



## Fengshui Forests as A Socio-Natural Reservoir in the Face of Climate Change and Environmental Transformation

By Chris Coggins, Bard College at Simon's Rock; and Jesse Minor, University of Maine at Farmington

### Abstract:

Chinese lineage villages are social-ecological systems (SEs) designed according to principles of fengshui ("wind-water"). Fengshui is a composite of cosmological beliefs and landscape management strategies, including the protection of sacred groves, aimed at optimizing the collective, long-term wellbeing of lineage groups by enhancing long-term natural and social resilience. Along with other adaptive management features, village fengshui forests promote social-ecological vigor by conserving plant, soil, and water resources, enhancing social memory, and serving as living models of resilience in the face of social, economic, and political changes. Modern programs to transform rural communities through state-led agricultural production systems included bans on fengshui practice and the destruction of forests. Many communities protected their fengshui forests, providing contemporary opportunities for local, regional, national, and international conservation initiatives incorporating locally preserved forests.

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As part of its commitment to the 2016 United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement, China's government drafted a fifteen-part plan to implement enhanced action on climate change. The Intended Nationally-Determined Contributions (INDC), a document required of each participant in the 2015 United Nations Climate Change Conference (COP 21), includes a section on "Increasing Carbon Sinks" that pledges the following:

*To vigorously enhance afforestation, promoting voluntary tree planting by all citizens, continuing the implementation of key ecological programs, including protecting natural forests, restoring forest and grassland from farmland, conducting sandification [sic] control for areas in vicinity of Beijing and Tianjin, planting shelter belts, controlling rocky desertification, conserving water and soil, strengthening forest tending and management and increasing the forest carbon sink.<sup>1</sup>*

Within China's national boundaries, the vegetation types with the highest biodiversity and the greatest capacity for carbon storage are the tropical and subtropical broadleaf evergreen and mixed forests found in scattered remnants in the southern and central regions of the country. Studies of forest carbon sequestration in southern China provide clear evidence that broadleaf evergreen species, and broadleaf forests as a whole, have higher carbon storage capacity than any other vegetation type, and that preservation and restoration of natural forest stands is a superior method for expanding natural carbon sinks.<sup>2</sup> In conjunction with efforts to protect and restore biological diversity across China's tropical and subtropical zones, patches of broadleaf evergreen and mixed broadleaf-needleleaf forests should be primary targets for conservation, preservation, and restoration. Village-protected fengshui forests provide precisely this type of conservation prospect.

## China's Fengshui Forests and the Socio-Ecology of Village Watershed Landscapes

Though little-known to people outside of rural southern Chinese communities, the most ecologically intact patches of tropical and subtropical forests are those that have been protected by village custom for many centuries in order to maintain community watersheds and livelihoods. Among Han Chinese villagers, these are commonly known as fengshui forests (*fengshuilin*) and comprise small patches of preserved forest or plantation believed to bring prosperity, wellbeing, and good fortune to the communities that protect them. Ours is the first systematic study of fengshuilin throughout their range in southern and central China; prior to 2003,<sup>3</sup> they were undocumented in the English language literature outside of Hong Kong. Over the course of mixed-method field research between 2011-2017 (and ongoing) we have come to realize that these sacred forests play a critical role in the village wet rice agricultural landscape complex, which covers roughly fourteen provinces in southern and central China.<sup>4</sup> Combining results from interviews and surveys on the history of forest management and socio-ecological change, stream and water sampling (aquatic and riparian ecology), forest ecology (tree identification, measurement, and tree ring analysis), and film/photographic documentation and analysis, we have developed a preliminary understanding of a complex, widespread, and ancient land use pattern and its associated cultural landscapes. From a socio-ecological perspective, fengshui forests and associated landscape features promote community sustainability by conserving village watersheds and their myriad resources.

A watershed consists of an area of land where precipitation collects and drains into a common outlet, such as a stream, lake, or other body of water. As such, a community's watershed is typically part of a larger drainage basin, and includes all of the plant, soil, and water resources that regulate local hydrology and microclimates. In small rural communities long dependent on wet rice cultivation, watershed management is an ancient tradition necessary for sustained crop production, and a complex of symbols, rituals, and everyday practices combining cosmology, ancestor worship, and landscape management would conceivably evolve as a means to ensure food security and other aspects of socio-ecological sustainability. As such, fengshui has helped enhance a sense of ecologically based social memory and well-being, providing a schema for resilience as well as a mental model of collective adaptability.<sup>5</sup>

This research deploys a methodology combining biophysical investigation of forests, ecology, hydrology, and environmental history to reconstruct the long-term socio-ecological significance of fengshui forests as critical components of the culture and landscape ecology of Han villages across southern and central China. In the course of seven years of field-based investigations, we have found that these sacred forests have long been important to the tens of thousands of communities that protect them while also comprising nodes in what can now be understood as a large-scale network of vegetation patches that has critical significance for nature conservation and climate mitigation policy. As the best representative remnants of the primordial forests that once covered southern and central China, these forests can serve as primary source areas for large-scale reforestation. Since 2000, Chinese researchers have begun to focus fairly intensively on fengshui forests, but because of the legacy of political campaigns against "feudal superstition," there is a marked lack of research on the historical, social, and ethnographic variables associated with these forests. There is also a dearth of research on the geographic extent of these forests across the region, and a paucity of scientific study of ecosystem services in rural and peri-urban settlements. This paper explains how fengshui traditions relate to customary forest protection, foregrounding the socio-ecological significance of fengshui forests within village landscapes and local watersheds and explaining their relevance in large-scale biodiversity management and climate change mitigation.

## Fengshui Forests as Historical Ecological Adaptation

Fengshui forests became primary components of southern China's cultural landscapes in the first millennium CE as Han settlers adapted to and altered the rugged landscapes of the tropics and subtropics using *fengshui* principles to develop sustainable settlements based on wet rice agro-ecosystems.<sup>6</sup> These zones are characterized by high rainfall, ranging from an annual average of 800 mm (31 inches) along the Qinling-Huaihe ecotone that marks the boundary between the subtropics and temperate climates to the north, to 2,000 mm (79 inches) along the southern coast. Average annual temperature shows a similar north-south increase, ranging from 14° C (57° F) at the Qinling-Huaihe ecotone to 24° C (75° F) along the southern coast. Environmental hazards include annual subtropical storms bringing high winds, heavy precipitation, and severe erosion, especially on steep and denuded slopes. In this biophysical context, fengshui represents an ancient yet dynamic composite of indigenous cosmological beliefs, and landscape management strategies focusing on topographic features and frequently utilizing groves and forests to enhance watershed-scale resilience. In the long history of Han Chinese migration and settlement of the mountains, valleys, and hills of the southern frontier, which peaked between the Han Dynasty (206 BCE - 220 CE) and the Song (960-1279 CE), this system evolved as a means for locating ideal settlement sites and designing built environments and wet rice agricultural zones in close proximity with forests, meadows, and other upland resource utilization areas. Fengshui lore and literature provided both cognitive maps and graphic diagrams to guide this process, and fengshui masters supplied specialized expertise in choosing auspicious sites and in modifying the built environment.<sup>7</sup>

The compound word “fengshui” literally means “wind-water,” but in addition to denoting the primary climatic elements of the living environment, it refers to a constellation of ideas and techniques for harmonizing human activities with the terrestrial and celestial forces that govern them.<sup>8</sup> Often translated as “geomancy,” it is a form of traditional ecological knowledge (TEK) best understood as a form of cosmivision<sup>9</sup> in which the optimization of vital life force (*qi*) is contingent on human agency. A complex set of formulas and guidelines direct ongoing individual and collective involvement with the landscape through active manipulation and management, observation, reflection, divination, and continuing adaptive response to both anthropogenic and non-anthropogenic environmental change. Our study shows that fengshui practice at the landscape scale — within the geographic context of villages and their immediate watersheds — is a cohesive and collective undertaking with centuries of precedent and the time-tested logic of trial and error. As an ethno-geographic practice, it encompasses a complex panoply of spiritual beliefs and magical practices involving supernatural forces and agents, including gods, ghosts, ancestors, and impersonal chthonic forces. These have survived the bans on “feudal superstition” associated with the utilitarian, industrial, scientific ideology of the Maoist period (1949-1978), but not without changing and adapting to new social and environmental conditions. Village fengshui forests are important components of rural cultural landscapes that not only represent nodes of connection between fengshui culture and ecology, but also prove that in many rural communities the two are intricately interwoven to protect watersheds. Watersheds comprise the infrastructure of life for humans, the non-human organisms upon which they consciously depend, and the complex biological assemblages that may not be well understood but are often no less crucial.<sup>10</sup> It should be noted that mystical elements of fengshui, including its grounding in correlative cosmology<sup>11</sup> and its global proliferation have ensured that many of its practices, particularly in urban, metropolitan and international contexts far exceed contemporary conceptions of “ecology,” “environment,” and indigenous sense of place.

In the first decades of the twenty-first century, fengshui may signify activities as diverse as hiring a professional fengshui master (*fengshui xiansheng, dili xiansheng*) to enhance the interior design of a Hong Kong or New York corporate office in preparation for an initial public offering, or choosing a site for a deceased family member’s tomb in a wet rice farming community in the rugged terrain of China’s subtropics. In both cases, the primary objective is to regulate the flow of vital energy (or substance) known as *qi*, a life-giving force associated with the flow of wind and water, whether at the scale of a vast landscape or an individual house and its rooms, in order to maximize the wellbeing of the inhabitants. As a metaphysical phenomenon, *qi* holds polysemic potentiality: in metropolitan areas, *qi* is now associated with the flow of currency in the form of capital or, more abstractly, the ebb and flow of power within the global political economy. In rural peripheries, it is imagined as a current of life force flowing through air, water, and earth, nourishing plants, animals, and people with equal generativity. In the latter context, village fengshui landscapes persist despite nearly a century of widespread rural modernization schemes.

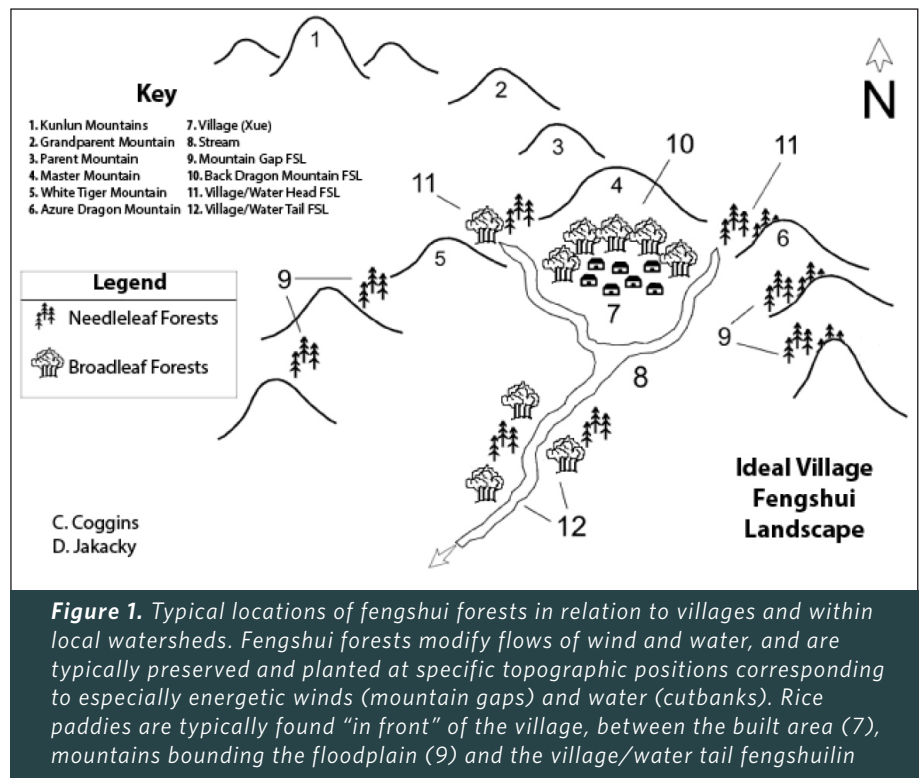
Fengshui is not merely a cosmological fantasy detached from ecological materialities of everyday life, but a way of understanding and shaping cultural landscapes that maximize the ecological capacity for sustaining wet rice agricultural communities over many generations. Village fengshui landscapes exhibit high levels of resilience,<sup>12</sup> having endured centuries of ecological and social perturbations. In the modern period, this has included the Maoist era (1949-1979) agricultural collectivization and industrialization and bans on fengshui belief and practice; the dramatic expansion of the road network and extensive rural electrification since the 1980s; and a massive, government-promoted wave of rural-urban migration from the early 1980s to the present. While it would be a grave mistake and an idealistic fantasy to assume that fengshui is analogous to environmental science or that it can serve as a fool-proof antidote to ecological and social ills,<sup>13</sup> the

long-term resilience of village fengshui landscapes is contingent on the maintenance of fengshui forests – not only because these forests help define collective cultural identity and community space, but also because they help regulate the watersheds and associated ecological systems upon which sustainable food production and continuing human settlement depend. Community stability is not a matter of human agents managing a separate entity or set of non-human variables associated with “the environment,” but rather an ongoing involvement in the everyday work of weaving human needs and interests into more-than-human systems. As noted by Folke et al.:<sup>14</sup>

*...many of the serious, recurring problems in natural resource use and management stem precisely from the lack of recognition that ecosystems and the social systems that use and depend on them are inextricably linked. It is the feedback loops among them, as interdependent social-ecological systems [SES], that determine their overall dynamics.*

In this regard, fengshui theory and practice emerged in ancient China as an art of landscape interpretation and design, an indigenous landscape architecture in which humans and the non-human world were ontologically inseparable. Fengshui evolved in continuous dialogue with Daoist, Confucian, and Neo-Confucian philosophy, as well as older ethno-sciences of divination and magic.<sup>15</sup> In concept and practice, fengshui assumes a unity and continuity between the “heavens” (or cosmos) – *tian*, the earth – *di*, and humans – *ren*. In this view, the natural and the supernatural lack discrete boundaries, and feedback loops are understood in terms of fengshui: visible and invisible forces immanent in the landscape and to a significant degree amenable to human modification. Poorly chosen settlement sites and unharmonious land use give rise to material hazards in the form of flooding, drought, soil erosion, crop failure, disease, and resource shortages. Well-chosen settlement sites and harmonious land use give rise to thriving communities enduring over the course of multiple generations. Fengshui practice involves vigilant attention to the cause and effect relationship embodied in feedback loops, and its purpose is to enhance living conditions for human communities—a matter of ultimate concern in the cosmo-ecology of corporate lineage villages.<sup>16</sup>

Fengshui encompasses far more than “environmental” concerns; a wide range of events involving personal, familial, and community fortune and misfortune are commonly attributed to good or bad fengshui. For instance, in 1994-95, Coggins<sup>17</sup> observed cases of suicide, lead poisoning, and job loss that were attributed to the bad fengshui of individual houses and rooms. These and other examples assume environmental causality in forms incommensurable with scientific explanation, and Bruun<sup>18</sup> provides strong caveats against the facile conflation of fengshui and modern environmental consciousness. In short, fengshui includes many



elements of correlative cosmology, in which symbolic associations between different domains and scales – ranging from the human body, to the landscape, to broader geographic features, and finally to the realm of astronomy – are conceptually linked and thought to be mutually influential, especially from larger phenomena down to finer scales.<sup>19</sup>

On a final note regarding fengshui and fengshuilin as historical ecological adaptations, just as we must avoid conflating ancient ethno-ecological theories and practices with the teleological and ontological assumptions that constitute the foundations of modern environmental science,<sup>20</sup> we must also avoid the assumption that village-level management of local watersheds prevented larger-scale environmental degradation across southern and central China. Village fengshui landscapes comprise small sections of vast watersheds, and assiduous management of watersheds in the upper reaches of large drainage basins alone is not sufficient to maintain large-scale regional hydrological stability or to prevent soil loss, sedimentation, deforestation, biodiversity decline, and other forms of long-term historical environmental degradation that have been well-documented.<sup>21</sup> In fact, the tension between watershed management within thousands of largely self-sufficient lineage villages (which we have referred to as “wind-water polities”)<sup>22</sup> and watershed degradation due to numerous historical inter-regional conflicts<sup>23</sup> is a subject in need of critical evaluation.

### Fengshui Models of Ideal Settlement Sites and Landscape Management Practices

The ideal village fengshui landscape consists of a nucleus of houses known as the “lair” (*xue*) that is nested within a small drainage basin (**Figure 1**). The village rests on a slope above the floodplain croplands below, in a site where *yin* and *yang* energies are believed to be in, or close to, natural balance. Streams descending the slope on both sides of the village provide water for the irrigation of rice paddies in the valley floor below (**Figure 2**), in which terracing can be kept to a minimum. Since China is in the northern hemisphere, it is considered best to “sit in the north facing south” (*zuobei chaonan*) with villages and individual houses “facing” the sun. Direct sunlight promotes the growth of rice crops, which are ideally located in a broad floodplain south of the village, and the sun’s rays provide warmth for the village in winter, while mountains “behind” the village to the north block cold continental winds of the winter monsoon. The fertile and generative *xue* is surrounded and protected by the master mountain in the north, and spurs or ridges to the west (the white tiger, *baihu*) and to the east (the azure dragon, *qinglong*). This general crescent-shaped configuration can be replicated at all scales of the built environment, including tombs, shrines, temples, and homes. Higher mountains extending farther north from the master mountain include the parent mountain, grandparent mountain, and ranges extending to the Kunlun Mountains at the edge of the Tibetan Plateau. This series of mountains replicates the ancestral lineage structure and metaphysically connects distant villages to the sacred origin point of gods in the Daoist pantheon. In fact, the ancestral record for Gonghe village, in Meihuashan region of Fujian, notes that the branching pattern of *qi* flow into the village originates in the Kunlun Mountains far to the west.<sup>24</sup>

Flourishing natural vegetation is a crucially important element of the ideal fengshui landscape, as exemplified in this passage from the *Book of Burial (Zangshu)*, the seminal text of the Forms School (*Xingshi*) of fengshui. Written in the fourth or fifth century as a commentary on the now lost *Classic of Burial (Zangjing)*, this passage contains the earliest use of the term “fengshui” in extant documents:

*The Classic says, qi rides the wind and scatters, but is retained when encountering water. The ancients collected it to prevent its dissipation, and guided it to assure its retention. Thus it was called fengshui (wind-water). According to the laws of fengshui, the site that attracts water is optimal, followed by the site that catches wind... Terrain resembling a palatial mansion with luxuriant vegetation and towering trees will engender the founder of a state or prefecture. (Guo Pu, The Book of Burial)<sup>25</sup>*

Tens of thousands of southern Chinese villages still show evidence of this idealized cultural model, even after a multitude of rural structural transformations entailed by the systematic development projects associated with *xiandaihua* (modernization). Thus, in both its ideal and instantiated forms, the village fengshui landscape exemplifies a stable and longstanding form of socio-ecological system. Within the village fengshui landscape complex, fengshui forests play a key role in maintaining the durability of the village-scale SES through their material effects on flows of wind and water, their amelioration of erosion, their enhancement of biological prosperity, and their symbolic representation of ancestry and lineage.

Within the village fengshui landscape complex, fengshui forests are typically situated immediately behind and upslope from the village (**Figures 1 and 2**), on what is called the *zhushan*, or master (also “host” or “owner”) mountain. Since the forests are located adjacent to human settlements in order to enhance the physical and spiritual qualities of the local environment, they are considered by current Chinese scholars as “pieces of history – living, cultural, biological, and ecological fossils.”<sup>26</sup> Though imbued with spiritual significance, the forests are also subject to a wide spectrum of human management and influence, with some fengshui forests undergoing clearing, harvesting, and gleaning, and others granted nearly total protection.

The current status of fengshui forests in China can only be understood in light of intentional transformational changes engineered by the Chinese Communist Party nationwide between 1949 and 1979. Revolutionary state-building under the banner of the People’s Republic of China explicitly demanded social-ecological transformation as part of Marxist-Leninist-Maoist revolution.<sup>27</sup> The state restructured village communities, long organized around insular corporate lineage interests, into production teams and production brigades, aggregating these into communes at the scale of townships. Private property was abolished, labor was collectivized, and agriculture fed the rapid expansion of the state industrial complex. Communist party ideological work that impacted fengshui forests included bans on fengshui belief and practice, which were deemed forms of feudal superstition. New demands on local timber supplies for charcoal production during the Backyard Iron Smelting Movement in the Great Leap Forward (1958-1961) caused the destruction of many village forest commons. Relatively remote, less-accessible communities protected their fengshui forests at far higher rates than did



**Figure 2.** Village fengshui landscape in Taxia, Nanjing County, Fujian, illustrating the idealized schema presented in Figure 1. Within the local watershed, an ancestral lineage hall (*citang*) sits in front of the Back Dragon Mountain (*houlongshan*) fengshui forest, with the Master Mountain (*zhushan*) located beyond the Back Dragon Mountain fengshuilin. Streams descend the slopes on both sides of the fengshui forest, and the village itself is built onto a point bar formed by the river flowing from right to left. Not visible are several water head (*shuitou*) and water mouth (*shuikou*) fengshui forests along the river above and below the village. Terraces for wet rice, tea, and mixed vegetables are visible. Stone *stellae* commemorating the scholarly and professional achievements of village members are visible in front of the lineage hall. The left foreground shows a distinctive *tulou*, the traditional rammed earth fortress-style house that is a famous form of vernacular architectures in southwest Fujian.

those undergoing urbanization and industrialization. It is to these latter villages that we devote the current study, noting that incipient efforts by the Chinese government to recognize and protect fengshui forests offer the possibility of adaptive SES governance at unprecedented spatio-temporal scales. Since official recognition of the fengshui forest complex as an important social-ecological phenomenon has yet to spread beyond Jiangxi Province and several nature reserves in Fujian, study of the potential for systematic, nationwide protection requires a synoptic view of the current knowledge of fengshui forests on the part of Chinese experts, as well as a comparison of their work with our own multidisciplinary and mixed-methods field research.

### **The Current State of Knowledge About Chinese Fengshui Forests**

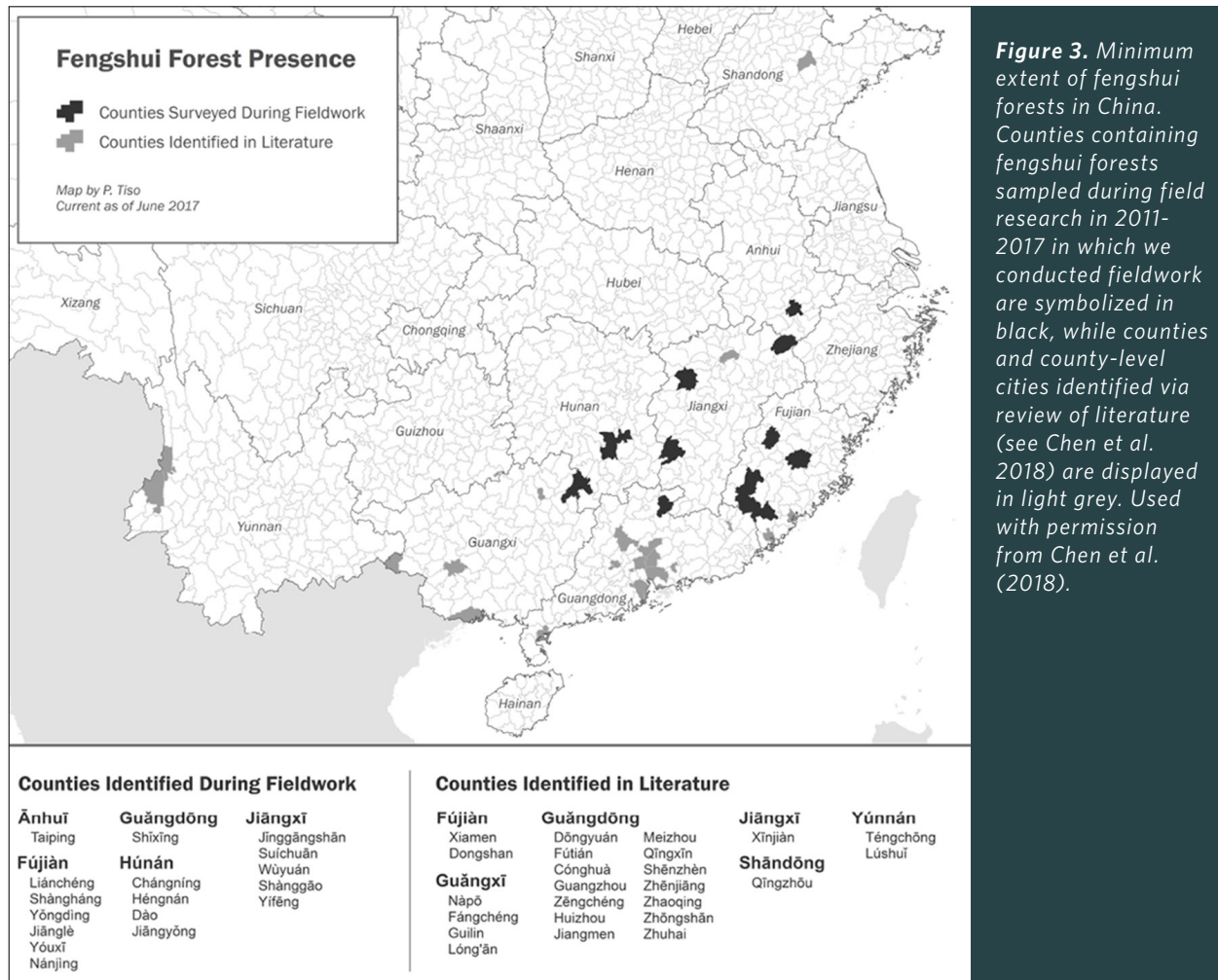
Over the past fifteen years, as fengshui has become a less taboo subject within public discourse, Chinese scientists have begun to focus on the ecological significance of fengshui forests. Recent years have witnessed an increase in the publications of Chinese scientists in international journals, although these still comprise a small number with diverse foci and no systematic attempts to delineate the full geographic range of fengshui forests within one country, much less throughout East Asia as a whole. There has also been little attention to the historical or current sociocultural dimensions of fengshui. The available case studies represent different regions, focusing on Hong Kong,<sup>28</sup> mainland China,<sup>29</sup> Japan,<sup>30</sup> and Korea.<sup>31</sup> This scholarship tends to treat fengshui forests as cultural relics<sup>32</sup> or as valuable repositories of native biodiversity,<sup>33</sup> with little study of the sociocultural elements that produce and maintain these forests within the village landscape. Although the promotion or protection of forests for the purpose of good fengshui is prevalent across East Asia, there is a dearth of comparative studies to discuss the commonalities and differences of these culturally protected forests in different regions. Taking into consideration that fengshui traditions and concepts originated in China, a clear vision of what has been discussed among Chinese scholars provides a good foundation for future comparative studies and informs future international research relevant to fengshui forests.

Existing Chinese-language scholarship on fengshui forests tends to focus on biophysical conditions and to utilize forestry research methods.<sup>34</sup> Because of their longstanding status as locally protected areas, fengshui forests preserve remnants of once-widespread subtropical broadleaf forests, and provide foresters and biogeographers with ideal research locations for locally and globally rare species.<sup>35</sup> The most frequently studied aspects of fengshui forests relate to biodiversity and forest demographic factors, with many authors reporting much higher diversity within fengshui forests than in nearby secondary successional forests.<sup>36</sup>

Within urban and rural environments, fengshui forests are understood to provide ecosystem benefits such as modifications to microclimates,<sup>37</sup> flood protection and water provisioning,<sup>38</sup> nontimber forest products,<sup>38</sup> and culturally important and medicinal species.<sup>39</sup> Importantly, some species found in fengshui forests show evidence of resistance to air pollution, which is why they are increasingly utilized in urban areas to provide microclimate and ecosystem services.<sup>40</sup>

An overall alignment between Chinese scholarship on fengshui forests and our own research results is illustrated in the mixed-methods, interdisciplinary field study of fengshui forests conducted in 57 villages in Fujian Province in 1994 and 1995,<sup>41</sup> and in Guangdong, Fujian, Jiangxi, Hunan, and Anhui Provinces in 2011, 2012, 2014, 2015, 2016, and 2017<sup>42</sup> (**Figure 3**). We are expanding this field research into four to seven additional provinces to capture the range of extant fengshui forests in southern and central China. Our interdisciplinary approach blends social science and physical science methods, and highlights the need for research on village forests to include sociocultural investigations, because fengshui forests exist and persist in their current form and extent due to a combination of local and state management. The ecological integrity and cultural ecology of fengshui forests can best be understood through careful simultaneous deployment of natural and





**Figure 3.** Minimum extent of fengshui forests in China. Counties containing fengshui forests sampled during field research in 2011-2017 in which we conducted fieldwork are symbolized in black, while counties and county-level cities identified via review of literature (see Chen et al. 2018) are displayed in light grey. Used with permission from Chen et al. (2018).

social science research methods. Such methods, along with their results, are critical for adaptive governance of SESs at all scales. We examine ways in which this research articulates with post-reform environmental policy in China to enhance local and regional adaptability, assessing incipient state initiatives to map, describe, and protect fengshui forests in conjunction with large-scale reforestation efforts. Global supra-national agreements on the protection of biodiversity and climate change mitigation, such as *China's Fifth National Report on the Implementation of the Convention on Biological Diversity and the INDC*,<sup>43</sup> provide new impetus for state support of community-based fengshui forest protected areas that help reconfigure the political ecology of resilience regionwide.

## METHODS

### Village-level Ethnography and Interviews

Village-level ethnography (n = 57) and interviews with province- and county-level forestry officials (n = 8) were used to understand the cultural ecology and conservation status of fengshui forests across a wide range of ethnic and social settings in southeastern China. Structured and semi-structured interviews were conducted in Mandarin with village elders, fengshui masters (*fengshui xiansheng*), community leaders, and local and regional forestry and nature conservation officials (n = 60). Interview results were recorded on survey sheets (**Appendix A**), and less structured, more detailed conversations were recorded, when possible, on videotape. Interviews were held on village lands in or near the fengshui forests, and focused on local cultural landscapes, environmental history, state and local conservation policy, and a variety of other demographic and sociocultural

variables. Questions pertaining to cultural landscapes focused on attitudes, beliefs, and narratives regarding village fengshui and fengshui forests; which activities were permitted or forbidden in local fengshui woods along with management and enforcement mechanisms past and present; and how fengshui is used as a system of landscape management and lineage protection at different scales, including the geographical relationship of fengshui woodlands to terrain features (hills, mountains, valleys, and water bodies) and the built environment (houses, temples, shrines, and tombs).

Interview questions also examined village environmental history, asking informants about village settlement history (age of village, number of generations in the lineage(s) and number of generations in situ, and origins of first settlers); local management of agricultural and forest resources (including timber and non-timber forest products); the history of fire use in landscape management; and the effects of large-scale political movements, economic policies, and forestry policies (including the Great Leap Forward, the Cultural Revolution, Deng-era economic reforms, and the Sloping Lands Conversion Program [SLCP]). Interviews with forestry and nature conservation officials provided data on the incorporation of local fengshui forests into formal county and province conservation plans and nature reserves – a trend that has increased in recent years. Other sociocultural data collected on village communities include their predominant ethnicity, population, household income, local employment patterns, rates of labor outmigration, and principal economic land uses.<sup>44</sup>

## Forest Surveys and Water Quality

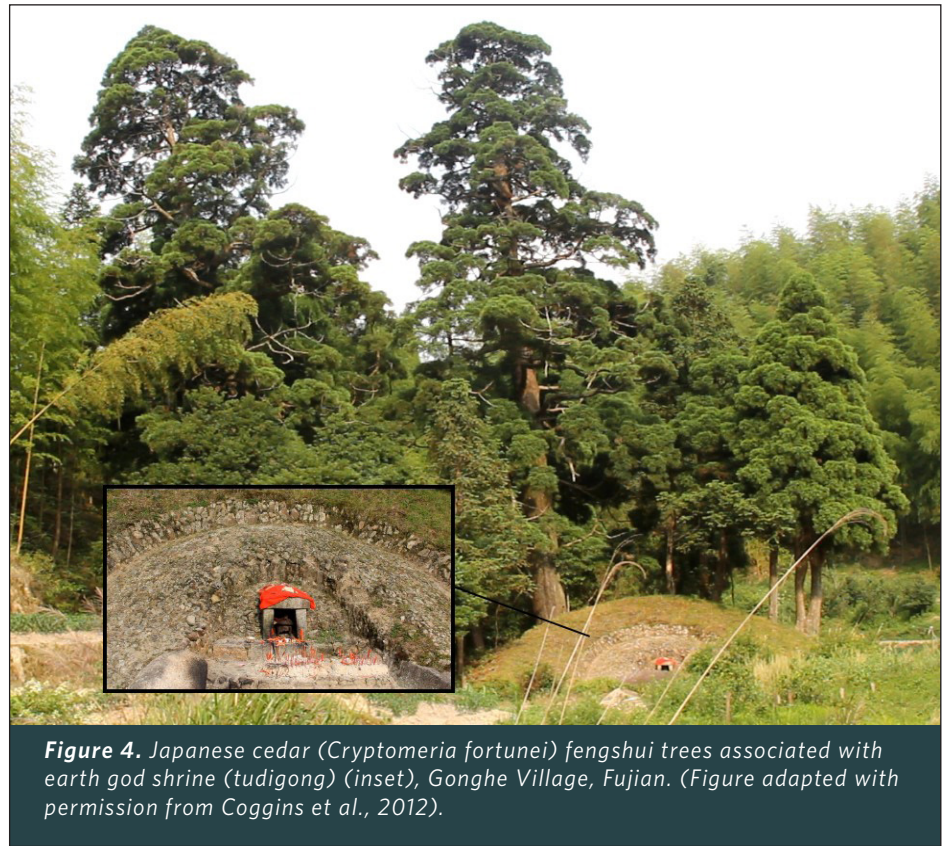
In addition to the ethnography described above, we collected biophysical data on fengshui forests and their associated water features. Within the forests, we conducted stand-level surveys in which we collected diameter and height of the largest trees, which are identified to species, and make note of indicators of human resource use and disturbance, as well as other natural history features such as wildlife, successional dynamics, and ecological disturbance. In streams adjacent to or associated with fengshui forests, we collected water quality data and recorded aquatic ecology indicators at locations above and below the forests (although the results of our forestry, aquatic ecology and water quality studies are not presented in this manuscript). The full survey form can be seen in **Appendix A**.

## RESULTS

### Demography and Village History

Fengshui forests are as much cultural and historical features as they are ecological ones; they are essential components of a cultural landscape based on fengshui beliefs and practices developed over centuries by lineage village communities in adaptation to the diverse subtropical environments of southern China. Today these patrilineal, patrilocal villages typically exhibit a compact settlement pattern in which houses, temples, stores, and other buildings are clustered on flat ground or slopes, near water, and above 10-20 year floodplains (**Figure 2**). These communities are designated by the state as “natural villages” (*ziran cun*), as opposed to the groups of adjacent villages of which they are also designated members, the so-called “administrative villages” (*xingzheng cun*) that were organized into “production brigades” (*shengchan dadui*) under the commune system (1958-1979). The average population of natural villages in this survey is 632, and in Han villages where information was available (n=55), 65% are single lineage villages in which all members share the same surname and trace their ancestry to a single male or group of brothers who founded the village and, in many cases, whose tombs are still maintained. Seventy-seven percent of the villages have lineages defined by only one or two surnames. All preserve strong connections to lineage history and local culture through the maintenance of lineage halls (*citang*, see **Figure 2**), tombs, and ritual practices based on ancestor worship and devotion to local and regional deities such as earth gods

(*tudigong* or *gongwang*, **Figure 4**), as well as major divinities within the Daoist and Buddhist pantheon. With a mean estimated village age of 648 years and an average of 29 generations in situ, these villages have maintained cultural practices associated with fengshui beliefs and cosmology over the course of centuries. While certainly susceptible to exaggeration and error, estimates of village age and lineage longevity conform to regional settlement histories, and tree-ring data from a mountain gap (*shan'ao*) forest near Guizhuping village collected in 2014 indicates that several *Cryptomeria japonica* trees



**Figure 4.** Japanese cedar (*Cryptomeria fortunei*) fengshui trees associated with earth god shrine (*tudigong*) (inset), Gonghe Village, Fujian. (Figure adapted with permission from Coggins et al., 2012).

(**Figure 4**) in a fengshui grove were planted in the late Ming Dynasty (1368-1644), over 400 years ago (**Figure 5**). Many of the villages in this survey have trees of comparable size and age, evidence of intergenerational veneration and long-term protection of specific trees and groves.

In all of the villages surveyed, local and regional fengshui masters (*fengshui xiansheng*) are hired to site, design, and modify houses and temples. Family and community fortune and failure are frequently assessed through the idiom of fengshui, and many stories recount how lineages and their members have risen to power, fallen from grace, or even emigrated en masse in response to the good or bad fengshui of village lands. When qi flow is deemed inauspicious at the household level, residents often take corrective or preemptive actions such as adjustments to courtyard gates, door widths, or other architectural features. Concerns for the fengshui of the entire village, which is influenced in part by local groves and forests, may be contingent on sociocultural cohesion. Community cohesion and collective commitment to good fengshui may well be influenced by a sense of shared ethnic identity. It is worth noting that 39% of the communities in the survey are Hakka and 18% belong to the Huizhou culture, both of which are Han sub-ethnic groups with distinctive identities and cultural traditions.

### **Fengshui Forests As a Keystone to Local Resilience Through Watershed Conservation**

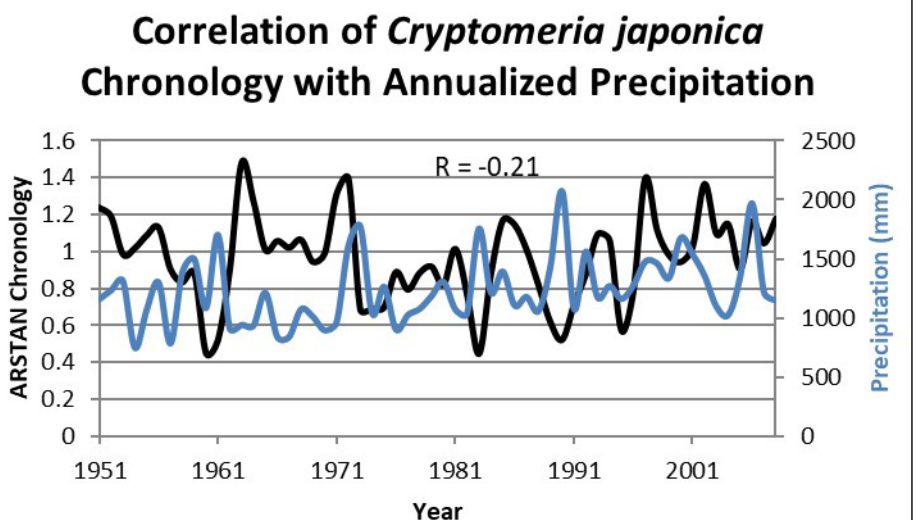
Despite the 30-year hiatus of the Maoist period (1949-1979) when fengshui could not be practiced openly, all of the sampled communities maintain environmental design features that have been developed over centuries in conjunction with livelihoods based on wet rice subsistence agriculture, vegetable horticulture, and the production of tea, bamboo, Chinese fir (*Cunninghamia lanceolata*), and other commodities. Fengshui forests play a critical role within these intensively utilized watershed-scale SESs through their contributions to sustainable hydrological systems via steady recharge and circulation of surface and ground water, and low rates of overland flow and erosion; shelter from mountain, valley, and coastal winds to prevent damage to crops and buildings;

and adjustment to seasonal insolation (incoming solar radiation) and temperature regimes to maximize agricultural production and comfortable habitation. Forest patches protected or planted in key sites within and around the village contribute to ecological resilience and, arguably as a result, have become subjects of veneration. Great pride and sense of place are derived from organic and anthropogenic features in the cultural landscape, which constitute living proof of lineage antiquity and vitality. Local consciousness of lineage history manifests in the form of ancestral records (*zupu*), stone markers commemorating village scholars (see **Figure 2**), and other signs in the village landscape, including the trees and forests themselves. As organic components of the lineage landscape, fengshui trees and woodlands are living reminders of the continuity of extended family lines that have established secure and ideally prosperous communities in superior places. For this reason, fengshui forests are maintained in close proximity to cultural features that symbolize lineage sovereignty and, of necessity, in places that enhance life-supporting biophysical process and help secure long-term ecological productivity. Just as dialects persist as living markers of cultural identity that are produced and reproduced in the course of everyday speech, the fengshui landscape is a combination of organic and inorganic features that give physical form to ethnic identity and lineage membership while undergoing a variety of changes at different scales over time.

### Landscape Management Beyond the Village Environs

Despite strong evidence for the prioritization of long-term resilience based on fengshui forest protection, ethnographic field data also indicate that anthropogenic vegetation disturbance was the norm beyond the immediate vicinity of the village watershed. These results suggest that village fengshui landscapes have long been the foci of SESs embedded within a larger-scale matrix of long-term local and regional deforestation of mountain tops and ridges. Higher elevation montane landscapes were often maintained as meadow and scrublands,<sup>45</sup> which arguably comprised part of the SES, but their function in village livelihoods varied regionally and depended on state management regimes and inter-village relations. Prior to 1949, the most pervasive force for systematic upland management was fire (n = 39 villages), with 17 villages having practiced extensive annual, biennial, or less frequent periodic burning as a component of landscape management. Twelve villages reported having used fire to improve conditions for the natural growth of bracken fern (*Pteridium aquilinum*), the roots and rhizomes of which were gathered and processed as a starchy staple in local diets where montane rice production failed to meet subsistence needs.<sup>46</sup> The collection of “fern powder” or “mountain powder,” common in Fujian and Jiangxi, involved extensive burning of mountain ridges and upper slopes, but this practice was banned by

**Figure 5.** Fengshui forests contain some of the oldest trees in southern China, and many of the species they contain are suitable for dendrochronology research. In our ongoing research, we will seek to expand our tree-ring collections, and also to obtain higher-quality climate data against which to calibrate the tree-ring chronologies. Our initial results suggest that growth in liu shan (*Cryptomeria japonica* var. *sinensis*) has weak negative correlation with annual precipitation.



the government in the 1950s, at which time many such areas were seeded with Huangshan pines (*Pinus hwangshanensis*) in an effort to reforest the uplands. In seven communities of Meihuashan (southwest Fujian), Jinggangshan (southwest Jiangxi), and Wuyuan County (northeast Jiangxi) mountain burning and fern starch production were revived in response to the widespread starvation of the “Three Bad Years” (1959-1961), which was induced by the disastrous environmental policies of the Great Leap Forward. In ten villages, our interlocutors mentioned the historical use of fire as a management tool on Chinese fir (*Cunninghamia lanceolata*) plantations, a practice with a long history because burning after harvest improves soil conditions for new seedlings, which were in many areas interplanted with corn, soybeans, and other dryland crops in a taungya system.<sup>47</sup> From these examples we see a preponderance of evidence that fengshui forests evolved as part of an indigenous landscape ecology involving widespread burning of the uplands for a variety of reasons.<sup>48</sup> This may explain the critical, long-term importance of maintaining protected forest patches to mediate the flow of water and wind in and around village community watersheds. This would also explain why a lineage-centric conception of fengshui landscape management often prevailed above and beyond any larger-scale management patterns involving groups of villages: a more systematic, large-scale, system of historical forest conservation for which we have found no evidence.

### Enforcement of Sacralized Forests

As with all common property regimes (CPRs), village management of fengshui forests requires enforcement mechanisms accepted by community members and enforceable by them or by an agreed upon third party.<sup>49</sup> Before 1949, in addition to ritual and cosmological significance, the forests were protected by a system of specific punishments meted out by village leaders and codified as a form of local law known widely in China as “village law and customary pacts” (*cunguiminyue*). Within the 44 villages where traditional enforcement was discussed, many informants noted that violations were extremely rare. Nineteen villages followed the widespread practice of punishing tree cutting by sacrificing the culprit’s pig – a devastating property fine for most villagers. Some respondents claimed that if large trees were cut, the fine was levied at the ratio of one pig per tree. This practice is sometimes referred to as “kill a pig and protect the mountain” (*shazhu fengshan*) and is related to a distinctive epithet for fengshui forests – “pig kill forests” (*shazhulin*). Other penalties for forest transgressions discovered in our survey include public burning of all timber harvested from the forest, public beatings, the punitive withholding of food from the wrongdoer, and even (in the case of Louxia village in Suichuan County, Jiangxi) execution by drowning. In Hewu village in Shixing County, in northern Guangdong, it was believed that damage to trees caused the violator to suffer bodily harm. In Yuantou village (Wuyuan County, Jiangxi), Daoist priests were said to issue incantations (*zhou*) ensuring that anyone causing damage to the forest would suffer supernatural punishments, sometimes even “no descendants” for those who cut trees. In some villages, no traditional punishments were necessary. Such was the case in Fengshuba village (Shixing County, northern Guangdong), because the grove of sweetgums (*Liquidambar formosana*) planted along a riverbank after a deadly flood were believed to ward off evil (*xie*) – no one would dare harm them.

Historical records indicate that periodic imperial and provincial decrees provided state sanctions that bolstered local protection of fengshui forests and other village woodlands. A villager from Mawu village in the Meihuashan Nature Reserve in southwest Fujian claimed that an order from the Qianlong Emperor (r. 1735-1796) required local enforcement of forest protection, but it is not clear that fengshui forests were specified. Similarly, in Yuantou village (mentioned above), a stone plaque dating from the eighteenth reign year of the Daoguang Emperor (1838) publicizes the rights of local people to protect their forests. Imperial forest conservation laws likely played a key role in local understanding and implementation of forest management, a subject explored in a number of works that may shed light on state-local relations and the management of village CPRs.<sup>50</sup> Historical

involvement by the state in local and regional forest management also suggests that the fengshui forest complex may have been, at least in part, an intentional regional phenomenon partially orchestrated by the state, rather than a strictly micro-local, anarchic practice that developed as an emergent local practice that diffused throughout the region.

## Evolving Governance of Fengshui Forests

Local cosmological and ecological imperatives are fully joined in fengshui belief and practice, but only under ideological conditions that permit the development and maintenance of robust CPRs. The Great Leap Forward (1958-1961) and the Cultural Revolution (1966-1976) challenged all village CPRs related to fengshui, watershed-focused CPR conservation, and spiritual property in general. The Great Leap Forward involved the mass mobilization of labor and the widespread appropriation of village timber resources for iron production during the Backyard Iron Smelting Movement (*Dalian Gangtie*). The Cultural Revolution mandated the intentional destruction of all artifacts and folkways associated with “traditional culture” and “feudal superstition” (*fengjian mixin*), of which fengshui was targeted as a notorious example. Selection of study villages for this research is heavily biased toward communities where fengshui forests were undisturbed or little disturbed; nevertheless, in the 46 villages where the subject of central-state disruption of local management practices was discussed, all interviewees cited both the severe threats and described reasons for survival of their woodland commons. Survival of the forests during the peak period of fuelwood demand was attributed to the claim that “no one would dare touch these forests” (and this remains a common refrain); remoteness from areas of active iron smelting; and the strategic use of bamboo or timber resources that were harvested from areas outside of the fengshui groves. In all ten villages surveyed in Hunan Province, fengshui forests were entirely felled for iron smelting, but were soon thereafter allowed to regrow. Today these groves comprise robust stands of secondary growth broadleaf forests.

In conjunction with local efforts to protect forests under siege by political directives, many villages adopted two new terms to stand in for “fengshui forest” and its equivalents. These were viewed as politically neutral signifiers of the ancient forest commons, and both contain the homophone “*feng*” but comprise different lexemes. The first, *fengjinlin* (“prohibited/forbidden forest”), is a revival of an imperial legal designation for state-protected lands; the second, *fengjinglin* (“scenic forests”), suggests a resource available for the People, free of problematic association with the feudal property regimes of clans and lineages. Several interviewees described the advent (or reinvention) of these terms in local efforts to protect fengshui forests – “prohibited” and “scenic” forests assuming a quasi-juridical status less impeachable by hardline ideological standards. These lexical maneuvers remain strategically important as certain state officials and agencies develop programs that identify fengshui forests for conservation, as discussed below. In addition to linguistic interventions, local people and in rare cases even state officials or other authorities took action to save fengshui forests from the axe. The most noteworthy in this sample being a biology professor from Xiamen University named He Jing, who in 1958-59 saved a 22-hectare houlongshan fengshui forest in Nanjing County, Fujian by embellishing a technical report with the suggestion that several species of indigenous lianas might yield industrial latex, and that the forest could serve as a source area for botanical experiments that might accelerate China’s rush to industrialization. By 1963 the forest was gazetted as the Letu Subtropical Rain Forest Nature Reserve, which remains a biologically unique protected area in the Fujian province reserve system.

Today such risky and radical measures may not be needed to convince the state to protect fengshui forests, but their future remains contingent on a combination of local values and government support. There is much to be learned from traditional and contemporary systems of preservation, conservation, and management, and how they relate to belief in fengshui and the sanctity of fengshui groves. Work on environmentality by Agrawal<sup>51</sup> and others reveals a multiplicity

of causes for local environmental advocacy, and thus contemporary fengshui forest preservation is not strictly contingent on traditional belief. Of the respondents in villages where the subject emerged (n = 18), eleven stated that current generations of young villagers believe in fengshui or the traditional lore surrounding fengshui forests, six said that some young people did not believe and others did, and only one said that young people were indifferent or did not believe. Lack of belief was attributed to science-based education, and implicitly to lack of participation in associated ritual practices. When asked whether young people were likely to become advocates for fengshui forest preservation (n = 17) sixteen responded positively, some noting that people become more aware of the importance of the forests with age, that intergenerational teaching ensures continuity, and, in one case, that young people in Wuyuan County, Jiangxi realize that the forests are important for tourism. As interviews with foresters and other officials have shown, a critical intervening variable in the discussion of forest preservation derives from the fact that 31 of the 57 communities surveyed either lie within nature reserves or have fengshui forests recognized as parts of state-managed networks of small protected areas (*baohuxiaoqu*), are designated state nature reserves in their own right, or are parts of other kinds of protected areas. Under post-reform land tenure regimes, fengshui forests that are appropriated outright as full-scale nature reserves are designated state land (*guoyoude tudi*), whereas fengshui forests within reserves, designated as small protected areas, or not recognized by the state remain part of “collective lands” (*jitide tudi*) that are managed by the administrative or natural village. Under these scenarios, monitoring of the fengshui woodlands is carried out by state officials in designated state reserves, by both state and local people (especially designated forest managers) in villages within nature reserves and in small protected areas, and by villagers alone in forests that are undesignated. In each of these scenarios, local state forestry organs are now the ultimate arbiters of forest law, imposing fines for illegal timber cutting. In these scenarios, contemporary state conservation discourse comes face-to-face with fengshui beliefs and values, and new forms of environmental awareness along with new conceptions of fengshui continue to emerge.

## DISCUSSION

Despite the increasing scholarly attention to fengshui forests, the majority of published studies only considers their ecological and floristic composition, leaving wide range of historical and social-ecological dimensions little touched by Chinese language scholarship on fengshui forests. Environmental services and the ecological significance of fengshui forests have been studied in terms of biodiversity, with forest refugia being accurately conceived as gene banks.<sup>52</sup> However, there is much to be learned from multidisciplinary research on the resilience of small anthropogenic forest patches of various sizes around the world.<sup>53</sup> In other words, fengshui forests, although typically small in area, play a tremendously significant role in SESs, increasing resilience at local and regional scales, while providing opportunities for adaptive governance of biological, cultural, and climate change mitigation resources. As mentioned, both official and popular conceptions of fengshui forests in China are complicated by the persistence of Marxist-Leninist-Maoist discourse equating fengshui with “feudal superstition.” This has led to the subjugation of fengshui discourse and made conservation of fengshui forests, as such, a politically problematic activity for state agencies and local people alike.<sup>54</sup> In this regard, it is especially noteworthy that the Jiangxi Province Forestry Bureau deployed the term “fengjinglin” (scenic forests) to launch a provincial fengshui forest conservation and restoration program, a project that began with the selection of a hundred model villages, where intact fengshui forests were chosen for state-backed preservation and less robust fengshui groves were targeted for restoration.<sup>55</sup>

Because the word fengshuilin is a combination of two words – “fengshui” and “forest” – there is a great need for interdisciplinary research, including methodologies associated with cultural

geography, environmental history, and forest ecology. The stigma of fengshui and the relatively weak position of social sciences in comparison to natural sciences in the PRC leads most researchers to focus on natural science topics such as biodiversity, ignoring the socio-ecological variables that not only produce and maintain fengshui forests, but that also make fengshui landscapes unique SESs. Thus, while scholarly attention on fengshui woods has increased in the past five years, the socio-ecological components of most research are still superficial or absent. The majority of research papers apply a case-study approach, in which field surveys have been conducted in selected plots within sample forests without regard to local conceptions of the specific functions of particular kinds of fengshui forests. This stands in notable contrast with the field-based evidence presented above, which shows that forest location and conservation is highly significant to local people and contingent on a host of sociocultural variables.

Our collective knowledge of the underlying concepts and functions of fengshui woodlands is evolving not just because of ecological studies of these forest stands, but also because of a growing appreciation for the value of the hydrological services and conservation of biodiversity that they provide as parts of SESs. Local preservation of thousands of village fengshui forests across southern and central China has increased resistance to perturbation and decreased ecological precariousness as rural and urban China undergo rapid infrastructural and environmental transformation. Depending on changing economic, political, and cultural circumstances, some values provided by fengshui woods might decline in importance, but alternative values may gain currency. Our field-based comparisons to the previously published literature on fengshui forests show a high degree of correspondence in terms of the ecological value, ecosystem benefits, and regional importance to biodiversity and habitat, particularly as these pertain to local watershed conservation. We believe that careful application of mixed social and natural science methods can illuminate more of the important relationships between human communities, changing political and economic conditions, conservation initiatives, and ecological changes affecting this widespread and unique form of coupled natural and human system.

As social values in urban and rural China change, fengshui woods, as cultural landscapes that hold cultural and biophysical legacies, are likely to be imbued with alternative meanings and interpretations, which might not relate to wind and water or luck and prosperity. For example, fengshui forests can serve as public landmarks associated with village heritage, and aesthetic values associated with fengjinglin (scenic forests) may assume recreational value for tourists and outdoor adventurers rather than embodying traditional landscape beliefs. Preliminary field data indicate that this process may be underway in places such as Wuyuan County, Jiangxi and Nanjing County, Fujian, where tourism is a critical component of village economies. The relative value of fengshui forests as sites for recreation, aesthetic value, and providers of historical and cultural functions could augment their functions as regulators of wind and water. Similarly, fengshui forests could be used as source areas for pollen, seeds, and genetic materials as the provincial and national forestry bureaus endeavor to restore the broadleaf evergreen and mixed forests that once covered the region. As the most mature fragments of this primeval forest biome, fengshui woodlands represent small anthropogenic arks for large-scale, long-term ecosystem restoration. Regeneration of the potential natural vegetation – the vast area of subtropical broadleaf evergreen forests of southern and central China that serve as a natural sink for carbon dioxide – can play a critical role in the global mitigation of anthropogenic climate change.

To further understand the future of fengshui forests within the SES of the wet rice agricultural village, additional field research remains to be done on household income, local employment, and labor outmigration of young people, all of which have implications for lineage continuity, sense of place, and land tenure, especially in conjunction with the accelerated urbanization that is both locally



initiated and encouraged by the state. The official policy of chengzhenhua provides incentives for villagers to leave their birth communities and move to local township centers, county seats, and prefectural capitals in order to decrease rural self-sufficiency and accelerate domestic consumption, in conjunction with decreasing reliance on global exports as a percentage of total GDP.<sup>56</sup> Preliminary field data from this study indicate that in many villages, over 50% of adults under the age of 40 are involved in long-term labor outmigration (in some villages over 90%), a phenomenon that has important implications for the viability of rural communities as places of long-term residence. The future of fengshui forests as critical components of southern China's lineage-focused cultural landscapes is uncertain.

Given the likelihood of demographic and ecological change in village communities across southern China under regimes of long-term labor migration and outmigration (despite strong village land tenure protection under current laws), national and provincial environmental policies are likely to play a determinative role in regional ecological resilience. Important national forestry programs include the Sloping Lands Conversion Project (SLCP) (aka "Grain for Green Program") initiated in 1999, and the National Forest Protection Program (NFPP) (aka "the Logging Ban"), fully implemented in 2000. The SLCP aimed to reduce runoff and soil erosion while increasing forest coverage by converting former crop-growing areas on sloping terrains into forest lands. As the world's largest payment-for-ecosystem-services (PES) project, the SLCP provides farmers with saplings to plant, grain, and cash subsidies in lieu of foregone income from agricultural production. The SLCP affects the landholdings of some 40-60 million households across 25 provinces, and works in conjunction with the NFPP, which calls for reducing annual timber harvests in natural forests by 63% and for the afforestation and revegetation of 31 million hectares. The NFPP has included logging bans in the upper reaches of the Yangzi and Yellow Rivers, reducing logging in state-owned forests, improving reforestation and silviculture, and providing alternative employment opportunities for state forest workers. Implemented in 18 provinces and autonomous regions, the NFPP predominantly targets the upper Yangzi and Yellow River watersheds, as well as the northeast and Hainan. The NFPP and SLCP played large roles in raising China's total forest coverage to 21% by 2008.<sup>57</sup>

Global supranational agreements on the protection of biodiversity are also significant drivers of forest management policy that have given rise to new kinds of protected areas that may reconfigure the SESs of which fengshui forests are a definitive component. The Convention on Biological Diversity (implemented 1993) provides a salient example. *China's Fifth National Report on the Implementation of the Convention on Biological Diversity* calls for increasing forest coverage, developing biodiversity monitoring systems, management of genetic and other biological resources, reduction of pollutants, and building a more "environmentally friendly society."<sup>58</sup> In-situ conservation was to be strengthened and terrestrial protected areas maintained on approximately 15% of the country's land area, protecting 90% of national key protected species and typical ecosystem types primarily through the growing network of nature reserves (*ziran baohuqu*) and ten other kinds of protected areas. Among these are community-based conservation areas (*ziran baohu xiaoqu*). As noted, Jiangxi and Fujian provinces have already designated some fengshui forests as protected areas within this official category, as well as specific provincial-level protected area categories.

## CONCLUSIONS

Our results show that fengshui is, among other things, an indigenous ethnosciences geared toward ensuring long-term socio-ecological adaptation to the challenging climates and topographic conditions of southern and central China. In concise terms, wet rice cultivators settled and transformed specific sites in the uplands and valleys with the aid of mental maps of the ideal cosmos and how it is reflected in the ideal humanized landscape. Far from being a strictly metaphysical concern, this was a key to material well-being based on food security, hazard mitigation, and

optimization of the climatic variables associated with wind, water, and microclimate. As China's government strives to meet the climate change mitigation parameters of the COP 21 Agreement, all parties should be cognizant of recent research indicating that increasing CO<sub>2</sub> levels is likely to lead to a decrease in the nutritive value of rice.<sup>59</sup> While climate change is a global problem requiring international cooperation and long-term global mitigation strategies, the connection between local resource management and food security remains critical. Our research calls for more concerted efforts to study the overall geographic distribution of fengshui woods across China, as well as their distribution at the regional level and the landscape scale. Fengshui forests may persist in as many as fourteen provinces spanning from Yunnan, in southwest China, to Hainan in the south and Fujian and Zhejiang in the east. Understanding the geographic range and landscape ecology of fengshui woodlands is critical for developing practical conservation strategies of the kind being pioneered in Jiangxi Province beginning in 2014.<sup>60</sup>

Future studies should encompass a broader range of socioecological variables and include practical conservation strategies that contribute to the collective knowledge of sustainable settlement and environment-building in tropical and subtropical southern China as well as other regions of East and Southeast Asia.<sup>61</sup> Fengshui originated in mainland China, and is widely applied in nearby countries and regions, including Hong Kong, Vietnam, Taiwan, Korea and Japan. Fengshui woods and similar groves comprise an important component of settled landscapes throughout the region.<sup>62</sup> Thus, international cooperation among a diverse set of researchers, planners, and conservationists employing mixed research methods will promote greater understanding of the principles of fengshui forest management, past, present, and future. Activist field and archival research tracks the emergence of new forms of scientific knowledge that ascribe ecological and cultural value to fengshui forests during the post-reform era while contributing new values of resilience and adaptation and new knowledge. Ecological research by Chinese scientists and socio-ecological research conducted by our team show that a resurgence of interest in and protection for fengshui forests is underway in southeast China. The ultimate goal is to increase SES resilience across southern China and thus contribute to the prospects for greater earth system resilience.<sup>63</sup>

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# APPENDIX A: Survey Data Collection Form

**Fengshui Forest Survey Form**

Date \_\_\_\_\_

Researchers \_\_\_\_\_

Interviewee(s) \_\_\_\_\_ Age \_\_\_\_\_

Permission to Interview \_\_\_\_\_ Permission to Use Name \_\_\_\_\_

Photo Numbers \_\_\_\_\_

**I. Basic Locational Information**

Province \_\_\_\_\_

Prefecture \_\_\_\_\_

County \_\_\_\_\_

Township \_\_\_\_\_

Administrative Village \_\_\_\_\_

Natural Village \_\_\_\_\_

Nature Reserve \_\_\_\_\_

Location (Coordinates) \_\_\_\_\_

Ethnicity \_\_\_\_\_

**II. Village Situation**

- Village Within Nature Reserve: Yes No

- Village Type: Cluster Non-Cluster Other \_\_\_\_\_

- Predominant building materials: Traditional \_\_\_\_\_/\_\_\_\_\_% ;  
New \_\_\_\_\_/\_\_\_\_\_%

- Age of Village: \_\_\_\_\_

- Predominant Family(ies): \_\_\_\_\_

- Number of Generations in situ/in record \_\_\_\_\_/\_\_\_\_\_

- Population: \_\_\_\_\_

- Average Income (Household, Fuqi) \_\_\_\_\_

- Primary Economic Activities General \_\_\_\_\_

- Primary Economic Activities that Affect Village Land Use \_\_\_\_\_

- Primary crops \_\_\_\_\_

- Primary forest products \_\_\_\_\_

- Approximate percentage of people under 40 outmigrating \_\_\_\_\_

**III. Forest Patch Sociocultural and Land Tenure:**

- What do you call these/this forest(s)? \_\_\_\_\_

- How many FSL in village? \_\_\_\_\_

- Estimated area (mu) of largest FSL \_\_\_\_\_

- Estimated area (mu) of other important FSL \_\_\_\_\_

2

- Are they designated collective or state land: *guoyoude/jitide* (circle one)

- Relative Location(s)? \_\_\_\_\_

- Participant Says the Purposes of FSL is:

Wind \_\_\_\_\_ Water \_\_\_\_\_ Qi flow \_\_\_\_\_ Erosion \_\_\_\_\_

Flood control \_\_\_\_\_ Water storage \_\_\_\_\_

- The village FSL are associated with the following features:

*Houlongshan* (Back Dragon Mt.) \_\_\_\_\_

*Shanao* (wind/water gap) \_\_\_\_\_

*Tudigong/gongwang* (Earthgod Shrine) \_\_\_\_\_

*Citang* (Ancestral Temple) \_\_\_\_\_

*anmiao* (Local Buddhist/Daoist temple) \_\_\_\_\_

Shuitou/cuntou (water source/top of village) \_\_\_\_\_

Shuiwei/cunwei (water exit/bottom of village) \_\_\_\_\_

TDG/GW, *citing*, *anmiao* associated with *this* village only? \_\_\_\_\_

Village FSL and shrine Sketch Map:

↑  
N

3

**IV. Rules, Regulations, & Management Practices**

Traditional Punishment for removing trees (村规民约):

\_\_\_\_\_

Present Punishment for removing trees (How different from past?):

\_\_\_\_\_

Who monitors the forest today? Who enforces the laws?

\_\_\_\_\_

Crop/economic plant propagation permitted:

\_\_\_\_\_

Gathering permitted (list medicinal, economic, fungus):

\_\_\_\_\_

Hunting permitted (past/present):

\_\_\_\_\_

Wildlife (birds/mammals) seen (past/present):

\_\_\_\_\_

- Management/ Disturbance

Understory allowed to be cleared?

\_\_\_\_\_

4

Downloaded from usfca.edu/center-asia-pacific/perspectives

Understory cleared?  
\_\_\_\_\_

Economic plant propagation permitted? If no, why not? If yes, which plants?  
\_\_\_\_\_

**V. Environmental History and Disturbance Regimes**

Fire history:  
\_\_\_\_\_  
\_\_\_\_\_

Disruption of, or threats to, FSL during Great Leap Forward and/or Cultural Revolution?  
\_\_\_\_\_  
\_\_\_\_\_

What are the most important present-day threats to the FSL forests here?  
\_\_\_\_\_  
\_\_\_\_\_

Additional Notes on Culture History or Prospects:  
\_\_\_\_\_  
\_\_\_\_\_

5

**VI. Belief and Prospects for Preservation**

Is there a connection between *fengshuilin* protection and conservation of biodiversity? If so explain. \_\_\_\_\_

Do young people in the village believe in *fengshui*?  
\_\_\_\_\_

Is the present cohort of young people likely to protect FSL in the future?  
\_\_\_\_\_

What could be done to improve the protection of FSL in the present and insure it in the future?  
\_\_\_\_\_

**VII. Forest Patch Ecology and Conservation – Field Observations**

- FSL Within Nature Reserve: Y/N
- Within Other Protected Area:
- Management (circle one): State    Village    Both
- Explain \_\_\_\_\_
- Location at Center (coordinates): \_\_\_\_\_ Aspect: \_\_\_\_\_
- Measured/estimated area (Ha) of forest patch \_\_\_\_\_
- Technique used for area measurement/estimate:

6

Rope \_\_\_\_\_ Paces \_\_\_\_\_ GPS circumference \_\_\_\_\_ GPS points \_\_\_\_\_

- Shape of individual forest(s) (sketch):
- Elevation of highest point in FSL: \_\_\_\_\_
- Elevation of lowest point in FSL: \_\_\_\_\_
- Forest Type: Cryptomeria    Other needleleaf
- Broadleaf Mixed (at least 30% deciduous, needleleaf, or both)
- Five largest Trees (Species, dbh, and height)
- 1: \_\_\_\_\_
- 2: \_\_\_\_\_
- 3: \_\_\_\_\_
- 4: \_\_\_\_\_
- 5: \_\_\_\_\_
- Wildlife signs (inquire with locals)
- Sightings: \_\_\_\_\_
- Tracks: \_\_\_\_\_
- Scat: \_\_\_\_\_
- Auditory: \_\_\_\_\_
- Insect evidence: \_\_\_\_\_

7

- Relationship of FSL to nearby streams and water bodies (check one)
- Stream flows through FSL \_\_\_\_\_
- Stream flows adjacent to FSL \_\_\_\_\_
- Streams distant from FSL (but within 100 meters) \_\_\_\_\_
- Streams absent or more than 100 meters distant \_\_\_\_\_
- Additional Notes on Streams and Forests:  
\_\_\_\_\_  
\_\_\_\_\_
- Additional Notes on Landscape Ecology:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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