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Ecological Civilization in the making: the ‘construction’ of China’s climate-forestry nexus

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ABSTRACT

In the Anthropocene, debates about global climate risks have taken carbon as a measure of policy success, with land-based mitigation strategies like afforestation receiving particular scrutiny. While scientists and policymakers discuss forestry as a potential climate solution, China has been implementing massive forestry projects for decades, drastically transforming environments under the Ecological Civilization framework. This article showcases China’s globally emerging paradigm of Eco-Civilization and its implications for the climate-forestry nexus. Drawing parallels with Ulrich Beck’s concept of ‘metamorphosis’ and Bruno Latour’s concept of ‘mutation,’ we argue that China’s Eco-Civilization aspires to a fundamental transformation in worldview – but one that is promoted as distinctly non-Western. We use the case of forestry to illuminate the potentially unique features of Chinese environmentalism as encapsulated in Eco-Civilization. We find that Eco-Civilization affords a strong role for the central state in actively *building* and *constructing* an ecological future in which the natural and the socio-political are not considered separate. This is in contrast to certain Western visions of preserving nature from human encroachment through grassroots environmental movements. We conclude by highlighting the theoretical contributions more pluralized debates about China’s environmental rise could bring to environmental sociology.

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1. A Civilizational turning point for debates about forestry

Defying scales, climate change links the mundane routines of billions of people across the globe with planetary environmental shifts that undermine future global stability. The sweeping global transformations required to address climate change necessitate a radical reorientation of practices and perceptions held by actors worldwide. Tackling climate change, in short, requires a complete reconfiguration of our understanding of the world and place within it – some might say, a *metamorphosis*. But not only does climate change *require* sweeping global transformation, it is also *engendering* such transformations, without any conscious intervention or programmatic change. As the late Ulrich Beck paradoxically declared in 2015, ‘climate change is not climate change ... it is a reformation of modes of thought, of lifestyles and consumer habits, of law, economy, science, and politics,’ and in doing so, it provides ‘new orientations, new compasses for the 21st-century world’ (79).

Such observations concerning the centrality of climate change are becoming more and more common in environmental sociology and beyond (Norgaard 2018). The potential of climate change to drastically

transform our societal worldview (*Weltbild*) has been noted by many social scientists in the past decade. Latour (2017) coined the term the ‘New Climatic Regime’ to refer to the radical repositioning of humanity with respect to the environment as a consequence of climate catastrophe. Once the most ‘natural’ thing – a stable environmental backdrop along which human history develops – the climate, according to Latour, has now become a deeply political agent of change in and of itself. It is as if, Latour notes, ‘the décor had gotten up on stage to share the drama with the actors’ (2017, 3). ‘From this moment on,’ he continues, ‘everything changes’ (3). Latour’s so-called ‘moderns’ – those who, with the advent of science, began approaching the ecological as inert and aloof, who would have scoffed at the idea of the climate as a political realm – are now, because of climate change, undergoing a ‘profound mutation’ in their relation to the world. Scholars agree: by fundamentally transforming our vision of the world and the place of humanity within it, the existential threat of climate change, literally ‘changes everything’ (Klein 2015). Concealed within this looming climate threat, however, is the potential to create ‘a vision of the future that goes beyond just surviving ... a vision in which we

collectively use the crisis to leap somewhere that seems, frankly, better than where we are right now' (7).

As different as these social theorists' accounts of climate change may be, in all cases the threat of climate catastrophe is sowing not only environmental destruction and societal collapse, but also the seeds for its potential undoing through a transformation of worldviews. Also in all cases, however, the image of the world that is being transformed is Western. Latour's New Climatic Regime is based on the reversal of distinctly Western philosophical tropes of the nature-culture divide that do not find resonance elsewhere across the globe (Gardes 2020) and Beck's metamorphosis (Beck 2016) may be 'highly applicable, but to only Western nation-states' (Honeybun-Arnolda 2017, 178). The conceptualization and deployment of these ideas remains largely limited to Euro-American geographies. Yet the threat of climate change is global and indeed inspiring distinct transformations in worldviews across the non-Western world. How, then, are non-Western *Weltbilder* transforming under the threat of global environmental collapse?

This article examines climate-induced metamorphoses in worldviews with a focus on China's climate-forestry nexus. Since the 2014 IPCC report, the climate-forestry nexus has become a heated debate in global climate science. While there are high degrees of confidence in the potential for carbon sequestration via large-scale tree planting and restoration, there are also clear warnings of associated risks: the permanence of planted forests as carbon sinks due to wildfires, the pressure on freshwater resources, the impacts to biodiversity, and the social impacts of engineering ecological interventions on such a vast scale (Canadell et al. 2021). Despite controversies, this solution is proposed – and implemented – on a massive scale, most notably in China.

The debate over the role of forestry in climate mitigation strategies is both scientific and cultural, concealing within it a range of disparate worldviews. Beyond scientific questions of carbon storage, issues of forestry and land use more broadly elicit deeper cultural debates over preserving natural ecosystems versus engineering them anew. During the past decade, visions of what a forest is and what it is good for – pristine nature to be preserved or carbon stores to be ecologically engineered – have become a central pivot of climate change debates. To what extent, researchers now ask, can both objectives be maximized and what are their trade-offs? While not mutually exclusive, these objectives also do not entirely overlap. They entail fundamentally different visions of a forest as: (1) a space to be engineered in pursuit of a sustainable future or (2) a space to be preserved as untouched by humans. That is, they

entail fundamentally different *Weltbilder* that may not be fully represented within current social science theories grappling with climate change.

As the debate over forests and climate rages on, China, meanwhile, is planting more trees than the rest of the world combined, nearly doubling its forest coverage since 1980 (Zinda et al. 2017; Our World in Data 2022). In addition to sheer quantity, China's brand of tree-planting rarely attempts to re-create 'natural' pre-human ecosystems and clearly skews toward one side of the preservationism-interventionism debate. Under the public pressure of being the world's biggest carbon emitter, these projects form a fundamental pillar in the country's dual carbon targets of reaching peak emissions by 2030 and carbon neutrality by 2060 (Teng and Wang 2021). Recently, plans were announced to re-plant an area of land the size of Ireland each year for the next five years (Xinhua 2021). This type of large-scale ecological engineering is among the most controversial.

In this article, we argue that China's artificial forest ecologies are representative of the country's wider ambition of building an Ecological Civilization (*shengtai wenming* 生态文明). We review the emergence of this term and how it relates to the country's massive forestry efforts executed over the past two decades. Ecological Civilization (Eco-Civilization) is best understood as a state-sponsored, socio-technical imaginary aimed at building a sustainable future, first domestically and now globally (Hansen, Li, and Svarverud 2018). Initially coined by the German philosopher Iring Fetscher in 1978 and later picked up in Soviet Union Marxist philosophy, the concept has most recently been pioneered by the Chinese government as a distinctly Chinese approach to addressing environmental ills of modernity (Hanson 2019; Lu 2021). Through an analysis of Eco-Civilization and its evolution, grounded in the empirical case of forestry, we show how this concept is being pioneered by Chinese leadership as an alternative to Western environmentalism that has dominated the twentieth century.

The implications for environmental sociology are certainly profound (Zinda et al. 2018, Dietz, Shwom, and Whitley 2020). Precisely because of its non-Western branding: Eco-civilization offers an appeal to countries across the world attempting to stand apart from a history of colonialism continuing under the guise of neo-colonial environmental movements (Kashwan et al. 2021). The concept's promotion at the global level may present new norms for global environmental governance (Weins, Ferreira, and Feodrippe 2020), new human-nature relations on the world stage (Zinda et al. 2019), and the pluralization of environmental approaches (Zhu 2022). Indeed, the rising influence of non-Western countries poses challenges for sociological theories arising from largely Euro-American traditions (Chen 2018, Zinda, Li

and Liu 2018). It is no doubt time to rethink liberal environmental theories within the context of new global environmental players.

This article attempts such a rethinking to better understand China's globally emerging paradigm of Eco-Civilization as it pertains to the climate-forestry nexus. The article does not provide a systematic literature or policy review, but rather a theory-guided analysis of an emerging environmental paradigm which aspires to stand apart from certain facets of Western sociological theories of the environment. We argue here that (1) the logic of global carbon forestry is transforming through China's policies, potentially leading to a normalization of large-scale interventions, and (2) a strictly preservationist approach to forests is being challenged as a consequence. This has important implications for environmental sociology as the Eco-Civilization doctrine makes its way into global debates. Section 2 provides a short overview of the development of environmental sociology in China, with a focus on the rise of Eco-Civilization in Chinese environmental discourse and its growing global salience. Section 3 uses the empirical case of forests as a climate mitigation strategy, domestically and globally, to better illuminate the environmental approach encapsulated in Eco-Civilization and its attendant controversies. Section 4 combines theory and empirics, demonstrating how, in aspiring to offer an alternative model for environmentalism globally, China's Eco-Civilization paradigm may challenge Western orthodoxies.

2. From risk management to civilization building

Environmental sociology in China is 'well afoot' (Zinda, Li, and Liu 2018, 868), with the country's quantitative, qualitative, and conceptual contributions to the field mounting (Li 2019). Despite these recent developments, China's early encounters with environmental sociology – as well as sociology more broadly – were more limited (Hua and Flint 2009). Take for example, Beck's theory of risk society, the precursor to his later metamorphosis theory. Since it was first conceptualized within the context of the industrialized Global North, this theory did not gain early interest from the Global South, including China. First engagements with risk society in the 2000s classified China as a 'developmental' risk society (Zhang and Zhao 2011), exploring the implications of the transnationalization of China's mounting environmental risks (Wishnick 2005). Western observers used this premise as evidence pointing to the inevitable downfall of the communist regime and the liberalization of the country (Thiers 2003).

Others pointed to China's potential for 'ecological modernization,' a term theorized in a Western context but also applied by Chinese scholars (Mol 2006; Zhang,

Mol, and Sonnenfeld 2007). Ecological modernization did not necessarily imply the country's liberalization, but a modernization on its own path 'with Chinese characteristics' that departed significantly from that of liberal, capitalist societies. Indeed, the continued prevalence of elements such as a strong centralized state, little transparency, a 'very particular market system, and little room for bottom-up civil society,' make China's modernization trajectory unquestionably distinct from Western approaches (Liang and Mol 2013, p. 67).

Notably, the 2003 SARS epidemic sparked interest in risk society (*fengxian shehui* 风险社会) within Chinese academic literature (Zhang and Zhao 2011). The country's radical social and economic changes around that time made it a particularly appealing case for exploring the theory in a non-Western setting. As sociological investigations into China's 'compressed modernity' grew, risk society has since been applied to issues of food safety, genetically modified organisms, nanotechnology, and other emerging environmental issues (Tong et al. 2020). Through these disparate applications, unique features of China's particular risk society – as well as any potential metamorphosis that might follow – emerged. Kyung-Sup (2017), for example, found that 'the risk syndromes accompanying reforms to the socialist system, stacked on top of the risk syndromes carried over from the previous socialist era,' have resulted in an *extremely complex risk society*.

Like the concept of risk society, Eco-Civilization retains Western roots, yet it has been taken up within Chinese discourse far more substantially (see Figure 1). Although not itself a sociological concept, the term has crucial implications for how China engages with the field of environmental sociology. Eco-Civilization has become the broad rhetorical and policy umbrella under which all environmental initiatives in China are situated, from national parks to carbon markets. Originating from a Soviet Marxist-Leninist concept posing ecology as part of a mature socialist future (Fedorov 1983), Eco-Civilization is now almost exclusively associated with China (Foster 2017). Beginning in 2007, President Hu Jintao made the 'Construction of an Ecological Civilization' (*shengtai wenming jianshe*, 生态文明建设) a central long-term goal of the country. This promotion culminated in 2018 under President Xi Jinping, when the concept was written into the Chinese constitution as the fifth and final pillar of 'Socialism with Chinese Characteristics' (Figure 2).

Eco-Civilization is one in a long series of 'civilizations' (*wenming* 文明) that are unique to Chinese politics (Huang and Westman 2021). China's broad historical trajectory when conceptualized from the vantage of Eco-civilization can be summarized as a transition from 'primitive civilization' to 'agricultural civilization' to 'industrial civilization' and now onto an 'ecological civilization' (Yang 2020; M. Zhang 2021).

Publications mentioning Eco-Civilization and Risk society (CNKI)

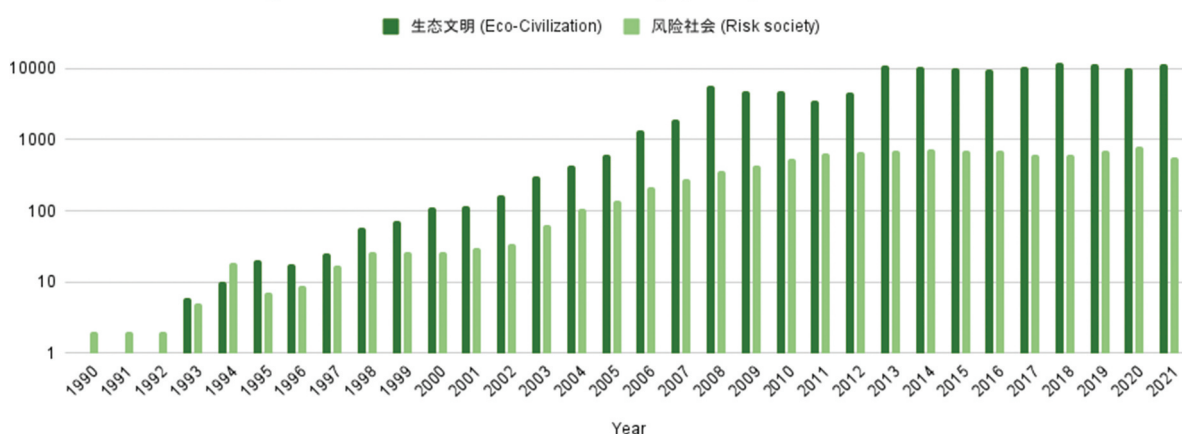


Figure 1. Publications containing ‘Eco-Civilization’ (*shengtai wenming* 生态文明) and ‘Risk society’ (*fengxian shehui* 风险社会) between 1990 and 2021 in logarithmic scale. Publications in Chinese language on Eco-Civilization rose starkly into the 10,000s after the uptake of the paradigm in political discourse in 2007; publications about risk society arose in greater numbers around the year 2000. The search was performed on 27 May 2021 in the database of the Chinese National Knowledge Infrastructure (CNKI) to better account for Chinese language publications.

This broad trajectory supersedes other minor civilizational episodes – the ‘spiritual civilization’ of the Mao era, the ‘materialist civilization’ of the Deng era (Dyner 2008) – but in all cases culminates in a contemporary civilization that is *ecologized*. That is, Chinese society as envisioned by the government is ‘built on a positive foundation of the cycles of the ecosystem’ (Liu 2013). The aspiration, as enumerated through the rhetoric of Eco-Civilization, is neither to control nor conquer nature, but rather to adhere to its rules and rhythms in order to realize shared prosperity (M. Zhang 2021).

The deployment and significance of Eco-Civilization has undergone a fundamental shift since President Hu began popularizing it in 2007. Its first usages at that time were almost in a defensive or shameful manner, recognizing that environmental health was key to the country’s prosperity and headed in the wrong direction (Wang, He, and Fan 2014; Y. Zhang 2021). The term was more about mitigating risks of burgeoning pollution. Since President Xi took office in 2013, the usage of Eco-Civilization shifted. Along with Xi’s presidency, the term has penetrated all of Chinese society, from the Communist party’s highest summits to the lowest cadres (Schmitt 2016; Pow 2018; Goron, 2018; Pan 2020).

Now, more than shame or remorse, Eco-Civilization is a marker of pride domestically and globally. It has become a vision for realizing ‘a community of a shared future for mankind’ (*renlei mingyun gongtongti* 人类命运共同体), one of China’s long-standing foreign policy goals (Wu 2018; Tong et al. 2020). Eco-Civilization has become so influential, it has instigated the expansion of this foreign policy goal to include not only all *mankind*, but all *life on Earth*, as taken up in the title of Convention on Biological Diversity’s 15th Conference of the Parties (CBD COP15; for which, China is the host), challenging all parties to position themselves towards this idea (Wei et al. 2021). In this way, Eco-Civilization is

distinctly Chinese, but gaining global salience. It is ‘increasingly presented not only as a response to environmental degradation in China, but as a vision for our global future’ (Hansen, Li, and Svarverud 2018, 195).

There is much debate over whether Eco-Civilization is actually being realized – if human-nature relationships are in fact changing to achieve a relative harmony – or if it is merely rhetorical greenwashing with little substance. Our goal is not to demonstrate whether and to what degree greenwashing and rhetorical flourish are at play, but rather to argue that the most important feature of Eco-Civilization as highlighted by Chinese leadership is that it is distinctly Chinese. Although resembling sustainable development or ecological modernization theory as pioneered in Europe and the US, Eco-Civilization deliberately distances itself from Western social theories, drawing on philosophical foundations of Confucianism, Daoism, and Chinese strains of Ecological Marxism (Wang, He, and Fan 2014; Pan 2006; Gardes 2020). The concept, as promoted by the Chinese government, provides a uniquely Chinese critique of modern civilization (Foster 2017), condemning international carbon politics, denouncing ‘ecological imperialism’ (Huan 2017), and providing a utopian vision of the advance of civilization from industrial to ecological, with China leading the way.

Eco-civilization is thus unique as a *global* environmental discourse because it is presented as a largely non-Western response to the global environmental crisis. As a new global environmental phenomenon (Ma and Wei 2021), Eco-Civilization has been included in the Post-2020 Global Biodiversity Framework and is increasingly exported alongside China’s Belt and Road Initiative (Zou et al. 2017; Buckley 2021; Lu and Harlan 2021), placing China in a leading role in navigating global issues

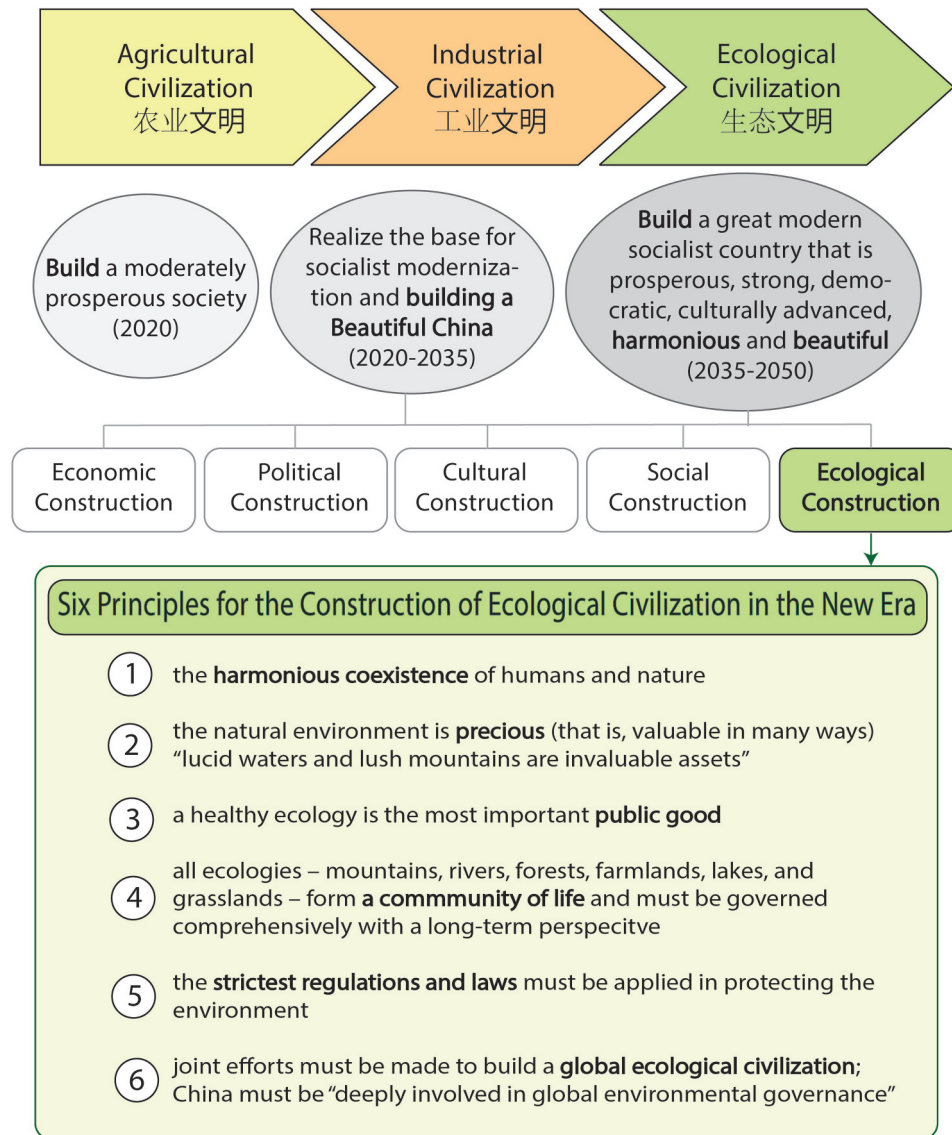


Figure 2. Political principles guiding the 'Construction of an Ecological Civilization.' At the top, Eco-Civilization is represented as a new stage of civilizational development. Below this, the government's three goals for building Chinese society by 2020, 2035, and 2050 are reached through a 'five-sphere integrated plan' (five pillars) or five 'constructions' (Huang and Westman 2021), the last of which – ecological construction – involves six principles as outlined by Xi Jinping at the National Conference on Environmental Protection in 2018 (Yang 2021).

such as climate change (Barbi, Ferreira, and Guo 2016). Making it into the agendas and titles of international fora like the CBD COP15 and the Erhai Forum (*erhai luntan* 洱海论坛), Eco-Civilization is starting to reach far beyond the borders of China. This is the first time that a deliberately non-Western environmental discourse is making its way to the global level.

3. Forestry with Chinese characteristics

The case of the climate-forestry nexus – in particular China's large-scale reforestation and eco-compensation efforts – offers rich empirical terrain for exploring the global implications of Eco-Civilization. Large-scale tree planting, including reforestation, afforestation, and

ecosystem restoration, has become one of the hottest and most controversial topics in global climate debates over the past five years. A 2019 article sparked much of the controversy, suggesting that planting 0.9 billion hectares of forest globally is one of the cheapest and most feasible means of combating climate change in light of massive political barriers to reducing fossil fuel consumption (Bastin et al. 2019). Media coverage of the study notes that large-scale tree planting is not just one climate change solution, but 'overwhelmingly the top one,' with 'mind-blowing potential' to reduce emissions (Carrington 2019).

Building on this enthusiasm, there is currently a wave of commitments by governments and companies to contribute to climate-related projects that halt forest loss or degradation and promote afforestation.

Following the UNFCCC and Kyoto protocol, the signatories of the Bonn Challenge committed to restoring 350 million hectares of forest land until 2030, sequestering 13–26 gigatons of CO₂ (IUCN 2020). In 2020, the World Economic Forum launched the 1 t.org platform and raised the 2006 ambition of planting one billion trees to one *trillion* trees. Elite billionaires across the world are also joining in. The founder of social news site Reddit, Yishan Wong, has launched the startup ‘Terraformation,’ conducting experiments with new ways of massive tree planting to terraform deserts into forests. Alibaba founder Jack Ma’s low-carbon lifestyle app, ‘Ant Forest,’ based on planting trees in exchange for low-carbon points earned by its users, won the Champions of the Earth award (UNEP 2019).

Controversies surrounding this type of large-scale tree-planting to mitigate global warming abound. While some studies contest the sequestration potential of such projects, while also emphasizing potentially adverse biodiversity and social impacts (Hua et al. 2016; Delang 2019; Zeng et al. 2020), others affirm the beneficial climate mitigation impacts of tree planting already underway (Lewis et al. 2019; Tong et al. 2020; Zeng et al. 2020; Zhu et al. 2020). Much of this controversy has played out in relation to China, the country engaging in such tree-planting projects at the largest scale.

3.1 China’s carbon forests

Tree planting in China is perhaps the longest-standing environmental tradition, dating back centuries and revived since the 1980s. In the thirteenth century already facing a largely deforested landscape, residents

in southern China initiated large-scale reforestation projects alongside a sophisticated system of speculative trading in timber market futures (M. Zhang 2021). Reforestation schemes continued on and off throughout the Ming and Qing Dynasties, but not enough to cover losses, with net forest coverage declining well into the 20th century (Ahrends et al. 2017). Since the founding of the People’s Republic in 1949, planting trees has become the most-featured environmental activity of China’s leaders. In the 1950s, Mao Zedong initiated large-scale afforestation programs (alongside massive tree cutting in other parts of the country) to protect the North China Plain from advancing desertification (Viña et al. 2016). Shortly after Mao’s death, construction began on the largest and most ambitious tree-planting campaign in history: the Great Green Wall, spanning all of northern China and including territories overlapping today with Alipay’s Ant Forest. Beginning in 1999, the world’s largest ecological restoration project – the nationwide Grain-for-Green (also known as ‘returning farmland to forests,’ *huigeng huanlin* 退耕还林) program – was spearheaded across the country and continues, like the Great Green Wall, to this day.

In the past two decades, these massive efforts have begun to pay off. Net forest coverage has nearly doubled from 115 million hectares in 1981 to 220 million in 2020 (Zinda et al. 2017; Our World in Data 2022), leaving the country with more planted forests than any other in the world – greater than the next top ten tree-planting countries combined (Figure 3). In net terms, by 2015, China had by far the highest net forest coverage increase of any country (Figure 4) and is the leading contributor to ‘global greening’ trends over the past two decades, enhancing

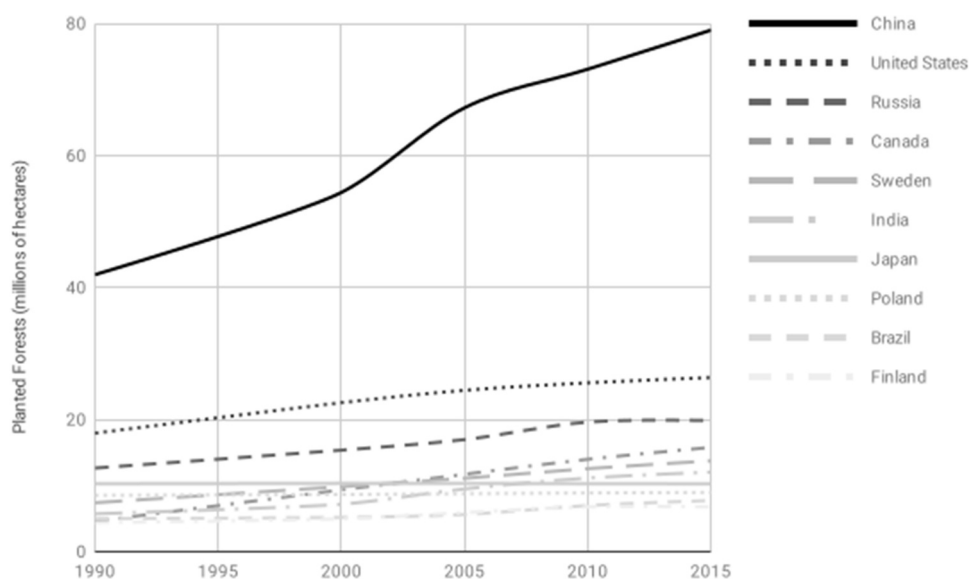
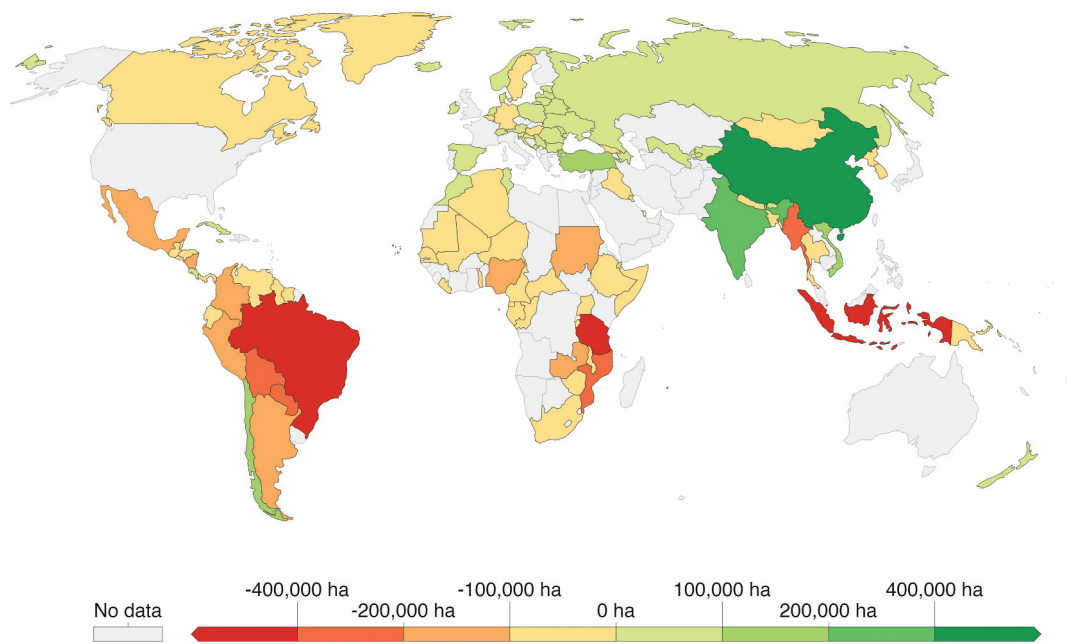


Figure 3. Top 10 contributing countries to planted forest coverage (in hectares) from 1990 to 2015. Data source: (FAO 2019).

Annual change in forest area, 2015

Net change in forest area measures forest expansion (either through afforestation or natural expansion) minus deforestation.



Source: UN Food and Agriculture Organization (FAO). Forest Resources Assessment.
Note: The UN FAO publish forest data as the annual average on 10- or 5-year timescales.

OurWorldInData.org/forests • CC BY

Figure 4. Net change in forest area, 2015. Specifically, forest expansion (either through afforestation or natural expansion) minus deforestation. *Source:* Our World in Data, using data from FAO, CC BY.

vegetation cover over an area equal to a quarter the size of the Amazon (FAO 2019; Chen et al. 2019). China's former goal of 23% of nationwide forest cover by 2020 (Viña et al. 2016) has been reached according to official data (State Council Information Office 2020). New reforestation and ecological restoration targets have been set in the latest five year plan (2021–2025), including re-greening an area of land the size of Ireland annually (Zastrow 2019). It is further expected that China's hosting of CBD COP15 (the first round of which was held remotely from Kunming, while the second round will be held in Montréal, Canada in December 2022) will catalyze the country's support for the 30 × 30 commitment, strengthening their land-based climate approach domestically and globally.

Eco-compensation mechanisms (*shengtai buchang* 生态补偿) are one of the primary policy vehicles for tree-planting in China. Different from many other countries, eco-compensations in China are framed as public regulations and paid for by local and central state institutions (Xiong and Wang 2010; Schomers and Matzdorf 2013). Compensation can be paid by the state or to the state (the constitutional owner of natural resources) by companies, individuals or groups for damage caused to natural resources. These can include, for example, forest harvesting, mineral exploitation, or the compensation and resettlement of

individuals from ecologically sensitive areas by the state (Wang et al. 2020). Despite controversies and protests in such interventions, the Chinese scientific community has a much less politically challenging role and focuses on technical debates rather than questioning the social justice of state actions (Teets et al. 2021).

An increasingly enthusiastic tone is not only found in Chinese but also noteworthy in English language publications in international journals. Compensation can be monetary or in-kind, but planting trees is a primary feature of nearly all. While in 1999 there were only eight eco-compensation projects, this number increased to 47 in 2008 (Bennett and Carroll 2014). According to a 2016 study by the Asian Development Bank (ADB 2016), China is overwhelmingly the largest investor in watershed services, of which investments in forestry are the most common (Figure 5).

China's Grain-for-Green program provides a prime example of eco-compensations involving tree-planting. Aiming to re-green large swaths of the country through a better integration of ecological and socioeconomic programs (Delang and Yuan 2016), this massive program is responsible for the conversion of more than 13 million hectares of farmland to forest or grassland between 1999 and 2019, involving 41 million households (Chen 2020). In some places, especially those with higher proportions of inclined

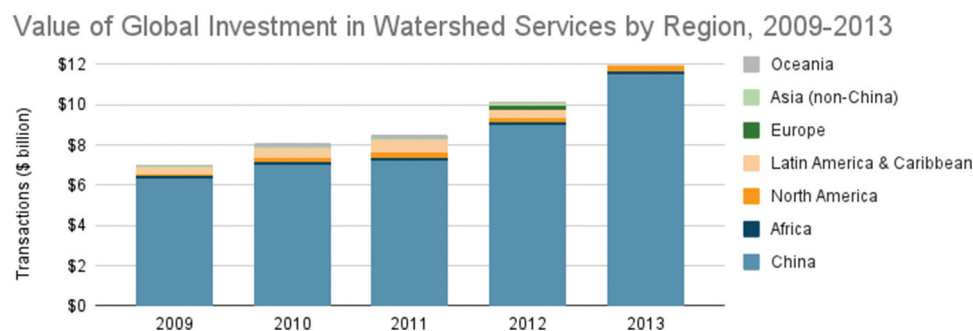


Figure 5. Value of Global Investment in Watershed Services by Region, 2009–2013. Based on 454 programs tracked, valued at \$12.3B in 2013. Source: ADB 2016.

territory, such as Yunnan, the Grain-for-Green program is responsible for re-greening more than 42% of former farmlands (Wang et al. 2017). This has significantly changed the sectoral distribution of local economies and reduced dependency on urban wage labor (Uchida, Rozelle, and Xu 2009), shifting policy priorities towards forestry and creating unforeseen changes in people's relation to forests (Yan 2019).

3.2 Critiques of China's approach

Media coverage and academic literature are rife with critiques of China's tree-planting and ecological compensation schemes (Yan 2019; Zastrow 2019). Some of these are applicable to large-scale ecological interventions across the board, Chinese and otherwise (Lewis et al. 2019; Canadell et al. 2021); others are targeted specifically at the social and political aspects of China's approach (Luoma 2012; Jiang 2016). There is clear evidence of many constructed forests simply not surviving or worsening water scarcity (Cao et al. 2011; Luoma 2012). Especially in the north, some consider efforts to green the desert 'foolish' (Zastrow 2019, 474). Is it time to 'take down the "Great Green Wall"' (Jiang 2016) and rethink the risks of creating novel human-made ecosystems whose future consequences we cannot foresee? Or are such works of ecological engineering the way out of the current climate crisis (Kleden 2010)?

The complete failure of many of China's early initiatives is widely attested to in the West, and even acknowledged within the Chinese scientific community (Cao 2008; Ye 2013). More recently, however, practices have moved away from monocultures toward various forms of vegetation regrowth (Ye 2013). In certain regions, there have been clear successes. The rehabilitation of the Loess plateau and forestry projects surrounding Beijing are the most commonly cited examples (Wu et al. 2019). The net carbon sinks of Southeastern China's newly planted forests have also increased substantially (Tong et al. 2020), and satellite imagery from the north demonstrates vegetation increases in line with government

statistics (Niu et al. 2019). In terms of net increases in carbon sinks via forestry, China is among the highest globally (Wang et al. 2020).

Beyond climate mitigation, additional critiques abound – mostly coming from outside Chinese academia and media. In terms of biodiversity conservation, China's forests have been called 'green deserts,' with few native species (Beiser 2018). The new tree cover, critics observe, has 'little to do with nature' and 'cannot be considered "forests" in the sense of preserving biodiversity' (Marks 2017). Indeed, critics question if it is possible to call such rampant tree planting *environmental*.

Beyond environmental issues, lie the social and political critiques. As with all targets in China – economic or environmental – forestry targets are achieved by imposing ambitious goals at the top, while lower-level provincial, municipal, and scientific bodies scramble to deliver results on the ground. This can lead to massaging the statistics to misleadingly demonstrate results or taking extreme measures that limit local practices in favor of tree growth. Agriculture and grazing activities that contribute to desertification are strictly prohibited, so much so that entire populations might be relocated or made sedentary (Zhang 2018). While there have been efforts to address data misreporting and increase the local benefits of projects (such as by planting species with market value), the generally non-participatory approach of abiding by top-down mandates is likely to persist. These social and political critiques of large-scale tree planting apply to many countries, but are most vociferously raised in relation to China.

Within China, however, the debate over large-scale tree planting is less likely to focus on the social justice impacts or ulterior political motives of the projects, but rather their ramifications e.g. for national food security. Indeed China's artificial forests have become so extensive that in 2020 the State Council issued a policy prohibiting the 'non-agriculturalization' of cultivated land in order to ensure the country's grain supply (State Council 2020). Referred to colloquially as 'returning forests to farmland'

(*tuilin huangeng* 退林还耕, or freely translated to ‘Green for Grain,’ indicating a partial reversal of the Grain for Green program, *tuigeng huanlin* 退耕还林, of two decades earlier), this policy seeks to ensure that certain prime arable land is not converted to decorative or non-grain producing purposes (including growing seedlings and fast-growing forests), thereby maintaining an arable land redline similar to the country’s ecological redlines (Xu et al. 2018).

4. ‘Constructing’ an Ecological Civilization

China’s forestry projects, as criticized as they may be, are unparalleled around the world. Whether considered a success or failure, no other country is pursuing such initiatives in a comparable way or at a comparable scale. These efforts are not only unique to China, but indicative of the country’s broader approach to the environment as embodied in the paradigm of Eco-Civilization. Prioritizing large-scale building and construction at the hand of a strong state, China approaches the natural environment as not necessarily distinct from politics and the built environment. The country’s large-scale forestry projects prioritize active building and ecological engineering over preserving natural ecosystems. In these initiatives, ecology is not considered, as Latour (2017) notes, simply a ‘term to designate the beings of nature considered from afar, through the shelter of bay windows’ (i.e., the ‘decor’ that surprisingly gets up on stage in Western climate imaginaries, as noted in the introduction). Rather, ecology, as evidenced by China’s approach to forestry and Eco-Civilization more broadly, is an active realm of governance.

Referred to in Mandarin as 造林 *zaolin* (literally ‘producing/building’ forests) or 森林建设 *senlin jianshe* (‘forest construction’), forestry in China has little to do with nature. Although uncommon in the West, the use of the terms ‘building’ or ‘constructing’ (*jianshe* 建设) when it comes to ecosystems is quite common in political discourse in China, not only for forests but many activities in addition to the environmental. As written into the constitution, Chinese environmental governance aims to ‘construct an Ecological Civilization’ and ‘build a beautiful China’ (Marinelli 2018; see Figure 2). To Western ears, such building and construction when it comes to the environment appears as a type of green-washing. Compare these slogans, for example, to the (largely Western) charge to ‘save the planet’ or the declaration that ‘nature needs half.’ They differ at every step: building and constructing versus saving and preserving, China and civilization versus nature and planet.

This linguistic difference hints at the underlying assumption that the ‘eco-environment’ (*shengtai huanjing* 生态环境) from a Chinese perspective is, unproblematically and unsurprisingly, a product of both human and natural processes. The shock and uproar that climate change has caused in the Western imaginary – ‘metamorphosis’ in the words of Beck; ‘a profound mutation in our relation to the world’ in the words of Latour – is perhaps not as stark when it comes to the Chinese imaginary. When Latour refers to ‘the moderns,’ who consider the natural and the socio-political (e.g., climate and governance) as discrete, he is referencing the birth of a specifically Western brand of dualistic thinking that has been disrupted by climate change. ‘The Anthropocene,’ ‘geohistory,’ ‘tipping points,’ he notes, all transgress this duality between the natural and the social, forcing contemplation of how ecologies and climates are in fact socio-political realms. Within this mindset, the ecological ‘construction’ that China has been doing for decades, if not centuries, takes on new significance.

In many ways, large-scale tree planting in China is no different than the country’s large-scale urbanization (Ren 2011): impressive feats of engineering the landscape to Chinese standards at the hand of a strong central government. The ecological environment is seen as a type of infrastructure to be engineered alongside the built environment. In this view, it is indeed difficult to call such tree planting efforts ‘environmental’ from a conventional Western perspective that privileges the natural as separate from the human. Yet, these massive state-led projects are in fact quintessential examples of Chinese environmental governance deployed toward the aim of establishing an Eco-Civilization. Not at all preservationist or grassroots, Eco-Civilization involves the melding of human intention and large-scale ecological processes at every step of the way (Li 2019).

Over the years, sustainability improvements have been made to China’s forest-building endeavors: using more bushes and shrubs than trees as the water table requires, not planting monocultures to avoid susceptibility to diseases, choosing species with economic as well as environmental benefits (Zinda et al. 2017), even cordoning off large areas to regrow by themselves through a system of ‘ecological red lines’ (Xu et al. 2018). But recreating natural landscapes is not, and has never been, the primary goal. Large-scale tree planting projects, like the Great Green Wall, the Grain-for-Green program, or Alipay’s Ant Forest, are not geared toward preserving nature, but rather tackling the extreme environmental threats of desertification, flooding, and climate change. Their aim, whether successfully achieved or not, is to quite literally *build* a sustainable future – that is, a future in

which China will persevere and prosper despite existential threats like climate change.

The state-led transformation of the landscape associated with China's forestry efforts has become one of the most tangible symbols of the country's national transformation toward Eco-Civilization. It is one of the few highly visible material changes the country can point to in order to demonstrate the scale and complexity of its new global vision. Leveraging human ingenuity and political will to construct or build new ecologies – that is combining social and environmental agencies – does not pose the same contradiction in China as it does when approached from a Western preservationist perspective. The radical repositioning with respect to the environment that Latour, Beck, and others propose as a consequence of climate change – 'metamorphoses' or 'profound mutations' – are perhaps not quite as radical, or at least proceed differently, in different cultural and political milieus. This is something that requires more nuanced social theorizing. 'Greenness' and its attainment, it turns out, are in many ways culturally construed (Pascual et al. 2021; Zhu 2022).

The role of the state in governing the melding of social and ecological agency that we will increasingly witness in decades to come also requires more nuanced theorizing. As a concept grounded in Chinese terms, Eco-civilization raises doubts over the emergence of societal transformations or 'metamorphoses' that lack all central planning and are based not on states, but a vague 'global cosmopolitanism' that transcends state authority (Beck 2007). In the case of China, the state is a driving proponent, making methodological nationalism appear more salient than assumed by Western theory (and for Western contexts).

Yet, despite China's 'nationalist twist,' the state can only push the paradigm of Eco-Civilization so far. It remains to be seen how this heavily promulgated concept will be received and evaluated by the Chinese population at large (Hansen, Li, and Svarverud 2018). While the state has set China on the path toward constructing an Eco-Civilization, what precisely that construction entails as it reverberates throughout the country in practice and everyday life, discursively and materially, remains to be seen.

5. Conclusion: how influential will China's approach be?

In global environmental debates, China is both the leading environmental threat and an emerging environmental leader. The country is by far the largest carbon emitter, but also the largest contributor to renewable energy and electric vehicles. It is the biggest threat to forests globally, yet the leading contributor to global greening within its own borders over the past

two decades. Through tree-planting, China has become the largest net carbon sink via land use globally. While the country's environmental digressions have been publicized for decades, its environmental initiatives are only recently gaining recognition, and even then, they remain highly controversial.

Eco-Civilization is not (yet) a clearly defined agenda, certainly due to its purposefully open-ended utopian character. As an environmental worldview, Eco-Civilization is more about differentiating itself from Western influence than remaining internally consistent (Boughen 2021). Consequently, doubts arise over whether the paradigm is more rhetoric than reality, more strategic than genuine (Li and Shapiro 2020). Is Eco-Civilization simply a consequence of international pressure or a guise for consolidating political control? Similar questions arise when it comes to China's massive reforestation efforts. Is all this tree planting about preserving the environment or rather engineering ecosystems anew with little concern for 'nature'? We suggest here that this may be the wrong question facing our engagement with Eco-Civilization as an object of study in environmental sociology. The more interesting question at hand is not whether Eco-Civilization is genuine or sincere, but rather: What vision of an environmental future is this new global paradigm conjuring and how might it be different from Western visions of the past decades? Impervious to the clear divide between the natural and the socio-political that structures modern Western thought, Chinese leadership approaches the ecological as an active realm of governance, ripe for the type of 'construction' or 'building' that we are likely to see far more in decades to come.

When discussing Eco-Civilization, then, it is useful to move beyond the common trap of understanding China as either an environmental threat or leader – a 'good' or 'bad' environmental player. Neither particularly good nor bad, China's emerging environmentalism retains cultural underpinnings not shared by such Western movements dominating the twentieth century. China's large-scale forestry projects reflect the country's unique environmental aspirations tied to national pride. They are hoped by the Chinese government to embody a type of 'environmentalism with Chinese characteristics' or 'Sinicization' of environmentalism (Wang-Kaeding 2018), presenting new norms in environmental governance that may soon structure global debates (Weins, Ferreira, and Feodrippe 2020, Zhu & Zhu, 2020). More and more, conflicting environmental aspirations – engineering a balanced ecology versus preserving untouched ecosystems – will play out at the global level, and Eco-Civilization will feature heavily in the debate. Environmental sociology has much to unveil about

China's Eco-Civilization and should not turn a blind eye to this discussion if we are to recognize the manifold ways in which environmentalism is pluralizing globally.

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