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a publication of the Center for Asia Pacific Studies

Volume 15, Number 2: Spring/Summer 2018

ASIA PACIFIC

perspectives

Volume 15, Number 2 • Spring/Summer 2018

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Editor's Introduction

by Dr. Melissa S. Dale, Executive Director, Center for Asia Pacific Studies

We are pleased to announce the publication of the Spring/Summer 2018 issue of *Asia Pacific Perspectives*. This issue highlights the inventive ways that scholars in the humanities and social sciences are looking at climate change and environmental issues in the Asia Pacific region.

The Spring/Summer 2018 issue considers climate change and the influence of the environment on the lives of the peoples and cultures of the Asia Pacific. Whether through the continued relevance of traditional fengshui forests in the lives of contemporary Chinese villagers or the detrimental effects of climate change and industry on the Philippines, these papers encourage us to reflect on the impacts of our actions on the environment and how the choices we make can influence our world and that of our neighbors. With this issue, we present the multifaceted ways in which the scholars and activists are bringing attention to the environmental challenges facing communities in East Asia and Southeast Asia today and the variety of approaches people are taking to mitigate environmental crises.

In the feature article for this issue, **Christopher R. Coggins** (Bard College at Simon's Rock) and **Jesse Minor** (University of Maine at Farmington) explore how contemporary Chinese villages' preservation of traditional fengshui forests as "sacred groves" contributes to watershed management, biodiversity conservation, and climate change mitigation in their communities. This study builds on the understanding of the fengshui forest complex as an important social-ecological phenomenon in Chinese communities' efforts to sustain their environmental well-being both past and present.

How does climate change impact communities, especially in island nations such as the Philippines? Our graduate student paper for this issue provides a comprehensive overview of the Philippines' topography and industry and the environmental challenges facing its people today. **Heather Tribe's** study reveals the nexus between climate change, public health, and the economy, especially among marginalized groups, and asks us to consider whether enough is being done or if it is simply too late to avoid the detrimental effects of increased environmental and climatic pressures on these communities.

Think Pieces

We are pleased to present two think pieces in this issue, both designed to give our readers an idea of the environmental challenges facing communities in **India** and the **Philippines** and the responses from grass root organizations working to effect change.

Photo Essay

In "Wave," **M. R. Hasan** narrows our focus to reveal what life is like for a community living along the river in Bangladesh. His vivid photos expose the extremes within the landscape as its inhabitants face a climate that includes floods and drought, and soil salinity and erosion. Many, unable to cope with the economic insecurity of their environment, have become climate refugees.

Book Review

In this issue's book review, **Stephanie A. Siehr** (University of San Francisco) reads *Eco-Criticism in Japan*, edited by **Hisaaki WAKE**, **Keijiro SUGA**, and **Yuki MASAMI**. This edited volume explores

representations of the environment and nature through the lens of Japanese literature and film. Providing a diversity of voices, ranging from a poet to a professor of socio-environmental studies, the book adds another dimension to the study of the environment in the Asia Pacific, both past and present.

As always, we hope that these articles will stimulate further discussion and research on the topic and promote positive change. We appreciate the collaboration of our new editorial board in bringing this special issue on climate change and the environment in the Asia Pacific to fruition. Thanks to **Dr. Leslie Woodhouse** for the time and energy she has devoted to communicating with our authors and her dedication to maintaining the high standards of our journal.

~ Melissa S. Dale, Editor

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

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.¹

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.² 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 2003,³ 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.⁴ 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.⁵

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.⁶ 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.⁷

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.⁸ Often translated as “geomancy,” it is a form of traditional ecological knowledge (TEK) best understood as a form of cosmivision⁹ 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.¹⁰ It should be noted that mystical elements of fengshui, including its grounding in correlative cosmology¹¹ 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,¹² 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,¹³ 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.:¹⁴

...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.¹⁵ 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.¹⁶

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, Coggins¹⁷ 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 Bruun¹⁸ provides strong caveats against the facile conflation of fengshui and modern environmental consciousness. In short, fengshui includes many

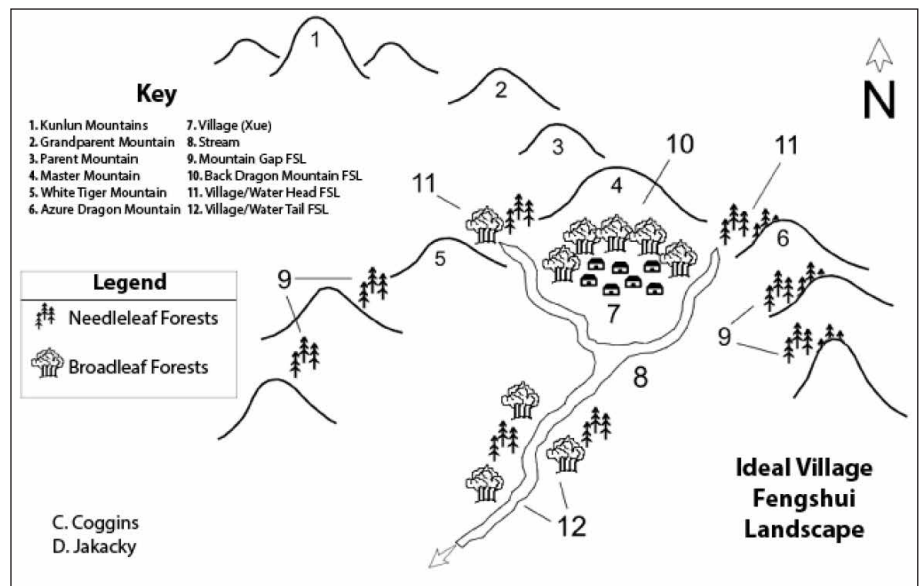


Figure 1. Typical locations of fengshui forests in relation to villages and within local watersheds. Fengshui forests modify flows of wind and water, and are typically preserved and planted at specific topographic positions corresponding to especially energetic winds (mountain gaps) and water (cutbanks). Rice paddies are typically found “in front” of the village, between the built area (7), mountains bounding the floodplain (9) and the village/water tail fengshuilin

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.¹⁹

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,²⁰ 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.²¹ In fact, the tension between watershed management within thousands of largely self-sufficient lineage villages (which we have referred to as “wind-water polities”)²² and watershed degradation due to numerous historical inter-regional conflicts²³ 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.²⁴

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)²⁵

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.”²⁶ 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.²⁷ 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.

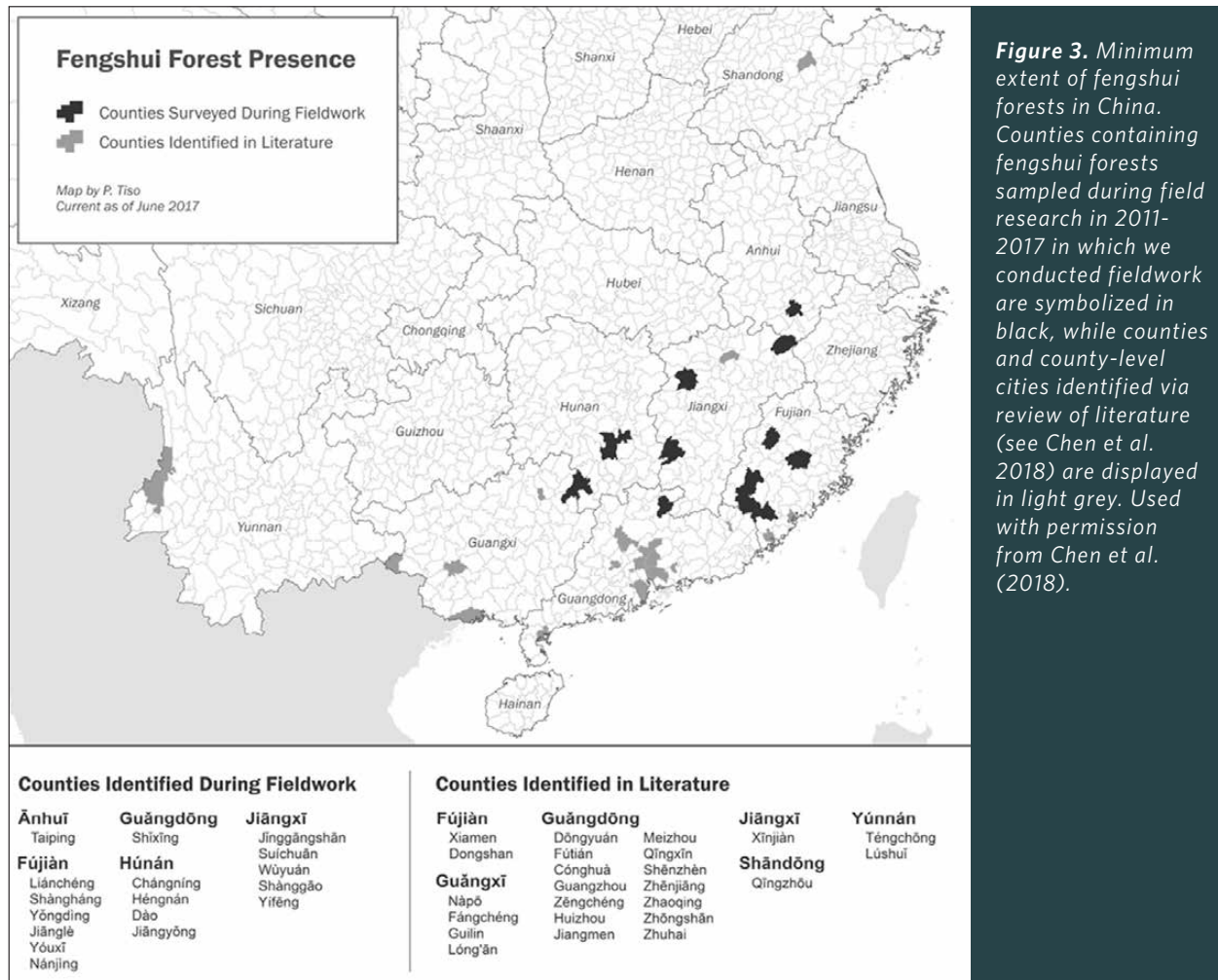
The Current State of Knowledge About Chinese Fengshui Forests

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,²⁸ mainland China,²⁹ Japan,³⁰ and Korea.³¹ This scholarship tends to treat fengshui forests as cultural relics³² or as valuable repositories of native biodiversity,³³ 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.³⁴ 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.³⁵ 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.³⁶

Within urban and rural environments, fengshui forests are understood to provide ecosystem benefits such as modifications to microclimates,³⁷ flood protection and water provisioning,³⁸ nontimber forest products,³⁸ and culturally important and medicinal species.³⁹ 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.⁴⁰

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 1995,⁴¹ and in Guangdong, Fujian, Jiangxi, Hunan, and Anhui Provinces in 2011, 2012, 2014, 2015, 2016, and 2017⁴² (**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



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*,⁴³ 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.⁴⁴

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

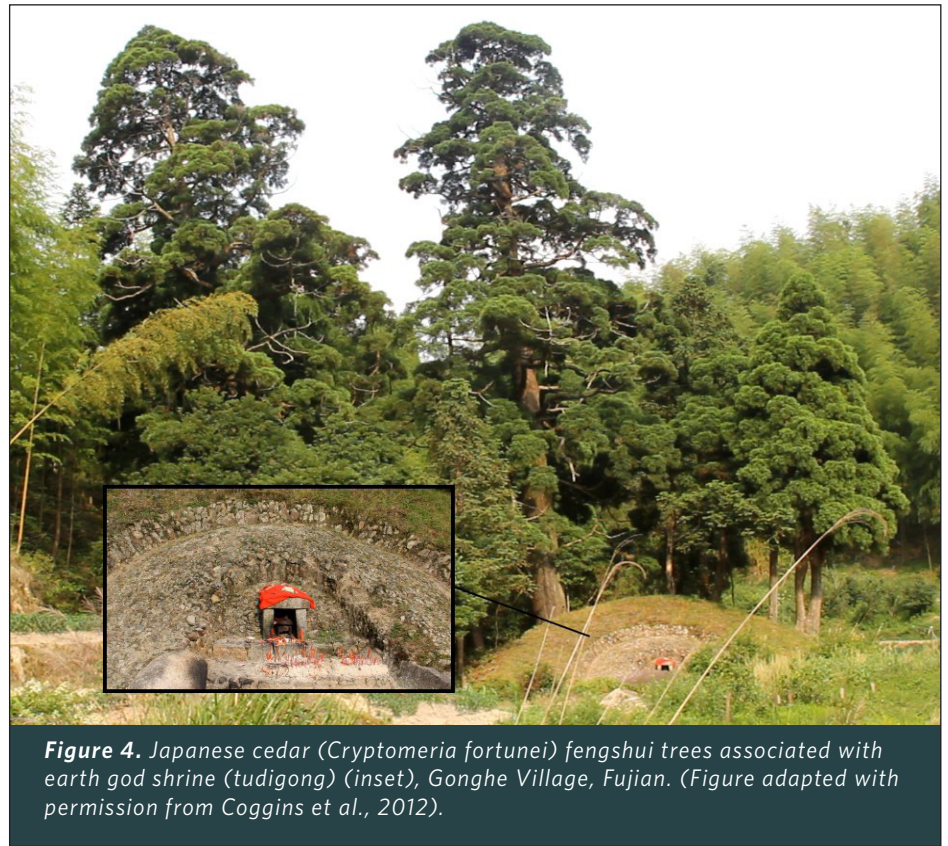


Figure 4. Japanese cedar (*Cryptomeria fortunei*) fengshui trees associated with earth god shrine (*tudigong*) (inset), Gonghe Village, Fujian. (Figure adapted with permission from Coggins et al., 2012).

(**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

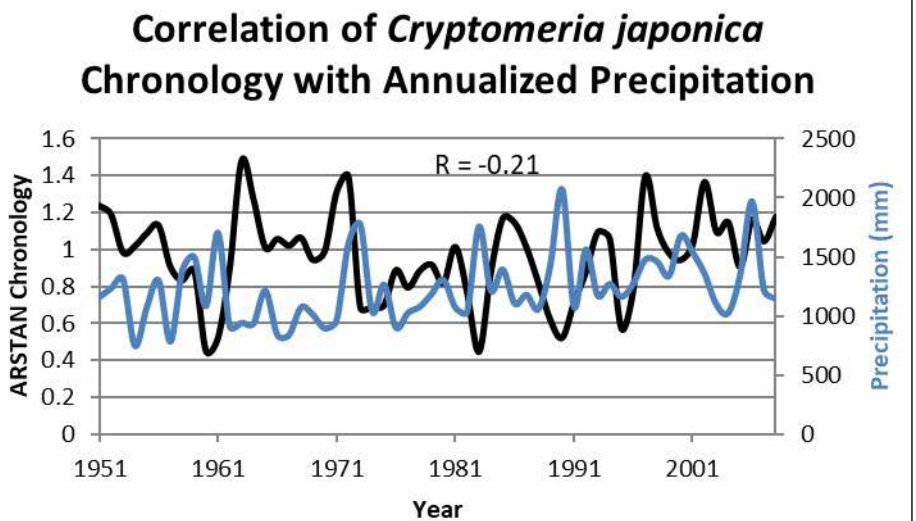
Despite the 30-year hiatus of the Maoist period (1949-1979) when fengshui could not be practiced openly, all of the sampled communities maintain environmental design features that have been developed over centuries in conjunction with livelihoods based on wet rice subsistence agriculture, vegetable horticulture, 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,⁴⁵ 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.⁴⁶ 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.⁴⁷ 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.⁴⁸ 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.⁴⁹ 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.⁵⁰ 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 Agrawal⁵¹ 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.⁵² However, there is much to be learned from multidisciplinary research on the resilience of small anthropogenic forest patches of various sizes around the world.⁵³ 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.⁵⁴ 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.⁵⁵

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.⁵⁶ 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 2008.⁵⁷

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."⁵⁸ 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 CO₂ levels is likely to lead to a decrease in the nutritive value of rice.⁵⁹ 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 2014.⁶⁰

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.⁶¹ 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.⁶² 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.⁶³

Acknowledgments

Chris Coggins wishes to thank the ASIANetwork Freeman Student-Faculty Fellows Program, The American Philosophical Society, and the Luce LIASE (Luce Initiative on Asian Studies and the Environment) program. Jesse Minor wishes to thank the Luce LIASE program and the University of Arizona Graduate College for research funding.

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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:

8

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GRAD STUDENT PAPER:**Climate Change Impacts on Philippine Communities:
An Overview of the Current Literature and Policies***by Heather Tribe, M.P.C.S., University of Otago***Introduction**

The Philippines is one of the countries most vulnerable to climate change in the world. An island nation which is heavily exposed to extreme weather events, the Philippines has little adaptive capacity. This article will begin by exploring the current and anticipated climatic changes as based on the most recent report released by the International Panel for Climate Change in 2014. After this, the economy of the Philippines is discussed; the main industries of which are agriculture, mining, and services (including tourism, business process outsourcing, and remittances from overseas Filipino workers). The primary industries of the Philippines, namely agriculture and mining, have varying yet significant detrimental impacts on the environment; these are explored, as are the risks of both these industries and macro scale anticipated climate change impacts to society. After this, current or proposed policies to improve the status quo of the mining and agriculture sectors are explored and critiqued. Following this, there is a discussion of the groups in the Philippine society who are most vulnerable to climate change and adverse industry impacts. A larger exploration of lower economic groups, particularly agriculture-based households is undertaken. The impacts on these marginalized groups are contextualized as forms of violence and reviewed in line with the themes of sustainable development and positive peace.

Overview of the Philippines**Geography and Climate**

The Philippines is an archipelago with over 7500 islands comprising approximately 30 million hectares, nestled between the Philippines Sea, the South China Sea, and the Celebes Sea. The islands of the Philippines are grouped into three regions: Mindanao (10.2 million hectares), Visayas (5.7 million hectares), and Luzon (14.1 million hectares) where the capital, Manila, is located. The Philippines is a collection of half-submerged mountains, which were pushed up as a result of the subduction zone of the collision of the Eurasian and the Philippine plates. This subduction zone makes the Philippines prone to earthquakes and volcanic activity. The climate is tropical, with an average humidity of 80% and an annual rainfall of 80-450cm.¹ Two of the regions, Luzon and Visayas, are affected by typhoons each year, which account for half of their annual rainfall.

Demographics

Of the 102.8 million people who live in the Philippines, 44.2% live in urban centers, while the remaining 55.8% live in rural areas.² According to the International Monetary Fund (IMF), the current per capita GDP is 12,430 Philippine Pesos, an increase of 6.7% over the previous year.³ Poverty has also dropped to 21.6% over the past year with unemployment dropping to a historic low of 4.7%. However, underemployment is still steady and significant at 18%. Underemployment reflects the number of workers who are working but would like to work more hours than they receive. This high value reflects the prevalence of informality, workplace corruption, and other job-related concerns.⁴ Poverty and underemployment are directly related to undernourishment, at a rate of 13.8% of the population.⁵ These are projected to worsen with the increased income inequality.⁶

Review of climate change and projected impacts

According to the National Aeronautics and Space Administration (NASA) climate change is defined as the change in the usual weather found in a place; specifically, it refers to the levels of precipitation or expected temperature of a month or season. This is a long-term alteration in the expected climate which usually takes hundreds or even millions of years.⁷ The basis for the review of climate change impacts is taken from the International Panel of Climate Change (IPCC) fifth assessment report (AR5) which was released in 2014. The IPCC was established in 1988 by the United Nations Environmental Programme (UNEP) and the World Meteorological Organization (WMO) to provide unbiased and clear scientific research on the current state of knowledge in climate change and its potential environmental and socio-economic impacts.⁸

This review acknowledges climate change is a global phenomenon and one which affects all regions and sub-regions differently, however, it is outside the capacity of this paper to review the global impacts of climate change, the scope of this paper is limited to South-East Asia, most particularly to the Philippines. This section aims to discuss only the changes in climate resulting from global increases of atmospheric carbon. Climate change is anticipated to have many impacts on the status quo of the Philippines.

Temperature Rise

As it stands, an increase of more than 3°C is expected throughout Southeast Asia.⁹ This temperature increase will be reflected in ocean temperatures, particularly at the surface.¹⁰ Not only will the temperature increase affect the oceans, but it will also affect terrestrial ecosystems in several ways. Temperature is quantitatively the most important driver of changes in fire frequency in terrestrial ecosystems.¹¹ It is not fully understood how this relationship works, however analysis of the past 21,000 years shows there is a positive relationship between temperature and fire frequency, more so than any other parameter. In addition to increased fire frequency risks, precipitation patterns will continue to be heavily impacted by the increased temperatures.

Precipitation

Overall, rainfall has only increased by 22mm per decade over Southeast Asia, which is not a significant increase; however the regularity of the rainfall has altered with 10mm of the measured increase being attributed to extreme rain days. This increase is predicted to continue over the coming decades.¹² The decreased regularity of precipitation has a two-fold consequence; firstly, longer and more intensive drought periods, and secondly, heavier rainfall once the droughts end. One part of the altered precipitation pattern is the increased level of precipitation occurring with tropical cyclones. Aside from the increased rainfall with each cyclone, there is less confidence in the knowledge surrounding the increase in frequency or intensity of these cyclones. Another weather pattern where precipitation will play a role is the monsoon season. Eighty-five percent of future projections show an increase in mean precipitation during monsoons, while more than 95% show an increase in heavy precipitation events.¹³

Fresh Water

Although the parameters to measure fresh water quality and quantity are heavily influenced by human activities, there is evidence to believe that climate change impacts not only the quantity of fresh water but also the quality. Delpla et al¹⁴ showed that warming and extreme events were likely to modify the physical-chemical parameters, micropollutants and biological parameters of the water.¹⁵ The physico-chemical parameters include measurements such as temperature, pH, dissolved oxygen, and total dissolved solids. Micropollutants are bioactive, non-biodegradable substances such as radioactive or biologically harmful metals (including mercury, lead, and arsenic),

pesticides, or pharmaceuticals, and biological parameters include the presence and volume of species such as algae and phytoplankton as well other microorganisms. Higher air temperatures increase evapotranspiration; when this occurs in tandem with increased frequency and intensity of droughts, then surface water quantity will be decreased. This can then increase the concentration of many of the physico-chemical parameters, micropollutants, and biological parameters listed above.

Oceans

As previously mentioned, the ocean is anticipated to increase in temperature, particularly at the surface.¹⁶ The current state of warming has been implicated in the northward expansion of tropical and subtropical macroalgae and toxic phytoplankton.¹⁷ This northward shift of species is anticipated to alter the marine ecosystems and provide new challenges for the species which have historically been present in and around the Philippines. With current predictions, the increased temperature combined with ocean acidification is expected to result in significant declines in coral-dominated reefs and other calcified marine species, such as algae, molluscs, and larval echinoderms.¹⁸ Current trends in sea level rise are expected to be exceeded by the future predictions.¹⁹ This, in combination with cyclone intensification, will likely increase coastal flooding, erosion, and saltwater intrusion into surface and groundwaters.²⁰ Unless they are provided with enough fresh sediment or are allowed to move inland, beaches, mangroves, saltmarshes and seagrass beds will decline also, and these declines will exacerbate wave damage.^{21,22,23,24}

Philippine Industries: Agriculture

Agriculture - including forestry, fishing, and hunting - is one of the biggest sectors of the Philippine economy, accounting for 9.7% of the GDP²⁵ and employing 28% of the total workforce. The sizes of the agricultural ventures vary drastically, including a significant number of subsistence farmers as represented by the large proportion of the population who live rurally, and commercial ventures from multinational corporations. The large commercial agriculture ventures hold significant swathes of land and grow vast quantities of produce. In the Philippines the main crops are sugar, rice, and coconuts, each year producing hundreds of thousands of tons of each for export.²⁶ There is a drastic difference between the commercial ventures and the subsistence farmers in terms of yield, intensity of farming practice, and exports. It should be noted that fishing and farming are the two sectors with the highest incidences of poverty,²⁷ which I will discuss in more depth below.

Services

Services are a highly profitable and diverse sector for the Philippines, and one which has expanded greatly over the past few years. Tourism is included in the services sector and provided 8.6% of the nation's GDP in 2016, up 0.4% from the previous year.²⁸ Another major part of the services sector is the rapidly growing business process outsourcing, where call centers and other such infrastructure are exported to places like the Philippines to exploit their lower labor costs. In the Philippines, this employs over 1.3 million people. A last significant part of the services industry - which isn't always accounted for but is nevertheless a crucial source of income for many families - are the remittances sent home from overseas Filipino workers (OFW). In the year 2016 there were 2.2 million OFW spread globally working in a large variety of roles. The remittances these workers returned to the Philippine economy added 146,029 million Philippine pesos, or roughly USD\$2.78 billion in the year 2016.²⁹

Industry

There is great variety of industries in the Philippines, including vast manufacturing outputs. These range from one of the largest shipbuilding industries in the world, to a growing automotive

and aerospace production. Construction is also a major employer as the country develops its economy and its population continues to grow, requiring more infrastructure. One of the main and more controversial industries of the Philippines is the mining and extraction industry. The Philippines has significant reserves of gold, nickel, copper, chromite, silver, coal, sulphur, and gypsum. While there has been significant debate over the legality of overseas mine ownership and mining procedures (as will be discussed later) the industry has continued to grow over the past year. The main contributors to the 8.8% expansion were stone quarrying, clay, and sandpits which grew by 17.7%, gold which grew by 16.5%, and crude oil, natural gas and condensate which grew by 7.4%.³⁰

Impacts of industries on environment

The impacts of many industries on the local environment make it very challenging to detect and disentangle the impacts of climate change from the surrounding pressures, which the literature reflects.³¹

Fresh Water

Many industries require access to fresh water, as a result, overexploitation of groundwater systems can result in land subsidence. When this is combined with the climate change driven impacts of coastal inundation and sea level rise, there is an increasing risk of worsened water quality.³² Mining, in particular, poses a significant risk of water contamination. Mine tailings – the excess earth and chemicals used to obtain the target metal – are often permanently stored in large lakes or used to create structures such as dam walls and piers. However, if the tailings are not treated or sealed correctly, poisonous contaminants can leachate out and pollute the water surrounding them. As mining is such a prevalent industry in the Philippines, and with choices being made to economize the handling of these tailings (often at the expense of long-lasting safety), there have been examples of significant water contamination, including from the Palawan Quicksilver mine,³³ along the Naboc River area near Mindanao,³⁴ and in the water supplies to the villages of Sta. Lourdes and Tagbueros.³⁵

Deforestation

Between 1990 and 2005, the Philippines lost a third of its primary forest cover.³⁶ This was due to a number of factors, one of which is the conversion of forest lands to promote growth and development. This is combined with high levels of poverty and landlessness in rural and urban populations, causing poorer families to move into less farmable uplands. This poverty is compounded by uncertain land rights, resulting in lack of long term investment in land and over-exploitation of its resources for short-term economic benefits. There is also a lack of policy and improper pricing of the land which results in poorly managed forestry practises, resulting in high capital intensity, low employment generation, and low investments in forest regeneration and protection.

There is an alarming feedback from forest cover to rainfall. Of course, without rain there is very little sustainable agriculture, including forestry. However, when forest cover is removed, it has been anticipated that rainfall patterns will also significantly change.³⁷ Consider that 25-56% of all rainfall in highly forested regions can be recycled in the ecosystem as tropical trees extract water from the soil and, through evapotranspiration, release it into the atmosphere, thus inducing rainfall. With the high rates of deforestation in the Philippines, we can assume that historic rainfall patterns will be significantly different in the future, not only through the broader forces of climate change, but also on a micro scale as a result of deforestation.

Land degradation

According to a report prepared by the Food and Agriculture Organization in 1999, approximately 75% of land in the Philippines is severely or very severely degraded. Due to the age of the report,

significant changes have occurred since its release; but in many cases, soil degradation has worsened. Land degradation is associated with accelerated soil erosion, siltation of irrigation systems, flooding, and water pollution. Land effects are intricately linked with the previously discussed issues of fresh water and deforestation. Land degradation can occur through two main pathways: firstly is erosion, the removal of soil. Erosion occurs naturally through wind and water moving particles of soil, but is accelerated through human activity, particularly deforestation. Steeper lands are more erosion prone than lowlands, hence, as deforestation of the uplands became so prevalent in the last few decades, steep slope erosion is a serious issue.³⁸ Official estimates show a slow rise of erosion from 340 million t/year in the late 1980's to nearly 350 million t/year in the early 2000s.

The second type of land degradation is in the changes to the chemical, biological and physical parameters of the soil, such as nutrient loss, salinization, acidification, and compaction. Nutrients leave the soil either through adherence to water and traveling over the surface or gravitating down through the soil to water bodies below. This consequently makes nutrient loss a relative issue; nutrients tend to accumulate elsewhere, causing downstream damage, either through blocking water pathways with sediment build up, or adding too many nutrients that promote algae growth and polluting water bodies. Through continuous cropping, extensive submergence, and high chemical usage, the production of one crop in particular – rice – has led to declined organic matter content, nutrient supply capacity, nutrient imbalance, water logging, soil salinity and alkalinity and forming of hardpans at shallow depths.³⁹ These impacts combined have led to a slowdown of overall yield growth.

Risks to society

The impacts of climate change and industry will likely manifest themselves through impacts on water resources, agriculture, coastal areas, resource dependent livelihoods, and urban settlements and infrastructure. These will have implications for human health and well-being. This section will explore food security, disease prevalence, and income and settlements. There are many links and feedback loops between each of these concepts, thus making a clear discussion a challenge. A lack of food security will lead to increased vulnerability to disease, as malnutrition reduces the immune system's ability to resist infection and viruses. Poor housing can also increase vulnerability to disease, through exposure to cold, damp, or unsanitary living conditions. All three of these interacting factors are affected by income, as without sufficient funds, households cannot afford adequate nutrition, medicine, or quality housing.

Food Security

As temperature rises, the growth period of many crops – including rice – is shortened. It is already shown that current temperature in parts of Asia – including the Philippines – are reaching critical levels during the susceptible stages of the rice plant.⁴⁰ Extreme weather events have significant destructive capacity, which when combined with increased precipitation events lead to higher flood risks, yields could drastically fall.⁴¹ Furthermore, with increased sea level rise, many coastal areas will lose agricultural lands due to submersion or increased salinization from a rising salt water table.

Added to the risks of climate change are those from industry. Unsustainable agricultural practices leading to land degradation have been previously discussed, but some industries also have negative impacts on the environment of other industries, one of which is mining. As previously mentioned, tailings from mines can leach out and pollute water sources. These water sources can be used for a number of purposes, including agriculture. The case of the Naboc River in Mindanao is one such example. Here, water from the river is being used to irrigate rice fields. This combined with high consumption levels of local fish (from the same polluted river) has led to high levels of mercury

exposure in the population, resulting in 38% of the local inhabitants being classified as mercury intoxicated.⁴² Further, tailings from the Palawan Mine, used to construct a jetty into Honda Bay, have leached out into the water, creating another food source pathway of mercury to humans which is particularly pertinent in the high-fish-consuming population. The last example is in the towns of Sta Lourdes and Tagburo, where a health crisis has been declared and residents exposed to mercury through similar pathways as those previously discussed are being evacuated and receiving medical treatment. These are just three examples with definitive literature; there are many more similar situations of contamination from mine tailings which further threaten food security in the Philippines.

Disease

Epidemics are often reported after floods and storms, both of which are set to increase as a result of climate change and unsustainable land clearing and farming practise, as previously discussed. These epidemics can come as a result of decreased drinking water quality, amongst other reasons. According to the Philippine Statistics Authority the main source of drinking water in the Philippines is bottled water with 27.2%, and cooking water sourced from community water systems with 43.4%.⁴³ While it may be assumed that bottled water is safe and unaffected in quality by floods or storms, the population which does not have access to this security is at risk from reduced water quality. Further contributing causes of epidemics after floods are mosquito proliferation and exposure to rodent-borne pathogens.⁴⁴

There are also links between heat and human health, showing that high temperatures subsequently increase mortality, particularly in the elderly and people with cardiovascular and respiratory disorders.⁴⁵ In addition to heat, droughts also have health impacts. Increased heat and drought frequency, as previously discussed, are the primary causes of increased frequency of wildfires, which in turn increase incidences of smoke exposure. Drought can also impact agriculture, as mentioned above, threatening food security and having further renders people susceptible to disease.⁴⁶

As previously mentioned, floods and storms may increase mosquito proliferation and exposure to rodent-borne pathogens. We can anticipate that increased temperatures will also affect vector-borne pathogens. This could be through shorter vectors life-cycles and extrinsic incubation periods, resulting in larger vector population sizes. This would enhance the spread of disease between the vector species and humans. One such example is that of dengue fever, which has a time-lagged positive correlation with increased temperature and rainfall.⁴⁷ Among all the impacts anticipated with climate change, the broadest impact on human health is the traumatic psychological effect these changes will have. Many mental disorders as well as post-traumatic stress syndrome have been observed in disaster-prone areas.⁴⁸

Income and Settlements

The Philippines is a country of rapid development and urbanization. However, more than half of its inhabitants still live rurally and still suffer disproportionate rates of poverty.⁴⁹ It is expected that impacts of environmental degradation and climate change will impact those below the poverty line with more vigor than those above it. In the national economy, agriculture is anticipated to be a key driver of growth over the coming years. Southeast Asia is the third poorest region (in regard to human development indicators) after sub-Saharan Africa and Southern Asia.⁵⁰ Considering its current situation, with anticipated global increase in food prices for staples such as rice, the Philippines stands a chance to improve its economy if it can manage the negative climatic impacts anticipated for the agricultural industry.⁵¹

Many settlements in the Philippines are in low elevation coastal areas which are particularly vulnerable to climate change hazards, such as sea level rises, storm surges, and typhoons. One

group, in particular, is those living in peri-urban areas who face particular risks. These peri-urban areas are often of lower socioeconomic standing, which consequently increases inhabitants' risks regarding food security, but also increased land title insecurity and price pressures. Secondly, peri-urban areas often serve as sinks for urban wastes, holding landfills and sewage treatment facilities which can pose local biophysical risks. Lastly, as they are outside of the inner-urban area, peri-urban areas are often not included in disaster risk management planning, even though they will most likely suffer just as much as inner-urban areas.⁵²

The risks of extreme weather events to industries are multi-faceted. Particularly regarding infrastructure, climate change poses many direct and indirect challenges to industrial production and enterprise. There is no doubt that climate change will deteriorate infrastructure, which can disrupt basic services such as water supply, sanitation, energy provision, and transportation systems, which can lead to mass migrations.⁵³ With increased frequency and intensity of cyclones and other extreme weather events, this can create an unsustainable cost for a developing economy. Over the past four years, climate-induced disasters have cost the Philippine economy 0.3% of its GDP.⁵⁴ This is anticipated to increase up to 2.2-5.7% of the GDP by the year 2100.⁵⁵ Furthermore, climate change can also exacerbate current socioeconomic and political disparities and add to the vulnerability of the Philippine people.⁵⁶

Current policies on the most environmentally damaging industries: Mining

In 2016, the previous environmental secretary of the Philippines, Regina Lopez, spearheaded an environmental audit of the mines in the Philippines, finding "serious environmental violations" at 23 of the 41 operating mines.⁵⁷ This audit resulted in a "ban of mining" which prevented new mining ventures.⁵⁸ Mining contributes less than 1% of the country's GDP;^{59,60} however, it also produces 8% of the world's supply of nickel, and 97% of China's supply, the decrease of which could result in serious international consequences.⁶¹ Appeals have already been made to lift the ban and release Lopez's audit for transparency.^{62,63,64} This international pressure could damage the ability of the Philippine administration to make clear and logical policies which consider both the economic and employment benefits of mining for the people of the Philippines, but also consider the longevity of the environment and any other economically beneficial alternative land uses.

Recently, the Duterte administration signed the Canadian Towards Sustainable Mining (TSM) initiative. This program was developed to facilitate the extraction of minerals, metals and energy products in the most socially, economically, and environmentally responsible way.⁶⁵ There are three core pillars which uplift this program: accountability, transparency, and credibility. Accountability is achieved through regular assessments at the facility level where the mining takes place, providing local communities with accurate and honest knowledge as to the health of the mine. Members of the TSM provide progress reports, measuring 23 set indicators; this is done annually and is audited every three years. These results are publicly available, thus providing transparency. The last pillar, credibility, is fostered through ongoing consultation with a national Community of Interest Advisory Panel, which is a multi-stakeholder group comprising aboriginal groups, community leaders, environmental and social NGOs, and labor and financial organizations. There are also members of the Mining Association of Canada board to provide a mining industry perspective.⁶⁶ There are still issues to resolve – including the open pit ban – before any growth can be expected from the industry.⁶⁷ Duterte said that while he would not lift the ban on new ventures, he would give current firms time to adapt to less environmentally harmful practices as opposed to enforcing their immediate closure.⁶⁸

Tourism

In early 2018, the new secretary for the environment, Roy Cimatu, visited one of the largest tourist destinations in the Philippines. During this visit he witnessed significant and widespread

environmental violations,⁶⁹ predominantly amongst the locally owned and run hostels and housing for migrants who work in the more established and well-endowed global hotel-chains.⁷⁰ This is mainly due to the well-financed position of many global chains who can ensure their facilities connect to water treatment systems and meet the requirements of the law. It should be noted, however, that while enforcing strict environmental security is of utmost importance to ensure the self-sustainability of local populations, it should not be done with disregard. Not only does the hard-line approach hamstring productivity and potentially frighten future overseas investors, in regard to both the tourism example and the previous open-pit mining ban, it also has significant repercussions for employment. Households who have migrated for work, such as in Boracay, or who are solely dependent on one industry, will face significant losses to livelihood in the event of a hard-line indefinite closure.

Agriculture

The primary goal of the agriculture policy in the Philippines is to achieve self-sufficiency in rice production, in the hope that it will effectively combat food insecurity and poverty through a stable food supply at an affordable cost.⁷¹ The interference of the government in the agriculture industry has ebbed and flowed over the past few decades. The level of intervention was particularly heavy in the 1970s and '80s before easing off to allow increased private sector control until the turn of the millennium.⁷² In the early 2000s Philippine agriculture refocused on rice, and there was a subsequent increase in government subsidies. This was more pertinent after the 2008 global food crisis, which further strengthened the drive for self-sufficiency in rice.⁷³ There were many suggested pathways to achieving this self-sufficiency, three of which will be discussed in more depth.

Traditionally, subsidizing input costs has been the main instrument in achieving self-sufficiency in the Philippines.⁷⁴ This includes preferential tax policies exempting agricultural enterprises from import duties on agricultural equipment and machinery. Furthermore, the government subsidizes ongoing and recurring inputs such as seeds and fertilizers. More recently, these subsidies have been tailored to increase planting of hybrid rice strains, with varying success. Many of these strains do not produce seeds of their own, so farmers are required to repurchase stock every year, unlike traditional inbred varieties. This combined with often a heightened fertilizer requirement, resulted in a low uptake of the new technology.⁷⁵

Since the turn of the millennium, there has been increased pressure to provide general services to the whole industry. These include investment into an extensive irrigation network, primarily to benefit rice farmers. A further priority intervention is the construction and maintenance of a road network, better connecting farms to markets. This increases agricultural productivity and reduces post-harvest losses. To further future-proof agriculture productivity, the Philippine government invests substantially in research and development. This research should pass through local level government, with reinvestment by the government.⁷⁶

The most powerful agricultural policy instrument used by the Philippines government to move towards rice self-sufficiency is price supports. These measures are placed mainly on rice and sugar; they include a support price, release price, government procurement and import restrictions. Government procurement stabilizes consumer price levels through buffer stocks, ensuring adequate and continuous supply.⁷⁷ Import restrictions regulate foreign trade, particularly on the import of rice. While it is crucial for self-sufficient industry not to import more rice than they produce, this is proving to be detrimental in the case of the Philippines. Self-sufficiency requires gross yield to match or exceed the requirement of the population. As the Philippines has undergone sustained population growth, particularly in recent times, in combination with decreased land availability and land productivity, the result is a significant gap between what is produced and what is required. In tandem

with high import tariffs on rice, prices go up, resulting in recent increases in malnutrition and poverty.

The budgetary transfers to subsidize agriculture from the government are five times higher than those of other regional countries.⁷⁸ This inefficiency is made clearer when comparing percentages of the total; employment in agriculture is almost three times the GDP produced by agriculture. This low labor productivity is one of the reasons explaining the low incomes of agriculture-dependent households.⁷⁹ Considering that more than 60% of poor Filipino households' income is spent on food,⁸⁰ low labor productivity rates are not financially sustainable. This seems to have started a reduction of the laboring population in agriculture. This movement from agriculture to non-agricultural sectors has provided overall economic growth. The movement of labor from low productivity to high productivity has increased incomes for families through the diversification of income sources. Furthermore, it has also raised the wage rate of agricultural labor as the supply shrinks, and reduced pressures on land and water availability.⁸¹ However, this is not spread in a uniform manner as will be discussed below.

Some of the government's agricultural policy instruments bring hope to the struggling sector, such as subsidized input costs and improved general services. However, as I have discussed, there is still real and significant water contamination from the mining industry, which has the potential to continue and worsen. While the government has invested in irrigation systems to stabilize and increase crop yields, these funds would be better invested in ensuring that the water used for irrigation is not contaminated. There is still positivity in the criticism of the general services investments; any investment to improve road connectivity will decrease vulnerability. Having clear and easy access between towns and cities will not only reduce post-harvest losses of crops as mentioned above, it will also increase accessibility to rural communities in the event of increasingly frequent natural disasters. Having this increased accessibility will allow emergency services and humanitarian aid into townships further afield, which would previously have been cut off.

Reducing input costs can also have detrimental impacts to the longevity of the agricultural sector. Tapering these subsidies to only a few crops, such as rice and sugarcane, will restrict diversity and increase vulnerability. Similar to the concept of having all one's eggs in one basket, having a lack of diversity in the agricultural sector reduces resiliency to crop specific diseases or market price fluctuations, particularly for rice, which is becoming dangerously vulnerable in to increased temperature and reduced precipitation during its growth period. Moreover, reducing input costs into agriculture can increase intensification. While this intensification is necessary in the name of self-sufficiency, it is detrimental long term, as it often reduces land productivity, stripping the soil of nutrients and its necessary micro biodiversity. One suggestion, put forward by the OECD director of trade and agriculture, is to move away from the concept of self-sufficiency to move towards increased productivity and profitability in a way which is environmentally sustainable.⁸²

Vulnerable Groups

The current and predicted state of the environment can be expected to have disproportionate repercussions for marginalized groups in society. In addition, research has shown an exacerbation in gender inequality. Chandra et al have explored the impacts of climate change and conflict on rural women in the wider Mindanao area⁸³ finding that climate change and conflict have been shown to disadvantage women to greater rates than men. According to Chandra women are more likely to farm smaller plots of land, work shorter hours, or limit their farming to cash crops.⁸⁴ Additionally, adult women frequently sacrifice their own food to ensure their children or the elderly in their care eat enough first – worsening food insecurity. Furthermore, should abandonment of the farm prove necessary – which is increasingly common – women tend to find work more easily in urban centers than men.⁸⁵ This can also lead to increased risk of sex trafficking.^{86,87}

A group that is similarly vulnerable to climate change and adverse industry impacts is indigenous peoples. The UN Economic and Social Council released a report in 2003 exploring human rights and indigenous issues occurring in the Philippines.⁸⁸ This report detailed many issues concerning resource management and sustainable development, poverty, and militarization. One case which is referred to throughout the report is that of the Bugkalot indigenous people who have been fighting for their rights over the OceanaGold Corporation and Didipio mine. Although the Bugkalot elected anti-mining parliamentary members and local councils, the military systematically raided the townships of the Bugkalot, using tactics of torture, harassment, and grave coercion.⁸⁹ The indigenous people, joining forces with local peasants, still work towards closing the mine. A few years ago, the Didipio Earth Savers Multi-purpose association successfully rolled back some of the mining operations in Nueva Viscaya.⁹⁰ However, the OceanaGold mine is still operating and last year won the ASEAN award for best practices in mineral processing, citing community investment as a main bonus.⁹¹ There should be serious concerns raised when a transnational corporation, such as Oceana Gold, has the political power to manipulate the military to act against the people. Looking forward, similar concerns should be raised with the open-pit mining ban regarding the ability of the Philippine administration to withstand heavy pressure from the appeals that have already begun. Not only did the indigenous group suffer land losses, they also suffered the political corruption of having their elected officials ignored and having the military turn against them. Though this is only one example, generally indigenous communities are more vulnerable to climate change. As I will discuss, the more reliant a community is on natural resources, the more susceptible they are to the negative impacts on the degradation of those resources. As many indigenous communities live wholly within the capacities of their environment, they witness the changes firsthand and feel them more intensely.

The largest and most widespread vulnerable group are those lowest in economic status, including women and indigenous groups. Currently the most poverty-stricken group in the Philippines are the rural poor whose livelihoods depend almost entirely on subsistence agriculture, as previously discussed. The low economic capacity of this group makes them the most vulnerable group for a number of reasons. During extreme weather events, economically marginalized families are not able to escape, do not have food supplies saved up, nor are they able to afford medicine should an epidemic follow an extreme weather event. For the predominantly agriculture-reliant families from the poorest decile, the low-labor productivity of agriculture, and difficult economic policies enforced to achieve rice self-sufficiency are partially the cause of their plight. While the open-pit ban and any developments under the TSM initiative will hopefully stem the ongoing resource degradation, any mining venture has the risk of going wrong and causing disastrous and often irreversible impacts. Those communities who are most dependent on these natural resources are the most vulnerable to their change, also do not have the economic capacity to withstand or financially absorb any detrimental impacts. Further, these communities often do not have expendable income for medication, or treatment of the contamination, which prolongs and exacerbates their suffering. For example, leachate from tailings with mercury and other physical-chemical pollutants has already been linked to contamination and intoxication of local populations.

Many of the current or suggested policies for some of the most environmentally damaging industries of the Philippines have disproportionate consequences for marginalized groups of society. This disproportionality represents violence, using Galtung's definitions.⁹² Violence can be direct from one individual to another, such as from a soldier to an indigenous villager who is protesting the illegal mining in their homeland. Structural violence, as Galtung defines it, is the violence exerted by one group upon another, such as the contamination of water from poor mining practice which results in mercury intoxication in significant numbers in a village. This is violence committed by both the mining companies who failed to ensure their practices were safe, and the government, who failed to enforce safe practices on the company to protect their citizens. Galtung defines cultural violence as

the parts of society which allow the previous two violences – direct and structural – to continue. This could be due to pressure from transnational mining corporations, or the economic benefits of cutting corners, which make society and government blind to the suffering of a marginalized group.

The problems faced by communities in the Philippines – be they land seizures, water contamination, increased malnutrition, mercury intoxication, sea level rise, or sex trafficking – have complex intersections and interactions. This means that dealing with an issue using an isolated and symptomatic approach cannot result in long term solutions; a systematic approach is required. Here is where the concept of sustainable development must be explicitly discussed. The Brundtland Commission⁹³ defines sustainable development as that which improves people's life-enabling habits to meet needs in the present without compromising the ability of future generations to meet their needs. In this context it is only when economic security, ecological integrity, and social equality intersect can sustainable development be achieved.⁹⁴ With this in mind, human well-being is essential in combating environmental degradation, or adapting to adverse climatic changes. This is because poverty is both a cause and an effect of environmental degradation. As has been illustrated previously, negative impacts on the environment – whether caused directly by poorly managed industries or by macro climatic changes – have equally adverse consequences for society. The environment is the basis of our existence, and without nature's capacity for regeneration or waste absorption, we would not be able to survive; this is most pertinent for those with a more direct interaction with the environment, and those with higher levels of poverty.

Ecological integrity is a critical component of sustainability and a requirement for poverty reduction. Without it, positive peace cannot be achieved. Positive peace, as defined by Harris⁹⁵ is defined as peace which is not only an absence of any of Galtung's⁹⁶ three types of violence; it is also social justice and ecological sustainability. Hence, a lack of ecological sustainability results in risks that will consequently lead to more explicit and widespread violence and conflict. Homer-Dixon⁹⁷ links environmental degradation to increased risks of conflict. This takes an indirect pathway through economic struggles as a result of decreased primary industry capacity. Rural economic struggles result in migration to urban centers, increased social tensions and a greater risk of conflict. The situation in the Philippines is not too dissimilar from the theoretical pathway observed by Homer-Dixon.⁹⁸

In the Philippines, resource degradation, such as reduced water quality, and damage to crops from increased extreme weather events have led to a decrease in agricultural yield. This has led to migration to urban centers, as previously discussed, and has consequential impacts on increased sex trafficking and other horrifying realities. At this point, many non-agriculture sectors, such as tourism, business process outsourcing, and remittances from overseas Filipino workers, provide welcome opportunity and change for those who are currently most affected by the degradation of the environment. This helps struggling newly urban migrants and reduces the risk of conflict. However, Jasparro and Taylor⁹⁹ have theorized how the anticipated climate changes occurring in Southeast Asia will reduce state capacity and human security to the point where states may fail and produce non-state threats and conflicts. This, they suggested, would be a result of marginalized groups resorting to violence, warfare, and raiding in order to cope with increased environmental and climatic pressures.

There is one question left to consider though: is it too late and is it enough? It would seem as though the national administration of the Philippines is implementing policies of varying successes in order to address the poverty of a significant portion of the population, and to develop in a way that the country is ready and capable of adapting to climate change. However, current measures may prove to make the agriculture sector, and society at large, more vulnerable to climate change. Furthermore, by restricting imports of food to create a facade of self-sufficiency, the Philippine

administration is effectively attempting to fudge the numbers, and by doing so, increasing malnutrition and food insecurity for a significant number of their most vulnerable citizens.

Retroactively acknowledging and addressing the long-term damage done to the environment from industries such as mining and tourism, may not be enough to combat the violence suffered by the local communities. Furthermore, however gallant and admirable the new goals may be, it is questionable as to whether they will withstand global pressure, and whether the intricately linked needs of the poor and the environment can be prioritized over the ability to make easy money. If this proves unsuccessful, and the previous rate of mining and subsequent degradation resumes, the combined impacts on the rural poor may be too much. Not only this, but the impacts suffered through a hard-line approach to violations of environmental regulations will have a greater impact on lower socioeconomic households who rely on income from work in mining or tourism.

Perhaps there can be another approach to restorative relationships between government, local communities, and many of the transnational corporations who provide significant sources of income. The Commission on Human Rights for the Republic of the Philippines (CHR) has begun an inquiry into climate change within the human rights framework, with a particular emphasis on “carbon majors” and their potential responsibility in contributing to climate change and its impacts on the rights of people in the Philippines.¹⁰⁰ These “carbon majors” are non-state entities which are transnational producers of oil, natural gas, coal, and cement. The first hearing began in late March 2018, and the inquiry will continue throughout the year and draw on community dialogues and experts from both scientific and human rights disciplines.¹⁰¹ The aim of this inquiry is to improve measures to protect and promote human rights in the Philippines in an era of climatic changes, it also seeks to determine the liability of companies which have had a notable contribution to climate change.^{102,103} While the interwoven nature of climate change and industry may prove a challenge for this inquiry, its goals are admirable and should provide intensely beneficial recommendations for community, government policy, and corporations. As the CHR is an independent body, any recommendations should consider the implications for the environment as well as local employment and income reliance.

Conclusion

Due to its geography of being an exposed archipelago, the Philippines is incredibly vulnerable to projected climate change impacts. Mining and agriculture play an important role in the health of the environment and when combined with the expected impacts of climate change, provide the Philippines with significant risks, including food insecurity, increased prevalence of disease, and income and settlement vulnerability. The ability for local communities to be resilient to these changes and impacts are both equipped and hindered by different industry-specific government policies. The detrimental effect of climate change and industry impacts on the environment culminate and combine to exacerbate marginalized groups vulnerability. This vulnerability is reconceptualized within the scope of this paper in Galtung’s forms of violence. This violence poses further threats for the attainment of positive peace and sustainable development.

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THINK PIECE**Eco-Swaraj vs. Global Eco-Catastrophe**

By Ashish Kothari, Activist with Kalpavriksh, Vikalp Sangam, and Radical Ecological Democracy

Across the world, “ordinary” people are coming up with extraordinary responses to the deepening socio-economic and ecological crises facing humanity. Whether in the form of resistance to activities like mining and big dams, corporate and state abuses of power, or in the form of creative ways of meeting needs for food, water, and energy, these responses represent an assertion that there are alternatives to today’s dominant ideology of “development.” Some of these are re-affirmations of continuing lifestyles and livelihoods that have lived in relative harmony with the earth for millennia, such as indigenous peoples’ movements for territorial and cultural autonomy. Others are new initiatives emerging from resistance movements against the destructive nature of capitalism, industrialism, patriarchy, stateism,¹ and other forms of power concentration, including de-growth, eco-feminism, eco-socialism, and the re-commoning of urban spaces and knowledges.

These initiatives and movements are incredibly diverse in their settings and processes, and indeed this is one of their strengths, as opposed to the tendency of “modernity” and “developmentalism” to shape the whole world in a homogenous western, consumerist, materialist frame. They are pluriversal, rather than universal.² But while diversity is their hallmark, alternative initiatives often also encompass common threads. They promote and work towards systemic change, altering the structures of domination and exploitation. They espouse, implicitly or explicitly, some common values and principles, such as those of cooperation and solidarity, interconnectedness and reciprocity, respect and dignity, autonomy and freedom, human rights as also the rights of nature, equality and equity, among others.

Asian Responses

Even as the Asia-Pacific displays acute social and ecological distress, and extreme inequities, the region is also a hotbed of alternative explorations. To give a few examples:³

- In Bangladesh, the *Nayakrishi Andolan* (New Agriculture Movement) promotes ecologically sustainable, biologically diverse agriculture amongst small farmers, using the principle of *shohoj*, loosely translated as “easy” but with deep spiritual and philosophical meanings related to a “transparent way of being in the universe.”⁴ Several hundred sustainable farming initiatives dot the landscape in India and Nepal, and they include assertions of seed/food sovereignty.
- In several South Pacific island nations, hundreds of coastal sites are governed by local fishing communities in what are called ‘locally managed marine areas’ (LMMAs), encouraging sustainable fisheries and coral reef and coastal conservation, and discouraging destructive extractive activities. Indigenous peoples and other local communities in several other countries are claiming rights to traditional territories and rebuilding the ability to manage forests, pasture lands, wetlands, and other ecosystems for conservation-oriented livelihoods, in a phenomenon globally known as Indigenous Peoples and Community Conserved Territories and Areas (ICCAs).⁵
- Several rural communities in India have asserted various degrees of autonomous political and economic governance, insisting that even as they respect the Indian

Constitution, in their regions they want to be the primary decision-makers, which according to them is the true meaning of democracy. Villages in Gadchiroli region of Maharashtra, and in *adivasi* areas of Jharkhand, have made these assertions in the face of threats by mining, dams, and other “development” projects.

- The Kurds in the region straddling Syria, Turkey, and Iraq, are attempting to devise a society based on eco-feminist, direct democracy principles, in the midst of a militarized, conflict-ridden region.
- Several movements of self-reliance and autonomy strive for greater equality and an end to social and economic exploitation; examples include organizations that have formed the national network MAKAAAM in India, focusing on women’s empowerment and rights to resources for agricultural, pastoral, and other land-based livelihoods; and those struggling to empower Dalits (the so-called “outcastes” of Hindu society in India) to get rid of the stigma of casteism.

Eco-swaraj: Towards a Radical Ecological Democracy

Examples such as the ones above point to transformations along various spheres of human existence, and to alternative frameworks for envisioning society. One such framework that has emerged from grassroots experience in India, with significant global resonance, is *eco-swaraj*. The term *swaraj*, simplistically translated as self-rule, stems from ancient Indian notions and practices of people being involved in decision-making in local assemblies. It became popular during India’s Independence struggle against the British colonial power, but it is important to realize that it means much more than simply “national independence.” In many of M.K. Gandhi’s writings,⁶ in particular *Hind Swaraj*, he noted that *swaraj* encompassed individual to community to human autonomy and freedom, integrally linking to the ethics of responsibility towards others (including the rest of nature), and to the spiritual deepening necessary for self-restrained and ethically just behavior.⁷

In India alone, there are hundreds of initiatives akin to the ones given above, in various kinds of communities, urban and rural. They include: sustainable farming, fisheries and pastoralism; food and water sovereignty; decentralized energy production; direct local governance; community health; alternative learning and education; community-controlled media and communications; localization of economies; gender and caste justice; rights recognizing the differently abled and multiple sexualities, and many others. These, like other initiatives,⁸ display an approach that respects the limits of the Earth and the rights of other species, while pursuing the core values of social justice and equity. With its strong democratic and egalitarian impulse, *eco-swaraj* seeks to empower every person to be a part of decision-making and requires a holistic vision of human well-being. Such a vision encompasses physical, material, socio-cultural, intellectual, and spiritual dimensions. Instead of states and corporations, *eco-swaraj* places collectives and communities at the center of governance and economy.

In the Indian context, such peoples’ initiatives are potentially a strong and viable response to the disastrous neo-liberal and capitalist economic policies pursued by the state, especially since 1991: policies which have added considerable ecological injustice and unsustainability to the inequities of traditional masculinity, casteism, and class domination prevalent for a substantial part of the Indian subcontinent’s history, as also the state-dominated power hierarchies present in colonial and post-colonial “socialist” eras.⁹ In every element of life, alternative initiatives are harbingers of transformation: movements from economic domination by the state and/or corporations to self-reliance especially for basic needs; from gender and caste and other social inequities to greater equity as “marginalized” sections become empowered; from the political hierarchies inherent

in liberal democracy to greater power distribution at the level of people and communities; from the denigration of “primary” and nature-based secondary economic sectors (agriculture, fisheries, forestry, animal husbandry and crafts) to their re-assertion as legitimate and dignified livelihoods; from a lack of viable employment for youth to the beginnings of alternative livelihoods for young people in a variety of sectors; from the capture of knowledge, media and the arts by elites and corporations to the re-commoning of these sectors in the hands of “ordinary” people – and much else.

The above are, of course, still marginal compared to the dominant trends in Indian society. But even as exceptions, they show great potential for transformation. This potential can be actualized much more widely and deeply with a set of processes including documenting and highlighting viable alternatives, networking them for greater critical mass, building solidarity with the movements of resistance and protest, generating links with similar initiatives outside India, and so on. I will describe one process that attempts some of these actions below.

Radical Ecological Democracy

Based on such grassroots experience and interactions with activist-thinkers and practitioners across India, a conceptual framework called Radical Ecological Democracy (RED) has emerged in the last few years as a somewhat more systematic or structured reworking of eco-swaraj. While it arose in India, it quickly found resonance in many other parts of the world as part of a process of generating Peoples’ Sustainability Treaties for the Rio+20 Conference.¹⁰

Eco-swaraj or RED, which has evolved through a process of bringing together alternative initiatives across India called *Vikalp Sangam* (Alternatives Confluence), begun in 2014, encompasses the following five interlocking spheres (thematic composites of key elements):¹¹

- **Ecological wisdom and resilience:** Reviving or strengthening the foundational belief in humanity being part of nature, and the intrinsic right of the rest of nature to thrive in all its diversity and complexity, promoting the conservation and resilience of nature (ecosystems, species, functions, and cycles).
- **Social well-being and justice:** Moving towards lives that are fulfilling and satisfactory physically, socially, culturally, and spiritually; with equity in socio-economic and political entitlements, benefits, rights and responsibilities across gender, class, caste, age, ethnicities, “able”ities, sexualities, and other current divisions; and an ongoing attempt to balance collective interests and individual freedoms, so that peace and harmony are ensured.
- **Direct or radical political democracy:** Establishing processes of decision-making power at the smallest unit of human settlement (rural or urban), such that every human has the right, capacity and opportunity to take part. From these basic units outwards growth is envisioned to larger levels of governance that are accountable and answerable to these basic units. Political decision-making at larger levels is taken by ecoregional or biocultural regional institutions, which respect ecological and cultural linkages and boundaries (and therefore challenge current political boundaries, including those of nation-states). The role of the state eventually becomes minimal and is limited to facilitating the connection of peoples and initiatives across larger landscapes. It carries out welfare measures only till the time the basic units of direct and ecoregional democracy are not able to do so.
- **Economic democracy:** Establishing or strengthening processes in which local communities including producers and consumers – often combined in one word as “prosumers” – have control over the means of production, distribution, exchange,

and markets. Open localization is a key principle, in which the local regional economy provides for all basic needs. Dependence on global trade is minimized, without falling into the trap of xenophobic closure of boundaries to “outsiders” (such as what we see in some parts of Europe that are anti-immigrant). Larger trade and exchange, if and where necessary, is built on – and safeguards – this local self-reliance. Nature, natural resources and other important elements that feed into the economy, are governed as the commons. Private property is minimized or disappears, non-monetized relations of caring and sharing regain their central importance and indicators are predominantly qualitative, focusing on basic needs and well-being.

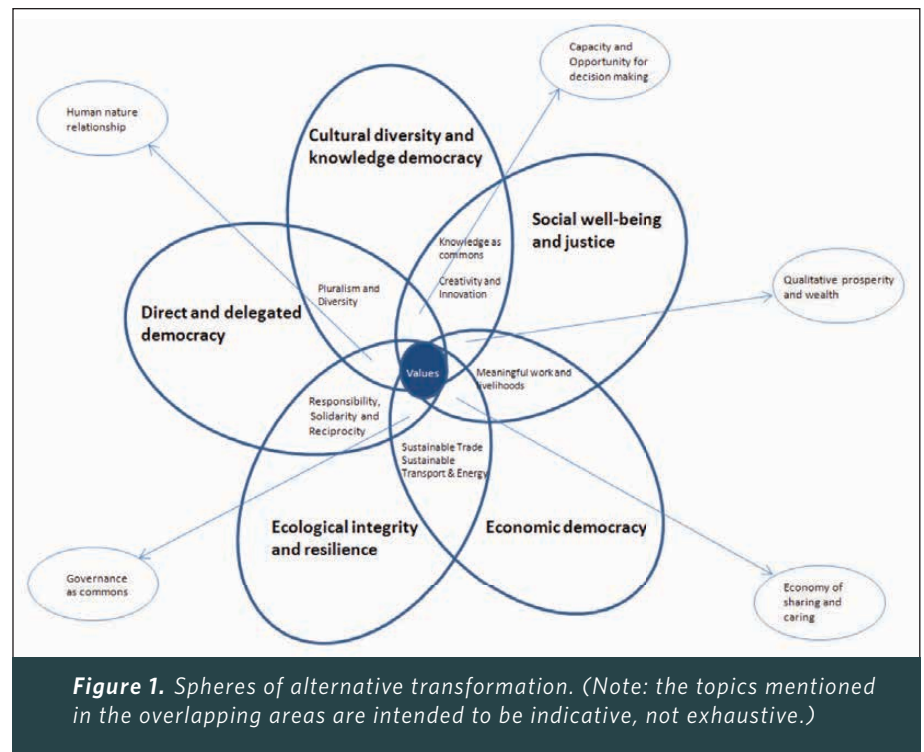
- **Cultural and knowledge plurality:** Promoting processes in which diversity is a key principle; knowledge and its generation, use and transmission is part of the public domain or commons; innovation is democratically generated and there are no ivory towers of “expertise;” learning takes place as part of life rather than in specialized institutions; and individual or collective pathways of ethical and spiritual well-being and of happiness are available to all.

Visualized as the petals of a flower (see **Figure 1** below), the core or bud where these principles intersect informs a set of values or principles, which also emerges as a crucial part of the alternative initiatives mentioned above. These values, such as equality and equity, respect for all life, diversity and pluralism, balancing the collective and the individual, can also be seen as the possible/ideal ethical or spiritual foundation of RED societies, or the world-view(s) that its members hold.

An Evolving Worldview

The broad components and values of eco-swaraj or RED have been under discussion across India through the process of *Vikalp Sangam* (Alternatives Confluence).¹² This process brings together a diverse set of actors from communities, civil society, and various professions who are involved in alternative initiatives across all sectors. A series of regional and thematic confluences that began in 2014, the *Vikalp Sangam* enables participants to share experiences, learn from each other, build alliances and collaboration, and jointly envision a better future. Documenting eco-swaraj practices in the form of stories, videos, case studies, and other forms provides a further means of disseminating knowledge and spreading inspiration for transformation, through a dedicated website,¹³ a mobile exhibition, and other means.

Over a thousand people have participated in a dozen or so confluences that have taken place since 2014 in various parts of India. Through this process a collective vision of a more just, sustainable, and equitable society has also evolved, and will continue to evolve as the process goes further.¹⁴



In 2012, about 20 civil society organizations and movements worldwide signed onto a Peoples' Sustainability Treaty on Radical Ecological Democracy as part of the parallel people's process at the Rio+20 Conference in Brazil.¹⁵ Since then, a discussion list has kept alive the dialogue, and opportunities have been found for mutual learning about approaches like de-growth, ecofeminism,¹⁶ cooperative societies and social and solidarity economies, *buen vivir*¹⁷ and its other equivalents in Latin America, *ubuntu*¹⁸ and other similar concepts in Africa, and others. A website launched in September 2017 showcases stories and perspectives on these movements from around the world.¹⁹

RED or eco-swaraj is not a blueprint but an evolving worldview, finding resonance in different forms and different names in different parts of the world. It is also the basis of multiple visions of the future.²⁰ In its very process of democratic grassroots evolution, it forms an alternative to top-down ideologies and formulations, even as it takes on board the relevant elements of such ideologies. While still struggling in the face of the powerful forces of capitalism, stateism, patriarchy, and other structures of inequity and exploitation, alternative approaches like eco-swaraj and RED appear to be gaining ground as more and more people are confronted by multiple crises and searching for ways out. This is the foundation of its transformative potential.

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Ashish Kothari is a founder-member of the Indian environmental group Kalpavriksh, which takes up research, education, grassroots work, advocacy and activism in environment and development issues. Ashish has taught at the Indian Institute of Public Administration, coordinated India's National Biodiversity Strategy and Action Plan process, served on Greenpeace International and India Boards, helped initiate the global ICCA Consortium, and chaired IUCN's Inter-commission Strategic Direction on Governance, Equity, and Livelihoods in Relation to Protected Areas. He is currently helping to coordinate India's Vikalp Sangam (Alternatives Confluence) process, the global Radical Ecological Democracy network, and the global project Academic-Activist Co-production of Knowledge on Environmental Justice (ACKnowl-EJ). His latest books are *Churning the Earth: Making of Global India* (with Aseem Shrivastava), *Alternative Futures: India Unshackled* (ed., with KJ Joy), and *Pluriverse: A Post- Development Dictionary* (ed., with Ariel Salleh, Arturo Escobar, Federico Demaria and Alberto Acosta).

NOTES

1. Stateism is a system in which the state concentrates most power in itself.
2. See Arturo Escobar, *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds* (Durham, NC: Duke University Press, 2018). See also Ashish Kothari, Ariel Salleh, Federico Demaria, Arturo Escobar, and Alberto Acosta (eds), *Pluriverse: A Post-Development Dictionary* (Delhi: Authors UpFront), (forthcoming).
3. For many more examples from India, which the author is most familiar with, pl. see www.vikalpsangam.org, and the publication 'The Search for Radical Alternatives: Key Elements and Principles', at <http://vikalpsangam.org/static/media/uploads/Resources/alternativesframeworkbookletrevisedfinal1512.pdf>
4. Farhad Mazhar and Nayakrishi Andolan, in Ashish Kothari, Ariel Salleh, Federico Demaria, Arturo Escobar, and Alberto Acosta (eds): *Pluriverse: A Post-Development Dictionary* (Delhi: Authors UpFront), (forthcoming).
5. See examples from India, Philippines, Iran, Nepal, China, Fiji, and other parts of Asia-Pacific at www.iccaconsortium.org.
6. See for example Anthony Parel (ed), *M. K. Gandhi: Hind Swaraj and Other Writings* (Cambridge: Cambridge University Press, 1997).
7. Some of the understanding of swaraj used here comes from the ongoing work of Aseem Shrivastava, including 'The Imperative of Prakritik Swaraj,' June 2016 (unpublished).
8. Parallel similar initiatives in other parts of the world include 'oil in the soil' and 'coal in the hole', anti-pipeline resistance movements in the Americas and Africa, the Zapatista and Kurdish autonomy regions, indigenous peoples' territorial rights struggles across the global South, agroecology, commons and de-growth movements in Europe and elsewhere, and many others.
9. For a detailed examination of the impacts of these policies, see Aseem Shrivastava and Ashish Kothari, *Churning the Earth: The Making of Global India* (New Delhi: Viking/Penguin India, 2012).
10. See Ashish Kothari, "Radical Ecological Democracy: A way for India and beyond," in *Development* 57(1) (2014): 36-45; Shrivastava and Kothari in *Churning the Earth*, 2012.
11. See also www.radicalecologicaldemocracy.org for details of the Peoples' Sustainability Treaties process for the Rio+20 Conference. Adapted from "In Search of Alternatives," a discussion note evolving through the Vikalp Sangam process (see note 10), available at: <http://www.vikalpsangam.org/about/the-search-for-alternatives-key-aspects-and-principles/>
12. For information on the Vikalp Sangam process and its outputs, see <http://kalpavriksh.org/index.php/alternatives/alternatives-knowledge-center/353-vikalpsangam-coverage>.
13. www.vikalpsangam.org
14. "In Search of Alternatives," see note 9.
15. <http://www.radicalecologicaldemocracy.org/treaty/>
16. An approach linking feminism with ecological perspectives, advocating the rehealing of the earth by reconnecting humans and nature that have been split by patriarchy.
17. Broadly translated as "good living," this and other equivalent terms like *sumac kawsay* are from indigenous peoples in Latin America, encompassing worldviews based on collective, mutually respectful living amongst humans and between humans and the rest of nature. See Eduardo Gudynas, "Buen Vivir: Today's tomorrow," *Development* 54(4), (2011): 441-447.
18. Loosely translated as "I am because we are," this and other African concepts put the collective or community at the center, rather than the individualism prevalent in dominant "western" society. See Thaddeus Metz, "Ubuntu as a moral theory and human rights in South Africa," in *African Human Rights Law Journal* 11(2), (2011): 532-559.
19. www.radicalecologicaldemocracy.org
20. For one example see Kothari, Ashish and KJ Joy, "Looking back into the future: India, South Asia, and the world in 2100," in Kothari and Joy, *Alternative Futures: Unshackling India* (forthcoming).

The Philippine Environment: Epicenter of Wealth, Beauty and Destruction

By Ricky Avanceña, Communications Director, Ecological Society of the Philippines

The Philippines has been truly blessed. Surrounding its 7500+ islands are the oceans and seas where the richest most biodiverse marine environments thrive, creating virtual factories of fish and aquatic resources. "The Philippines is located within the coral triangle, at the center of the highest marine diversity. Its vast, rich and diverse coastal and marine resources are composed of coral reefs, seagrass beds, mangrove and beach forests, fisheries, invertebrates, seaweeds, marine mammals and many others." Carpenter and Springer (2005) noted, "that there is a higher concentration of species per unit area in the Philippines than anywhere in Indonesia and Wallacea, that the Philippines is the center of marine shore fish diversity in the world, and that there should be special focus on marine conservation efforts due to its being an epicenter of biodiversity and evolution."

Our land has fertile plains embraced by majestic mountain ranges with tropical forests teeming with all sorts of unbelievable life forms. The diverse flora includes 8,000 species of flowering plants, 1,000 kinds of ferns, and 800 species of orchids. Common mammals include the wild hog, deer, wild carabao, monkey, civet cat, and various rodents." If you weren't a believer in a divine being, a Creator, master planner or whatever you wish to call God, seeing the beauty and bounty of the natural resources in the Philippines would make a convert of anyone. But that was then. Today the state of the environment both marine and forest would not make one believe in God but in the devil, because it sure is like hell. Easily 70% of first growth forest is gone, and whatever is left is going fast. Reforestation efforts of invasive single species can never recreate the fragile co-dependent ecosystems that exist in virgin forests. The Philippines is facing environmental issues that must be addressed in order to prevent its destruction for future generations.

The Philippines' coral colonies are being destroyed and if not addressed, the planet will feel the ecological impact. Antonio M. Claparols, President of the Ecological Society of the Philippines, reported on the destruction of the South China Seas coral colonies by China in 2016. In his organization's Facebook page on July 11, 2018, he described the wanton destruction of a marine environment which produces fish not only for Southeast Asia but for the entire world. As a result of the Philippines' early awareness of the beauty and wealth of our marine resources, we have managed to preserve some of our inter-island coral colonies. Some 60% were destroyed by the dynamite and cyanide used by small fishermen to catch fish; these fishermen were unaware that as they destroyed the coral they were destroying the breeding ground and home of the fish. They had to go farther and farther out to sea to catch fish, and with the unscrupulous trawling and massive overfishing operations of big fishery canning and manufacturing enterprises, fish once plentiful and abundant have become scarce. A country surrounded on all sides by oceans and seas, the Philippines is experiencing one of the highest rates of hunger and malnutrition not only in Asia but in the world. That is the interdependence between man and the environment. However it is not enough to say, we will take care of the marine environment. Because massive deforestation in the mountains and hills cause erosion, and with the rain causes siltation, and where does the silt end up? The ocean where it is a deadly killer of corals. There lies the environmental linkage and interdependency.

Our oceans are also facing environmental destruction as a result of the disgusting amount of waste that ends up there. Experts say that as soon as 2025 there will be more plastic than fish in the ocean. And where does all this plastic waste come from? The Philippines is one of the top five

contributors of plastic waste in the ocean, most of it coming from its rivers which flow through the urban cities into the sea, into the sea into the oceans of the world. The Pasig River, which runs through all the major towns and cities of Metropolitan Manila before ending up in Manila Bay, is one of the ten rivers in the world that contribute the most waste. These five countries contribute 60% of total plastic waste in the world. The other countries like China and Indonesia are huge countries with massive populations. For a small country like ours, it is just plain sick how irresponsible we are.

Ironically, on paper the Philippines has the best environmental protection laws in the world. Sadly, these laws are often not enforced. As a 2013 policy paper on Philippine solid waste practices¹ states, "Human activities contribute significantly in waste management. Recognizing the effects of improper management, garbage crisis can be prevented by practicing waste characterization and segregation at source, proper collection and transfer, recycling, and composting as mandated by the law." For our forests there is a total ban on logging, and open pit and strip mining is not allowed by executive order. For marine resources our Philippine Fisheries Code of 1998 expressly bans aquatic pollution. On climate change, President Duterte, despite initially opposing the Paris Agreement, has reversed his position and in doing so, recognized of the many dangers posed to the Philippines, and many other vulnerable nations, from the impacts of climate change. Many of the countries which have emitted the least carbon are going to bear the brunt of climate change impacts. That is why the Philippines and other nations formed the Climate Vulnerable Forum for "cooperation on tackling climate change and transitioning to 100 percent renewable energy."²

While not always readily apparent, we cannot ignore that climate change is happening in the Philippines. As Alexandra Gamboa, former Deputy Legal Counsel of the CCC and current Manager of Government Initiatives in the Philippines for RARE, wrote on her FB page:

The thing about climate change awareness is that we often don't think it would ever happen to us, or affect us directly, especially for slow onset events like salinization or, in this case, sea level rise. . . What is alarming to realize is that the effects of slow onset events are here and now, felt by us. Slow onset events have always been harder to justify and quantify compared to typhoons, heat waves or floods as the effects are cumulative and not readily seen or felt. That is until now. What's worse is that slow onset events, by reason of the word slow, are effects that are results of action from decades ago. If we see this sea level rise as a result of actions from years that weren't even as record breaking as those we have now, with behaviors that weren't as destructive as what we have now, what are we in for for the future? (July 15, 2018)

Gamboa calls for Filipinos to step up their carbon footprint reduction game now. Her call for action includes concrete steps we can all take to lessen the destruction of our environment: lessen consumption, buy second hand, ride a bike, divest your fossil fuel shares, invest in renewable energy, jog outside instead of using the treadmill, eat less meat, etc.

Two enlightened leaders of major institutional religions practiced worldwide accept this reality. In 2015, Pope Francis I issued a papal encyclical entitled *Laudato Si: On the Care of our Common Home*. While there are many world leaders - including President Trump of the U.S. who has pulled America out of the Paris Climate agreement³ - and scientists (usually on the payroll of big coal plants) who still deny the existence of climate change, the Pope was ahead of many not only to acknowledge the reality, but to call for urgent action. He truly lives up to his chosen name Francis, in memory of St. Francis of Assisi, today known as the Father of Ecology.

The second figure is the Dalai Lama, who tweeted on June 5 (2018) that:

The world belongs to its seven billion inhabitants. In the past communities could flourish in

isolation but know we can't. This World Environment Day let's remember that we depend on each other and that to meet the challenge of climate change, we have to work together.

In an earlier tweet, he said: "Because of our intelligence, we human beings are uniquely capable of not only creating problems, but of doing so in a large scale..." (June 1, 2018.)

In response to the challenges posed by environmental destruction resulting in climate change in the Philippines, ESP (The Ecological Society of the Philippines) has initiated the planting of mangroves in two areas in the Negros islands. This has been quite the fad lately and one often reads about companies sponsoring massive mangrove planting activities as part of what they call Corporate Social Responsibility – the catchphrase corporations use to show that they exist for more than just profit. In the past, when mangrove forests were plentiful, they protected the islands from erosion due to waves and tides, and provided breeding grounds and homes to fish and other aquatic life. These groves have been depleted due to their being cleared to create tourist-friendly beaches or developed as residential or commercial areas. But the main reason for the rapid disappearance of mangrove forests has been their being the most accessible source of cooking fuel. Due to the density of its wood and exposure to seawater, dried mangrove wood burns longer and generates intense heat. Bakers nationwide have long sworn by the use of mangrove to bake the Philippine staple bread 'pan de sal,' arguing that aside from the attributes mentioned, it adds a distinctive smokey flavor to the bread.

However, ESP is careful to replant mangroves only in places where forests had existed before but were depleted. Recent studies have shown that planting them where they did not exist affects biodiversity in the seas. By the same token, ESP is about to embark on the reforestation of an area that belongs to the Northeastern Sierra Madre Mountain ranges. This area comprises the Aurora Memorial National Park and belongs to what was once till the 1970s first growth tropical rainforest. The planting of invasive or single-species trees has also affected biodiversity in the forests. Before planting begins, however, a handbook is being created by foresters, based on studies and interviews with the indigenous people who have lived off the forests for hundreds if not thousands of years to catalogue what tree and plant life actually are endemic to the area.

A novel approach is being employed by RARE, an international NGO that emphasizes coastal restoration and resource conservation. Working with local people to find a balance between use and preserving natural resources, RARE encourages people to take pride in their natural environment and to feel a sense of accountability for how they use natural resources. When local attitudes flow from having pride in what has been given by nature, it follows logically that one must preserve it and be responsible.

We must all do what we can as the Dalai Lama has urged and help get the Creator out of the fix he has found himself in.

Enrique Quezon Avanceña is Communications Director of the Ecological Society of the Philippines. He is also a certified Climate Reality Leader trained by Al Gore, as well as an award-winning author whose work has received the Philippines' National Book

NOTES

1. See "Ecological Solid Waste Management Act (2000): Environmental Protection Through Proper Solid Waste Practices," by Albert P. Aquino, Jamaica A.P. Deriquito, and Meliza A. Festejo. http://ap.fftc.agnet.org/ap_db.php?id=153&print=1#_ftnref1
2. <https://thecvf.org/web/climate-vulnerable-forum/>
3. Tweeted June 1, 2018.

Photo Essay: "Wave"

by Mohammad Rakibul Hasan

As one of the major victims of anthropogenic climate change, Bangladesh is experiencing variable climatic conditions. Bangladesh is a small, yet overpopulated country in Southeast Asia with a largely agro-based economy. Climatic hazards like cyclone, flood, drought, soil salinity and river erosion are more frequent today. These two facts contribute to the increasing number of climate refugees who are forced to migrate to the cities, worsening the socio-economic problems there. The barrages built across the rivers inside the border of India have resulted in both flooding and drying of the river beds in Bangladesh.¹ Major rivers like the Padma, Jamuna, Meghna, Brahmaputra as well as smaller rivers in the coastal region suffer massive erosion when the water level rises. Due to prolonged droughts the temperature is increasing every year at an alarming rate. Sadly, people can't adapt to this rapidly changing climate and are on the brink of socio-economic insecurity. The waves - whether present or absent - bring no hope for these people. When they hit, they wash away people's valuable land as well as their livelihoods. After the waves are gone, nothing is left but parched, cracked river-beds.

Mohammad Rakibul Hasan is a documentary photographer and visual artist. He is currently pursuing a Certificate of Higher Education in the History of Art at the University of Oxford and also studying an MA in Photography at Falmouth University. Hasan holds a Postgraduate Diploma in Photojournalism from Ateneo de Manila University and also graduated in Film & Video Production from UBS Film School at the University of Sydney. He has been nominated for many international awards and won several photographic competitions worldwide. His photographs have been published and exhibited internationally. He is based in Dhaka, Bangladesh and represented by Redux Pictures, USA.

NOTES

1. See this report on the impact of Farakka barrage on the human fabric by Manisha Banerjee, on behalf of South Asian Network on Dams, Rivers and People (SANDRP). http://sandrp.in/dams/impct_frka_wcd.pdf



Figure 1. After the flood subsides, two friends approach the banks of the Padma River.
Location: Padma River, Mawa, Munshigonj, Bangladesh
Date: 9 September 2014



Figure 2. Trees and houses are submerged during the flooding of the Padma River.
Location: Padma River, Rajshahi, Bangladesh
Date: 28 August 2013

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Figure 3. People had to move away when the flood devastated this area near the Padma River.
Location: Padma River, Rajshahi, Bangladesh
Date: 28 August 2013



Figure 4. Roads, markets and houses are swallowed up by the Padma River during the flood.
Location: Padma River, Mawa, Munshigonj, Bangladesh
Date: 20 September 2013

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Figure 5. A building structure is being removed as the Padma River gets closer.
Location: Padma River, Mawa, Munshigonj, Bangladesh
Date: 20 September 2013



Figure 6. The Jamuna River is about to take over a village; many of its inhabitants have already left.
Location: Jamuna River, Islampur, Jamalpur, Bangladesh
Date: 5 October 2013

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Figure 7. *The river's inhabitants are always under the threat of forced migration.*
Location: Jamuna River, Islampur, Jamalpur, Bangladesh
Date: 4 October 2013



Figure 8. *Cattle in search of food; the flood destroys the green fields of their usual habitat.*
Location: Padma River, Rajshahi, Bangladesh
Date: 28 August 2013



Figure 9. Rather than move, many people struggle to live with the flood as they have nowhere else to go.
Location: Padma River, Rajshahi, Bangladesh
Date: 28 August 2013



Figure 10. A large number of cattle were washed out by the force of the flood.
Location: River Padma, Rajshahi, Bangladesh
Date: 28 August 2013

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Figure 11. Many areas of the Sirajgonj district are under great danger from serious river erosion.
Location: Jamuna River, Sirajgonj, Bangladesh
Date: 20 December 2014



Figure 12. This river resident, who lost her house to river erosion, plans to migrate.
Location: Jamuna River, Islampur, Jamalpur, Bangladesh
Date: 5 October 2013



Figure 13. This fisherman on the river Padma doesn't have an alternative place to live if the river swallows up his home.

Location: Padma River, Mawa, Munshigonj, Bangladesh

Date: 9 September 2014



Figure 14. This fisherman's livelihood depends entirely on the Padma River.

Location: Padma River, Mawa, Munshigonj, Bangladesh

Date: 9 September 2014



Figure 15. This family may have to move away as the Padma River is about to flood their home.
Location: Padma River, Mawa, Munshigonj, Bangladesh
Date: 9 September 2014



Figure 16. Children playing on the eroded riverbank.
Location: Jamuna River, Islampur, Jamalpur, Bangladesh
Date: 5 October 2013

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



Figure 17. A woman bathes in the Padma River.
Location: Padma River, Mawa, Munshigonj, Bangladesh
Date: 9 September 2014



Figure 18. A riverside resident near the Padma River.
Location: Padma River, Mawa, Munshigonj, Bangladesh
Date: 9 September 2014



Figure 19. People bathing in the Jamuna River.
Location: Jamuna River, Sirajgonj, Bangladesh
Date: 20 December 2014



Figure 20. An embankment at the Padma River that protects the town of Sirajgonj.
Location: Jamuna River, Sirajgonj, Bangladesh
Date: 20 December 2014



Figure 21. Workers bring sand to dump at the river bank to protect their villages from flooding.
Location: Jamuna River, Islampur, Jamalpur, Bangladesh
Date: 5 October 2013



Figure 22. This view of the river seems tranquil, but during the flood it changes.
Location: Padma River, Mawa, Munshigonj, Bangladesh
Date: 9 September 2014



Figure 23. Man checks the vulnerability of the river bank.
Location: Padma River, Rajshahi, Bangladesh
Date: 26 August 2013



Figure 24. The waves of the Padma River.
Location: Padma River, Rajshahi, Bangladesh
Date: 28 August 2013

BOOK REVIEW

Eco-Criticism in Japan,
Hisaaki WAKE, Kejiro SUGA, Yuki MASAMI, eds.

by Stephanie A. Siehr, University of San Francisco

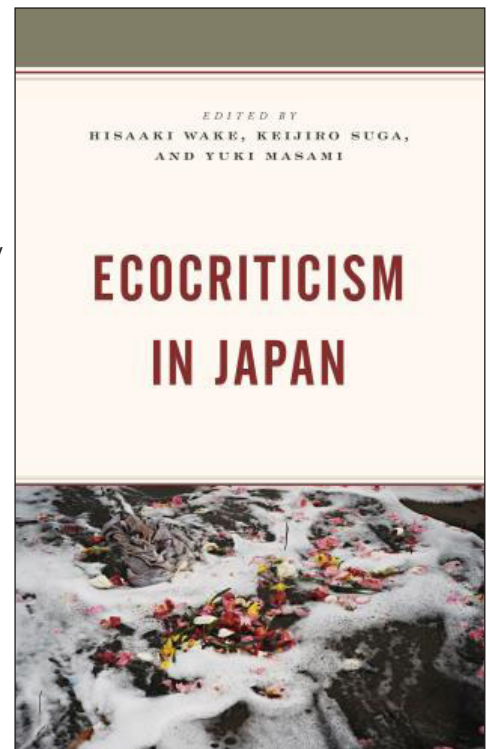
As reflected in traditional Japanese poetry and artwork, Japan is a place of beautiful yet fleeting cherry blossoms and waves so fearsome they are known worldwide by their native name of *tsunami*. From the onset of Western industrialization and world wars, Japan has also become known for man-made disasters inflicted on nature and society, and these disasters figure prominently in modern Japanese literature and film. The book, *Eco-criticism in Japan* (Wake, Suga, and Masami, eds. 2018), explores Japanese literature and film through the themes of environmental crisis, harmony with nature (or lack thereof), and the 'slow' injustice of long-term environmental damage.

Eco-criticism as "environmentally oriented literary study" was formed as a discipline in the US in the 1990s (Heise, Forward). Culturally contentious from the start, the discipline has evolved through international comparative analysis and by authors within a culture shaping their own critiques. A broader view of eco-criticism by Kerridge (in Loftus, Ch. 2), expands the definition across cultures and history, "to track environmental ideas and representations wherever they appear... in cultural spaces..."

The book follows the more expansive definition as it examines representation of nature in Japanese literature and film. The collection of essays spans a range of historical periods and cultural forms, from the 11th-century *Tale of Genji* and literary critiques of industrial modernity in the late 1800s by Reiu Taoka, to present day examination of environmental disasters in the *anime* work of Miyazaki and numerous artists exploring the aftermath of the 3/11 earthquake, tsunami, and Fukushima nuclear disaster. Typically, the essays address environmental issues of radiation and toxic waste, deforestation and soil erosion, air pollution and species extinction.

The essays — and the cultural works they discuss — give varying degrees of attention to the environment. Nature is often noted as a nostalgic connection to the past, not the present. Visions of the future are mostly portrayed as dystopian, with human devastation of nature. Nature seeks to protect and revive itself by excluding or even battling humans, as in Miyazaki's *anime Princess Mononoke* where forest creatures battle human destruction of the forest (Wake, Ch. 12) or grasses and cows slowly reform the post-Fukushima radiation-laden landscape, as envisioned in Shinnami Kyosuke's non-fiction work *The Cattle and Soil* (Suga, Ch. 9).

Even more than nature, much of the literature and film examined in the book emphasizes social issues — from nuclear radiation to oppression of women, and the internal struggles of individual characters — such as the kamikaze pilot in *The Eternal Zero* and the warrior princess in Miyazaki's *anime, Nausicaä of the Valley of the Wind*. This emphasis on the individual was noted by the writer and social critic Reiu Taoka nearly 100 years prior, in his critique of Western-style modernity and its dangers of industrialization and "a purely selfish and utilitarian spirit" (Loftus, Ch. 2). Reiu held



that every human being has a right to the essentials of water, air, and land, but access to those essentials was being restricted by the rising prices and pollution of capitalism and industrialization.

Reiun's early critique of the problems of individualism, echoes the observations of the Bengali novelist, Amitav Ghosh, in his book *The Great Derangement: Climate Change and the Unthinkable* (2016). Ghosh argues that the failure of modern society to act on climate change is reflected in the failure to write literature about climate change; the modern emphasis on the individual dissuades writers from imagining the collective epic. Ursula Heise nods to Ghosh in her Foreword to *Ecocriticism in Japan*, noting that despite Japan's active participation in global climate agreements in the political and economic spheres, Japanese cultural output has focused on more localized and acute environmental problems.

Indeed, there is almost no attention to climate change in the entire book. Only in the eerily prescient novel *Inter Ice Age 4*, published by novelist Abe Kobo in 1959 (Ueno, Ch. 4), is climate change mentioned. In this dystopian story, sea-level rise motivates the clandestine genetic engineering of humans to live underwater as cyborg aquans. There is no notion of fending off climate change or of reconciling with nature; the aquans go underwater, leaving plants and creatures on land to adapt without interference from humans.

In perhaps the most skeptical essay, "On the Ideological Manipulation of Nature in Japanese Popular Culture" (Ch. 12), Hisaaki Wake asserts that "popular culture products" rather than artistic work itself, can manipulate audiences. Wake examines the anime of Miyazaki, the war-time novel *The Eternal Zero* by controversial author Hyakuta Naoki, and Ishimure Michiko's tale of mercury poisoning in Minamata Bay, *Paradise in the Sea of Sorrow*. Wake views all the authors/artists as conflicted or "ambivalent" about the production of their work and their public statements about nature. He concludes that "environmental consciousness... employed in a popular culture product, is only likely to serve to increase the work's market value."

In contrast, Takazawa Shuji (translated by Caroline Wake) offers another interpretation of Ishimure in the essay "From <Passion> to <Compassion>: The World of Ishimure Michiko's Works" (Chapter 10). Takazawa highlights Ishimure's personal experience living near Minamata Bay and her spiritual connection to nature and outcasts there. Her writing portrays a young girl as a spiritual messenger, envisioning herself as a white fox transformed into a human, feeling that human words could never describe the vivid and nuanced world of nature and its spirits.

The work of artist Okabe Masao does not use words at all. Rather, the artist works solely in frottage, creating rubbings on paper of "surfaces charged with historical significance" such as buildings and trees in Hiroshima and Fukushima (Suga, Ch. 9). Suga eloquently explains that "trees are the living testimony of a place," and that Okabe, "...by his rapid steady motion of arms and hands ... gives voice to the surfaces" which "begin to emanate the buried memories."

Ecocriticism in Japan benefits from the varying perspectives of its Japanese and North American authors, who include a poet (Suga), a Japanese language professor (Wake), and a professor of socio-environmental studies (Masami). The richness of the book also comes from its broad sampling of Japanese literature and cultural media, giving us a glimpse of environmental aesthetics before industrialization, along with deep and detailed examination of current cultural interactions with nature.