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Sustainable Territories: Rural Dispossession, Land Enclosures and the Construction of Environmental Resources in China

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Abstract

As urbanization and industrialization continue to spread through China's countryside, the central government has officially declared the construction of master planned eco-industrial zones and eco-cities as primary strategies for accelerating the transformation of industrial structure and the prevailing model of economic development, as well as for "constructing a socialist economic, politically, culturally… and ecologically civilized… harmonious society" (NPC 2011: chapter 1, np).

Based on recent fieldwork, this paper demonstrates how these strategies extend beyond the "green washing" of rural land enclosure and transformation, arguing that processes of rural dispossession are linked to the commodification and circulation of natural capital. This paper analyzes processes of environmentalization and enclosure as linked state-led strategies for governing economic growth, rural transformation and interventions into global market-based solutions to climate change as integral problems of Chinese national development and modernization.

As a basis for theorizing the relationships between Chinese models of "green development," forms of environmental governance and new circuits of accumulation, the paper utilizes a case study of Yixing city, where eco-city, renewable energy and ecological conservation projects are being planned in tandem, enclosing over 200 square-kilometers of rural land and displacing over 50,000 residents since 2006. The technical and discursive "dividing practices" (Foucault 1972, 1977) of local government planners are examined in conjunction with the scalar construction of rural land as a fungible national "resource" under central government policies for renewable energy development, food security, "ecological withdrawal of agriculture" and arable land reclamation quotas (e.g. State Council 2007).

Following Marxian scholarship on the enclosure of access to land and the establishment of property regimes as ongoing moments of "primitive" accumulation and state-territorial projects (Thompson 1975; Harvey 2003; Hsing 2010; Peluso and Lund 2011; Corson and MacDonald 2012), this paper argues that rural land enclosure in China functions in different circuits of accumulation corresponding to different constructed scales of environmentalization. The paper analyzes such environmentalized transformations, including ecological set-asides, non-fossil fuel energy generation, and high-intensity non-village agriculture and the requisite conversion of collectively owned rural land into state controlled urban land, as a process of territorialization. Drawing upon the work of Poulantzas and recent scholarship on environmental enclosures (e.g. the volume by Peluso and Lund 2011), I argue that the construction of discrete environmental functions for—and apart from—rural land is fundamental to the constitution of "homogenizing enclosure" and territoriality as the "institutional materiality of the state" (Poulantzas 1978: 93-107). Following Lefebvrian analysis of the production of space (Roth 2008) (Lefebvre 1991 [1974]), I find that such abstraction refigures the local in a process of territorialization, highlighting the importance of state power to the establishment of market-based forms of environmental governance and the circulation of "natural capital."

Keywords: Dispossession; land enclosure; agrarian transition; environmentalization; China

> *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, lifting its urban character.*
>
> *Green Planning Principle 2: Integrate planning of infrastructure and key features in order to create a green space leisure system wealthy in humanistic delight.*
>
> —Yixing New City Regulatory Plan (YXEDZ Planning 2008: 17)

> *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 (1996: 182)

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 rationalize 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 (Thompson 1975), I argue 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 (Harvey 2003; Glassman 2006).

These enclosures simultaneously comprise an important dynamic of "green grabs" as an "expropriation of land or resources for environmental purposes" (Corson and MacDonald 2012: 263), and a systematic means of shaping environmental governance as a mode of capital accumulation. 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" (e.g. State Council 2012b; NDRC 2012; NPC 2011). In the following, 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.

I observe and analyze 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 1 and 2). Between 2006 and 2011, these projects enclosed over 330 square kilometers of rural land (see Table 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 (Chen 2012). 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's (1996) well-known prompt above 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.

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 (e.g.: Heynen and Robbins 2005; Peluso and Lund 2011). In line with the recent literature on "green grabs," this paper examines rural land enclosure for environmentalized development goals as a "new appropriation of nature" (Fairhead, Leach, and Scoones 2012). Drawing from conceptual and theoretical approaches to the political economy of dispossession as an ongoing dynamic of primitive accumulation (Glassman 2007), the paper outlines linked processes of the enclosure, commodification and market valuation of "ecological land resources" (e.g. MLR 2008). 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 (MLR 2012b, 2012c; State Council 2012a; MLR 2004). 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 what McAfee calls "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 (McAfee 1999: 134). 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 'sustainability by dispossession.'

The paper will proceed from a critical examination of the political ecology of the Yixing region within the context of China's ideologies of environmental resource governance. Following, I will analyze recent archival and fieldwork data on the planning,

enclosure and dispossession for green development in Yixing to outline the scalar construction of rural land as a fungible national "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.

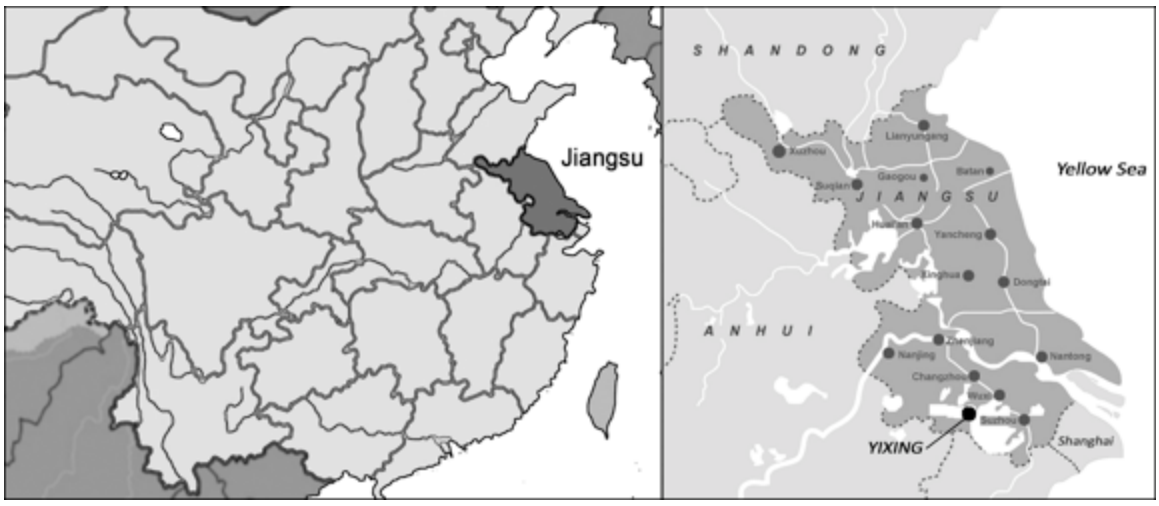

Figure 1 Location of Jiangsu Province and Yixing City (source: the author).

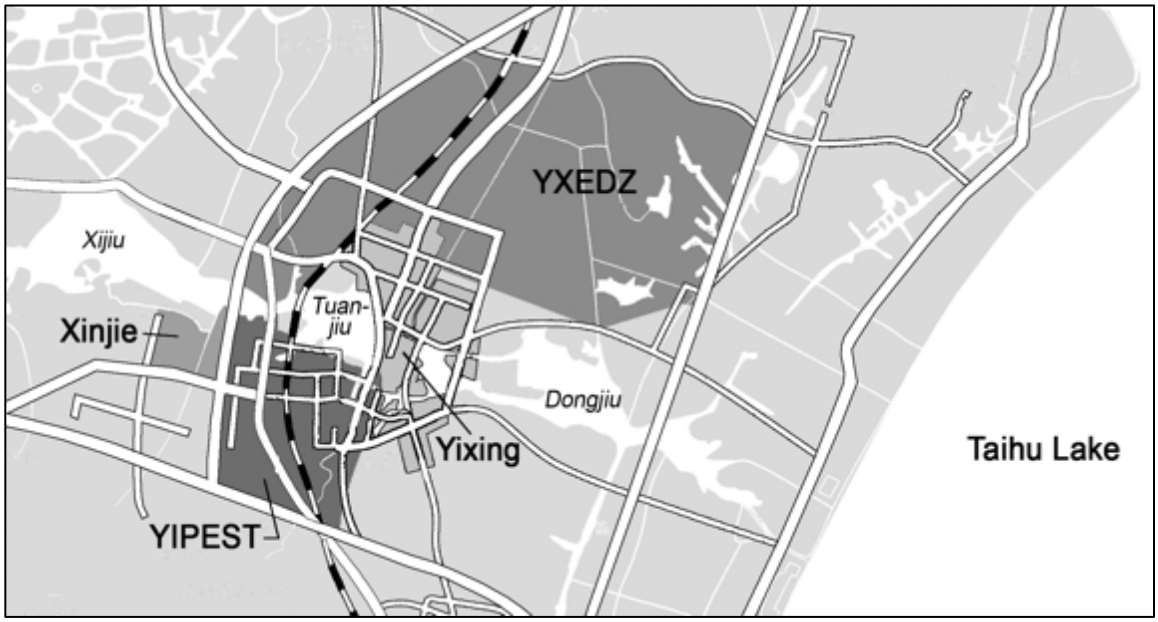

Figure 2 The Yixing city-region; two green development zones are shown in grey: YXEDZ; and the YIPEST, the first national designated zone for environmental protection (source: the author).

Table 1: 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 Township (under YIPEST planning authority)	2012	"World class city" urban–rural integration of the YIPEST eco-industrial zone	110
		TOTAL AREA	**331**

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

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 (Watts 1996; McMichael 2005; Bernstein 2010). 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 Chinese socialism and rearticulates the question of agricultural production as an "environmental question" centered on the enclosure and conveyance of rural land resources. 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 (1988 [1899]: 297), this transformation is driven largely by phenomena and forces outside of agricultural production. 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 (O'Connor 1994; McMichael 2012).

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 (e.g. Shapiro 2001; Greenhalgh 2008).

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 (2001: 9) 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." The disastrous results of the Great Leap campaigns to remake the countryside through massive land reclamation projects are a

prominent historical referent (Smil 1984). 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 (Smil 1984).

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 (e.g. MLR 1999, 2008). Development pressures mounted under the 1988 amendments to the Constitution, which established a land leasehold system along with official recognition of the private sector economy.[1] 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 (Huang and Yang 1996; Lin and Ho 2005).

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 (Hsing 2010; Ren 2003; Fan 1997; Smith 2000). Even as this "development zone fever" of the 1990s left 85 percent of enclosed land undeveloped (Ren 2003), cascading spatial restructuring fed an urban revolution with real estate development and local government-controlled land rents forming a major

[1] 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."

engine of economic growth (Hsing 2010; see Lefebvre 2003 [1970]). 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?* (Brown 1995). 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 (Smil 1995; Lin and Ho 2003; Shapiro 2001), the central government took notice of the question of food security as a major problem of social stability (Lin and Ho 2005). 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 3). 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 "basic farmland" (*jiben nongtian*), 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-kilometers.[2] 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 (e.g. MLR 1999, 2007, 2008) (see Figure 3).

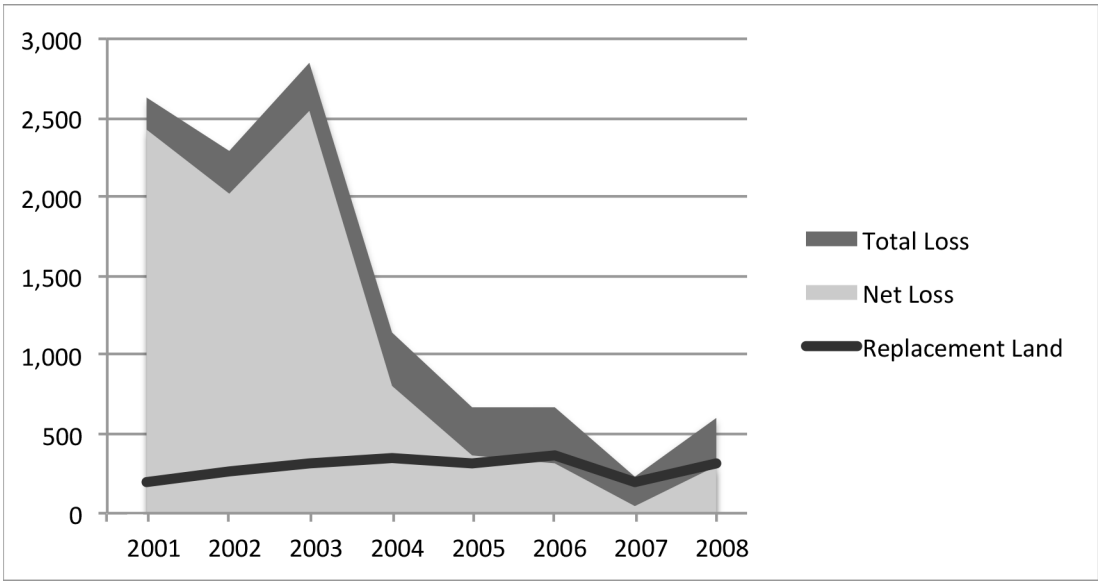

Figure 3 Recent National Cultivated Land Losses and Replacement Offsets 2001-2008 (1000 hectares) (sources: National Bureau of Statistics; Ministry of Land and Resources; compiled by the author).

Dividing Environments: Scaling Land, Resources, and Services

The preceding discussion illustrates how state environmentalization functions as a mode of "fixing, dividing, and recording" practices (Foucault 1977: 305) that simultaneously work to classify rural land and people as objects "in a field of exteriority" (Foucault 1972: 50). Foucault (1972: 49-50) describes such discursive practices as establishing relations between "institutions, economic and social processes, behavioral

[2] 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).

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…" 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 discursive classification further works to "separate natural history from social history" (Williams 1980: 76), 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.

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" are constructed at nested and

imbricated scales can be understood through what Sayre identifies as a dialectic between epistemological and ontological "moments" of scale (Sayre 2005). 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.

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 (Smil 1993; Cartier 2001; MLR 2012a) (see Figure 4). During the 1980s, major social and environmental contradictions emerged in the region as the result of rural industrialization through township and village enterprises (TVEs; see Rozelle 1994; Zhang 2003). 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. 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 (Bramall 2007: 39).

Although Yixing and its neighbors were counted among the top economies at the county level,[3] unregulated TVE industrial and agribusiness development had direct and indirect environmental impacts leading to large and cyclical economic losses (Ge 1992). Between 1978 and 1990, output in the region's TVE sector topped 28 percent (Bramall 2007: 29). This growth continued through the 1990s, accompanied by the annual

[3] See the 100 Strong Counties Rankings (*bai qiang xian*) issued by the National Bureau of Statistics. In 1994, Wen Jiabao (then a central leader of agricultural, finance, and environmental policy) produced a commemorative work of calligraphy for the county economic rankings that emphasized what he saw as the model spirit of the TVEs in the region. The main inscription, taken from a classical poem, reads, "a thousand sails unexpectedly unfurl, one hundred boats vie in the current."

Figure 4 Large scale wetlands reclamation continues in Yixing (source: the author, 2010).

discharge of one billion tons of un- and improperly-treated wastewater into Taihu's wetlands and rivers (Zhang 2002). As chemicals including arsenic and mercury contaminated groundwater and soils, negative health impacts became evident as several villages in Yixing's jurisdiction developed high incidence of cancer. These and other acute clusters in several coastal provinces were subsequently documented as "cancer villages" (*aizheng cun*) with official data in 2007 (Yu 2007). 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 higher cancer rates (Wu et al. 1999; Chen et al. 2002) and caused drinking water crises and production shutdowns with hundreds of millions of yuan in annual direct

economic losses (Ge 1992; Zhang 2002). Subsequently dubbed the "Taihu paradox" (*Taihu beilun*), the region was held up as illustrative of the costs of GDP-centric development policies (Mu 2007).

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 (Chen 2007). By the time China signed the Kyoto Protocol in 1998, Yixing generated 18 percent of the national total value added in the environmental industry (Zhang 2002). 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 (YIPEST). 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 (cf. Zhang and Wen 2008).

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" (YXEDZ Planning 2008: 41). 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 (YXEDZ, or "the 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 implementation have increased. In 2012, the central government announced investment in solar power during the Twelfth Five-Year Plan (2011-2015) would total 250 billion yuan to produce 21 gigawatts of generation capacity (MOST 2012).

After a successful 234 million Chinese yuan (CNY; about 35 million US dollars) joint venture in 2007 with Guodian, one of the five primary state-owned utilities, 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 5). 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).[4]

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 (Rong 2011; Zhang et al. 2010). 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 Yuanhu, who proposed to construct a model ecological "water city" extending from the western shore of Taihu across Yixing's chain of lakes (Xu and Ling 2010) (see Figure 2).

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 (Liu 2010; Min 2008b).[5] Under the slogan of "returning fields, pens and ponds to forests, lakes and wetlands," the "Protecting Mother Lake" project includes a 1,333 hectare afforestation project to build a "green screen" along the lake (Min 2008b). According to central government statistics,

[4] 2011 EU price of USD 16.4 per ton of CO2 equivalent
[5] 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 a model eco-tourism industry (Wuxi People's Government 2009).

such "ecological withdrawal of agriculture" and "grain for green" afforestation projects—including some for certified carbon credits—account for the majority of agricultural land losses nationally (Tian 2007; NBS 2011; UNFCCC 2012).

In the Yixing 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 (Min 2008a: np). Although praised as a new agricultural "green economy to enrich the people" (Min 2008a: np), the projects consist primarily of specialty horticultural agribusiness. Thus, despite ongoing concerns and policies promoting grain production and food security, model "ecological cultivation" (Min 2008b) is a fundamental aspect of China's environmentalized agrarian transition.

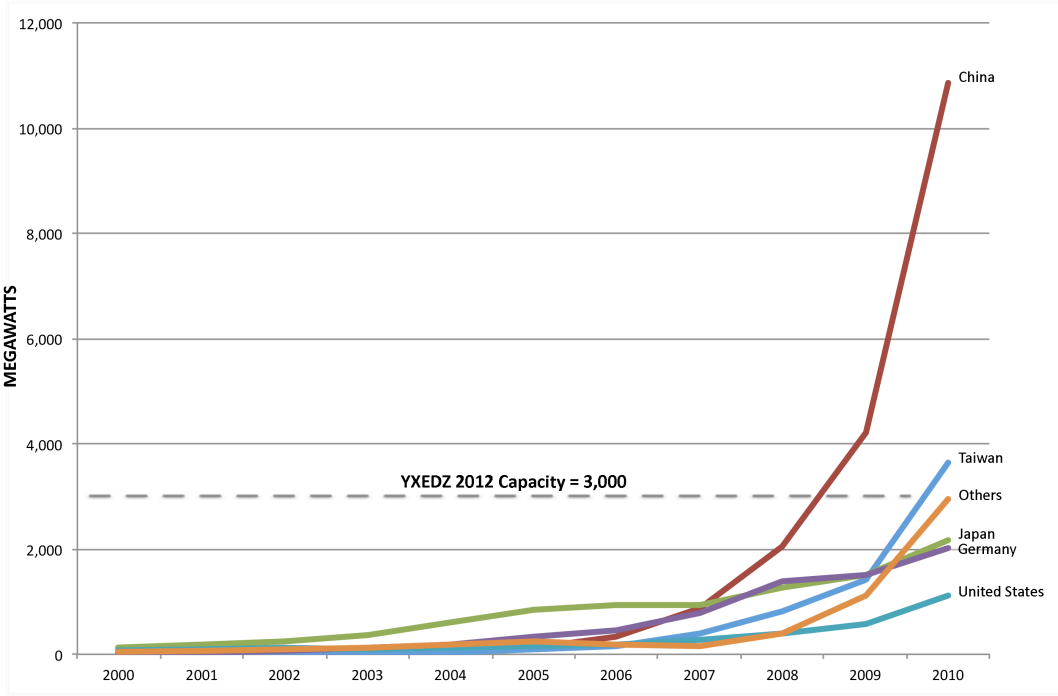

Figure 5 China Produces Over 45% of the Global Supply of Solar Photovoltaics; Yixing manufactures over 10% of China's PV solar cells and panels. Jiangsu province has approximately 25% of the national total manufacturing capacity (source: Data compiled by the Earth Policy Institute, 2011).

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 basic farmland from 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 churning 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. As the redline is maintained through quota systems for conversion, preservation and reclamation through piecemeal accounting at project, district, municipal, provincial and national levels, errors and structural opportunities for arbitrage abound (Chen 2010a).

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. 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" (MLR 1999) and quota can be exchanged with other government units (Chen 2010a). Such practices by provincial level bureaus under the MLR have been documented (Wang et al. 2010). However, the overlapping environmental transformations to agrarian and the local state itself have not been adequately examined. 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 reorient, rather than are gamed by, local officials exercising (and producing) state-territorial authority

(see Hsing 2010: 7-14).

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 (Yixing People's Government 2003). 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" basic farmland during the enclosure process, and the internally reconciling the amounts that are marked as cultivated land versus other village uses.

In 2005, Yixing took six months to map its cultivated land and to delineate basic farmland protection zones. The Yixing BLR mapped approximately 60,500 hectares of basic farmland in 1,385 zones (Wuxi People's Government 2011). This effort was widely publicized as a model village responsibility system for enforcing basic 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. In 2010, nearly four years after administrative enclosure of the village under the YXEDZ planning authority, I interviewed Jiang, one of the last residents to be relocated from the village. When I asked him about the origin of the village name and its relation to the Great Leap mantra, he replied "eviction isn't a mobilization campaign," and wryly repeated "*rén dìng shēng tían*," altering the tones and writing his pun out for me: "from people's asses, fields are born" (Chen 2010b).

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 "rationalization" and land-use consolidation can be used to produce land conversion quota as freely available "land resources" (Chen 2010a). Local authorities first enclose a rural area under administrative planning authority. Next, they begin to 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 circulation to other projects through quota banking (Chen 2010a). 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 6 and 7).

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 basic 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 Figure 8).

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.

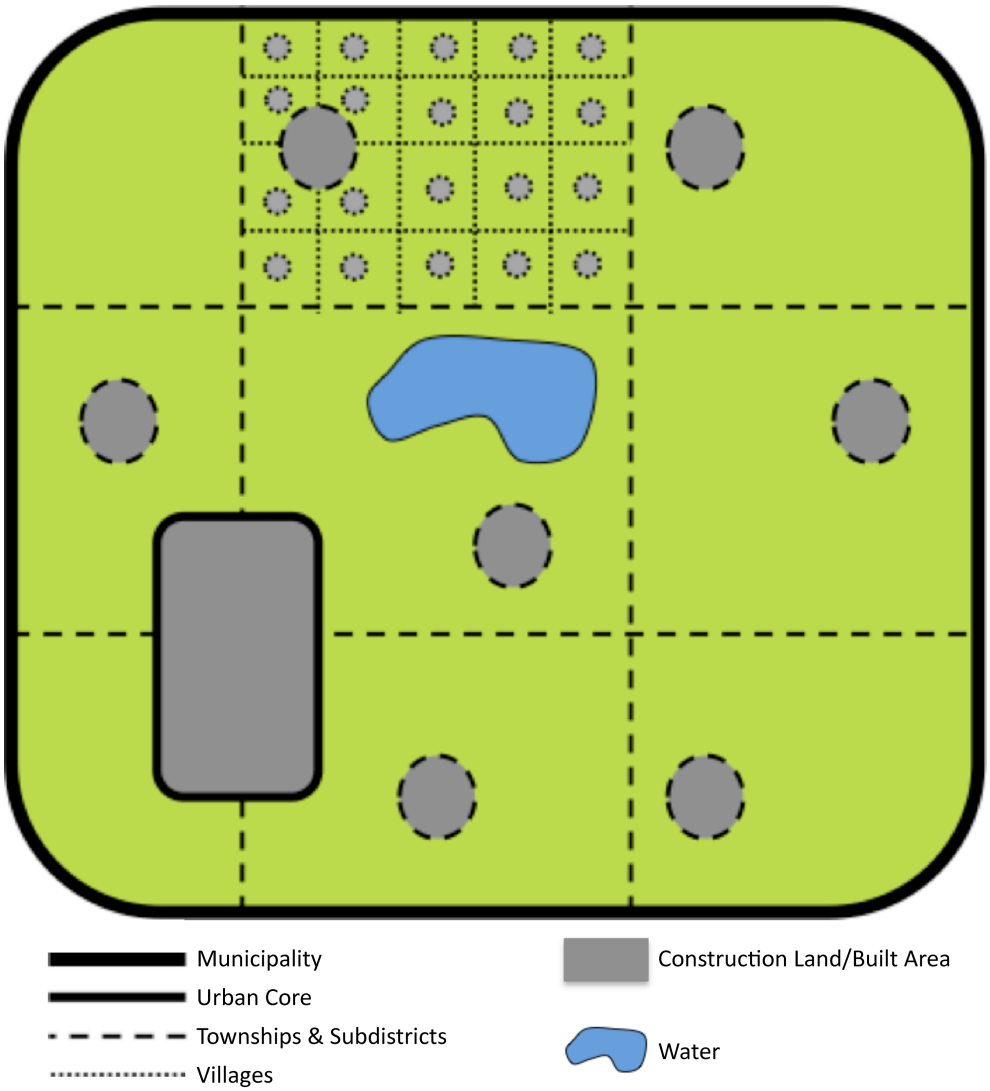

Figure 6 Diagram of Municipal Space (source: the author)

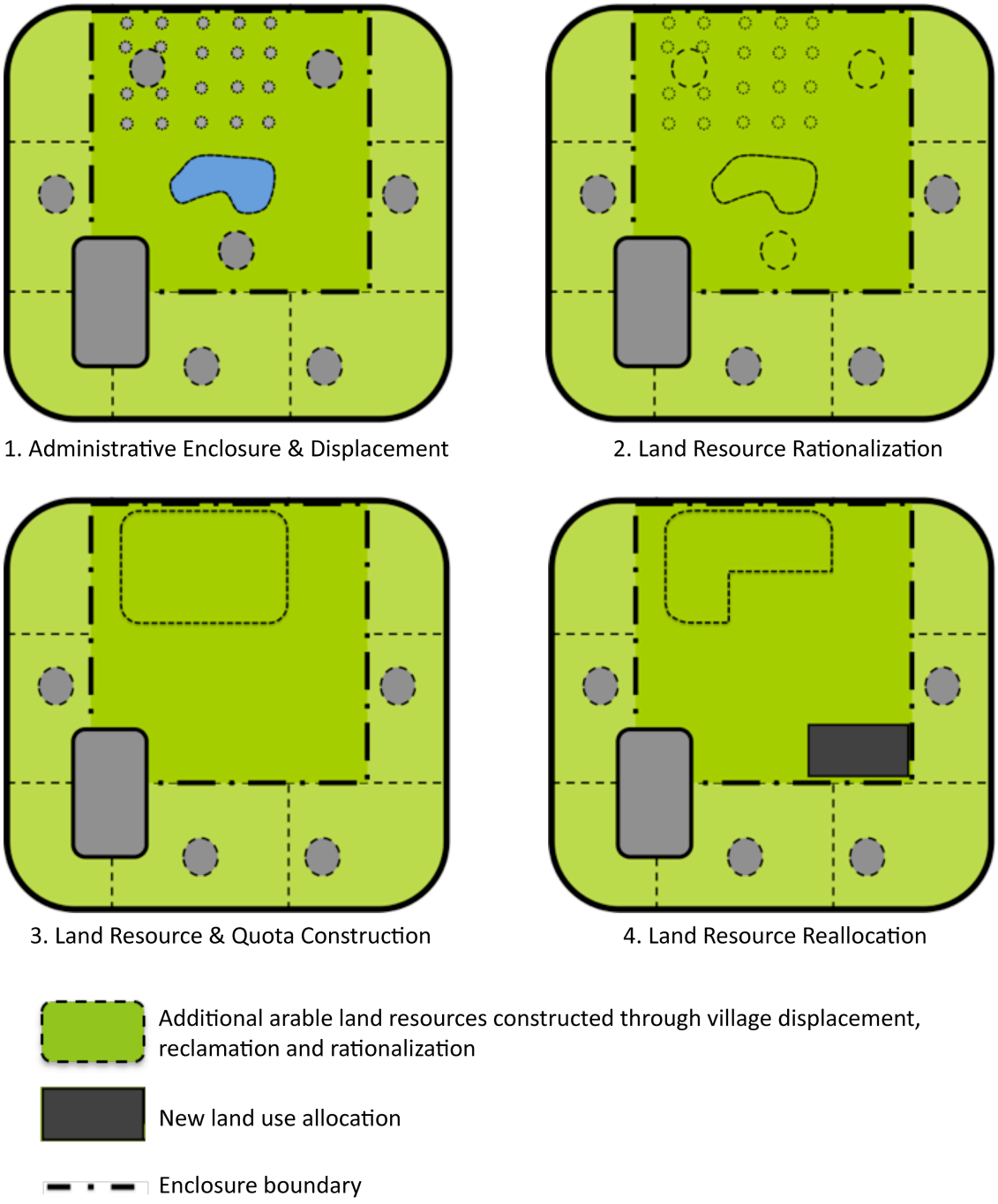

Figure 7 Diagram of Arable Land Resource Construction (source: the author)

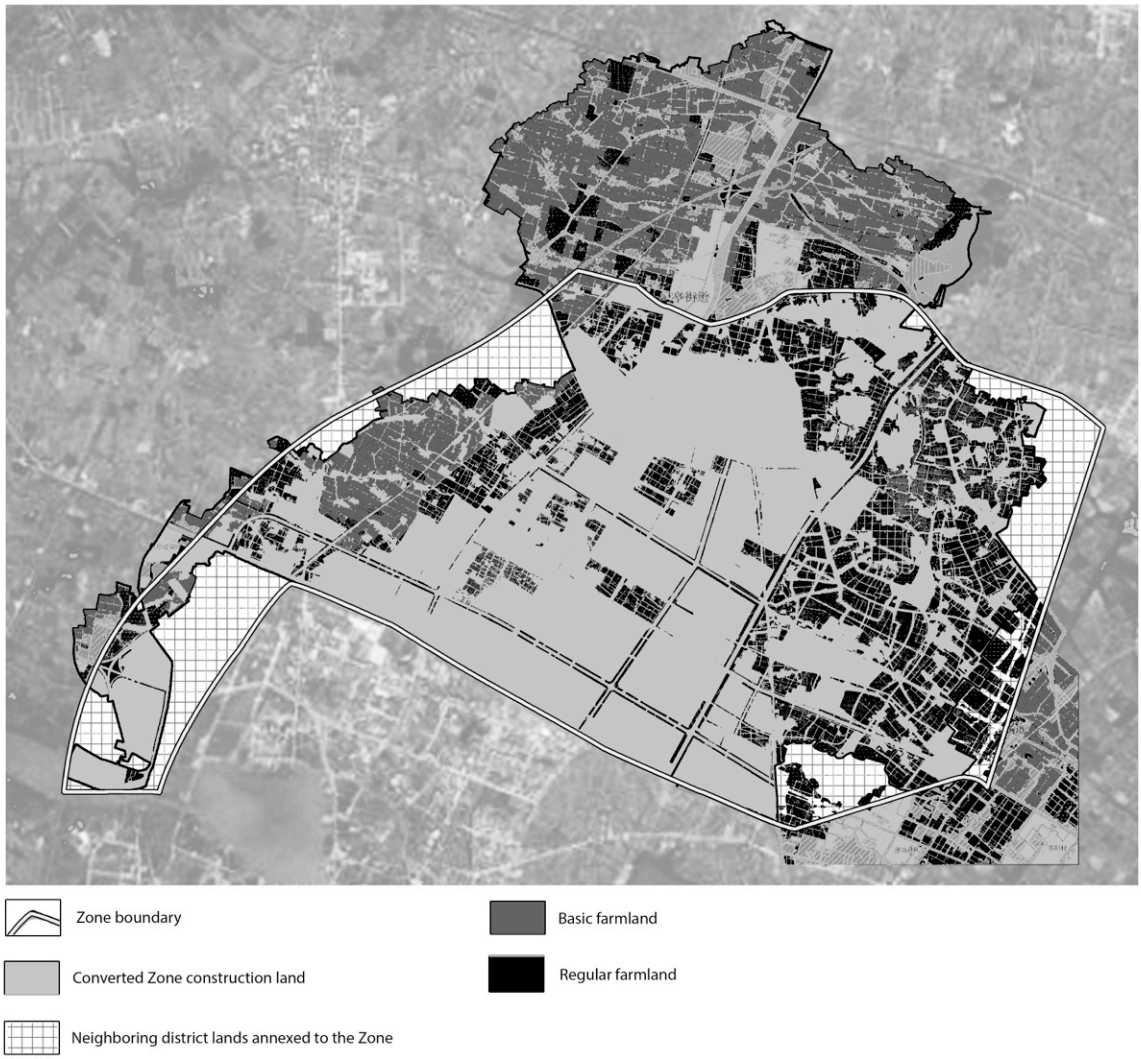

Figure 8 Qiting District Farmland Enclosed within the Zone (source: Yixing Bureau of Land and Resources, Yixing Economic Development Zone; compiled by the author)

Exporting Sustainability: Dispossession as a Means Of Production

Since 2006, Yixing's various green development projects discussed here 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 approximately 100,000 villagers. 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 (Hsing 2010: 209, n.18). 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 (Solinger 2006).

A class of 'four withouts' is also emerging as some villagers lose permanent housing. Because the compensation system requires dispossessed families to pay for the difference between the government-determined "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 lose the "compensation"

for their demolished homes as the money is tied to a compulsory mortgage system to underwrite the construction of the relocation housing. 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 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 (see also Hsing 2010: chapter7).

Here, it is not my sole intent to highlight the social injustice of uneven development per se. Rather, following diverse analyses of agrarian transition (e.g. Muldavin 1997; Byres 2004; Levien 2012), 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 structural changes; in this case, of state territorialization for green development. 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 (see Glassman 2006), nor of "primitive socialist accumulation" (Byres 1986: 15).

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 (Glassman 2006; cf. Harvey 2003) 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 (Hsing 2010).

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 (1992) argues, 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" (Buttel 1992: 16). 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" (Scott 1998).

The process of constructing new environmentalized forms of value for rural land lays bare the remaking of "social relations between things" (Marx 1990 [1867]) inherent to the production of commodities. 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.

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