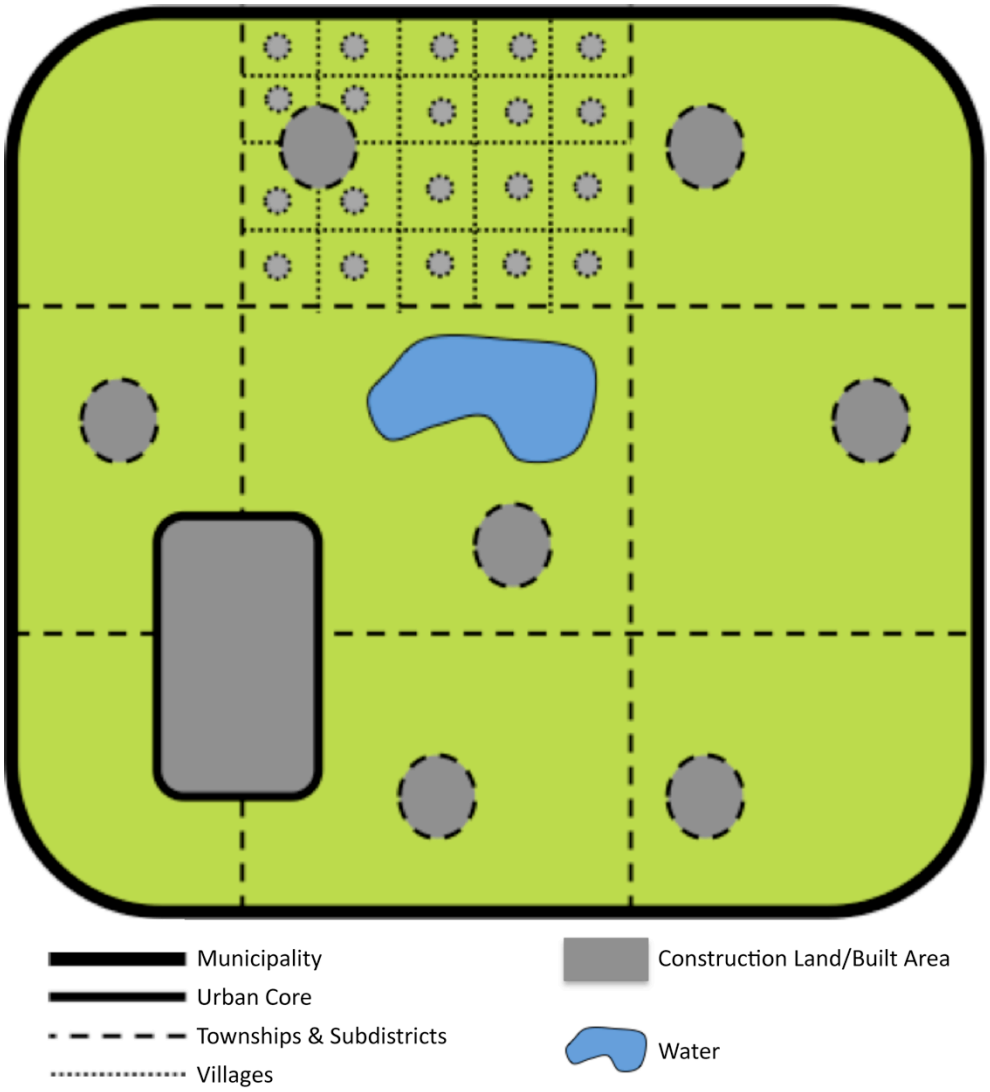


Figure 5.2: Large Scale Wetlands Reclamation Continues in Yixing

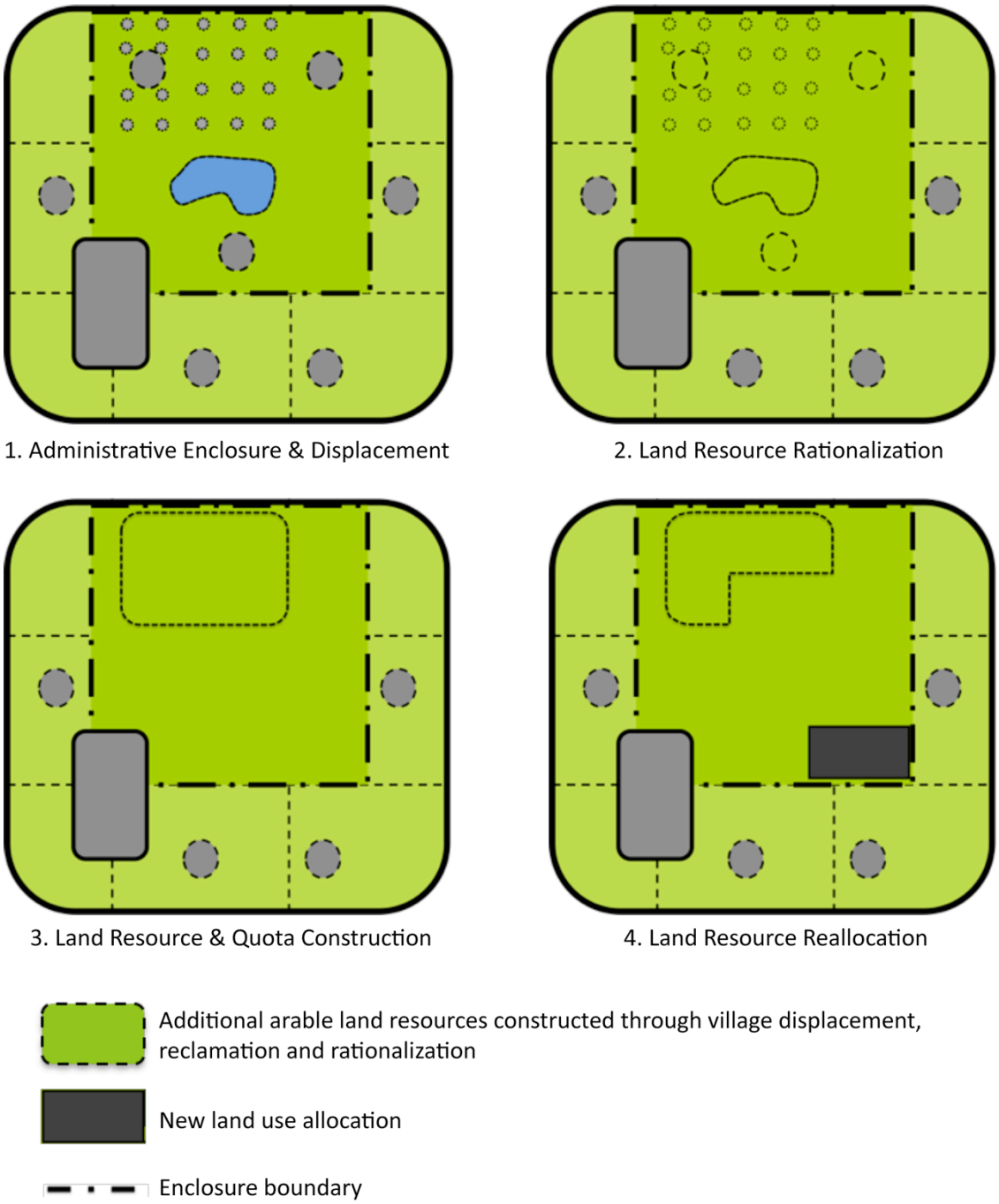
Source: the author, 2010

Figure 5.3 Diagram of Municipal Urban and Rural Space



Source: the author

Figure 5.4 Diagram of Rural Land Resource Construction



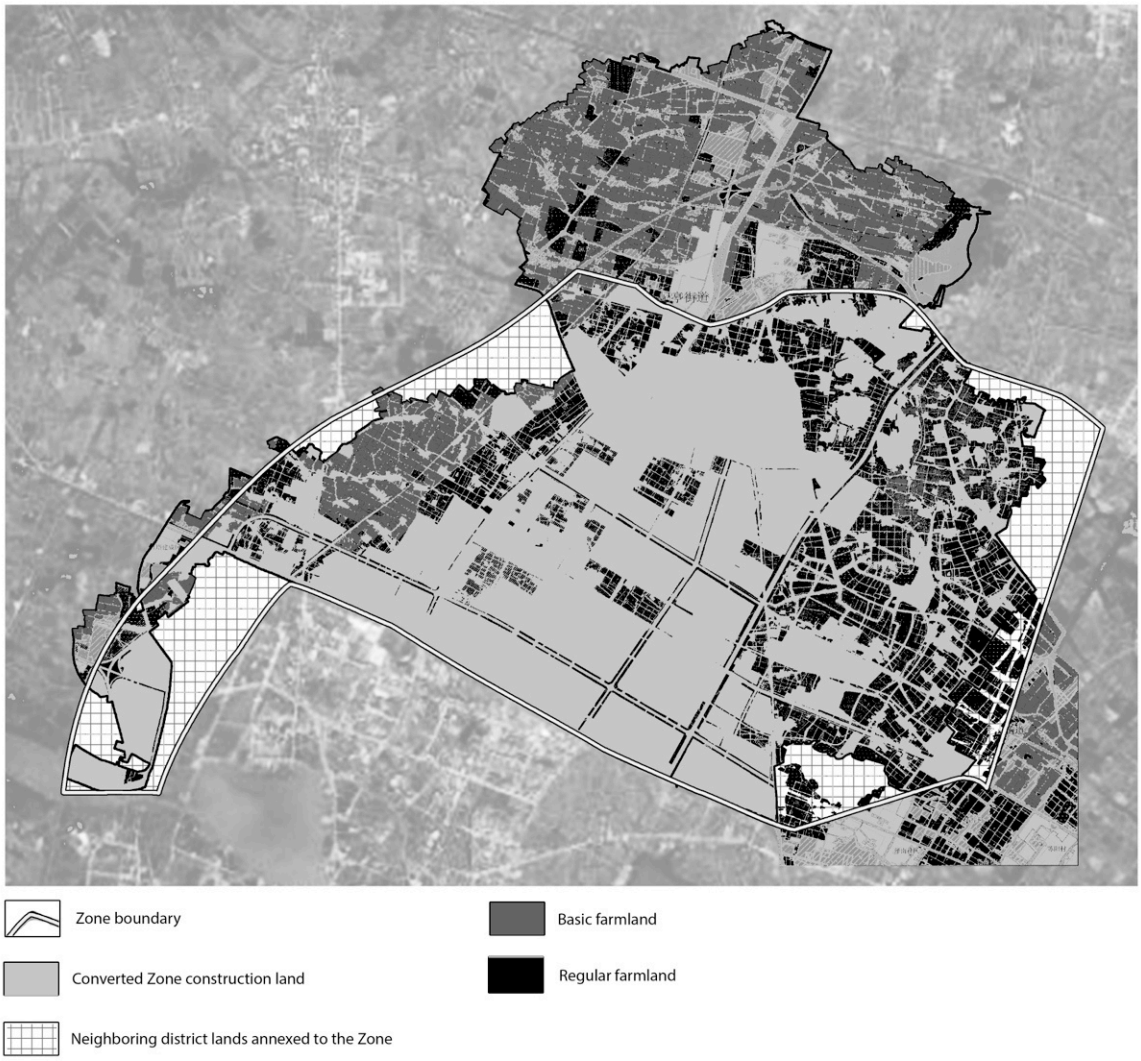
This diagram demonstrates the temporally distinct succession of processes for the local administrative production of surplus farmland replacement quota and farmland conversion quota through the "consolidation" and re-ordering of village lands.

Source: the author

Figure 5.5 Qiting District Farmland Enclosed within the Zone in 2006

Source: Yixing Bureau of Land and Resources, Yixing Economic Development Zone; compiled by the author)

Figure 5.6 Qiting District Farmland Enclosed within the Zone 2010



Source: Yixing Bureau of Land and Resources, Yixing Economic Development Zone; compiled by the author

Chapter 5 Tables

Table 5.1: Land supply quota is the common coinage in multiple areas of green development

	METRIC	POLICY CONCEPTS	MAXIMIZATION PRACTICE
LAND SUPPLY FOR GREEN DEVELOPMENT	Urban green space	Ecological lifestyle	Urban design
	Cropland area	Grain security	Arable land construction
	Green space and tree cover area	Ecological Framework	Park and Buffer Afforestation
	Certifed Emissions Credit	Low carbon development	Preservation Zone Afforestation
	Solar PV manufacturing capacity	PV R&D New Energy Construction and SD Zone	National production quota
	Solar PV generation capacity		National Development & Reform Commission / National Energy Commission JV Solar Portfolio Targets
Source: the author			

Chapter 6
Planning Environmental Value:
Discursive and Technical Practices of "Ecological Construction"

> *Green Planning Principle 1: Begin with the area's characteristically dense network of waterways, fully utilize these natural resources in order to create the area's environment, molded from its distinguishing features, elevating its urban character.*
>
> *Green Planning Principle 2: Plan the integration of environmental structure and emphasize key features in order to create a green space leisure system wealthy in humanistic delight.*
>
> —Scientific Innovation New City Regulatory Plan[257]

> *Fiction —even the wildest or the most sacred— and things of nature —even the lowliest— have a meeting ground, a common place, because they all benefit from the same "optical consistency". Not only can you displace cities, landscapes, or natives and go back and forth to and from them along avenues through space, but you can also reach saints, gods, heavens, palaces, or dreams with the same two-way avenues and look at them through the same "windowpane" on the same two-dimensional surface ... Impossible palaces can be drawn realistically, but it is also possible to draw possible objects as if they were utopian ones.*
>
> —Bruno Latour, "Visualization and Cognition"[258]

In its pursuit of urban–ecological greening strategies, Yixing has deployed the disciplines of urban and landscape design and industrial ecology for its expanded master planned eco-urbanization. In this chapter, I will focus on analyzing the Scientific Innovation New City project (the "New City") within the Yixing Economic Development Zone as a site where relationships between complex processes and relationships among environmental governance, industrialization, urbanization, economic growth, and social development are being reimagined and made subject to planning. More specifically, I examine how government discourse places a wide range of developmental strategies under the rubric of "constructing an ecological society" and how this overarching policy is translated into an imperative of rural transformation that is addressed through spatial planning and urban design.

In this endeavor, I draw on Latour's conceptualization of "visualization and cognition," or practices of representation and the agonistic contexts in which they "make a difference."[259] Based on analysis of planning documents, policies, official discourse,

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[257] YXEDZ Planning (2008) p.31.

[258] Latour (1986: 8), emphasis in original.

[259] In context, Latour's (1986: 5) comment here on enrollment is regarding a "binocular focus" on both the "agonistic encounters… in changes to our scientific societies…" and "the way in which someone convinces

interviews and ethnographic observation with planners, consultants and rural residents, I unpack Yixing's construction of the New City as a "high-tech, low-carbon model community."[260] In its "drawing together" of its comprehensive environmental, economic and social goals with rural sites of change, the New City project represents an expansion and reorientation of the Zone's mandate of green development from one focused on growth in environmental industries to a broader notion of eco-urbanization and place making. At the same time, the New City plays a role in the larger master planned spatial structure of Yixing. This broader process was discussed in the Chapter Three as taking place in the context of modeling commonplace greening.

As this chapter will show, the ability of the myriad documents—"inscriptions" in Latour's language—produced by the New City planners (broadly conceived) to "draw together" complicated goals across a "comprehensive" array of concerns is not the primary result of expert application of accepted techniques. The planners did not have a greater specificity of knowledge that allowed their functional zoning plans, road layouts, prospective population distributions, landscape and skyline designs to be applied anew to green effect. However, it is not remarkable that the New City plan "is something which has an aim"[261] and which represents that aim through projections of existing reality into text and images. In other words, an analysis of the practices of planning and design in the context of Yixing's eco-urbanization primarily yields the mundane consistency of its technical attitudes and visual vernacular. That zoning plans and aerial renderings can be environmentalized to reflect eco-industrial innovation and eco-city aesthetics is not, in itself, the critical moment of planning for Yixing's green development.

Rather, there are two things that need to be understood. The first is the process of constructing a new domain of power-knowledge. The second is how that domain becomes able to make a difference in social norms through the planning of spatial forms. Here, I draw upon Paul Rabinow's (1989: 9) description of "technicians of general ideas," which highlights the role of planners in the linked construction of social norms and the built environment. In this sense, the bureaucratic space for planning extends beyond the Planning Bureau and the Design Office. "Planning" in Yixing, then, also refers to a broader assemblage of actors and processes that enable industrial planning, infrastructural engineering, and economic development to be imbricated with village demolition, rural quality of life, tree planting, water tourism development, and geothermal gradient pumps. In a simplified description, this drawing together of Yixing's ecological construction with the inscription practices of spatial planning consists of:

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someone else to take up a statement, to pass it along, to make it more of a fact…"; on the contextual situation of change and the modes of truth and sense making.

[260] YXEDZ Cmte (2010b: 11)

[261] Foucault (2008) 172. Here, I draw a link to the characterization of state authority in planning in Foucault's discussion of the neo-liberal distinction between the planned economy and the rule of law, he describes "the plan" to be understood (in Hayek's view) as presupposing "that the public authorities can be a subject capable of mastering all the economic processes. That is to say, the great state decision-maker is someone who has… the clearest possible awareness of all the economic processes. He is the universal subject of knowledge in the order of the economy."

1. The designation of a new range of social-environmental objects for spatial planning in line with green development rationality;

2. The construction of an environmentally rationalized order of classification and legibility of the objects to be planned, foregrounding boundaries between Nature and the Social;

3. The identification of sites for intervention;

4. The production of the programmatic goals for spatial planning.

In this sense, the "apparatus" for producing the inscriptions of green development planning includes an assemblage that occurs before and also through the succession of planning processes that result in the inscriptions. These embody the political rationale of green development, represent the necessary objects of spatial planning action, and prescribe and justify pathways for implementation. Meanwhile, the operation of these apparatus-procedures maintain an effective "immutable mobile" relationship between the "two-dimensional surface" of the inscription and the represented programmatic goals on the one hand and the social-environmental realities of the site on the other.

In this chapter, I first introduce an approach to studying the New City planning based on Latour's conceptualization of inscription practices. Second, I examine the inscriptions in the official discourse and planning documents that produce the New City and its social–ecological environment. From these sources, I document how social and cultural transformation is explicitly addressed as integral to the goals of ecological construction (*shengtai jianshe*) and ecological civilization (*shengtai wenming*). Third, in order to gain insight into the technical practices of planners, I utilize interviews and discussions of various planning documents with Planning Bureau staff at YIPEST and YXEDZ, other Zone staff, and consultants from Tsinghua University.[262] By examining the spatial organization of the New City and its planned relationships to the environment as a model of eco-urbanism, I analyze the roles played by the landscape and urban designers. I argue that the technical and discursive practices of these actors shape the places where the New City inhabitants live and how they relate to their so-planned sustainable urban environment. Finally, using observations and interviews at sites of transformation, I briefly illustrate how the process of constructing new ecological values through Yixing's model eco-urbanization is ultimately conflictual and violent.

Inscribing Nature through Planning

The first epigraph to this chapter presents the dual principles in the New City Regulatory Plan that are guiding Yixing's project of eco-urbanization. First, the ecological city is created and molded directly from the region's natural distinguishing features. Second, planning "integrates" the natural environment into the functions of the

[262] "the Park" refers to Yixing Industrial Park for Environmental Science and Technology (YIPEST); "the Zone" to the Yixing Technology and Economic Development Zone

new city for social benefit. The second principle demonstrates an incipient urban conception of the "natural" environment as one recovered from rural uses as a space produced for urban leisure that is more in tune with the distinguishing characteristics of the landscape.

The somewhat lyrical official prose of this representation of the New City planning evokes Latour's discussion of scientific practices of visualization and cognition in the second epigraph. As an example of such apparatuses and practices of "inscription," he argues that the "optical consistency" of linear perspective presents a basis for the "realistic" visualization of "absent things"—of fiction *or* nature—in a two-way relationship between forms of representation and their objects (either "from nature or from fiction").[263] In the seminal work, *Laboratory Life: The Making of Scientific Facts*, Latour and Woolgar describe such inscription devices as any apparatus used to "transform pieces of matter into written documents…a figure or diagram which is directly usable by one of the members of the office space."[264] These "inscriptions" are artifacts that are "regarded as having a *direct relationship* to 'the original substance.'"[265] Latour's approach is to highlight not only the construction of knowledge of the antecedent object. Rather, he emphasizes the production of "hybrids" of indistinguishable nature and fiction, "with all the elements made so homogeneous in space that it is now possible to reshuffle them like a pack of cards."[266]

To most planners, the green planning principles of the New City plan seem quite reasonable and even laudable. After all, the wetlands and riverine landscapes referred to are undoubtedly biologically fecund as habitat for non-human organisms. Our contemporary understanding of ecological value stems from such conceptions of a Nature "out there" and in equilibrium apart from human causes.[267] Here, Latour's methodological argument for investigating the "mundane" objects of writing and imaging inscription and the "strange missions" that mobilize them as co-constituted is germane. The production of the inscriptions of planning is one such "mundane" process—mundane in their visual language and ability to "take back" not only some accurate form of representation, but of a "two-way" relationship with the site's *nature* and a means to act upon it directly. Of this ability, Latour describes the inscriptions as "immutable mobiles."[268] Below, I will discuss the hydrological analysis of the New City site as such

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[263] Latour (1986: 7-9)

[264] Latour and Woolgar (1986 [1979]) p. 51

[265] Latour and Woolgar (1986 [1979]) p. 51

[266] Latour 1986: 8.

[267] e.g. Williams (1975, 1980); Cronon (1996)

[268] Latour 1986: 7-14. Söderström (1996) refers to Latour's (1987) *Science in Action* in utilizing the concept of immutable mobiles in his genealogy of the visual practices that co-constitute planning expertise and intersecting forms of power-knowledge. His history of the "zenithal gaze" of totalizing abstraction—the winged eye of Leon Battista Alberti's ca. 1445 *Descriptio Urbis Romae*—in the ichnographic plan as the key tool of planning is a useful counterpoint to my discussion of the disembodied aerial view.

an inscription with the ability to convey the same information—its "direct relationship to the original substance"— through displacements of time and space.

How is this relational status of the plan-ecology created and subsequently made to act? In other words, what are the relationships that planning produces between its inscriptions and social-environmental space? What constitutes the apparatus of inscribing eco-urbanization in China and elsewhere? In Yixing and across China, how do such plans for environmentalized rural transformation gain the currency of science and political viability in a time when conflicts over rural land dispossession are of increasing concern to the central government?

To begin to address these questions, I recall the argument in the preceding chapters about the context of what I call commonplace greening, which produces a domain of scientific governmental action for refiguring rural categories of society and space for environmentalized goals. In this context of crises, contradictions and accepted solutions, the work of planning in producing "possible utopias" is both commonplace and in demand of new sorts of *designed* intervention. Put another way, the emergent policies for shaping urban and rural space—and the people that (as Weber reminds us) breathe its air, the forms of production and consumption and the people who derive their livelihoods from them—must be translated into design *programs*. These programs of ecological construction, I argue, are not simply ideological veils (e.g. for political economic projects).

The constellation of national policies discussed below and in the preceding chapters, together with specific development projects and their programmatic goals, the authorities who discern them, and the experts and functionaries who are their practitioners, altogether constitute what Jonathan Crary describes as the "mixed" status of an optical apparatus: "an epistemological figure within a discursive order and an object within an arrangement of cultural practices… what Gilles Deleuze [and Félix Guattari] would call an assemblage, something that is 'simultaneously and inseparably a machinic assemblage and an assemblage of enunciation,' an object about which something is said and at the same time an object that is used. *It is a site at which a discursive formation intersects with material practices*."[269] This assemblage (diagrammed in Figure 6.1) forms the social-cultural apparatus that allows the techniques of planning to create plans—maps, bird's eye renderings, diagrams, photographs and words—that function as Latourian inscriptions—the two-way relationships that allow planners and the local government to construct and act upon ecological value in the process of eco-urbanization.

In order to make sense of Yixing's 'planning things together'—the construction of spatial planning programs through the assemblage of multiple policy dimensions with Yixing's local model of green development and sites of rural transformation—I examine these linkages of "the ecological environment" across such disparate policy domains into spatial planning and urban development. The following section outlines the national governmental concepts of "ecological civilization" (*shengtai wenming*) and "ecological

[269] Crary (1992: 30-31) 30-31, emphasis added.

construction" (*shengtai jianshe*). I argue that these concepts encapsulate the current ideology of green development as an explicitly spatial-territorial form of state planning linking environmental, economic, social, and industrial development to eco-urbanism as a cultural and place making program. This discussion will then serve as the policy context for analyzing how Yixing's planning practices enter into these domains.

The National Codification of Ecological Construction as State Planning

At the 2005 Central Work Conference on Population, Resources and the Environment, Hu Jintao proposed the term "ecological civilization" (*shengtai wenming*) as a concept to link development and regulatory policies to a framework for environmental protection, planning and public education. The concept was further expanded at the 17th National Congress to signify the overall strategy of building an industrial structure, consumption model and mode of growth based on resource and energy efficiency and ecological protection as the "the first objective of a moderately well-off society."[270] The discussion of ecological civilization as codified in the Twelfth Five-Year Plan in 2011 emphasizes "strengthening awareness of environmental crises" in relationship to resource consumption, pollution, climate forcing carbon emissions, adequate quality of life and the ability to achieve sustainable development.

In 2012 at the CPC ministerial level work conference of the CPC 18th Congress, Hu Jintao emphasized "ecological construction as an ideal, a principle and goal must merge comprehensively with China's economic, political, cultural and all aspects and processes of constructing society." He continued: "We must work hard to build a beautiful China, and realize sustainable development (*yongxu fazhan*) for the Chinese nation, [and]… strive for green, circular and low-carbon development." In his work report, Hu presented the construction of ecological civilization as an explicit spatial-territorial nation-building project, framing targets for water, energy and land consumption intensity per unit of GDP:

> *Energetically advance the construction of ecological civilization. Improve the structure of national territorial development. The national territory is the spatial vehicle for the construction of ecological civilization, and we must cherish every inch of it. Guided by the principle of maintaining balance between population, resources and the environment and promoting economic, social and ecological benefits, we must keep the pace of development under control and regulate its spatial structure. We should ensure that the space for production is used intensively and efficiently, that residential space is livable and proper in size, and that ecological space is unspoiled and beautiful; and we should leave more space for nature to achieve self-renewal. We should keep yet more fertile farmland for farmers, and leave to our future generations a beautiful homeland with blue skies, green fields, and clean water. We should ensure the speedy implementation of the functional zoning strategy and require*

[270] MEP (2012)

> *all regions to pursue development in strict accordance with this strategy, and advance scientifically rational urbanization, agricultural development and ecological security*.[271]

Coming at the end of Hu's incumbency, these wide ranging policy statements set the tone for continuity that the incoming administration under Xi Jinping would pick up in the Third Plenum of the 18th Congress in 2013. In the plenary communiqué, the first major policy statement of his administration, Xi highlighted ecological construction as an integral part of building socialism with Chinese characteristics. The Central Committee suggested further systematization of targets including payment for ecosystem services, offset fee systems, and the establishment of "ecological protection redlines" (*shengtai baohu hongxian*) as the basis for further reform in the national environmental protection regime. Moreover, the communiqué addresses the urban-rural dual structure as a primary obstacle to "the modernization of agriculture and a healthy system of urbanization." The statement also calls for the establishment of a unified urban-rural land market with expanded rural property rights to "enable vast numbers of farmers to participate equally in the modernization process, to have a common share in the achievements of modernization."

With its calls for the establishment of scientific planning and systematic management of "urban-rural integrated relationships between workers and peasants, the city and the countryside," these statements demonstrate a progression toward a view of "comprehensive overall development" (*quanmian fazhan*). However, its vision of ecologically rational and socially development is presented as being "holistically" predicated on rural transformation. This approach was recently made national policy with the promulgation of the National Plan for a New Model of Urbanization (2014-2020). The plan promotes ecological civilization as a "guiding ideology" (*zhidao sixiang*) to be made "a comprehensively integral part of the urbanization process… to forcefully advance green, circular, low-carbon development, and the efficient and intensive use of land, water, energy and other resources; to strengthen environmental protection and ecological recovery, reduce disturbances and harm to nature, and push forward the formation of green, low-carbon livelihoods and models of urban construction and operation."[272]

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[271] Xinhua News Agency (2012b: sec.8, p.1). At the end of Hu's incumbency as president and general secretary of the CPC, Xinhua published a multilingual website dedicated to his work reports and resolutions from the 18th Party Congress (Xinhua News Agency 2012a). Xinhua, the state press agency of China, is a ministry level state-owned enterprise under the control of the central party leadership in the State Council, is a primary "state ideological apparatus" (Wu 2000) 51). Under the central leadership, Xinhua was founded to "present the voice of the government, with exclusive rights to cover the Party and the government's official documents, leaders' activities, and politically sensitive events… implement centralized control over its branches… in order to keep a unitary political tone… [and] guide domestic news organizations to follow the Party's principles" (Song and Chang 2012: 50).

[272] The plan and accompanying statements were released on March 16, 2014 by the Central Committee and the State Council (Central Committee and State Council 2014).

Ecological Construction in Yixing

In this national context of increasing policy imperatives linking environmental governance to social and economic development, the term "ecological construction" (*shengtai jianshe*) is frequently used in Yixing to indicate a simultaneous process of transforming rural space and society in an inclusionary ("integrated") form of development: the eco-city. In Yixing's Eleventh Five-Year Plan, ecological construction is emphasized in two areas. The first is in the "construction of a resource efficient and environmentally friendly society."[273] Targets for this goal are described as promoting a circular economy (*xunhuan jingji*) based on principles of dematerialization ([*wuzhi*] *jianliang hua*) and renewable resourcing (*zailiyong ziyuan hua*).[274] The plan promotes the construction of cleaner production industrial parks with ISO 14000 Standard certified comprehensive environmental management systems in order to develop market incentives through subsidies and land supports for these objectives.[275] The second area of ecological construction is the improvement of residential quality of life and the image of Yixing's urban form (*chengshi xingxiang*). Related to this goal are specific objectives for building a unified wastewater management system, a hazardous waste landfill, 'rectification' of rural village environments, and the construction of new scenic areas.

In subsequent key planning documents, the notion of resource efficiency is further linked to spatial planning and urban-rural integration.[276] In 2006, the Yixing People's Congress passed the *Yixing Eco-City Construction Plan* as a framework policy for ecological construction, spanning environmental protection, new socialist countryside policy, ecological tourism, air quality, resource efficiency, urban-rural integration of sewer and wastewater infrastructure, industrial restructuring for cleaner production in key sectors, and landscape beautification.[277] In the plan and subsequent policy statements, municipal officials envisioned transforming the Yixing region into an eco-city with

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[273] p. 33 (Yixing People's Government 2009) the 11-5 Plan covers the 2006-2010 period, but was not completed and promulgated until 2009.

[274] Ibid. The language of "dematerialization" (物质减量化) is taken from the gloss in the 2002 Cleaner Production Promotion Law, and frequently abbreviated as "reducing" (*jianliang hua*, read as a gerund to denote a process). In the Law, dematerialization is centered on continual improvement in the reduction and "comprehensive utilization" of resources in the course of industrial production. The first step in implementation as outlined by the law is comprehensive assessment and enumeration of impact on the environment (Article 18). This aspect of the law and planning for cleaner production has contributed to the growth of industrial ecology and related areas of process and environmental engineering.

[275] The promotion of the ISO 14000 series standards and certification for environmental management systems (ISO 14001) has become widespread in China. However, because ISO 14000 does not establish any performance standards, actual environmental performance depends on the strength of private company policies and local regulatory enforcement regimes. As one staff member of the Beijing office of the National Resources Defense Council remarked to me, "Monitoring is maybe still the first step. Verification systems for [pollution] reduction is necessary for economic incentives to operate. But, without shifts to political incentives, this information does nothing." (Interview 20100707_BJG.2)

[276] JSAES (2010)

[277] Yixing City Eco-City Construction Plan (宜兴市生态市建设规划) is commonly referred to as the Eco-City Plan (*shengtaishi guihua*) (Yixing People's Government 2010).

interlinked urban centers with "first-class" infrastructure, environmentally rational land use and optimized agriculture.[278] Following the outline of quantitative "veto targets" for reduction of air pollution and energy intensity in the 11-5 Plan, Yixing's top officials set their ambitions for ecological construction to the rapid tempo of political promotion cycles, and sought construction to be substantially realized by the end of the plan period in 2010.[279]

In its revision of its long-term comprehensive plan (2003-2020) to conform to the Eleventh Five-Year Plan, the Yixing government emphasized rural transformation as a fundamental means to operationalize the goals of the Eco-city Plan and ecological construction. In its discussion of urban-rural integration, the 2006 revised comprehensive plan emphasizes action on Three Consolidations, which promotes the movement of rural populations into urbanized settlements, rural industries into industrial zones and cities, and farmland into larger-scale holdings. The plan says:

> *Enlarge the "Three Consolidations" policy and the implementation strength of withdrawing villages and combining them into towns. Promote the [rural] population and industries to move to the city center and into key towns. Accelerate the circulation of agricultural land, and increase the agricultural labor production rate and added value of agricultural commodities. Promote the movement of village residual labor to towns. Adjust urban spatial structure, lowering the non-native population in-migration rate. Raise the standard, ideals and efficacy of the governmental management of the city. Strengthen the city's attractiveness.*[280]

In a separate section, the plan goes on to link urbanization planning and the Three Consolidations to the planned restructuring of land use with new categories of ecological construction.

> *Urban space can be differentiated according to land use function into three major categories of farmland protection zones, ecologically sensitive areas, and urban construction areas. Among ecologically sensitive areas are included national forest parks and natural protection areas, ecological scenic tourism areas, important watershed protection areas, water source conservation areas, and mountain and forest areas. In order to realize industrialization, marketization and urbanization in close integration, the plan will implement spatial restructuring through the Three Consolidations: consolidation of industries into urban area industrial zones, consolidation of residences into urban residential areas,*

[278] see (Xu 2008); (JSAES 2010; Yixing Municipal Government 2006; Yixing CPC 2006b, a)

[279] If not met, veto targets (*yipiao foujue zhibiao*) are grounds for dismissal or demotion. On the use of targets for promotions in the bureaucratic system, see (Smith 2013)

[280] Yixing People's Government (2006b) p.16.

> *and the consolidation of village collective farmland into large private farms. Farmland will move toward modern large-scale management. Competition will create balance. The ecological environment will receive practical safeguarding and improvement, and engender the high performance, intensive, rational and sustainable use of space*.[281]

After a 2007-2008 process of expanding the 2020 comprehensive master plan to reflect the goals of the Eco-City Construction Plan (which I will discuss further below) the municipal government and Zone officials began discussing the Scientific Innovation New City as a new center of ecological construction and an important node in the overall spatial structure of the Yixing region.[282] Early on, the leadership committee set the goal of leveraging the development to meet provincial and national standards for eco-industrial parks, and model sustainable development zones. These requirements are based on standards for infrastructure, air and water quality, green space, as well as economic metrics such as level of investment per unit area.

Inspired by the explosion of the solar sector across Jiangsu province, an area was earmarked for the master planned development of the sector through cooperative investment joint ventures. Often referred to as a "new CBD" (in the English, as the acronym for "central business district"), the New City was envisioned as the heart of Yixing's burgeoning knowledge economy, with "world-class" architecture, landscape design and urban amenities to support a carefully vetted and incubated range of environmental industries.[283] According to plans, the New City would be home to new institutions geared toward expanding expertise and human resources "talent" (*rencai*) for Yixing's green economy. These projects include a solar photovoltaic research and development institute and a four-year technical university campus co-founded by the Yixing municipal government and the Nanjing University of Posts and Telecommunications.[284] As outlined in the Zone's 12-5 Plan, the New City project is a linchpin in Yixing's "de-carbonization" (*ditanhua*) strategy. Utilizing ground-up utilities and transportation infrastructure planning including solar and wind energy electricity generation, distributed energy systems, geothermal energy and architectural design requirements for solar heating and other green technologies, the New City project is modeling ecological construction for an additional four new eco-city projects in Yixing's master plan.

This linkage of goals for social, economic and spatial change was captured by a billboard for the Yixing Solar Valley, a New City project to promote investment in the renewable energy industry through earmarked incentives of land and financing for the

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[281] Yixing People's Government (2006a) p. 61

[282] The project name, *Ke Chuang Xin Cheng*, plays on the use of the character for "new" (*xin*) in joining "creation and innovation" (*chuangxin*) to "new city" (*xin cheng*). The emphasis on newness and its paradoxical conflation with a notion of landscape "regression" will be elaborated below.

[283] YXEDZ Cmte (2010b: 11); also (Interview 2010)

[284] The R&D center was sited at the Guodian campus in 2013 (Guodian 2013).

solar industry.[285] Towering over the demolition sites of Sidong and Huayu villages, the billboard heralded: "New Talent, New Industry, a New City." Such a scheme recalls projects of authoritarian high modernist "total planning," described by Holston as premised on "the merging of state and society… [with] the identification of the state as the organizer of social life, through work, in every sector of society… each motivated, organized, and regulated by the same planning agent—the state."[286] However, there is a not-so-subtle difference: the refiguring of rural labor through the urban-rural integration of "the New Socialist Countryside" has meant massive unemployment. Unmoored from their historic means of livelihood and reproduction, farmers do not possess the "talent" required by Yixing's new industries.

Visualizing the New City and its Ecological Structure

This section discusses the initial development of an urban design trajectory for the New City project that would tie the project's diverse array of goals for ecological construction to the site itself. In the interpretive framework of the chapter, this process should be understood as the drawing together of the program assemblage—the construction of the context in which NITA's plans could be taken as environmentally and socially rational and enfolded with the authority of the state in its pursuit of urban ecological construction.

In 2006, urban expansion projects for urban-rural integration entered initial phases of planning in sites across the region. These included a proposed new town development to the east of the Zone. Altogether, these expanded the level of urbanization planning in the 2020 comprehensive plan to include all nine of the rural township level subdivisions within Yixing's jurisdiction. These appear in a 2008 version of the proposed plan by the Yixing Urban Planning and Design Institute, which includes more than double the land area of the previous planning boundary (*guihua yongdi fanwei*; see Figures 6.2 and 6.3).

The project area that would eventually be the site of the New City lies to the north of Dongjiu Lake in the eastern district of the city, an area that appeared just a year earlier in the 2005 revision of the 2020 Long-term Comprehensive Land Use Plan as an expanse of "other green space" (*qita lüdi*; see Figure 6.2). In the Prospective Urbanization Plan, the same area is zoned as segregated blocks of residential, industrial and green space (see Figures 6.7 and 6.8). In the prospective revision of the comprehensive plan, the site is shown as a gridded continuation of the Zone and separated from a planned extension of

[285] The Solar Valley project includes investment from two major power sector SOEs (the Guodian Group, and Dongfang Electric) and Magi Solar (Yuanqiang and Ling 2010). Magi Solar was founded as a joint venture between a German solar cell equipment manufacturer, Centrotherm, and capital from the Zone's investment company and a local electric cable enterprise. The deal was facilitated by the Zone administration, which shepherded land acquisition, plant build out and human resources management until the venture became profitable. The company was subsequently sold to Dongfang Electric. This process significantly reduced costs and risk to the external parties.

[286](Holston 1989) 154

the urban core by a substantial green space surrounding Qianshu Lake and an east-west green belt corridor. In its diagrammatic analysis, the plan describes the resulting urban-rural integration as a spatial structure, consisting of a primary urban core with an axis running roughly north-south and linking the townships to the west of the core.[287] This initial vision approaches the Three Consolidation goals primarily through the expansion of the Zone to provide construction space for concentrating population and industries.

Soon after its founding in April 2006, the eastern district was incorporated into the Zone.[288] Upon receiving the mandate to develop the district for residential and industrial consolidation, the Zone leadership committee immediately rejected the original master plan made by the Yixing Urban Planning & Design Institute and the Yixing municipal planning bureau. The committee chairman, Zhu Xufeng, told me plainly at our first meeting that he deemed the plan "very ugly" and that it would produce an "old style" industrial park rather than a city. In its efforts to transcend its industrial park legacies, the Zone leadership envisioned "utilizing the industrial base as the foundation for a modernized city with ecologically positive feedback cycles."

Zhu and Zone Director Shi both emphasized on numerous occasions their distinction between industrial and urban growth as strategies for social development and environmental improvement. During one conversation, Shi described Yixing's development in terms of a successive progression of industrial sectors, each displacing its more resource intensive and lower value predecessor. Alongside, his hand-drawn diagram of Yixing's development, Shi described social development as a parallel process of moving away from direct dependence on land and local physical resources that enabled a linear improvement of living conditions (*shenghuo tiaojian*).[289]

> *Of course the industries we choose must be correct. However, in any industry, you don't know how long it will perform. Right now, solar power has a good outlook to support our becoming developed. People think our purpose is to build new energy industries. In fact, it is not. New energy is simply a rapidly rising sector at this time. It has a good future potential, but we don't know for how long. The only way to ensure sustainable development is to build a modem innovation city.*

He further argued that the *necessity* (*biyaoxing*) of the project to the historical process of development in Yixing was evidenced by rural residents' response to eviction as "happily" (*hen leyi de*) compliant, and sanguine regarding prospects of a better life.

In their descriptions of such developmental motivations for the project, the leadership committee recited the narrative of Yixing's environmental culture. However, in discussing its course of design and planning, they frequently also made explicit

[287] The slogan describing the spatial structure is "one plate, one axis" (*yi pian, yi zhou*)

[288] As discussed in the previous chapter, this administrative enclosure also served to facilitate the management of land conversion and usage quotas.

[289] (Interview 20100811_YXZ.1)

mention of "world-class" and "international standard" experts, ideas and understandings of urban development. In the early process of master planning urban development in the Zone, Zhu sought out Shi Kuang, the chief planner for the China-Singapore Suzhou Industrial Park (CSIP).[290] In that role, Shi Kuang is credited with introducing Singaporean-British practices of advanced statutory master planning to China, which he has now applied to over 150 planning projects. The Zone leaders explicitly sought Shi Kuang out for his profile and the prestige of the CSIP project as the premier industrial park in the country. Shi Kuang subsequently directed an "international standard" functional zoning plan, a concept plan, comprehensive plan, and a detailed control plan for the entire Zone.

In the written documents of the master plan, completed in August 2007, special attention is given to coordinating development between existing and prospective industrial areas and the eastern district. To accomplish this, the plan outlines the role of spatial planning in building the road and infrastructural network as the base foundation for coordinating all functions toward the goals of industrial growth and a beautiful environment. Having described the original plans produced by the Yixing Urban Planning & Design Institute as "very ugly," the management committee of the Zone placed a high degree of importance on visual aesthetic markers that would distinguish the new development as a separate green urban entity apart from the industrial districts that preceded the Zone. Accordingly, Shi Kuang's program for the New City project emphasized features of the site's natural landscape.

Whereas the landscape is barely acknowledged in the previous proposal, the new approach was to be centered on Qianshu and Xiapei Lakes and the riverine and canal system. This approach also sets the tone for subsequent new district planning at the municipal level and creates the vision and a model for transforming Yixing into model ecological "water city"—a region-scale eco-city patterned around Yixing's major wetland features. The evolving plan projected an integrated urban-rural geography of growth pole townships, and new ecologically planned model city developments (see the Comprehensive Plan in Figure 6.3; green development projects are listed in Table 4.2). While still dominated by the grid of the Zone, the layout of the New City in Shi Kuang's master plan is sited in relation to the lakes and wetlands in the 22 sq-km of village lands and to the east of the Zone (see Figure 6.4). The plan shapes a modified grid around the water features to form a core of connective green space between Dongjiu Lake and the

[290] Shi Kuang, now famous as the chief architect at CCDI (the Chinese partner behind the Beijing Olympics Water Cube), was trained in Singapore for eight months in 1994 prior to his role as the CSIP planner. During this period, Shi Kuang reflected on the lack of detailed statutory planning in China's industrial parks. With his collaborators in Singapore, he sought to learn from British town planning practice. The result was the production of the CSIP master plan including a comprehensive plan, a detailed statutory control plan and an implementation management framework (Fang 2010). Though not an official part of the narrative, the New City project section chief described Shi Kuang's training in Singapore as a "brainwashing of all the backward practices in Chinese planning at the time"(Interview 20100813_YXZ.1). For a discussion of the inability of previous master planning practices to govern piecemeal development, see (Wu, Xu, and Yeh 2007),160-4.

hills at the northeast edge of the district. Nonetheless, with even a studied examination, there is not much that appears to distinguish these plans. I argue that this calls our attention to how each iteration performs as an inscription. That is, the inscriptions produced by Shi Kuang's "machinic assemblage" make wholly other arguments than those produced by the local institute. I will describe some key aspects of this difference in the sections below.

Circulating "Green" Expertise

Although formal land requisitions did not begin until 2009, detailed master planning for the eco-city project began in 2008 when the Zone administration conducted an invitation-only tender for plan proposals for a 3 sq-km initial phase. The competition included five firms: Beijing Tsinghua Urban Planning Design Research Institute, Shanghai Tongji Planning Design Research Institute, Shanghai United Design Group, the Alsace Architecture Design Institute (AADI), and the NITA Design Group.[291] NITA (Nederlands Instituut voor Tuinbouw en Architectuur—Netherlands Institute for Horticulture and Architecture) is a Dutch consultancy that is composed of architectural, landscape and urban designers.[292] In 2006, NITA had gained national recognition when they won the site plan and landscape design competition for the 2010 Shanghai World Expo. On August 7, 2008, the Yixing Planning Bureau announced that NITA won the invited competition based on its proposal of a "green city" design. To Zone project staff, this was not a surprise. The zone leaders had explicitly sought out NITA's participation as "award winning, world-class designers with a background in emphasizing 'green' landscape designs and therefore an ideal firm to lead the master planning design process.[293]

By utilizing the competition tender framework to (pre-)select NITA as the designer, the Yixing government combined the legitimating force of the jury panel with the expertise exhibited by the firm. Here, it is important to highlight that the winning 'entry' was not a completed design proposal.[294] Rather, the competition was based largely on the self-representation of qualifications and reputational capital. Although the work of AADI was also represented at the Expo, NITA's status as the master planner of the project was critical to the selection. Centered on the theme, "Better City, Better Life," the

[291] (Yixing Urban Planning Bureau 2008a)

[292] NITA compares its organizational form and culture to LEGO toys, describing its practice as an "open platform" that includes many designers who have their own respective firms (see nitagroup.com/en/). In 2012, NITA's China practice signed a formal partnership agreement with the Dutch architecture and engineering. In press releases, NITA-Inbo partnership is described as a platform to "merge experts from multiple industries, sharing innovative design and green technologies from the green Kingdom of the Netherlands with different Chinese cities, to enhance more cities with green vitality" (NITA 2012); providing "… the innovations, new concepts and designs to meet China's ambitions to make Green Cities, top quality business parks and preserving the heritage landscape and buildings China is proud of" (Inbo 2012).

[293] (Interview 20100811_YXZ.2)

[294] (Interview 20100813_YXZ.1)

Shanghai 2010 World Expo was cast as an intervention into the future of global urban life (SWECB 2007). More literally translated as, "the city, yielding a better life," the slogan in Chinese (*chengshi, rang shenghuo geng meihao*) is less a call for the improvement of the city for the sake of a better life, than a projected equation of development with urbanization.

The proposal from NITA was centered on mobilizing its green city-building credentials *before* construction of the Expo began. This circular logic of justifying design through precedence, and producing the success of a given precedent through citation is, of course, not unusual. Rather, such regression to precedence is at the very center of modern design pedagogy. Here, I highlight this dynamic in the selection of NITA in order to call attention to the bureaucratic-discursive construction of expert authority in ecological construction. The bureaucratic process of selection imbues the experts with the authority of the state in producing plans for the construction and dispensation of spatially planned ecological value. The links in constructing ecological value are thus cemented by state authority and a cultural geography of green expertise that promotes urbanization as inherently progressive in social and environmental terms.

Designing Ecological Value

In subsequent statements on the programmatic goals for the project, the management committee further reveals how Yixing's project of ecological construction is embedded within this ideological conception of urbanization. In the 12-5 Plan, the committee describes its goal to utilize "the natural and historical heritage of Yixing" as a basis for shaping the Zone's development—to cultivate a place-specific urbanism and culture using "'born and growing from nature' as the planning ideal… to construct a green tapestry with the mountains and waters, a beautiful and elegant new city" (YXEDZ Cmte 2010a: 11). This aesthetic conception is evident in the aerial rendering shown in Figure 6.5. Dense with environmental imagery and allusions to national cultural values and local heritage, statements like these construct a discursive aggregate of nature and development. The statement conflates an idealized Nature "out there" with the ways that Nature is valued in an aesthetic image. In the master planning process, these aesthetic representations became decisive. Jacques Rancière (2004) conceptualizes aesthetics as "the distribution of the sensible," meaning a sort of common sense that shapes what can be perceived and understood as correct in a social system of valuation and ethics. In the common sense of green development, this Nature can be seamlessly woven into a new city—in a new form of urbanism—through its representation in plans and discourse, and its mobilization in the planners' aesthetics of expertise.

The NITA designers spoke eloquently about their core values and design approach.[295] In particular, their notions of "green city building" and "Regression Design" caught the attention of Yixing city leaders and the leadership committee of the Zone. Though the actual techniques of Regression Design are unspecified in the plans, NITA

[295] (Interview 20100813_YXZ.1)

describes the concept in quasi-philosophical terms as "veneration of nature and respect for humanity" with the role of design to "regress the site to its natural state, to return to the site its cultural carrying capacity."[296] These basic principles echoed language in Yixing 2003-2020 Comprehensive Plan. In its opening passages, the plan refers to Daoist concepts of "the unity of heaven and humanity" (*tianren heyi*) and the "natural way" (*ziran guan*).[297] Since establishing a toehold in China designing the Holland exhibit at the 1999 Kunming Horticultural Expo, NITA has clearly made strategic cultural translations between eco-city ideas and supposed indigenous ideas of nature and social-environmental balance. For instance, the reference the natural way in the Comprehensive Plan refers to a common explication of the concept as "non-interference" with the dynamics of Nature. In its Regression Design approach to green cities, NITA describes a similar a path to which Chinese society must be restored.

Following its dual concept of green city construction based on local environmental-structural capacities, NITA's team sought to understand the site, and to build connections between its Nature and the new program. However, the depth of understanding required by NITA's design process was minimal. According to personal accounts of the design process by the Zone project staff, site surveying was cursory and conducted on a very short visit of a few days. "They saw the whole area. They also saw the development zone, the temple and the historic sites in the city. Basically, they would ride in the car and take pictures." Taking cues from the Shi Kuang master plan, NITA proposed a mixed-use block of the site to connect the two lake areas. This new programmatic element would be centered on R&D, with housing oriented to its professional workers. NITA argued that by linking to a high-technology park in the north and residential communities in the south, the R&D center would reduce peak hour transportation congestion and "emphasize a concept of merging research and development with production." It was further proposed that by running along the western edge of a restored wetland area, the R&D block would also present opportunities to "interweave natural scenic resources with public space and ecological corridor extensions."[298]

That these design concepts were based largely on reviews of the master planning documents and cursory visits to the site are not of concern here. Such design practices are mundane and fully accepted. Rather, my task here is to examine how such common practices work in the context of the ecological construction apparatus. Thus far, we know that knowledge of the site—its hydrology, wildlife ecology, native plants, wetland soil structures, algae bloom cycles, weather patterns, etc.—and its residents, their livelihoods and habits, utilized by the designers to perform their tasks were not derived from the deep

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[296] "回归设计"的核心内涵是敬畏自然和尊重人文... 设计的本身是回归到场地原本的自然风貌，回归到场地承载的文化精神。See, NITA (2010).

[297] In its discussion of these ideas, the Preface to the 2003-2020 Master Plan plagiarizes substantial amounts of text from Wang (2003), who briefly discusses the relationships between Daoist thought and eco-city construction.

[298] (Zhao and Chu 2008)

study of books, scientific papers or specialized staff trained in the collection of such data. Yet, the arguments carried by the design inscriptions—even their bare concepts—are evident in what ensued as ecological construction.

Excited by the green industrial mandate of the larger Zone, the team also researched precedents that could support the inscription of green economic goals into urban designs. This approach to design practice creates circular representations of "success" based upon a conflation of social and economic development processes in other places with features of the local built environments in those places. In this way, NITA's eco-city arguments, predicated on common design practices, are *regressions to precedent* rather than to the "nature" of the actual site.

The Regression approach is further elaborated in the New City control plans. For example, the notion of return finds expression in the effort of the designers to differentiate "natural" and human landscape features in order to subsequently create fixity for the ecological values that are supposedly recovered by eco-city as "carrying capacity" for perpetual human reproduction. To achieve this end, the NITA designers proceeded without hesitation, assembling a team of primarily Chinese designers under the direction of a Dutch project leader. The team interfaced with the newly established Scientific Innovation New City Development Company under the Zone committee with staffing provided as dispatched unit of the Yixing Planning Bureau. The local staff served as guides for the non-Chinese speaking planners and production staff to produce base drawings upon which the NITA designers embellished their vision.

In NITA's planning process, this abstraction began from initial surveys of villages and their environmental conditions. In order to construct their model of green urbanism, the planners shaped much of the conceptual planning around environmentalized physical features observed during cursory site visits. From the designer's viewpoint, the site was interpreted according to observations of physical "present conditions" (*xiankuang*). In Figure 6.9, the NITA planners represent these analyses. Space was reified from social contexts and analyzed as single-factor elements; for example, as a particular "land use" or type of surface. In representing areas without existing construction as "open spaces" and "green spaces," the planners constructed the countryside as an empty *tabula rasa*, belying the great extent to which the land itself has been built out of the marshes over hundreds of years. Instead, these wetlands are now referenced as "ecological resources" in need of protection, and as a Nature discernible from human causes that could yet be integrated with the new sustainable development aspirations of eco-city construction through NITA's Regression Design. NITA claimed that this "ecological framework" (*shengtai goujia*) was incorporated into the eco-city design in order to maintain the overall environmental integrity of the site; for example, by serving as a network of contiguous habitats. However, in the urban design, the key physical features of this framework have been paradoxically transformed into a space of recreation and commercial activity. Within globally circulating concepts of new urbanism, this type of urban greening is also broadly associated with the concept of "quality of life," and ecological progress is

increasingly interpreted through physical, aesthetic signifiers such as parks, clean public space, and newly constructed housing.

During the master planning process, the "ecological value" of the entire site was defined and assessed according to an environmentalized aesthetic that justified rural dispossession. Despite references to ecological service functions, the planning agencies did not employ wildlife biologists, hydrologists, soil scientists or other ecological scientists. Instead, the designers analyzed the site by abstracting the landscape into a series of aerially mapped layers, separating surface water, land uses, and describing "ecological service corridors." With the purported goal of identifying and preserving ecological services and value, the analysis proceeded based largely on a purely visual interpretation of land cover that conflated observable surface features with discrete land uses, and made a bright-line distinction between "natural landscape condition" (*ziran jingguan xianzhuang*) and "land use conditions" (*tudi shiyong xianzhuang*). The resulting analysis placed primary "ecological service value" (*shengtai fuwu jiazhi*) on three bodies of water and connecting canals, and assessed the site accordingly in gridded spectrum of preservation values and suitability for construction (as shown in Figure 6.6).

Such practices and discourses of environmentalization work to separate ecological functions from human activity. This has the consequence of obscuring the ways in which rural people actually make their livelihoods, and the complex social–environmental interactions between ostensibly distinct land uses. Although the small lakes and ponds, fringed by orchards and riparian plants, do serve as habitat to birds and other animals, the wetlands now enclosed within the Zone have been continuously manipulated and managed for centuries. The edges of water features have been transformed through aquaculture, and reclamation for settlement and agriculture. Aquaculture stocks interact with fish and other organisms in adjacent waterways and ponds, which are also stocked for subsistence fishing. The fact of a long history of social–environmental interaction undermines any conception of an *a priori* natural environmental condition for preservation or restoration, and foregrounds the political–economic and aesthetic–cultural choices behind the construction of the New City project. This aesthetic construction of a dichotomy between human and ecological space is especially striking in a resultant hydrology plan (shown in Figure 6.10) that highlights surface water features that will be filled in to provide construction land.

This aesthetic produces ideological connections between the social–environmental transformations of urbanization, industrialization, dispossession and village demolition. The resulting "green tapestry" of the Scientific Innovation New City belies the paradox of mobilizing local cultural and environmental heritage as a motive justification for the project even as rural social space is being refigured in the name of the "new" and "modern." These discursive and technical practices demonstrate how as agricultural land is constructed as a green development resource, it is divorced from rural society, effectively making rural people obstacles to the urban–ecological vision of sustainable development.

The design process proceeded quickly and the Zone administration approved the plan in November 2008. In order to fulfill the beautification and urban-rural integration goals of the Eco-City Plan, the Zone management committee placed a high degree of importance on aesthetic markers that distinguished the new plan from the industrial districts that preceded the Zone. A "comprehensive urban layout" (*zonghe chengshi buju*) with a heavy emphasis on urban design including green belts, landscaping, an incorporation of water landscape features, and consideration of views became as important as the allocation of parcels for industrial construction. The early prioritization of what was explicitly conceived of as urban–spatial over industrial development demonstrates the degree to which urbanization has superseded industrialization as a policy priority. In the statutory control plan, regression and future urban form are achieved chiefly through zoning and the layout of the urban grid. In the approach of Shi Kuang and the CSIP model, the grid provides fundamental physical structure even as Zoning may be revised. In this regard, the interventions by NITA sought to restore ecological value by using the grid as a skein for its own programmatic interventions.

Conclusion

By the beginning of 2010, the master planning process was complete, major infrastructure was under construction and most villagers within the area were aware of immanent eviction. The speed with which the New City project progressed from initial conceptualization through processes of government approval, planning, enclosure, land clearance and groundbreaking speaks clearly to the political strength of the current ideology of green development as a mode of urban modernization and economic development. The first phase of construction, occupies 10.3 sq-km, with 450,000 sq-m of newly constructed residential floor area accompanying 480,000 sq-m of business and commercial space. Land assembly and village evictions for this new district progressed in unpredictable waves as remote decision making processes linked to pressures from external investment capital and project financing pulled the demolition crews from one area of the site to another.

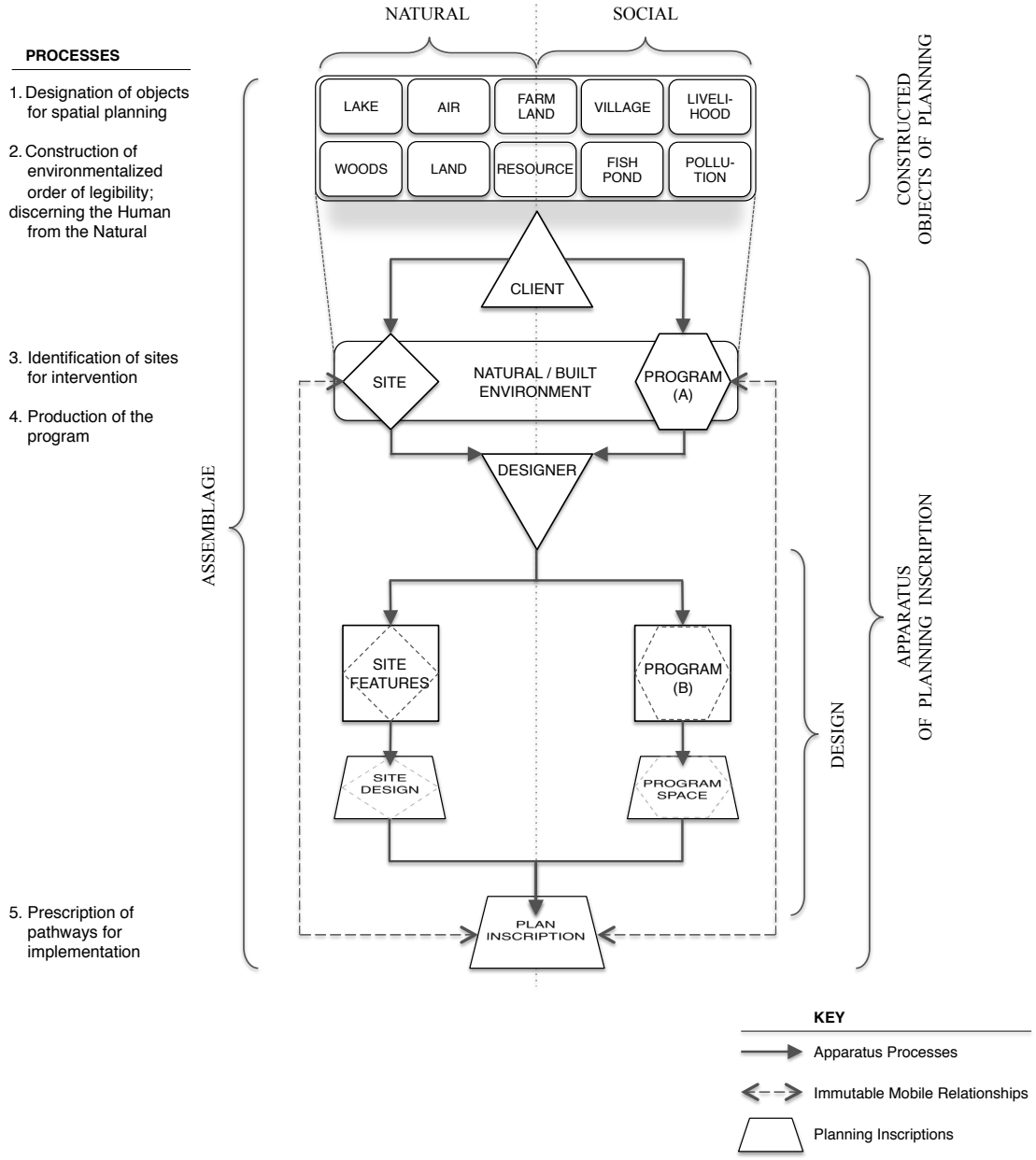
In its 2020 plan, the New City project will relocate over 10,000 rural residents from 36 villages in order to provide land for Yixing's new urban center with a new population of 100,000 urbanites and planned growth to 150,000 residents. In the context of such radical socio-spatial transformation, the technical and discursive practices of planning play a pivotal role in conceiving and representing the green development aspirations of the project. As a result of this *green dispossession*, villagers' assets are commodified and transferred into urban development projects. These projects reveal a politics of aesthetics and expertise that construct local land as a national environmental resource, while deeming rural people and livelihoods as environmentally irrational.

In the previous chapter, I discussed the ongoing importance of categories of rural land in to municipal authorities in balancing centralized land management quotas in relationship to master planned urban development. Here, I have examined how such administrative zoning intersects with the explicit identification of landscapes as ecologically significant. In other words, this is a process of locating ecological processes

in relation to administrative space in new domains of power-knowledge that are necessary for the construction of planned ecological value. Such forms of ecological expertise are reified and linked to the inscriptions of plans through a range of policies and practices, each occurring within political processes and ideological attachments.

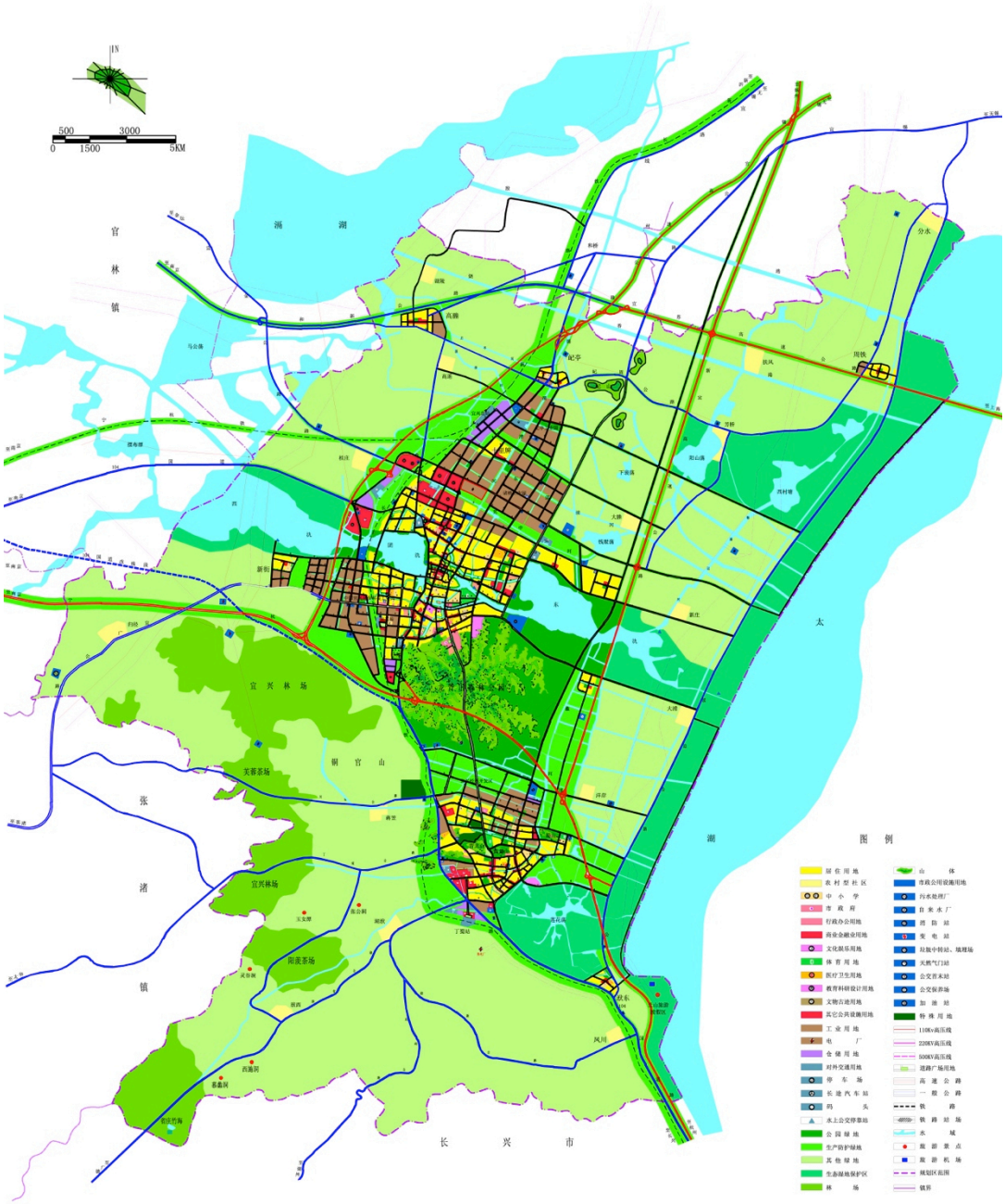
Chapter 6 Figures

Figure 6.1 Conceptual Diagram of Planning and Design Relationships



This diagram illustrates an abstracted succession of planning apparatus processes that result in the inscriptions such as plans. These embody the political rationale of green development, represent the necessary objects of spatial planning action, and prescribe and justify pathways for implementation. Meanwhile, the operation of these apparatus-procedures maintain an effective "immutable mobile" relationship between the "two-dimensional surface" of the inscription and the represented programmatic goals on the one hand and the social-environmental realities of the site on the other.

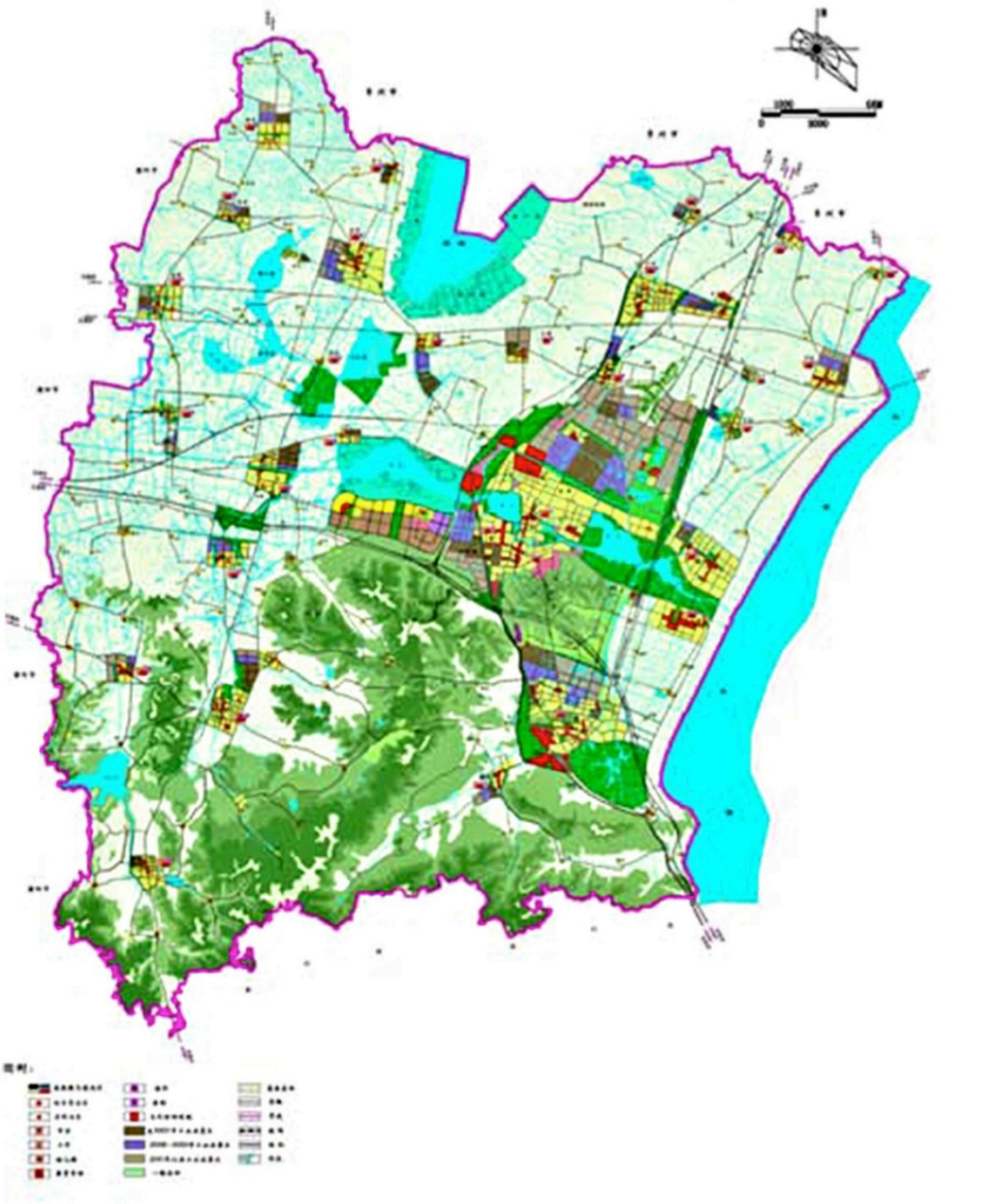
Figure 6.2 2005 Yixing Planning Area Long-term Comprehensive Land Use Plan [for 2020]



The plan shows the area of the New City project as originally planned in 2005-2007: as farmland designated as "other green space." Compare to the urbanization Prospective Plan in Figure 6.4 below.

Source: Yixing People's Government 2005

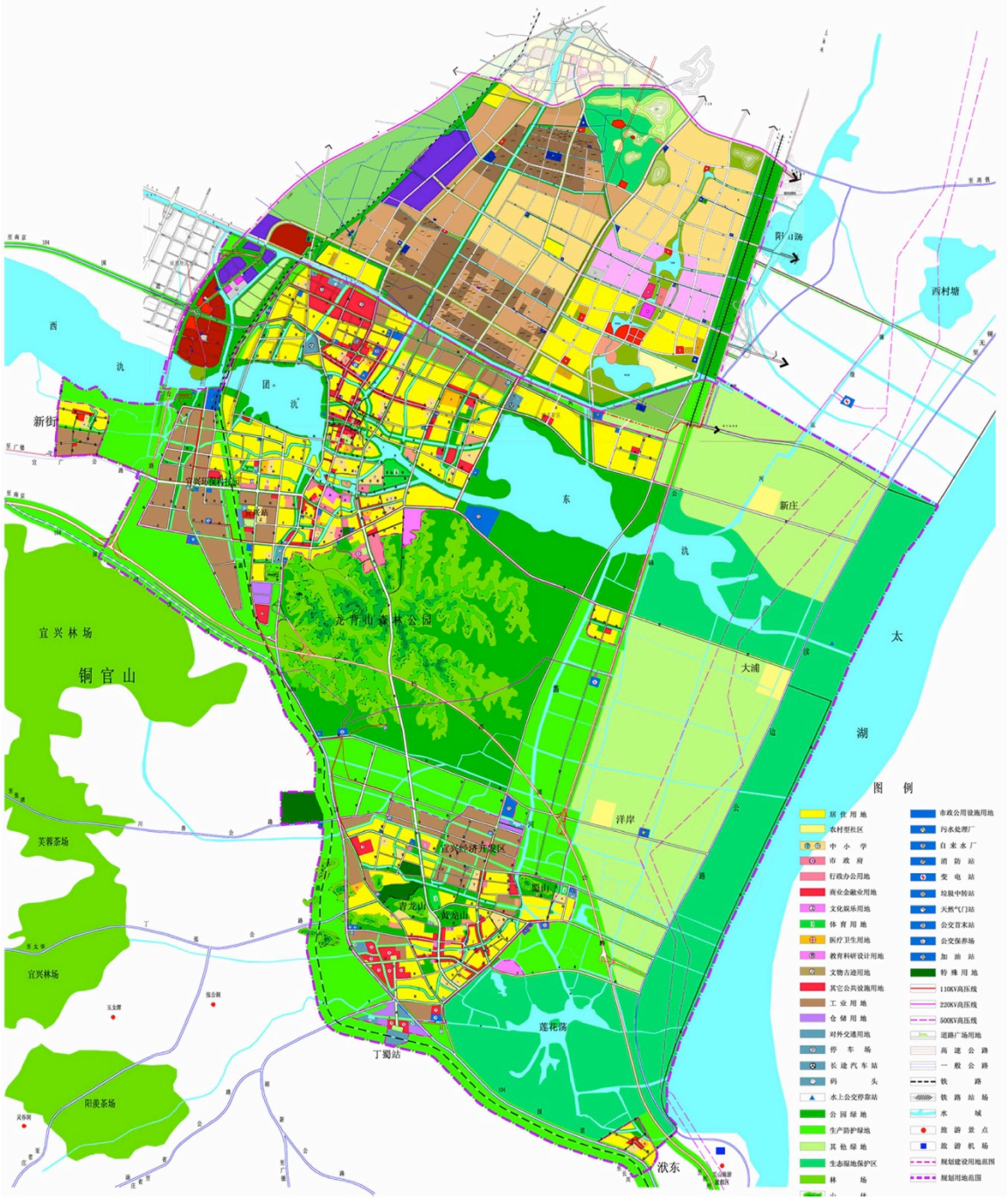
Figure 6.3 Yixing Comprehensive Plan (2008)



The expanded urbanization and rural land use planning scope in the Yixing Comprehensive Plan for 2020, which, in following the 2006 Eco-City Construction Plan, includes more than double the area of the 2005 plan for 2020 (see Figure 6.2 above).

Source: Yixing Urban Planning & Design Institute, 2008 (full resolution document not provided).

Figure 6.4 Shi Kuang's Yixing Urban Core Comprehensive Plan 2008

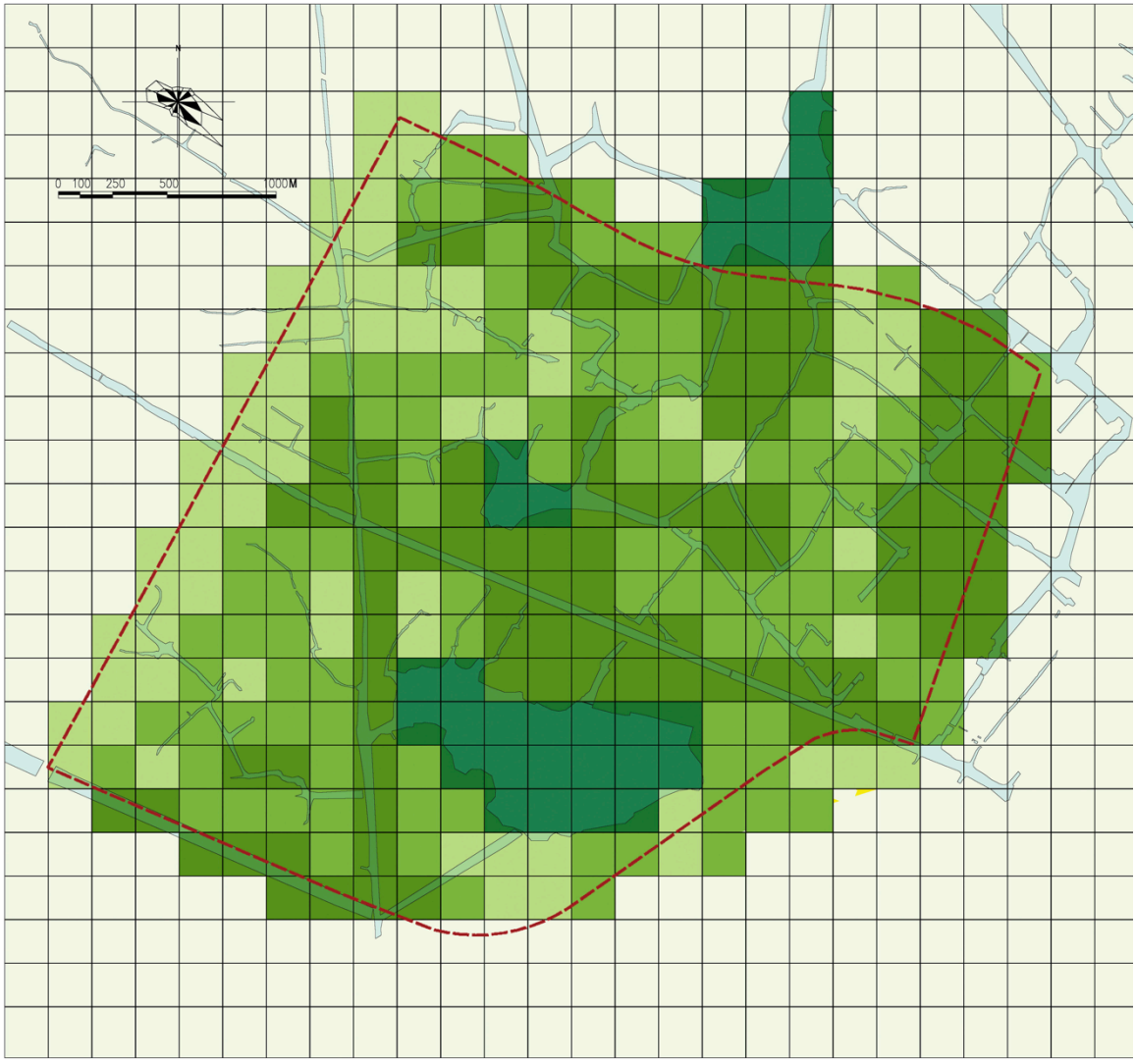


Source: YXEDZ Concept Plan Documents; Yixing People's Government 2008; this plan was produced under the direction of Shi Kuang in 2007. While the zoning shown is specified in detailed statutory plans, the structure of the grid infrastructure was the primary constraint for NITA's subsequent interventions.

Figure 6.5 Aerial view rendering of the New City project as a "green tapestry"

Source: Scientific Innovation New City Urban Design. 2008. Yixing Economic Development Zone Administration.

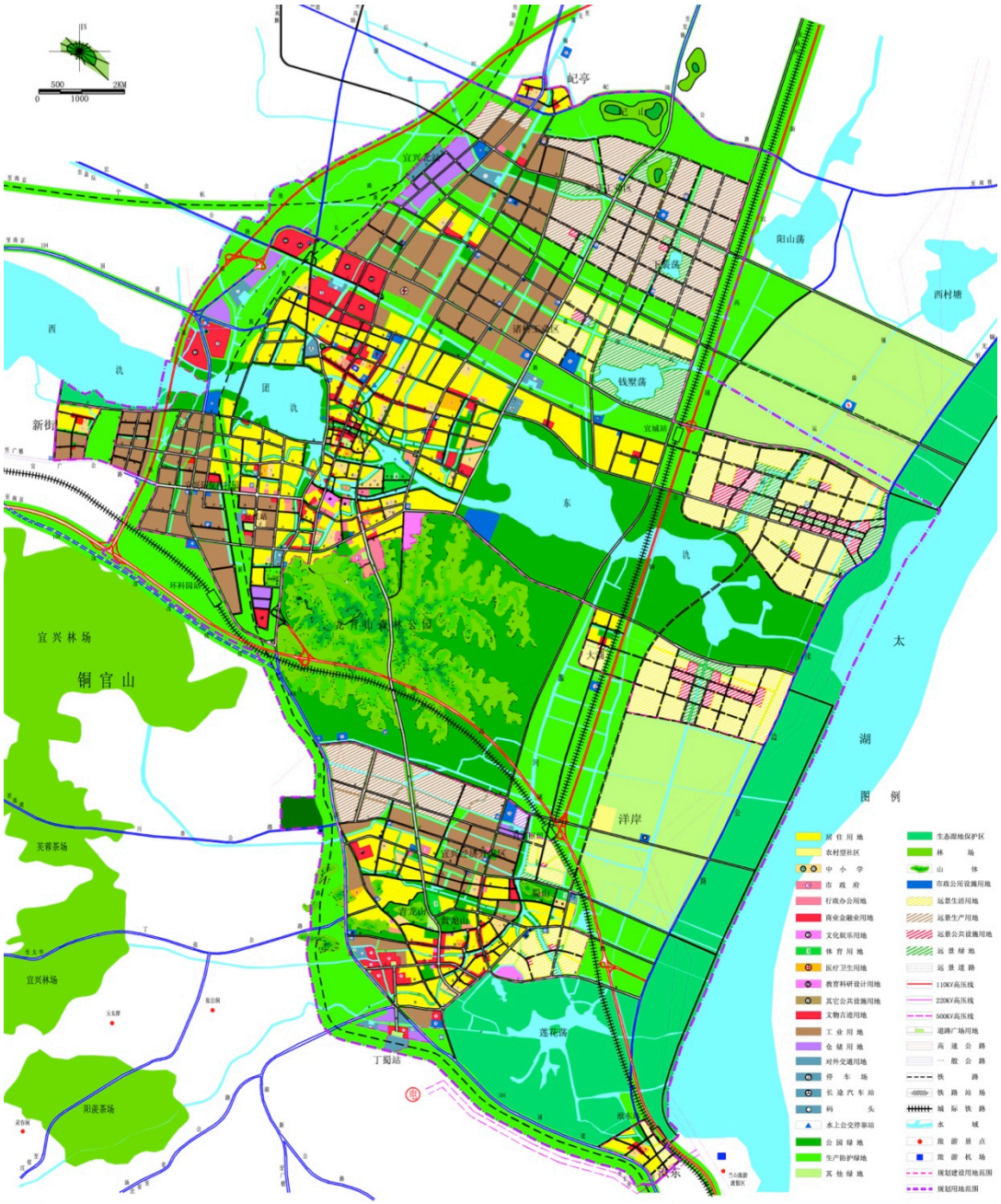
Figure 6.6 “Ecological Preservation Value Appraisal Map”



This “ecological value appraisal map” categorizes ecological values in order to determine (and justify) designated “preservation zones” and areas suitable for construction. “Higher” values are shown in darker shades of green and emphasize what the designers discerned as “natural” bodies of water. Such distinctions also help to justify the ongoing reclamations pictured in Figure 5.2.

Source: Scientific Innovation New City Control Plan. 2008. Yixing Economic Development Zone Administration.

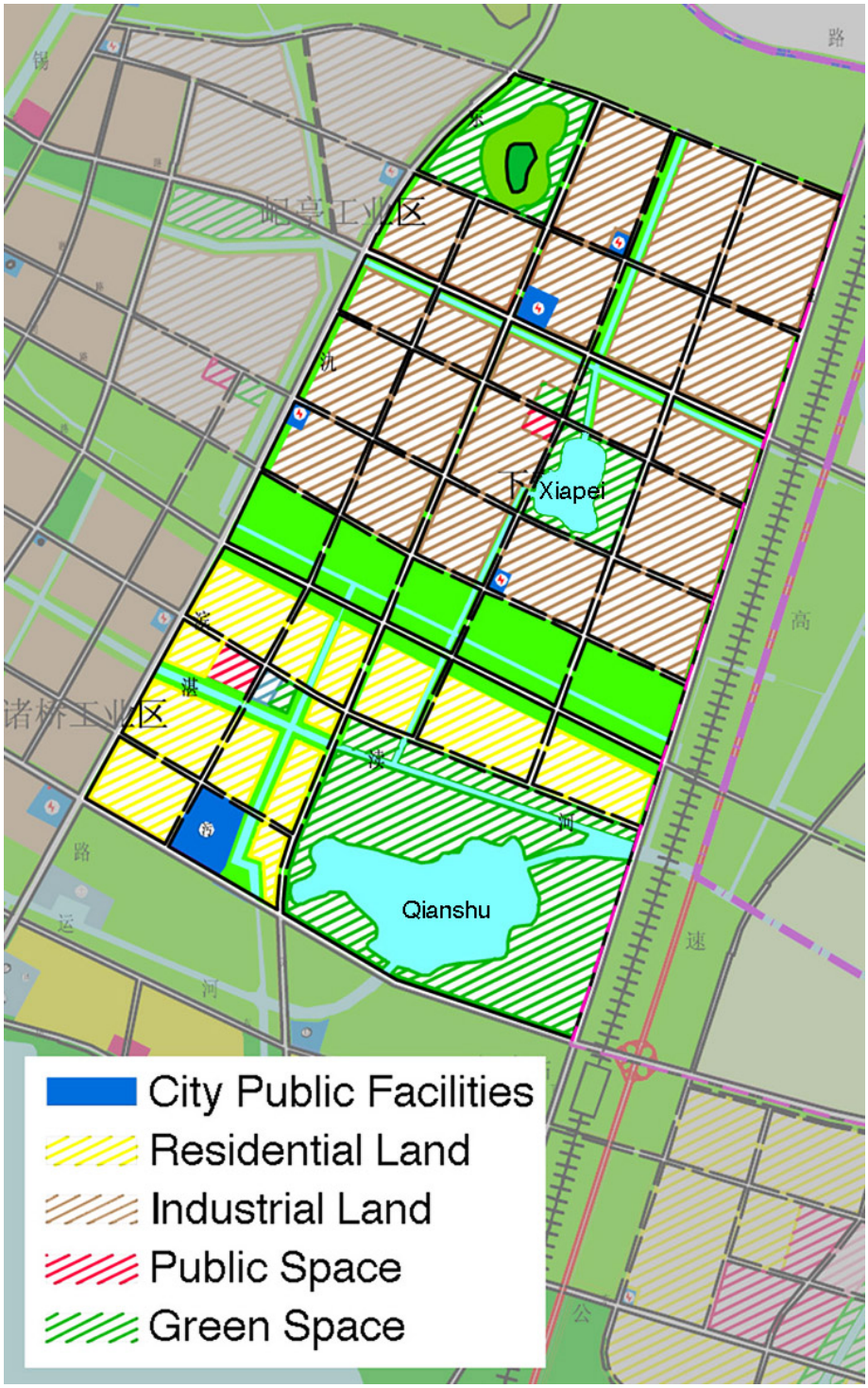
Figure 6.7 2008 Yixing Urban Core Prospective Plan [beyond 2020]



This urbanization plan includes more than twice the urban area as the long-term plan in Figure 6.2 above.

Source: Yixing People's Government 2008

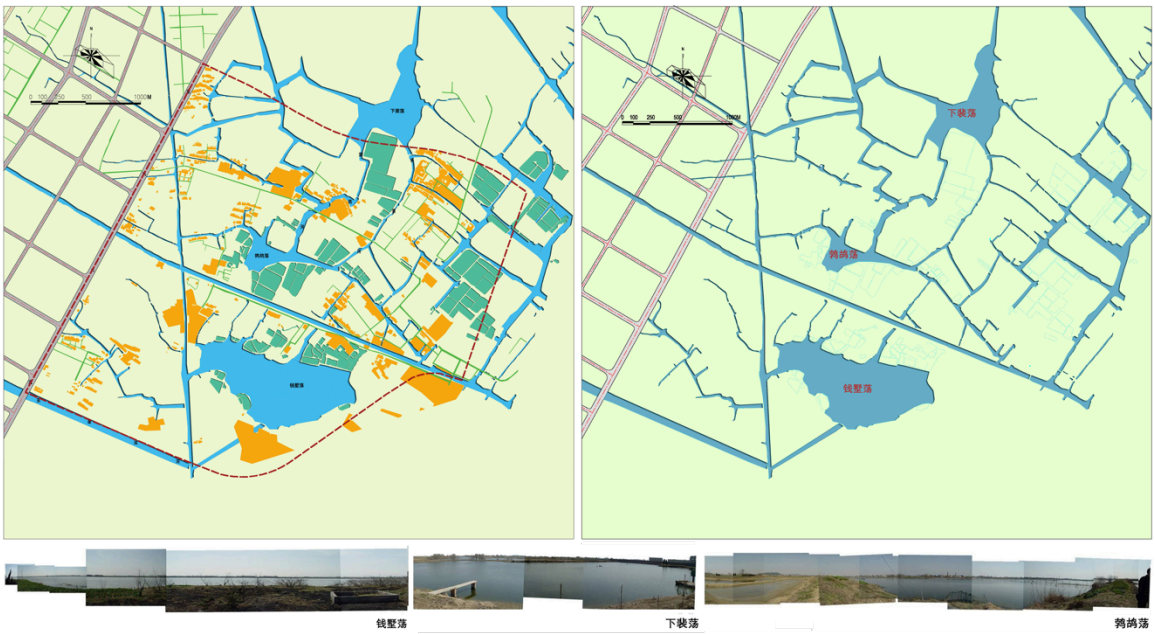
Figure 6.8 Yixing Urban Core Prospective Plan Detail: Scientific Innovation New City Project Site



This is a detail of the Urban Core Prospective Plan produced by the Yixing Institute of Planning shown in Figure 6.4 above. In contrast to the plans by Shi Kuang (Figure 6.6), the grid does little to respond to the existing landscape and land uses are strictly segregated.

Source: Yixing People's Government 2005; excerpted highlight detail by the author.

Figure 6.9 New City Site Present Conditions

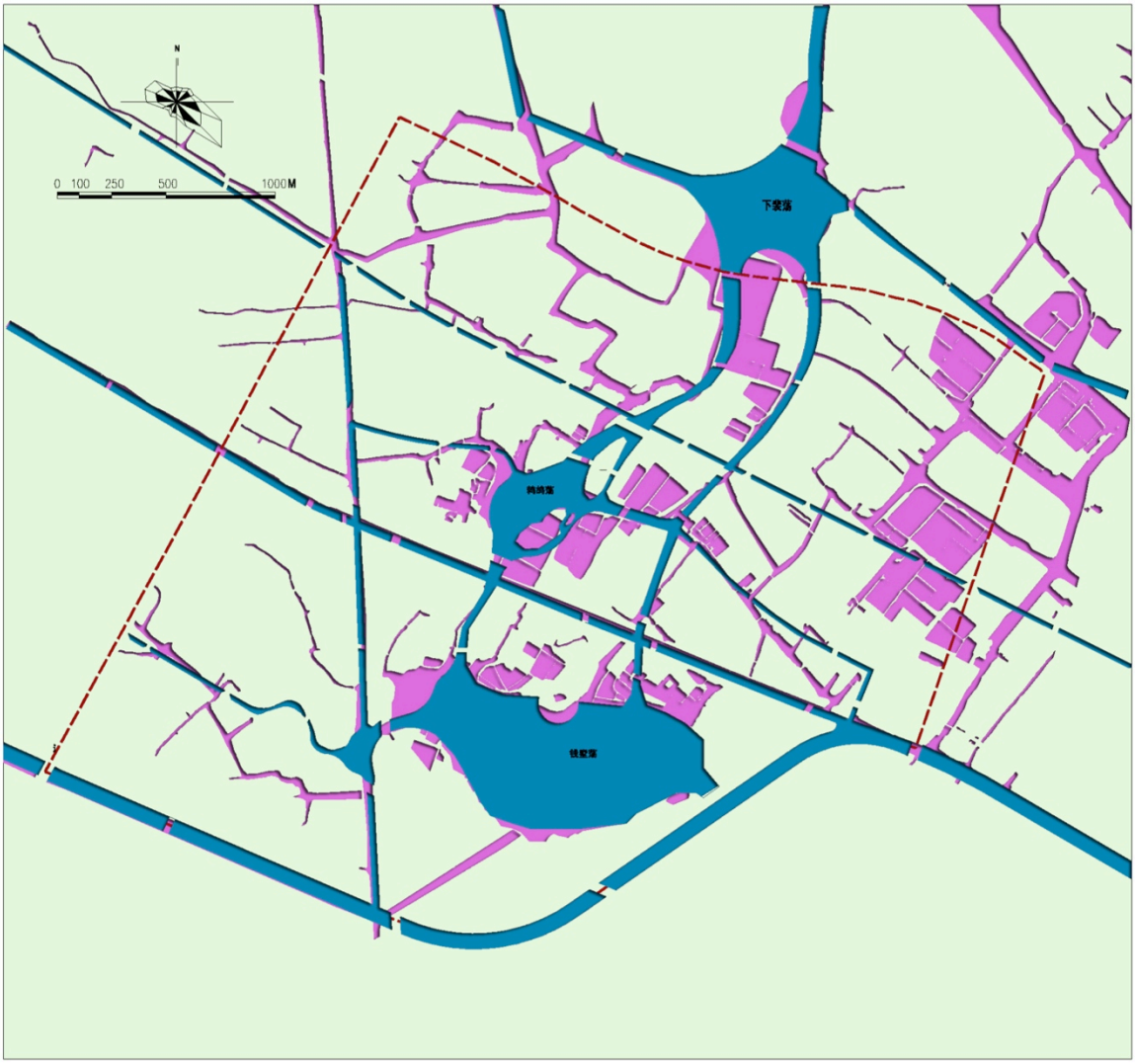


The composite representation of "Land Use Present Conditions Analysis" and "Hydrological Present Conditions Analysis" (left) diagrams rural uses as spatially discrete forms of land cover. Village and township construction land is shown in orange. Aquaculture and field irrigation are shown in green and as totally distinct from "natural water systems," rivers and canals for irrigation and navigation, which are categorized together in blue.

From this analysis, the map of "Natural Water System Present Conditions" was produced (right). The map ignores actual hydrology and emphasizes an artificial category of "Natural Landscape Conditions" (composite photos at bottom) for ecological preservation. This analysis was subsequently layered with habitat corridor analyses and becomes the basis for arguments regarding the ecological structure of the site and the urban design principles of the project.

Source: Scientific Innovation New City Control Plan. 2008. Yixing Economic Development Zone Administration.

Figure 6.10 River Ways and Hydrology Plan



The features to be filled for construction land are highlighted in pink. The opening phase of the New City project is outlined in red.

Source: Scientific Innovation New City Control Plan. 2008. Yixing Economic Development Zone Administration.

Chapter 6 Tables

Table 6.1: Conceptual links between forms and domains of technical practices

	(1) Environmental Value	*(2) Land Resources*
(a) Visual Representation	Distinguishing "natural" ecological space from rural space; Representing regional ecological structure;	Locating ecological processes in relationship to administrative space.
(b) Discourse	Defining environmental value in terms of: 1. natural capacities to sustain human livelihoods in a moderately well-off culture 2. as inherent to processes distinctly separate from human causes 3. as able to be planned and recovered through interventions in the landscape	Constructing project objectives for land use including: • Ecological protection • Low-carbon development • National land resources • Modern agriculture • Rural–urban integration

CONCLUSION
Global Political Economies of Green Development

> *A cynical observer might be tempted to conclude that discussion of the environmental issue is nothing more than a covert way of introducing particular social and political projects by raising the specter of an ecological crisis or of legitimizing solutions by appeal to the authority of nature-imposed necessity. I would want, however, to draw a somewhat broader conclusion: all ecological projects (and arguments) are simultaneously political-economic projects (and arguments) and vice versa.*
>
> —David Harvey[299]

Yixing is an important case for understanding global political economies of "sustainable development." Harvey's insight that "… all ecological projects (and arguments) are simultaneously political-economic projects (and arguments)" allows us to see clearly how the case of Yixing's eco-urbanization is related to logics of capital accumulation and a longer term process of land capitalization. Yet, this case also reveals how capital and environmental logics do not perfectly match our expectations while presenting contradictory justifications and material results. Yixing's villages are being managed not only as a source of land for development and corporate accumulation. These villages and their residents are also being managed environmentally. Here, I follow Harvey and political ecologists in revealing the normative assumptions attached to "environmental" policy and action.

The ideology of green development that links rural transformation to the construction of "environmental" industries is tied to global market for carbon reduction commodities. In the past decade, subsidies in the European Union and the United States have underpinned the rapid construction of China's solar industry. In China, direct subsidies in land leases and cheap financing contributed significantly to China's touted Green Leap Forward.[300] In the course of only a few years, China expanded its solar photovoltaic manufacturing capacity nearly fiftyfold from around 1 gigawatt in 2007 to an estimated 49 gigawatts in 2013.[301] This irruption linked China's national agenda on green development to global markets for renewables, including carbon credit projects for solar farms certified by the Kyoto Protocol Clean Development Mechanism. However, this 'success' created a crisis of overproduction, dropping prices 350 percent faster than

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[299] Harvey (1996), p. 182.

[300] For a decade now, experts and boosters have been pointing to China's combined economic power and political system as the largest—and perhaps most important—venue for the development of "a clean energy future" (Friedman 2010a; Finamore 2011). See Friedman (2010b) for one of many sanguine references to China's "green leap forward."

[301] National capacities estimated by Earth Policy Institute (http://www.earth-policy.org/data_center/C26) and Bloomberg (http://www.bloomberg.com/news/2013-09-08/chinese-zombies-emerging-after-years-of-solar-subsidies.html). A 1 GW capacity thermal power plant would provide electricity to over 400,000 U.S. homes.

predicted between 2010 and 2013. This crash in prices contributed to bankruptcies and the loss of billions in cash as well as fixed capital as plants were shuttered. In 2012, a report by GTM Research estimated that 180 solar panel manufacturers would go under, 54 of them in China.[302] On the heels of major bankruptcies, including of Solyndra, a company that received USD 536 million in federal loan guarantees, American solar companies filed antidumping suits against Chinese suppliers. In its 2012 findings, the U.S. imposed tariffs of 31 percent on imports of solar panels and solar cells from China. The two main companies named in the dispute are based in Jiangsu: Wuxi Suntech and Trina Solar. Suntech was the world's largest producer until it declared bankruptcy in March 2013.[303]

China's industrial policy has become international climate policy. By leveraging a massive resource base of rural land and social fabric to serve as a form of collateral for state financing of solar industrialization, the Chinese government was able to capture a majority of global market share. However, this came at costs not represented by rising land rents or state-backed interest rates. The revaluation of rural land and the transformation of social-environmental relations is the direct origin of the exponential rise of China's manufacturing capacity—and its subsequent market crash (see Figure 7.1). Moreover, there is an impact on the broader solar energy field in terms of the support given to the relatively old technology of crystalline silicon-based solar photovoltaics. This dynamic is frequently discussed as an industrial policy effect of "picking a winner," and can impact the establishment of other technologies and their market viability.

These contradictions between national economic development and local environmental and social outcomes in China's environmentalization are indicative of the larger contradictions of "green capitalism" in China in a global context. First, *exporting sustainable development* occurs because the actual environmental sustainability of "green" industries is often not weighed in terms of local impacts, and measures of sustainability privilege end-of-chain outcomes. This enables, for example, an inordinate amount of pollution and resources for solar panels to be held as separate from the "sustainability" credentials of the end product when it is installed elsewhere. *Legitimation and consent to dispossession and enclosure* – green discourse is used by local government officials as a basis of social mobilization and to justify ongoing processes of dispossession and state violence for the purposes of capital accumulation. *Urban-rural division* – as green discourse is used by developers and government officials to justify land conversion and urban redevelopment projects, "green" is increasingly equated with urban development within a hierarchized vision of modernization, thus reinforcing previous constructions of the rural as "backward." *International political legitimation* – as China receives increased global recognition for its achievements and potential in

[302] Analysis by GTM Research, a source of expert analysis on renewables markets, reported by Forbes http://www.forbes.com/sites/uciliawang/2012/10/16/report-180-solar-panel-makers-will-disappear-by-2015/

[303] ITA (2012)

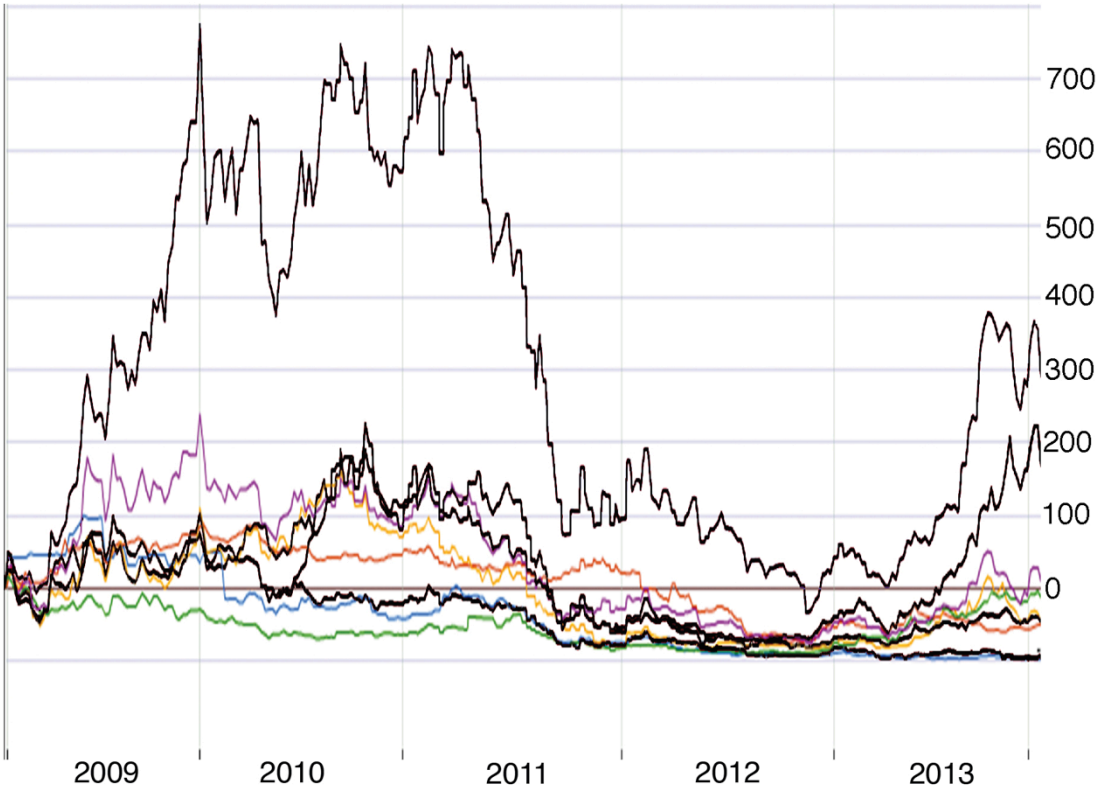
greening industrialization and urbanization, perceptions of its authoritarian political system as a means of achieving these ends are normalized. Here, I do not mean to characterize the Chinese state as monolithic and totalitarian. Rather, this point emphasizes the ways in which different levels of government and problems of governance (i.e. environmental protection, rural urbanization, and green industrialization) are sites of contestation where social and political dynamics are refigured in relation to green development.

These contradictions suggest potential conflicts between different scales of sustainability objectives, and tension between a global green economy and local economic and environmental outcomes. Village fields are plowed for solar farms and forests of carbon credits, leaving dispossessed villagers with uncertain futures as members of "ecological civilization." For example, as "green" is increasingly adapted and linked to Chinese socialism, we see that it plays a role in refiguring of social values and perceived entitlements, especially rural land tenure and livelihoods. Day (2008) explains Cao Jinqing's analysis of China's agrarian contradiction. He argues that the because village smallholder agriculture cannot compete effectively in global capitalist markets, but are paradoxically tied to those markets for inputs and sales, smallholder production with land privatization "would lead to rural poverty, unrest, and growing inequality, not agricultural efficiency and smooth urbanization" (Day 2008: 56). In attempting to resolve this contradiction, the Chinese state is using a combination of dispossession and the creation of a social safety net for rural residents facing rapid and radical changes. This safety net, including the *dibao* and the rural pension championed by Wen Jiabao, helps to secure consent to forceful dispossession.[304]

Environmentalization is not only a political rationale for justifying dispossession, it is a reshaping of global resource geographies. Environmental political economies call our attention to how resourcing takes place and how it entails the construction of new "urban natures." If we take for granted that cities have historically been founded for different locational advantages, grow through the slow accumulation of various types of surplus and subsequently birth new forms of sociality, then these examples of master planned green developments circumvent the processes of accretion and change for the amplification of a single agenda. In the case of green development, this is an agenda that has broad international support and a mandate underscored by the politics of crisis. At its largest horizons, green development purports to remake the environmental bases of production and, therefore, of accumulation. If, as Harvey (2003b) suggests, the city is the historic place where the world can be "re-imagined and re-made," then that imagination must encompass an understanding of how global environmentalization is linking these new urbanisms and reshaping us all in the process.

[304] A comparison to the role of dispossession in contemporary India is instructive for broader generalization. Levien (2013c: 384) describes how the present neoliberal "regime of dispossession" in India has not won the legitimacy of a previous developmentalist political economy of state-led land acquisition. He argues, "SEZs… represent the shift to a regime of dispossession in which the state has become a mere land broker for capital, expropriating land for any private use generating more profit than agriculture..."

Figure 7.1 Relative Changes in US and EU Market ation of Top PV Manufacturers



This chart shows the relative changes in U.S. market capitalization based on share price for the top ten solar panel manufacturers (largest by market share). The top five Chinese manufacturers are shown in black (from top to bottom): Trina Solar, JinkoSolar, Yingli Green Energy, JA Solar, and Suntech Power. The remaining producers are in descending order: Sunpower (US, pink), Hanwha Solarone (Korea, green), Sharp Corp. (Japan, orange), FirstSolar (US, red), SolarWorld (Germany, blue). SolarWorld led the international trade suits against Suntech Power and the Chinese solar industry in 2011. This recently yielded renewed tariffs and an over 4500 percent relative increase in SolarWorld's share price in the week following February 7, 2014 when the US International Trade Administration released its findings.
Source: google.com/finance

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