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THE SIAM SOCIETY
UNDER ROYAL PATRONAGE

Cover: Shaq Koyok, "Confession of Palm Oil", 2013; see the authot's article in this volume.

The *Journal of the Siam Society* is a peer-reviewed and Scopus-listed journal published by The Siam Society Under Royal Patronage, one of Thailand's oldest and most active scholarly organizations. At the Society's foundation in 1904, it was resolved that "The objects of the Society shall be the investigation and encouragement of Art, Science and Literature in relation to Siam and neighbouring countries."

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Papers and presentations from a conference on
"Cultural Wisdom for Climate Action: The Southeast Asian Contribution,"
held at the Siam Society on 12–14 January 2023

Heritage and Politics, Past and Future

Introduction: Southeast Asian Culture
Countering Climate Change

What can Southeast Asian cultural heritage offer in the struggle against climate change? That was the subject of a conference at the Siam Society in January 2023.

As the prospects for averting catastrophic levels of global climate change dim, governments and international organizations convene ever more conferences, which conclude with commitments to reduce carbon emissions, explore carbon sequestration, and aid developing countries exposed to devastation from droughts, floods, heatwaves and rising seas. Solemn pledges are made, couched in turgid diplomatic prose. Results are disappointing.

At these international forums, hopes rest primarily on technological solutions which will enable countries to avoid fundamental change in their ways of life. Vested interests, domestic political constraints, and international power rivalries block any commitment to the transformative actions that are required to protect the planet.

Amongst all the technological approaches to the climate challenge, cultural heritage is overlooked. We tend to look forward to technological solutions to problems that technology itself created, but we lack the imagination to look back at indigenous and ancestral ways of living that were climate friendly, environmentally benign, and eminently sensible. This accumulated wisdom can enable us to imagine a different future that no longer accepts the inevitability of our present "take and waste" way of living that is poisoning our air, land, and water.

In recent years, however, civil society, primarily in Europe, the Americas and Africa, has pointed out lessons are at hand in the traditional knowledge and ways of life embedded in our cultural heritages, but largely forgotten. We just need to open our eyes and minds to find them.

In January 2023, the Southeast Asian Cultural Heritage Alliance (SEACHA), with the Siam Society as its secretariat, brought together a group of experts and youth leaders from the ten nations of ASEAN to explore the potential of culture and cultural heritage to supplement technological solutions to the challenge of climate change. At a three-day conference, civil society leaders and academics joined with ASEAN youth representatives passionate about cultural heritage and climate change to consider the topic of "Cultural Wisdom for Climate Action: the Southeast Asian Contribution." Speakers demonstrated the potential value of recovering the traditional knowledge, techniques, and ways of life that allowed earlier generations of Southeast Asia to live in circular economies and in harmony with nature. This was the first time that such an approach to climate action had been considered in Southeast Asia.

Due to the importance of the subject matter and the value of the proceedings,

this volume presents the scholarly articles authored by the civil society leaders and academics, and a summary of the eloquent, insightful and passionate presentations by the youth representatives. The articles cover a wide range of topics: traditional stewardship of forests, land, and water and its role in preserving biodiversity and natural resources; traditional approaches to architecture and urban design, and their adaptation to the present day; the legacy of colonialism and the need to move beyond dominant Western approaches; and the roles of beliefs, religious systems and artistic practice in spearheading change. The youth panels present case studies on sustainable living; sustainable cultural production; the mobilization of traditional beliefs and practices; and overcoming the language barriers that inhibit traditional communities and access to their wisdom.

Three principal messages emerged from the conference.

First, traditional climate friendly methods for living in harmony with nature, which are largely ignored by policy makers, are wide-ranging in scope and available for broad use in the modern world.

Second, the age-old and eco-friendly principles of traditional architecture and urban design can be adapted to modern materials and conditions to create better homes and cities.

Third, spiritual traditions, based on historically deep beliefs, wrap nature together with humanity to form a basis for activism.

The output of the conference captured in this volume stands on its own as a contribution to the global discourse on climate action, with a perspective that is entirely new for Southeast Asia. More importantly, SEACHA and the Siam Society conceived of the conference as the start of a campaign to win recognition that the cultural heritage of Southeast Asia offers alternatives to the Western pattern of modern life that underlies the looming climate catastrophe.

SEACHA will be involved with Western civil society partners in pressing for inclusion of cultural heritage, culture and the arts in strategies for dealing with climate change. SEACHA will also work with ASEAN youth to establish a robust movement pushing for climate heritage approaches in their countries and in the region. This generation stands to suffer most from climate change, and must ultimately lead us to solutions. SEACHA will attend COP conferences and associated regional meetings to explain the role of cultural heritage as a supplement to technological solutions of a problem that technological progress caused in the first place.

From the Floating Lotus to Groot's Wisdom: Engaging Contemporary Ecological Challenges with Southeast Asian Cultures

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ABSTRACT—The late ASEAN Secretary General, Surin Pitsuwan, had a yet to be realized dream of turning ASEAN from a relatively successful regional organization into a community. Given the heightened threats to human security coming from ecological problems, it is important to ponder the ways in which cultural treasures in Southeast Asia could help Southeast Asians, young and old, face these ecological threats as a community. To pursue this thesis, this article is organized in five steps. First, it identifies the ecological threats in Southeast Asia in the forms of traditional elements: earth/soil, wind, fire, and water. Second, it examines the traditional epistemic grounds for knowledge and practices in dealing with nature. Third, it uses the ancient story of a wounded warrior discovering the Malay martial art of *Silat* to suggest solutions to these threats. Fourth, it reviews two successful cases of protecting nature in Southeast Asia, "yellow trees" in Thailand and "green mosques" in Indonesia. Finally, it turns to a successful Marvel movie for inspiration on how to achieve a new self-understanding to protect and foster human (and non-human) community.

Introduction: Surin Pitsuwan's legacy

In the program "The Asia Chess Board" organized by the Center for Strategic and International Studies in Washington, DC on 25 June 2021, Professor Amitav Acharya, the eminent scholar of ASEAN, pointed out that there are three basic ideas that ASEAN owed to the late Surin Pitsuwan, perhaps its most colorful, widely respected, and authentic secretary general. They are: Surin's criticism of ASEAN non-intervention stance and his call for a more flexible approach "even if it means interfering in the domestic affairs of member states"; his commitment to "people's ASEAN", not merely state relationships but also civil society; and lastly his open advocacy of democracy and human rights.[1]

While I have little to disagree with Acharya's take on Surin's contributions to ASEAN, the image that vividly stands out in my memory of Surin Pitsuwan as ASEAN Secretary General is of him tirelessly giving talk after talk, waving the ASEAN little green book while speaking. Toward the end of his tenure, I believe Surin understood that his most difficult mission was to transform ASEAN from a highly successful regional

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[1] https://www.csis.org/analysis/pawn-or-queen-asean-chessboard (accessed 26 September 2022).

organization into a human community that is "caring and sharing," which would only be possible with tolerance and acceptance of cultural, historical, religious, and linguistic diversity, among others.[2] Surin reiterated his conditions for engendering the ASEAN community by underscoring three aspects: because ASEAN is diverse, "our people" need to learn to live with diverse behavior, with mutual respect among them; while ASEAN economic success is great, "what is more important … is the equitable distribution of that growth"; and there is a need for cultural, civilizational, and religious dialogue. He concluded optimistically that ASEAN leaders "are very much aware of the challenges before them. That's why the cultural and religious community are as conscious of this as the economic and political community as the security community, because without a strong

Figure 1. Surin Pitsuwan

human cultural community ASEAN will be on a very flimsy foundation."[3]

I believe that his most ambitious mission for ASEAN was to move it from being a regional organization of ten diverse states into a human community with multiple ethnic and religious identities among people with hundreds of languages. Surin's intended legacy is so very difficult to realize precisely because ASEAN was too successful as a regional association of states. The question at this point is: would ASEAN's existence as a regional organization be adequate to cope with unprecedented ecological threats presently facing the Earth, both natural and human-made? Or due to these perilous threats, does Surin's legacy of an "ASEAN human community" have a chance to spring to life to usher in the new age of Southeast Asia?

The thesis and the argument

In pursuit of Surin Pitsuwan's ASEAN legacy of transforming the regional organization into a human community underscoring the values of sharing and caring among people, this article is an attempt to argue that it is important to raise the question

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[2] Surin Pitsuwan, "Vision of ASEAN Community on Societies and Cultures," in Saran Wongkajit (ed.), *ASEAN: Community in Dimensions of Culture, Conflict and Hope* (Bangkok: Sirinthorn Anthropological Center, 2014), p. 18 (in Thai).

[3] Surin Pitsuwan, "Untitled Keynote Speech," 24 August 2012, in Imtiyaz Yusuf (ed.), *ASEAN Religious Pluralism: The Challenges of Building a Socio-Cultural Community* (Bangkok: Konrad Adenaur Stiftung, 2014), pp. xix–xxii.

of how cultural treasures in Southeast Asia, both traditional and popular, ancient as well as contemporary, could help Southeast Asians face these ecological threats as a community. Courting this question, this article begins by discussing the prevalent ecological threats in the forms of Asian traditional elements: earth/soil, water, wind, and fire. Second, given how ASEAN has dealt with such threats suggests that there is indeed a need to let go of the dominant conceptual mode which renders people blind to others' sufferings and deaf to cries of those oppressed, and in which "the others" are seen only as objects that states can utilize and manipulate at will. This part is to demonstrate that it is difficult to pursue Surin's legacy precisely because of the dominant epistemic belief governing the structure and practices of modern lives including organizations such as ASEAN. I then advance a critique of such dominant understanding of being human not as one who thinks, but as one who breathes, an act that naturally connects one's life with others. To accentuate the fact that such epistemic critique is not merely isolated philosophical rumination, the third part explores an ancient Southeast Asian story of how a wounded warrior discovered *Silat*, a traditional Malay form of martial arts, in the process of fighting the floating lotus, as a fascinating example of how humans might reconnect with the elements in nature through different body movements including breathing. Fourth, to move into real life experiments of how Southeast Asian cultural resources could be used to protect nature, two relatively contemporary examples will be briefly examined. They are: "yellow trees," the ordination of trees by Buddhist monks in Thailand to protect the forest; and "green mosques," the setting up of environment friendly mosques in Indonesia. Finally, drawing from contemporary popular culture, the immensely successful Marvel movie, *Guardians of the Galaxy*, this keynote address concludes with an examination of how a most unique superhero explains why he decides to sacrifice his own life to save his inter-galactic friends from impending death as a modern inspirational story of how living nature could foster human (and non-human) community. Though contemporary popular culture is oftentimes condemned as the foreign invasion of globalization through cultural artifacts such as Hollywood films, I argue that these artifacts are in fact sites of power and resistance where cultural politics manifests itself.[4] The steps by which I walk through this thesis can be captured in five phrases: Threats: Soil, Water, Wind and Fire; *spiro ergo sum*, "I breathe therefore I am"; the warrior and the Floating Lotus; "Yellow Trees" and "Green Mosques"; and finally: the Guardian Groot's wisdom.

Threats: soil, water, wind and fire

In the eyes of the US Secretary of Defense Lloyd Austin, climate change is "a profoundly destabilizing force of our world" that makes it difficult to defend the US and its allies. To stabilize global security, it is therefore important for the US to seriously address the existential threat of climate change in Southeast Asia. Such American policy would also help the US "reap the soft-power benefits, gain advantages from high levels

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[4] William A. Callahan, *Cultural Governance and Resistance in Pacific Asia* (London and New York: Routledge, 2006), pp. 5–6.

Figure 2. Impact of tsunami of 26 December 2004 at Banda Aceh (photo Michael L. Bak at Wikicommons)

of trade and investment, and promote US prosperity back home."[5]

Instead of pursuing Austin's security-oriented lead to identify "existential challenges of climate change in Southeast Asia," I would rather return to a traditional notion of what constitutes the Earth as a living planet, namely earth/soil, water, wind and fire.[6] While it could be argued that it is these elements that make planet Earth a living organism, under the drastic environmental changes that have put our world at risk, the erosion of these elements themselves indicate how our planet is heading towards a descent into a grim future. Let me elaborate.

Soil. When focusing on the soil threat to the Earth in general, and Southeast Asia in particular, many would be rightly reminded of the deadly effect of the tsunami of 26 December 2004. A 9.1 magnitude earthquake shook the seas near the coast of Sumatra, the northwestern reaches of the Indonesian archipelago. Within weeks, 227,000 people were declared dead or missing in the tragedy that affected fourteen countries across two continents. Shockwaves caused by the monstrous quake reached shorelines as far as South Africa, some 5,300 miles away.[7]

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[5] Murray Hiebert and Danielle Fallin, "Security Challenges of Climate Change in Southeast Asia," Center for Strategic and International Studies, 5 October 2021, https://www.csis.org/analysis/security-challenges-climate-change-southeast-asia (accessed 27 September 2022).

[6] I understand that there are at least two theories of fundamental elements constituting the earth: Chinese and Indian. In Chinese Wuxia literature, there are five elements (五行) that serve as the foundation of the earth. They are: earth, water, wood, fire, and gold. On the other hand, Buddhism, influenced by Indian philosophy, proposes that there are four fundamental elements comprising a human body. They are earth (solid element in the body: skin or eyes), water (liquid element in the body: blood, sweat and tears), wind (body gases), and fire (body temperature, burning energy).

[7] Feliz Solomon and Suyin Haynes, "A Look Back at Asia's Most Devastating Earthquakes," *Time*, 10 August 2018, https://time.com/5359504/asia-earthquake-tsunami-history/ (accessed 9 September 2022).

Figure 3. Xiaowan Dam in Nanjian county, Yunnan province, Southwest China (photo Credit: Guillaume Lacombe/Cirad)

It is important to note that the frequency of earthquakes in the world is not increasing. In fact, earthquakes with a magnitude beyond six seem to have decreased from 16,849 occurrences in 2021 to 8,433 in 2021 up to the month of August. In Southeast Asia alone, the West Sumatra earthquake of 6.1 magnitude on 25 February killed nineteen people, while the Luzon earthquake of 7.0 magnitude on 27 July killed eleven people in Cordillera, Philippines. I believe there is another danger related to soil that also merits our thinking about the future of Southeast Asia.

Over 22–26 August 2022, the Malaysian Society of Soil Science together with the Institute of Biological Sciences, University of Malaya organized its fifteenth international conference of the East and Southeast Asia Federation of Soil Sciences Society in Kuala Lumpur (ESAFS 2022) on the theme "Our Soils Our Future." The conference looked at degradation due to soil erosion, soil pollution, soil organic matter, carbon depletion, soil sealing/capping, soil compaction, and soil acidity, salinity, and alkalinity. Such soil atrophy, influenced by climate change, is negatively affecting food production, and therefore food security, national economies, provision of ecosystem services and increasing poverty in East and Southeast Asia. In addition, the situation is aggravated by unsustainable soil management practices, resulting from rapid economic development and intense urbanization of countries in the region. In short, "our soils are indeed our future" because maintaining and improving soil health is crucial for Southeast Asia to have sufficient food for its population in the future.[8]

Water. In 2019, Southeast Asia was said to have faced its worst drought in a hundred years, aggravated by the fact the China's eleven dams on the northern part of

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[8] https://www.msss.com.my/esafs2022/, accessed September 27, 2022.

the Mekong River further deprived downstream nations of water.[9] The Mekong River is the tenth largest river in the world. From its origins in the Tibetan plateau, the first 2000 kilometers of the Upper Mekong Basin, covering some 190,000 square kilometers, are in Chinese territory. From Yunnan province in China, the Mekong flows downstream through five other countries: Laos, Myanmar, Thailand, Cambodia, and Vietnam. Rich in both biological and cultural diversity, this region is home to over 240 million people with more than a hundred different ethnic groups.[10]

Due to rapid socio-economic and cultural change, guided by a growth-oriented economic development model, increasing transnational cooperation in infrastructural development, and freer cross-border flows of people and commercial goods, the existing cultures characterized by subsistence practices and local knowledge have come under serious threat. Focusing on the impacts of transnational infrastructure development, especially the construction of hydro-electric dams in China and the blasting of shoals and reefs for commercial navigation, Yos Santasombat argues that this "transnational enclosure", an increasingly centralized decision-making process, enables the state and commercial interests to gain control of this great river of life. He writes:

> Enclosure tears people from their rivers, lands, and forests, removing these natural resources, along with accompanying knowledge and cosmologies, from the cultural framework in which they have been embedded and forcing them into a new framework which reinforces the values and interests of the state and dominant groups."[11]

Wind and Fire. A combination of wind and fire threatens the well-being of people in Southeast Asia in the form of haze. Often produced by fires in extremely fire-prone swamps in Kalimantan (Indonesian Borneo), Sumatra or in Malaysia, haze severely undermines Southeast Asian economies by reducing productivity and tourism, while increasing emergency medical spending. In 2015, haze cost Indonesia US\$ 16 billion, while in 2019, the cost was US\$ 5 billion. Haze is made up of dangerous biomass particles which can enter human lungs and bloodstream, causing short and long-term respiratory, dermatological, and ophthalmological complications among young children and adults alike. The 2015 haze killed from 40,000 to 100,000 people in Indonesia, Malaysia, and Singapore.

The fires that produce these hazes occur both intentionally when land is prepared for planting, or accidentally from lightning during thunderstorms. These fires can burn underground for a very long time while releasing potent smoke that can travel vast distances, crossing various national boundaries. Very bad haze reaches almost all areas of Southeast Asian nations. Without a large amount of water from heavy rainfall, it is close to impossible to suppress.

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[9] Hiebert and Fallin, "Security Challenges."

[10] Yos Santasombat, *The River of Life: Changing Ecosystems of the Mekong Region* (Chiang Mai: Silkworm Books, 2011).

[11] Yos, *River of Life*, pp. 7–8.

Figure 4. Haze in Riau province, Indonesia in March 2014 (photo: AFP)

What is most remarkable about the haze produced by wind and fire is that both the causes and effects cross national boundaries. Sometimes, it was local commercial palm-oil and pulpwood plantations. Other times, foreign plantations have been linked to fires. Home governments of foreign plantations have defended their national companies against accusations of causing haze. Haze has caused diplomatic rows between Indonesia, which labeled complaining neighbors as "ungrateful" for the fresh air that Indonesia provided them outside the haze season! Singapore has put in place an extraterritorial law that can hold liable any entity that causes haze in Singapore.[12]

Taking the threats from the four elements of soil/earth, water, wind, and fire together, what emerges is that ASEAN is facing multiple problems that have a very complex transboundary nature which cannot be addressed by any individual country. More importantly, because of the dominant transnational enclosure reality of ASEAN, unless the regional organization finds a way to shed the shield of collective nation-states that constitute this regional organization and pursues Surin Pitsuwan's legacy of transforming it into a "sharing and caring" community, it has very little chance of coping with the avalanche of complex threats which have produced destructive climate change in Southeast Asia.

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[12] Helena Varkkey, "Borderless haze threatens Southeast Asia," *360 One World Many Voices*, 15 August 2022, https://360info.org/borderless-haze-threatens-southeast-asia/ (accessed 28 September 2022).

Spiro ergo sum[13]

In the previous section, I have discussed various environmental threats to Southeast Asia. A most glaring man-made threat perhaps is what the Chinese government has done in the past decades to the international Mekong River. In constructing its eleven hydro dams in the northern part of the Mekong River, the Chinese government has exercised its rights on the portion of this international river which passes through its national territory. As Yos Santasombat puts it sharply: Mekong as the river of life for hundreds of millions of people is torn asunder from local fabrics of self-reliance and redefined as "state-property" to be exploited for commercial interests.[14] Yos's ferocious indictment of the Chinese could be construed as resulting from how his theoretical notion of "transnational enclosure" has been influenced by Marxist ideas, and specifically primitive accumulation, or David Harvey's "accumulation by dispossession" as suggested by some.[15] However, I believe that something much deeper has been at work to make it possible for a river of life to be transformed seamlessly into a commercially viable state-property. It is the epistemic grounds responsible for such a cruel miracle that needs to be called into question.

In the early 20th century, drought in India caused so much distress that around nineteen million Indians are reckoned to have died of hunger in 1901. But according to Sarah Dry's *Waters of the World* (2019), these famine-led deaths were due less to lack of rain than to the British imposition of a cash economy. Indian farmers were discouraged from their traditional practice of storing grain for hard times with the result that millions perished when famine struck.[16] It is also remarkable to note that the proposal that human activity was affecting the atmosphere was rejected as implausible as late as 1938.[17] Because human action was not considered part of the earth ecology at the time, this almost self-evident truth was considered far-fetched. To alter this belief requires an assessment of the dominant epistemic ground responsible for such segregation.

This need was eloquently addressed by Amitav Ghosh in his *The Great Derangement* (2016), which delivered a strong indictment of European and American fiction for failing to address "the most pressing problem of all—the global climate change catastrophe."[18] Ghosh pointed out that this failure could be attributed to the fact that contemporary fiction is heir to an intellectual legacy that values the probable over the improbable, and the steady norm over the turbulent exception. As a result, fiction writers were incapable of even imagining the scale of the crisis. Calamity of such magnitude was therefore

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[13] Some discussion in this part is drawn from my "Breathing the Others, Seeing the Lives: A Reflection on Twenty-First Century Nonviolence," in Joseph Camilleri and Deborah Guess (eds), *Towards a Just and Ecologically Sustainable Peace: Navigating the Great Transition* (Singapore: Palgrave Macmillan, 2020), pp. 229–248.

[14] Yos, *River of Life*, p. 8.

[15] Ian G. Baird, "Review of Yos Santasombat's River of Life," in *Anthropos: International Review of Anthropology and Linguistics,* 108 (March 2013), pp. 360–361.

[16] Jenny Uglow, "What the Weather Is," *The New York Review of Books*, 65, 20 (19 December 2019), p. 57.

[17] Ibid., p. 58.

[18] Aaron Matz, "Flaubert's Planet," *The New York Review of Books,* 69, 12 (21 July 2022), p. 23.

Figure 5. Amitav Ghosh (photo: asiasociety.org)

"unthinkable." Ghosh concluded that it was this vast "Western" *epistemic tradition* that had restrained them.

To critically examine such epistemic ground influencing modern intellectual traditions, let me proceed by analyzing a book *Time* considered "the eco-bible" of the latter part of the 20th century. E. F. Schumacher's *Small is Beautiful* is in fact a creative critique of mainstream economics which shifts the focus to "economics as if people mattered" with a prominently innovative chapter on "Buddhist Economics." Mainstream economics, he believes, has been under the influence of six leading ideas dominating the modern mind, which are products of 19th and 20th-century thinkers: evolution, competition, materialism, sexual instinct, relativism, and positivism. I believe, however, that Schumacher missed a most distinguished 17th-century philosopher who continues to influence modern and postmodern thought in terms of dominant epistemology and its critique. His name is René Descartes.

Descartes wrote: "I, who was thinking them, had to be something; and observing this truth: I am thinking therefore I exist, …." He continued: "if I had merely ceased thinking, I would have no reason to believe that I existed, even if everything else I had ever imagined had been true. I thereby concluded that *I was a substance whose whole essence or nature resides only in thinking*, and which, in order to exist, has no need of place and is not dependent on any material thing."[19]

It is the thinking activity of the person as a disengaged actor that defines one as

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[19] René Descartes, *A Discourse on the Method of Correctly Conducting One's Reason and Seeking Truth in the Sciences*, translated with an introduction and notes by Ian Maclean (Oxford: Oxford University Press, 2006), pp. 28, 33.
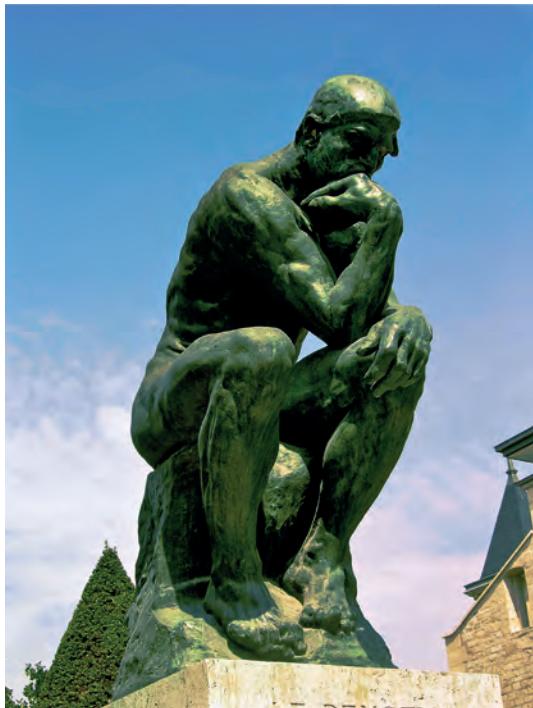
Figure 6. Rodin, The Thinker (photo: Wikicommons)

being human. This formulation was elegantly enshrined in the renowned philosophical dictum: *Cogito ergo sum* or "I think therefore I am." The image of the Cartesian human could very well be August Rodin's statue "The Thinker," but with a roofed wall blocking him from the world, with all lives effectively left outside so he could do his "thinking" in isolation. It is this idea of the isolated human being doing the thinking, separated from the rest of lives of the world, that is in some ways responsible for one's inability to see life in other living beings. Or if the life is indeed seen, then it becomes a means to the ends of the seeing agent, which consequently makes it easier to indulge oneself in a globalized world of indifference instead of facing and preparing for the ecological crisis that will impact all of us as a human community. It is therefore important to explore alternative epistemic ground that could help forge a way to be human that is conducive to caring for the earth and other humans.

While Descartes' dictum of *Cogito ergo sum* connects the thinking agent with their existence philosophically, for the human agent who thinks, no matter how secluded or concentrated they are, a realistic philosophical assumption will have to also assume that *the thinking agent is alive*. For humans, to be alive means to be able to breathe. But there are different ways to imagine a human being who breathes as a replacement to the unrealistic disengaged self that is trapped in a Cartesian wall doing the thinking in seclusion. Through the Buddhist exercise of concentrated breathing, the being reconnects with the world, cares for the world, and, in a world framed by the language of detachment, pursues the cessation of suffering born from the illusion of attachment. In Islam too, breathing is what makes us human. But while in the Buddhist lexicon the key word is *detachment*, in Islam it is through *remembering the profound way in which humans are connected to God* that makes us human and different from other living beings.

The Qur'an says that once God breathes life into the human, then hearing, sight, feelings and mind follow.[20] This means that when a human is with life, then they can hear, see, and feel the world around them. What then does one see or feel when looking at the world? This Qur'anic verse invites humans to see the lives of all created living things. But *how does* one see these lives? One must remember that in the act of creation,

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[20] Surah-chapter 32: Ayah-verse 9; *The Qur'an*, translated by M. A. S. Abdul Haleem (Oxford: Oxford University Press, 2008), p. 13.

God breathes life into humans and so they themselves breathe. For a human, breathing is the act of living. But what does the human breathe? In the physical world, in the company of other humans, is it the dust of lives from the others that they are breathing in?

Inspired by both Buddhist and Islamic deliberations on breathing, I argue that we do indeed share the same source of lives. When we breathe others in, they can be seen and heard as the precious life that we all are. Hearing and seeing other humans therefore enables us to feel how they are, and as a result care for them. This enables us to replace the philosophic *Cogito ergo sum* (I think therefore I am) which has trapped humans helplessly in the Cartesian wall for so long, with *Spiro ergo sum* (I breathe therefore I am). By breaking down the Cartesian wall to breathe in others in the context of the natural world, one emerges with a new epistemic sense of how it is precisely the wind of life that connects us all in a human community.

The question at this point is: is this "alternative epistemic ground" of *Spiro ergo sum* only a philosophical rumination? Or is it possible to find traditional Southeast Asian cultures, perhaps outside of philosophical Buddhist and Islamic influences discussed above, that could serve as a fertile cultural ground for the advent of a Southeast Asian Community? This is where one turns to the ancient story of the warrior and the floating lotus.

The warrior and the floating lotus

Once upon a time, there was a wounded warrior floundering from a defeated battle in pain. Overwhelmed and delirious in agony, the warrior reached a fast-flowing stream. He followed the water upstream until he reached a gorgeous waterfall. To rest his wound, he sat beneath the shade of a nameless old tree. Suddenly he noticed a lotus flower rushing down the torrent. The beautiful flower ended up floating on the pool right underneath the waterfall.[21]

The wounded warrior found something strange about the nature of the alluring lotus. He watched it carried by the current. The lotus looked like it could dance. Sometimes

Figure 7. Floating lotus

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[21] Lian Sutton, "Embodying the Elements within Nature Through the Traditional Malay Art of Silat Tua," *eTropic* 17, 2 (2018), https://journals.jcu.edu.au/etropic/article/view/3652.

it sank under the raging river, but then popped up again. The curious warrior picked up a rock and threw it at the dancing lotus on the luminous water. With his trained accurate throw, the lotus sank just below the surface only to reappear unfazed on the pool elsewhere. Now even more agitated, the warrior, who had by now forgotten his wounds, picked up a nearby branch and threw it at the frolicking lotus as a wooden lance. Again, the flower twisted and turned, flowing with the current, sometimes sinking and at other times rising exquisitely.

Now evidently furious, the warrior drew his mighty sword, charged into the water, and began thrusting and hacking at the playful lotus without success. The delicate lotus flower merely swirled, twirled, and twisted away, each time appearing either too far or too close for his sword to attack. Already defeated in battle, the warrior must now have felt worse for being defeated by the lotus flower. He staggered back to the old tree, drenched in constrictive anger and tired beyond belief. With a heart of burning fire, the warrior took a deep breath and decided to meditate on the experience of his battle with the strange lotus flower.[22]

What followed was an awakening within the warrior which was at once simple and profound. The apparent fragility of the lotus flower combined with the softness and yielding nature of the water to create a harmonious form which no hardened force could destroy. The warrior began looking at all aspects of nature to aid his battle against the invincible lotus. He found his answer in a profound understanding of the Four Elements commonly cherished in so many Southeast Asian cultures.

It was this new-found imagination of the connection between the Four Elements that was at the forefront of a holistic understanding of the mind and body as reflected in *Silat Tua* in the Malay World. The Elements are explored in both the environment of training, and in terms of how they are harnessed in the mind and body. It is common for the *Silat* practitioner or the martial arts maestro to begin by defining and differentiating the characteristics of each Element, taking the maestro from the outside to the inside, and vice versa. This is indeed an example of a possible pedagogical structure of Elemental exploration within the art.

At first the *pesilat* (the *Silat* fighter), like the wounded warrior in the story of the origin of this martial art, searches from the outside, in the interaction between man and Element. The *pesilat* may be encouraged to train in different terrains, from grassy plains to sandy beaches, and muddy banks to thick jungle grounds. In this process, the *pesilat* may learn to move closer to the earth for strong grounding (Earth), *to work with the breath (Air/Wind)* and the natural internal rhythm of the heart (Fire), so as to flow (Water) with Nature, as did the lotus flower when dancing in the water in the origin story.[23] This in fact was the beginning story of *Silat Tua*, a traditional Malay martial art that has an intimate and complex relationship with nature.[24]

I have discussed the origin story of *Silat Tua* to convey the idea that within the heart

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[22] Zainal Abidin Shaikh Awab and Nigel Sutton, *Silat Tua: The Malay Dance of Life* (Kuala Lumpur: Azlan Ghanie, 2006), pp. 17–19.

[23] Sutton, *Embodying the Elements.*

[24] Awab and Sutton, *Silat Tua*, p. 13.

of Southeast Asia, especially in the Malay world, the advent of a traditional martial arts alluded to the ways in which the human can connect with nature, not dominating it, but living in accordance with its foundation, flows, energy, and connections: earth, water, fire and the breathing air. In an extraordinary way, if the story of the wounded warrior and the floating lotus is in fact the cultural story of how in the "dance of life", humans can touch, flow, catch the fire inside, and breathe in the lives around them, then I would argue that the need to shift the epistemic ground from *Cogito* to *Spiro ergo sum* is not merely a philosophical contemplation, but a possible future because the cultural underpinning for just such a shift does exist. The next step is to explore some modern manifestations of how a reimagined relationship between humans and nature have been attempted in modern times.

Buddhist "yellow trees" and Islamic "green mosques"

Yellow trees. Thailand is a country of 517, 645 sq km. In 1973, 43.2 percent of this area was forest. Some forty-six years later in 2019, this had fallen to 31.7 percent.[25] Deforestation was worst in the late 1980s, when forest cover was only 28 percent in 1988. In Northeastern Thailand at the time, there were 932 cases of conflict of which 54 percent were over land use and 31 percent over forests. In the early 1990s, Thailand experienced a rising wave of conflicts related to natural resources, with more than half between rural villagers and state agencies. They were results of a development policy with a strong emphasis on industrialization and a highly centralized management of natural resources by the state. Importantly, state officials believed that villagers could not live in harmony with the forests, and that state agencies were the "real" protectors of natural resources.[26]

In this context, one fine afternoon in 1992, the Coordinating Group for Religions in Society and other Thai NGOs invited the leaders of the Chipko Movement to come to Thailand to share their experiences of fighting against deforestation in India with their Thai civil society colleagues. The Chipko Movement began in Chamoli district in 1974, when women and girls from Reni village led by Gaura Devi stood in front of trees marked for felling. They put their bodies between the trees and armed men prepared to cut down those trees. Gaura Devi told the tree cutters in front of her: "This forest nurtures us like a mother, you will only be able to use your axe on it if you shoot me first." After a three-day standoff, the men withdrew and the movement of courageous activists who nonviolently protect the forests with their lives by hugging the trees (*chipko* means "hug" in Hindi) became legendary.[27]

In the packed small auditorium at Thammasat University on that day, I saw in the audience a young monk, well-known for his respected demeanor and interest in

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[25] Royal Forestry Department, Ministry of Natural Resources and Environment, Forest Mapping Project 2020 https://www.forest.go.th/land/รายงานโครงการจัดทำข้อม-9/ (accessed 12 November 2022).

[26] Wongsa Khamdee and Suvit Laohasiriwong, *Conflict Management in Thailand: Synthesis of Experiences and Research Document* (Khon Khaen: Dispute Resolution Institute, Khon Khaen University, 1996), pp. 32–36 (in Thai).

[27] Chaiwat, "Breathing the Others, Seeing the Lives," p. 245.

Figure 8 (top). The Chipko Movemenet, Uttar Pradesh, 1973 (photo: Wikicommons, author unknown)
Figure 9 (left). Sunderlal Bahuguna (photo: India Today archives).
Figure 10 (right). Phra Paisal Visalo (photo: semsikkha.org)

nonviolent action. If my memory serves me right, I thought I saw his eyes glitter with hopeful wisdom while listening to the story as told by the then Chipko leader, Sunderlal Bahuguna, a close associate of Gaura Devi. This monk Phra Paisal Visalo had earlier edited the first book in Thai on the Chipko movement,[28] and later started an extraordinary cultural experiment in Thailand's forest protection.

What is most fascinating is how the traveling story of the Chipko movement inspires other forms of highly creative nonviolent action to protect forests in different contexts. From the mind of the young Buddhist Thai monk listening to the Indian Hindu activists, perhaps among other influencing factors, an innovative way to protect local forests in

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[28] See Phra Paisal Visalo (ed.), *Oab Kord* (Chipko) (Bangkok: Coordinating Group for Religions in Society and Peace and Development, 1991) (in Thai).

Figure 11. Ordaining trees in the community forest for protection at Ban Thung-yao, Lamphun, in 2017 (Photo: Jarunee Khongswasdi).

Thai society was born. Creatively drawing on their own cultural resources and strength, the monk and his colleagues decided that since they were empowered to ordain people according to Buddhist tenets, why not ordain trees as a cultural measure to save the forest from the loggers' saws and blades? Thai monks then performed Buddhist rituals and tied saffron or yellow robes, the color of Buddhist monks' simple attire, around some trees that needed protection. With cultural resources at their disposal, the trees turned magically yellow, and the forests became visually enchanted with Buddhist sacredness.

Though it is hard to tell whether this cultural nonviolence put a complete stop to illegal cutting of trees in Thai forests, it is not that difficult to imagine that some Thai loggers were discouraged from cutting down trees when they saw Buddhist yellow robes around them. I would also contend that, while in the Indian case the woodcutters might be deterred from carrying out their abominable task due to the legal and moral forces underscoring the consequences of cutting down people hugging the trees in front of them, in the Thai case it is highly likely that it is the *cultural force*, not legal, of seeing ordained yellow trees that has the power to halt them.[29]

The idea of ordaining trees to save Thai forests also caught the official imagination. On 5 June 1996, a network of Northern Thai farmers together with local monks,

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[29] Chaiwat Satha-Anand, "Two Plots of Nonviolence Stories: From the Streets of Bangkok to the Forests of Thailand, *Social Alternatives*, 16, 2 (April 1997), p. 14.

academics, private companies, and state agencies initiated a mega-project to ordain fifty million trees in one hundred community forests in Northern Thailand. The project, designed in honor of the fiftieth anniversary of the Late King Rama IX's ascension to the throne, concluded on his birthday, 5 December.[30] Thai state agencies continue to organize events for ordaining trees on different occasions. For example, on 5 June 2021, the mayor of Umong Tambon in Lamphun inaugurated a 2021 environment day campaign with tree planting and ordaining trees.[31]

These activities vouch for the fact that the cultural power of ordaining trees has moved beyond the extraordinarily creative initiatives of civil society to become accepted and even fashionable among the mainstream establishment, namely Thai state agencies at different levels, local as well as national.

Green Mosques. In November 2017, the then Indonesian Vice President Jusuf Kalla launched an initiative to help mosques in the country to generate renewable energy, manage water, increase food sustainability, reduce and recycle waste, and provide environmental education. This new initiative aimed to establish a thousand eco-mosques by 2020.[32]

This ambitious project was a collaboration between top Muslim clerics, the private sector, the health and planning ministries, universities, and other religious groups to create environmental awareness in communities across the country. Hayu Prabowo, head of environment and natural resources at the Indonesian Ulema Council, said: "Most Muslims in Indonesia listen more to religious leaders than the government…. If an Islamic leader says something they will follow but if the government says something, they may not."[33] The idea of eco-mosques or "green mosques" is said to stem from asking how to make mosques the center for environment and education within a community.

Though I have not seen what has become of former Vice President Kalla's thousand eco-mosque initiative, perhaps the most glorifying example of how Indonesia has been successful in carrying out its "green mosque project" is how the Istiqlal Mosque, the biggest mosque in Southeast Asia with a capacity to accommodate some 200,000 worshippers right in the heart of Jakarta, has become the first place of worship in the world to be certified as an environmental-friendly place of worship by the International Finance Corporation of the World Bank Group. Here are some of the things that earned the Istiqlal Mosque such an accolade.

The Indonesian government redesigned the Istiqlal Mosque with state-of-the-art energy-saving measures which include reflective paint for roofs and external walls, energy-saving light bulbs, and solar photovoltaics. As the notion of Islamic cleanliness is defined by water, and Muslims need to use water faucets for ablution at prayers five times a day, the use of water at mosques presents a real problem. The Istiqlal Mosque

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[30] Ibid., pp. 14–15.

[31] https://www.chiangmainews.co.th/social/1681282/ (accessed 8 November 2022).

[32] Michael Taylor, "Indonesia unveils plan to roll out 1,000 eco-mosques by 2020," Reuters, 16 November 2017 https://www.reuters.com/article/us-indonesia-climatechange-religion-idUSKBN1DG1J8 (accessed 27 October 2022).

[33] Michael Taylor, "Can Indonesia's Muslim leaders boost public climate change action?" 17 August 2022, https://www.context.news/nature/can-indonesias-muslim-leaders-boost-public-climate-change-action (accessed 1 November 2022).

Figure 12. Solar panels at Istiqlal Mosque, Jakarta (photo © Yorri / Greenpeace)

solved this issue by reducing its water consumption. The mosque installed new low-flow faucets which flow at a rate of five rather than sixteen liters per minute, along with water-efficient urinals, flush system, and grey water treatment.[34]

What is remarkable about the Istiqlal Mosque's achievement is that everything listed which enables the mosque to receive a high honor from the World Bank Group are all assessable technical measures. Indonesia's biggest mosque is painted "green" with energy-saving technologies. A question could also be raised at this point: in what way do such actions by a mosque work toward alleviating environmental challenges in Indonesia and create conditions where society will indeed become more ecologically sustainable? In thinking through these questions, it is important to briefly examine what a mosque really is in Islam.

In Islam, a mosque is far more than a religious place of worship. It has always been understood as having dual functions, both religious worship and civil, ever since the time of the Prophet Muhammad. From Egypt to Algeria, mosques turn out to be centers of opposition with privileged status, oftentimes outside the sphere of state control, with a communication network that will always be partially independent. Ideas generated from these networks of mosques, the core of the Islamic religious structure, cut across national borders. From Friday sermons (*khutba*) to unofficial teachings and activities in these mosques around the Muslim world, "customary values have been perpetuated, political and social issues discussed, and strategies for action planned."[35]

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[34] Ayu Purwaningsih, "Indonesia Mosque Goes Green," DW, 9 June 2022, http://85.217.170.64/en/mosques-in-indonesia-go-green/video-62077965 (accessed 14 November 2022).

[35] Chaiwat Satha-Anand, "'Red Mosques': Mitigating Violence Against Sacred Spaces in Thailand and

Perhaps because of what a mosque is in Islam, it is far more important to ask what a mosque can do in the fight against environmental destruction and perhaps how it can restore a better-balanced ecological reality in Indonesia? In July 2022, top Islamic representatives met at the Istiqlal Mosque to discuss ways to raise awareness about global warming and develop climate solutions linked to Islamic teachings. Imams and other religious leaders are respected and listened to in Indonesia, and might have a big impact on both government policy and citizen action. A digital campaigner at climate activist group 350.org remarked: "Imams could affect a lot of social change…seeding awareness of environmentally-friendly life and propelling the climate movement at the grassroots level." The head of Greenpeace Indonesia urged religious leaders to "dig more into Islamic teachings about the earth and repairing it." On grounds that almost 90 percent of Indonesia's 270 million people are Muslims, and the nation has 800,000 mosques, 37,000 Islamic boarding schools, and more than 170 Islamic-led universities, Zulfira Warta, a climate project leader at WWF Indonesia, demanded that Muslim religious leaders promote environmental issues among their congregations and communities. In 2014, a few years before the "green mosque" project, Indonesia's highest Muslim clerical council (Majelis Ulama Indonesia, MUI) issued a world first non-legally binding *fatwa* (religious edict) against killing endangered animals, and in 2016 another edict to stop the burning of land and forests. Such *fatwas* could certainly bolster government regulations and inspire people to support environmental protection. The head of the Indonesian conservation group Satya Bumi concluded that: "We have the solutions—we (just) need all actors to play their part and our Muslim faith can underpin all of this."[36]

Conclusion: From "Nowhere left to go" to Groot's wisdom

This article began with a dream of ASEAN's most prominent visionary diplomat, the late Surin Pitsuwan of pursuing a caring and sharing Southeast Asian *community*, and has offered examples of climate action in two very different cultural topographies: Thai/Buddhist and Indonesian/Islamic. But if we are now living "with a whole row of Damocles swords hanging above our heads,"[37] especially in terms of ecological reality, then we need to realize that at present, we have *Nowhere Left to Go*.[38]

We have "nowhere left to go" because a new exodus is rapidly taking place all over the world. The rise in global temperature is causing plants, animal species, as well as people to move toward the poles and higher cooler ground. This exodus has begun to

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Beyond," in Ken Miichi and Omar Farouk (eds), *Southeast Asian Muslims in the Era of Globalization* (New York: Palgrave Macmillan, 2015), pp. 201–202.

[36] Taylor, "Can Indonesia's Muslim leaders boost public climate change action?"

[37] Umberto Eco, "Sign of the Times," in Umberto Eco, Stephen Jay Gould, Jean-Claude Carriere, and Jean Delumeau, *Conversations About the End of Time*, produced and edited by Catherine David, Frederic Lenoir, and Jean-Philippe de Tonnac (New York: Fromm International, 2001), p. 213.

[38] Benjamin von Brackel, *Nowhere Left to Go: How Climate Change is Driving Species to the Ends of the Earth*, translated by Ayça Türkoğlu (New York: The Experiment, 2022).

overwhelm biological and political stability.[39] Compared to the Biblical/Quranic great flood, the problem of today's climate change is far more onerous. While Noah had to cope with just forty days of rain, according to Camille Parmesan, "there is no end in sight" for the perils of today's climate change where the change never stops.[40]

Benjamin von Brackel concludes his captivating work *Nowhere Left to Go* with these words:

> the less we allow the earth to warm, the more areas we return to nature, and the more reserves and corridors we create, the more species we will be able to save, and we will at least be able to pass on fragments of life on this planet to our children and their children."[41]

But even if our modest aspiration about the world is merely "to pass on fragments of life on this planet to our children and their children", I think it wise to heed Mark Brett's painful admonition that: "Our grandchildren will not thank us for righteous indignation that simply leaves our politics broken."[42]

How then should we try *not* to leave "our politics broken"? Let us reread von Brackel's conclusion in *Nowhere Left to Go* again, but this time with a close textual analysis. In a portion of that prophetic paragraph comprising just fifty-four words, von Brackel uses the word "we" five times, "our" once, and ends the sentence with the future of "our children and their children." These five "we" words are also associated with four clear climate actions: first, "we" must work not to allow the earth to get warm; second, "we" must return more areas to nature; third, "we" must create more reserves and corridors; fourth, "we" must save more species. Only by committing to these climate actions, will the fifth "we" be able to pass along "fragments of life on this planet" to our children and theirs. Put another way, the most important task is to construct a sense of "we" that is powerful enough to carry out these required climate actions.

Here I will turn to popular culture and solicit Groot's wisdom as the final inspirational story necessary for the construction of a sense of "we" that is powerful enough to face the existing climate malady. Groot is a most unusual superhero from one of the most successful Marvel movies in the past few years, *Guardians of the Galaxy*. The movie is an intergalactic adventure of four "losers": Peter Quill/Star Lord, a human (with a godlike father, but that is another story); two humanoid aliens, the female assassin Gamora, daughter of the Titan Thanos, and the frightful Drax; Rocket, a genetically-engineered raccoon with advanced technical knowledge and a foul mouth; and Groot, a tree-like being with immense power. While innocent, Groot is at once deadly and sweet in equal measure.

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[39] Bill McKibben, "Where Will We Live?" *The New York Reviews of Books*, 69, 15 (6 October 2022), pp. 6–10.

[40] Ibid., p. 6.

[41] Ibid., pp. 6–8.

[42] Mark G. Brett, "Response: Utopian Versus Prophetic Visions," in Camilleri and Guess, *Towards a Just and Ecologically Sustainable Peace*, p. 331.

Figure 13. Guardians of the Galaxy: Groot, Rocket, Peter Quill, Gamora, Drax (images: Disney+)

The most memorable attribute of Groot is his speech which consists of only three words: "I am Groot." His communication technique depends on the various tones, sounds, and facial expressions which accompany these three words and are expertly used with fantastic communicative effect.[43]

At the end of the movie, when the guardians' galactic ship has been shot down, and the heroes are about to meet their demise, Groot the hero-tree uses his power to protect the guardians. The tree is protecting other lives. In Groot's dying moment, when he can save everyone in his tree-like shielding embrace, Rocket the bio-engineered raccoon, his closest friend, tearfully asks Groot why he is doing this when he knows full well that using his power in this way will kill him. Groot musters what's left of life to answer Rocket's question with the never-before spoken words: *"We are Groot."*

Perhaps, Groot's wisdom lies in knowing that there comes a time when the singular "I" that he has used all his life has to give way to the collective "we". By substituting the "I" with the "collective we" that cares for others and is ready to share our destiny, at times paying the necessary price, could a human community, in Southeast Asia or elsewhere in the galaxy, become strong enough to engage the challenges of climate change?

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[43] Vin Diesel, the gravelly voiced American actor who vocalizes Groot's three words, had fun doing this in so many languages.
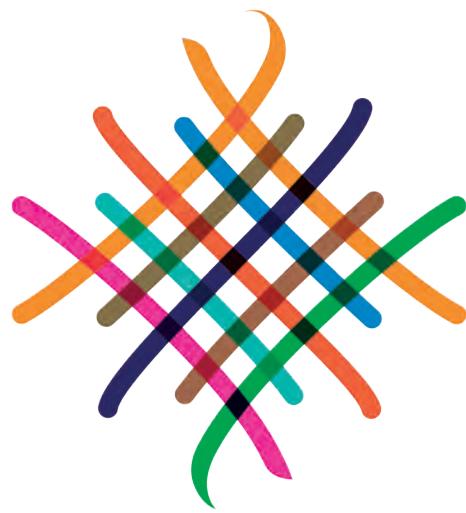
Youth Voices

An Ode to Future Generations

Joshua Anak Belayan

ASEAN Youth Advocates Network, Brunei Darussalam

ABSTRACT—Prior to the conference, a search was made to identify youth leaders on climate change and related issues from all countries of ASEAN. In August 2022, twenty-four were brought together for a workshop in Bangkok. They elected Joshua Anak Belayan to give a conference keynote on their behalf, and they formed into four groups which each chose a topic to work into a presentation at the conference. Below is a lightly edited text of the keynote speech, and a summary of the four presentations.

The right to a clean, healthy and sustainable environment was officially adopted by the United Nations General Assembly to cement the rights of future generations to enjoy the life that our ancestors and we have enjoyed for thousands of years. This legislation also helped to incentivize many environmental human rights defenders such as indigenous people who have fought valiantly to preserve their land, culture and livelihood against the unfettered greed of corporations which focus on short-term profits. As an indigenous Bornean who has roots both in Brunei and East Malaysia, Sarawak, I have seen how government policies influence the health of the forest. In Brunei, the revenue from the fossil fuel industry obviated any need to commercialize the forest, whilst in adjacent Sarawak, many forests are cleared for both timber and palm oil. At the border, there is a clear line between the monoculture palm oil of East Malaysia and the thick tropical rain forest of the Brunei border (Figures 1, 2).

Recently, I had a conversation with my grandma about how flooding is more rampant than before and how the trees once helped to manage the flood. She suddenly said quite passionately "*siapa bawa tauke balak sama sawit tu datang sini? - perintah lah!*" Or in English: who and what enabled this timber and palm oil conglomerate greed to begin with? We all know the answer, and that's our policy-makers and leaders. This symbiotic relationship between corrupt leaders and businesses is not a surprise in this part of the world. Often these leaders are of indigenous origin which justifies the exploitation of the forests because the leaders enabled the concession of these tribal lands to begin with.

In 2022, our region hosted three major geopolitical and trade summits. At this point, why do we fly thousands of miles, contributing immensely to emissions, just to agree to the status quo? This constant "beating of the drum" might be redundant but nonetheless necessary because leaders and policy-makers are not fulfilling their commitments to their grand and great-grandchildren.

I'd like to consider myself a rational optimist because I believe many strides have been made. One highlight from the 2022 COP is the introduction of the loss and damage clause, allowing developing countries to claim compensation from the developed global

Figure 1. The boundary between Sarawak (left) and Brunei near Mukim Sukang, Belait, Brunei Darussalam, showing the stark difference in vegetation (source: NASA, https://www.jpl.nasa.gov/images/pia22034-brunei-sarawak-border)

north for climate-related disasters in their region. Economies which developed in the 19th and 20th centuries have a moral duty to tackle their own emissions to give room for developing economies to expand their economic capability to enrich their population..

I am also pleased to see a growing movement supporting indigenous people's rights, especially acknowledging their contribution as environmental defenders of the land which is very much intertwined with their culture, religion and identity. Many have died protecting their heritage land, which for centuries had been feeding their people. Living off this land also helped these people to acquire knowledge from their environment, which in turn enabled them to manage their resources sustainably and to predict any approaching disaster. This knowledge can provide tools for adaptation and mitigation.

I have the great privilege of being amongst youth in both ASEAN and the Asia-Pacific Region who championed environmental and climate justice within their localities. At the recent summit, I heard an old yet new perspective on how our ancestors utilized their local knowledge to adapt to changes within their localities. I would also like to
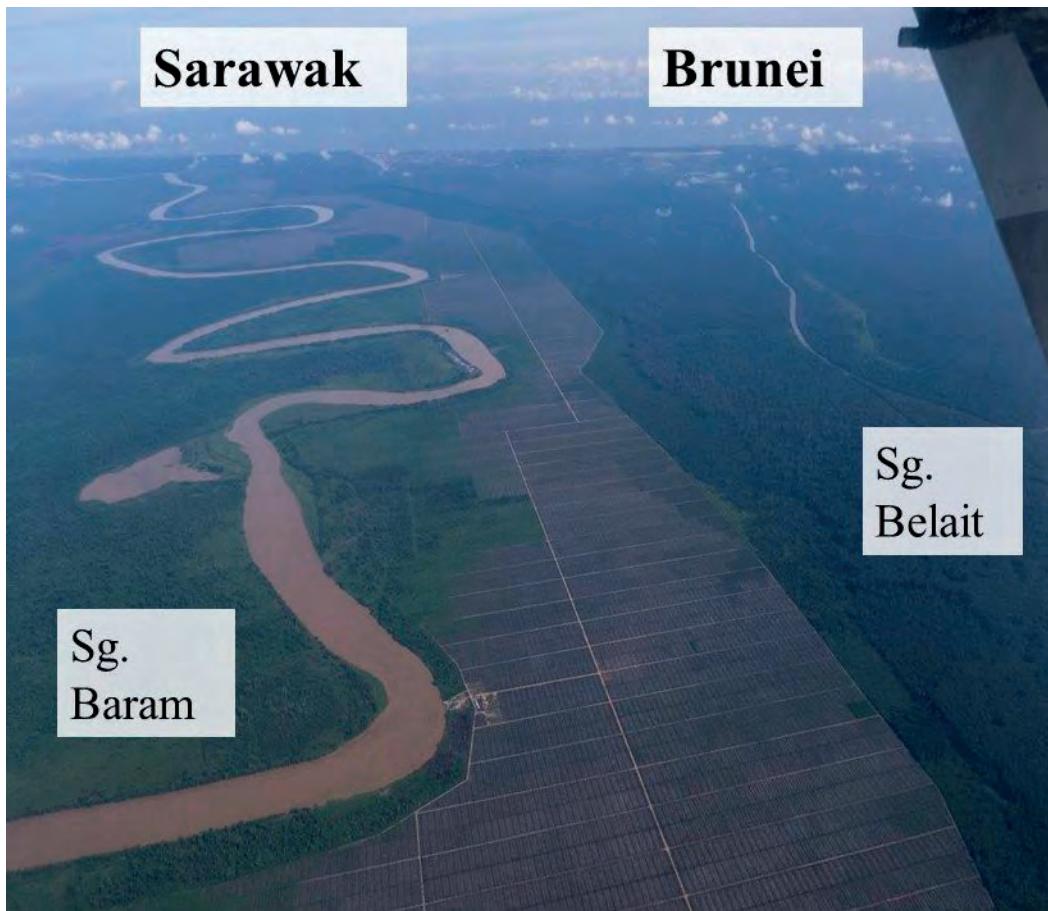
Figure 2. Side by side comparison along the Brunei-Malaysia border illustrating the intense palm oil development along the Baram river (source: Brunei Nature Society Nature Society, https://images.app.goo.gl/Zm8n5yDGJZryV9CEA)

highlight Brunei's initiative in establishing the ASEAN Centre for Climate Change which has been agreed upon in principle by the ASEAN Member States, but needs real support and commitment to further this initiative.

Policy-makers are not the only people who can influence rapid change. Businesspeople can shift their mindsets away from short-term profit and high-income revenue streams and rather look towards long-term sustainable growth. All of us have a role to play. Climate change does not discriminate. It affects all levels of society, just some later than most. I genuinely hope people in positions of power will consider the topics presented at this conference and I hope the event with inspire some passion for change.

Sustainable Living for the World

Sustainable living starts from thinking about the basics: where we live and what we wear.

In the Indonesian city of Semarang around new year, some extreme weather caused a housing complex to be flooded up to 2.5 meters deep, so people had to climb up onto their roofs to stay dry. Moreover, this was not a low area, but quite high up in the hills. It turned out the housing complex had been built very close to a river bank. Local wisdom knew this was wrong, and local regulations prohibited construction within 30 meters of a river bank, but a permit had been issued. Now the residents have to pay the cost, not only in damage to the property but also the impact on their health.

Figure 3. Ho Tay Pidok Library, Savannakhet, Lao PDR (photo from https://discoverlaos.today)

All humans need a roof over their heads and clothes on their bodies. But the construction industry and the clothing industry are two of the biggest contributors to global carbon emissions and to global waste.

Half a century ago, development and urbanization were seen as ways to improve everyday lives. Few people thought about the consequences: declining air quality, congestion, traffic, noise pollution, health problems, and climate change. The building industry is responsible for 40 percent of global carbon emissions and 2 billion tonnes of waste a year (https://architecture2030.org/why-the-building-sector/). What can we do about this?

We have forgotten about the beauties and benefits of our traditional, vernacular architecture.
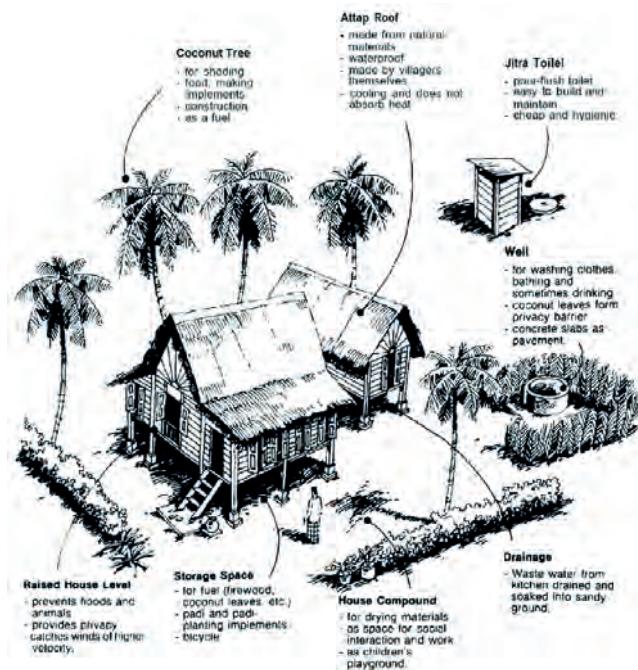
Figure 4. The external environment of the Malay House (from Lim Jee Yuan, *The Malay House*, 1987)

Vernacular architecture has four key elements. It must

1. respond to the climate conditions;

2. respond to the needs of the community;

3. be a cultural reflection of the nation; and

4. use local materials and techniques.

What does this mean in Southeast Asia?

In Southeast Asia, we share the same hot and humid tropical climate, and we share the vulnerability to natural disasters of floods and earthquakes, so we have many similarities. We like to build houses on a raised platform to allow the air to circulate and to provide for flooding. We like to have greenery to serve as a natural fence and to give shade and freshness. We like to have verandahs and balconies where the family can gather to relax in the shade.

Our traditional construction used natural materials that were found close at hand, reducing the need for transportation. These could be just as durable as modern materials. The Ho Tay Pidok library in Lao PDR is 400 years old (Figure 3; https://discoverlaos. today/savannakhet-province/thing-to-do/hotay-pidok-library). And when the materials do decay, they become fertilizer or can be repurposed in other ways.

There is intangible heritage embedded in the construction. At Inle Lake in Myanmar, the community cooperates to build a new house. The process starts with rituals to ask permission from the spirit of the land, and raise the sacred post. These traditions are passed down from generation to generation.
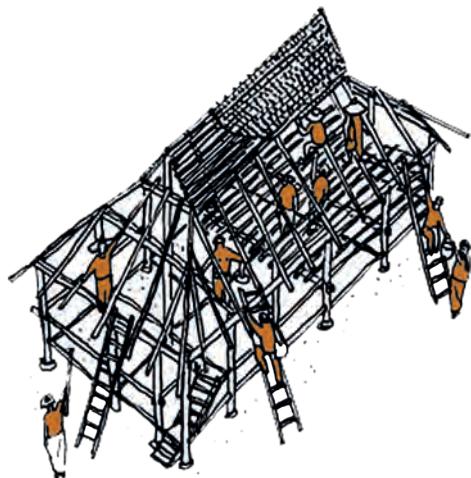
Figure 5. Communal house construction, Shan States (from: Rawiwan Oranratmanee, *Vernacular Houses of the Shan in Myanmar in the Southeast Asian Context, C*hiang Mai University)

Today we have "fast fashion". The fashion industry makes clothing fast, and consumers use it fast. The costs are hidden from our eyes. The garment industry produces 92 million tonnes of waste a year, is the second biggest consumer of water, and responsible for 2 to 8 percent of carbon emissions (https://earth.org/statistics-about-fast-fashion-waste/; https://www.unep.org/news-and-stories/press-release/un-alliance-sustainable-fashion-addresses-damage-fast-fashion). Garment workers are exposed to low wages, poor conditions, sexual harassment, and health risks from handling carcinogenic materials (https://www.oneplanetnetwork.org/sites/default/files/unep_sustainability_and_circularity_textile_value_chain_1.pdf).

Again, we should look to our ancestors. They made clothing *slowly* from natural fibers using natural processes, resulting in clothes that are comfortable to wear. They preferred items that could be used in multiple ways – as a shawl, a head cover, or a baby sling. And they favored local designs which were a distinctive part of local identity.

Xonphao is a non-profit organization in Lao PDR that supports people with disabilities to make clothing using traditional materials and traditional skills. Members of the group come from different ethnicities. They live together and they put different stories, different patterns and different skills into the clothes they make. They grow many of the raw materials they need. The group has also experimented with making accessories like bags from single-use plastic. They have been empowered to overcome their disabilities.

Figure 6. Textile from the Xonphao group (photo from: https://www.facebook.com/Xonpao/photos)

What are the messages from these stories?

In industries like construction, making a quick profit today may result in hidden costs to be paid in the future. The same can be seen on a global scale in the construction and textile industries. We must develop a mindset on sustainability. That means favoring

Figure 7, 8, 9. Xonphao group, Lao PDR (photo 5, 7 from https://www.facebook.com/Xonpao; photo 6 by Souphanith Paengmala)

local and natural materials, respecting nature, and preserving intangible culture. We must respect the wisdom of the ancestors and question how it can be relevant today. Architects must study local designs and find ways to adapt them to the climate, the natural environment, and the social demands of today. We must put pressure on business and government to support grassroots projects, marginalized people, and traditional methods.

We must look to traditional culture for learning on ethics, empowerment and the value of nature for the benefit not only of the environment but also our own wellness and health.

Widya Amasara, young heritage professional, Indonesia
Souphanith Phaengmala, environmental worker, Lao PDR
Nay Myo Htet, architecture student, Myanmar
Chanraksmey Seng, architect, Cambodia

Sustainable Cultural Production

For production to be sustainable, it must be designed to work within the ecosystem, without causing damage. At present, the world's oceans are being ravaged by plastic waste and by agrochemicals. This need not be so.

Every year, 8 million tons of plastics end up in the ocean. These materials take 800 years to degrade. They break down into micro-plastics, cycling into the food chain, and eventually into our stomachs.

The emphasis on food production through higher yields is causing imbalances in the nutrient system. The oceans are overloaded with nitrogen and phosphorus from agro-chemicals. These chemicals foster algae blooms which suffocate all life underwater, and result in emissions of nitrous oxide, reckoned to be 300 times more harmful to the climate than carbon dioxide.

We can try to reduce the use of plastics and fertilizers, but that is difficult. An alternative is to make plastics and fertilizers from materials that are kind to the ecosystem. Here there is an opportunity to use seaweed that is well established as a product all round the coasts of Southeast Asia.

Figure 10. Harvesting seaweed at Samporna in Sabah (photo by Bernama Photo via The Borneo Post)

There are records of seaweed production in Vietnam back to the 10th century. Now there is commercial production of seaweed also in Mindanao and Sula in the southern Philippines, along the coasts of the peninsula in Thailand, in Kampot province of Cambodia, in Rakhine and Tanintharyi areas of Myanmar, in Indonesia, and on the east

coast of Sabah in Malaysia. The varieties include Eucheuma and Kappaphycus. The seaweed is used for food, animal feed, traditional medicines, and the extraction of agar.

Figure 11. Seaweed production around Southeast Asia.

The calm waters around Sabah are especially good for seaweed production. The main producers are the boat dwellers or sea gypsies, known as Bajau Laut, Sama Dilout and other names around the region. They live from the ocean through fishing, pearl diving, and various crafts. They live on their boats, in stilt-houses built on reefs or small islands, or on house-boats.

Figure 12. Sorting seaweed in Sabah (photo courtesy of Salleh Abdul Salleh via New Straits Times)

To sustain the ecosystem, products should be designed based on their natural function, and their lifecycle should be a circle where the end is the beginning is the end. Seaweed has many applications. It can used as fertilizer, which is spread on farmland, from where trace elements are leached into the waterways, and return to the sea. It can be converted to seaweed powder which is used to produce bioplastics, pharmaceuticals, or cosmetics, then degrades into carbons, and again trace elements are leached from landfill into waterways and back to the sea.

Figure 13. Lifecycle of sustainable seaweed producton

Figure 14. Lifecycle of sustainable seaweed production

This industry has the potential to transform the economic and the social status of the coastal communities that have the local wisdom on the cultivation of seaweed. This project will need a lot of support from government and should involve the local communities as stakeholders from the beginning. They will need access to finance. They

deserve fair payment for their work. The aim must be to create a production system that can be scaled up and can connect to major markets in the future, similar to the model of biofuels over recent decades. It can be like turning the coastline into a fertilizer mine or a bioplastics mine.

A truly bio-circular production system for seaweed can reduce emissions and reduce ocean waste

Figure 15. Cultivatting seaweed at Samporna in Sabah (photo by Bernama Photo via The Borneo Post)

The vision is a production system that is based on local wisdom and innovation; that is truly bio, circular, and green; that reduces emissions and pollution; and that enhances the social and economic status of local communities that are often marginalized.

All with humble seaweed.

Chung Ngin Zhun, Malaysia
Thepduangchan Bounthideth, Lao PDR
Paolo Andrew C. Hasegawa, Philippines
Shar Thae Hoy, Myanmar

Faith and Culturally Based Environmental Attitudes

The 370 million indigenous people are only 5 percent of the world's population, but they hold tenure over 25 percent of the world's land surface and support almost 80 percent of global biodiversity. They have strong and intimate connections to nature and to higher beings. Their stewardship of natural resources is closely bound up with their faith. Their stewardship and their faith are vital assets in the fight against climate change. But they struggle to survive and to be heard.

Figure 16. The impact of Typhoon Haiyan or Yolanda in the Philippines (photo by Kevin Frayer, Getty Images)

In 2013, Typhoon Haiyan or Yolanda, one of the strongest and deadliest ever, struck the Philippines, killing perhaps 10,000 people, affecting over 3 million, and leaving floods that took three months to recede.

The Mamanwa are an indigenous community in Samar and Leyte provinces where the typhoon struck hard. Nobody in the community died. Two weeks earlier, a female

Figure 17. The Mamanwa of the Philippines (screenshot from UNTV News and Rescue)

elder had an omen, a warning in a dream. They took refuge in *kurob*, evacuation shelters, situated on high ground, sheltered by large rocks or caves, and designed to be low to the ground to evade the wind. These *kurob* played a crucial role in their survival.

Figure 18. The *kurob* shelters of the Mamanwa (photo: Nimfa Bracamonte)

According to their belief, the warning was given by Magbabadja, the creator and supreme being, who also creates the typhoons as punishment for sin and wrongdoing.

The Mamanwa relocated to Samar, an island facing the Pacific Ocean which is frequented by typhoons. Over hundreds of years, the ways to survive natural disasters have been ingrained in their beliefs, practices and faith. They regularly cultivate sweet potatoes and taro as crops that will not be devastated by a natural disaster and can enable them to survive.

The Mamanwa have their own ecological calendar which is focused on the wind. Each of the winds that blows at different seasons has its own name and character. The Mamanwa monitor these winds to time their agricultural activities and to anticipate typhoons. They know that if the *Kabunghan* wind and the *Kanaway* wind interact in the last quarter of the year, there is a risk of high winds, heavy rain, floods and landslides.

Timing is an important part of indigenous knowledge and practice across Southeast Asia.

In Aceh province of Indonesia, the largely Muslim communities along the coast follow *Hukum Laut*, the law of the sea. In accordance with this law, they will not go out to fish on a Friday. This practice is a matter of faith, but also has an underlying rationale. Marine life has a break from human activities. Humans have a chance to get together as families. Boats and fishing gear can undergo routine maintenance.

In Borneo, the indigenous Iban and Kedayan people also pay attention to timing. Traditionally they practice rotational cultivation in the forest areas. They consult the stars for guidance on the timing of cultivation and other practices. At the start of a cultivation cycle, they carry out rituals to ask permission from the land and to receive signs from the gods which guide the what, where, and when of their cultivation.

Shifting cultivation is often vilified for destroying the forests, but these communities have pursued these practices for hundreds of years and Borneo is still covered with forest. Their practice is designed to allow the forest to regenerate and to allow other species to coexist.

The Kedayan have an ecological calendar. It allocates times of the year for various tasks. It identifies signals such as bird calls that trigger certain tasks. It makes space for animals that live in the same ecosystem to survive and prosper. It includes rituals to give thanks and ask for blessings.

Figure 19. The Iban carrying out a ritual at the start of the agricultural cycle

But these indigenous communities are under pressure. Many have already been displaced. They have to battle with government and battle with the encroaching palm-oil plantations that clear-cut the forest, trigger soil erosion, and threaten their way of life, their identity, and their connections to the land and to the gods.

Each indigenous community is different, but there are also commonalities. They are intimately connected to nature. As a result of long experience, methods for protecting the ecosystem and mitigating natural disasters are embedded in their indigenous knowledge and practice.

They also face some common challenges.

First, the dominance of the Western episteme has marginalized indigenous knowledge systems and practices. Second, states and other institutions practice policies which are incongruent with realities at the grassroots. Third, indigenous peoples have to struggle to survive in the face of the dominant contemporary culture.

There has been some fighting back. Academics such as F. Merlin Franco at Universiti Brunei Darussalam have documented the Kedayan ecological calendar, presenting these practices in a format that accords with conventional ideas on how knowledge should be presented. But it is still difficult to explain how the Mamanwa avoid a disastrous typhoon because of an omen delivered in a dream.

In sum, indigenous communities across Southeast Asia have close cultural and spiritual connections with the environment. They possess vast knowledge accumulated across generations, but they are threatened by the advance of the dominant contemporary
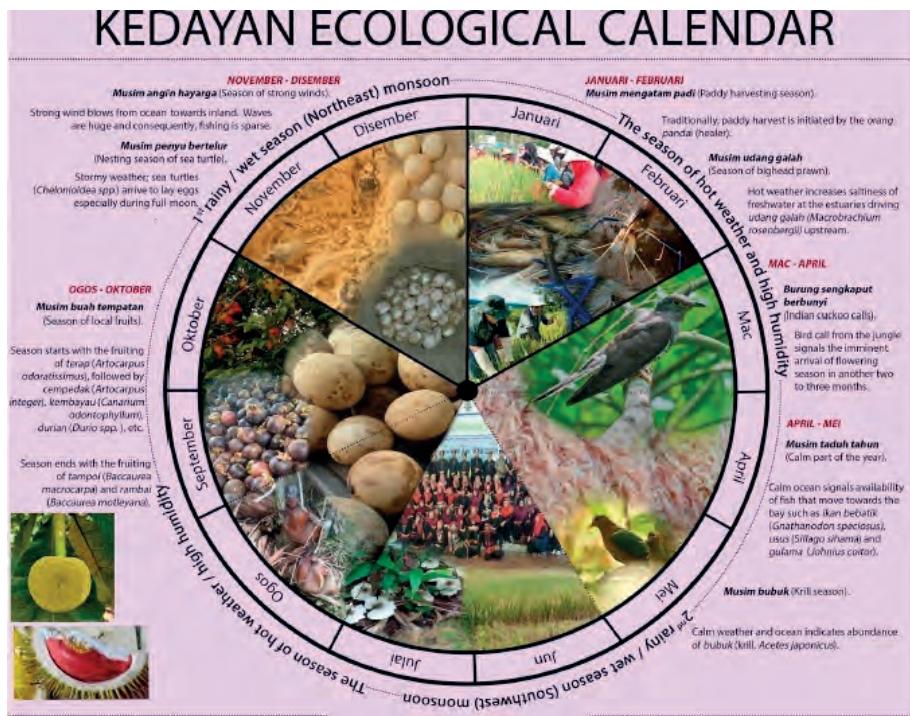
Figure 20. The Kedayan ecological calendar

culture. It is important to preserve this knowledge and to mobilize it on a larger scale in green initiatives to combat and mitigate the effects of climate change.

Call for action!

- Create an enabling environment that allows communities to preserve their beliefs and knowledge systems and to practice their faith and culture-based environmental activities.
- Persuade national and international institutions to recognize the effective contributions of indigenous knowledge systems and practices to mitigating natural disasters
- Enhance the participation of indigenous communities as rightful stewards of the environment in the local, national and international agenda for conservation of the environment and combating climate change.
- Empower the leaders of indigenous communities to communicate more effectively with the world by assisting with knowledge, networks, and platforms.

Alex Lew Wen Jie, Singapore
Alfikri Muliadi, Indonesia
Joshua Anak Belayan, Brunei Darussalam
Royce Lyssah M Malabonga, Philippines

Climate Action: Lost in Translation

Why is it important to think about language and translation in the context of traditional wisdom and climate action?

If you look at the map of biodiversity hotspots around the world and the map of language hotspots, places where languages are endangered, it's obvious that many areas coincide. One such area is the Southeast Asian massif, the mountainous region to the south of China where there are over 100 million indigenous or minority peoples.

There is a proven connection between language diversity and biodiversity, and they share the same risks. As the world becomes less diverse, the number of languages in use falls; and vice versa.

Conservation International (conservation.org) defines 35 biodiversity hotspots — extraordinary places that harbor vast numbers of plant and animal species found nowhere else. All are heavily threatened by habitat loss and degradation, making their conservation crucial to protecting nature for the benefit of all life on Earth.

Figure 21. Biodiversity hotspots of the world

Figure 22. Language hotspots around the world

Knowledge is contained within language. The indigenous peoples who are the caretakers of biodiverse environments speak several languages known by only a small number of people. These languages are vessels that contain their local wisdom about caring for the ecosystem. But these languages are at risk.

How do languages serve as vessels for traditional wisdom? Take an example. The Hmong and Khmu communities who live in Southeast Asia are divided into clans named after fruits and animals. Among our interviewees, one was from the plum clan and another from the civet clan. They are forbidden to consume the fruit or animal of their clan-name. In this kin-centric worldview, the Hmong and Khmu view the surrounding environment as their own kin and family, and treat it with the intimacy that this relationship demands.
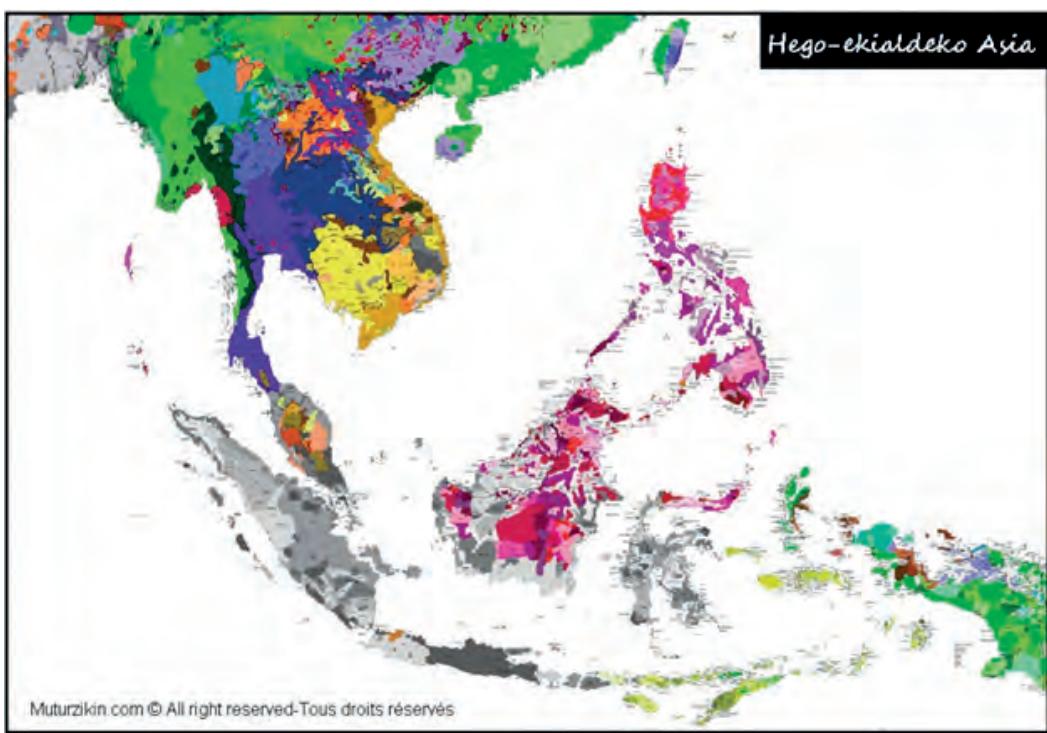
Figure 23. Language map of Southeast Asia

This perspective can serve as the basis for actions to preserve biodiversity and to combat climate change. But language can both connect and disconnect.

There are around 1200 languages spoken across Southeast Asia. Only a handful of these are the mainstream languages adopted as the national languages by the region's countries. Many of the others are neglected. People speaking these other languages lack representation in debate at the national and international level. They rarely appear in academic scholarship. Some knowledge simply has no words in these languages. They have difficulty inserting their local wisdom into debate and policy-making. And at the same time, they have difficulty in getting access to modern knowledge on climate change. This is why language matters in the climate action conversation.

We conducted a small survey among indigenous and minority people about their understanding of some of the basic words and concepts in the debate on climate change. We found that most had words in their language for "environmental conservation" and "climate change" and they understood these ideas well. Their grasp of "global warming" and "carbon footprint" was hazier. They had the essence but needed more elaboration. They struggled over "climate adaptation" and "climate resilience." Most had no equivalent words and no appreciation of the meaning.

Some of the translations were revealing. The Moken's word for "greenwashing" is simply "liar," and the Yhor phrase for global warming is simply "the world is going to explode."

There are disconnections at many levels. Because climate change cannot be expressed adequately in the local language, these people lack appreciation of the concepts and lack up-to-date knowledge on climate discourse. They can describe how their lives are affected by dam construction, by drought, and by wildfires, but do not connect these to human-induced climate change. As a result, they tend to have a passive attitude towards climate change, and no sense of urgency.

At the same time, traditional wisdom from local communities is not translated into the dominant, mainstream languages. Painfully, this effectively means that centuries of knowledge and wisdom from these communities, who have taken care of these biodiverse environments, are not passed on to the next generation or to people outside those communities.

These disconnections are true even among the Hmong who have relocated to California. Because of limited proficiency in English, they have difficulty understanding their rights, and difficulty contributing to debate.

They also face barriers which go beyond language. They are not given status within the processes of government. They are not embraced as stakeholders on the same level as

others. Typically, they are not consulted on development projects at the planning stages, but only when the plan has been decided and they participate in the implementation.

Their traditional wisdom is not credited with the same status as modern scientific knowledge. Their methods of managing the environment are seen as specific to a certain time and place. They are recognized as "measures that serve the survival of local communities," without any wider application. These methods are portrayed as different from the universal scientific concepts which are suitable for planning long-term adaptation to climate change.

Their traditional wisdom does not realize its potential to contribute to climate action. And when this knowledge is sidelined, there is a risk that this knowledge will be eroded, and will not be passed on to future generations

How then can local communities get knowledge about climate change and action, and how can their traditional wisdom contribute to the collective effort on climate mitigation? How can all the disconnects be turned into connects?

- Improve translation from mainstream to minority languages, especially for the key scientific and technical vocabulary of climate action. This alone can be empowering.
- Include indigenous and minority communities as full and equal stakeholders from the inception of projects that will affect them. Stop treating them as voiceless minorities with the no rights or status to make themselves heard
- Find ways to integrate traditional wisdom into the debate on climate action. This means (crucially) making policy-makers aware of the value of traditional wisdom. Demonstrate the utility of traditional knowledge on mitigating and adapting to the impacts of climate change. Bring together those who know how to create policy but lack traditional wisdom with those who own traditional wisdom but lack access to the channels of policy-making.
- Invest in the infrastructure that facilitates multilateral knowledge transfer across the boundaries of knowledge, place and status.
- Build bridges where now there are gaps. Connect what is disconnected. Regain what is lost in translation.

Lê Bùi Anh Thơ, Vietnam
Kamori Osthananda, Thailand
Nazrul Nazri, Malaysia
Supitcha Sutthanonkul, Thailand
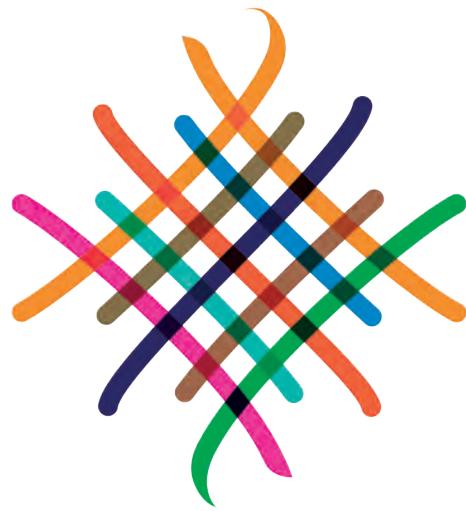
Community, Belief and Stewardship
of Natural Resources

Indigenous Art and the Biodiversity Crisis

Shaq Koyok
Temuan artist, Malaysia

ABSTRACT—Indigenous people and local communities play a vital role in the protection of land to foster biodiversity. Peatland is especially important for storage of carbon. Malaysia has a large area of peatland, including areas which are the traditional lands of the Orang Asli indigenous people. These lands are under threat from the development of highways, dams, ports, and plantations. As an artist, the author focuses on the fight of indigenous peoples to protect the land, their identity, and their way of life. Protecting indigenous land rights is a critical environmental strategy, a bottom-up approach to climate mitigation.

Indigenous people and local communities have been the stewards of the land for thousands of years. Their active engagement is essential in preventing and reversing degradation of forest and peatland. In 2021, the International Union for Conservation of Nature (IUCN) published a report on *The State of Indigenous Peoples' and Local Communities' Lands and Territories*. Based on a careful global survey, the IUCN found that 91 percent of lands controlled by indigenous peoples and local communities are in good or moderate ecological condition. These lands cover 17.5 percent of the world's terrestrial surface. The Report noted: "Many of these areas are potentially important biocultural landscapes that achieve conservation and climate-resilient outcomes while also advancing Indigenous Peoples' rights, and preserving cultural, spiritual and other values." The Report's main finding was as follows:

> Indigenous Peoples and Local Communities (IPLCs) are vital custodians of the world's remaining natural landscapes. As such, achieving the ambitious goals and targets in the post-2020 global biodiversity framework will not be possible without the lands and territories recognised, sustained, protected and restored by IPLCs. (IUCN 2021: 7)

Peatlands and the *Orang Asli* of Malaysia

Among these lands, some of the most important are peatland because they store so much carbon. In Malaysia there are around 2.6 million hectares of peatland.

Peatlands have formed over thousands of years and have always been important to indigenous communities. They store more carbon than any other type of ecosystem. Globally more carbon is locked up in peatlands than all the forests of the world. Damaged

peatlands are a major source of greenhouse emissions, responsible at present for about 5 percent of human-linked emissions.

The indigenous people of Malaysia are known as the *Orang Asli*. We are the poorest and most vulnerable people in Malaysia with poor health care and education levels. We harvest natural resources such as bamboo, rattan, herbal medicines, and wild game from ancestral lands in the forests. Like many other indigenous peoples across the world, we depend on the immediate environment for our living, predominantly from ancient forests and peatlands. Our ancient culture views nature as part of an extended, ecological family that shares our ancestry and origins. We believe that any living thing on earth has a spirit.

Figure 1. The author's father.

I belong to the Temuan people, one of the largest groups of the *Orang Asli* who live in the western part of Peninsular Malaysia. My home village is in a peatland area near Kuala Lumpur. The plants from the peat forest are used in my community for medicine and for building materials. The peatland also provides water supply to the villages for crops. These peatlands are under threat from mixed development proposals.

My mother and father are both master weavers in my village, especially making fish traps and pandanus mats. Both of my parents have a deep understanding of nature and people. My father told me that nature comes first, before us, the humans.

Art and the struggle of indigenous peoples

I have become an artist. In a rapidly modernizing Malaysian state, In my paintings, there are many images of deforestation, overdevelopment, and consumerism. I'm always trying to capture the tension and pressure faced by my people, whose lives interact with and respect the natural environment. My work emphasizes the inequalities that exist

between modern consumerism and traditional sustainable ways of life. My paintings are a reflection of my people and the rain forest in which I grew up, and to show the importance of nature to the *Orang Asal* indigenous people. The presentation of artwork also captures a contemporary view of the struggle faced by Malaysia's indigenous people and the aim is to contribute to a deeper understanding of multiracial Malaysia.
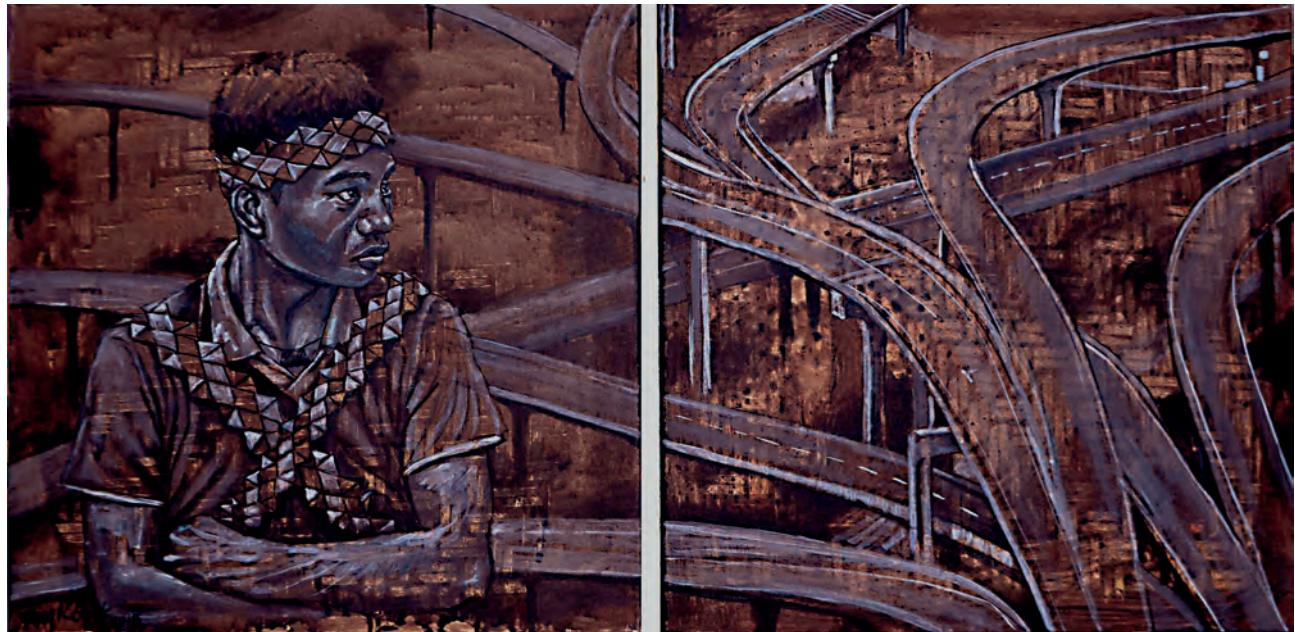
Figure 2. "At the Crossroads"; diptych, acrylic on canvas, 2018

All the inspiration for my work comes from my village, my background and especially the indigenous people. The indigenous people in Peninsular Malaysia now have to deal with the effects of modernization, with development projects that encroach on indigenous land. Many of these projects encourage the buiding of new roads and highways. This building development is like a virus that keeps on growing and spreading. Many people think that in order to go to work, they need a car and a road. Therefore there are more cars and they have to build more roads. When there are more roads, more people buy cars. It's an infinite circle.

Figure 3. "Stop Telom Dam"; acrylic on canvas, 2015

Dams are needed to generate electricity and to supply water to the population. But the land used for these dams is where the indigenous people live, which is not fair. They are the people who are flooded out, who must move away from their traditional land to make way for these projects. They are the ones who suffer a hard time. This has an impact on culture, on lifestyle, and on health. But in the case of this Telom Dam, planned near the Cameron Highlands, we managed to have the project stopped in 2019.

Figure 4. The author with a painting about Kuala Langat North Forest Reserve, 2020

Kuala Langat North Forest Reserve is a peatland swamp gazetted as forest since 1927. In February 2020 Selangor State Government proposed to degazette 97 percent of the area for a mixed development project. Despite protests, it went ahead with the plan. After big protests, the government had to cancel the project in September 2020.

As an artist I always want to reflect what happens in my village, and at the same time I want to preserve and practice the culture of the indigenous people. Many people in my village are master weavers who use the pandanus plant from the peatland forest to weave into mats.
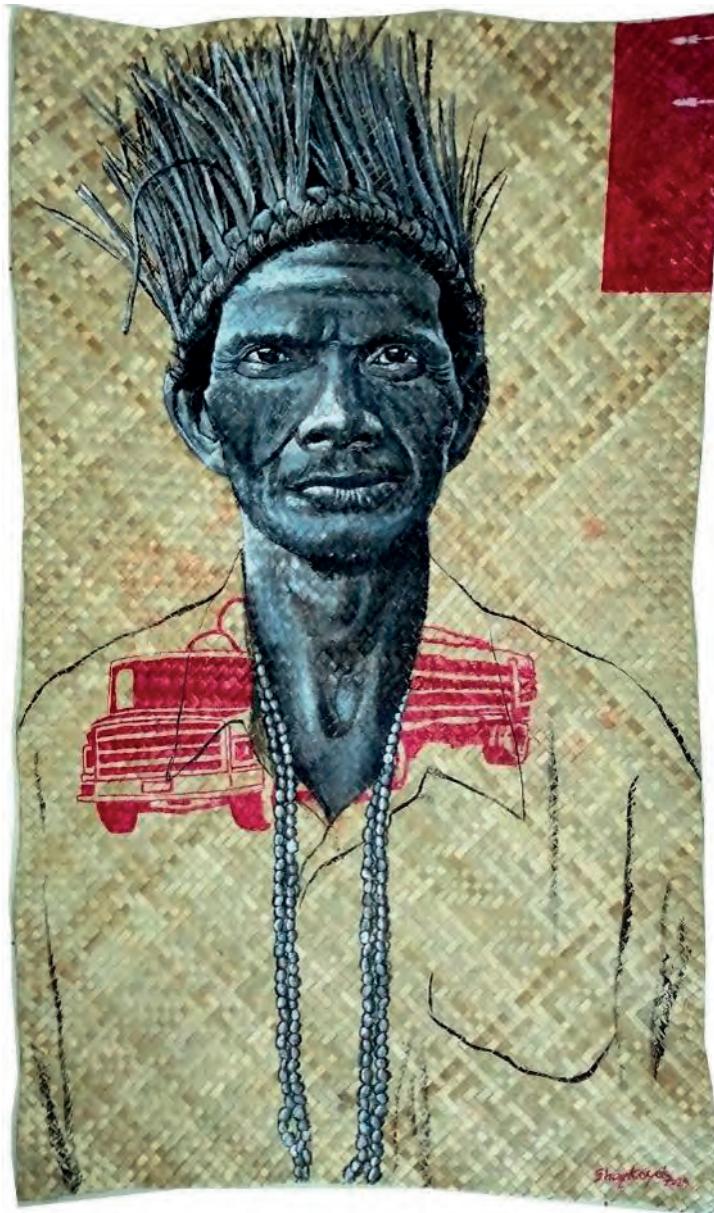
Figure 5. "Cold Stare"; acrylic and charcoal on pandanus

Logging is still a big problem, especially in the undeveloped parts of the state of Malaysia. Many indigenous people have to fight to stop logging activities with road blockades and even human blockades. Logging not only destroys the road and ancestral land of indigenous peoples but creates pollution in the rivers and the habitat of wildlife.

I use mats as canvas for paintings for personal reasons. I grew up in a hut, living a very traditional indigenous lifestyle. I still remember that my mother wove a big mat for me and my six siblings to sleep on. If somebody snores, everybody hears. If somebody farts, everybody smells. That is the beauty of living the *Orang Asli* life.
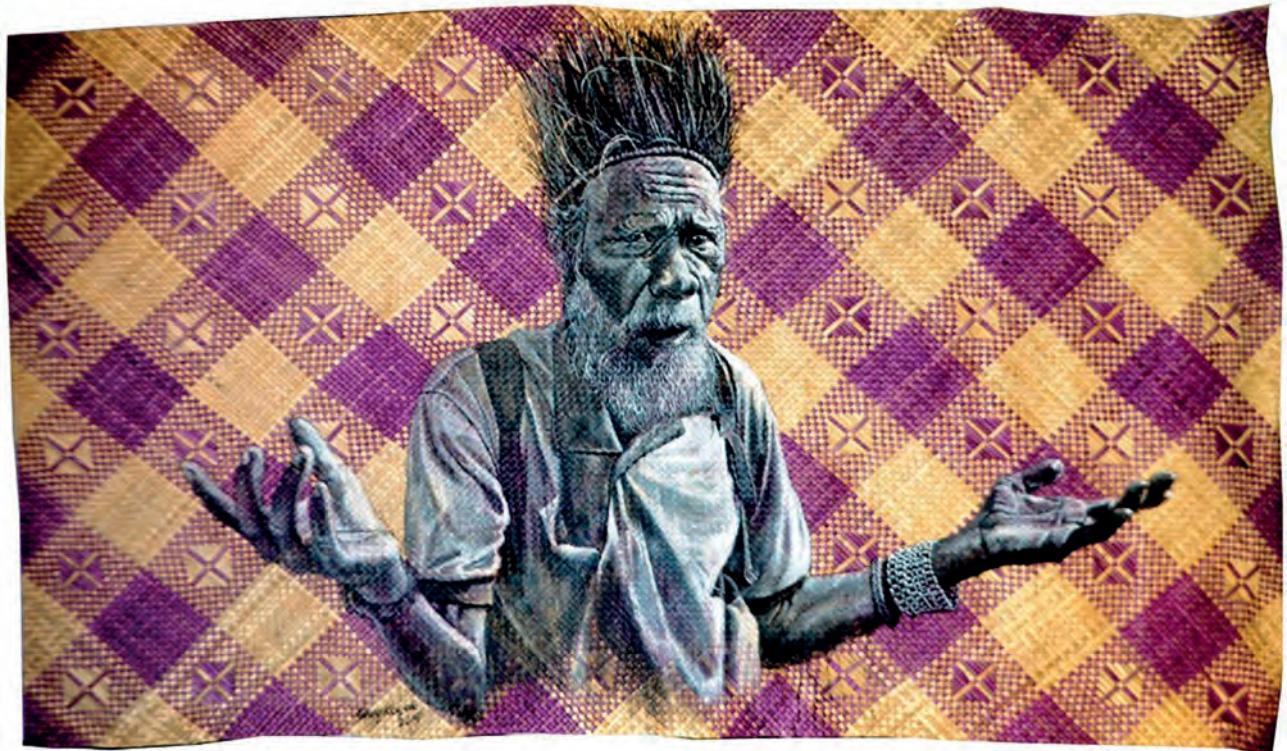
Figure 6. "Malok Hak Kannik" (Where Are Our Right?);. acrylic and charcoal on pandanus, 2019

Titi Aban Anjang, or grandfather Aban, is a Temiar person from the rural east coast of Peninsular Malaysia. He is a cultural activist who has long been fighting for the rights and the land of the Temiar people who live right inside the forest, where there are problems over logging. I used a pandanus woven mat from the village for the canvas for his portrait. He is ninety years old, but he still goes out on the street to protest even though the protest is far from his home.

Figure 7. "The Witnesses"; installation art, 2019

I also do installations, using local articles like traditional woven mats made by the indigenous women. Many of the woven articles are made of pandanus leaves. In this installation, there is the stump of a tree cut down by a logging company. I want people to experience what the indigenous people witness in their lives, particularly the so-called developments that encroach on traditional land.
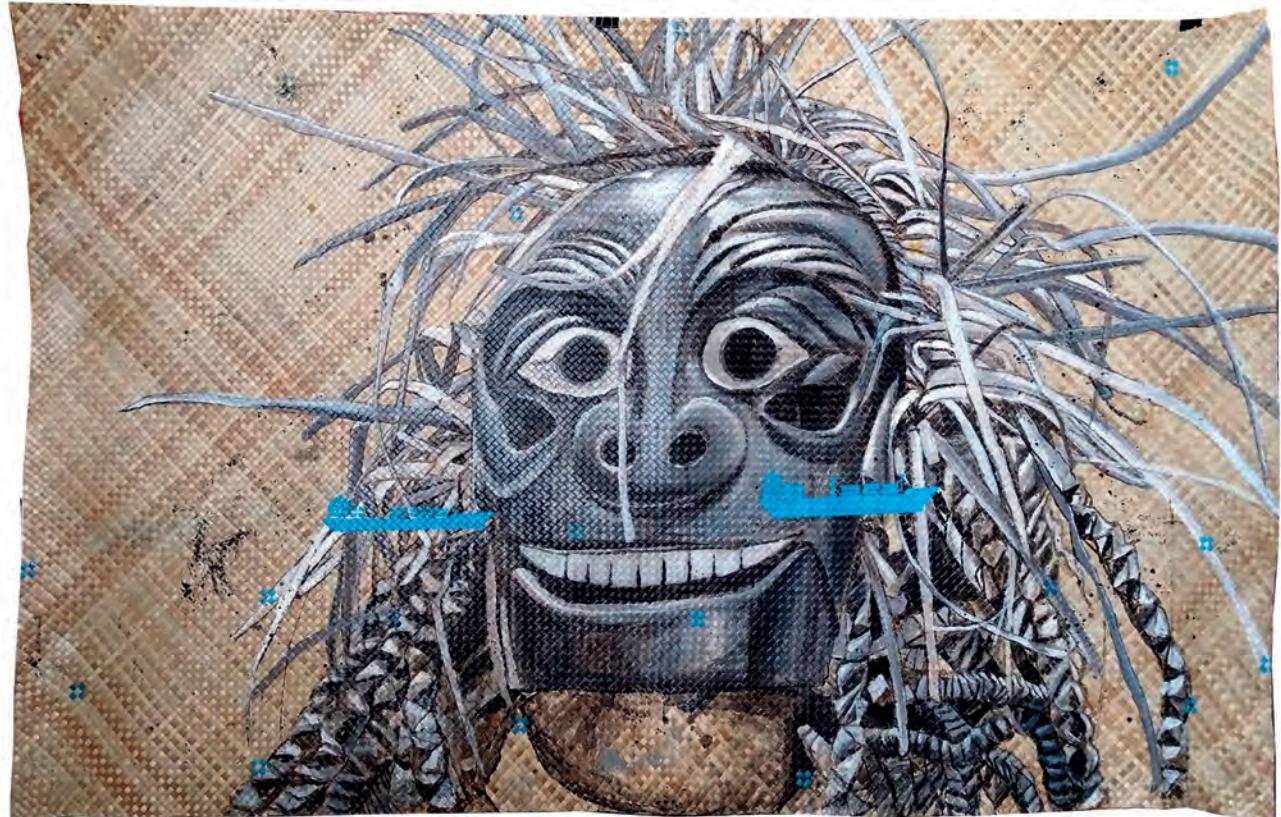
Figure 8. "Sacred Sea Dance"; acrylic on pandanus weaving, 2021

In Malaysia, many think of the indigenous people as gentle people, who will see something happen but not say anything, not protest. But our gentle nature does not give people license to violate our human rights. That is the message of this installation.

In the coastal areas, there is a problem that comes from consumerism. The indigenous communities, especially Mah Meri people who live along the coast, depend on fishing. In the Malacca Strait, there is a lot of shipping. The more ships there are, the more ports they build. The more ports they build, the more ships come. And the ports expand their premises and now encroach onto traditional land.

This affects the Mah Meri people who live from the sea. They are famous for doing ceremonies at the coast to ask the sea for permission and for good luck.

Figure 9. "Nightmare of Moyang Bajos"; oil on canvas, 2020

The Mah Meri community suffered when some mangrove trees were chopped down and others died because of pollution from nearby Port Klang. The painting "Nightmare of Moyang Bajos" shows a Mah Meri person in a mask at a festival celebrating their *moyang* (protector spirit) called Puja Pantai. In the celebration, the community march in their traditional attire, led by masked dancers and shamans, and offer food to the protector spirits.

Figure 10. "Confession of Palm Oil"; acrylic on canvas, 2013

Palm oil plantations are another big problem in Malaysia. Many plantations encroach on peatland in the Selangor area. The Selangor government has removed protection from areas of peatland to facilitate development projects and palm oil plantations. We fight against these projects, and sometimes we get them stopped.

Figure 11. "Pembangunan"; linocut, woodcut and silkscreen on paper, 2006

This is one of the artworks made to respond to the incident where half of Kuala Langat North Forest Reserve was deforested in 2005. I was still in university when this deforestation happened. I felt helpless to stop it. The forest was my childhood playground and where I learned how to hunt with a blowpipe with my friends.

Figure 12. Community art class

I also do performance art to raise awareness of issues, and I do community art activities to encourage young people from the indigenous communities to express themselves. I help them to use visual language. I tell them: there is no need to speak, just draw.

Conclusion

We destroy our forest, especially peatlands, at our peril! If global peatlands are destroyed, the release of carbon dioxide into the atmosphere will be catastrophic. Our small effort in our local community to save the ancient peatland environment needs to be repeated around the globe. This task needs real commitment given the pressures. Protecting indigenous land rights is a critical environmental strategy, a bottom-up approach to climate mitigation. We are often told "we need the help of the authorities." I would argue that the authorities can learn from the sustainable lifestyles of indigenous people.

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The Protection of Water and Livelihood in Two Communities in Sarawak

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ABSTRACT—The Penan and Lun Bawang communities practice sustainable management of natural resources in Sarawak. Both communities have a vocabulary which expresses simultaneously their claims to the usage of natural resources of the forests and rivers and their responsibility to conserve them for the future. Both communities pay special attention to the cleanliness of water which is vital for the production of their staple foods of sago and rice respectively. The arrival of logging companies since the late 1980s has resulted in contamination of the water. The Penan attempted to blockade logging roads and petition government while the Lun Bawang erected signage warning the loggers to stay away. These community lands merit definition as areas of High Conservation Value.

Introduction

No indigenous community in Borneo underestimates the importance of rivers and streams; this extends beyond the essential ecosystem services. They manage water resources to meet current and future needs of their communities. Here I explore this topic among nineteen Penan settlements that lie between Mulu and Pulong Tau national parks in the upper Tutoh River, Baram District, Sarawak. The Penan were traditionally hunter-gatherers who depended on pure fresh water to process their staple, sago (*Eugeissona utilis*). I also draw comparison with the Lun Bawang who practice a form of wet or pond rice cultivation. This form of agriculture, like the Penan processing of their staple, is dependent on the availability of pure mountain streams. I also explore the sustainable management of water resources in seven villages in the Long Semado and eight villages in the Ba Kelalan cluster, both localities found in the upper Trusan River in Lawas District, Sarawak (see Figure 1).

Lifeway: Penan of the upper Tutoh River, between Mulu and Pulong Tau

The Penan of the upper Tutoh, between Mulu and Pulong Tau national parks, comprise nineteen settlements with an approximate population of two thousand people (Langub 2011).[1] They were the last to abandon the nomadic way of life, with some

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[1] Information provided to me by Ezra Uda of the State Planning Unit, a government development planning agency of the Malaysian state of Sarawak, in July 2020. He indicated there were 21,367 Penan in Sarawak, largely found in the upper Rejang and Baram, two largest rivers in Sarawak. There were approximately 5,000
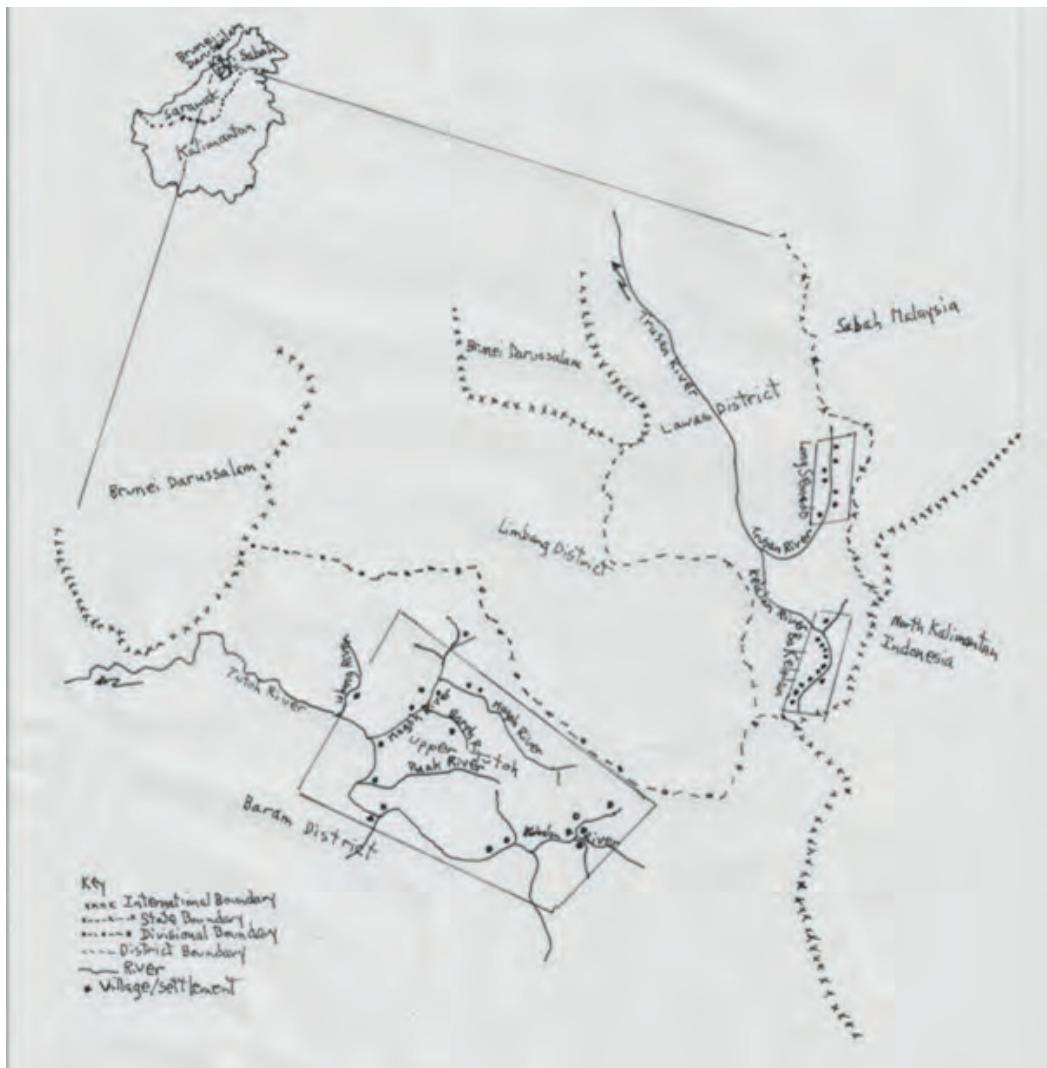
Figure 1. Map of the upper Tutoh and Trusan showing the locations of the Penan and Lun Bawang settlements.

groups adopting the settled way of life as recently as ten years ago.

As nomads they stake claims (*molong*)[2] to resources and establish stewardship and management over them. As nomads they live in lean-tos, which they call *lamin tana'* (forest hut or dwelling). When resources in the area are exhausted, they move to a new area and build new *lamin tana'* (Langub 2011). The former campsite is now referred to as *la'a* (old campsite). *La'a* are not forgotten; they are frequently visited in a somewhat circular movement within a specific area of the landscape they traditionally occupied by a nomadic group. A new *lamin tana'* may be built at a former campsite (*la'a*) or close to it. The term nomadic is in some ways misleading as the groups move through the same territory in a cyclical fashion, returning to previously harvested areas that have

---

Penan living in the Lurah River, tributary of the Bahau River, in North Kalimantan, Indonesian Borneo.

[2] The idea of *molong* incorporates the claim to a resource, its conservation for the future, their stewardship ethos, and sustainable utilization and management, to be discussed below.

regenerated. In other words, the same campsite may be occupied by a group more than once in the life of an individual or the group itself.

Penan refer to the numerous *la'a* scattered across their river system territory as their *uban,* marks or footprints. When they refer to *la'a* as *uban,* they are talking about its cultural significance, past events, connections, relationship, sustainable management, customary rights to the area and all that it encompasses. A nomadic Penan group moves within its home territory that normally has hills or river systems that act as boundaries with other groups. As a group moves around, it leaves traces of *la'a* behind. Through years of constant movements within its territory, a group establishes numerous *la'a* over its "territorial landscape."

The geographical area where the group moves is referred to as *tana' pengurip,*[3] the land area that provides the essentials of life, such as food and other resources that they collect to trade or convert into handicrafts for domestic use or for sale. In the *tana' pengurip,* Penan lay claims to all sorts of resources such as wild sago, especially *Eugeissona utilis,* rattan, fruit trees, *getipe* (a type of wild rubber for gumming), trees to make blowpipes, and *tajem* trees that produce poison for blowpipe darts used in hunting game. The concept of claiming resources or *molong* does not simply mean a claim to a resource, but also the conservation of that resource for future sustainable use.

When an individual *molong* a wild sago, he or she harvests the mature trunk and leaves the young plants and the buds for the future (Brosius 1986, 1990 and 1991; Langub 1988, 1989, and 2011). Sago palms grow on aerial roots, and the mature sago is cut above the aerial roots so this does not kill the sago cluster, but lets it regenerate for the future. The Penan also rotate their harvest of sago from one clump to another to allow the regeneration of previously harvested clumps. The same harvesting strategy is applied to other resources, such as rattan. When the Penan harvest rattan, they cut the mature vines and conserve (*molong*) the young vines for the future.

Another concept unique to Penan that guides them in their management of resources in the forest is *mihau*, which means to protect, preserve, or take care of. *Mihau* is a fundamental ethical principle that not only instructs Penan to take only what they need from the forest, but to respect (*mengadet* or *seva*) creation It is an ethically powerful principle shared by all Penan of *kua kenin* ("one feeling" or "one heart"). While *mihau* guides the way Penan conduct their activities sustainably in the forest, *molong* is a system of preserving and fostering (sustainable management) resources in the surrounding areas.

A conspicuous feature of the Penan landscape is the presence of rivers, big and small. Rivers provide the Penan with a framework for organizing their knowledge of the geography of the landscape. Weaving their way through the forest, Penan use the river system to determine their precise location relative to hills and other landmarks.

A place in the river system where one was born or where one's parents or grandparents were born is referred to as *oko' bu'un* (place of origin), conferring one with an identity and rights to the place as well as access to its resources, and the responsibility for ethical

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[3] *Tana'* is land that encompasses the forest itself; *pengurip* comes from the root word *urip,* meaning life; hence, forested land area that provides livelihood.

stewardship of these resources. Villages or settlements are identified with confluence of rivers, for example the Penan village of Long Siang is named after the confluence of Siang and Tutoh rivers. The river itself can identify the name of a village such as Ba Bareh located on the bank of the river of the same name, a tributary of the Magoh.

Rivers and streams are an important source of fish protein. Penan communities between the two national parks of Mulu and Pulong Tau also apply the *molong* management system to rivers, especially sizeable pools or *levahau* which have a large population of fish. The word *molong* carries the idea of respect and adherence.

To process wild sago, the palm trunk is cut into sections and the pith is removed (Figure 2). The pith is transferred to a mat and clear water is added to separate the starch from the pith (Figure 3). This is left for 30 minutes while the water drains through the rattan mat, leaving behind the starch residue. Clear water is essential to ensure that impurities are not left behind in the starch that is the Penan's staple food.

Figure 2. Splitting the sago palm trunk and chipping the pith out of the trunk (photo: Henry Chan)

Figure 3. Trampling the sago fiber to separate the starch (photo: Henry Chan)

Companies logging the upland dipterocarp rainforest reached the Penan communities in the late 1980s and through the 1990s. Prior to this, the isolated Penan communities lived in balance with the resource-rich forest. The arrival of logging companies brought with them numerous problems, particularly soil erosion and pollution of rivers and streams which made it difficult to process sago because mud particles contaminated the finished sago starch. The affected Penan settlements in the area barricaded logging roads to draw the attention of the outside world (Figures 4, 5), especially owners of timber companies and government authorities to the importance of clear, clean river water to process their staple food, wild sago.

Lati' Ba': wet rice cultivation

The Lun Bawang of Ba Kelalan and Long Semado together with their cousins, the Lundayeh of Sabah, Malaysia and Krayan district of North Kalimantan, and the

Kelabit of the Kelabit Highlands in Sarawak, cultivate wet rice as their main occupation (see Padoch 1981, 1983; Langub 1984; Janowski 1988; and Crain and Pearson-Rounds 1996). The farming system is better known as *lati' ba'*, where *lati'* means farm and *ba'* means wet, hence a wet rice farm. It is an efficient farming system involving the interaction among several elements, man, stream water, animal and the environment. Water is an important element in the system, and farmers take particular care of rivers and streams that bring water to the fields to provide nutrients to the rice plants.

Figure 4. A barricade erected by the Penan community to prevent logging in the area they claim (photo: anonymous)

Figure 5. The Penan community presenting their case against logging to government officials (photo Jayl Langub)

The Lun Bawang word that describes the way farmers take care of the river or stream or any other resource is *ngasa'*. *Ngasa'* encompasses the idea of taking care, ministering, nursing, or raising. A person who raises buffaloes is known as *lun ngasa'*

Figure 6. Blocks of rice fields are carved out of the deep alluvial soils (photo: Ibrahim Komo)

Figure 7. Conduit made of bamboo to transfer water from one block of a field to another block (photo: Jayl Langub)

kerubau; similarly, a person who looks after a garden or orchard is known as *lun ngasa' kebun.* Like the Penan *mihau, ngasa'* is a powerful principle of sustainable management which incorporates the idea of respect for nature.

Blocks of rice fields are carved on the deeper alluvial soils of the flood plains of the highland valleys (Figure 6). This is done after careful consideration of soil quality based on indicator plants, slope, drainage and availability of water. Bunds (*ibpeng*) are created around each section of the rice field. The flow of water into the cultivated area of the valley is done through irrigation, which involves damming (*ngelaleng*) the mountain streams and guiding the water into the rice field through a system of small canals (*abang*

Figure 8. Clear running water supplied to the field pond (photo: Daniel Chew)

Figure 9. Immediately after harvest buffaloes are released into the field to eat the straw (photo: Daniel Chew)

abpa). Small water gates (*laleng*) are constructed at strategic points to regulate the flow of water into the fields. Conduits (*tabu*) made of bamboo are constructed to transfer water from one section of the field to another (Figure 7). Distribution of water to different parts of the field is controlled by opening and closing the conduit.

In the wet rice fields of highland Borneo, clear clean water is found in field ponds (Figure 8). The continuous flow of fresh water brings micronutrients that fertilize the field, gradually increasing the fertility of even infertile soils. Where different sources of water are available, farmers avoid "tea-colored" or black water as it is poor in nutrients and low in pH (Padoch 1981: 23).

Figure 10. The buffaloes are returned to the gazing ground once the rice fields have been planted (photo: Daniel Chew)

Figure 11. Bamboos hold the soil of the rice bunds, streams and riverbanks in place (photo: Ibrahim Komo)

Buffaloes are an important part of Borneo highland wet rice cultivation. Immediately after harvest, around the middle of January, buffaloes are released into the fields to eat the rice straw (Figure 9). As the buffaloes move about in sections of the field, they soften the soil. They also defecate on the fields and increase the fertility of the soil.

When farmers prepare the fields for planting around the middle of June, the buffaloes are taken out of the fields and put into grazing grounds (Figure 10). By this time the grass in the grazing grounds has recovered and multiplied from previous grazing.

Figure 12. A sign indicating that the river has been adopted to stop logging in the area (photo: Jayl Langub)

The rice fields are then flooded with water to kill off the remaining weeds and grass. While this is done, a nursery plot (*samai*) is prepared for germinating rice seeds around the beginning of July. When rice seedlings are ready for planting, the flow of water into the field is controlled, and the buffaloes are taken out of the rice fields and released into the grazing ground.

As the buffaloes have worked the soil so well, almost no weeding is required. Rice is ready for harvesting at the end of December or in early January. Immediately after harvesting, the system is repeated, and the buffaloes are released into the rice fields.

The system is beneficial to both the rice fields and buffaloes. From January to June, the buffaloes graze and fertilize the rice fields, and the grazing ground is allowed to rest to let the grass grow. From July to December, the buffaloes are put into the grazing ground to feed on the lush field of grass. By the end of the next harvest season, the rice fields are ready for replenishment of fertilizer from buffalo dung.

Bamboo also plays a variety of roles in Borneo highland wet rice cultivation. It is planted between the grazing ground and the rice fields as well as along banks of streams and rivers (Figure 11). First, the roots of the bamboo hold the soil of the rice bunds and banks of streams and rivers in place. Second, the stems are used for constructing fences to keep buffaloes and other animals out of the rice fields to protect the crops from destruction. Third, the bamboo stems are used as conduits to transfer water from one section of a field to another. Fourth, the bamboo plants enhance the beauty of the landscape.

Logging activities, which potentially pollute rivers and streams that feed into the rice fields, have also penetrated the highland area of the upper Trusan. Farmers in the Long Semado area decided to focus special attention on seventy-one small rivers and streams that feed into the rice fields along the alluvial plain of the upper Trusan valley. To inform loggers not to log the area, they put signage on each river and stream (Figure

12) with the message: *"Abpa' ini inasuh Kampung* (name of the village) *pad ngebaku' ulun pulong* which translates as "this river has been adopted by the people of (this named village) to keep the forest healthy."

Although this is not a traditional method of conserving or utilizing water resources in a sustainable method, it is in line with the concept of *ngasa'*. The streams are identified as an area that requires protection in the same way that an adopted child needs to be protected and cared for. It also corresponds to the current concept of High Conservation Value (HCV) areas.[4] This is a mechanism that attempts to balance economics with the conservation of the natural environment. According to the six HCV principles, natural ecosystems can be identified as having unique features that need to be conserved. Broadly the principles are (Brown 2013):

HCV 1 Species diversity
HCV 2 Landscape-level ecosystems and mosaics
HCV 3 Ecosystems and habitats
HCV 4 Ecosystem services
HCV 5 Community needs
HCV 6 Cultural values

The streams and the forests through which the streams flow may be classed as HCV 4 and 5 as pure water is needed not only for the *lati' ba'* rice fields but also for household use. Rice and in particular the *lati' ba'* system is an intricate part of the cultural identity of the Lun Bawang people in Long Semado. As the streams are required to ensure the continuation of this form of agriculture, it could be argued that the streams and the surrounding forest ensure cultural identity.

Concluding remarks

Water is a vital resource for the Penan and the Lun Bawang, not only a necessity of life but also a much-needed element to produce their staple foods of sago flour and rice respectively. Although the linguistic terminology differs between the two groups, the concepts are similar.

Among the Penan, sustainable utilization of resources is expressed as *mihau* and *molong*. *Mihau* is the fundamental ethical principle that not only instructs Penan to take what they need from the forest, but to respect (*mengadet* or *seva*) creation or nature. While *mihau* guides the way Penan conduct their activities sustainably in the forest, *molong* is a practical system of preserving and fostering resources for the future and this concept is applicable to water.

The Penan communities blockaded logging roads to stop logging in the areas that are their homelands. They wrote letters and visited various government officers but with no result. The blockades could not be ignored as they were evident for all to see as an

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[4] HCV is a designation introduced by the Forest Stewardship Council, an international non-profit organization dedicated to responsible management of forests.

open invitation to the interested parties to the negotiating table. Was this an effective tool to protect the land? That is open to discussion, but it did enable some negotiations to take place and did bring the issue to the world stage.

The Lun Bawang concept of *ngasa'*, taking care of or adopting a resource, has been integrated with High Conservation Value areas. Both ideas are linked to preservation and sustainable management. The Lun Bawang community used the visual signage to indicate that the streams had been protected by the community and the areas under protection of the community remained intact.

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Community Forests as a Traditional Nature Based Solution to Climate Change in Myanmar

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ABSTRACT—Nature Based Solutions (NBS) are increasingly recognized by politicians, businesspeople, academics and donors as effective means to address climate change and biodiversity loss. Although NBS is a new terminology, it refers to ways that local people have used and managed natural resources for many years. In Myanmar, the traditional practice of shifting cultivation known as *Taung Ya,* under which farmers were allowed to cultivate crops in forested land while caring for the teak plantations, has been well integrated with scientific forest management since the colonial days. The development of modern community forests dates back to the 1970s. These forests contribute to the supply of timber while also helping with mitigation and adaptation of climate change. Community forests are proven to sequester carbon, especially in mangrove areas. The market for carbon credits is being developed through improved policies and regulatory framework development. The experience in Myanmar has lessons for developing community forests as tangible and intangible cultural heritage which contributes to the mitigation of climate change.

Community forestry, cultural heritage and climate change

The policies and practices of community forestry have been well integrated into the global development agenda for decades. Community forests have been adopted as a local solution to global development issues such as poverty reduction, food security, rural development, gender equity, biodiversity loss and climate change. The original concept of community forestry is rooted in the traditional cultural system of the Karen people in Myanmar. For many centuries, the Karen have practiced a form of shifting cultivation known as *Taung Ya*. During the colonial period, *Taung Ya* was well recognized and scientifically adapted as a collaborative approach to forest management. Local farmers were given the opportunity to grow crops under forest trees (mainly teak) while also helping to nurture the teak plantations.

The world in which we live is facing many challenges. Economists, scientists and development practitioners invent tools and approaches to address these challenges. The biggest challenge today is climate change and its impact on our daily lives. The global effort to address this challenge has progressed with various results. There is an

ambitious target to keep the global temperature rise within 1.5°C, primarily by reducing greenhouse gas emissions. Many sectors—public, private, community, individual—have stakes in achieving that goal. Many methods have been proposed for reducing emissions, particularly carbon emission reduction. Using natural systems to reduce carbon emissions is a cost-effective way to tackle climate change. These methods are called Nature Based Solutions (NBS), addressing a broad range of challenges, and Natural Climate Solutions (NCS), specifically targeted to address climate change. Community forestry has been widely adopted within these approaches..

Community forests have appeared in the rural landscape of many developing countries including those in ASEAN. Community forests in ASEAN play significant roles in rural development, food security, poverty reduction and local subsistence. Mangrove forests well managed by local communities have saved thousands of lives by serving as an effective natural barrier against storms, floods, and other extreme weather. During wars or famines, community forests have provided survival nutrition and shelter for displaced people. When Myanmar was hit by Cyclone Nargis in 2008, over a hundred thousand people died, but survival rates were higher in areas with good mangrove forests managed by the community, and recovery was faster in areas where community forests were well developed. When a community forest is formed, the people in the locality become more systematically organized as a user group. The aid agencies find it easier to communicate with this kind of user group when they deliver emergency relief assistance.

The protective value of mangrove forest is well understood among the survivors. The people in the Ayeyarwaddy delta, Rakhine coastal region and Taninthayi coastal region of Myanmar have depended on natural mangrove ecosystems for their livelihood for many generations. They are willing to protect the mangrove forests through a community forest or other organization because they have witnessed the value of mangroves and the effectiveness of user groups in climate change mitigation and adaptation. Recent research found that mangrove trees can absorb more carbon than terrestrial trees. Protecting mangrove forests through proper participatory management under a community forest can produce sustainable carbon credits and attracts responsible investment for the carbon market.

Community forest development in Myanmar

The *Taung Ya* system of the Karen is a three to five-year rotation. The Forest Department in the colonial era formed an agreement with the Karen people to partner in land management by allowing them to cultivate crops under the department's teak plantations while also helping to nurture the teak trees. *Taung Ya* became part of colonial forest management in Myanmar. The key concept of partnership from this era is well integrated into modern development of community forests, guided by the fundamental values of partnership, respect, and fairness, without paying undue attention to the ownership of the land. In the early stages of developing modern community forests, the focus was on tenure, on the bundle of rights. There are still issues over the bundle of rights enjoyed by the local communities. Most of the land in Myanmar, as in other

countries in ASEAN, is public land. All forest land in Myanmar belongs to the state and is managed by the Forest Department under various classifications as forest reserves, protected areas, unclassified, and so on. In the colonial period and early independence period, forest management in Myanmar was systematic and scientific. The management of community forests became more systematic after the Myanmar Forest Act of 1992 and the issue of regulations in 1995. The Act was updated in 2018 and the regulations in 2019, providing more opportunities for the development of community forests. In 2015 the Community Forestry National Working Group was formed as a platform to discuss various issues, opportunities, and solutions for community forest development.

By 2022, there were 7,223 user groups with 185,235 in community forest of over 400,000 hectares. The target is to have 919,000 hectares by 2030 as part of Myanmar's Nationally Determined Contribution under the Paris Agreement of 2015. Most of the development of community forests has been donor driven. The current extent of community forests is only 41 percent of the target due to reluctance on the part of the authorities, low capacity of the communities, and lack of incentives and linkages for sustainability (RECOFTC 2022).

The political commitment to promote community forestry seems encouraging but the implementation is slow. The district forest officers have to be convinced to cooperate. The local user groups have to show the commitment to follow the rules, responsibilities, and benefit sharing. The productivity of the land is another obstacle as most community forests are on poor land. The early community forests were established to provide fuelwood supplies to the user groups and villagers, or to protect watersheds, habitats and biodiversity. Some were established to provide commercial timber. In such cases, the quality of the land and the accessibility of markets are important factors. There have been successful instances that need to be scaled up through stronger policies, responsible markets, and sustainable financing. Community forests run by women in Kachin State have been well recognized for their commitment to maintain their community forests against competition from other land uses such as mining, agricultural land conversion and development projects. A Kachin group in Wai Maw township of Myitkyina district, Kachin state has successfully cultivated timber using local thinning practice. A community forest in eastern Inle lake in Shan State has been successful in conserving a watershed area. Community forests in the central dry zone have restored the degraded landscape with native species. There are several community forests that provide fuelwood to local communities throughout the country.

Some community forests in mangrove areas are set up to protect against strong winds, storms and tsunamis as well as providing livelihood options for the local people. The role of mangrove forests in mitigating and adapting to climate change issues has been well recognized. More importantly, people rely on the mangroves for their survival, livelihood, and prosperity. As a result, many community forest have been established in the coastal area of Ayeyarwaddy division, Rakhine State, Taninthayi state, Yangon division and Bago division and Mon state with the support of international donors and recently also private investors. There is a need to reduce the reliance on donors by promoting more community-initiated projects, particularly in areas that are vulnerable to natural disasters associated with climate change. The obstacles lie not with the local

people, who have suffered from the consequences of degrading mangrove forests, but with the limited availability of land and the competition from agriculture, fishery, and tourism.

Figure 1. Learning existing local knowledge and culture to address climate related issues in one of ten villages supported by JICA in eastern Inle Lake, Shan State, Myanmar (photo by Tint Lwin Thaung, October 2022)

Community forestry and cultural heritage

Community forests in Myanmar are deeply rooted in the traditional farming practice of ethnic groups. Traditional practices are intangible cultural heritage. The Karen and other ethnic groups normally cultivate crops after preparing the land under the *Taung Ya* system. Communities collaborate in preparing the land and cultivating the crops, and they celebrate harvest festivals together after the end of the cultivating season. Mutual support and mutual benefits are the cultural norms of Karen and other ethnic people in Myanmar. However, this culturally based land management is not totally free from criticism.

Earlier, the practice of *Taung Ya* was not much criticized as there was land available and little population pressure. With long periods of rotation, the forest vegetation could recover without damage. As the available land became limited, the rotation period got shorter and the result was more damage to the forest ecosystem. *Taung Ya* or shifting cultivation was frequently criticized as a major cause of deforestation in many developing countries including Myanmar.

New concepts of community forest development attempt to overcome these problems

with the *Taung Ya* system. Rights and responsibilities are clearly defined. The partnership between the local people and the Forest Department to manage teak plantations becomes a more complex affair, addressing issues of land tenure, management, and access to

Figure 2. Gender equity in culturally sensitive communities is an essential part of solutions to address climate change. Ethnic Pa O women and men participated in the CF certificate award ceremony, eastern Shan State, Myanmar (photo by Tint Lwin Thaung, 2017)

markets and finance. Boundaries are demarcated. User groups are formed. A business plan is developed to manage the demarcated and permitted land. These improved land management practices are well adapted into the existing cultural landscape of the local communities.

There are other forms of community-based natural resources management community fishery management, community-based reforestation, community-based management of protected areas, community-based ecotourism, community-based organic farming, and other nature-based solutions to climate change. These are well-established in the cultural practices of the local people. The new terminology of Nature Based Solutions serves to attract political will, business interest and public support for climate change mitigation and adaptation policies, programs, and facilities. With broader support of people from all walks of life, community forestry and other community-based projects can contribute to climate change mitigation and adaptation as well as future emerging global issues. Community forestry is the nature-based cultural heritage of the society.

Such cultural heritage can serve as a means to harmonize economic development, culture and nature conservation, but this requires certain conditions. The existing cultural norms and practices of society need to be well recognized. The available or potential

nature-based solutions need to be observed. There has to be a participatory process to determine the best options, manage potential risks and ensure a fair sharing of the benefits. The guidelines of Free, Prior and Informed Consent should be a prerequisite of the participatory exercise.

Figure 3. Promoting principles of Free, Prior and Informed Consent through participatory community consultation to establish private-community partnership plantation in Myin Ma Hti village, Aung Ban township, Shan State, Myanmar (photo by Tint Lwin Thaung, October 2022)

The cultural norms may be based on faith or custom. In the past there was harmony between cultural heritage and nature-based livelihoods, but this harmony has been disrupted by population pressure, market demand and the declining carrying capacity of the natural systems. Local people have suffered as a result. The principles and guidelines of Free, Prior and Informed Consent are designed to ensure that the most disadvantaged people in society are not excluded. Applying Nature Based Solutions to climate change in harmony with intangible cultural heritage cannot be successful without these principles.

Community forest and cultural heritage to tackle climate action

Recently, many donors have become interested in expanding community forestry to address global issues such as climate change and biodiversity conservation.

For example, the Japan International Cooperation Agency (JICA) supported the Myanmar branch of the Center for People and Forests (RECOFTC) to enhance the

capacity of ten community forest villages in the eastern watershed area of Inle Lake to address issues of climate change and disaster risk reduction. The project was simply designed to improve the resilience of the communities through diversifying their production of food and raising their awareness of global issues.

Figure 4. Successful mangrove plantation established by World View International Foundation in partnership with local communities and the Forest Department to claim carbon credits, Shwe Thaung Yan, Irrawaddy Delta, Myanmar (photo by Tint Lwin Thaung, 2022)

A study on the contribution of dry-zone community forests to the adaptation to climate change indicated that community forests had not yet enhanced the physical, financial, and natural capital of these communities to adapt to natural disasters associated with climate change.

The role of community forests in the Cyclone Nargis disasters of 2008 is still under-appreciated. Villagers from Amar and Byone Hmwe island, Bogalay township, reported that fewer lives were lost in villages with good mangrove forests under community forest management or protected areas.

Mangroves have been scientifically proved to sequester more carbon than terrestrial vegetation. The World View International Foundation has established or restored over 20,000 hectares of mangroves in Ayeyarwaddy delta, Sittaung delta, Rakhine coast and Taninthayi coast in collaboration with the Forest Department and local communities over the last decade. Half of the estimated carbon sequestration resulting from these projects has been delivered to the local communities as carbon credits. Eventually, these reforestation sites will be transferred to local people as community forests. This

kind of investment is rather new to Myanmar and participatory monitoring is essential to ensure that all stakeholders are well informed, that the benefit sharing mechanism is transparent, that there is a mechanism for resolving conflict, and that local cultural norms are well respected.

The dry zone of Myanmar is an unique ecosystem with a severe temperature ranging from 10°C to 45°C and rainfall below 500 mm per year, but still home to over 15 million people. Their livelihoods and cultural practices have evolved with nature. They are known for their honesty, bravery, and resilience. Due to extreme weather and other factors, they are accustomed to climate shocks and have developed the cultural wisdom to survive in extremely difficult situations. Governments and development organizations have helped to improve livelihoods. Community forests have been developed not only to supply fuelwood but also to serve as shelter against extreme heat.

Figure 5. Resilient people from the dry zone of Myanmar photographed with the Director General of the Forest Department after clarrifying land issues and receiving efficient cooking stoves, Myaing township, Pakoku, Myanmar (photo by Dr Maung Maung Than, 2016)

Conclusion

Local communities in Myanmar have evolved cultural values to live in harmony with nature, particularly within the harsh climate of the dry zone, the disaster-prone area of the Ayeyarwaddy delta, and the long coastlines.

The key values applied to the usage of natural resources of land and water are sharing, partnership, respect, and fairness. These values are fundamental to many community-based natural solutions such as community forests, community fishery management, community protected areas, and community ecotourism.

Modern community forest management has evolved based on historical practices

through the application of rule-based systems based on participation and consent. Community forests can contribute to climate change mitigation and to climate change adaptation.

The practice of community forest management in turn strengthens the existing and evolving cultural heritage of the rural societies in Myanmar.

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Traditional Natural Resource Stewardship in Malaysia's Rapidly Changing Landscape

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ABSTRACT—Malaysia is exceptionally rich in natural resources, especially in its forests. The indigenous peoples, known as Orang Asli, live in the forests and depend on their natural resources. One such group is the Temiar living in the forest on the Titiwangsa range. They view forest as *Tuhad*, the creator. They have accumulated indigenous knowledge on preserving the forest over centuries. Some of this knowledge is encapsulated in their calendar, known as *Tahud*. They observe rules on the timing of cultivation, on the hunting of animals, and on the extraction of resources. These rules ensure the survival of the forest for the future. As Malaysia has embraced development, many projects threaten the forests, especially the clear-cutting by logging companies. Deforestation affects other aspects of the ecosystem such as water supply, biodiversity, and the climate. For the indigenous peoples, forest is life so the loss of forest is like the loss of life. Some have been forced to migrate to the cities to work, and there they lose their indigenous knowledge. Some communities have defended their traditional lands by blockading the loggers, and getting help from lawyers and NGOs. It is vital to preserve, document, and mainstream this indigenous knowledge for the benefit of the indigenous communities, the nation, and the planet.

Biodiversity and ecological connectivity: The safety net

The Malay Archipelago is remarkably rich in biophysical resources and is recognised as one of the twelve most megadiverse areas of the globe. Malaysia is blessed with a mosaic of tropical ecosystems and landscapes, from jagged mountain peaks in the interior to lush rainforests on lowland hills, wetlands, mangroves, languid coasts, offshore islands, and one of the richest reef-endowed seas. The number of different habitats is high in proportion to the size of the country's land-mass, with a high number of plant and animal species, including many endemic species both on land and underwater.

With a long geological and evolutionary history, Malaysia is a global centre of tropical floral diversity where over 90 percent of the country's terrestrial biological species occur in natural forests. In its million-year old dominion lies countless wealth that will never be known to man, from the hidden life that occurs below ground to majestic life forms high above the canopies. In the seas, Malaysia makes up part of the Coral Triangle that has the highest diversity of marine life in the world. The seas are flanked by an extensive continental shelf that is home to a bountiful and rich plethora

of marine life in the coastal ecosystems of reefs, mangroves, lagoons and estuaries. The mangrove forests along sheltered, muddy shores, bays and deltas act as coastal defence against large waves and erosion, as witnessed during the tsunami of 2004. Mangroves are also ecologically important as they serve as breeding and nursery grounds for juveniles of many marine fish and shellfish species, including commercially important ones. These landscapes are important local carbon sinks and sources that are intricately woven into the global bio-geoclimatic tapestry that governs earth processes.

Malaysia's plentiful natural resources perform many critical ecological functions and ecosystem services that are utilised by indigenous and local communities living in the hills and coastal areas. The many types of biologically diverse forests provide countless varieties of crops, fruits, vegetables, medicines, spices, ornamentals, timber and non-timber products that are socially, environmentally and economically important to urban, rural and indigenous communities.

The mountains and forests that occupy the hinterland of the country supply clean potable water and fresh, clean air, regulate floods and protect soil and watershed for remote communities, villages as well as urban ones, that live along the main rivers and tributaries and in the downstream settlements. The flowing waters are laden with vital nutrients that feed and nourish connected ecosystems from the hills to the rivers and the

Figure 1. Titiwangsa and other ranges in West Malaysia (map from www.smugmug.com)

sea, sustaining terrestrial and aquatic life. Vast rainforests, such as the Titiwangsa Range running down the spine of the peninsula, the Crocker Range in Sabah and the highlands of Sarawak, are instrumental in maintaining the hydrological cycles, contributing to the formation of atmospheric rivers in the sky that are crucial in regulating the country's climate. The interacting biophysical foundation makes up the climatic resources of Malaysia, which is affected especially by the dynamics in the amount of warmth from the sun, and rainfall that varies throughout the year depending on seasons across the land.

The interconnectedness and interdependence of biodiversity and ecosystems reflect the complexity and balanced intricacies of the web of life they maintain and protect,

which in turn, not only benefit the local people but also the region, and globally (Sodhi and Ehrlich 2010: 51, 65). Our dependence on natural resources and the free services they bless us with is complete and crucial. For indigenous peoples, this dynamic complexity is the focal point of their traditional ecological knowledge accumulated over a long period of time.

Since its independence in 1957, Malaysia has experienced tremendous development and progress (Zafir and Magintan 2016: 5). Population growth and fast economic development have put extremely high demands on natural resources. Pressures on the environment have intensified. The extraction of natural resources, along with urbanisation and industrialisation, have impacted the ecosystems and natural landscapes, including the air, causing changes to the very biophysical foundations we depend on, and, upsetting the balance of nature, in some cases reaching its tipping points. The country has not avoided unsustainable development, especially in recent times, causing fragmentation of ecosystems and disruption of biodiversity and ecological processes.

Traditional knowledge: The epitome of sustainability in natural resource stewardship

Malaysia is populated by approximately eighty distinct ethnic groups, each with its own unique history, background, and variations in religion, culture, belief and value systems. The communities can be found interspersed from the highlands to the coastal areas, utilising resources in their immediate surroundings. Many of these ethnic groups belong to the indigenous communities that have had a long history of interacting with the natural landscapes they inhabit. There are relationships, connections and, dynamics between the two that create their unique cultural identities, traditions, beliefs and value systems. All these factors make indigenous communities very prudent in maintaining a harmonious and sustainable relationship with the environment.

In Malaysia, indigenous peoples occupy specific geographical areas, commonly living in their customary or traditional lands in the forests or rural areas, while a few groups live close to the coast. In Peninsular Malaysia, eighteen sub-ethnic groups are collectively known as *Orang Asli* (aborigines), while in Sabah and Sarawak they are commonly known as *Orang Asal* (original peoples) (Salleh 2006: 20). Traditionally, their lands are surrounded by natural forest areas, rivers, and mountains. The terrain and its geographical locations have important roles in shaping these communities and the way they have practised their livelihood for centuries. Natural resources are very important in the life of the indigenous people and shape their aesthetic, cultural and spiritual values. The majority of the indigenous people still make their livelihood in traditional ways that are heavily influenced by their natural environment and the ancient wisdoms passed down from their ancestors. Due to their close affinity to their lands, their culture, spirituality, beliefs and values are closely associated with their natural environment. Their hunting, food collection, farming, and fishing are oriented to subsistence, taking only what they need. They contribute to the conservation of plants and wildlife, and the protection of soil fertility, water and other resources. Thus, indigenous people's lifestyle and livelihood practices are the epitome of sustainability.

The indigenous people, such as the Temiar sub-ethnic group, who live in sixteen villages deep in the central forest on the main Titiwangsa Range of Peninsular Malaysia, view the forest as the most important factor in their lives. They describe their relationship with the forest proverbially as "*isi dengan kuku*" (nail and flesh). If there is no forest, then there can be no beliefs, culture, customs and traditions as everything that qualifies an individual as an indigenous person originates from the forest. Births, illnesses, deaths, celebrations, and other aspects of the life cycle revolve and intertwine with the forests. Their way of life is ecologically connected to the environment, hence they are part of their environment. To them, forest is *Tuhad*, the Creator, a sacred embodiment. Any activities involving the forest, such as entering the forest, has its own special ritual, conducted to seek approval from their ancestors and gain protection from evil spirits. There are many acts forbidden while going into the forest because they would offend the spirits. They have a holistic and systemic relationship with their environment. For example, their perception of forest includes all types of vegetation (there are many types in Malaysia), along with the rivers, rocks, hills and mountains — namely, both the living and non-living elements, as one cannot exist without the other. This is similar to the concept of an ecosystem, the environment as an interconnected system of organisms interacting with their physical environment. The Temiars' profound respect for the forest and its inhabitants is the very foundation of deep ecology and land ethics.

They see themselves as custodians responsible for protecting the welfare of all lives in the forest. They believe that everything created by *Tuhad* has its role and function. For instance, the plants from the forest provide medicines to cure many of the illnesses that they encounter. The forest holds many secrets waiting to be revealed. The local indigenous knowledge of medicinal plants has high potential for use in the modern medical field in treating ailments and diseases. All forest resources can be used, such as palm fronds for roofing, bamboos or tree bark for house walls, flowers and fragrant plants for celebrations. They find it unfortunate that the public in general views the forests only as a quick source of cash from timber without fully understanding their secret riches.

The Temiars' way of life revolves around their community's calendar that is founded upon their interpretation of the forest. The calendar is the result of their long observation of the dynamic, interwoven processes of nature which has formed their ancient wisdom and worldview of the forest and its environment. The calendar, called *Tahud*, does not follow the typical twelve-month cycle of the modern calendar but reflects the diversity of nature's cycles in phases of time and season. *Tahud* manifests the deep understanding of biodiversity and ecological connectivity that the Temiar has with their environment. Important "dates" include *grob* and *tendrel,* the start and end of the "year." both observed in a small welcoming celebration by the whole community. *Grob* is the start of the flowering and budding season of most forest trees while *tendrel* is at the end of dry season when deciduous trees drop their leaves. *Grob* is followed by the fruiting season, the rainy season, and the dry season. After this, there are a couple of months of rest for the forest to recover. Throughout this calendar, community activities are designed to sync with the availability of resources within the specific phases. This adherence is strictly enforced and no one is allowed to conduct activities, such as hunting,

outside the appointed period. They are only permitted to hunt for certain species of wildlife, and breaking the taboo will cause illness and diseases. They are forbidden to track down any species, and may kill only those animals that they encounter by chance and only fast-growing species which reproduce frequently, such as deer. Species that grow slowly and reproduce only once are prohibited from being hunted. Although this hunting strategy has been practised for thousands of years, the animals still thrive and can be harvested regularly until this day as they have not been hunted to extinction. However, the encroachment of logging and the clear-cutting of many forests has caused many species to disappear in a short period of time, resulting in a shortage of food and an increase in human-wildlife conflicts.

Figure 2. Traditional hill rice cultivation, harvesting and processing are still carried out as a communal activity (photos by Persatuan Aktivis Sahabat Alam)

Farming of the staples, rice and millets, starts at the end of the rest period. They practise shifting cultivation and time the cropping to coincide with the availability of water during the rainy season and end with harvesting and processing during the dry season (Figure 2). The perception that the farming practices of the Orang Asli are destructive to the forest is unfounded and based on superficial analysis. The farmers first conduct a ritual known as *tatak tandil* and *tatak halak* to obtain approval from the elders and leaders before a piece of land can be cleared for farming. After approval is given, they identify the suitable sites. Clearing the land for each family is done together communally as *gotong-royong*. The vegetation is cleared carefully, observing certain

taboos, such as not removing large trees, fruiting trees or other trees forbidden by their ancestors. This method ensures regrowth at the site within twenty to thirty years. Because the site is not completely bare of vegetation, the soil is protected from damage and loss. The size of the cleared area is limited but large enough to support the community for the year.

The farming rotates among several fixed locations without having to clear new areas during the designated period. When one area starts to decline in fertility, the community moves to the next suitable area, and the previous land is left idle to rest and undergo natural healing through regeneration of the soil and vegetation. The farming is only a minor disturbance which spurs the cycle of ecological succession. Remnants of the previous vegetation are allowed to regrow and within twenty to thirty years the forest can revive. With the wisdom from such practice over a long period, the communities know how long it takes to allow natural regeneration and the recovery of the land's fertility. These practices preserve biodiversity and ecological connectivity, ensuring minimal disruption to the land and maintaining the ecological resilience of the utilised area and the ecosystem in general.

The tradition of this ancient calendar is still practised and ingrained in the Temiars' way of life and livelihood. In essence, *Tahud* reflects the deep ecological knowledge and comprehension of forest ecology that allow the Temiar to sync their daily activities with that of nature's without having to spend extra energy. Through this practice they make use of nature's technology, which is non-intrusive and free, and are able to coexist harmoniously with all of its elements without any conflict. For the Temiar, and Orang Asli in general, their farming practices balance productivity with environmental sustainability and species protection. As a result, the Temiar and other indigenous communities can still farm even after thousands of years utilising the same resources in the same foraging grounds of their traditional lands. By contrast, modern use of forest resources is extractive, exploitative and exhaustive, lacking any regard for anything but the most profit, and hence unsustainable. Modern land and resource use and management have a lot to learn from indigenous people.

For the Orang Asli, loss of forests is seen as a critical matter because without forests they will also perish. They see forests as life itself. Forests are not only important for their sustenance but also for the survival of their children and their future generations, hence the forests must be protected at all costs. That is why the Orang Asli are unwavering in their efforts to protect their customary lands from land-grabbing and logging by erecting blockades and standing guard round the clock.

Environmental crisis and its implications for the sustainability of traditional knowledge

Over the years, as Malaysia progressed, modernisation and economic development have imposed pressures on these communities, some of which have staged intense struggles to withstand the impact on their practice of traditions, customs and livelihood. In the last fifteen to twenty years, they started to experience gradual but significant decline in many of the resources on which they depend, largely due to encroachment

Figure 3. A vast area of primary rainforest clear-cut for timber in the Kelantan-Terengganu border of Peninsular Malaysia. Forest conversions to agricultural use, such as this, has resulted in the loss of biodiversity and habitat, and the displacement of indigenous people (photo by Persatuan Aktivis Sahabat Alam).

on their forests by corporations with approval for development projects such as forest plantations, quarrying, mining, dam construction, and lately the Musang King durian plantations. This decline has become widespread on indigenous peoples' traditional lands throughout Malaysia. Some of the most destructive projects are forest plantations that clear-cut the original forest several tens of thousands of acres down to the bare ground (Figure 3).

Such rampant deforestation is critical as it results in habitat loss for many species. The indigenous communities also lose their source of foods, medicines, herbs and flowering plants used for celebration of traditions and customs such as *Sewang*. They lose basic resources such as materials for hunting tools, blowpipes and traps, as well as bamboo and timber such as *Nibong* and *Bertam* used for housing. They have to travel by foot for longer distances to seek out the same resources. In some instances, they lose all of their customary land (*tanah adat*).

Deforestation ultimately results in the loss of their traditional knowledge, because the natural resources on which they rely to maintain their customs, beliefs and traditions disappear permanently. The community has to migrate to urban areas to generate income and depend on purchased resources (as opposed to wild free resources), such as modern medicines and purchased food. Another effect of deforestation is change in the weather patterns, such as rainfall. When massive tracts of rainforests are destroyed, the natural ecological balance of the forest ecosystem is disturbed. The large-scale loss of forest affects evapotranspiration and the hydrological cycle, altering the movement of moisture in the atmosphere and resulting in shifts in the weather patterns (Sodhi and Ehrlich

2010: 153). This in turn disrupts their traditional calendar, especially the farming of rice and millet, which depend on sufficient rain and sunlight. If the timing of planting and germination does not sync with the expected weather, many disasters ensue including devastation by pests, such as munias and rodents that feed on the crops. Unpredictable weather patterns are challenging to manage within their traditional calendar. If the clearance of forest areas continues each year, there is greater likelihood of major changes in weather patterns (Gray and Ewers 2021: 4). The revered traditional calendar may lose its significance as a focal reference. Traditional wisdom and knowledge will come under challenge. Deforestation diminishes the biodiversity and ecological connectivity of the forest ecosystem and threatens its resilience. The resulting decline in the provision of forest resources will cause indigenous communities to depend more heavily on farming and other means of livelihood (Figure 4).

Figure 4. Training on organic farming conducted by NGO groups for communities affected by deforestation (photo by Diribumi Ecological Services

There has been an increase in human-wildlife conflicts in all sixteen Temiar villages in central Peninsular Malaysia over the last two decades. Reports on encounters with elephants, tigers, and bears entering villages, farms and plantations are on the increase ((Shahriman et al. 2017: 113). In some cases, these encounters cause injury or even death, usually with wildlife on the losing end. Tigers are on the IUCN (International Union for the Conservation of Nature) Critically Endangered species list threatened with extinction; the Asian and endemic pygmy elephants are on its Endangered list; and sun bears are on its Vulnerable species list. Decline in the population of these mammals could alter the forest as these species play important ecological roles in the forest ecosystem. All three species are known to be seed dispersers of forest trees. Their decline could cause changes in the distribution of the Orang Asli's food trees, medicinal

plants, and culturally important plants. This is another strong reason that could result in their traditional knowledge not being passed down to younger generations.

Although Malaysia is a signatory of the United Nation Declaration on the Rights of Indigenous Peoples (UNDRIP) and has obligations to uphold the basic rights of Orang Asli, this is not well implemented. The Orang Asli should be able to practise their culture, customs and traditions freely, and should not need to migrate. But when logging takes away their forests, many young people migrate to the city, or get employment in farms, oil palm plantations, or as skilled and unskilled workers. They are assimilated into modern lifestyles and become detached from their original identities and culture. They lose their traditional knowledge which is bound up with the forest. Traditions and culture exist as long as the forest exists, but disappear when the forest disappears. Those who move to the city are in survival mode. They are satisfied with their income and new lifestyle, but they have lost the rich culture that makes them Orang Asli. The Orang Asli Act 1954 defined an Orang Asli as someone who "speaks an aboriginal language, habitually follows an aboriginal way of life and aboriginal customs and beliefs and remains a member of an aboriginal community."

Most of those who have migrated to cities no longer conform to this definition and hence may lose their rights as Orang Asli. From a legal point of view this is a huge loss especially in relation to customary land. By moving away from the old way of life, they effectively forfeit their rights to their land. They not only lose their customs, culture, tradition and eventually traditional knowledge, but they lose their future, because they no longer have rights to the land.

Traditional knowledge is gradually being dismantled by development, resource extraction, plantation agriculture, urbanisation and modernisation. Deforestation of the traditional lands and forest deprives the indigenous people of the means to adapt to rapid change. The affected communities are often not consulted about an impending project. When forests are logged out and lost permanently, the impacts on people, biodiversity and the physical landscapes are severe. The traditional knowledge that indigenous communities have safeguarded for generations may be lost.

Changing the narratives

It is well known that traditional community practices and traditional knowledge can provide solutions to climate change. In Malaysia, there is a rich and diverse heritage of traditional knowledge among various ethnic groups, but little of this is documented and thus this treasure is at risk of being lost. The main threat is large-scale deforestation. All the sixteen Temiar villages are affected but the impact differs. In some, the forest is already completely lost. In others, the forest is seriously affected, partially lost, or still intact but vulnerable. One community has persistently blocked the attempts of logging operators to enter their customary land.

The Titiwangsa Range is the last bastion of lush, abundant, and highly biodiverse primary forest ecosystems in Peninsular Malaysia, but is being plundered mercilessly for short-sighted economic gains.

The Temiar communities have sought help. They have got lawyers from the Bar

Figure 5. The NGO Persatuan Aktivis Sahabat Alam conducts training on community forest watch, documentation and mapping customary land boundaries with various indigenous communities using simple technology such as hand-held GPS and drones. (photos by Persatuan Aktivis Sahabat Alam)

Figure 6. Indigenous communities have been more vocal in protecting their land rights from loggers and land developers (photos by Persatuan Aktivis Sahabat Alam)

Council to educate and train them on legal issues, customary land rights, human rights, and social and environmental justice. Environmental NGOs, such as Sahabat Alam Malaysia and Persatuan Aktivis Sahabat Alam, have also assisted them by raising awareness on environmental issues in the media, writing memoranda to state governments, and giving training on advocacy work (Figure 5). The communities have learnt how to use technology, such as drones and GPS (global positioning system), to conduct their own monitoring of the forest monitoring and mapping of the boundaries of their traditional lands, for use in court cases against logging companies. The Temiar have also reached out to other indigenous communities in the central peninsula to share their knowledge and experience. They are aware of the need to resist now before the degradation of the forest becomes even worse. In recent years, more and more indigenous communities have organised human blockades and demonstrations to obstruct loggers from gaining access to their customary lands (Figure 6).

After fifteen years, this movement is growing stronger. Through court actions, it has prevented 61,000 hectare of prime forest from being destroyed by logging companies. The communities have negotiated a steep learning curve and shifted their perspective from originally taking care of just their community to safeguarding the indigenous peoples as a whole.

The physical health, culture, traditions, and beliefs are closely connected to the health of the ecosystem they inhabit. The sustainability of traditional practices and knowledge depends on the sustainability and biophysical health of the natural resources. Indigenous peoples need support from the larger mainstream communities in their struggle to preserve the planet that we share. Their future is also our future. The resources they depend on are the same resources we depend on, but they value their importance more highly. They feel the weight of their responsibility to struggle, not only for indigenous people in the forests but also for the downstream communities, because deforestation will affect everyone in various ways, such as the loss of access to clean drinking water and flooding in downstream catchment areas. Their love and intimacy with the forest allows them to see the significance of protecting this critical ecosystem which is a key to combating climate change.

The way forward

Prevention is better than cure. Protecting the resources of forests, rivers and seas is fundamental to the protection of other elements of the ecosystem, as well as the cultural heritage such as the traditional knowledge accumulated by traditional communities. The wisdom that indigenous knowledge embodies is universal – total interconnectedness (man-man, man-nature, man-creator), harmonious co-existence, sacred, respect, humble, ingrained, reciprocity, deep ethics – these are all inherent values of humanity. Traditional knowledge is a key to climate action, a guide to the protection and wise use of resources to ensure their survival. This knowledge needs to be mainstreamed from the individual level, to the community, to local, state and federal government, to the global community. The following are some suggestions for the way forward.

Practice and apply a holistic ecosystem approach to natural resource utilisation and management. The *Tahud* calendar is aligned with the complex processes of nature across the whole cycle. By analysing and understanding this calendar, better strategies can be applied to land and resource development, utilisation and management.

Introduce systemic and ideological change or reform at all levels of governance. Environmental sustainability and climate change are systemic problems, hence, require systemic solutions. Re-engineering of the whole system is needed to be effective. Traditional knowledge has survived thousands of years without harming ecosystems or causing extinctions. Unlearning conventional knowledge and relearning traditional knowledge can give us an insight into our errors and recalibrate our development paths for the next generations.

Undertake continuous advocacy and strategising to mainstream environmental issues in order to raise awareness and gain support for the protection of natural resources and assistance to indigenous communities. Most city dwellers are not sensitive to these problems. A collective voice from all walks of life and levels of society is needed to put pressure on politicians and decision-makers. More professionals and researchers are needed to collaborate with indigenous communities.

Provide more training to indigenous community groups, assist them in documenting traditional knowledge, and support their resistance against deforestation of their customary lands. More skill-based training in documentation is needed, such as video documentation, computing skills, social media, report writing, public speaking, leadership, and youth empowerment, to quickly curb further loss of remaining forests.

Recognise the land and resource rights of indigenous peoples which are essential for safeguarding the ecosystem and building climate resilience. Indigenous peoples are among the most marginalised. They are not included in policy-making on matters that affect their rights and interests, and their welfare is often neglected and undermined. Building strategies for effective stakeholder engagement can support this process.

Adopt many traditional and indigenous practices, such as ecologically conscious farming practices that take advantage of natural processes. This includes a whole-systems thinking approach of permaculture, SRI, agroforestry, and syntropic forestry. They have similarities with *Tahud*. These nature-based farming practices need to be expanded to more areas and get more people involved so that they can become mainstream.

Promote and develop biomimetic and biophilic technology for resource extraction.

Indigenous and traditional communities use nature's technology to extract and use resources. The research in these areas is still in its infancy. The process of unlearning, and relearning can help to facilitate this undertaking.

Introduce indigenous traditional knowledge in school education. There is a wealth of science, technology, art, crafts, sustainability, environmental ethics, culture, heritage, social, conservation, biodiversity, wildlife, and plant studies that could be integrated in the curriculum. Children living in cities have little connection to the forests and natural environment. Countries such as India, Canada and Australia have retrained teachers in these areas.

Include education in ethics in formal and informal education. Environmental problems result from unsound ethics and behaviour. The environmental crisis is threatening human survival through the depletion of natural resources, biodiversity loss, climate change, and pollution. These are problems of humanity. The solutions lie in fundamental human values of responsibility, empathy, justice, selflessness, co-operation, and tolerance. If we aspire towards a sustainable future, ethics will have to be in our everyday conversations.

Understanding the traditional knowledge and resource management systems of various indigenous peoples in Malaysia and around the world can help to form strategies to achieve sustainability. Traditional knowledge is the culmination of thousands of years of learning through experience about the sustainable use of resources. This knowledge protects and preserves biodiversity and ecological connectivity over time. It needs to be applied across the globe to offer new and effective models for development that are ecologically, socially and ethically sound.

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Karen Environmental Stewardship of Natural Resources

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ABSTRACT—In northern Thailand, state-driven discourse has often labeled diverse highland minority groups or "hill tribes" as destroyers of the forest, associated with the drug trade, and as non-indigenous migrants. The reality is far more complex. Indigenous groups such as the Karen practice sophisticated traditional ways of environmental stewardship. Specific sites and portions of community lands are set aside and protected from resource usage, including watershed forests, cemetery forests, and forests of spiritual protection where community members' umbilical cords are ritually deposited. A series of complex and variable taboos regulate hunting activity, including bans on killing certain animals, restrictions and practices that limit waste and overuse. Portions of the landscape that are used for agriculture or resource extraction are carefully stewarded through a cyclical process of asking permission for the temporary use of the land, asking forgiveness for any misuse that may intentionally or unintentionally occur, and offering thanksgiving before ending the stewardship and returning the land to its true non-human owners. These three axes of Karen stewardship – permission, atonement and thanksgiving – comprise a "green circular cycle" that mediates reciprocal relations between human communities and non-human beings, spirits, and the land.

Forestry discourse in Thailand

In northern Thailand, state-driven discourse often labels diverse highland minority groups or "hill tribes" as destroyers of the forest, associated with the drug trade, and as non-indigenous migrants. This discourse, which has its origins in the late 19th century and became more prominent in the early 1980s, justifies an approach to forest and landscape management based on the principle of "Separate people from the forest." Government efforts in forest conservation focus on pushing people who live and work in forest zones out of the area and expanding conservation zones to encompass the rotational farmland used by highland villagers. The argument that highland ethnic groups, who generally practice sustainable rotational farming, are causing the destruction of watersheds, water sources, and forest resources is used by the government to declare national parks and wildlife sanctuaries over forest and farmland falling within the customary lands of minority villagers. Tensions between forestry officials and local villagers have led to both sporadic outbreaks of violence and large-scale protest movements, including several marches in the 1980s and 1990s that brought protesting highland villagers to the Chiang Mai City Hall and even to government offices in Bangkok.

Conflicts between the state and local communities on the issue of forest resource management can be summarized as comprising three main issues: 1. conflicting interpretations of the definition of a forest; 2. conflicts over the ownership of forest lands; and 3. conflicts in thinking and practice that stem from different ontological and epistemological perspectives. Regarding the definition of forest, the Thai government relies upon Section 4 of the 1941 Forest Act, which defines forests as lands that have not yet been acquired by a person under the land law. Following this definition, land which was once forested but is currently without trees is still considered forest, as long as it has not been legally assigned to someone's ownership. However local communities tend to believe that the forest ownership exercised by the state refers naturally only to forested lands. Unforested areas, such as the agricultural land used by highland peoples, are generally viewed as spaces where everyone has the right to occupy and pioneer. We can summarize this conflict by saying that the state claims ownership through recourse to *legal rights*, while highland villagers claim ownership to the same lands by means of their *traditional rights* (Kanjanaphan and Kaosa-ard 1995). These traditional or customary rights are based on highland communities' roles as stewards, who have maintained, exploited, and lived in the forest for a long time, usually longer than the existence of the 1941 Forest Act.

The Thai state uses a Western model of natural resource management based on the belief that people are a threat to forest security. As is now well-known, this model originated with thinkers like John Muir in the United States, who mistakenly observed what he thought were "pristine lands" but were, in fact, carefully managed ecosystems whose indigenous stewards had been massacred by colonial settlers shortly before Muir's time. This misunderstanding went on to become enshrined as the guiding principle of the US National Parks System, which has in turn inspired national park systems and landscape management approaches worldwide, including in Thailand. The natural outcome of this "pristine forest" model is that it is necessary to separate people from the forest in order to protect it. This "exclusionary" approach to resource management refuses to recognize that minority peoples may have their own cultures and ways of living on the land that differ from those of the majority people.

In Thailand, the prerogative to exclude local communities from the forest is also influenced by their perception as itinerant migrants coming from other lands. The belief that such groups also participate in drug trafficking (which has historical reasons) further labels them as threats to national security that require strict control and management. Ironically then, in Thailand, the state has concluded that it must "defend" the forest against the people, while from the perspective of indigenous defenders, the people and their carefully stewarded natural resources must be "defended" against the state. These two perspectives are at odds and constantly threaten to bring the state and local communities into states of opposition and conflict.

Karen history in Thailand

"Karen" refers to groups of people who call themselves Pgaz k'Nyau, Sgaw, Pwo, Kayah, Kayan and Pa-O. They live mainly in areas which are defined as "forest lands"
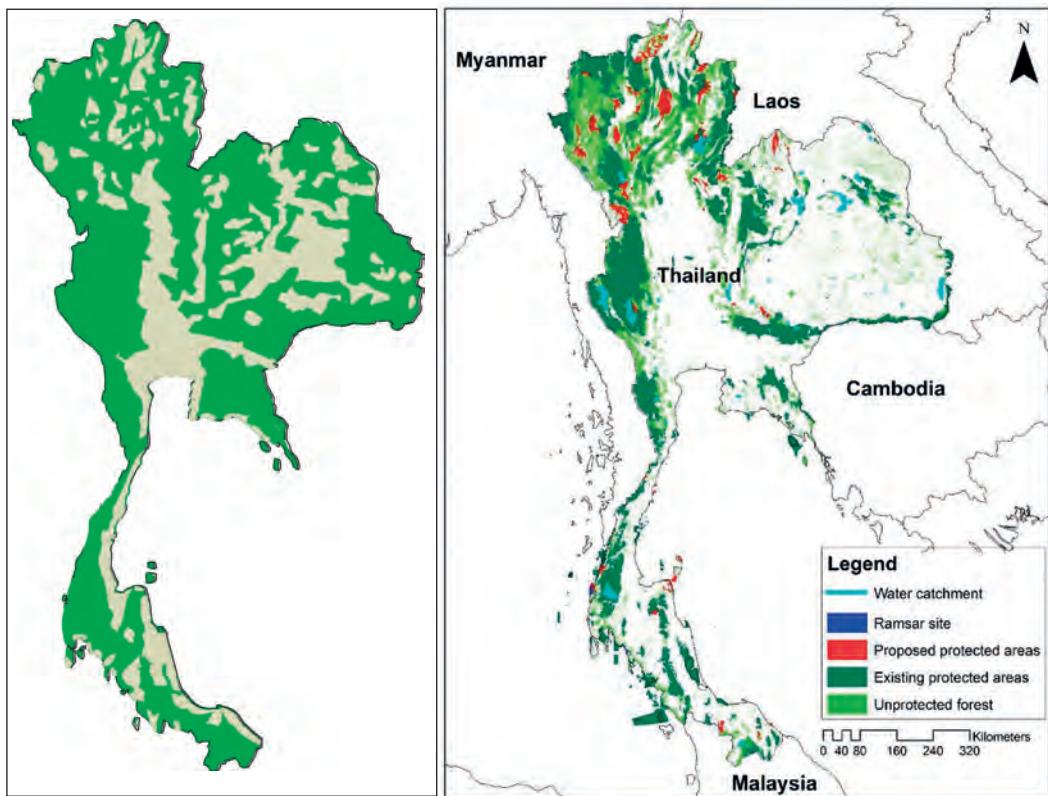
Figure 1. (left) Forest cover from Forestry Department map in the 1950s; (right) current situation from Pomoin et al (2022)

by the state in fifteen provinces: Chiang Rai, Chiang Mai, Mae Hong Son, Lamphun, Lampang, Phrae, Sukhothai, Tak, Kamphaeng Phet, Kanchanaburi, Ratchaburi, Phetchaburi and Prachuap Khiri Khan. The Chiang Mai Hill Tribe Research Institute in April 2002 reported that the Karen population in Thailand totaled 438,450 people (Hill Tribe Research Institute 2002), while a report of the Karen Community Data Survey project states that the total Karen population in 2017 was 549,395 people in 125,673 households across 1,993 villages (Northern Farmers Group Network 2017).

Karen people have a long history of ties with the kingdoms of Lan Na and Siam. Most Karen people in Thailand had ancestors in the north and central west. Some of these communities have histories that can be traced as far back as 1,200 years, although most can identify no more than 400 years of history. Even though these histories of settlement extend far beyond the periods when "forest lands" were defined for different kingdoms and states, governments have not generally recognized Karen territorial claims. The Forest Management Bureau, Department of Forestry, Ministry of Natural Resources and the Environment, reports that forest cover has decreased from 28.3 million hectares or 53.3 percent of the total area in 1963 to 16.3 million hectares or 31.5 percent in 2014 (Figure 1). Currently, most of the remaining forested lands are in the northern and western regions of Thailand, the areas where most Karen communities live. The Thai state has declared forest reserves and other categories of protected areas which overlap with Karen territories and agricultural lands, relegating all such communities to illegal status.

Panichkul et al. (2017) studied the rights of Pgaz k'Nyau Karen communities and

the implementation of special cultural zones for swidden cultivation in strategic areas as a method to resolve agricultural land disputes and Karen housing problems in the northern forest lands. They report that 1,661 communities (out of a total of 1,930) are located in National Forest and 492 of these communities are located in conservation forests such as national parks and wildlife protection zones. There are 583 communities in both national forest and conservation forest. Almost all the Karen communities in western Thailand are in protected forests.

The declaration of protected forest areas which are superimposed on Karen and other highland groups' community territories significantly affects their ways of life. Those communities located in protected areas are often prevented by forestry officials from practicing shifting cultivation, or are forced to limit their areas of cultivation. Limiting the amount of land in cultivation shortens the length of cycles of rotation, causing degradation of the soil, an increase in grass and decrease of rice yields per acre. In such situations, Karen people, besieged by the state, are both faced with food vulnerability and prevented from practicing their tradition of shifting cultivation. Beyond forestry policies, another key factor in the vulnerability of Karen communities is the mounting influence of capitalism. External networks of capital and merchants, commercial markets, and state economic promotion programs together pressure self-reliant local economies to transform into commercial economies, forcing villagers to shift from rotational fields to commercial crops, particularly maize. This situation has been created through national forestry policy coupled with the growing influence of commercial agriculture, as found in the work of Boonchai et al. (2014).

Although besieged by the dual powers of state policy and capitalist markets, Karen communities continue to uphold the values and ideals of natural resource stewardship. The widespread perspective that "Because we use it, we have to take care of it" reinforces a cycle of sustainable consumption that maintains a balance between people, natural resources, and the spiritual world.

Customary protected areas in Karen communities

Specific sites and portions of Karen community lands are set aside and protected from resource usage (Junsongduang et al. 2013; Phatthanaphraiwan, Zeitler and Fairfield 2022; Platz 2003). These conserved areas, such as the upper portion of *tee kwa kee* (watersheds), are considered fragile, and cannot be farmed or even entered under normal circumstances. If people enter the upper watershed, they may become sick. If these areas are exposed to too much heat or cold, they will also become "sick", so they must be maintained at a stable, balanced temperature. Cutting trees, collecting firewood, hunting, and other forms of natural resource extraction are forbidden in these areas. Most designated upper watershed areas account for 30–40 percent of the total community territory (Maniratanavongsiri 1999).

Another category of preserved lands are cemetery forests, which are called *ta sua kho* in the Pakinyaw language, meaning zero space or empty space. This signifies that these areas have been returned to nature; they are empty. Everything in the cemetery forests are forbidden to the living, and living beings cannot use any resource in these areas

(Flanagan 2019). They are only used when someone dies, for instance to gather wood to construct the coffin. Otherwise, all plants and animals that live in cemetery forests cannot be hunted or killed, as they are believed to be the property of the deceased souls. If living people break the rules, such as crossing the line that delineates the cemetery forest, the spirits of the dead may become dissatisfied and claim damages (Paul, Roth, and Moo 2021). Therefore, cemetery forests are strictly controlled conservation areas, as well as refuges for animal and plant species.

Figure 2. (left) A sign marking the protected umbilical cord forest in a northern Thai Karen village; and (right) a Karen elder pointing out a recently hung bamboo tube containing a newborn's umbilical cord attached to a navel tree in a *pga dei pau* (photos by Suwichan Phatthanaphraiwan)

When someone dies and is buried in the cemetery forest, plants, fruit trees and flowers that were favored by the deceased are brought by their relatives and planted in the burial area, thus increasing the site's biodiversity. The body is sent back to the earth and back to the forest. While a person is alive, they use many natural resources to survive. In death, they are able to pay back this debt by returning their body as an offering for the food, animals, firewood, and other resources which they used during their lifetime. The average area of these forests is about 5–6 hectares, so across the 5,790 Pgaz k'Nyau Karen villages in Thailand, there are roughly 37,500 hectares of land under conservation as cemetery forests.

The third category of protected forests are called *pga dei pau* (Figure 2). They are forests of spiritual protection where the umbilical cords of newborn community members are ritually deposited in trees. According to the Karen tradition, after birth, the umbilical cord is cut with a special bamboo knife made for this purpose, and it and the placenta are placed in a bamboo tube. The father or grandfather of the newborn child then goes to the *pga dei pau* and ties the tube to a large, strong tree, ideally a fruiting one (Greene 2021). This act establishes a spiritual link between the child and the tree. While the child grows, this "navel" tree must be protected by their parents, and once they have reached an adult age, this responsibility becomes their own (Georgiadis 2022). If the tree is cut down, it is believed that the human "owner" of the tree may get sick or even

die (Santasombat 2004). If the navel tree is cut down or harmed, the person responsible must hurry to apologize by offering a chicken egg before they get sick. Afterwards, the tree's owner must find a new navel tree within three days or pay a fine of a pig. Similarly, if the child falls sick, one of their family members often visits the child's navel tree to make offerings in order to return the child to health (Omori et al. 1999)

The number of navel trees depends on the number of people in the community. Normally, each community will set aside one area to be the *pga dei pau*, which makes it easier to protect the trees. It is a restricted area, because the souls of all the community members are believed to reside there. The *pga dei pau* is where the notification of someone's birth is delivered to the land, the forest, and the natural elements, opening a kind of contract between them and the other beings with whom they will coexist. Each community's *pga dei pau* is roughly 5–6 hectares, the same size as the funeral forests, so across the 5,790 Karen communities in Thailand, these forests protect around 37,500 hectares of land.

Karen taboos and regulations on hunting

In the Karen way of life, animals are hunted for food and traditional medicine, but a series of cultural beliefs and complex taboos regulate this activity and ensure that it is sustainable. These taboos include bans on killing certain animals, and restrictions and practices that limit waste and overuse (Moo et al. 2018). These practices can be classified into three categories: outright bans on killing certain animals; bans on killing certain animals in certain areas; and bans on killing certain animals at certain times of year.

Some animals, such as gibbons, cannot be killed, hunted, or eaten for any reason (Steenhuisen 2020). Such species can be considered "culturally protected", and the beliefs connected to them are often transmitted and preserved in the form of stories, myths or songs called *hta* (Ribó et al. 2021). Gibbons, like humans, live in social groups, and they are respected because they will never destroy or eat agricultural crops. They are believed to be the gift of the mountain, and when a gibbon dies, people say that "the seven mountain peaks will be lonely". If someone kills or eats gibbons, the community will be divided (just as the gibbon troupe is divided by the loss), and agricultural crops will suffer. Similarly, hornbills are large, showy birds that mate for life, displaying what the Karen consider to be a devotion to family. Their monogamy is equated to that of the Karen, so it is believed that if one kills a hornbill, the family will split up and the hunter will become a nomad without a home. Hornbills are considered to be the gift of the banyan tree, and if a hornbill is killed, its mate will die and "seven banyan trees will be sad." Asian elephants are believed to be the gift of rice. Anyone who kills an elephant will never be able to grow rice and eat it again. Conversely, one who dreams of wild elephants will receive a plentiful harvest.

Other animals can be eaten, but only if they are hunted outside the restricted areas outlined above. Once in the restricted area, these species also become taboo. Examples include frogs, eels, softshell turtles, and dwarf snakehead fish. When these species are found in the upper watershed area, they are believed to be protected by the spirit of the water. Hunting these animals in the watershed will cause the water spirit to get angry

and possibly leave to seek a safer area, causing the water supply it once protected to dry up. Another group of animals can be hunted in the forest but not near the community within the area where one can hear a rooster crowing from the village. Such species, which include deer and turtles, are believed to be messengers of the spirits of the forest, sent to the village as signals that something unusual is going to happen (Steenhuisen 2020). Killing such messenger animals near the village can result in disaster for the community. A final group of animals, including rodents and birds, should not be killed around the house. They are believed to be auspicious, merit-bearing animals, so killing or eating them is like killing one's own merit. If someone wishes to get rid of these animals, they have to let other animals do it, such as using cats to kill rats.

There are also some animals which can only be eaten during certain seasons. Wild boar, for instance, can only be eaten in the early winter, after the rice harvest and before the next planting. Once the rice has started to grow, it is believed that the meat of wild boar stinks, making it unappetizing. Red-crested carp can only be eaten in the rainy season and winter, but not in the dry season. The dry season is when this species spawns, so if they are fished at that time, they will not have a chance to spawn. It is believed that if they are eaten in the dry season, the person will get diarrhea or feel sick. Squirrels cannot be eaten in the winter. It is believed that during that time their smell is very strong, and if someone kills and eats them, the smell will stay with them.

These examples show that while hunting is an important activity for Karen communities, it is embedded in a network of regulatory beliefs and prohibitions. The overall goal of these taboos is to maintain a balance between the needs of people and the needs of animals and their habitats. However, the regulatory beliefs extend beyond animals, embracing plants, creeks, and other beings. The overall principles are the same, whether they are applied to plants, animals, or places: some things are never permitted, some are permitted only in certain places, and others are permitted only at certain times. As the ancestors say in the *hta*, "How to cut a tree without letting it die? How to eat frogs without breaking their legs? How to eat crabs without breaking their claws?"

Karen relations with the spiritual guardians of the land

In the Karen cosmology, the landscape and the resources that emerge from it are not the possessions of human beings, but in fact belong to "owners" called *K'Jah,* spirits whose dominion extends over certain areas, animals, or resources (Paul 2018; Steenhuisen 2020; Yamamoto 1991). Whenever the community needs to use land for agriculture or other forms of resource extraction, these areas are carefully stewarded through a three-step cyclical process of relations with the land's true owners:

- asking permission for the temporary use of the land;
- asking forgiveness for any misuse that may intentionally or unintentionally occur;
- offering thanksgiving and ending the stewardship in order to return the land to its owners.

Rice cultivation in the traditional swidden system provides a perfect example of this process. Before beginning to cultivate a certain plot of land, there are several steps taken to ritually ask permission for the use of the land (Chiumkanokchai 2008). Failing to obtain this permission and still farming the area is considered a form of theft and disrespect toward the owner of the land, who can claim damages against the perpetrator.

After identifying a potential area, the first step of asking permission is to perform a divinatory ritual by visiting the site and leaving a little pile of rice there overnight. If you have a nightmare that night, or see a snake or a barking deer run in front of you while walking back to check the pile the next morning, permission to use the site has been denied and a new area must be found. However, if the person arrives at the site without incident and sees that the pile of rice has decreased, this shows that the owner has accepted the offering and granted permission to farm the land. Before cutting down the trees, the spirits of the trees must also be supplicated. Then permission is asked of the god of fire, whose help is needed to burn only the site and prevent the fire from spreading beyond it. Birds, rodents, insects, grasshoppers, termites, and ants are asked to evacuate the area before the planting season.

Figure 3. A thank-you ceremony after removing the weeds in the rice fields (photo by Suwichan Phatthanaphraiwan)

Before planting rice, the *K'Jah* of the soil is asked for permission to use the soil. Before mowing the grass, the spirit of the grass is also asked for permission. Once the grass has grown but before it produces seed, another ceremony is held to ask the gods to influence the sky to fertilize the rice stalks, making them pregnant. Each rice plant is believed to be female, so they must be fertilized by the god of thunder, who is male. Before harvesting the rice, there is a harvest festival, and before threshing, the owner of the rice must be asked for their blessing in order to produce a large amount of rice. In all of these rituals, food and drink are offered first to the owners and then the participants also partake of the offerings (Yamamoto 1991).

Since different resources are being taken and consumed at all times, constant vigilance must be paid by the community to ensure that harmonious relations are maintained with all the spirituals owners (Buergin 2002). If a spiritual owner is unhappy, they will cause disturbances in the environment, so constant vigilance is paid to the conditions of rivers, forests, and weather, as well as to the health of people, crops, and animals. Any abnormality, such as a flood, an agricultural disease, a person or animal falling sick, or strange messenger animals appearing in the village, indicates that something is out of balance. This imbalance is perceived to be caused, perhaps unintentionally, by some person or people of the community. In such cases, an elder must be asked to interpret the cause of the phenomenon, and then a ritual is held to confess the wrongdoings and ask for forgiveness. After crops are harvested, a ritual of thanksgiving and gratitude must be performed (Rajah 1989). The purpose of this ritual is to offer thanks to all the spirits who played a part in the agricultural season, including the spirits of the earth, water, wind, fire, forest, and rice (Chiumkanokchai 2008). Thanks are also offered to the other non-human beings who temporarily sacrificed their homes for the rice harvest, such as birds, rodents, insects, grasshoppers, termites, and ants. As in other ceremonies, the various owner spirits are first invited to eat and drink, and later people join them and celebrate together.

Conclusion

These three elements of Karen stewardship – permission, atonement, and thanksgiving – comprise a "green circular cycle" that mediates reciprocal relations between human communities and non-human beings, spirits, and the land. This cycle of reciprocity is also articulated in a series of moral precepts (sometimes mentioned as thirty-seven in number) which traditionally guided human affairs (Walker 2003). They essentially state the equality of all beings, whether human, animal, plant, spiritual or physical. They further point out that given that each being passes the majority of their time in certain parts of the landscape, it is the responsibility of that being to protect its specific environment. Fish, for example, must respect the river, birds must take care of the air, and humans must obey the laws of the land. If any of these parts of the ensemble are damaged, the beings will have to leave their homes and will no longer be able to live easily. When the community's connections to that which sustains it are damaged, the community itself suffers.

In the Karen worldview, humans as consumers must be conscious and respectful

of the fragility of the resources upon which we depend. Human beings are no more the center of creation than any other being or force. Recognizing this and allowing natural rhythms to guide human behavior honors the circle of dependence, which embraces not only the concept of a circular economy, but more broadly, a circular way of life. Unfortunately, this circular way of life is under significant threat.

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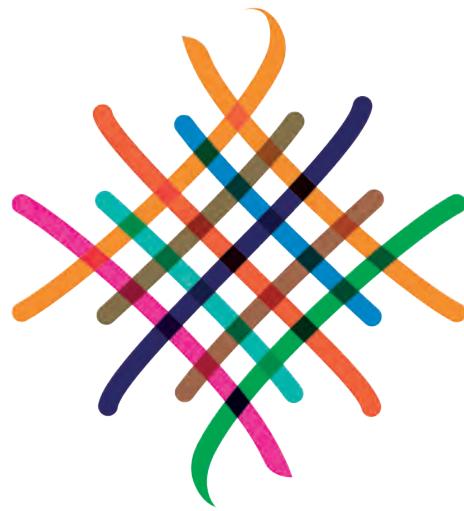
Adaptation of Traditional Architecture
and Urban Design

Heritage Conservation as Green Development at the George Town World Heritage Site

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ABSTRACT—George Town was inscribed as an UNESCO World Heritage Site in 2008. The conservation of heritage buildings is based on the principles of green development. The characteristic shophouses, built since the 1790s, used locally sourced and eco-friendly materials such as clay bricks, terracotta tiles and timber in designs suitable to the climate, culture and geology to create naturally cool interiors with low energy use. Modern materials such as cement, concrete, steel, glass and plastic consume more energy in their production, are poorly suited to the climate and geology, and pose threats to traditional-style buildings. Conserving the heritage buildings using traditional materials and conforming to the traditional deisgn principles minimises the contribution to global warming and the depletion of the earth's stock of natural materials.

Introduction

The city of George Town was established in 1786 by the British East India Company (EIC) on the north-east corner of Penang Island, along one of the most profitable trade routes in the 18th century. Its favourable location at the northern entryway to the Straits of Malacca, and sheltered from the monsoon winds, made the town a preferred port of call along the route. The town flourished as merchants from east and west converged in the town, bringing diverse yet distinct influences that shaped the built architecture and social fabric of the town that can still be seen today.

In 2008, George Town, along with the historic city of Malacca, was jointly inscribed as a UNESCO World Heritage Site (Figure 1). The recognition was based upon three Outstanding Universal Values, acknowledging both cities as multicultural trading towns; for their multicultural heritage and traditions; and the unique architecture, culture and townscape. A total area of 2.62 km² (262 hectares) of George Town was listed in the inscription, and it covered ninety-two streets and seven traditional jetties belonging to specific clans. The site also held 5,285 buildings, of which 3,890 units were pre- and post-war heritage shophouses, which had been designed to suit the geology and climate and which used materials close at hand for their construction.

Importance of heritage conservation

The Burra Charter, first published in 1979 by the Australian International Council on Monuments and Sites (ICOMOS) and revised in 2013, serves as an important guiding
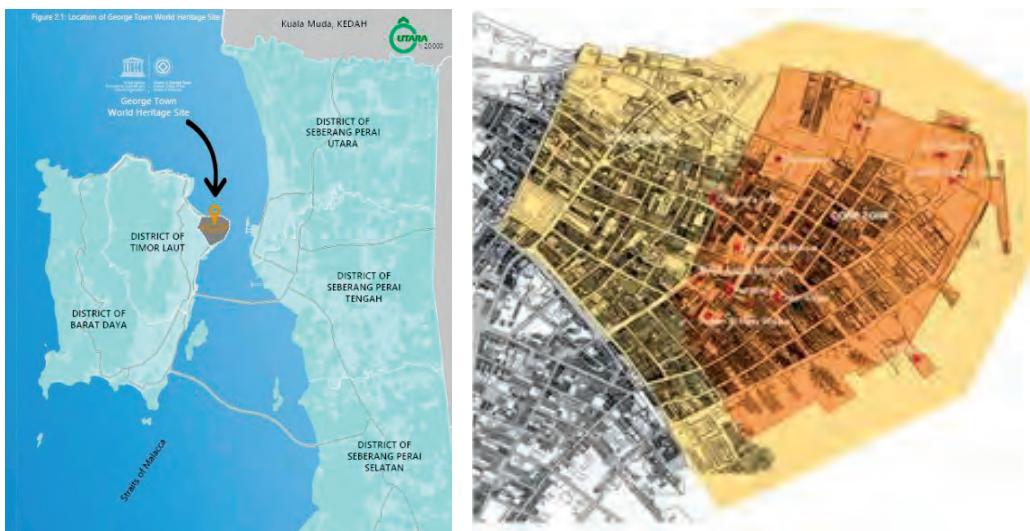
Figure 1. Map of George Town, Penang, indicating the UNESCO World Heritage Site Core Zone (dark orange) and Buffer Zone (light yellow). Source: Replacement SAP for George Town World Heritage Site

document that defined heritage conservation beyond tangible and physical forms, while providing standard guidelines for best practices in conserving built heritage around the globe. Article Two of the Charter mentioned the need to adopt a cautious approach in heritage conservation, changing as much as necessary but as little as possible. Article Four specified the importance of all heritage conservation efforts to employ all knowledge, skills and disciplines which can contribute to the study and care of the place.

Traditional techniques and material are preferred for the conservation of buildings in whole or in part, in order to retain the cultural significance of the building. In some circumstances, modern techniques and materials must be employed, when these alternatives offer substantial conservation benefits over traditional options. Therefore, conservation of heritage buildings, especially in multicultural fabrics and landscapes, can be built on the following principles: 1. maintain the original architectural form as much as possible; 2. maintain the original architectural structure as much as possible; 3. maintain the original material as much as possible; and 4. use the original technique as much as possible.

The Special Area Plan for George Town World Heritage Site (2016) further defined conservation for built heritage in the George Town World Heritage Site (GTWHS) as follows:

> Buildings to be conserved shall be retained, restored or preserved in accordance with this regulation. In the event that the original structural elements need to be repaired or replaced, their features shall be retained. Selective replacement may be considered only when absolutely necessary. Total reconstruction is totally and strictly prohibited. No building or structure shall be altered or demolished if there is any conceivable way of preserving it in its original or current condition. Adaptive reuse of heritage building is recommended and encouraged to generate new life to such buildings in line with the "Intelligent and Sustainable Heritage City" concept.
> When upgrading and adapting a building for new use, the existing structure

should be retained by strengthening and repairing the structural elements. Any alteration or strengthening to structural elements should be done in the most sympathetic and unobtrusive way possible, using original methods and materials whenever possible, or if not, matching with materials of similar properties. If a building is deemed unsafe, it should be made safe, following original methods and materials.

The preservation and conservation on activities on heritage assets and new compatible developments in the GTWHS shall need to adhere and be carried out to achieve the vision and conservation objectives as described.

There is a clear alignment and synergy in conservation principles, especially for built heritage, between the Special Area Plan and the Burra Charter, whereby the identity and integrity of the restored building, and its surrounding ecosystems, are maintained as close as possible to the original building. This applies to all buildings in GTWHS, shop or residence, but in particular to the shophouses that are threatened by redevelopment, dilapidation and climate change. Failure to uphold, apply and implement these principles will result in impending loss and demolition of both the built heritage as well as the social history of GTWHS.

Can heritage conservation be considered as green development?

The concept of development is often misconstrued as the need to replace existing old or vacant development opportunities with new, modern and technologically-advanced structures. For heritage city development, this is often perceived as the demolition of old and dilapidated buildings, only to be replaced by modern high rises that can accommodate more people per unit area of land. However, in Pearson (1992), development is described as an improvement — either qualitative, quantitative, or both — in the use of available resources. Urban and city planners have also adopted approaches that are more people-sensitive and context-specific, while abiding by limitations such as resource availability, capacity and skills, and the need to secure and de-risk heritage cities from impending threats of climate change. Development must be guided by principles of sustainability, whereby development meets the needs of the present without compromising the needs of the future.

Green development is commonly represented by images of environmentally-conscious designs, whereby buildings are developed to be energy and resource efficient, while reducing the environmental costs. Very often, green developments are associated with the use of modern solutions such as solar cells, LED lighting and effective waste water management. However, there is another element, namely the community and cultural sensitivities and values that should be taken into the guiding principles of green development.

While the concepts of heritage conservation and green development may appear to be two separate, non-interactive aspects for guiding urban redevelopment, there are many synergies in practice that makes these two concepts complementary. By drawing examples from heritage conservation of buildings in GTWHS, we can clearly see the

overlaps in heritage conservation and green development, and how these interactions should be mainstreamed to further guide conservation efforts in other parts of Penang, as well as being adopted and adapted to other heritage-significant sites that share similar conditions.

Green heritage houses

Penang lies approximately 5 degrees north of the Equator, hence the climate is hot and humid throughout the entire year. In certain periods within a year, the weather can be extremely hot and dry, while other periods will see heavy rainfall and occasional inundation. These fluctuations have proved to be challenging for urban development in the past. As an island, Penang has a high underground water table, and this was both a challenge and an opportunity for builders in the past, as they had to build structures that were resilient to fluctuations in the water table, while using the evaporation effect to cool the houses naturally.

Many houses predate the introduction of electricity to Penang in 1905, hence these buildings were designed to optimise natural lighting and ventilation within the houses. Even after 1905, many of the newer buildings maintained the traditional layout and design of the houses, as electricity was not easily available and affordable. Many modern appliances such as electrical fans, lights and air conditioning units have replaced the use of fan lights, air wells and air vents, meaning the homes are less energy-efficient and have higher environmental costs. However, modern conservation efforts have seen conservation architects and designers seamlessly blend modern technology with traditional design, allowing them to restore heritage buildings to their original, less-costly and more energy-efficient homes.

Figure 2. Chinese temples and shophouses along King Street, Penang

The shophouse as an identity for George Town

Shophouses are unique architectural solutions to accommodate growing population, balanced with economic and social growth, commonly found in Penang and other

regions of Southeast Asia, with variations also found as far away as South China and South Asia. There are six main shophouse styles in Penang, reflective of the different temporal and cultural influences throughout its development (Figure 2). The earliest shophouses were simple, low structures dating from the 1790s until the 1850s. Over time, the shophouses became grander and more elaborate, and adopted Western and Eastern styles. Many shophouses adopted the Southern Chinese Eclectic Style (1840s to 1900s), before evolving to the Early and Late Straits Eclectic Styles (1890s to 1940s), and the Art Deco (1930s to 1960s) and Modern Style (1950s to 1970s).

Figure 3. A cross-section of shophouses found in Penang. Source: *The Encyclopaedia of Malaysia Architecture*

Typically, shophouses are built facing a street or walkway, terraced with a load bearing wall between units, and low-rise, having only two to three storeys (Figure 3). These buildings are usually narrow and long, partly because taxes were levied based on the width of the façade, and partly because this layout accommodated more units on a limited plot of land. A row of shophouses may also share a common veranda, or five-foot way, that is open at all times as a continued walkway on the side of the streets (Figure 4). These five-foot ways, or *goh kha ki*, are distinctively Southeast Asian, adopted to mitigate the sun and rain in the tropics. Another distinctive characteristic of shophouses is that they use lime plaster on structural walls and pillars, allowing for underground water to travel from the ground to the surface via capillary effect, before evaporating and cooling the houses naturally.

These buildings are multifunctional, with the ground floor usually used as business or trade premises, while the upper floors are used for residential purposes. As these houses are long, air wells and courtyards are also incorporated to provide lighting and ventilation for the lower storey, as well as to break the units into several sections, separating the formal, business area from the informal, living area.

As with many buildings, the façade of the shophouse is supposed to showcase the

Figure 4. An example of five-foot way (left) along a row of shophouses, and an air well (right) in George Town. Source: Lim Gaik Siang

status and social standing of the owners and occupants of the unit. This is especially reflected in the later styles, especially the Straits Eclectic Styles in which the façade features ornate pillars ending with either Chinese or European pillar heads. The upper level of the façade also features three-dimensional decorative plaster walls heavily adorned with both Chinese and European decorations. While the decorative façade adds aesthetics to the street view, it also plays an important, functional role in keeping the shophouse energy-efficient and climate friendly (Figure 5).

At the lower level, heavy timber doors with intricate carvings are used to provide ventilation to the unit, without compromising on the security of the occupants and business within the unit. Windows flank either side of the main door, topped with fan lights to increase the flow of light and air into the house. Decorative air vents are also installed right above the fan lights to improve ventilation to the house. At the upper level, wooden louvre shutters and fan lights are installed across the façade wall to improve lighting and ventilation to the house, hence improving the quality of life in the absence of modern innovations such as lights, fans and air conditioners.

When viewed from a modern perspective, shophouses are ingenious solutions to mitigating urban sprawl, while providing ample opportunities for business and families to flourish. The design of living premises above business premises means better utilisation of space, and reduced need for commuting. The five-foot ways, first mandated by Sir Stamford Raffles for the Town Plan of Singapore in 1822, and then spreading across other Straits Settlements including Penang, encouraged the development of walking passages along the streets while discouraging the use of cars, which indirectly reduces
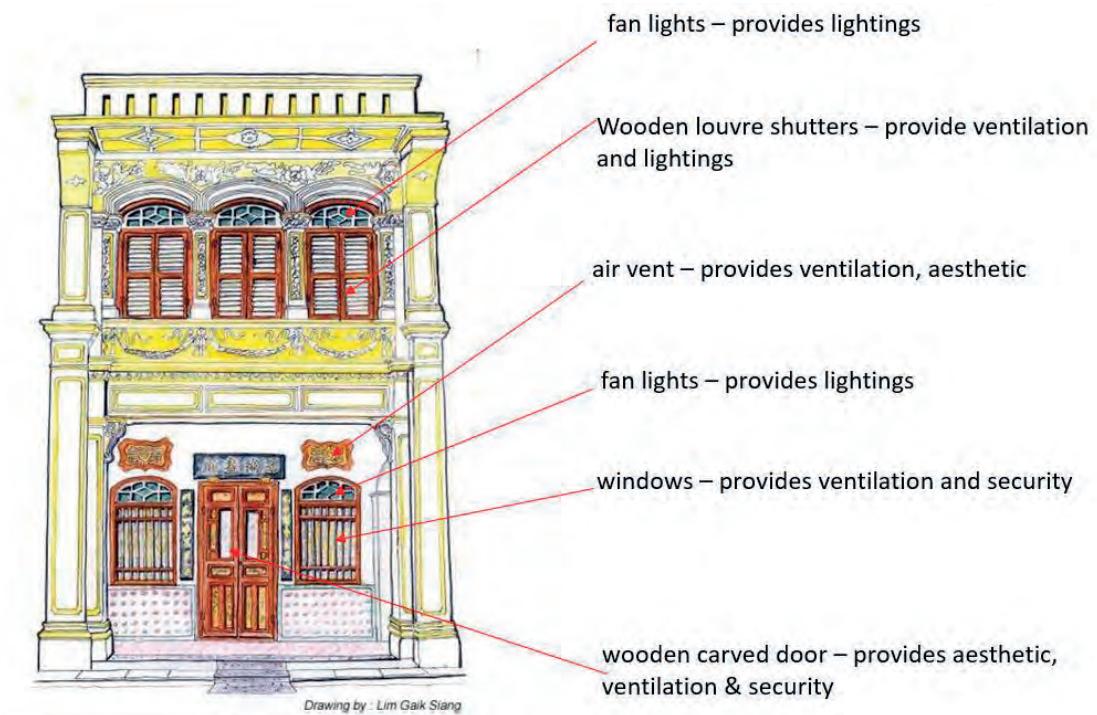
Figure 5. A typical façade of heritage shophouses found in George Town. Source: Lim Gaik Siang

emission of carbon monoxide, carbon dioxide and heat on the road and reduces ambient street temperature. The façade, while adding to the aesthetic value of the streetscape, is carefully designed to ensure that the shophouse is well lit and ventilated throughout the day. This solution can be readapted to the modern day setting as a means to reduce dependency on modern technology and innovation.

Sustainable materials for Penang shophouses

Although the shophouses in Penang can be categorised according to the time period and architectural style, they share many common materials used. These materials are very often sourced locally, in a sustainable manner, with very low carbon footprints.

Flooring

The floors of many shophouses in Penang are lined with the easily identified, red hued terracotta tiles. These tiles are made from a mixture of iron-rich clay with water, pressed and dried in the sun before they are baked in a kiln at a temperature of approximately 1300ºC. The high temperature is necessary to render the tile porous, a trait that is very advantageous in tropical houses, including the shophouses in Penang. The porous nature of the tiles allows moisture gathered from underground water to pass through the tiles to the surface, before it is evaporated or carried away by the wind. This process balances the underground hydrostatic pressure, due to tidal fluctuations and surrounding ecosystem changes, while the evaporation provides a cooling effect for the house.

Terracotta tiles are also highly durable, making it an ideal material for flooring. They are also naturally resistant to mould and bacteria as these tiles are alkaline in nature. Terracotta tiles are also fire resistant, as the base material is clay, and have a higher heat capacity as compared to other materials, making it a good insulator. This helps to protect homes from heating up during the day, and prevents rapid cooling of the ground during the night. Most of the terracotta tiles found in GTWHS are handmade from clay, a material that can be sourced sustainably without negatively impacting the surrounding ecology. Terracotta tiles are also inert, hence they do not release any hazardous chemicals or gases throughout the duration of their use.

Wall masonry: clay bricks

Shophouses marked a departure from traditional village or attap houses as the walls are built with clay bricks instead of wood or other traditional materials. Clay bricks have been widely used across the world. They were hand made up until 1825, when the brick making machine was invented to replace human labour. Clay bricks have been used extensively in buildings in GTWHS, as indicated by historical records. On Kelly's map from 1891-1893, there are detailed drawings showing the use of clay bricks for walls (Figure 6). Most of the bungalows and shophouses marked on the map were constructed with clay bricks. Most of the bricks used in Penang were sourced locally, and place-names such as Brick Kiln Road still record this legacy. Clay bricks are simply produced by mixing clay with water, before it is hardened under the sun or in kilns. The ratio of water to clay affects the density, durability as well as porosity of the bricks for usage in different parts of the house.

During the manufacturing process, clay is heated to a sintering process that causes the particles to fuse, resulting in clay bodies with strong, stable ceramic bonds. These strong bonds enable clay bricks to withstand severe weathering actions, and make them inert to almost all chemical reactions. These bonds also make the bricks highly durable, especially when exposed to severe temperature changes.

Clay bricks exhibit better thermal insulation properties as compared to other building materials such as concrete. The perforations within the brick structure create a vast capillary network that draws water and moisture away from the ground into the brick structure. As the water droplets have high heat capacity, they draw heat away from

Figure 6. A section of Kelly's map (1891–1893) indicating clay brick structures in red ink. Source: JUPEM, Department of Survey and Mapping Malaysia

the surrounding, making it an ideal insulating material. The capillary effect promotes the 'breathability' of the walls, whereby salt and moisture travels from the ground to the surface of the brick, before it is evaporated or blown away, leaving a naturally cooling effect to the house.

Clay brick walls were favoured as a building material for shophouses in Penang also because of their ability to insulate against sound. Due to their thickness and density, the brick structure deadens noise transmission, muffling noise from the streets, neighbouring homes and other sources. Clay bricks are also fireproof and incombustible, making them ideal building materials. The use of bricks will not contribute to the start of rapid fire, and instead, has the ability to withstand and slow down the spread of fire, a common hazard in heritage cities. As clay bricks are made entirely of natural products, they can be crushed and returned to the soil to be repurposed for other use.

Wall masonry: lime plaster

Slaked lime has been used as a binder for lime concrete, lime, mortar and lime plaster for thousands of years, across various cultures, and is still in use today. This environmentally friendly material is made from naturally-occurring resources such as limestone or mollusc shells which are crushed, burnt and cooled before use. The burning in a kiln at 800ºC removes carbon dioxide from the material, which will be reabsorbed later. The slake lime is processed into mortar and applied onto clay tiles to secure the walls. The lime plaster reabsorbs atmospheric carbon dioxide to form calcium carbonate, resulting in a mortar matrix that is strong yet flexible, and less prone to cracking from weathering.

The high pH value of lime makes the mortar a natural fungicide, preventing mould and algae from growing on the walls. As lime plaster is permeable, it further promotes the 'breathability' of walls, as ground moisture drawn up through the capillary effects of clay bricks passes through the lime plaster before it evaporates. The use of lime plaster is still strongly advocated in heritage conservation practices as it is a more environmentally sensitive material compared to modern mortar and plaster alternatives.

Finishing

Most of the walls of shophouses in Penang were traditionally finished with coats of lime wash for aesthetic value as well as many other environmentally sensitive properties. As the walls of Penang shophouses play an important role in underground


Figure 7. Exposed wall showing clay brick tiles in a shophouse in George Town. Source: Lim Gaik Siang

Figure 8. Stonemasons using lime plaster to repair an exterior wall in George Town. Source: Lim Gaik Siang

Figure 9. Terracotta clay U or V tiles on the roofscape of George Town. Source: Gwynn Jenkins and Tan Yeow Wooi, *Introduction to Heritage Building Materials*.

hydrostatic regulation, it is vital that all materials chosen are permeable or breathable. This applies even for the finishing, hence lime wash was used. The use of other types of paint, especially synthetic paint, prevents trapped moisture from escaping into the atmosphere, resulting in unsightly build ups, bubbles and cracks that will further compromise the structure.

Lime wash can be obtained by thinning aged lime putty with water before it is applied on walls (Figure 8). Certain natural pigments including ochre and indigo are added to the lime wash before it is applied on the walls, allowing for the buildings or walls to stand out aesthetically. As the pigment tone changes in relation to moisture content of the wall, it lends a layer of depth and luminosity to otherwise flat walls.

Traditional lime wash is environmentally friendly, as the source materials are natural lime and natural pigments, and free of chemical solvents. Lime wash has high pH value, resulting in a highly alkaline environment which inhibits the growth of mould and bacteria. As lime wash is made from natural products, it contains no volatile organic compounds, and hence is odourless and non-toxic.

Roof tiles

Most of the roof tiles used for Penang shophouses are terracotta. They share similar properties to the terracotta tiles used for flooring, and gives the distinctive red roof-scape across the city. Terracotta tiles are chosen for their high durability and ability to withstand severe weather changes, especially from direct sunshine. The ability to insulate heat makes it an ideal material for roofing, as it prevents the interior of the house from heating up. As terracotta is also slightly porous, the roof tiles allow for hot

air to rise and pass through the tiles, before it is disbursed into the atmosphere.

In the GTWHS, the roof tiles are made to shape like a V, and laid in specific manner to allow for rain to flow downwards smoothly without compromising the structure of the house (Figure 9). Similarly, the overlapping laying method creates small voids between the tiles, allowing for air to be trapped in these voids, hence enhancing the insulating effect of the roof.

Wooden and timber structures

Wooden and timber materials were still very much preferred in the design and building of shophouses in Penang, but instead of serving as the main construction material, they are now used to furnish and fit the house accordingly. Solid timber such as teak, merbau and belian (or Bornean ironwood) are sourced from neighbouring states and processed into various fittings such as doors, staircases, flooring and windows. Timber and wooden materials are also chosen because they are durable, able to absorb vibration and heat, and can be easily painted over to improve the aesthetic quality of the wood.

Many shophouses in Penang still sport intricately carved, double-leaved wooden doors at the front of the house (Figure 10). These wooden doors are carved with auspicious designs to bring blessings to the occupants, but also serve as an important barrier to prevent the outside world peeking into the inner workings of the home. Some doors are designed to have movable vents in the middle to allow for air to flow into the house when the doors are closed, without compromising the security or the privacy of the household.

A pair of timber-panelled windows usually flank the front door, and they are topped with fan lights. These windows and fan lights allow air and light into the house. The iron grill design also allows for better security

Figure 10. Carved wooden door (top) and window structure (bottom) commonly seen in shophouses across George Town. Source: Lim Gaik Siang

and privacy, while still allowing air to flow into the house. Similarly, wooden louvre shuttered windows are installed on the upper levels of the shophouses, allowing light and air to flow into the upper levels of the house.

At the top of the façade, a pair of air vents are installed on either side, just above the fan lights. These wooden, carved air vents, usually bearing auspicious symbols for prosperity or longevity, allow for constant air flow into the house, hence cross ventilating the house, even when all the doors and windows are closed.

Figure 11. An elaborately carved wooden screen separating two sections of the shophouse. Source: Lim Gaik Siang

In some shophouses, a big, wooden partition screen is installed to separate the business area from the living area, which lies further inside the long house (Figure 11). The wooden screen prevents patrons and traders working at the front of the house from peeking into the back of the house. These screens are also carved or inlaid to allow air and light to flow from the front of the house to the further reaches inside the house.

Timber floorboards are often used for the flooring of the upper levels of the shophouses. These floorboards are preferred as they are lighter in comparison to other materials, highly durable and can withstand strong vibrations. Wooden floorboards are also chosen because they can expand and contract with changes in temperature, and the flexibility will not compromise the stability of the upper levels. The tiny gaps in between the floorboards also allow for hot air to rise upwards and away from the house, allowing for cool air to naturally ventilate the house.

Timber is also used for the staircase and its fittings, including handrails and balustrades. The flexible nature of wood absorbs the impact and vibration of occupants moving up and down the stairs. The wooden staircases are also lighter and more easily installed compared to other materials. However, the first three steps from the bottom are always replaced with granite for better stability and anchorage.

Granite air well

Air wells are another distinct feature in shophouses across GTWHS (Figure 12). As these shophouses are long and narrow, one or more air wells are installed in suitable breaks along the house, opening up the house for better ventilation and lighting. These air wells are fitted with granite slabs at a lower level, and completed with drains leading to and away from the air well (Figure 13). When it is dry, the air well serves as an open courtyard and common area for members of the household to gather and socialise. When it rains, water is directed from the roof, through the gutters, to the air well before it is directed outwards and away from the house. The temporary pooling of water at the air well reduces the immediate run-off into nearby drains, hence reducing the risk of overloading the drains and flooding. This is particularly important as most shophouses open onto the street, and floods will affect the frontage and business area of the house.

Figure 12. An air well, or open courtyard, in a shophouse in George Town, featuring granite slabs embedded in a recess to collect water. Source: Lim Gaik Siang

The careful selection of materials such as clay bricks, terracotta tiles and lime plaster shows that traditional designers and architects place emphasis on using locally-sourced materials that are better adapted to local culture and climate, as opposed to using materials that are non-sustainable and with higher energy cost. However, the lack of awareness and knowledge of these natural designs has resulted in modern buildings that are less energy-efficient and that add to the urban heat island effect in the city. There is an urgent need to adopt heritage-sensitive policies in restoration, adaptive reuse and brownfield development in the city to conserve the integrity and identity of these heritage houses, while indirectly mitigating the impact of climate change within the city.


Figure 13. A cross-section diagram showing the flow of water into the house, through the granite air well, and out to the common drain. Source: Gwynn Jenkins and Tan Yeow Wooi, *Introduction to Heritage Building Materials.*

Unsympathetic developments are not fit for heritage cities

There is a need to redevelop heritage cities like GTWHS to be livable and functional, while preserving the historic diversity of the city. Heritage redevelopment and regeneration need to be guided by principles that respect the *genius loci*, and be sympathetic to the original use and structure of the building. The construction of new buildings on vacant land or replacing dilapidated buildings will increase the energy and emission footprint of the city. Selection of modern materials may not always be compatible with the existing ecology, and should be strongly discouraged in both new developments and for conservation projects. Below are some examples of materials and methods employed for new developments which are unsympathetic to the ecology of heritage cities such as GTWHS.

Piling

As modern materials tend to be heavier than traditional building materials, there is a need to stabilise the soil and ground before construction can take place. In GTWHS, parts of the city sit on sandy soil while other parts were previously swamps. Very often, piles are hammered into the ground to provide for solid foundation before the buildings are erected on these foundation pillars. However, modern piling methods disrupt the underground hydrostatic pressure, and displace the water to surrounding structures. The use of concrete piles, which are non-permeable, blocks underground water from flowing, and forces the water to find other channels. This leads to increased pressure in traditional heritage houses near the development site, resulting in possible damage including seepage, settlement and cracking, and erosion.

Waterproofing

In modern buildings, barriers are created to prevent water from passing through surfaces such as foundation pillars, walls and roofs. While this is useful to prevent rainwater from entering the home, it further disrupts the underground hydrostatic pressure. The capillary effect formed by using clay bricks and terracotta tiles is greatly reduced, and underground water has no means to reach the surface and evaporate. The change in hydrological balance possibly increases the flow and pressure underground, leading to possible cases of erosion and collapse. The rapid movement of underground water also disrupts the stability of the buildings, leading to potential cracking and collapse of walls and other structures.

The selection of construction materials also affects the fragile ecosystems surrounding heritage buildings, including the many shophouses found in GTWHS. While these modern materials are preferred for modern development, they are not compatible for heritage conservation purposes, and are less ecologically friendly than traditional materials.

Concrete and cement

Concrete forms the backbone of modern architecture. Concrete is made with cement, sand and water, mixed in a fixed ratio, to form bonded aggregates for mortar
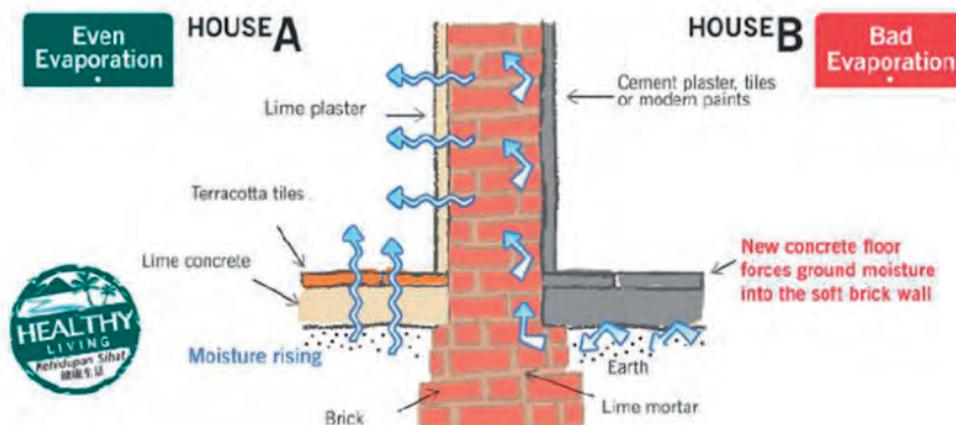
Figure 14. Diagram showing the displacement of underground water to surrounding houses due to the use of unsuitable materials such as concrete and cement. Source: Gwynn Jenkins and Tan Yeow Wooi, *Introduction to Heritage Materials*.

and plaster. The use of concrete had replaced the use of lime plaster, but there are many disadvantages when used in a heritage setting. Concrete is generally heavier than lime mortar, and has lower tensile strength in comparison to other materials, with a higher tendency to crack. It is less malleable than other types of mortar, and has lower seismic load. Very often, it needs to be reinforced with iron bars or other materials to increase the ability to withstand a heavy load. Concrete may contain soluble salts which can effloresce and cause damage to the surrounding structures and buildings. It also has the tendency to shrink over time, due to the loss of absorbed water, rendering the structure fragile and brittle.

Cement is one of the most important building materials for modern construction, as it acts as a binding agent for stones, bricks, or tiles. Cement is a very fine powdery substance chiefly made up of limestone (calcium), sand or clay (silicon), bauxite (aluminum), and iron ore, and may include shells, chalk, marl, shale, clay, blast furnace slag, and slate. The raw ingredients are processed in cement manufacturing plants where they are heated to form a rock-hard substance, which is then ground into a fine powder to be sold.

Cement is an integral part of the urban infrastructure. It is used to make concrete as well as mortar, and to secure the infrastructure by binding the building blocks. When mixed with water, cement undergoes a chemical reaction and forms a paste that sets and hardens to bind individual structures of building materials.

Concrete is made of cement, water, sand, and gravel mixed in definite proportions, whereas mortar consists of cement, water, and lime aggregate. These are both used to bind rocks, stones, bricks, and other building units, to fill or seal any gaps, and to make decorative patterns. Cement mixed with water silicates and aluminates makes a water-repellant hardened mass that is used for waterproofing structures and walls. However, there are also significant disadvantages when using cement.

Cement is generally not environmentally friendly. To produce cement, materials such as limestone, clay, and chalk are extracted from natural resources and burnt to

produce an ash-like substance. The production of cement is energy and resource intensive, and releases a lot of carbon dioxide into the atmosphere, where it remains for the rest of its life, while lime absorbs carbon dioxide for the rest of its life. While cement is a preferred binding agent, it is not able to withstand heavy loads, and often needs to be mixed with other materials to reinforce its strength and durability. Cement is also chemically unstable, and will disintegrate easily when in contact with alkaline-based or sulfate-based substances. Cement is also non-permeable, hence underground water travelling up through the walls cannot pass through cement. This will then displace the underground hydrostatic pressure to the surrounding buildings, increasing the hydrological load of those buildings, and in the long run, will compromise the structure.

Figure 15. The use of glass as an exterior wall in a modern building along Penang Street, Penang, altering the traditional ecosystem of the area. Source: Lim Gaik Siang

Steel and glass

Steel has been commonly used in new buildings to replace timber as beams, pillars, battens, and purlins. Steel is very heavy and rigid, and is not malleable to accommodate heavy load and impact. The heavy weight of steel, combined with other heavy materials such as concrete and cement, requires strong foundations to support such building through the use of underground piling.

As steel is rigid, it does not absorb vibration easily. When there are strong vibrations, buildings loaded by steel structures will crack easily. If it is a development where the new building is sharing a load-bearing wall with another heritage building, then it will affect the heritage buildings.

The use of glass has been gaining popularity for modern buildings, as it is used to replace walls, doors, windows or partitions (Figure 15). While the use of glass gives the building a modern look, it does not provide good insulation from the heat of the sun. The use of glass in buildings has increased the use of air-conditioners, as the air-cooling system is required to remove the latent heat from the building, hence increasing the energy cost of the building.

There are several other disadvantages in using glass as a building material for heritage conservation. The manufacturing of glass is energy intensive, and as there are no recycling facilities available for glass in the country, it cannot be crushed or ground for reuse. Glass is also highly brittle, and the rigidity of glass makes it weak against impact or shocks. Strong vibrations or impact will shatter glass easily, leaving broken pieces that may be harmful to people and the environment. The use of glass as the exterior of buildings increases glare and heat deflection into the streets, hence raising the ambient temperature of the ecosystem, contributing to the urban heat island effect.

Plastic

In recent years, plastics have been used extensively in the construction industry. Plastics have the advantage of being lighter in weight, easily malleable, durable and able to withstand strong shocks and vibrations. Materials such as polyethylene and PVC are widely used to manufacture flooring as they are light, easily assembled, easily cleaned and easy to replace when damaged. Certain forms of plastics such as olefin or vinyl have been used for roofing as they can withstand high temperatures without changing their composition or their ability to repel water. Polyurethane has also been used as doors, window frames and in-wall filling as it is light, and able to provide insulation against temperature fluctuations.

Despite the many varieties and possible uses of plastics in modern construction, they are not suitable for heritage homes, including shophouses in GTHWS. Plastics are sourced from hydrocarbons such as crude oil and coal, and these natural resources are fast depleting. The mining of crude oil is also one of the leading causes of global warming and climate change, and there have been numerous calls globally to decarbonise our industries, essentially stopping the use of crude oil and gas and their associated products in modern day living. Most plastics are single-use plastics, and cannot be reused or recycled to form other materials. They take a long time to degrade, and in the process, release significant amounts of greenhouse gases into the environment. Plastics are therefore not a green and development-friendly solution for heritage conservation. Plastics are also non-permeable, and when used in construction and restoration of heritage houses may disrupt the natural hydrostatic pressure and water ecosystem of the building, leading to long-term defects and damages.

Conclusion

In conclusion, when new buildings are built, new construction materials are used, and these have a huge impact on the environment, such as their contribution to global warming, their use of energy and their depletion of natural resources.

Accelerating global warming

The use of new materials makes the building hotter, so air-conditioning is required. When air-conditioning is used, the ambient temperature of the environment increases, leading to intensified use of air-conditioning systems. This negative feedback cycle (Figure 16) is hard to break, and will lead to more significant environmental impacts such as urban heat island effects, and degradation of microbiological ecosystems in urban areas.
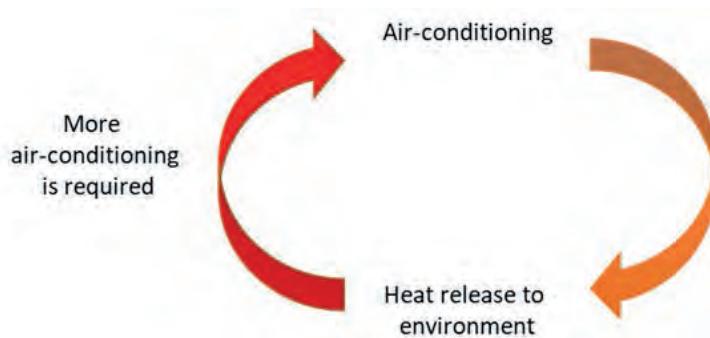
Figure 16. A negative feedback loop showing the cycle of heat disbursement and demand for air-conditioning in modern setting. Source: Lim Gaik Siang

Studies have shown that some refrigerants deplete the ozone layer, leading to an increase in the amount of type B ultra violet light (UVB) that reaches the earth's surface. Laboratory and epidemiological studies demonstrate that UVB is a threat to human health and well-being, such as non-melanoma skin cancer, and plays a major role in malignant melanoma development. In addition, UVB has been linked to the development of cataracts, a clouding of the eye's lens.

Using more energy and mineral resources

Production of new building materials is energy-intensive, has higher energy cost compared to traditional alternatives, and requires the use of non-renewable resources, such as crude oil, and in the long run will lead to depletion of these resources.

In conclusion, by restoring a heritage building, we help to save the environment because the materials are recycled. At the same time, due to the original design and use of material, the heritage buildings are naturally cooler and do not need to have air-conditioning. This also helps to reduce global warming. In addition, the materials used in heritage buildings are "organic" and do not harm the environment. We must consider heritage conservation as part of green development. We should conserve existing heritage buildings in the process of development instead of pulling them down and building new structures.

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Using Space Syntax to Rediscover Metro Manila's Old Urbanism: Retrofitting a City-Region for Sustainability and Resilience

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ABSTRACT—The sustainability of the built environment is reliant on the spatial configuration of our towns and cities. The post-war, car-centric suburban expansion of cities like Metro Manila must be retrofitted to adapt our built environment into something more sustainable and resilient to climate change and man-made disasters. New Urbanism distils concepts that can be used as best practices to retrofit suburbia and create new settlements that recall traditional towns and cities, but with mixed results. Some have argued that New Urbanism is historicist, and merely another way of creating new gated communities, while some have questioned the success of its application in retrofitting existing suburbs. An extension of New Urbanism is the discourse of the Fifteen-Minute City, which attracted renewed attention as a reaction to lockdowns brought about by the COVID pandemic. Distances covered by pedestrian and cycling journeys are used to define the Fifteen-Minute city. This article uses space syntax, a set of techniques for analyzing urban space, to analyze the "old" urbanism of Metro Manila and discover the latent spatial configuration. The findings add some quantitative detail to the discourse on the Fifteen-Minute City and New Urbanism, which can guide the retrofitting of city-regions like Metro Manila. New Urbanism needs to learn quantitatively from "Old" Urbanism to rediscover how to create sustainable and resilient cities.

Introduction

Background

The World Green Building Council and International Energy Agency (2017) finds that up to 39 percent of worldwide carbon emissions are produced by buildings and construction, made up of 28 percent for operational emissions (cooling, heating, etc.), and 11 percent for the actual act of constructing buildings. This clearly does not account for the effects of how buildings, land uses, and streets are planned and organized within city-regions like Metro Manila, namely the carbon emissions brought about by the need to travel longer distances to and from suburbs, the time and energy lost to traffic, and the downstream adverse effects to health, mental well-being and family life.

Post-war expansion in Metro Manila has seen an explosion in the distance and time of travel for suburban residents, and a rise in socio-spatial inequities as the real estate

markets push the working class further away from centers of employment, or force those who must live within cities to live in smaller and smaller air-conditioned flats with less access to free and public open spaces and amenities.

These extremes of development are increasingly unsustainable as they increase both energy consumption and emissions that contribute to climate change. Advocates from planning and architectural professions like Duany Plater-Zyberk preach on the need to develop new walkable communities in line with New Urbanism and its conceptual toolbox of methods and terminologies such as transect planning, smart growth and the smart code (Congress for New Urbanism 2000; Duany and Plater-Zyberk 1992 1999; Duany, Plater-Zyberk, and Speck 2000; Plater-Zyberk 1999; Duany and Talen 2002; Duany et al. 2010; Duany and Plater-Zyberk 2005). While these ideas appeal to developers looking to build new and more affluent communities from scratch (Al-Hindi 2001), it has become challenging to translate the same principles to redevelop and retrofit existing communities into more sustainable settings because of existing building stock, street networks, and status-conscious communities (Sweeney and Hanlon 2016). Many have argued that New Urbanism is a nostalgic repackaging of suburbs into what people recall as small-town America (Silver 2016; Garnett 2015; Trudeau and Malloy 2011).

Pandemic-induced lockdowns have also raised the discourse on the Fifteen-Minute City in response to the lack of local jobs, opportunities, and amenities for distant suburban communities. Duany and Steuteville (2021) expounded a concept of nested travel sheds (areas within the range of a certain mode of transport) as an extension of concepts previously discussed under the broader umbrella of New Urbanism.

New Urbanism and the 15-Minute City have been part of urban planning discourse for some time now. It is important to look deeper beyond these old typologies of buildings and open spaces, and the circular radii of travel sheds to adapt these concepts for the task of retrofitting existing settlements. This article uses space syntax, a set of techniques for analyzing urban space, to trace Manila's historical and colonial forms of urbanism, and to understand latent patterns in its existing suburban fabric, which could be the key for suburban retrofitting and reorganization. The article examines the underlying patterns of spatial configuration in Manila's Spanish Intramuros and Extramuros; the patterns of spatial configuration in Daniel Burnham's City Beautiful Plan and its adaptation during American colonial city development; the patterns of spatial configuration that drove Manila's post-war suburban development; and the latent spatial centralities in Metro Manila's suburban fabric that can be used to reconfigure car-centric suburbs into a 15-Minute walkable city.

Manila's historical urban development

Metro Manila grew outward from a historical core like the layering of tree rings (Ocampo 1992; Murphy and Hogan 2012). The Spanish walled-city of Intramuros was based on church-and-plaza urbanism described in Phillip II's Laws of the Indies (Armengol 1958; Doeppers 1972; Quirino 1971; Shioda et al 2012; Goma 2012; and Jimenez Verdejo et al 2015). The Americans expanded Manila beyond its Spanish walls using Daniel Burnham's City Beautiful Plan as a guide (Duque 2009; Morley 2014;
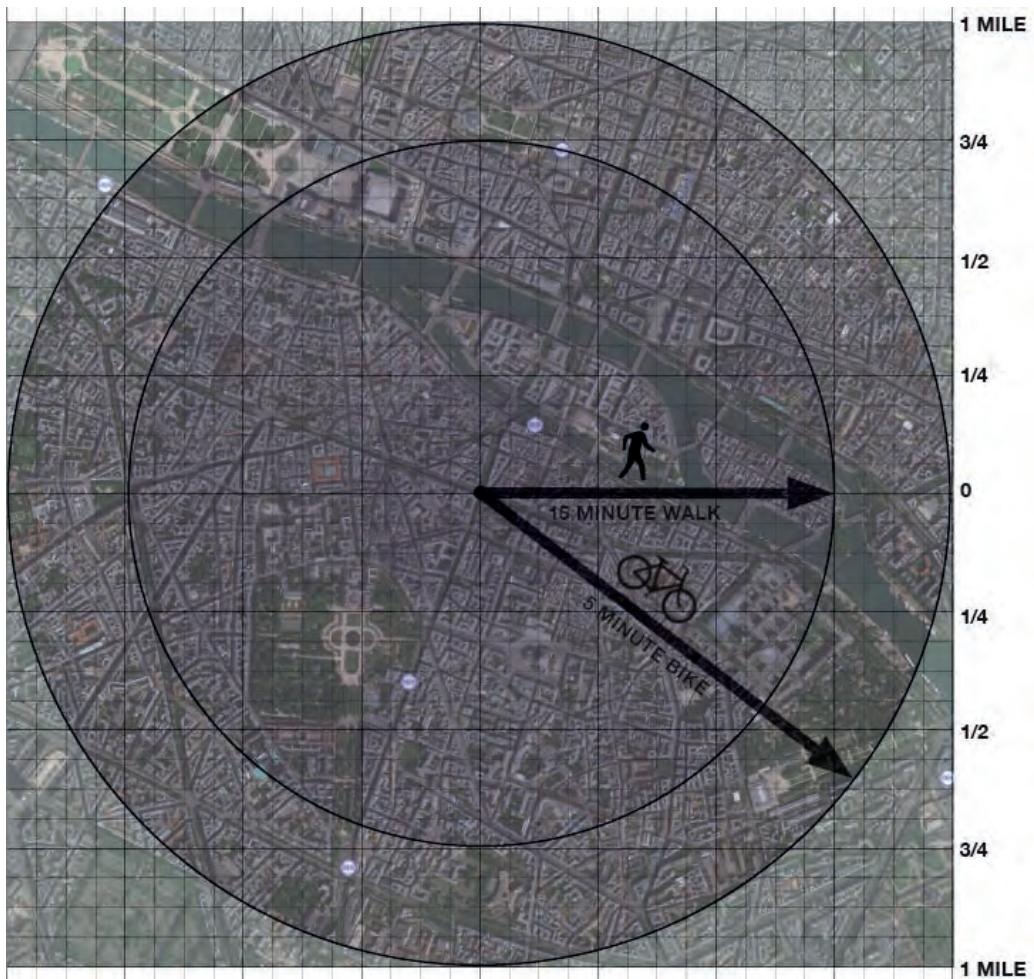
Figure 1. The scale of the 15-minute walk and 5-minute bike sheds in the center of Paris, France. Source: Duany and Steuteville, 2021.

Vernon 2014; Kirsch 2017; and Morley 2018). After the Second World War, Metro Manila underwent suburbanization, typified by the extension of Epifanio Delos Santos Avenue toward new suburbs of Quezon City to the north, privatized suburbs of Makati to the south, and further to the regional fringes of Cavite, Bulacan, and Laguna, forming a sprawling urban mass (Pante 2017; Connell 1999; Garrido 2013, 2019).

The post-war boom saw the growth of suburban regions carpeted by mass-produced housing built on relatively cheaper land, connected by highways to downtowns and new business districts and malls (Garreau 1992). This car-centric pattern of development arose in the United States and was copied worldwide, especially in countries looking to let their citizens partake in the sense of freedom and space afforded by cheap oil, cars, and their own single-family lots (Duany, Plater-Zyberk, and Speck 2000). This explosion in scale and distance around old city cores was paralleled by the concentration of commercial activity into new towns and edge cities, dotted with large shopping malls that became their new downtowns (Gruen and Smith 1960). These new regional centers were designed to be accessed by cars, and configured to capitalize on the surrounding catchment population within the single-family-only residential areas, where

other land uses and amenities, including local neighborhood shops, were forbidden. This benefited mall-based businesses, which managed the supply chain as far as the mall, and left the shopper to provide the last car-borne leg from the mall to the home, allowing the mall entrepreneurs to gain the critical mass needed to lower the price of goods while increasing selection and convenience for their suburban clientele. The typical suburban resident enjoyed the convenience of one-stop shopping within the climate-controlled comfort of the mall (Gruen 1964).
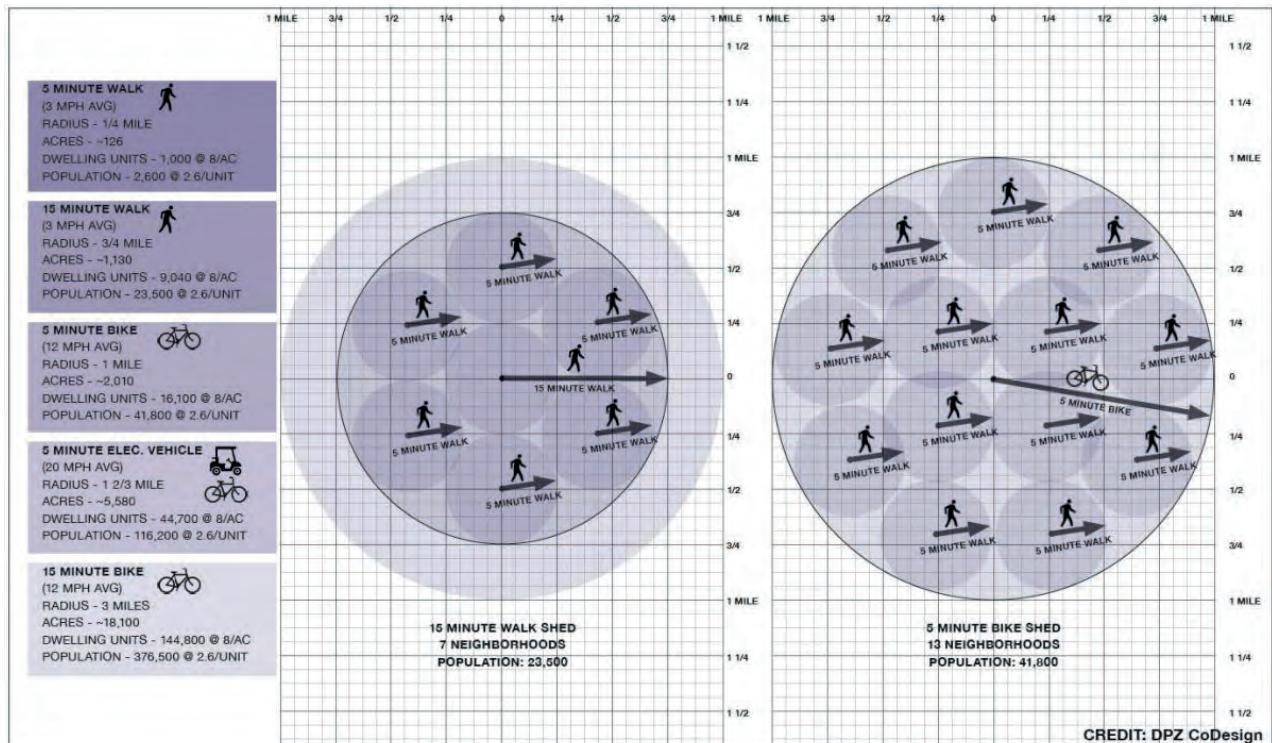

Figure 2. Neighborhoods fitting in the 15-minute walk and 5-minute bike shed. Source: Duany and Steuteville, 2021.

In cities with problems of inequality, security and safety, malls become the social venues for suburban residents (Chiodelli and Moroni 2015; Staeheli and Mitchell 2006). This car-centric suburbanization was a global homogenizing force, creating the same values and expectations for global suburban residents (Ortega 2016, 2018). But this was underpinned by cheap oil with clear consequences for climate, resiliency, public health and obesity (Low et al. 2016; Davis, Valsecchi, and Fergusson 2007; Banister 2011; Wee 2014). This pattern appeared throughout Southeast Asia (Mohamad and Kiggundu 2007; Mohamad 2005; Small 2022), where Japanese and Korean auto manufacturers succeeded the Americans, and local housing and mall entrepreneurs helped to market the suburban American lifestyle. Manila was perhaps more enthralled with this development than elsewhere, given its colonial heritage and its residual affinity for all things American (Rith et al. 2018; Ortega 2016).

Responses to suburbanism, COVID lockdowns, 15-Minute Cities and New Urbanism

Government-imposed lockdowns during the COVID pandemic speeded the trend to online working, especially for knowledge-based occupations, and highlighted the true value of essential workers, who still had to commute long distances to service their client communities. These lockdowns emphasized just how dependent urban residents are on long-distance travel and supply chains, and led to debate on how to move beyond this dependence (Sharifi and Khavarian-Garmsir 2020; Sadowski et al. 2021; Askarizad,

Figure 3. Seaside Florida's Main Plaza / Park. Source: SoWal Staff, 2022

Jinliao, and Jafari 2021). Duany and Steuteville (2021) proposed localizing settlements within ranges without the car: fifteen minutes by walking (1.2 km), five minutes by bicycle (1.6 km), public transport stops at every 1.6 km, main commuter hubs at every 3 km, and e-vehicles for daily travel commutes up to 8 kms. The 15-Minute City envisages a localized lifestyle where living-working-learning-playing is confined within a tighter geographical scale than the former metro-regional scale.

The 15-Minute City is an elaboration of New Urbanism which proposed a menu of methods to revive local neighborhoods with a sense of historical character (Congress for New Urbanism 2000; Duany and Plater-Zyberk 1992, 1999; Duany, Plater-Zyberk, and Speck 2000; Duany and Talen 2002). New Urbanism is open to the criticism that it is just another form of "branded placemaking" for gated developments for the wealthy (Al-Hindi 2001), such as Seaside and Celebration in Florida (Figure 3).

Understanding Metro Manila with Space Syntax

The elements of Space Syntax

Space syntax is a set of techniques for analyzing spatial layouts and patterns of human activity in buildings and urban areas, that can be used to trace how urban settlements have developed organically over time (Hillier and Hanson 1984).[1] Space syntax uses graphical representations through geometric forms such as axial lines to portray streets, connected by nodes to form networks, to reveal the underlying spatial system of the built environment (Figures 4, 6). Emo (2014) shows that humans visually perceive space through such axial lines (Figure 5).
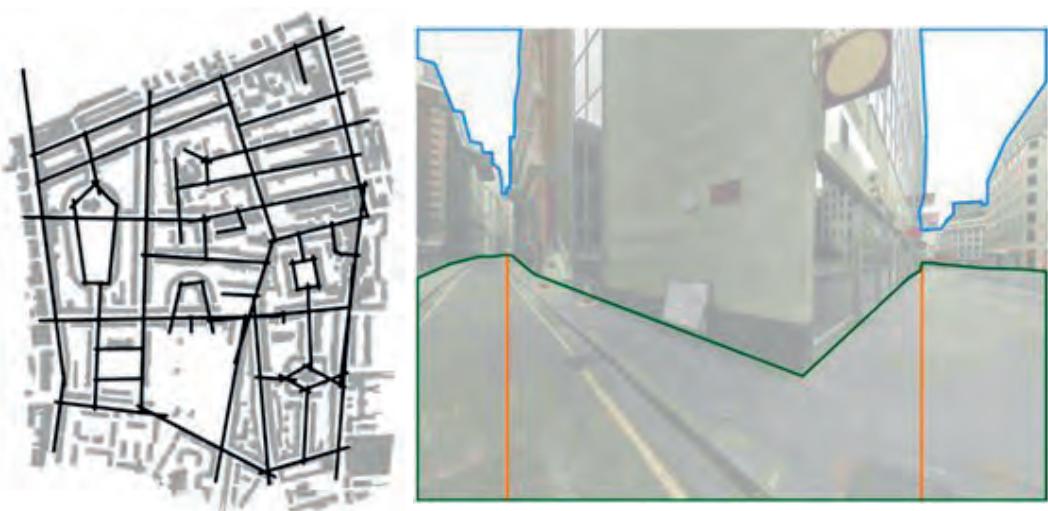

Figure 4. Barnsbury Axial Graph. Source: Al-Sayed et al. 2014: 62; Space Syntax Methodology, Bartlett School of Architecture, UCL, London.

Figure 5. Axial Lines shown overlaid onto streetscapes. Source: Emo, 2014.

The form of a network is mathematically analyzed using graph theory (Hillier and Hanson 1984). The relationships between spatial elements are analyzed using two main measures. *Integration* is a measure of the closeness of this space to all other spaces, in other words its "centrality," given a certain means of transport. Integration measures the probable capacity of the spatial network to foster movement toward this location. *Betweenness* (sometimes termed *choice*) is a measure of the attraction of this space as a

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[1] Space Syntax is a probabilistic method based on applying graph centralities to highlight latent patterns and understand how they correlate and support historical and ethnographic patterns/observations. As this is a limited and largely historical study, there has been no attempt to confirm how centralities correlate with actual traffic and movement counts from those eras, or in the present-day context. All spatial network analysis is undertaken using a combination of QGIS and Depthmap X software (depthmap X development team 2017), with statistical analysis using IBM SPSS software. The majority of this study was undertaken offsite in London during a span of five months. It relies on available historical maps from archival sources online and from the British Library, and from Open Street Map, Google Earth and the Philippine Geoportal.

route between other spaces, given a certain means of transport. *Betweenness* measures the probable capacity of the spatial network to generate through movement between any two points.[2] These two measures show the configuration of space which determines the probability of pedestrian and vehicular movement, and thus also social settlement and behavior (Hillier et al 1993).
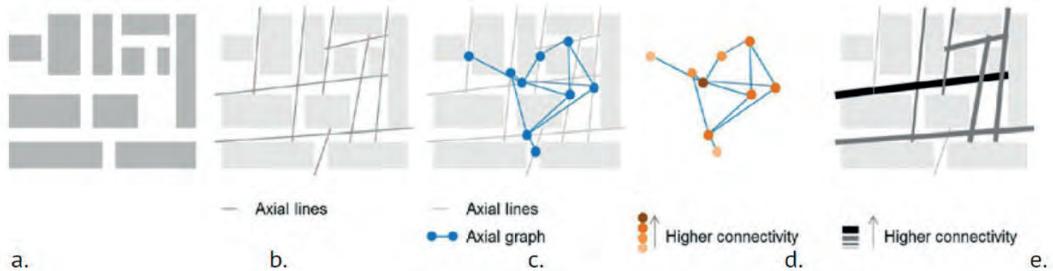

Figure 6. Translation from streetscape to axial lines, to spatial graph. Source: Al-Sayed et al. 2014: 12; Space Syntax Methodology, Bartlett School of Architecture, UCL, London.
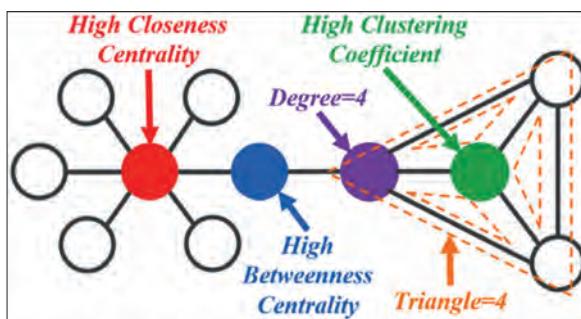

Figure 7. Applied Graph/Network Theory Centralities. Source: Leskovec (2019)

   The pattern of *integration* and *betweenness* creates some areas which are more vibrant and active and other areas that are relatively quiet. Hillier and Vaughan (2007) described a dual network with a foreground network of more intense exchange and interaction, and a more stable background network of the social and cultural relations within residential communities. Hillier (1999) highlights that centralities grow, migrate, shift or diffuse over time as the foreground and background networks grow and develop.

   The study of London after the great fire of 1666 by Hanson (1989) and the study of ancient Persian cities by Karimi (2012) discuss the interplay between order, which is imposed top-down, and structure, which grows bottom-up. Both authors discuss how attempts to impose order on disorderly spatial fabrics fall apart when they confront the centralities in the structure which underpins the society.[3]

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[2] "These two measures reflect the two fundamental elements in human movement: firstly, the selection of a destination, and secondly, the selection of a route. One measures the ease of access (integration) and the other measures the passing flow (choice)." UCL Space Syntax (n.d.).

[3] This study uses space syntax's method of angular segment analysis (Turner 2000; Turner 2001; Turner 2005; Dalton 2001; Turner 2007; Charalambous and Mavridou 2012), to produce measures of Normalized Angular
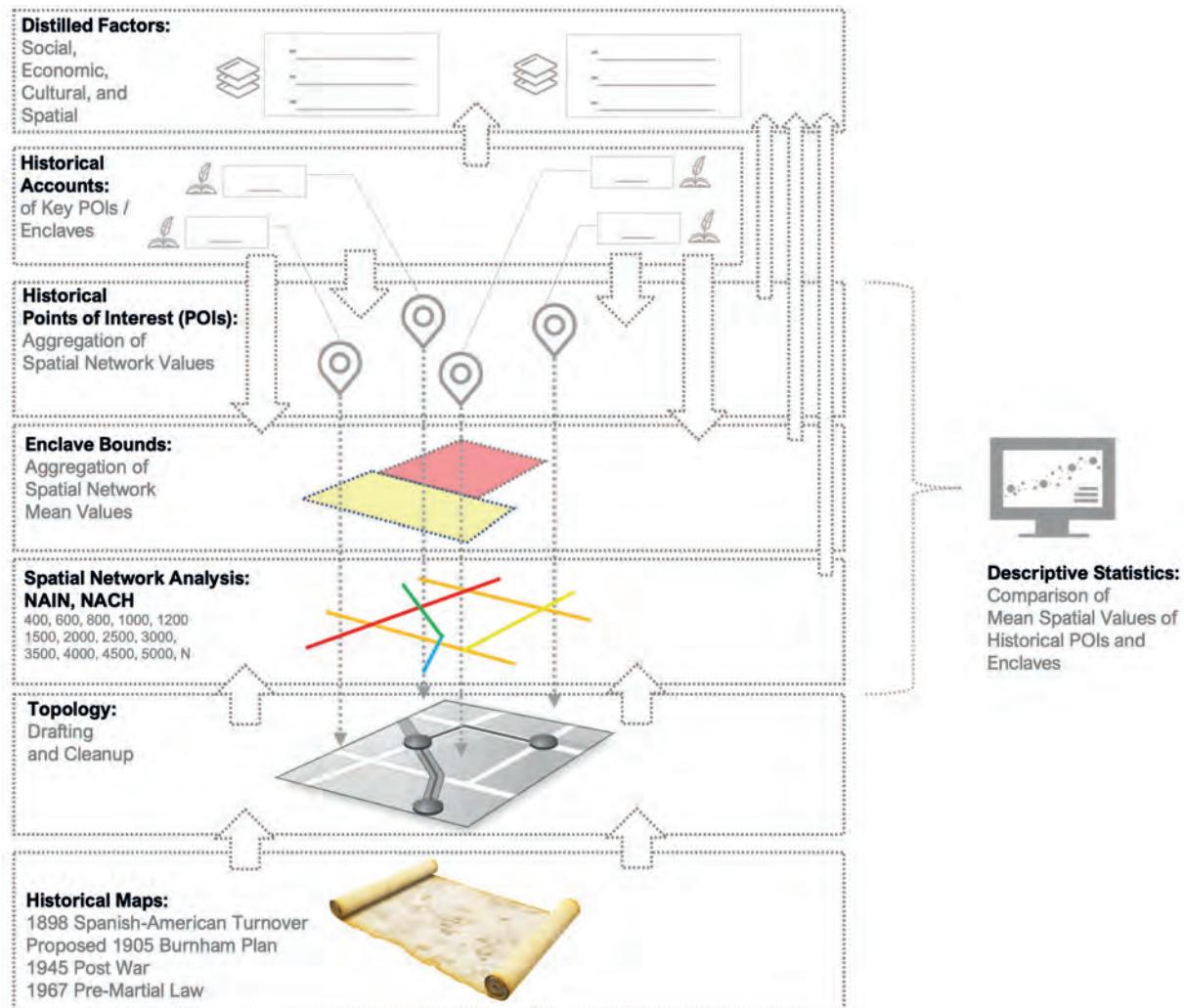
Figure 8. Framework for assessing Manila's historical configuration, showing historical maps and historical accounts as sources for data for aggregation and descriptive statistical analysis.

Manila by Space Syntax

Spanish Manila, Intramuros and Extramuros

The walled city of Intramuros (Figure 9) was planned according to King Phillip II's Laws of the Indies, with a grid of streets that connect a hierarchy of plazas with various

Integration (NAIN/closeness or nearness centrality) and Normalised Angular Choice (NACH/betweenness centrality) (Hillier, Yang and Turner 2012) for the historical and present-day spatial networks. These values vary according to the scale of movement ranging from local/pedestrian (400, 800, 1200m) to macro/vehicular scales (2500, 5000m, global range). The values derived from the spatial analysis are related to points-of-interest (Yang 2015), including historical landmarks and boundaries, and the socio-spatial narratives in the historical literature. This methodology is summarized in Figure 8.

points-of-interest such as churches, government buildings, educational, healthcare, military and commercial buildings (Doeppers 1972: 769–792). Figure 10 shows the spatial graph of an 1851 map of Intramuros. These points-of-interest are all within a walking distance of 15-20 minutes of one other within the walled city, hence this spatial network has a high probability of generating pedestrian movement.

Measuring less than 1.5 km on the longest dimension, Intramuros was a self-contained walkable 15 to 20-minute city. Its spatial network graph (Figure 10) lights up the warmer color ranges indicating that its street grid has high *integration*). Cooler ranges (green to blue) are found on the edges of the grid network, within interior streets, on the northern triangular end (point 33) of Fort Santiago, and on the pathways leading out of the walled city. These show that Intramuros looks inward and is segregated from the spatial network outside the walled city, a legacy of its role as an urban fortress for colonial residents.

The mission settlements of Extramuros were founded by the Spanish colonists under the *reducciones* system of evangelization to relocate the indigenous population within range of *bajo de la campana* or the "voice" of the church bells. They formed the suburbs or *arrabales* outside the walled city of Intramuros (Figure 11).

The 1898 spatial graph (Figure 12, generated from Figure 11) shows *integration* centrality within a pedestrian range of movement of 400 meters. The mission churches are largely located in areas with higher local/pedestrian integration values than those within Intramuros (Figure 14). Each of these mission areas was integrated within a 5–10-minute walking distance. 1898 Manila was around 6-7 km from end-to-end. This was within the travel range of around 15-20 minutes by the Tranvia tram system from the Spanish era.

While the 1898 Manila map was drawn with Intramuros at the center, on a *betweenness* graph (Figure 13), the major routes identified by warm colors lead to the Binondo trading district. An *integration* graph has the same result (Figure 14). Binondo was the true center of the colonial city.

On this same graph, the cooler colors of the street segments within Intramuros show that Intramuros was segregated as an enclave. Through the military camps on the major routes from Intramuros and Binondo, the Spanish segregated Intramuros as a means to impose order on the city itself and the surrounding area.

That Binondo emerges as the spatial integration core of 1898 Manila (warm segments concentrating within Binondo in Figure 13), is a twist of irony since Binondo was founded in 1594, the first Chinatown in the world, as a means to isolate and marginalize the Sangleys (Chinese traders), who originally set-up shop just outside Intramuros, within a mission district across the Pasig River. The Spanish were afraid of revolt, fire, and disease close to Intramuros. Through a network of bridges and feeder streets, Binondo became the true socio-spatial core of the city. The attempts to impose order and control on the built environment had unintended consequences for the latent centralities in the spatial network.
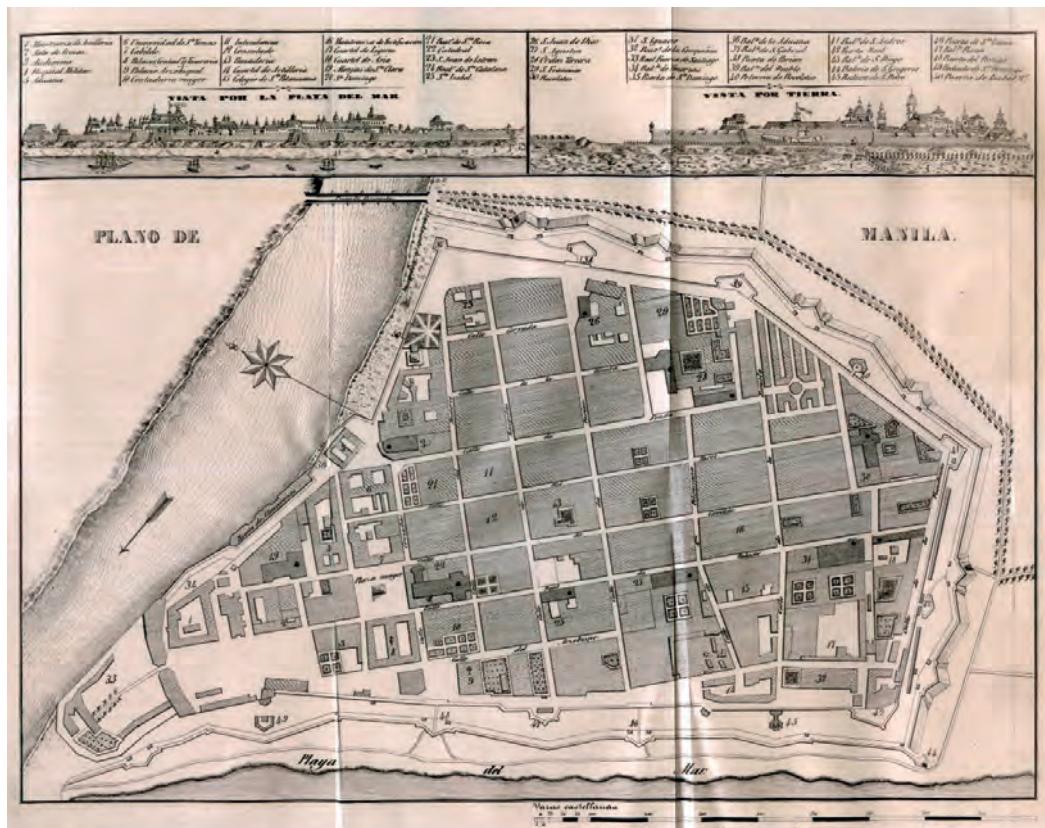
Figure 9. Intramuros 1851. Source: Intramuros (1851).
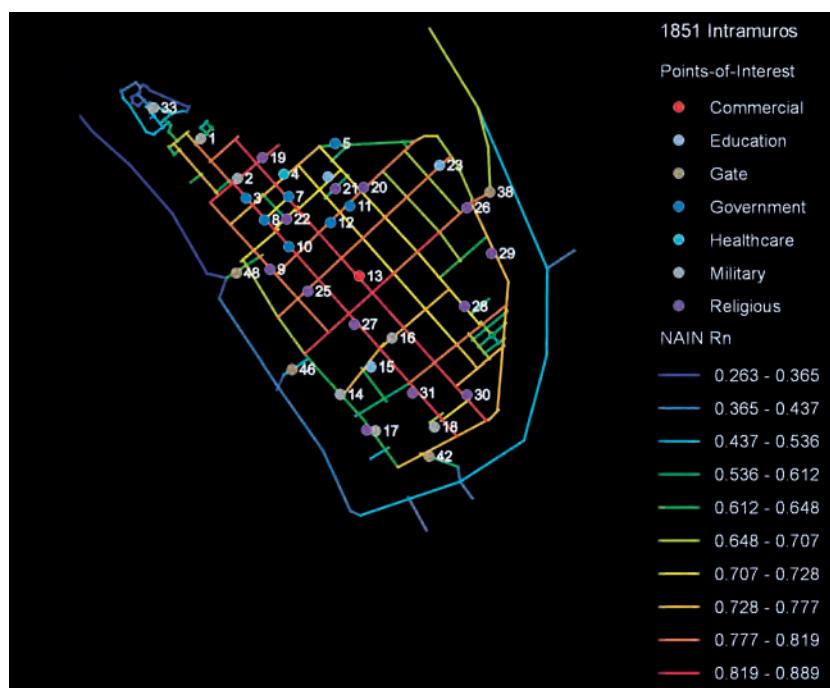
Figure 10. Graph of 1851 Manila, showing Intramuros' points-of-interest with major government buildings located on globally integrated segments of the 1851 Intramuros enclave network, based on Intramuros (1851).

Figure 11. Manila 1898 and its surrounding suburbs. Source: de Gamoneda (1898).
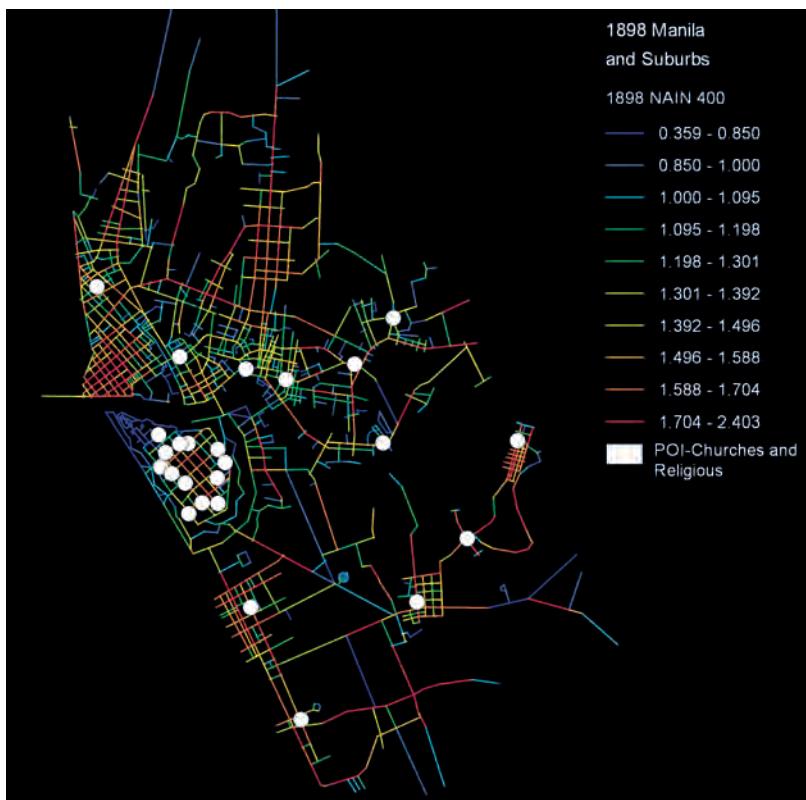
Figure 12. Graph of Manila 1898 showing religious points of interest, with mission churches located on pedestrian integrated segments of the 1898 Network; based on de Gamoneda (1898).

Figure 13. 1898 Manila, showing military camps, located on major global routes of the 1898 Network; based on de Gamoneda (1898).

Figure 14. Manila 1898, showing markets without accounting for access from the river; based on de Gamoneda (1898).

Daniel Burnham's City Beautiful Plan and its partial implementation

After the Spanish-American war, the Philippines came under American control in 1898. Daniel Burnham and his associate Pierce Anderson were enlisted by the colonial government to create a masterplan for Manila. This plan was later expanded beyond Intramuros in an attempt to create a Civic Core inspired by Enfant's Washington, DC (Ocampo 1992; Parsons 1915; Scott 1969; Morley 2014; Figures 15, 16).

Figure 15. Plans for the development of Manila, submitted to the Philippine Commission by D.H. Burnham, 1905. The essential elements of this plan are the government center, arteries radiating from it, the railway station, and the shore road. Source: Burnham (1905).

Figure 16. The proposed Capitol Buildings and National Mall to be located beside Intramuros, on what was known as Luneta. Only two of the proposed buildings were constructed: the Department of Agriculture and Department of Finance, which now house the Philippines' National Museum's Natural History and Art Branches. Source: Burnham (n.d.)

Burnham's plan had a radial concentric grid system, focused on the Civic Core, which was supposed to link with the existing fabric of Spanish Manila and assimilate the mission districts founded by the Spanish into a broader whole (Parsons 1915).

The warm colors of street segments on the *integration* graph on a 400 m pedestrian range show how the Burnham Plan expanded the existing network of Spanish mission districts (churches as white dots) to create a new integrated area for pedestrians with several sub-centers (Figure 17).

Figure 17. Proposed Burnham Plan for Manila, 1905, showing 1898 Spanish Manila's original mission churches, integrated into Burnham's proposed broader spatial network. Source: Burnham and Anderson (1906)

The warm colors of street segments on the *betweenness* graph of the Burnham Plan show that the sub-centers were interconnected by a network of 10-minute walking routes that were likely to have pedestrian traffic, creating the potential for commercial development (Figure 18).

The warm colors of street segments on the *integration* graph for 2500 m range, simulating local mass transport like the *Tranvia*, shows that the Burnham Plan was likely to divide Manila into two cores to the north and south of the Pasig River (Figure 19). Both Intramuros and the planned Civic Core were effectively side-lined. The divisions last down to the present in the separate north and south university belt clusters. Again, the attempt to impose order had unintended consequences. The creation of a concentric street pattern focused on the Civic Core stimulated local social interaction in other, more accessible parts of the city.

Figure 18. Proposed Burnham Plan for Manila, 1905, showing pedestrian interconnectivity of the proposed radial road network. Source: Burnham and Anderson (1906)

Figure 19. Proposed Burnham Plan for Manila, 1905, showing shift of integration core away from Binondo toward two fragmented integration areas north and south of the Pasig River. Source: Burnham and Anderson (1906)

Burnham's City Beautiful Plan was never fully implemented. It was meant to be a statement of intent and a vision for Manila. The 1945 Map of Manila captures what was completed over the four and a half decades of American colonial rule and city-building (Figure 20).
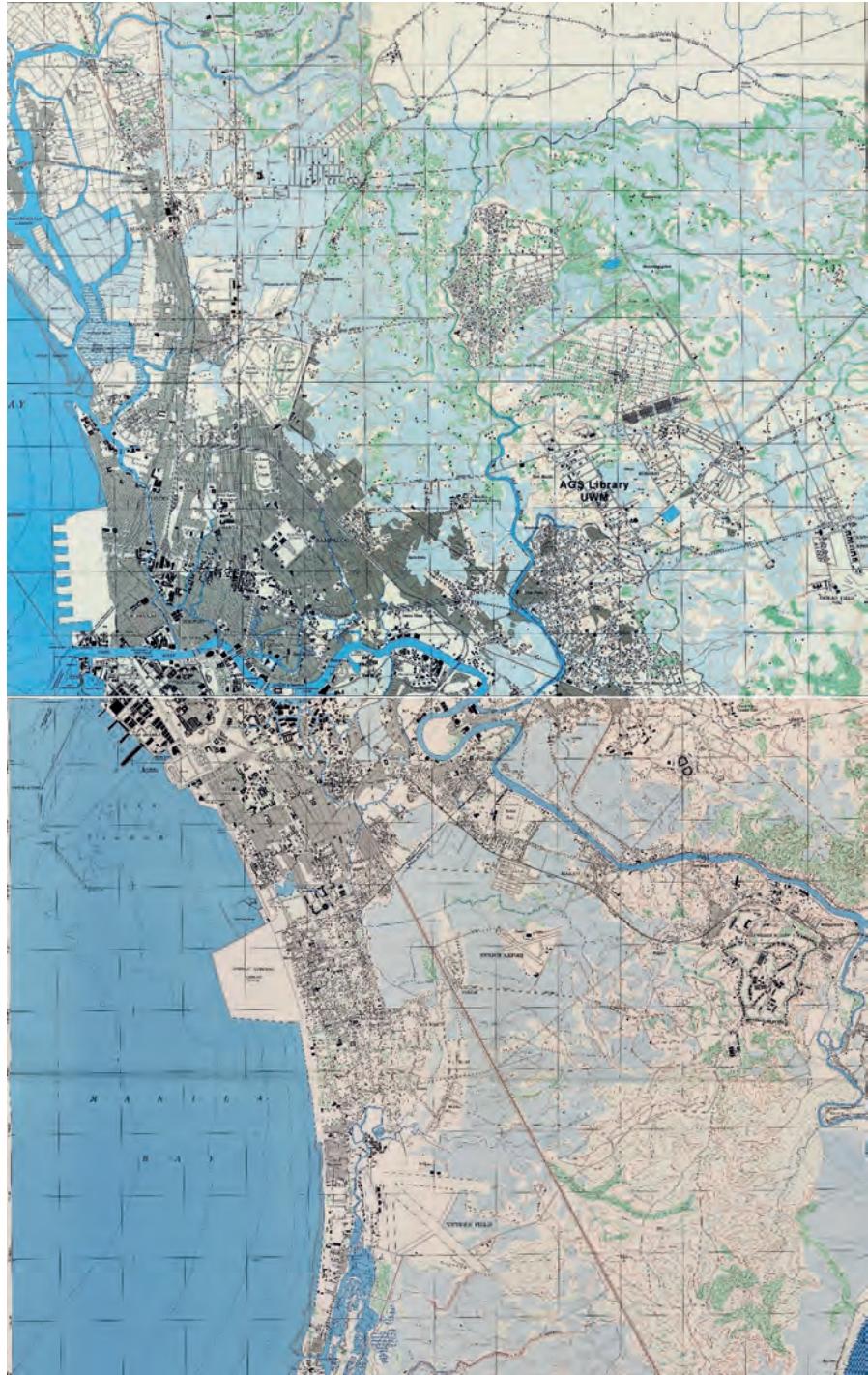
Figure 20. Manila 1945, composited from artillery and air ordnance maps of US Army and US Army Air Force. Source: US Army Map Service (1944–1945).

An *integration* graph of this 1945 map at 2500 m range (Figure 21) shows that Manila did indeed become divided, with two cores indicated by segments in warm colors to the north and south of the Pasig River.
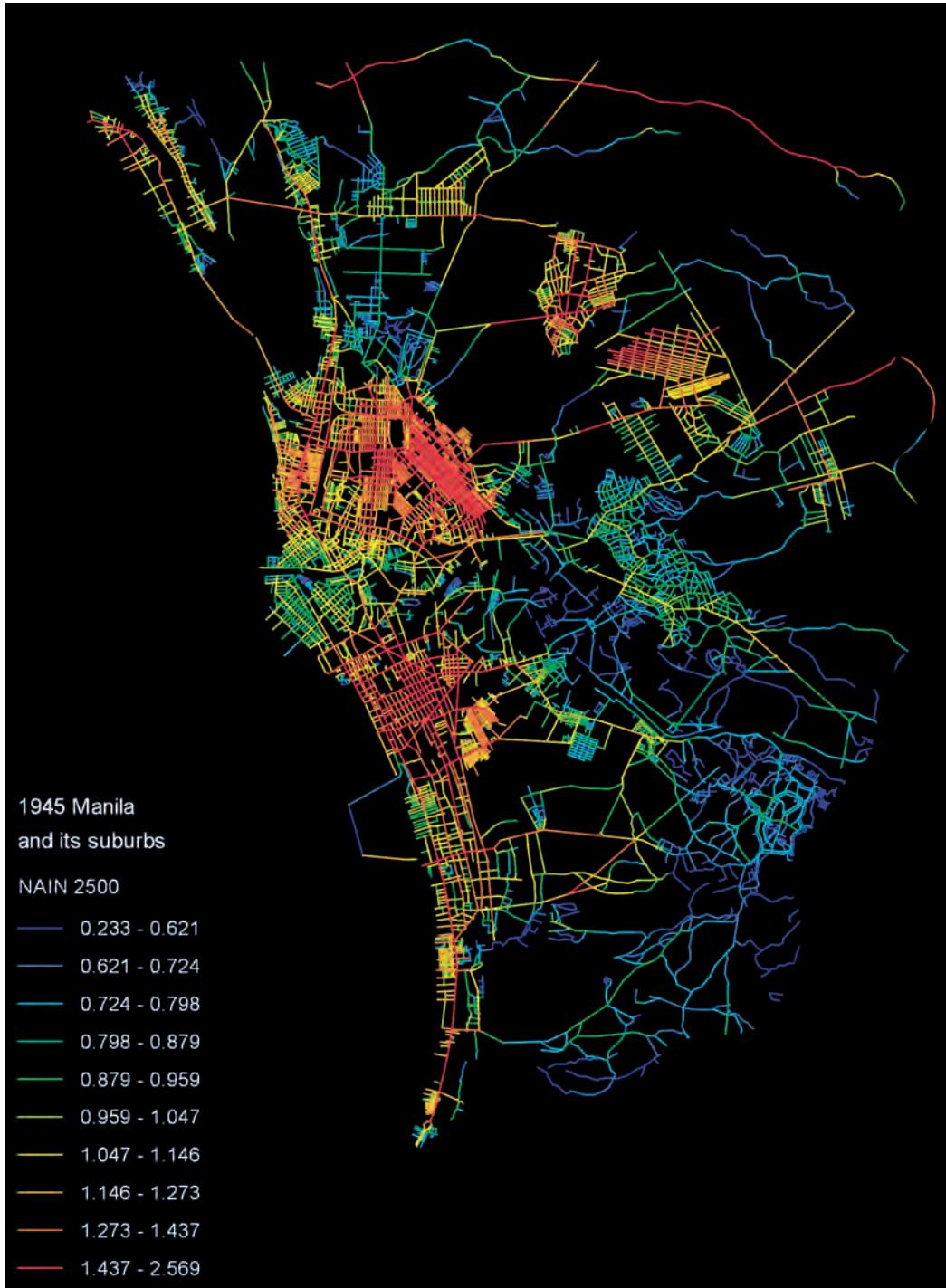
Figure 21. Spatial graph of Manila, 1945, showing integration core beginning to fragment into separate halves; based on US Army Map Service (1944–1945).

The expansion of the city grid to the north and south of Intramuros and Binondo resulted in the old downtown being hollowed-out and new centralities developing in the new suburbs. This fragmentation was partially caused by the lack of new river crossings and the allocation of large tracts of land for industry along the Pasig River that cut off one side from the other.

The southern core facing Manila Bay has a concentration of American-founded points-of-interest and is buffered from the surrounding street network by the Civic Core, Intramuros and the Pasig River to the north, the Estero de Paco to the east, and Burnham's Park No. 1 to the south (Figures 22, 23).
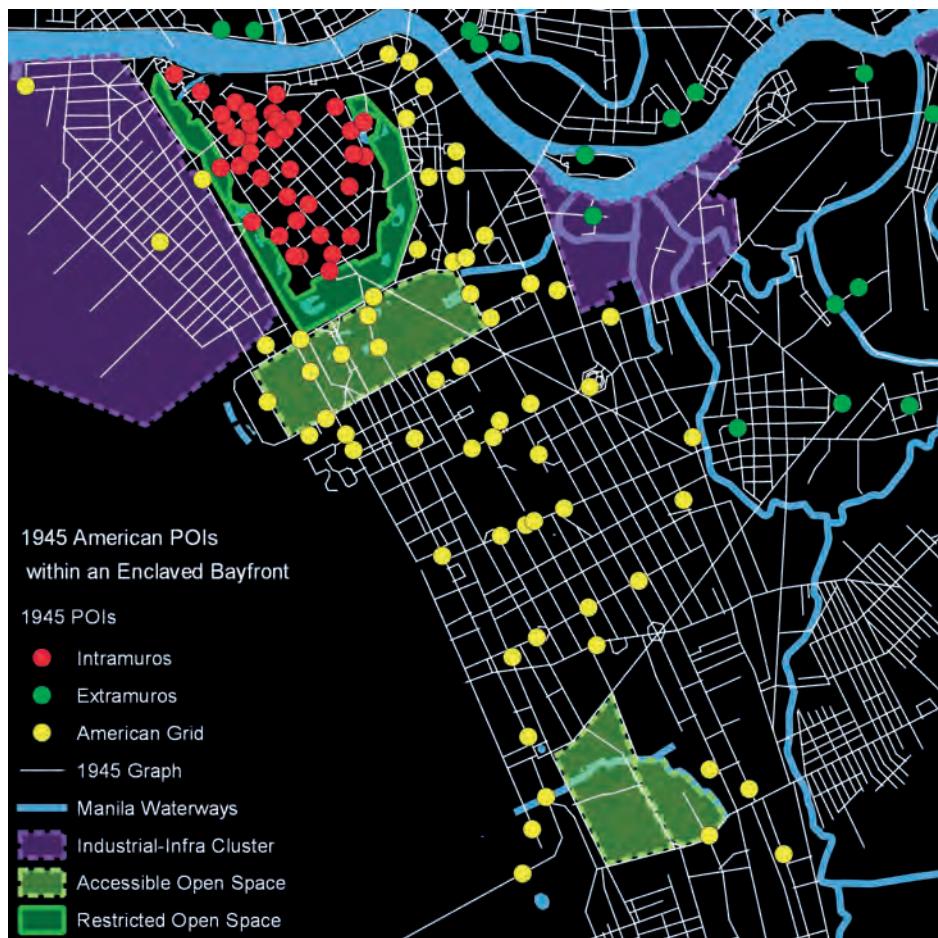
Figure 22. Spatial graph of Manila 1945 showing clustering of American points-of-interest around bayfront area and the land-use/natural buffers surrounding the bayfront; based on US Army Map Service (1944–1945).

In effect, this southern area became an elite enclave without gates or fences, highly valued as a suburban residential address by the elite of that period. However, the accessibility and centrality of this core was also an attraction for commerce. Over time, the palatial homes of Manila's elite gave way to office buildings, commercial frontages, and high-rise towers overlooking Manila Bay.
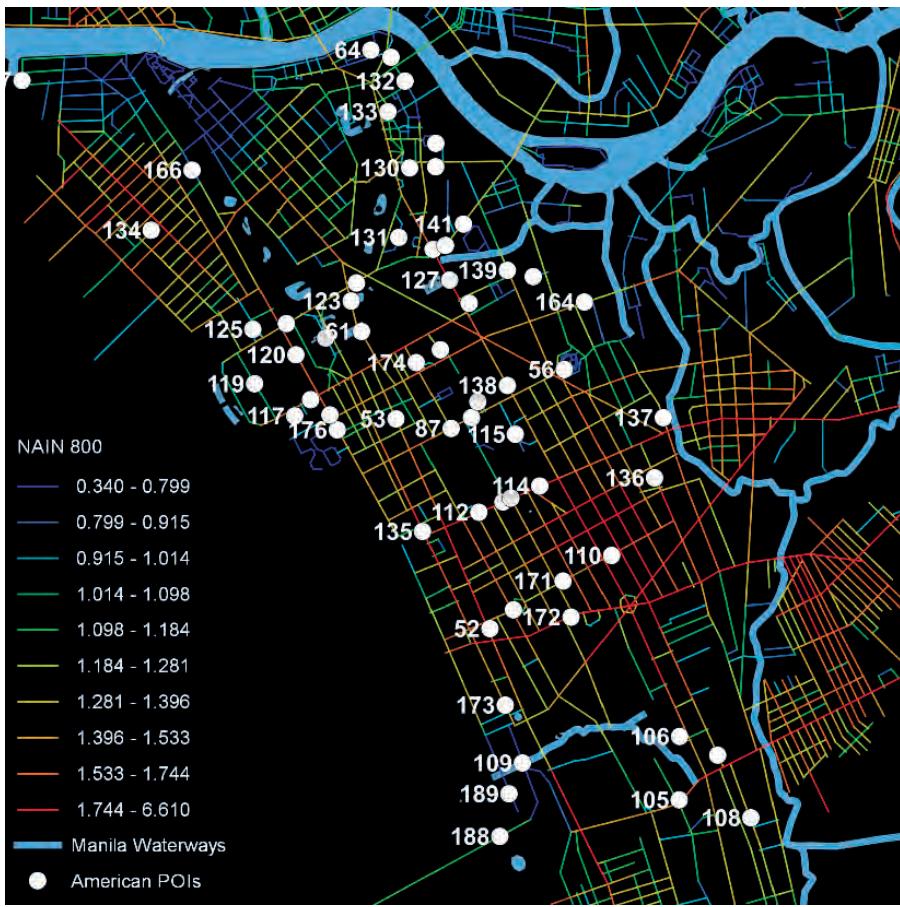
Figure 23. Spatial graph of Manila 1945 with American points of interest within the B\bayfront enclave; based on US Army Map Service (1944–1945).

Metro Manila's post-war suburban expansion

American colonial rule ended in 1946. By the time of the 1967 Map of Metropolitan Manila, the old downtown core had expanded into car-centric suburbs defined by the Epifanio Delos Santos Avenue Ring Road (EDSA/C-4). The zones colored yellow are single-family residential suburbs. American rule may have ended, but the wealthy and the middle class who sought new lives away from the old core devastated by the war were still influenced by the American lifestyle (Murphy and Hogan 2012: 26; Garrido 2013).

The *integration* graph of this 1967 map for 2500 m range of movement shows that the division into north and south cores remained (Figure 26), as there were still few bridges and still industrial zones acting as barriers.

New centralities appeared farther out in Quezon City to the northeast and Makati to the southeast. The government intended to develop Quezon City as a city for workers (Pante 2017), but the *integration* graph for 800 m range shows that its grand avenues and elliptical rotunda created a space that was not pedestrian friendly and hence at odds with this original aim (Figure 30).
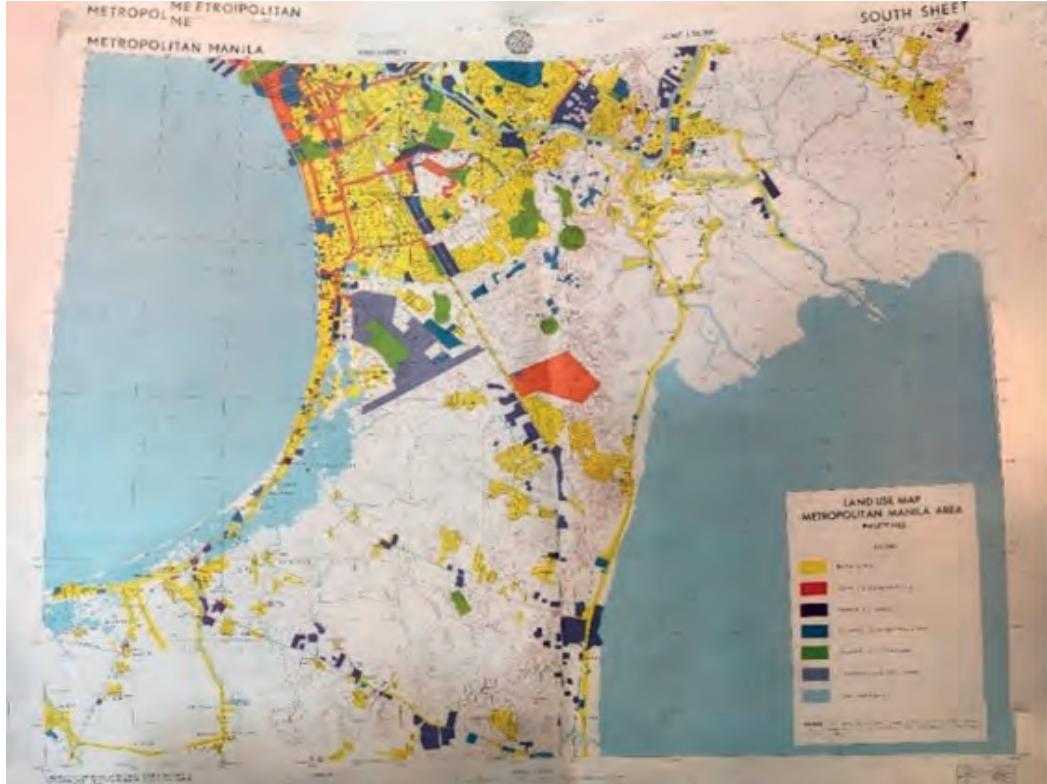
Figure 24, 25. Metropolitan Manila 1967, north and south, land-use and road networks overlaid on topography. Source: Board of Technical Surveys and Maps (n.d.).
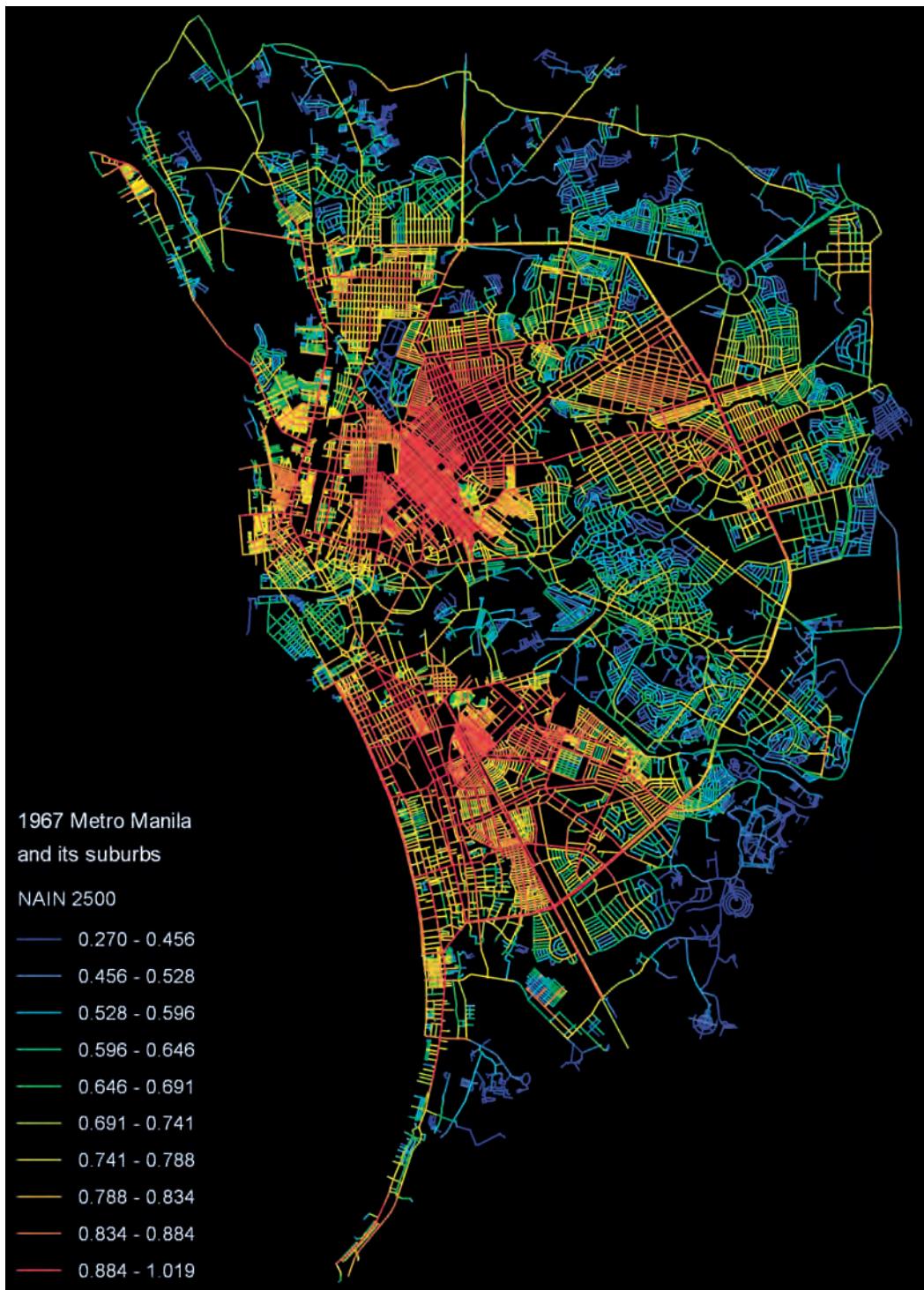
Figure 26. Spatial graph of Metro Manila, 1967, showing fragmentation into north and south integration cores. Source: Board of Technical Surveys and Maps (n.d.).

Figure 27. Spatial Graph of Quezon City, Metro Manila, 2019, showing present-day government agencies and their respective enclaves. Drawn by author using OpenStreetMap.

Figure 28. 2019 Spatial graph of Makati, Ortigas, and Greenhills Enclaves. showing Global Integration Centralities under the Gates Closed/Status Quo condition. This represents how access gates suppress the generative capacity of the spatial network within the villages; drawn by author using OpenStreetMap.
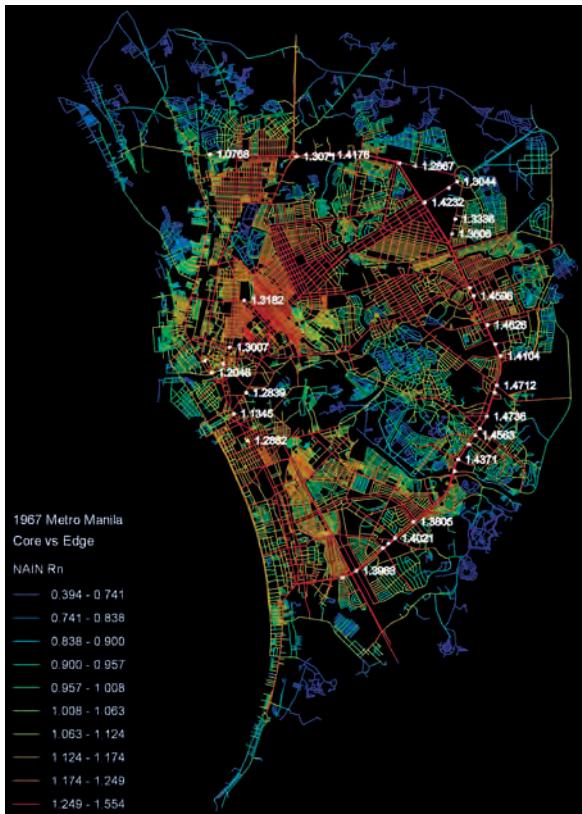
Figure 29. Spatial graph of Metro Manila, 1967, showing higher global integration values along Circumferential Road 4/Epifanio Delos Santos Avenue compared to Manila's original business district of Binondo, American Bayfront district, Ermita, and shopping district of Avenida Rizal. Source: Board of Technical Surveys and Maps (1967).

Figure 30. Spatial graph of Metro Manila, 1967, showing higher global route choice values along Circumferential Road 4/Rpifanio Delos Santos Avenue compared to Manila's original business district of Binondo, American Bayfront district, Ermita, and shopping districts of Avenio Rizal. Source: Board of Technical Surveys and Maps (1967).

By contrast, Makati was developed by private enterprise, becoming a new commercial core, surrounded by gated residential villages. In the 1970s and 80s, the suburbs of Greenhills and Ortigas developed on a similar pattern. The *integration* graph for 2019 shows warmer colors for their central business districts, and cooler colors for the segregated, exclusive residential subdivisions with introverted street networks (Figure 28).

Makati and Quezon City both worked as car-centric suburban new cities because of the EDSA/C-4 ring road. The *integration* graph for 1967 shows that EDSA/C-4 became a destination, while the *betweenness* graph for 1967 shows that it also became a popular corridor for movement (Figures 29, 30), resulting in it becoming more attractive than the original urban core.

The attraction of EDSA/C-4 furthered the hollowing-out of Manila's historical core and set the stage for further car-centric suburban expansion into fringe towns to both north and south, leading to longer travel distances. The Filipino middle class abandoned the intimate and local scale of walkable neighborhoods in the pursuit of an American lifestyle in segregated residential zoning made available by cheap oil (Roderos 2013). They now only sampled the experience of walkable neighborhoods on school field trips to Intramuros and Rizal Park or visits to walkable cities abroad. The historical core lost its vibrancy, parts being "de-gentrified" into informal slums in the absence of liveable public housing (Recio 2013).

Latent centralities in Metro Manila's existing suburban fabric

The 2004 Land Use Map of Metro Manila (Figure 31) shows the expansion of Metro Manila to north and south in single-family residential subdivisions (the yellow zones) with commercial corridors of strip mall and big-box mall developments and older-style retail streets.

An *integration* graph at 2500 m range of movement on the 2019 map shows the latent spatial patterns within Metro Manila's residential suburbs and suggests what is needed to create a 15-Minute city (Figure 32). The areas in warmer colors from yellow to red are more accessible within a 2500 m journey, roughly equivalent to fifteen minutes. These are mostly along main routes which are heavily trafficked by vehicles and which are often the sites of the car-centric strip mall and big-box mall developments that have become common outside the old city core. These also correlate to the red areas of commercial land-use on the 2004 Land Use Map of Metro Manila (Figure 31). This analysis also highlights interior street networks within the yellow residential zones in the 2004 map.

This hints at the latent local centralities within the gated residential subdivisions. The warm colors (yellow to red) on an *integration* graph at 1200 m range of movement of the 2019 map denote areas with good pedestrian access within the yellow residential areas (Figure 33). These include the existing commercial zones and mall developments along the major roads, but also spaces within the residential areas which are within 1200 m or a fifteen-minute walk.

This analysis suggests that something of the fine-grained networks present in Metro
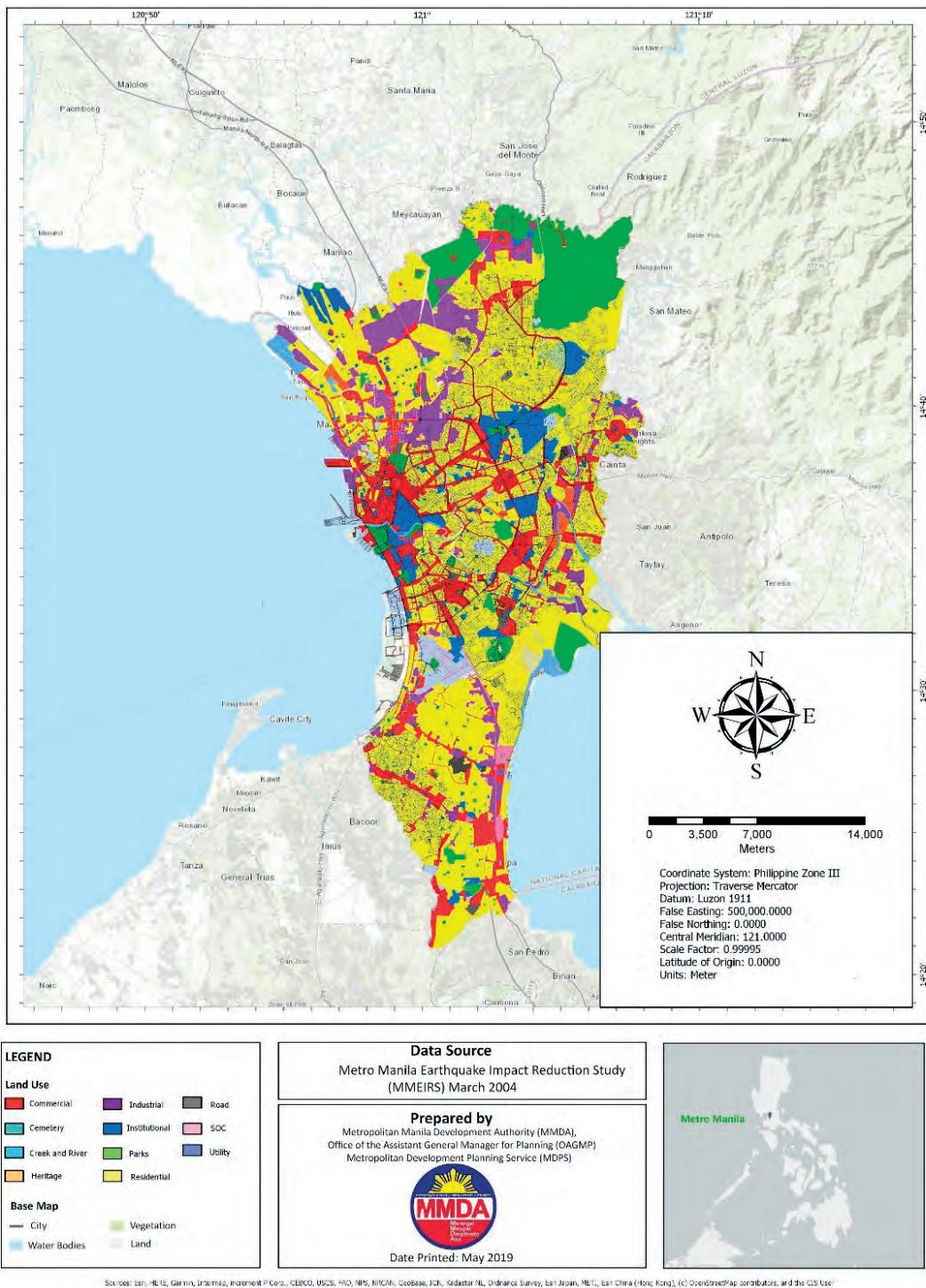
Figure 31. Land Use of Metro Manila, 2004. Source: Office of the General Manager for Planning (2019).
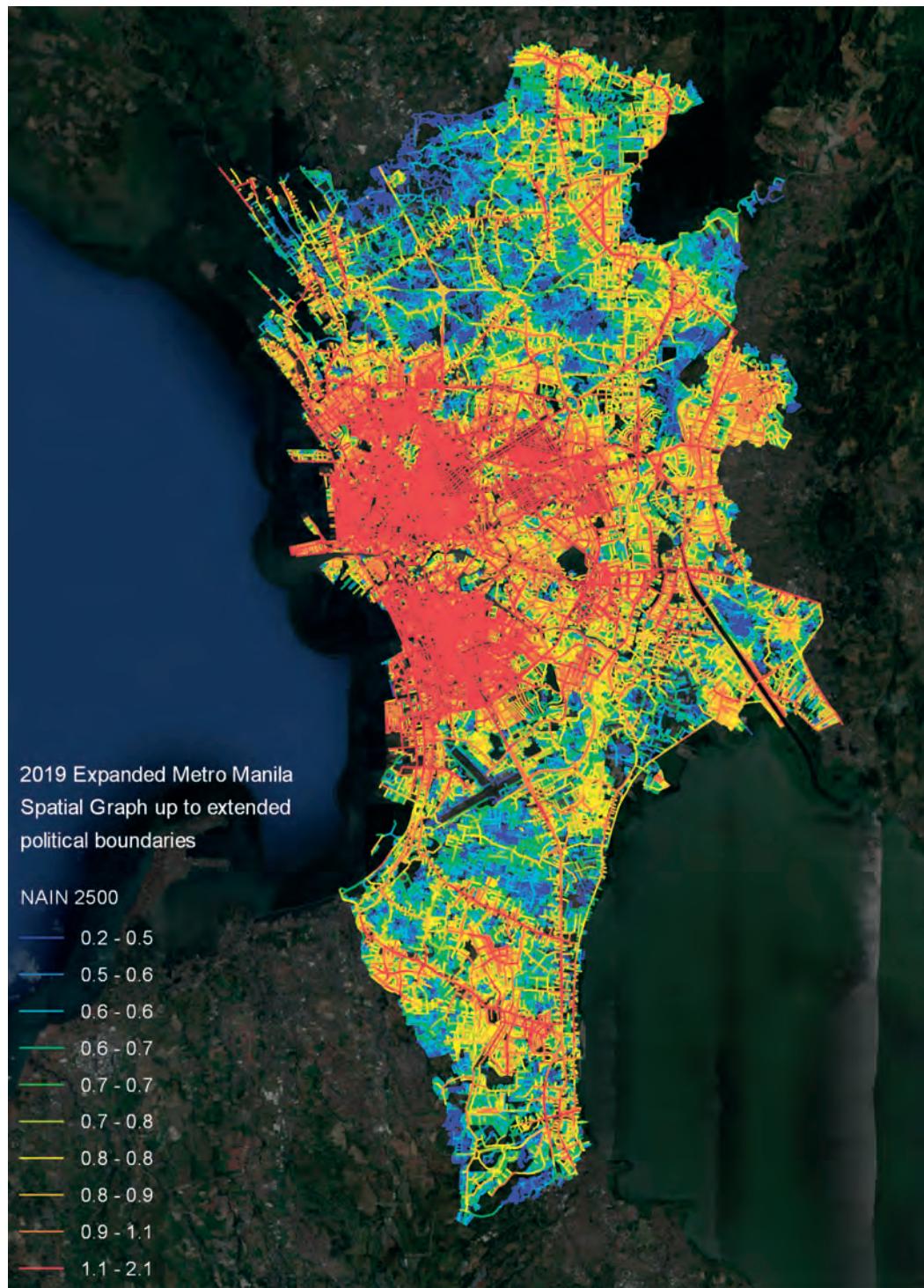
Figure 32. Spatial graph of Expanded Metro Manila, 2019, showing local centralities for movement of 2500 m range; drawn by author using OpenStreetMap.
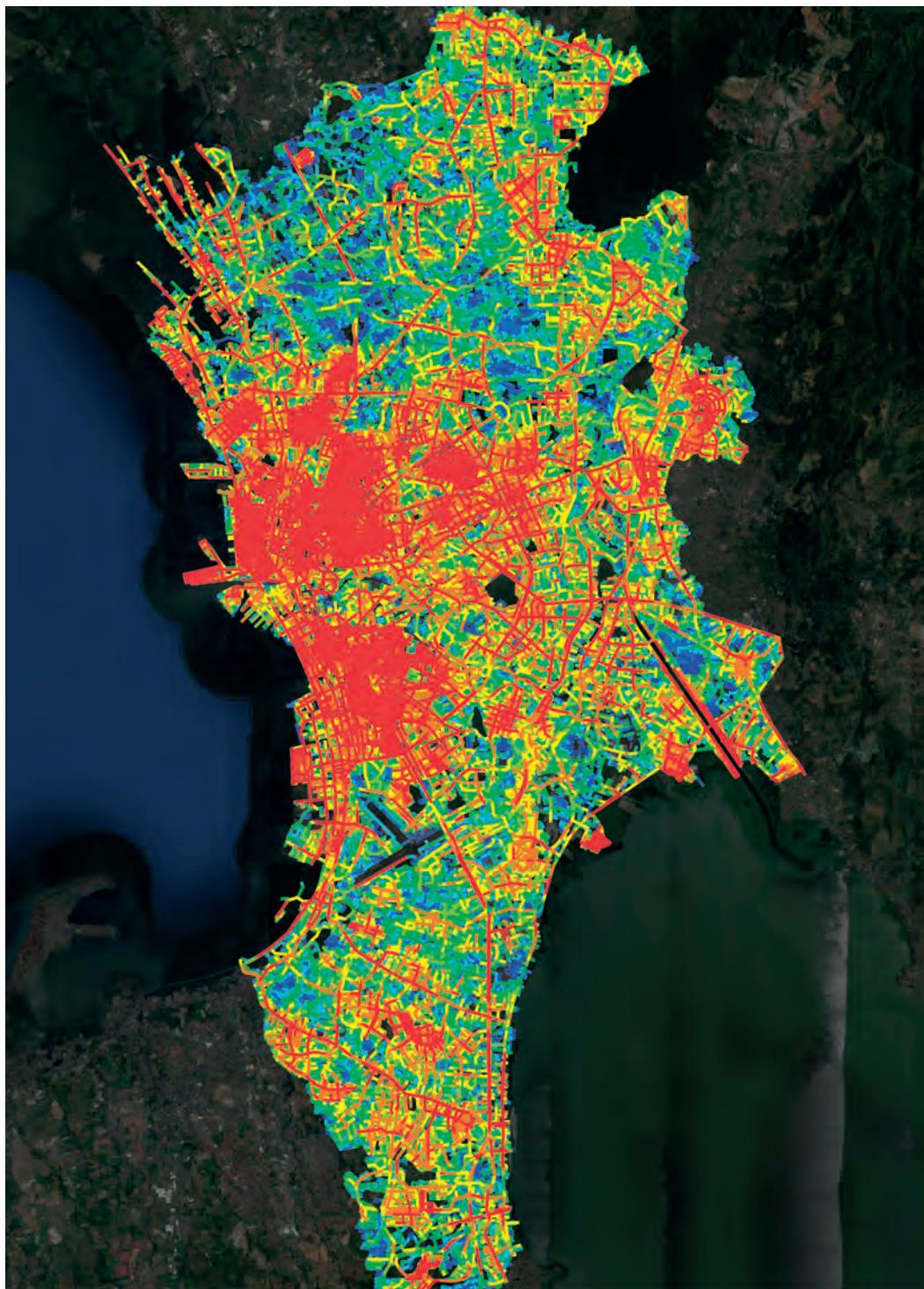
Figure 33. Spatial graph of Expanded Metro Manila, 2019, showing local centralities for movement of 1200 m range, drawn by author using OpenStreetMap.

Manila during the Spanish and American colonial periods can be rescued by a scaled approach to planning and retrofitting the built environment. This will require new policies on land-use, density, and security policies. Security cordons may have to be dismantled to improve access. Restrictions of commercial land-use and zoning density may need to be relaxed. Parking may have to be outlawed to allow the streetscapes within these areas to be retrofitted to encourage walking, cycling, and more use of public transport.

Conclusion

During the Spanish colonial period, Intramuros with its clustering of different land uses and its permeable grid of streets and interconnected plazas was a walkable 15-Minute city. The various mission districts were also locally integrated for pedestrians and centered around their mission church. the buffering of Intramuros allowed the development of a second spatial network focused on Binondo. The whole city, around 5-6 km end-to-end, was well integrated by the *tranvia* network that connected the various local mission areas with Intramuros and Binondo.

The Burnham Plan created a new Civic Core beside Intramuros with a concentric grid that assimilated the mission church districts and created new pedestrian-friendly neighborhoods. At the same time, the Burnham masterplan created industrial areas alongside the Pasig River which, with the lack of bridges, divided the new city into northern and southern segments.

The post-1945 expansion of Manila was shaped by the Epifanio Delos Santos Avenue (EDSA/C-4). The city expanded to the northeast to Quezon City, intended as a new grand capital of boulevards and avenues for workers, and southeast to Makati, a cluster of gated residential villages for Manila's elite and middle class. Both new developments were car-centric and very suburbanized. They accentuated the north-south division of Metro Manila. Along with EDSA's value as a through route, they contributed to the hollowing out of the historical core.

Metro Manila continued to sprawl further to the north and south, increasing travel distances, and creating a very car-centric city with inaccessible localities. However, space syntax shows there are latent centralities within the suburbs which have the potential to be retrofitted in line with the concept of 15-Minute cities.

New Urbanism and the 15-Minute City are toolboxes of concepts for urban planning. Space syntax can be used to sharpen understanding of how both New Urbanism and the 15-Minute City can be implemented, especially by retrofitting existing communities. The analysis of Manila's historical urbanism by space syntax shows patterns of localization in a suburbanized metro region, going beyond the aesthetic historicism of New Urbanism, and the application of circular travel ranges used in the discourse on the 15-Minute City.

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Architecture of Happiness: The Work of Hoang Thuc Hao

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ABSTRACT—Hoang Thuc Hao's projects, particularly the community buildings, ask what it means to be in Vietnam, what the transformative growth of recent years has meant to everyday lives. He is preoccupied with climatic response, local craft and materials, the relationship between indoors and outdoors. He too seeks meaning, combining old and new, albeit not in the city but in rural Vietnam. Embedded within Hao's reading of the zeitgeist, there is a position on the environment. Hao offers an implicit nod to the sustainability movement that has mushroomed in Vietnam since the 2010s. However, his worldview is rooted in the phenomenological, which contrasts with other green architects, who rely mostly on technological solutions.

Hoang Thuc Hao (b. 1971) is a Vietnamese architect who has been celebrated for his projects for disadvantaged communities, his use of traditional and local materials, and his awareness of climate change. During the early stages of his practice, Hoang noticed that while rapid urbanisation paralleled the growth in the economy, rural communities, which earlier were doing well, have often suffered owing to rapid urbanisation and urban migration. He opened his own practice, 1+1>2 Architecture in 2004 and has since dedicated much of his career towards advancing rural societies.

To frame the work of Hoang Thuc Hao, it is useful to revisit Regionalism, a discourse that preceded his career by some four decades, and which did not, in its heyday, have a champion in Vietnam. Vietnamese architects Tran Dinh Quyen and Nguyen Van Hoa imparted regional influences to the largely modernist styles of the period, particularly in Southern Vietnam. They were, however, not as well-known as other regionalists of the period (Loan and Lan 2017). Regionalist masters in Asia are remembered for their approach to site, climate and materiality (Tzonis et al. 2001). These imperatives, in their hands, gave rise to meaning; and new meaning, as a semantic force, was necessary to forge identity. This reimagining of architecture would, for some, also be a preface to rethinking the city which was changing, spurred on by new political and economic realities.

In Hao, we see a kindred ideology. His projects, particularly the community buildings, ask what it means to be in Vietnam, what the transformative growth of recent years has meant to everyday lives. He is preoccupied with certain form-drivers: passive design, local craft and materials, edge conditions between indoors and outdoors. He too seeks meaning, combining old and new, albeit not in the city but in rural Vietnam. The pull of the city is to be resisted, and the way to resist, says Hao, is to restore and

regenerate the countryside. He is drawn to small communities, giving form to what might be described as a *New Vietnamese Vernacular*.

Embedded within Hao's reading of the zeitgeist, there is a position on the environment. This is not unlike, say, Ken Yeang (Malaysia) and Tay Kheng Soon (Singapore) who, in the 1980s, were drawn to building performance as a direct response to the energy crises of the 1970s (Soon 1996; Yeang 1996). Hao adopts a similar stance, an implicit nod to the Green building movement that has mushroomed since the 2010s. His take on Greening is rooted in the phenomenological, and offers a perspective that is unique in an industry reliant on certification checklists.

Hao's visual style is an amalgam of traditional techniques and materials, served up with a twist. On the surface, his buildings read like an ode to the past. On examination, they reveal a Modernist sensibility: clean lines, sharp geometries, the mannered tectonics of material and space. It is this stylistic ambiguity and the stories he tells of life in rural Vietnam that explain his success on the global stage and popularity in Vietnam.

Architect as activist and agent of change

Rural communities in Asia compete with cities. Since 1986, the year of national economic reform in Vietnam known as *doi moi*, large numbers of people migrated from the countryside to cities to work in factories. In official estimates, some 100,000 people move to Hanoi and some 130,000 to Ho Chi Minh City every year (www.thanhniennews.com). In the process, many were disconnected from their roots, traditions, culture, and social networks. Those who stayed back struggled to cope with changes to both the physical and social structures of their communities, one falling into disrepair, the other fragmented.

Figures 1. Hoang Thuc Hao (third from right) bringing together stakeholders (photo: https://tiasang.com.vn)

Most of Hao's community projects are a direct response to this erosion of rural life. Each starts by bringing together stakeholders and aggregating resources. Fellow practitioners, non-governmental agencies, social organisations, and educational
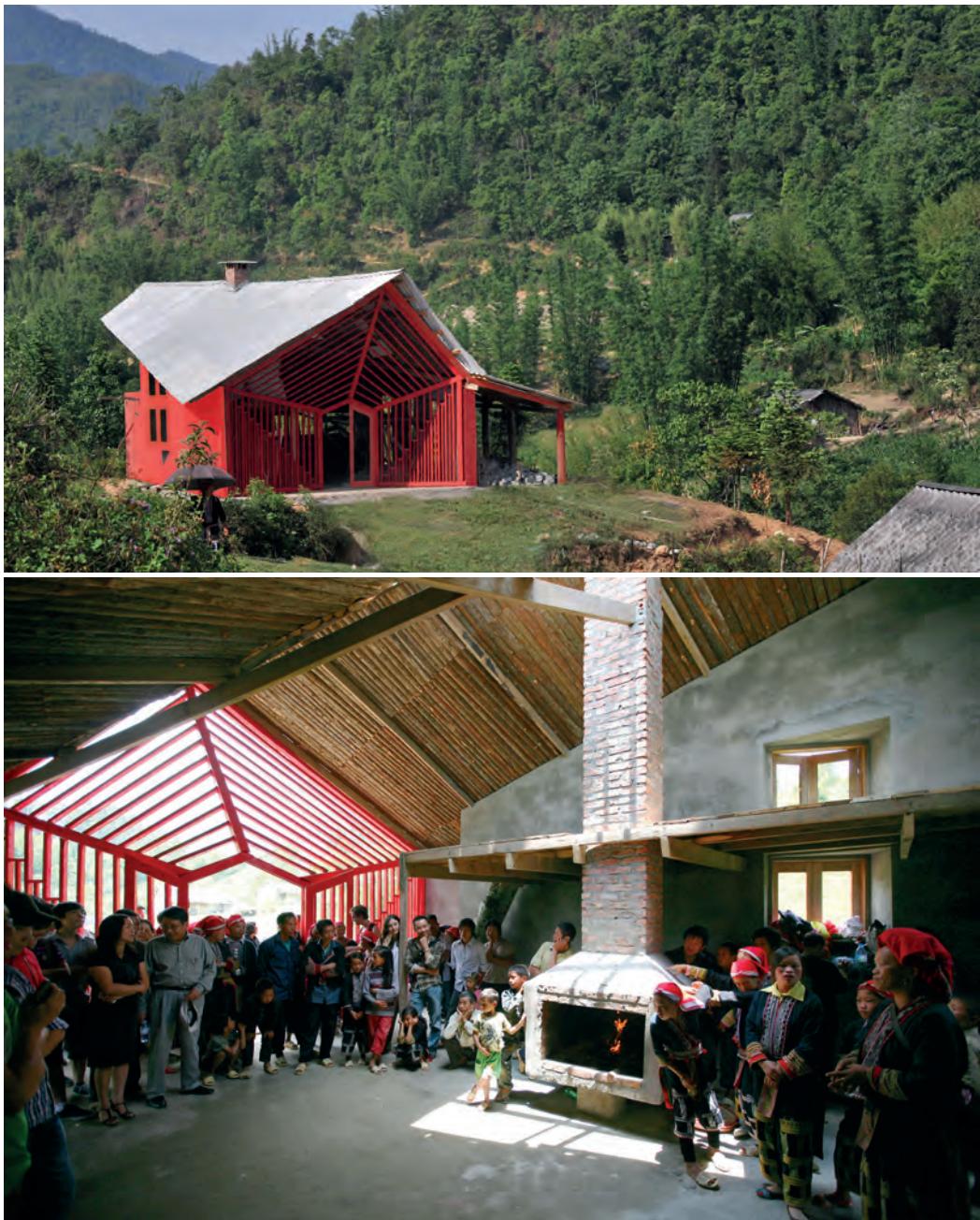
Figures 2, 3. Ta Phin Community House (photos 1+1>2 Architects)

institutions are roped in to brainstorm ideas. The resulting architecture reflects the collaborative processes that produce it.

This principle of participatory design is common to much of Hao's practice, wherein he becomes a conduit for dialogue, and process shapes programme and spatial outcomes. In the Ta Phin Community House in Sa Pa District (Figures 2, 3), for instance, the aspirations of locals were identified through active engagement of various community associations. The building, by consensus, showcases traditional skills and products in an exhibition room, library, communication centre and training spaces.

The most exemplary of Hao's community-led projects is the Earth Village in Nam Dam, a minority area located in Vietnam's northernmost province (Figure 4). In 1992, the villagers began to relocate to the nearby foothills where they could access roads and amenities. Since 2013, Hao, began collaborating with Caritas Switzerland (Vietnam) to lend his design skills to improve the quality of construction, to build and create various prototypes of homestays. These houses made it possible for owners to host tourists, thereby creating a new income stream. As of 2021, twenty-five households have adopted Hao's model.

Figure 4. Earth Village (photo: Son Vu / 1+1>2 Architects)

In collaboration with other stakeholders, Hao has been working in the Quan Ba District (where the Earth Village is located) to preserve and improve rammed-earth (Figure 5) and clay construction in the area, which he deployed in the structures he designed and built for the Earth Village. Here, the goal has been to upskill craftsmanship through the act of construction.

Architect as maker of form and meaning

In the best of Hao's work, the roof is often the defining element. This preoccupation with the *parasol* echoes the early projects of Tay Kheng Soon (1997), who spoke of it as a signature of tropicality: denoting climate, altering skyline, connecting to the past.

Hao's roofs reveal structure and revel in materiality. Volumes confer meaning, from the very public (without roof) to the private (low headroom). It is in the in-between, the semi-public, where Hao is at his best, crafting playful spaces that foster social exchange and that moderate the climate.

The roof takes many forms, from the whimsical compositions of the Da Hop

Figure 5. Rammed earth construction, Earth Village (photo: Son Vu / 1+1>2 Architects)

Figure 6. Da Hop School (photo: Hiroyuki Oki / 1+1>2 Architects)

School (Figure 6) to the studied curves of Tomodachi Retreat, also known as "Jackfruit Village" (Figures 7, 8). What is striking about these complex geometries is that they rely on rudimentary construction techniques and often sit atop a remarkably simple and orthogonal floor plan.

Figure 7. Tomodachi Retreat, Jackfruit Village (photo: Son Vu / 1+1>2 Architects)

Figure 8. Adobe brick and thatched roof at Jackfruit Village (photo: 1+1>2 Architects)

In all his works, Hao makes a case for climate response. This is seen as notations in drawings, indicating directionality of light and shade, or the flows of air and water. These principles of passive design are sometimes backed with computer modelling of performance (Figures 9, 10).
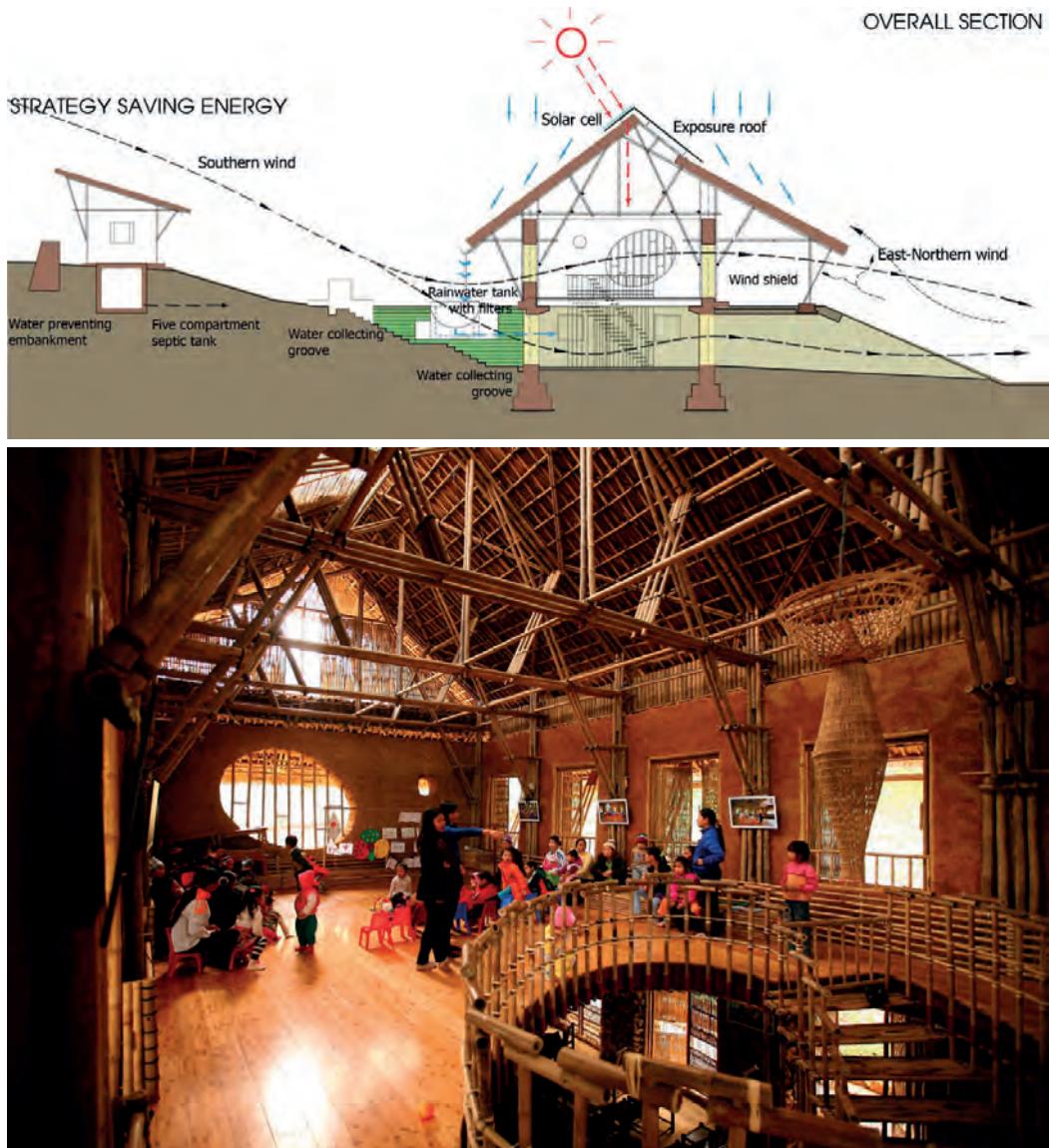
Figures 9, 10. Suoi Re Multifunctional Community House (photos: (photo: 1+1>2 Architects)

In a Hao building, there are encounters with courtyards and verandas, elements found in traditional architecture. His courtyard, however, is more than a mere void. He interprets it as a series of non-linear contiguous spaces that interfaces in new ways with the volumes around it. This creates edge conditions not seen before, where Hao walks the line between the familiar and the experimental, between measured comfort and delight. In the Cam Thanh Community House (Figure 11), for instance, this soft

Figure 11. Cam Thanh Community House (photo: 1+1>2 Architects)

Figure 12. Natural stone and bamboo construction at Suoi Re Community House (photo: 1+1>2 Architects)

boundary between the inside and outside offers a symphony of shade and light and sustains a connection between the constructed and the natural.

The porosity of the envelope is matched by the flexibility of the interior, designed as unobstructed spaces with few partitions and barriers. The floors of the Suoi Re Multifunctional Community House, for instance, are sometimes deployed as kindergarten, library or community space, depending on the time of day and need (Figure 12). Here, Hao also showcases his deft handling of local materials. He is a master of

the low-impact – rammed earth, natural stone, adobe bricks, timber, bamboo, thatched roofs – assembled in ways that test the limits of traditional know-how (Figures 8, 12).

Upscaling of ideas and actions

Hao's reputation has risen in the last decade and, as a result, he has received multiple commissions for ambitious projects in Vietnamese cities. The question he faces is what, if anything, to carry over from his experiences in the countryside to an urban intervention that is bigger, taller and has less access to nature. In the Dream Residences (Figure 13), for instance, Hao embellishes the upper floors of this multi-unit development in Hanoi with vegetated terraces (Figure 14), which sets it apart from other buildings in the neighbourhood. Here, vegetation is a thermal and psychological buffer, something that was not necessary in a rural setting.

Figure 13, 14. Vegetation to counter urban density at Dream Residences, Hanoi (photo: 1+1>2 Architects)

. The most divergent, perhaps enigmatic, of Hao's urban offerings is the Bat Trang Pottery Museum (Figure 15), a bold tectonic experiment inspired by the industry it showcases. The complexity of its form, curving simultaneously in section *and* plan, is not something for which Hao is known. Nor has he, in the past, taken on the task of fashioning an urban icon. And whereas in earlier projects, Hao might have worked alongside craftsmen and village elders in a consultative manner, the stakeholders here are specialists and client committees, which puts him in the role of auteur, as arbiter of taste and public good.

Figure 15. Bat Trang Pottery Museum (photo: 1+1>2 Architects)

Bat Trang is one of many urban projects undertaken by Hao. It is clear from this and others on the drawing board that he is actively thinking of the city, even though this has not yet produced a position on urbanism. He has, however, penned a position on architecture.

Hao's manifesto, *Architecture of Happiness*, expresses core principles that, he says, are guardrails in his work (Hao and Nguyen 2016; Hao 2021). It stipulates three responsibilities of a designer. S/he must *give*, becoming as an agent of change in societal and professional contexts; understand *how* construction is, at heart, an act of creating social space and comfort; and learn to *serve* users of a building and other stakeholders.

The egalitarianism at play here will undoubtedly resonate with Asian audiences for whom the world has bifurcated into city versus countryside, rich versus poor. As a playbook for the drawing board, however, it poses a challenge. Many architects and city planners in the region grapple with unregulated density, impatience in profit-taking and short-termism in policy that, combined, feel like a Gordian knot.

There is no doubt that Hoang Thuc Hao is, and will continue to be, one of the most significant voices on the design scene in Vietnam. What he says and does – how he bridges the rural and urban, how he elucidates happiness, how he formulates a position

on the city – will be important to his country and to the many other Asian architects who are on the same path.

Figure 16. Hoang Thuc Hao (photo Trannam 4890 via Wikpiedia Creative Commons)

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New Direction in the Culturally Inspired Urban Forms of Indonesia's New Capital City of Nusantara

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ABSTRACT—The plan to relocate Indonesia's capital to Nusantara, Penajam Paser, Kalimantan Timur is a big leap in Indonesian history. Nusantara is envisioned to represent Indonesia's identity; establish social, economic, and environmental sustainability; and create a smart, modern, and international standard city (Smart Metropolis). Situated in the equator zone, Kalimantan Island, known also as Borneo, has a rain forest ecosystem with great biodiversity. Therefore, the relocation has sparked debate on deforestation in Borneo. From the contrary perspective, the existing environment of Nusantara is seen as an opportunity for Indonesia to forge an extraordinary example of city development that brings together nature and city as one ecosystem by rooting to Indonesia's nature and cultural heritage, and by adopting advanced smart technology as enablers to create a city for the future. Nusantara is designed to respect and emulate the wisdom enshrined in the forests and culture of Indonesia. The axis principle of mountains and ocean in traditional Indonesian cosmology is used to create the city's underlying structure. The tradition of stilt houses, the concept of the veranda in tropical buildings, and the provision of arcades for street vendors have been incorporated in the design in modern forms. This article describes the strategies and concepts underlying this new capital city of Nusantara.

Introduction: Relocating the capital to Kalimantan Timur

In August 2019, Indonesia's seventh President, Joko Widodo, announced the relocation of Indonesia's capital from Jakarta in Java to East Kalimantan in Borneo. The new capital is to be located at Kutai Kertanegara and Penajam Passer Utara, which are considered to be strategic locations, with minimal risk of natural disaster, between the current main cities, Balikpapan and Samarinda (BBC News, 2019). The relocation decision was made after three years of in-depth studies by the national government in light of the burden that Jakarta carries as the center of Indonesia's governance, business, finance, trade, and services since the nation's independence (BBC News, 2019; Lyons, 2019). In early 2022, the new capital city was named as Ibu Kota Nusantara (IKN), meaning the Capital City of Nusantara. According to the plans, it will accommodate about 500,000 people by 2024 in the first development stage and about two million people by 2039 (Lechner and Sibarani, 2022). The plan has until today been developed by the government at a very fast pace.

For the area called Kawasan Inti Pusat Pemerintahan (KIPP) or Government Core Area, a design competition was held in 2019. The entry by URBAN+ and team titled "Nagara Rimba Nusa" won the competition and has now been brought forward to be implemented. Nagara Rimba Nusa translates as "State, Forest, Islands", meaning a city that is built on the wisdom of local Indonesian culture and forests, as envisioned by the President.

The plan of Nagara Rimba Nusa introduces "five transformations" for Indonesian society and culture – in nature preservation, nationalism, living, working, and mobility – as the key drivers to achieve the new vision for the capital city according to the President's direction. The "five transformations" offer new concepts of how people live, work, move/travel, preserve nature, and develop nationalism, that will create new life experiences for the Indonesian people.

Transformation in Nature Preservation. The plan proposes dynamic urban spaces with minimal disruption of nature; encourages reforestation and rehabilitation of the natural ecosystem; provides ecological corridors as a contribution to biodiversity conservation and a good regional climate; all through the creation of ecological connectivity, biodiversity enhancement, and rainwater harvesting and management.

Transformation in Nationalism. The plan celebrates Indonesian diversity, richness of culture, and treasures through the creation of spaces that represent Indonesia on the national stage as a symbol of the nation's progress and a showcase to the world.

Transformation in Living. The plan creates an inclusive smart, collaborative, compact living environment through vertical housing, instead of landed houses, as the village of the future. The vision is achieved through shared living facilities, collaborative active-space at ground level, compact living modules, one-level connectivity, and green infrastructure technology in all residential areas and units.

Transformation in Working. The plan develops an efficient and flexible collaborative work ecosystem, instead of the conventional cubical pattern, through high-performance, environmentally friendly, and integrated working spaces which blend with the natural environment.

Transformation in Mobility. The plan envisions a 10-minute City through the Green Mobility concept, where pedestrians, cyclists, and integrated public transport are given priority in order to achieve sustainability goals.

The plan is governed by nine major design values delivered through a comprehensive framework of urban design reflecting the three pillars of the Nusantara vision: Indonesia's identity; sustainability in economy, society, and environment; and a smart, modern, and international standard city. The plan is further guided by five design principles: appreciation of natural land morphology (valley and hill), green fingers connectivity, connectivity system, formation of visual axis and corridor, and land zoning. The Capital City of Nusantara is planned as a pilot project city that will lead to the innovation and development of sustainable, smart, and future-ready cities in the country.

The new capital is sited in Kalimantan which is famous for its tropical rainforest ecosystem (Figure 1). Situated in the equatorial zone of the Indonesian archipelago, Kalimantan has a rich biodiversity of flora and fauna, sensitive environments, and the finest and most extensive remaining dipterocarp forest in Southeast Asia (Hairah et al., 2017). Borneo has thousands of endemic tree species, but its soil is less fertile than in Java. Borneo is often called the lungs of Southeast Asia as it has the potential to store enormous amounts of carbon in its forests. For years, however, Borneo has suffered from rapid deforestation. The biodiversity level has been gradually degraded through excessive exploitation of the forests and their products beyond carrying capacities (Hairah et al., 2017). According to Gaveau et al. (2016), the conversion of natural forests to industrial plantations has been increasing. The concept of Nagara Rimba Nusa highlights this issue and the need to restore the environmental condition of the Nusantara site by trying to bring back the rainforest ecosystem.

Figure 1. Location of the new Capital City of Nusantara (source: National Geographic Society).

The vision for the new capital also emphasizes the importance of Indonesian culture as the foundation for building the new capital city. Indonesian architecture and urban forms have evolved over a long period with influence from many local cultures, and infiltration from foreign cultures. Indonesia's history and geography have contributed to the shapes and forms in built environments, and have brought transformations in styles and construction techniques. In the post-independence era in Indonesia, modernism and Western culture have been influential. Silver (2007) explains how economic growth and the development of jobs, transportation and services drove the explosive expansion of a handful of mega-cities in Southeast Asia, including Indonesia, over the period from 1950 to 2000, resulting in urban sprawl and environmental degradation. The diversity of Indonesia's vernacular architecture was also eroded with the shift towards new global, modern architectural morphology, which accentuates the functional aspects and pays less attention to locality, community and contextual conditions. By reflecting this background, the concept of Nagara Rimba Nusa emphasizes the need to recover the philosophical and locality aspects of Indonesian culture in the Capital City of Nusantara's built environments and architecture for the future.

This article highlights these issues by examining how the heritage of Indonesian urban forms and architecture can be incorporated, and bring a new direction into future urban developments. It first expounds the thinking behind the concept of Nagara Rimba Nusa in making the forest and Indonesian culture fundamental elements in the design. It then elaborates how these concepts were translated into a distinctive and unique design approach rooted in Indonesia's natural environment and cultural heritage, but which also looks forward to the future by adopting smart technology to enhance the city's performance. The design of the new capital presents an opportunity to build a new and distinct form of sustainable and smart city that features a high degree of local context along with urban forms for the future.

Figure 2. The view of Borneo's rainforest from Bangkirai Hill (source: Diana Zerlina, 2021)

The nature and cultural heritage of Indonesia and Borneo

Geography, climate, geology, flora, and fauna

Located in the equatorial zone, Indonesia is well known for its tropical rainforest that covers 94.1 million hectares and stores an enormous amount of carbon (World Bank, 2022). The archipelago has more than 18,000 islands, stretching about 1,760 kilometers from north to south and 5,120 kilometers from east to west (Chepkemoi, 2017). Borneo is located at the heart of the Indonesian archipelago. The Indonesian portion, called Kalimantan, has four provinces, including Kalimantan Timur, the site for the Capital City of Nusantara.

Borneo has high rainfall and a temperature in the lowlands ranging between 25°C and 35°C, which are ideal conditions for plants, resulting in the island's rich biodiversity (MacKinnon et. al 1996). Unlike Java, Borneo has no active volcanoes, but an igneous mountain chain which makes the coastal area of East Kalimantan considerably drier

than other parts of the island. Kalimantan has several regions with a distinct soil condition, altitude, topography, geology, climate and vegetation. Most of Kalimantan is an area of rolling plains dissected by hills above sedimentary and old igneous rocks. The rocks are poor in metal elements and generally less fertile than the volcanic soils in Java (MacKinnon et al., 1996; Burnham 1984). The high rainfall leaches away the soil's soluble constituents. These rolling plains require extensive land improvement for development as a built environment. This is a high consideration in the development of the Capital City of Nusantara.

Borneo's forests are of several types—mangrove, peat swamp, freshwater swamp forest, heath forest (*kerangas*), lowland dipterocarp forest, ironwood forest (*ulin*),

Figure 3. The rolling hills of the Government Core Area covered with plantations (source: Diana Zerlina, 2021)

forest on limestone and ultrabasic soils, hill dipterocarp forest and various montane formations. In the coastal areas, there is beach vegetation, sea grass beds and coral reefs (MacKinnon et al., 1996). In the forests, trees towering over twenty meters tall create a canopy frameworks that shelters many smaller trees (Figure 2).

The site of the Government Core Area (Figure 3) is in the lowland rainforest, which includes both wet swamp forests (mangrove, freshwater swamps, and peat swamp forest) and dry lowland forests. Currently much of the land is used for industrial plantations, as a result of clearance and conversion over several decades. A mapping study found that Borneo lost 30.2 percent of its forest cover over the four decades from 1973, when the conversion of land began. In Kalimantan, 30.7 percent of the forest was lost in this period, and 97 percent of the loss was in the lowland area (Gaveau et al., 2014). According to MacKinnon, Kalimantan loses more than 500,000 hectares of forest every year, causing disruption to the flora and fauna species. The conservation and revival of the forest ecosystem is thus an urgent aim of the project to build the new capital city.

The cultural heritage of Nusantara

According to Hans-Dieter Evers, the term Nusantara was taken from two Sanskrit words: "nusa" meaning island and "antara" means in-between or including. Evers cited Benhard Vlekke (1961) who argued that the original meaning of Nusantara was "the other island" or "the outside world" as seen from Java or Bali, and became applied to mean the whole archipelago (Evers, 2016). In the anti-colonial struggle, the term Nusantara was used by Indonesia's first president, Soekarno, to mean "Greater Indonesia" (Indonesia Raya).
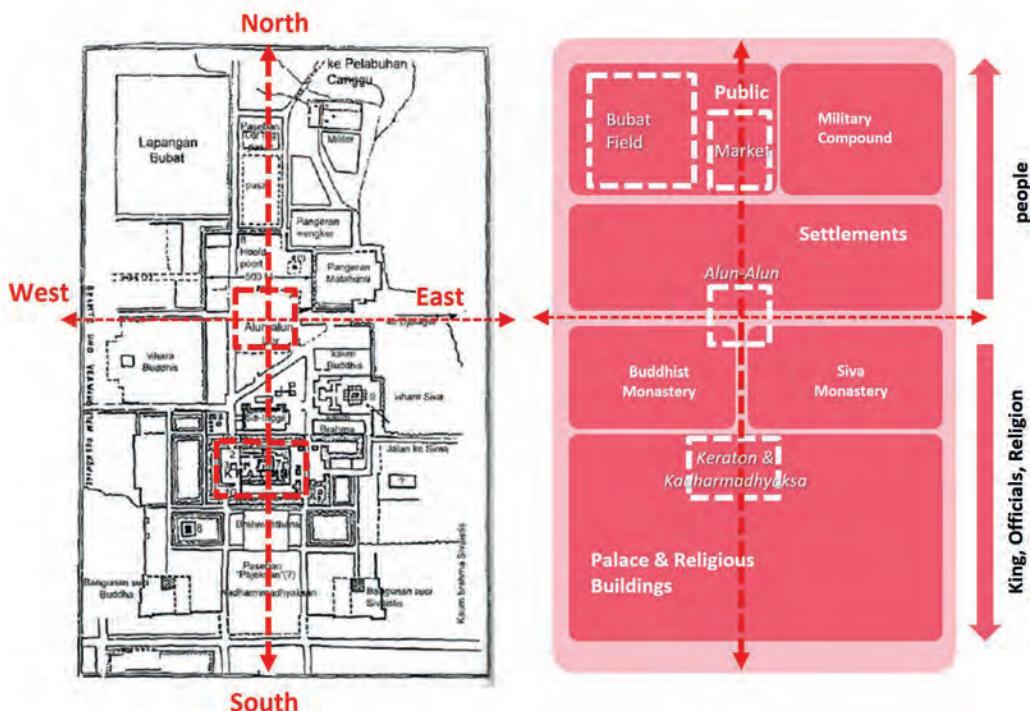
Figure 4. Cosmological principles and settlements in the cosmopolitan 13th-century city of Majapahit (source: Mitu M. Prie, 2021)

As an archipelago, Indonesia has a rich diversity of cultures, united in the concept of Nusantara representing the shared history, identity, cultural values, imageries and symbols. Mitu M. Prie explains that in the macro level of the Nusantara cosmology, there is a main axis or "high/above place", which is the residence of the Creator and the spirits of nature and the ancestors who protect humans and the universe (Prie 2014). At the micro level, humans occupy the middle realm and pay respect to the Creator and the ancestors who are responsible for maintaining and preserving nature and other creatures.

This cosmology has travelled from pre-history to modern times with its own dynamics and features in each period. It is represented in many aspects of life, including the spatial structure of a city and its architecture. The character and identity of modern Indonesia has evolved from the Nusantara civilization (*pucuk-pucuk peradaban*). The local wisdom and local genius of the archipelago have become the central values and foundations of the nation and the state (Prie, 2014).

The authentic culture of the archipelago has become Nusantara's distinctive values in the world. The descendants of Nusantara's original ethnic population have survived through the generations and have preserved the architecture, cosmology, residential technology, and customary arrangements of their ancestors. This inheritance still shapes the use of space and the form of buildings amidst intense socio-cultural changes (Prie, 2014). In the original Nusantara, the pattern of settlement reflected a balance between the macro and micro levels of the cosmology. The macro level was expressed in the overall layout, the head, body, and legs of a space or a building, while the micro level was expressed through the initiative, creativity, and work of the human population.

The culture of living has shaped the settlement pattern, which in turn has shaped the built environment or urban pattern. However, the protection, maintenance, management, and utilization of the natural environment have remained major considerations in shaping the cities in the archipelago because of the human dependence on the natural surroundings and the customary order (Prie, 2014). Meanwhile, the working culture has evolved under the impact of economic and political changes, especially trade, and the development of urban-based bureaucratic states from the 13th century CE onwards.

Until circa 500 BCE, the population was scattered in ethnic groups resident in villages. Over the next thousand years, interactions between these groups intensified and eventually evolved into cities with acculturation, assimilation, and diffusion from outside. The old cosmology from the ancestors regulated the traditional village order and the spatial location of the traditional elders and families (Prie 2014). The traces of this cosmology survive in the urbanized society of the present. Indonesian cities are planned along an axis with a community space in the strategic position at the center, which used to be called *Alun-Alun* (Figure 4). This term conveys both the idea of a focus of socio-cultural interaction and the balance between the macro and micro cosmos. This Nusantara Cosmology was adopted as the foundation for the design of the Government Core Area in Indonesia's new capital city.

Reflection upon Indonesian urbanism and architectural heritage

Indonesian cities and urban forms

Cultural identity and settlements in Indonesia evolved under the influence of cosmology and the dynamic trajectory of urban development. Inherited culture played a great role. At the beginning, the urban layout and building orientation followed a linear settlement pattern, shaped by river channels, coastlines, and certain areas in the hinterlands. The Nusantara cosmology evolved through different eras with different influences to become a unique and important identity in the repertoire of today's cities in the Indonesian archipelago.

The early peoples depended on nature to survive. They wandered from place to place; lived in the forest, caves, mountains, river valleys, fields, and forest. Later, the emergence of kingship and cities introduced a new harmony between human life and the natural surroundings, as represented on the Lalitavistara relief panels in Borobudur Temple built in the 8th century CE. Around sixty-three species of plants are depicted on

the relief panels, attesting to the awareness of biodiversity at that time (Metusala et al., 2020). The images indicate the deep connection between humans and environment as the plants provided food and drink, were used as trading commodities, served as aesthetic decorations, and gave off fragrance that helped to establish a peaceful atmosphere for deep meditation (Metusala et al., 2020). The concern to maintain the balance of nature, space, and buildings was evident in traditional Nusantara.

In modern times, cities in Indonesia are spaces of socio-cultural interaction between citizens from multicultural backgrounds including the Nusantara people along with foreign settlers from India, China, Portugal, the Netherlands, and other European countries who significantly enriched the diversity of the Indonesian national culture. These intense and complex interactions took place in the economy, technology, art, and religious activities. Under globalization, cities are driven by industrialization and capital, but retain the culture of community engagement down through the generations.

Nas (1989) described changes in urban society as a process of redefining the meaning of the urban through functions such as habitation, work, and recreation. Acculturation and assimilation contributed to Nusantara's heterogeneous and multicultural character. Those multicultural patterns varied across regions in spatial, architectural, and social aspects. The spirit of community and collaboration was defined as a root concept of the development of the Government Core Area.

Nature-inspired design and vernacular architecture

Local wisdom and tradition have been passed down by most Indonesian communities. The respect, protection, care, utilization, and supervision of nature have a long history. Traditional communities preserved the local wisdom on the environmental, cosmological, and customary order. Local wisdom reflected the people's views of life, knowledge, understanding, and habits within the local communities in responding to life's various problems, especially in their relations with one another and with nature.

Over recent centuries, cities around the world have expanded on a more-or-less common pattern with little variation according to the specific culture and context. The relocation of Indonesia's capital city is an unique opportunity to create a better model for a future city with greater respect for Mother Nature and for local culture and tradition. Unlike the current Indonesia capital of Jakarta, the site of the Capital City of Nusantara lies amid Borneo's dense tropical forest, rolling hills and valleys, and rich ecosystem. In the development of the new capital we aim to retain the elements of Borneo's environment within a new urban context.

The design of the Government Core Area is envisioned to return to the ancient principles of human settlements, where Mother Nature played an important role as the foundation of the universe. Indonesian vernacular architecture has always drawn inspiration from the natural surroundings and been respectful towards it. The architecture of the traditional Indonesian house resulted from a community's response to its environment and creative adaptations to suit the climatic conditions (Yeang, 1987).

The tropical architectural heritage of Nusantara is found in forms such as veranda, porch, balcony, ventilation, courtyard, and high ceiling. Traditional Indonesian houses

were built on stilts or pilotis to suit the natural surroundings (Figure 5). The structure allowed water to flow at ground level, made space for vegetation and wildlife to flourish, and minimized the building's footprint. This form of construction is also proven to be more resilient during disasters, such as earthquake and flooding. For instance, most of the structures that survived an earthquake of 6.5 on the Richter scale in Padang in 2009 were old stilt houses.

Figure 5. Indonesian traditional houses built on stilts (source: Indonesia Tourist Forum, 2014; Portal Informasi Indonesia. 2019; Beranda, 2023; Kikimunai, 2020)

Those principles of tropical and vernacular architecture are applied in the design development of the Government Core Area, although the process required inventive adaptations for contemporary use and construction. For instance, the stilt structure is planned for constructions on the Government Core Area site where it provides a solution to the rolling nature of the terrain. The concept of the veranda is being translated into porous or permeable building façades which allow for open vertical interior spaces, reduce the discomfort of the tropical climate, and give protection from the rain and sun. Learnings from vernacular architecture can be translated into advanced technology.

Regionalism and Nusantara architecture

Cities in Indonesia as elsewhere in Asia have tended to be homogenized under the influence of Western models. Ken Yeang (1987) argues that most cities in Asia have lost the indigenous and unique characteristics that made them Asian in the first place. Yeang emphasizes the importance of regionalist design that respects the specific regional context.

Western influence on architecture has combined with the pressures for economic

growth in a developing country. Indonesia and other developing countries are keen to compete on the international stage and to build cities that win global recognition. The same homogenized skyscrapers appear everywhere because of the neglect of regional context and identity. Regional designs have been gradually eroded.

In contrast to globalism that prioritizes universal values, regionalism prioritizes the characteristics and cultures of a specific geographical area (Tzonis and Lefaivre, 2021). Ken Yeang contended that: "Regionalist architecture seeks to incorporate in its design the spirit of the place in which it is located", including the deeper sensibilities and tangible realities of the place (Yeang 1987). A place has distinct physical, social, economic, and political characteristics as well as cultural and architectural heritage and natural history. Regionalist architecture emerges through adaptation to these characteristics and conditions of the place.

In tropical countries, there are three common attributes that shape the architecture (Tzonis and Lefaivre, 2021). The hot and humid climate is the first condition that impacts on people's productivity and mobility, and indirectly influences the architecture. The second attribute is the common historical and political condition of ex-colonial countries, which are influenced by Western models in many aspects of life. The third attribute is the architectural heritage inherited from the colonial period, which serves as a precedent for building types and urban patterns. These three attributes shape the regionalist tropical built environment. In Indonesia, this regionalist architecture is commonly called Nusantara architecture, but there are many interpretations of what this means.

Abidin Kusno (2020) positioned Nusantara architecture in five different ways within a historical timeline. In the first, Nussantara architecture is positioned as foreign or peripheral architecture when viewed from the imperial center of Majapahit, as described by Vlekke. In the second, Nusantara architecture is positioned as "Indonesian architecture" in the context of the decolonized nation-state after Independence. In the third, Nusantara architecture is positioned as the architecture of a maritime culture in the context of the surrounding oceans. The stilt house belongs to this position. In the fourth, Nusantara architecture is positioned as crossroads architecture, subject to the influence of external cultural interactions. In the fifth, Nusantara architecture is positioned as a space of resistance and defense that can equal Western architecture. In this last position, Nusantara architecture has the capacity to marry traditional or vernacular objects with contemporary materials in order to emulate other architectures. However, Kusno admits that urbanism has a significant influence in the construction of Nusantara architecture.

Nusantara architecture is widely accepted among Indonesian architects as the direction to represent Indonesian identity. However, the details of the means to represent Indonesian identity are the subject of debate. Across the geographical range from Sabang to Merauke, there are various cultural and natural backgrounds. Indonesian or Nusantara architecture cannot be identified by a single culture or characteristic. As noted by Yeang, climate, environment and culture shape the regionalist architecture. Architectural design must be adapted to function and context. Nusantara architecture must not only acknowledge the traditional or vernacular architecture of each region, but also encompass the aesthetic structure, construction technology, tectonics, styles,

philosophic meanings, customs, and traditions of the interaction between humans and the built environment. This perspective on Nusantara architecture is incorporated in the development of the Capital City of Nusantara.

Urban design approaches and strategies at the Capital City of Nusantara

As directed by President Jokowi from the very beginning, the development of the new capital of Nusantara must embrace and represents the identity of Indonesia. The design of the Government Core Area emphasizes the spirit of Nusantara. The concept of Nagara Rimba Nusa guided several aspects of the design process. In accordance with Vlekke (1961), the meaning of Nusantara as the Indonesian archipelago is implemented as a polycentric city in the new capital (Figure 6). There are several compact activity centers, each with a distinct main function, that are analogous to islands linked to one another through green corridors of existing nature that resemble the ocean. The macro and micro cosmology of Nusantara is implemented through an axis or backbone that represents the relation between the Creator, humanity, and nature. In addition, biophilic and biomimicry designs in all the building developments reflect the concept of Nusantara architecture and its respect for existing nature. The new capital is also conceived as a green and sustainable city which respects the valuable forest ecology of the site.

Figure 6. The Government Core Area as a polycentric city, inspired by the Indonesian archipelago (source: Urbanplus, 2021)

Land forming process

Yeang (1987) argues that considerations of climate, environment, and culture can be synthesized in a regionalist approach to architectural design. The design of the Government Core Area embraces the spirit of regionalist architecture and urbanism by highlighting the importance of nature as the foundation. The city structure was developed through elevation modeling and analyses to exploit the topographical values of the site (Figure 7). The road network was laid out following the contours of the land. The usage of land was differentiated by elevation. The valleys and riparian area were designated as landscape features. Hills and slopes were analyzed to preserve hilly areas as protected

KIPP's Land Forming Process
1. Elevation modelling & analysis
2. Dynamic road networks placement following land contour
3. Valley and riparian area identification
4. Potential preserved landscape and riparian area
5. Hill and slope identification
6. Potential preserved hilly area for landmarks and protected forests
7. Development area identification
8. 10-minutes city concept iterations

Figure 7. Land forming process at the Government Core Area site (source: Urbanplus, 2021)

forests and city landmarks. The built area was planned only after the placement of these natural elements of the overall design. In order to create a compact and livable city, the concept of the 10-minute City was adopted into a polycentric city scheme.

The axis cosmology

As noted earlier, in the traditional cosmology of Nusantara (Indonesia), the Creator and ancestors, who occupy the highest level of the cosmos, determine all primary and secondary aspects of human life and nature (Figure 8). This cosmology is reflected in the layout of Indonesian towns and cities and was adopted for the structure of the Government Core Area. The backbone is a Nationalism Axis (Sumbu Kebangsaan) reflecting the macro level of the traditional cosmology.

The Nationalism Axis is planned to stretch about three kilometers from the hilly area through the lowland mangrove zone towards the ocean at Balikpapan Bay (Figure 9). The hilly area represents the abode of the Creator and the ancestors; the urban center represents the abode of humans and the mangrove zone represents nature. The overall structure mimics the balance between the Creator,
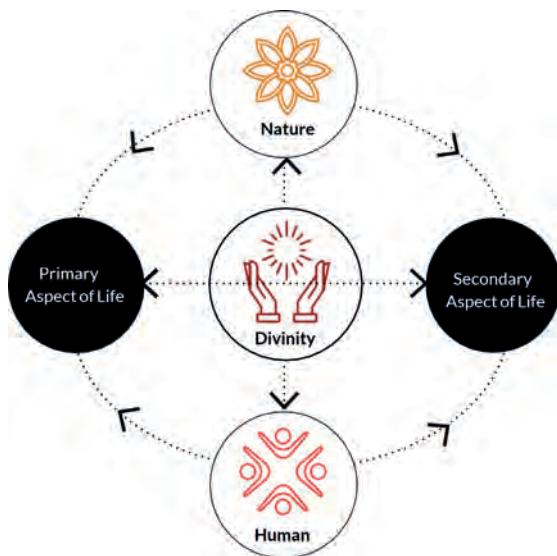
Figure 8. The cosmological principle of Indonesian cities' urban space (source: Mitu M.Prie, Urbanplus, 2021)
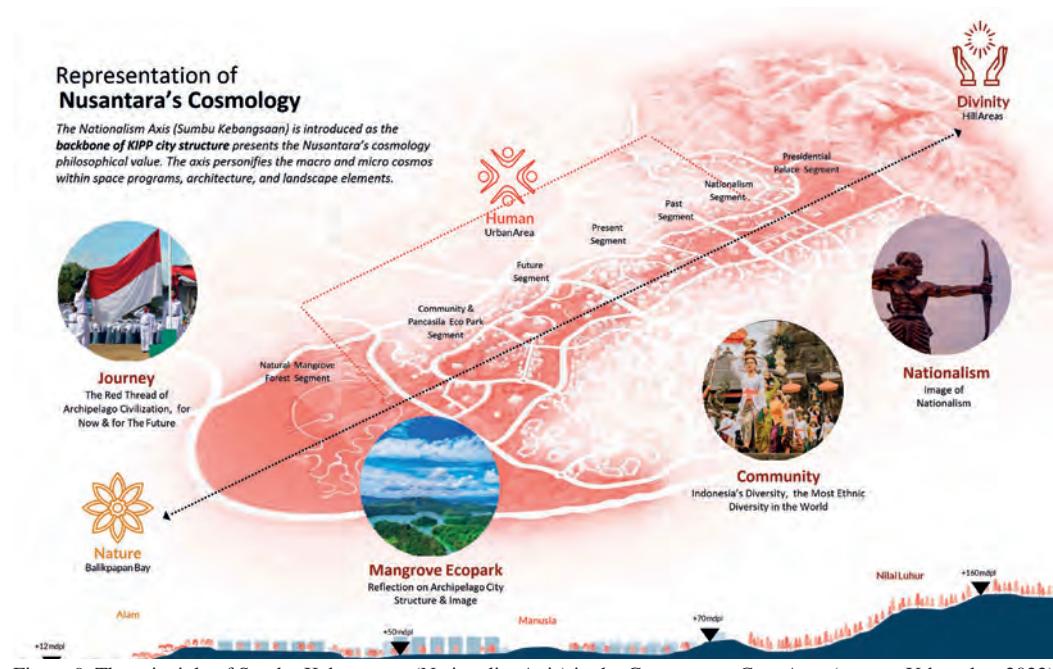
Figure 9. The principle of Sumbu Kebangsaan (Nationality Axis) in the Government Core Area (source: Urbanplus, 2022)

humanity, and nature, while the details of each segment along the Nationalism Axis tell stories about Indonesia.

Indonesian history and culture is showcased in the spaces and local elements along the landscape of the Nationalism Axis in five segments running from the Presidential Palace in the north to the Mangrove Ecopark in the south. Each segment has a theme taken from the story of the Indonesian nation, past, present, future. Each thematic zone has plazas with focal points and facilities to serve as the main public spaces in the Government Core Area.

Plaza Seremoni (Ceremonial Plaza) is a multifunction court for various formal and informal activities. The story of the Indonesian past is told through Plaza Sipil (Civilization Plaza), Bukit Bendera (Flag Hill), the museum of Beranda Nusantara and a display of the landscapes of the Indonesian ecoregion (Figures 10, 11). The story of the present is told through Plaza Bhinneka (Diversity Plaza), a series of three plazas framed by the cultural pillars of the government precinct. The ground zero of the new Capital City of Nusantara is located at this Diversity Plaza. The story of the future is told through a Science and Tech Park. Further south towards the Mangrove Ecopark, the story of Indonesian community and culture, along with the spirit of democracy, is told through Plaza Adi Budaya (Cultural Plaza) and Plaza Demokrasi (Democracy Plaza). The stories represented along the Nationalism Axis portray the macro and micro aspects of the Nusantara cosmology through space, architecture, and landscape elements.

Biophilic and biomimicry approaches

The architecture of the new Capital City of Nusantara's built environment is designed to be harmonious with the existing forest ecosystem. Biophilic and biomimicry approaches are the means to fulfill this vision.

Figures 10, 11. (above) Plaza Seremoni, (below) Plaza Sipil (source: Urbanplus, 2022)

The theory of biophilia recognizes that humanity has an "innate tendency to focus on life and lifelike processes" (E. O. Wilson), namely, a preference for adaptive responses to nature over pure human creations (Kellert and Calabrese, 2015). Biophilic approaches in architecture thus focus on human associations with nature. Biomimicry is the emulation of the models, systems, and elements of nature for the purpose of solving complex human problems through technology and engineering in a sustainable way (Ghisleni, 2020).

Biophilic design in architecture seeks to create a good habitat that contributes to human health and wellbeing through reconnecting people with nature. Kellert and Calabrese (2015) divide the approach into three ways of experiencing nature: direct experience, indirect experience, and the experience of space and place. Direct experience refers to direct contact with nature such as natural light, air, or landscape. Indirect

experience refers to the representation of nature through images, artworks, natural materials, and ornamentation inspired by natural shapes and form. The experience of space and place refers to spatial features characteristic of the natural environment, such as mobility, wayfinding, and transitional spaces.

Biomimicry design is also concerned with functional solutions (Pawlyn, 2016). The biomimicry approach seeks to understand how the natural ecosystem works and to preserve it by incorporating its principles into the built construction, rather than just using nature as inspiration for aesthetic aspects of design. Biomimicry accepts that nature has already provided the best adaptation to any set of conditions and seeks to render that adaptation through technology. The biomimicry approach is employed in today's architecture to address issues of climate change, waste, and sustainability.

The design of the Government Core Area was developed to harmonize with the existing condition of the site and the original landscape of Borneo's forest as the ecological model. The biomimicry approach is used to explore the principles and elements of the rainforest ecosystem and to incorporate them into an urban context. The rainforest provides clues on ways to establish connections between different elements of structures, to handle issues of light and shade like a rainforest canopy, to have permeable surfaces which harness nutrients like a rainforest floor, and to have sturdy and efficient constructions analogous with the buttress roots of the taller rainforest trees. All these clues were translated into the built environment in the Government Core Area. The designs allow sunlight to penetrate into internal building courts; create ways for air to ventilate the spaces within urban blocks and buildings; and allowing water and wind to move at ground level by elevating parts of the ground floor with stilts or pilotis structures. In this way, the design preserves most of the original land and creates minimal impact on the soil condition.

In accordance with the biophilic concept of reconnecting humanity with nature, the design of the Government Core Area is based on the natural conditions of land, forest, and rivers. The built environment works with the natural topography by embracing the existing contours instead of fighting against them (Figure 12). The buildings are organized to blend with the landscape, with many open spaces and green corridors between the multiple centers. Community and collective spaces at ground level serve
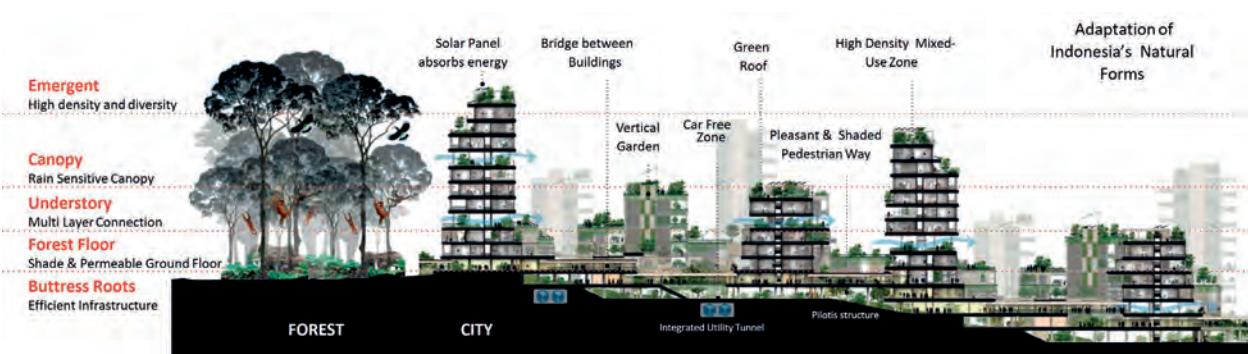

Figure 12. Biomimicry approach at the Government Core Area (source: Urbanplus, 2020)

as transitional space between buildings and nature. Stilts or pilotis are used in as many buildings as possible. The design follows the strategies of local Indonesian architecture, where humans respect Mother Nature and live harmoniously with other living organisms.

Figure 13. The Government Core Area as a compact city model (source: Urbanplus, 2022)

The Compact City and mixed developments

The existing land condition at the Government Core Area site presented challenges for the development of an urban environment, which is most easily achieved on flat ground. However, the undulating topography made the existing environment "rich" with features that allow designers to "play" with nature as a foundation and apply analytical thinking to elaborate an urban environment in a different way. The forest is seen as a background that coexists with the built environment. All the urban design strategies are conceived within this vision.

The city is designed to be compact and provide a mix of functions. Following New Urbanism theory, the Government Core Area is developed with a focus on the human. The design is based on a series of walkable urban blocks, where domiciles and activity centers are in close proximity, pedestrians and non-motorized vehicles have priority, and there are accessible public spaces. These urban blocks are connected through public transport interchange hubs. The 3D principles of Density, Diversity, and Design are adopted to establish an urban environment that contributes positively to the communities' health, livelihood, and environment.

The model of a Compact City has attracted attention around the globe as more than four billion people now live in urban areas (United Nations, 2018). The Compact City concept aims to create an efficient urban environment by creating self-sustaining communities within urban cores. According to Burton, Jenks and Williams (1996), the Compact City model is the most sustainable form of city because it offers completeness,

compactness, conservation, comfort, coordination, and collaboration within all its elements. The traditional Indonesian city followed the concept of a Compact City with all the main public buildings positioned within a confined area. As cities have grown

Figure 14. Second level pedestrian connections at the West Residential precinct of Government Core Area (source: PT. Mataram Surya Cipta, Indonesia Ministry of Public Works and Housing, 2021)

and become more complex, the Compact City model is achieved by building mixed use areas within the city center to support people's needs.

The pattern of the Government Core Area as a Compact City with mixed development allows the creation of an efficient city ecosystem which also conserves the existing natural features (Figure 13). The design of the Government Core Area has a fundamental structure of multiple urban core areas, each of which has a mix of functions. Each neighborhood core provides facilities for citizen's basic needs such as schools, clinics, retail and open spaces. Multi-layer and vertical stacking is used to concentrate the multiple functions within accessible distances, while also conforming to the existing topography and the background forest ecosystem. Mid- and high-density towers allow efficient use of the land along with flexibility for residential and commercial use, but are deployed with careful consideration of the carrying capacity of the land. Through this compact and mixed-use development, it is possible to create a sustainable and ecologically responsible city.

Pedestrian connections, amenities and main streets

The rolling nature of the site became the biggest challenge to creating an efficient system for mobility in the Government Core Area. As one of the goals of the development of the Capital City of Nusantara was to create a 10-minute City, studies were made of pedestrian walking distances. At the same time, pedestrian corridors are also conceived as spaces of community interaction. In the culture of Indonesian societies, people met

and mingled in the "main street" of compounds which served as the community space and the heart of the livelihood of Nusantara's people.

In Indonesian city planning, a distance of 350–400 meters is typically used as the benchmark for a 5-minute walk, and 750–800 meters for a 10-minute walk. However, this standard refers to a flat surface, while the rolling topography of the site of the Government Core Area has an average slope up to 20 percent, so the distance was reduced to 440 meters for a 10-minute walk and 220 meters for a 5-minute walk.
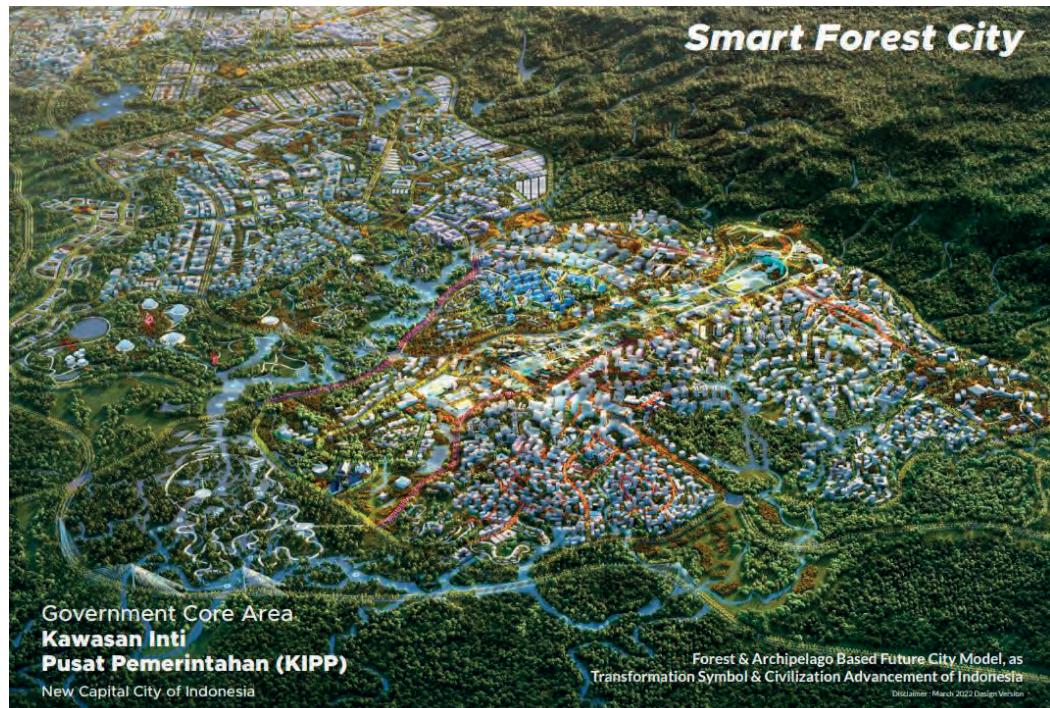
Figure 15. Overview of the plan for the Government Core area (source: Urbanplus, 2022)

To provide mobility between buildings in the core areas, reflecting "skywalk" pedestrian connections are provided at the second level, preserving the ground level in its natural form (Figure 14). The network of "skywalks" is linked to public transport nodes. This design mimics vernacular architecture's minimal footprint on the environment, while providing space for public and community engagement along this second level network.

In the traditional pattern, the main street of an Indonesian city was the site for various formal and informal interactions. These are accommodated within these layers of pedestrian corridors. The skywalks not only conserve the existing topography at ground level but also provide public amenities at the second level.

Conclusion

What do you think cities will look like in fifty to a hundred years? Will we see the same character of cities in the future? Will culture, geography, or climate have significance for the character of cities or will cities survive while ignoring them?

Rapid urbanization and the effects of climate change require critical thinking about the planning of the urban environment. Local conditions such as local wisdom, social traditions, climate, nature, landscape, and geography need to have a predominant consideration in urban design. The regionalist approach is considered essential to guiding appropriate and sustainable urban design. The cultural heritage of a place provides lessons learned in dealing with nature.

The plan for the Government Core Area in the new Capital City of Nusantara is designed to be sensitive to the natural conditions of the site and the value of Indonesia's cultural heritage. The forest ecosystem is the foundation on which the design is developed. The urban land forming process was planned to follow the existing topography and to preserve key features such as green corridors and riparian areas. The natural elements of the original landscape indirectly determine the urban structure. The concept of a Compact City allows the creation of an efficient urban environment that coexists with nature.

The Government Core Area design is respectful towards both local heritage and nature. The local traditions of Nusantara offer examples of living together with nature, promoting social life at the community level, and providing efficient, effective and livable urban spaces. Respect for nature is key to crafting a green and sustainable city. The natural landscape of Borneo's forest ecosystem is the foundation of the Government Core Area plan to explore the possibilities for developing a built environment on the site which is harmonized, agile, smart and sustainable. This respect for culture, heritage, and nature offers new possibilities for the sustainable cities of the future.

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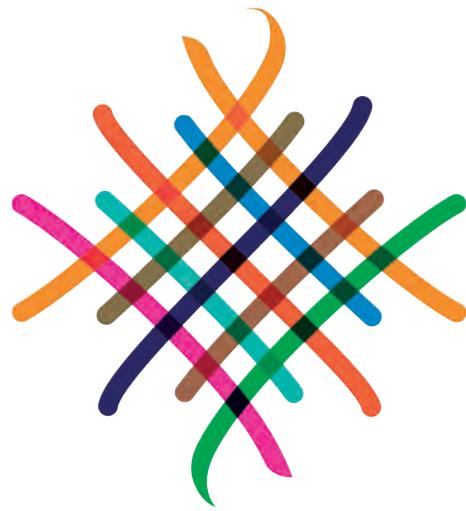
Spiritual Connections to Nature
and to Climate Change Action

Creating Safety and Beauty in the World Starting from Humans: Cultural Wisdom and Natural Disasters in Yogyakarta

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ABSTRACT—Cultural wisdom has a role in disaster management. Yogyakarta is situated in the Ring of Fire, prone to earthquake, tsunami, and eruption of nearby Mount Merapi. For centuries, people have been aware of the "bio-detectors" and "geo-detectors" that signal the approach of a disaster. However, such cultural wisdom is obscured by the rise of modern technological knowledge. The traditional Javanese cosmology positions humans as subordinate to the universe and its powerful forces. The traditional rulers of Yogyakarta strove to maintain harmony between human and human, human and nature, and between human and God. This cultural value is embodied in the ceremony of *Labuhan*, performed as a symbol of human gratitude towards God, nature, and the universe. Old manuscript accounts of fatal eruptions attribute the death toll to the failure of humans to respect their relations to God and nature. They also recount the efforts of past rulers to create harmony between the spirit of the sea, the spirit of the mountain, and the region of Yogyakarta through their own respect for nature and through management of their own attitude through meditation. By analogy, such attitude management on the part of everyone can achieve a more effective management of disasters in the present day. The watchword of Yogyakarta carried down from the past to the present is "creating safety and beauty in the world starting with humans."

Introduction

Humans and nature are interrelated. Nature has been given by God to human beings to be managed and utilized. Their care and concern for nature affects the lives of the inhabitants of the earth. Their well-being or suffering are consequences of human choices. This article is about human efforts to create harmony with nature in the Special Region of Yogyakarta, situated on the south coast of central Java (Figure 1).

Yogyakarta has the active volcano of Mount Merapi to the north and the Southern (Indian) Ocean to the south. These resources have great potential to bring prosperity to the people who live around them. The government has control over the utilization of these natural resources. If these natural resources are not well maintained or even treated carelessly, they will trigger natural disasters with very detrimental results.

Natural disasters are events that destroy livelihoods. Djati Mardiatno (2019) stated that the large scale of human casualties and property damage inflicted by disaster events in the past was more often due to the lack of awareness on the part of the government and the community and lack of understanding of the potential disaster and the means of mitigation. Yet people have known about disasters since ancient times. Our ancestors already had that knowledge and had long coexisted with the threat of floods, droughts, volcanic eruptions, earthquakes, and tsunamis. For example, people knew how to

Figure 1. The territorial borders of the Special Region of Yogyakarta (source: an attachment to Law of the Republic of Indonesia No. 13 of 2012)

observe the signs that precede a volcanic eruption, especially the "bio-detectors," such as the sound of certain birds, or the phenomenon of snakes and monkeys descending from mountains, or the "geo-detectors," such as the unusually low tides that signal an incoming tsunami (Mardiatno 2019). The relationship between nature and humans is also recorded in a number of ancient manuscripts. These manuscripts describe in detail the impacts of disasters and the cultural-based mitigation of these disasters through traditional wisdom.

Ahimsa-Putra (2009) has defined the term traditional wisdom as a set of knowledge and practices in a community that are used to solve problems and difficulties encountered. This knowledge and these practices were obtained from previous generations through oral transmission or through actions. Rahyono stated that by studying and living its own culture, a community will instill intelligence in its own members, because they are directly involved in the creation of their culture. Therefore, cultural wisdom should be regularly lived and applied in social life. The wisdom that is continuously developed and applied in life makes way for the advancement of civilization (Rahyono 2015).

Although we are aware of the positive influences of local wisdom on our daily life, the efforts to preserve such wisdom are constrained by modern beliefs and ideas which are seen as more practical and effective approaches, even though they can have unfavorable impacts on nature, because these approaches involve arbitrary or careless treatment of natural resources. For example, sand mining on the beach using heavy equipment has resulted in increased coastal abrasion and beach erosion. Such activity also damages the environment for marine life around coastal waters. Similarly, sand mining in the rivers at the foot of Mount Merapi has caused physical impacts such as landslides, reduced volumes of surface water (springs), and high traffic of trucks transporting sand that damages roads and causes air pollution. All of these have been done solely for the sake of improving the economy.

Roikhwanphut Mungmachon (2012) observed that there has been an erosion of local wisdom in Thailand because science and technology have rapidly changed the ways of life of Thai people that were earlier based on nature. She concluded that several actions undertaken solely for economic profit have destroyed natural resources because they ignored traditional wisdom and its inherent values. She proposed that the solution for recovery was to immediately revive traditional (Thai) wisdom while incorporating new ideas and manners in ways that do not supplant the traditional system of their culture (Mungmachon 2012).

At Yogyakarta, a local wisdom known as *hamemayu hayuning bawana kapurba dening manungsa*, meaning "creating the safety and beauty of the world starting with humans," has been used both as the basis for the cultural development of the region and a "shield" in the face of technological advances that come as a consequence of globalization. This piece of wisdom is contained in one of the region's official regulations (Regional Regulation No. 4 of 2011), but there are problems over how this idea should be implemented as a tool or principle for harmonization both between humans and nature and between humans and God the Creator. In this article, a hermeneutical approach is used to confront these problems. First of all, data were collected from several sources including ancient manuscripts, scientific publications, and information possessed by the

community. Second, the data was analyzed using an analogical and comparative mindset in order to understand the concept of *hamemayu hayuning bawana kapurba dening manungsa* as it is embedded in the repertoire of cultural and environmental knowledge that includes traditions and languages (Sunarto 2008).

This article discusses the efforts made by Yogyakarta's people to handle disasters, especially the eruptions of Mount Merapi, earthquakes, and tsunamis. First, some background is presented on Yogyakarta's history and cultural roots. Second, historical texts on past disasters are analyzed to show how Yogyakarta's leaders and people interpreted and reacted to these events. Third, the learnings from the past are brought to bear on disaster management in the present day.

The background of Yogyakarta

The Law of the Republic of Indonesia No. 12 of 2012 concerning the Privilege of the Special Region of Yogyakarta states that Yogyakarta holds a special administrative position in the Republic of Indonesia. The Region has a sultan as the governor, holding the title of Sultan Hamengku Buwana, and an *adipati* as the deputy governor, holding the title of Adipati Paku Alam, from generation to generation (Law on Privileges 2012). The first Adipati Paku Alam (r. 1813–1829) was the son of the first Hamengku Buwana (r. 1755–1792) with one of his concubines. The second Hamengku Buwana (r. 1792–1810, 1811–1812, and 1826-1828) was the son of the first Hamengku Buwana with his queen consort. Thus, the sultan and *adipati* are of one lineage. They are all the descendants of Panembahan Senapati, the first king of Islamic Mataram (r. 1575–1601).

The sultan and the *adipati* are responsible for maintaining and developing the culture of Yogyakarta. The culture is shaped through a long history of interaction between various cultures, Javanese, Hindu, Buddhist, Islamic, European, and contemporary cultures. Ki Hadjar Dewantara, known as the Father of Indonesian National Education, stated that culture always grows and develops along with the development of human thought, feelings, and determinations to gain prosperity and happiness in life. He proposed that culture develops by the Trikon or Three-Cons Theory of continuous, converging, and concentric developments, as follows:

> Continuity means that the cultural values of the forebears should be maintained and implemented in everyday life.
> Convergence means that space should be provided for dialogue between our culture and foreign cultures.
> Concentricity means that any new culture created should be constructive and beneficial to people's lives.

He concluded that such a culture will not be easily uprooted from its foundations (Dewantara 1994).

Argo Twikromo (2021) stated that the main framework for the management of social life, the relations between humans and other humans, and relations with nature and with God are the foundations for a harmonious life passed down from the ancestors.

This harmony rests on several intertwined components including values and policies. Yogyakarta's values follow Javanese cultural values, which aim to mobilize all resources *(golong gilig)* in an integrated fashion *(sawiji),* through dynamic persistence, hard work *(greget),* confidence to act *(sengguh),* and unwavering determination to face any risk *(ora mingkuh)* (Regulation of the Special Region of Yogyakarta Province No. 4 of 2011).

Luhuring panguningan
(most profound understanding)

spread wings

coral stone

bricks

banner, flag and war equipment
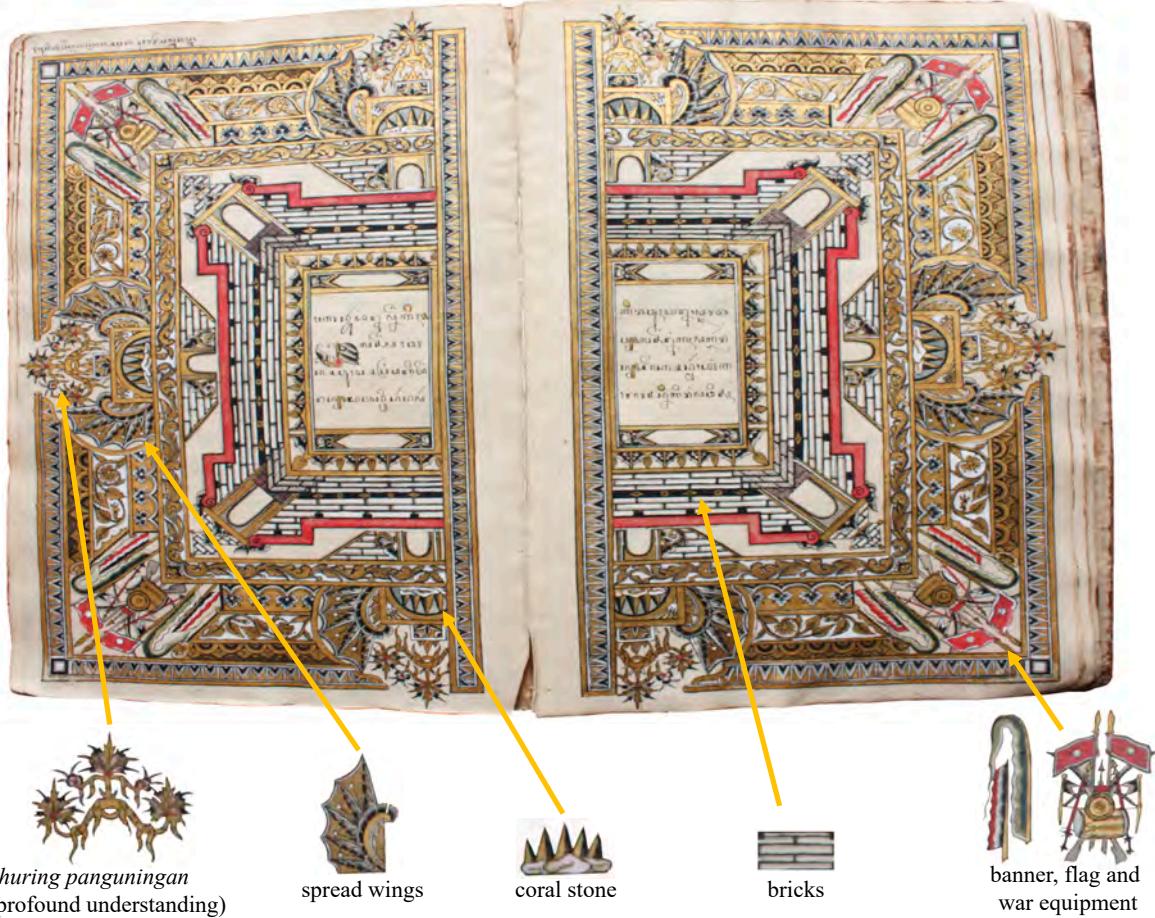
Figure 2. "Sawat Subajra Palguna Smu" (Source: Babad Matawis saha Candra Nata, Pura Pakualaman Library, Yogyakarta)

Historical accounts of interpreting and managing disasters

Old manuscripts record values and traits deemed useful for humanity. *Babad Matawis* is an ancient manuscript that tells the story of Panembahan Senapati from his early days until he gained glory as the first king of Islamic Mataram. The story was recomposed around 1830 based on an 1815 manuscript. The 788-page text was written in Javanese script and language, accompanied by beautiful illuminations. Each picture contains a message whose meaning can be understood after reading the text.

Sawat Subajra Palguna Smu

The following illustration, one of fourteen, contains a summary of Panembahan Senapati's story full of moral messages for leaders and their people, including ways to

build harmony with nature (Figure 2). The sultan and people of Yogyakarta uphold these teachings to this day.

The illustration is entitled *Sawat Subajra Palguna Smu* meaning "With his wings spread wide, Palguna bears a resemblance to a shining gem." The illustration summarizes the life journey of Panembahan Senapati, the shared ancestor of all the sultans in Yogyakarta and Surakarta, through the following details:

- The bricks surrounding the text in the inner frame represent the first settlement of the Mataram land after which a brick fence was built around the palace area.
- The flags, banners, and war equipment in each corner of the background represent the efforts by Panembahan Senapati and his troops to expand their territory through warfare.
- The coral stone in the main frame represents the intervention of Kanjeng Ratu Kidul (the Queen of the Southern Ocean) to help achieve Panembahan Senapati's goals.
- The *Luhuring Panguningan* ("most profound understanding) at the center of the left and right portions of the outer frame represents the accumulation of teaching received by Panembahan Senapati from his advisors.
- The spread wings that surround the coral stone and *Luhuring Panguningan* symbolize Panembahan Senapati's success in improving the region and enhancing his people's prosperity as the result of hard work, the unity between the people and their leaders, and, particularly, God's permission.

In summary, the illustration can be interpreted as follows. Panembahan Senapati is analogous to Palguna or Arjuna in his youth. Palguna, who is diligent in meditating and actively practicing archery, becomes a smart, humble, and wise knight whose glory is famed. Sutawijaya, the son of a farmer, succeeds in becoming the king of Mataram and is later named Panembahan Senapati (Saktimulya 2016).

The Labuhan ceremony

Senapati's accomplishment was partly due to the support of Kanjeng Ratu Kidul, the Queen of the Southern Ocean. The text relates that the two loved each other and that Kanjeng Ratu Kidul promised to help him maintain the safety of the Mataram Kingdom for generations. The meeting at which they promised to care for each other and to strive for harmony between creatures is believed by the people of Yogyakarta to be the origin of the *Labuhan*, a ceremony where people present offerings in certain hallowed sites to prevent bad luck. The Kingdom of Mataram was divided into two parts, the Surakarta Sunanate and the Yogyakarta Sultanate, through the Giyanti agreement in 1755, yet the *Labuhan* tradition is still to this day carried out at least once a year by Sultan Hamengku Buwana, Adipati Paku Alam, and their Surakarta counterparts Sunan Paku Buwana and Adipati Mangkunegara.

The main purpose of the *Labuhan* ceremony is to ask for protection from God and the supernatural spirits that reign over the Southern Sea, Mount Merapi, Mount

Figure 3. Equipment for the *Labuhan* ceremony (source: Pura Pakualaman, Yogyakarta)

Lawu, and several other places. Through spiritual protection from various directions, the kingdom aims to create a balance in its relations with God, human beings, and nature (including that of other realms). This is part of the sultan's essential role of *mangku buwana,* meaning "to put the world on one's lap" or to "hold the world" as the ruler

of Yogyakarta or Surakarta. Because the legitimacy of the two *adipati* is constrained with their respective kingdoms, they conduct the *Labuhan* ceremony at Glagah Beach, Yogyakarta, and Mount Lawu in Central Java respectively.

The ceremony is an expression of gratitude, sincerity, cooperation, and love for one another. Humans should be grateful for God's abundant favors to them through the creation of this world, and should realize that they are also God's creations. Humans must be able to protect nature by not mistreating it or taking it for granted. Humans must also be willing to relinquish everything if God takes it away since it was entrusted to them by God. This is symbolized by various offerings made at the ceremony including vegetables and a mountain of sweet potatoes and rice (see Figure 3). Several clothing items favored by Kanjeng Ratu Kidul and belonging to the sultan or *adipati* are sent away on the sea as a symbolic act of gratitude. The values contained within the *Labuhan* ceremony are embedded in the hearts of Yogyakarta's people and regarded as a guiding code of conduct, reminding them to always be grateful and sincere in handling every situation.
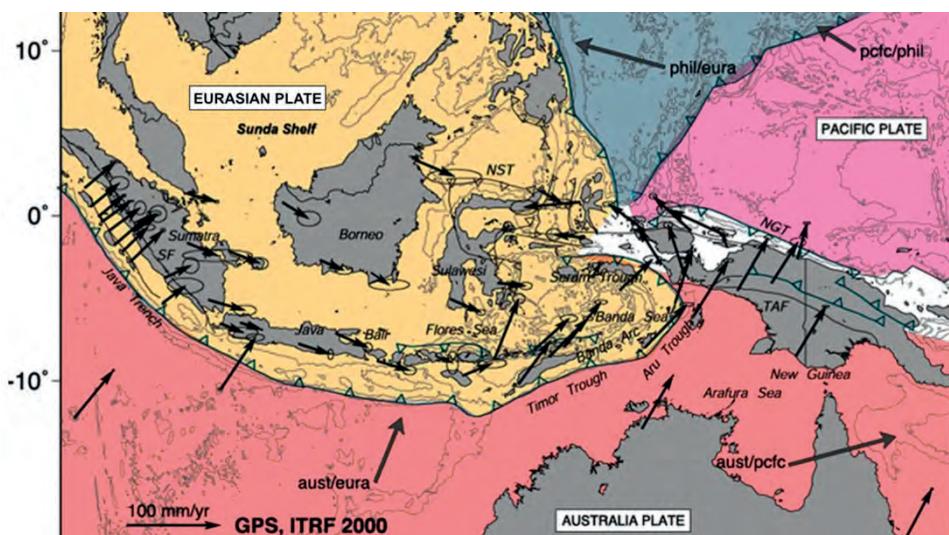
Figure 4. Indonesia and the three continental plates (Source: www.bmkg.go.id)

Earthquakes, tsunamis, and eruptions of Mount Merapi

For hundreds of years, Indonesia has experienced frequent earthquakes and tsunamis. A 6.3-magnitude earthquake struck Yogyakarta at around 05:53 on 27 May 2006. Since the epicenter was on land, the death toll was 4,659 persons (www.katadata.co.id). Indonesia is located in the Pacific "Ring of Fire" above three continental plates, the Indo-Australian, Eurasian, and Pacific (see Figure 4). The land is fertile because of the nutrient content of volcanic ash, abundance of springs, and numerous geothermal energy sources, but is prone to volcanic eruptions, earthquakes, and tsunamis.

The old manuscript of *Babad Pakualaman* states that on 10 June 1867, a terrible earthquake hit Yogyakarta. It lasted for about two minutes. The ground swayed as if being swung, and trembled as if it was about to be lifted. The earth and sky seemed to be

collapsing. The roar at the top of Mount Merapi was horrendous. High waves crashed on the coastline, sweeping water and fish on to the land. People did not have enough time to save themselves. Most of the estimated 1,000 victims were Chinese. According to the *Babad Pakualaman*, the terrible earthquake occurred because, among other factors, many people had become slack in their worship of God.

Figure 5. The eruption of Mount Merapi in November 2010 (source: above, Volcano Discovery; below, Bay Ismoyo/AFP/ GettyImages)

An account of another eruption of Mount Merapi appears in the *Babad Ngayogyakarta: Hamengku Buwana IV dumugi V*. On the afternoon of Friday 27 December 1822, Yogyakarta was struck by a sequence of strong earthquakes that kept coming and going until midnight. Mount Merapi emitted incandescent lava and the sky became bright. Fire

emanated from the mountain top. Rocks spewed from the belly of the mountain. The shocks, the molten lava, and the hurling stones from Mount Merapi destroyed several Dutch buildings and plantations on the slopes of the mountain. According to the *Babad Ngayogyakarta*, this disaster occurred because God heard the prayers of people who were oppressed by the arbitrariness of palace officials. Common people had to bear the impact of the higher-ups' decisions to rent land to private entrepreneurs for plantations of coffee and indigo. The people were so devastated that they could only scream asking God for justice.

The dates of the eruptions in the manuscripts accord with archival sources. The causes of the disaster are recorded only in literary works. The authors of the accounts stated that the disasters occurred because humans forgot to worship God (*Babad Pakualaman*) or because God heard the cry of the common people who were oppressed by the arbitrariness of palace officials (*Babad Ngayogya*). Both manuscripts were written by a palace clerk who lived decades after the natural disasters occurred.

Lucas Sasongko Triyoga (2010) studied the responses to the Merapi eruption in October-November 2010 by interviewing local people. The eruption was one of the largest in the history of Merapi as recorded by the National Disaster Management Agency. Merapi spewed materials from the bowels of the earth and blew a pyroclastic storm (*wedhus gembel*) toward Yogyakarta. Residences, livestock, and plantations were scorched by the storm. The government reacted immediately. People were evacuated, and later relocated to an area that was safe from the dangers of Merapi. Many refused to be relocated as they believed that living far from the slope of Merapi would not necessarily guarantee their safety and welfare. They were more confident and happier to live with Eyang Merapi (*eyang* is usually used to address a grandparent), a nickname for Mount Merapi. For centuries and generations, they had been able to adapt to living with the highly dangerous volcano. They believed that Mount Merapi was guarded by spirits, namely Eyang Rama, Eyang Permadi, Kyai Sapu Jagad, Nyai Gadhung Melati, Kyai Krincing Wesi, Kyai Petruk, and others. These guardians often informed the residents of Yogyakarta if something was about to happen to Merapi through messages in dreams or supernatural sightings (Triyoga 2010).

Triyoga (2010) further explained that such beliefs about Merapi are not superstition or religious belief but rather a system of knowledge and values that enables people to adapt to the natural environment of Merapi. All of Merapi's activities are closely related to the supernatural realm. This belief system generates awareness among the locals that supernatural forces exist in this universe, and that people can live and interact with them.

Cultural wisdom and Babad Matawis

The accounts written in manuscripts 200 years ago tell of two powerful and interconnected kingdoms of spirits located in the Southern Sea and Mount Merapi respectively. The *Babad Matawis* (1815) explains the relations between these kingdoms and Yogyakarta as follows.

In 1587, Sutawijaya was crowned as Kanjeng Panembahan Senapati. After the coronation, he meditated and received a message to meet Kanjeng Ratu Kidul, the Queen of the Southern Ocean. Following the direction of his advisor, Ki Juru Martani,

Panembahan Senapati went to Kanjeng Ratu Kidul, while Ki Juru Martani left for Mount Merapi. Their purpose was to establish an agreement between the rulers of the Southern Sea, the palace of Mataram, and Mount Merapi to guard each other continuously in order to create mutual peace and prosperity. Panembahan Senapati's meeting with Kanjeng Ratu Kidul is visualized in the manuscript in an illustration entitled *Dhatuning Samodra,* "Queen of the Ocean" (Figure 6), and interpreted as follows.
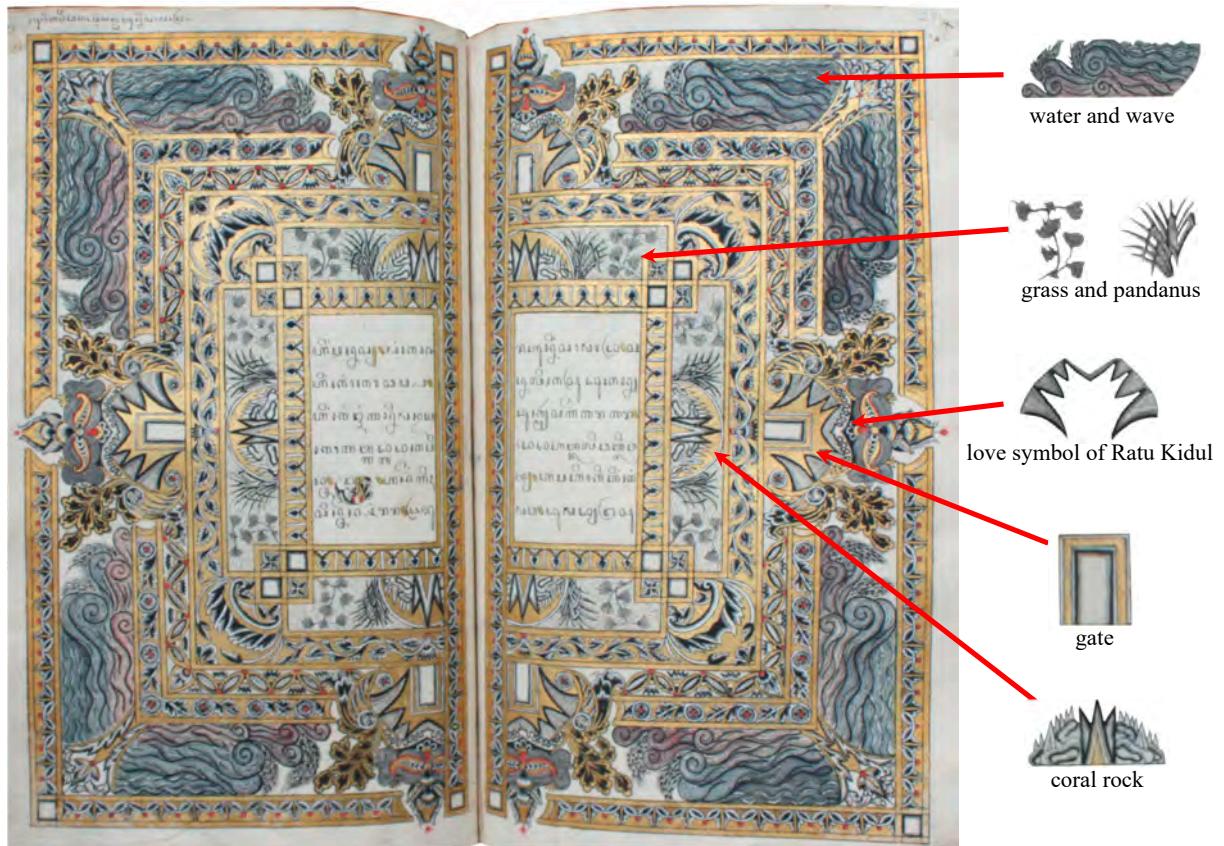
Figure 6. "Dhatuning Samodra" (Source: Babad Matawis saha Candra Nata, Pura Pakualaman Library, Yogyakarta)

Through his humility and his desire to draw closer to God, Panembahan Senapati journeyed to meet Kanjeng Ratu Kidul at the Southern Sea Palace. The Queen promised to help him when needed. Kanjeng Ratu Kidul's help and contribution in protecting the land of Mataram expressed her devotion to the noble Panembahan Senapati (Saktimulya 2016). This relationship is depicted in the illustration through the images of sand, grass and pandanus, coral rock, water and wave, gate, and the love symbol of Ratu Kidul.

The illustration shows that the sultan and *adipati* of Yogyakarta believe that they must show to Kanjeng Ratu Kidul, the spirit of the Southern Sea, and to Eyang Merapi, the spirit of the mountain, that they themselves respect God's creations and are able to maintain self-control. Otherwise, greed will emerge and drive people to exploit natural resources without considering the negative impact on the survival and livelihood of

later generations. If the inhabitants keep denying their responsibility and offer various excuses, such as ignorance, the earth will be ruined. Hence the proposition *hamemayu hayuningbawana kapurba dening manungsa,* which means "creating safety and beauty in the world starting from humans," is adopted by Yogyakarta as a guiding principle.

Rahyono (2015) stated that the cosmology of the Javanese is structured through the concept of *jagad gedhe* (big universe or macrocosm), meaning the physical world and its powers, and *jagad cilik* (little universe or microcosm), meaning humans. Thus, humans are dependent on the world and must cultivate a spiritual relationship with the *jagad gedhe*. This cosmology shows that the Javanese believe that both humans and the physical world or nature are God's creations and that both are part of a single structure. Humans must develop a communication network between humans and the universe that possesses supernatural powers. Javanese culture identifies humans and the universe as having a commonality, that is the world of life with different roles (Rahyono 2015).

The Javanese conduct various rituals to attain the safety and beauty of the world through the practices of remembering and being aware. To remember means to understand one's position as a creation of God so that one will try to carry out God's commands and avoid God's prohibitions. If a man remembers God, he will not act arbitrarily. The manuscripts, *Babad Ngayogyakarta* and *Babad Pakualaman*, record that when humans forget to worship God and act irresponsibly, God will warn them through natural disasters. Therefore, humans must always be aware of the turmoil of various desires that grow from within the human heart (small universe) so as not to disturb the peace of the world (big universe). Rahyono (2015) states that greed and arrogance will not be able to defeat the power and to take control of the nature that provides sustenance to humans. Arrogance can make the atmosphere of life uncomfortable and ruin the system of human life.

Cultural wisdom and disaster management today

What else can humans do to be in harmony with nature? In his writing on "Caring for Memory: Natural Disasters and Local Wisdom in the Island of Java," Djati Mardiatno stated that disaster management can be divided into several phases:

1. pre-disaster: mitigation and preparedness;
2. the immediate response: seeking shelter, evacuating, and responding to emergencies;
3. post-disaster: recovery through rehabilitation and reconstruction (Figure 7).

Those instructions bring positive results such as material assistance from the government, relocation, and counselling to recover from their trauma. However, these are inadequate. Many victims prefer to return to their old homes which are clearly prone to disaster. Government responses to natural disasters must raise the community's awareness through the cultural wisdom *hamemayu hayuning bawana kapurba dening*

manungsa (creating safety and beauty in the world starting with humans) by taking into account the locus of control of both microcosm and macrocosm.
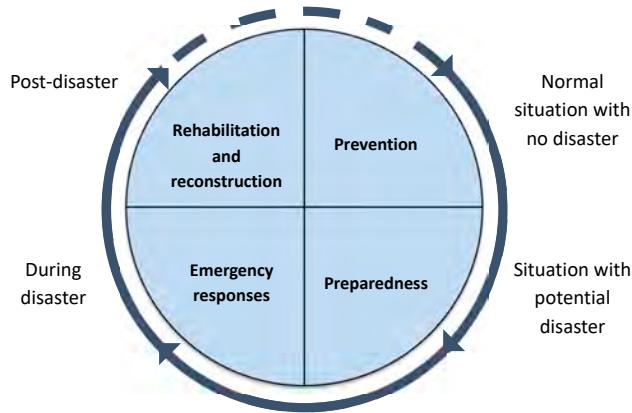
Figure 7. The cycle of disaster management (source: Guide to Contingency Planning for Disaster Management, BPNB 2017)

Mudji Sutrisno (2020) argues that respecting culture is a means to create a comfortable space for human life and development within the freedoms granted by God. Under this approach, disaster management takes a different form, as shown in Figure 8.
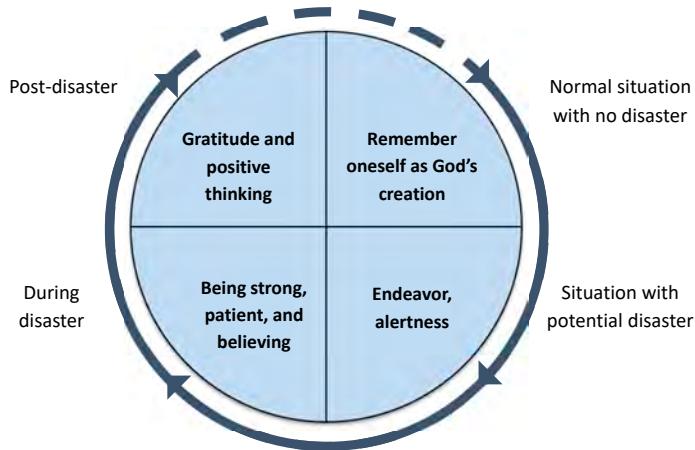
Figure 8. Disaster mitigation through attitude management (Source: Guide to Contingency Planning for Disaster Management (BPNB 2017)

This attitude management needs to be practiced by people every day. Humans should remember that they are creatures of God, and must be persistent, be alert, be strong, be patient, believe in God's love, be always grateful and think positively. According to the *Candra Nata* text, which records the character and attitude of Javanese rulers, such attitude management was exercised by Panembahan Senapati and passed down to his descendants along with all his people.

Since his youth, Panembahan Senapati was known for his fondness of mediation. He liked to go to places away from the crowd, such as *Gilang Lipura* near the Southern Coast, and meditate there from midnight until dawn. He thus drew closer to the Creator. He praised God and asked for protection, both physical and spiritual. Panembahan Senapati's perseverance in practicing meditation is recorded in numerous Javanese manuscripts, making him a paragon to be followed by later generations. Nowadays, songs describing his virtue are still broadcast on various mass media in various regions of Java. Even though it is difficult (but far from impossible) to follow his method of attitude management through regular meditation today, the values inherent in this practice remain relevant to the present time and must be allowed to take other forms appropriate to the spirit of our age.

Conclusion

Old manuscripts describe the enormity of natural disasters, their causes, and their mitigation. *Babad Ngayogyakarta* and *Babad Pakualaman* attribute these disasters to human neglect of God the Creator, acts of arbitrariness, and human greed. These texts never attribute these disasters to external factors such as changes in the Earth's orbit.

The authors of these old manuscripts and the past rulers of Yogyakarta used cultural approaches to maintain harmony between humans and other humans, humans and nature, as well as humans and God. The value system of *hamemayu hayuning bawana kapurba dening manungsa* (creating safety and beauty in the world starting with humans) is designed to make people responsible and adaptive because humans must live in harmony with nature, not as its rulers but as its caretakers.

Public awareness of protecting the environment can be nurtured through attitude management — by remembering oneself as a creature of God, being alert, being strong, being patient, believing in God's love, being grateful always, and thinking positively. This will bring peace, both in our hearts and on our earth. If practiced sustainably, the values will also increase people's awareness of climate change and guide their attitude to tackling the problem, starting from the simplest things around them.

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Animist Cosmology and Socio-cultural Practices among the Thái in Vietnam: Beyond Superstition

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ABSTRACT—This article examines the main features of the animist cosmology of the Thái, an ethnic group of wet-rice cultivators in valleys in northwestern Vietnam and explores how this ontological stance influences their current socio-cultural practices. The Thái, like many other ethnic groups in Southeast Asia, conceive their surrounding as populated by a variety of spirits, including the spirits of mountains and forests (*phii puu, phii paa*), ancestors (*đăm pang*), the spirit of the house (*phii hươn*), the spirit of rice (*khoăn khảu*), and the spirit of the rice terrace (*khoăn naa*). All spirits are thought of as having person-like features or personhood with full capacity of will, intention and agency. The relation between human being and these person-like sprits is divided but intersubjective. Unlike the classical understanding of animism, however, the spirits in the Thái cosmos, including ancestors and natural spirits, are not equal but are ranked along a hierarchical scale of power and agency. Although Thái animist practices were previously considered as "superstitious" and "backward', this animist ontology continues to shape socio-cultural practices among the Thái, and is now considered part of heritage.

Introduction

In a home interview during my fieldwork on ecological cosmology of the Thái in the spring of 2022, Ms Thay, a Thái herbalist and shaman, told me about the myriad of rituals that she had to perform before going into the forest to forage for medicinal herbs for her clients. Before leaving the house, she first had to offer incense at the shrine of the Medicine Deity (*pán sớ pú Chạu háng da*), a relatively big shrine that she built in the front yard of her stilt house, in order to get the permission and guidance of the Medicine Deity (*pủ cháu háng da)* to find the herbs easily (Figure 1). When stepping into the forest, she had to pray to the Forest Deity (*chạu pả*) for permission to enter. Finally, once she found the needed plants, she had to put a small set of offerings, usually consisting of an areca nut and some betel leaves, underneath it and hold the branch down so it touched the offerings, while praying to the plant to allow her to take the medicines to heal the villagers' illnesses. Another principle is that she can only take the exact amount that she asks for. She explained: "If you do not perform these rituals correctly, the herbs will never work. Many people don't know and just cut off the plants from the forest to sell in the market. But those herbs will surely be ineffective," Taking in excess of the necessary amount will make a family member of the healer suffer from the same disease

as the patient seeking treatment. The husband of Ms Thay added that if the incense offering was not done to ask for permission from *pủ hang máy* in advance, it would be extremely difficult to find the needed herbs. He recounted that he once went to the forest to get herbs for his wife but forgot to offer the incense to *Pú háng da* and hence was unsuccessful. He said: "I had to phone my wife and told her to do the ritual. Strange enough, I found the herbs afterwards."

Figure 1. Altar dedicated to the Medicine Deity *(pủ cháu háng da)* of Mrs. Thay (photo by Hoàng Cầm 2022)

The rituals described by Ms Thay and her husband are one materialization of the animist cosmology of the Thái in Vietnam. Although many of the rituals connected to the cosmology of the Thái as well as other ethnic minorities in Vietnam were banned for a long time for being "superstitious" (Endes 2002; Salemink 1997; Hoàng Cầm and Phạm Quỳnh Phương, 2015), animist cosmology continues to govern many economic and socio-cultural practices of ethnic minorities. During my fieldwork, I found that Thái communities in Sơn La, Yên Bái and Thanh Hoá provinces have also revitalized many communal ceremonies that embody their animist cosmology, such as ceremonies for the well-being of the village or province, and requests for rain in Mộc Châu, worshipping Nguok ceremony in Yên Bái and the Po Then Luang worship ceremony in Thanh Hoá.

Animism is a global cultural phenomenon that has long existed in human history. In scholarship, this concept was first used by Edward Tylor in his work *Primitive Culture* (1871). In this classic book, Tylor built a method to interpret this global phenomenon. He claimed that "primitive" peoples believed in the existence of spirits, drawing

from their dreams. Spirits not only exist in humans, but also in all natural phenomena including animals and plants. However, as a cultural evolutionist, he argued that this belief in spirit was erroneous and ignorant. Tylor believed that the faith in spirits and religions would be supplanted by scientific rationality. Modern anthropologists rejected the analytical validity of animism for a long time due to the evolutionist interpretation that viewed animist societies as backward, "primitive", and naïve. However, over the past three decades, animism and its practices have become an attractive subject in the fields of anthropology and environmental science. As Guido Sprenger (2021: 4) noted, this resurgence of interest in animism "is not because of new discoveries about 'animist peoples,' but rather because modernity is currently in crisis."

In these new studies, animism is no longer seen as a primordial form of religion rooted in indigenous peoples' lack of knowledge about natural laws, as Tylor argued. Rather, recent ethnographic studies in various regions in the world, including Latin America, Africa, and Southeast Asia (Descola 1996, 2013; Ingold 2000; Bird-David 1999, Viveiros de Castro 1992, 1998; Århem and Sprenger 2016; Harvey 2013), treat animism as a type of ontology, a mode of perceiving the world, and "an holistic (and systematic) understanding of the intimate relationship between humans and their surroundings" (Århem 2016). In the animist ontology discussed in these new studies, personhood and relationality, or intimacy, are two key concepts. Harvey uses the term animism "to refer to ways of living that assume that the world is a community of living persons, all deserving respect, and therefore to ways of inculcating good relations between persons of different species" (Harvey 2013: 5).

Although all animist societies have in common the recognition of beyond-human personhood and inter-species relationship, Kaj Århem (2016) pointed out, based on his case study in Southeast Asia, that unlike the horizontal cosmos of ontological equals (standard or immanent animism) popular among hunting communities in Latin America, the cosmological prototype in Southeast Asia, especially in rice-growing and livestock-raising communities, is hierarchical animism. An outstanding feature of the Southeast Asian hierarchical animism is the "proliferation of spirits – nature spirits, ancestors, and ghosts of all kinds – and the universe of spirits tends to be hierarchically ordered with the Supreme Beings – a transcendent subject – at the apex" (Århem 2016: 19). Compared to standard animism, the Southeast Asian hierarchical animism is more comprehensive, consisting of "also living physical beings and things, including humans, inserted between spirits of the Upper World and the Beings of Below (the Dead, ghosts and spirits of wild animals and plants" (19). In this cosmology, the hierarchical order is articulated in animal sacrifice rituals, and "in contrast to the symmetric intersubjectivity of human-animal relations in venatic animism, ontological intersubjectivity in the sacrificial animism of indigenous Southeast Asia is fundamentally asymmetric and centered on human-spirit relations" (19).

In this article I examine the main features of the Thái animist cosmology, with special focus on the roles that this animist cosmological stance plays in their current socio-cultural practices related to natural resources management. Field data shows that the Thái, like other Southeast Asia rice-cultivating communities, conceive their surroundings as populated by a variety of spirits. All spirits are thought of as having person-like features,

or "personhood," with full capacity of will, intention, and agency. The relation between human beings and these person-like sprits is divided but intersubjective. The spirits in the Thái cosmos are not equal but are ranked along a hierarchical scale in terms of power and agency. Like other animist communities in Southeast Asia, the shaman (*mo một*) plays a critical role in connecting humans and other-than-human persons via rituals, sacrifices, and other magical practices. Although Thái animist practices were previously considered "superstitious" and "backward', animist ontology continues to exert significant influence on socio-cultural practices among the Thái, especially since the state relaxed its opposition to superstition following a shift in the perception of cultural heritage after the 1986 Reform (*Đổi Mới*).

Contextualizing the Thái's animist landscapes

The Thái, one of fifty-four state-classified ethnic groups in Vietnam, have a population of nearly two million and are the third largest ethnic group after the Kinh (Việt majority) and the Tày. Thái people call themselves Tay. Ethnically, they are distantly related to the Thai of Thailand and the Dai in Sipsongpanna of Yunnan, China, and their ancestors have always lived in the territory that is Vietnam today. They are known generally as the Tai in Western literature and designated as "Thái" in Vietnam. They live mainly in the large valleys in the northwestern region, including Hoà Bình, Sơn La, Lai Châu, Điện Biên provinces, and in the western part of Thanh Hoá and Nghệ An provinces.

Prior to the Việt Minh victory over the French at Điện Biên Phủ in 1954, the Thái were organized into autonomous *muang*,[1] the highest socio-political organization, functioning as independent polities.[2] After the French established their colonial administrative system in northwestern Vietnam in the late 19th century, efforts were made by both Black and White Thái to unite all Thái principalities in the northwestern region into a political federation commonly known as "Sip Song Chau Thái" (Twelve Thái Principalities).[3] According to Schrock et al. (1972: 43), however,

> no historical evidence has indicated any strongly centralized political organization among the Black Tai [and White Tai and Red Tai] above the level of *muang*. The

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[1] *Muang* was the traditional political unit or principality of the Thái. The French came to Thái areas and began establishing colonial administration in the area in 1895. However, because of the French "divide and rule" strategy, the *muang* of the Thái remained autonomous polities under the management of the Thái ruler until the early 1950s. After the independence of Vietnam in 1954, the *muang* administrative system was abolished and the valley and its habitants have been integrated into the Vietnam nation-state ever since. See more on *Muang* in Condominas (1990); Cầm Trọng (1978)).

[2] The French occupied Vietnam in 1858 and first went to the Thái areas – now in Hòa Bình, Sơn La and Lai Châu provinces – in 1883. However, Thái regions did not come under French rule until 1895, when Deo Van Tri (a Thái lord in Lai Chau province) surrendered to the French.

[3] The twelve Thái principalities were Muang Lay (Lai Châu), Muang So (Phong Thổ), Muang Chian (Quỳnh Nhai), Muang Than (Than Uyên), Muang Thaeng (Điện Biên Phủ), Muang Muay (Thuận Châu), Muang La (Sơn La), Muang Mụa (Mai Sơn), Muang Lo (Nghĩa Lộ), Muang Wat (Yên Châu), Muang Sang (Mộc Châu), and Muang Tấc (Phù Yên). After independence in 1954, the new government established the Thái-Mèo Autonomous Zone, encompassing these twelve *muang*. This Autonomous Zone existed until 1976.

strong position of the hereditary rulers within the *muang* has usually constituted a formidable obstacle to the formation of an effective central political organization among the Black Tai. The Sip Song Chau Tai appears to have existed as only a ritualistic entity that various influential Thái rulers of the region have attempted to use as a basis for establishing more coherent and comprehensive forms of rule.

All traditional *muang* socio-political systems of the Thái ceased to be autonomous polities in 1952, following the introduction of a new administrative system by the Việt Minh. The Thái have been integrated into the Vietnamese nation-state ever since. Over the course of more than seventy years since integration, however, local people in the northwestern valleys have continued certain socio-cultural and religious practices associated with the *muang* polity.

The Thái are wet-rice cultivators who also rely on forest foraging. Under the *muang* polity, both natural resources and human labor were under the management of the Thái *phiia*, the hereditary *muang* ruler. The *phiia* established the boundaries with neighboring *muang* along mountains, rivers and trees, and their positions were orally transmitted from one generation to the next (Cầm Trọng and Hà Hữu Ưng 1973; Cầm Trọng 1978; Sikor 2004). Outsiders were strictly prohibited from using resources within the territory of the *muang*. They had to ask for permission of the *phiia* to use the community forest territories or rice fields or to gather forestry products, or else they were regarded as thieves. They had to return the stolen products to the *phiia*, pay a fine, usually in cash, and in some cases perform a ceremony to ask for the forgiveness of the *muang*'s soil spirit. The land and all natural resources within the *muang* boundary were considered common property and were available for all members of the *muang* to use.

Each family was allotted a certain part of the *muang*'s rice fields for cultivating for a certain period of time depending on the family's labor strength and conditional upon fulfilling some collective activities and obligations, such as preparing and contributing offerings for communal rituals or serving as soldiers of the principality during wartime. Each family also had rights to cultivate new land and had exclusive use of newly cleared land for three or five years, after which it was merged with the community land and could be allotted to other members by the *phiia*. The ruling *phiia* obtained the most fertile rice fields for his family, and had the customary right to distribute portions of the communal rice fields to families under his control. However, the *phiia* could not privatize any portion of land or other natural resources within the *muang* boundary, and could not sell land to anyone in the principality or give it to non-*muang* citizens to cultivate (Cầm Trọng and Hà Hữu Ưng 1973; Condominas 1990; Hoàng Cầm and Sikor 2019).

In contrast to wet-rice paddy fields, where all the land was used for cultivation, the upland areas were utilized only partially for cultivation or other economic purposes. At least until quite recently, local people kept some forest areas as ritual grounds to be used only for religious and cultural practices for the whole community. Such forest areas could be either *dong sua muang* or *dong sua ban* (forests inhabited by the spirit in charge of the *muang*, or village soul) located in each village or in very dense primary forests on the main watershed (*dong kam*). Customary rules regulated the access of both

locals and outsiders to the forest (Hoàng Cầm 1999, 2011). Those who violated the customary rules had to seek forgiveness from the forest spirit with an animal sacrifice. Fear of supernatural forces in the forest discouraged people from over-harvesting forest products. In Muang Tấc valley, one of the four biggest valleys of the northwestern region, there was very little exploitation of the sacred forests before the late 1980s. Some older Thái in Muang Tấc told me that they went to the forest to get bark (for betel chewing) and rattan, but they never dared go deep into the forest. They had to go in groups, as the forest at that time was very dense and they were afraid of being "caught by forest spirits". Because of their protection by customary rules of the *muang*, many sacred forests remained green until they came under the management of local state authorities.

In the past two decades, as the socio-economic life of highland communities was integrated into the market economy, Thái communities gradually adjusted their livelihoods to adapt to the new social and economic conditions. Instead of producing and foraging mainly for household needs, people now sell vegetables, bamboo shoots, yam roots, and fruits collected from forests in local markets. Gardens and hillside fields that were previously used for subsistence agriculture are now used to cultivate cash crops. Many farmers apply technology and machines to agricultural production. Despite these drastic changes, animist rituals and traditional agricultural practices remain popular.

Living with spirits (*phii*), souls (*khuan*) and gods *(then)*

Until recently, the Thái in Vietnam, unlike a number of Tai groups in Southeast Asia, mainly followed an animist cosmology. In the manner of other animisms (see more in Hoàng Cầm 2023), their surroundings are populated by a variety of spirits (*phii*), souls (*khuan*) and gods (*then*). The spirits include natural spirits such as the spirits of mountains and forests (*phii puu, phii paa*), of the earth (*chạu* đin), of the village (*phii baan)*, of the *muang* (*chau sưa*), of herbal medicine (*chạu daa*), of ancestors (*phii* đăm *pang*) and of the house (*phii hươn*). Living beings, including animals and plants, all have souls, such as souls of humans (*khuan cân*), of rice (*khuan khạu*), of wet-rice terraces (*khuan naa*), and of buffaloes (*khuan khoai*). There are also the deities or gods, including Po Then Luang (the great father god) and his subordinate deities.

All these spirits, souls, and deities are thought of as having human-like features or personhood, with the capacity of will, intention and agency. Unlike the "standard" animism, however, in the Thái cosmos, as in many other Southeast Asia animist communities (Århem 2016), the spirits, including ancestors, deities, souls and natural spirits are neither equal nor egalitarian. They are ranked within a hierarchy of power and agency. This "vertical classificatory system" partly corresponds to hierarchical levels of the universe in the Thái cosmology, including *muang then* (celestial *muang*), the highest *muang*, reserved for gods and deities, and *muang piêng* (human *muang*), the lower tier, reserved for humans and non-human actors, including plants, animals and other natural spirits (Hoàng Cầm 2023).

In *muang then*, the Great Father God, Po Then Luang, is considered the supreme god with the power to preside over all other souls, spirits, deities and beings in the

universe. These gods have features of personhood. Po Then Luang has ten assistant *then*, each in charge of a distinct duty. In addition, there are other lower-ranked deities under their supervision in *muang then*, such as *da mom* ladies (in charge of molding humans), moon and star fairies, *kẹ* court officers, attendants on the *then*, *một* spirits, and soldiers of Thái shamanesses. An area in *muang then* called *Đằm đoi ngói phá* (the end of the universe) is the dwelling place of human family lines after death. As in the living world, the life of the ancestors in *muang then* also involves regular activities of labor and production. The spirits of the dead in *Đằm đoi ngoi phá* also plow with buffaloes, wear clothes made of cotton, use blankets and mattresses, eat sticky rice from steamers and collect wood from the forests and grass from the hills to build houses. According to a funeral chant of the Thái in Muang Tắc, although this world and the dwelling place of the Then is separate, they are closely interconnected (Hoàng Cầm 2019). The spirits of the dead in *Đằm đoi ngoi phá* often come to the *then* palaces to drink wine and watch dance performances. The descriptions in the funeral chant show this relationship is more hierarchical than equal. Although the spirits are allowed to drink wine and watch dance performances at the *then* palaces, they have to follow certain rules set by the *then*.

The lower-ranked *muang piếng* is where humans reside. The "populations" of this world also include supernatural beings, such as spirits of the earth (*chau* đin), spirits of the forest (*phii paa*), spirits of rivers and streams (*phii naam*), and so on. According to a Thái shaman in Mộc Châu, among these spirits, "*chau đin* is the most powerful one because, like the Po Then Luang in the celesterial world, *chau đin* could preside over all other spirits in Muang Piêng". *Muang piêng* is also the dwelling of other non-human living entities, including plants, animals (both domestic and wild) and their souls. Like many other ethnic groups in Southeast Asia and unlike hunting-gathering Amerindians (Sprenger 2016), supernatural spirits in Thai cosmology have more agency and power than plants and animals, especially domestic ones. In *muang piêng*, spirits exert an impact on the well-being and prosperity of humans as well as animals and plants. Humans also use certain animals and plants, such as buffalo, goat, and chicken, as sacrificial offerings in their exchanges with spirits. In ritual chants and folk tales, plant deities, especially those of rice and corn, the two crops that have the most intimate relationships with humans, are usually described as sensitive, vulnerable maidens. In the worship ritual for the rice souls, family members have to prepare mirrors and combs so the rice souls can put on their make-up. The ritual chants also have to be very gentle to avoid scaring the rice soul away. Buffalo spirits know how to communicate with humans via shamans, but they are unable to make a strong impact on human life like natural spirits. Animal and plant souls can also be harmed by natural spirits. They also demand to be treated appropriately by humans during production processes if humans want to have their cooperation. A human has to ask for permission from medicinal plants before taking them home, and has to use a pair of pincers instead of a sickle so the rice souls will not be hurt and fly away.

Despite living in the same *muang*, the dwelling spaces of humans and natural spirits are completely separate. Each type of spirit dwells in a different area. In the Thái community in Moc Chau District where I did my fieldwork in 2021, the *muang* spirit (*chạu muang*) resides in a forest called *tu sựa muang*. This forest is situated at

the heart of Muang Sang (the local Thái name of Mộc Châu district). Before the era of the state's anti-superstition policy (during the High Socialism era that lasted from 1954 to 1986), local people in the *muang* used to gather here at the beginning of the year to organize a ceremony with buffaloes as a sacrificial offering, under the guidance of the *muang* leader (*phiia*) and the *muang* shaman (*moo muang*), to worship the spirits and beseech them to give the community good health and prosperity. Other Thai *muangs*, such as Muang Mun (Mai Châu District in Hoà Bình Province) and Muang Tấc (Phù Yên District in Sơn La Province), also have sacred forests (đông *tu sựa*), and every year they hold similar offering ceremonies to their *chạu sựa* to ask for his protection (Hoàng Cầm 1999, 2011; Cầm Trọng 1978).

These sacred areas are usually upstream forests with many ancient trees, and the dwelling places of forest spirits. In Muang Tấc (Phù Yên district, Sơn La province), this sacred forest, considered the dwelling place of forest spirits (*phii paá*), is the entire mountain area called Khau Li. This forest is at the headwaters of the Tấc stream, which provides water for the daily life and irrigation of the whole valley of Muang Tấc. Spirits of rivers and streams (*phii nặm* or *phii nguak*) often reside in the upstream areas of rivers, streams, and springs. As these spirits are considered full of power and agency, their dwelling place is extremely sacred. Before the war against French colonialism in 1954, the Khau Li forest area was considered a sacred source of water for all ethnic groups of Muang Tấc Valley under the management of the *phiia*. Customary rules regulated both locals' and outsiders' access to the forest. Those who violated customary rules had to make an animal sacrifice to seek forgiveness from the forest spirit. Fear of supernatural forces in the forest kept people from over-harvesting forest products. The customary laws of Thái *muangs* also prohibited all forms of encroachment on the đông *tu sửa* (sacred forest) areas. Disturbing the spirits in these zones will result in the souls of the humans or the family's cattle and poultry being captured in the night. Until recently, Thái elders advised their descendants to avoid approaching, much less encroaching on, the spirits' territories, such as deep forests, forbidden waters, or river-heads.

Despite geographical separation, the two *muang* are in a state of constant influence on each other. The human world is managed and governed by the *then* world of Po Then Luang and his subordinates. The gods can descend to the human world to punish the descendants of the deceased whose spirits violate celestial rules. The belief that there is such an intimate connection between *muang pieng* and *muang then* is reflected in ritual songs, folktales and daily spiritual practices in Thái communities. In the Thai's worldview, the *then* reside both in their own world and in *muang pieng*. In Như Hoa district of Thanh Hoá Province, Thái communities built dwelling places for the *then*, called *Hướn xớ then* (Figure 2). These are situated on a sacred mountain known locally by the Thái name Pú Póm (Hoàng Cầm 2023). Lady Xỉ Đa, who is Po Then Luang's daughter, is said to have been sent by her father to the earth to teach Thái people sericulture, cotton production, weaving, and agriculture to ensure their livelihood. Another important god worshiped in the temple is Chief Lo Ý, the ancestor of Thái people in the area, who is believed to help the Thái people of the Như Hoa region to build their *baan* (village) and *muang*. The locals built this temple in the style of a traditional stilt house using locally

Figure 2. *Hướn Xớ Then* of the Thái in Thanh Hóa (photo by Hoàng Cầm 2022)

available materials, such as wood, bamboo, and leaves. The temple has three sections (*họng*), and the inner space is divided into nine small areas corresponding to the nine principalities of the area. Before 1954, every year in the lunar month of June, people of these nine *muang* organized a buffalo offering ceremony to pray to the gods for good weather for their crop, health for the villagers, and growth for the cattle. This most important ceremony in the Thái ritual system lasted for three days, and was conducted by the *muang* shaman (*mo*) from the Lường family and chaired by the *muang* ruler (*phiaa muang*). Besides the buffalo, the offerings also included chickens, pigs, and other local products. Each *muang* prepared their own offering tray to be placed at an assigned place in the main hall.

Right after the Việt Minh took over the Northwest in 1954, the *muang* socio-political system of the Thái was abolished, and many of its associated rituals, including the buffalo offering ceremony, were no longer maintained. Under the "new person, new culture" (*con người mới, văn hoá mới*) policy that served the socialist state-building agenda between the 1950s and late 1980s, animist practices and rituals were deemed superstitious and thus prohibited. As a result, Thái communities in Như Hoa and elsewhere were not allowed to practice their animist rituals. Despite the official ban, some local Thái communities refused to renounce their traditional faith. In Như Hoa in the late 1950s, they held a ceremony to send Po Then Luang and other worshiped deities to the celestial world since they were not allowed to repair the temple dedicated to their Po Then Luang. However, the ritual practice was not abandoned, but delegated to the

Figure 3: (above) A female Thái Một holding a ritual to reward her "supporters" (*phii một*) (photo by Hoàng Cầm, Mộc Châu, March 2023); (below) a Thái Một at the "*xên xú khuan*" (photo by Hoàng Cầm, Yên Châu, July 2022).

hereditary shamanic Lường family. Every year, instead of the entire community offering buffaloes, the family of the shaman held a small ritual on behalf of the villagers to pray for good luck for the entire *muang*. This tradition was maintained until the temple was rebuilt by the local government of Như Hoa District in 2016. Similarly, in Mộc Châu,

the ceremony of praying for rain was banned during the High Socialism era (1950s to 1980s), yet, according to Ms. Thay, "every year, my mother still quietly prepared the offerings by herself to pray for rain for the whole village".

Among all Thái communities, both before and today, shamans (*mo một*), both male and female, play the critical role of mediating the communication between human and other-than-human persons including animal souls, natural spirits and deities.[4] Through acts of magic, including chants and performances, *mo một* pray for the protection of the deities (*then*) and spirits (*phi*) so that the communities can enjoy good health, good weather, and successful crops. They use rituals and sacrificial offerings to ask for forgiveness from the deities in case humans breach a taboo. They also communicate with, persuade, and in many cases, scare away, human and non-human souls, so that they return to their appropriate bodies and restore their well-being (Figure 3).

In short, unlike the naturalist cosmologies characteristic of modernism, Thái people, as other animist communities, ascribe person-like features to their surrounding entities. These entities are not passive objects as construed in naturalist cosmologies, but have agency and intentionality like humans. Animist cosmologies are thus holistic in the ways they allow humans and non-other human persons to be interwoven and integrated.

Heritagization and the animist cosmological turn

During the era of High Socialism from the 1950s to late 1980s, although communal animist rituals were no longer held, individual practices and village-scale practices continued to be observed, such as asking for the permission of the medicine and forest deities to obtain medicinal herbs. Since the 1986 Reform that marked the state's shift towards a more open attitude regarding spiritual and religious practices, Thái communities have revived most of the ceremonies dedicated to the important deities in their animist pantheon. To achieve the goal of preserving "beautiful customs" and "worthy tradition" set forth by Resolution no.5 of the Party Central Committee in 1988, hundreds of cultural and religious practices, which had been damned as "superstitious", "backwards" and "irrational", have been repositioned as heritage that need to be rehabilitated and promoted (Hoàng Cầm 2023; Endres 2002; Salemink 2016). Against this backdrop, a number of Thái animist rituals and ceremonies, especially those that relate to natural resources, have been revitalized.

In the village of Nà Bó (wellspring) in Mộc Châu District, Sơn La Province, on 15 February 2010 by the lunar calendar, the local Thái community organized the important rain-praying ceremony (*Pang moo xoo naam phôn*) after many years of being banned (Figures 4, 5). This ceremony has been held annually ever since. The villagers believe that whether the community will have good weather and a sufficient amount of water in the year depends entirely on the auspices of *chạu nắm* and the *then*. Hence the villagers strictly followed the traditional ritual processes under the guidance of the shaman from the Lường clan.

An important part of this ceremony is preparing the *Xăng bok mưn tô*, the blooming

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[4] See more on the roles of Thái shaman and magic in contemporary Thái society in Đỗ Thị Thu Hà (2019).

Figure 4. *Xên xo phôn* rain-praying ceremony of the Thái in Mộc Châu (photo by Hoàng Cầm, March 2023).

Figure 5. The Po Moo and Thái villagers in Mộc Châu asking the Chau Năm snake monster at his abode for rain during the *Xên xo phôn* ceremony of the Thái in Mộc Châu (photo by Hoàng Cầm, March 2023)

tree of all being. This tree is decorated with hanging figures made from wood or bamboo of animals such as buffaloes, cows, monkeys, tigers, pigs, and chickens, plants such as rice, corn, cotton, and grass, and tools and utensils such as plough, rake, hoe, fishing bucket, and rice holder. According to a shaman, the spiritual meaning of this "blooming tree of all beings" is that all sentient beings, humans and others, delegate humans to convey to the deities their common wish for good weather. The locals hang the figures of various beings on the tree and carry it to the place where the Water Deity is worshiped to convey the wish of all beings for auspicious weather and sufficient water for their lives. Another important ritual is planting trees. After the shaman finishes the rite at Nóng Bỏ, all community members, including children and elders, have to plant at least one tree of any sort within the village territory, especially in the Pú Chăn Luang area, the sacred forest. A shaman in Nà Bó explained the spiritual meaning of this activity: "In the shaman's prayers, it was said to the deities that trees, especially newly planted ones, need a lot of water. Therefore, the more trees that are planted by the villagers the better, so that the deities can see them and bestow rain upon the village." After the revitalization of the ceremony, the village's sacred forest is now not only protected and cared for by the Nà Bó villagers, but also considered sacred by people in the larger region. During the ritual held in March 2023, I observed that a number of Việt, both men and women, participated with the Thái. According to Ms Thay, "after the ceremony was revived, the annual amount of rain in Mộc Châu District has been regular and drought no longer ravages the region. Therefore, people in Mộc Châu District, both Thái and other ethnic groups, all benefit from it."

Besides the rain praying ritual, since the 2000s, a number of communual animist ceremonies have been rehabilitated. Among these is the *muang* worshiping ceremony (*xên muang*), which was also revitalized by the Thái community in Mộc Châu in 2014 and has since been held annually in the lunar month of January. Unlike before when it was limited to locals, the ceremony is now considered a "traditional cultural heritage" of the ethnic group, and its organization thus attracts participation by the local government and other ethnic groups in the region. As in the case of the revitalized rain-praying ceremony, the đông *sửa muang*, the spiritual area reserved for their Chảu Muang, has also been restored and protected. The state now officially recognized such animist practices of the Thái and other ethnic minorities by adding the new concept of "spiritual forest" (*rừng tín ngưỡng*) to the Forestry Law passed by the National Assembly in 2019 under the category of "special-use forest," which is legally protected.[5] A similar significant communal ritual among the Tay Khao in Yen Bai has been held again since the 2000s when their temple complex of Dong Cuong (literally, "inner forest") was rebuilt and recognized as a "historical and cultural relic" at the provintial and national levels in 2000 and 2009 respectively. The two central deities of this temple complex are the *Phii ngoak* (snake monster or Naga) worshiped at a small temple one side of the Red River and his wife, a Thai lady, worshiped at the main temple of the complex, which is

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[5] Vietnamese law divides forests into three categories: *rừng* đặc *dụng* (special-use forest), *rừng phòng hộ* (protection forest) and *rừng sản xuất* (production forest). Among these three categories, the law bans all encroachment in areas designated as special-use forest, including national reserve zones, national parks, and from 2019, "spiritual forests" (*rừng tín ngưỡng*), in order to protect and improve biodiversity.

Figure 6. (above) The Naga (*Phii Nguak*) possessed by a Thái Khao shaman when he visited his wife at the main temple of Đông Cuông during the ritual of 2023; (below) and the sacrificial white buffalo at Đông Cuông ritual (photos by Hoàng Cầm, January 2023).

located on the opposite side of the river. One of the most important rites of this ritual is the "procession" of the snake monster's wife to visit him on the other side of the river. As in other Thái communities in the northwest of Vietnam, the main sacrificial animal is a white buffalo (Figure 6) which is hung to death in the main courtyard of the temple. In January 2023, this festival was inscribed on "The national list of intangible cultural heritage".

The Thái community in Thanh Hoá Province has similarly revived ceremonies dedicated to the Po Then Luang at *hướn xớ then* on Pú Póm mountain. Since 2015, with the permission and financial support from local authorities, Thái communities here have reconstructed and expanded the shrine for Then Luang, as well as revived their traditional ceremony of worshiping Then Luang after fifty years under a ban. The local people have revived the "buffalo offering" ritual at the shrine, and have voluntarily returned the entire four-hectare area of Pú Póm mountain to the Thái communities for spiritual purposes. Under the *muang* polity administration, this mountain area was considered sacred and protected by customary laws. During the era of the state's anti-superstition policy, ceremonies were not allowed and the entire mountain area was "de-sacralized." Some forest areas on the mountain were converted to agricultural production. Since 2015 when the shrine was rebuilt, people have replanted trees to provide dwelling places for the deities, and have again enforced the customary laws that prohibit all forms of violation to this "re-sacralized" area. The community's customary laws are now bolstered by the state's regulations of "historical and cultural heritage" and by the addition of "spiritual forest" to the Forestry Law (see also Hoàng Cầm 2023).

Although communal ceremonies for the worship of animist deities were abandoned for a long time because of the state's prohibition, animist cosmology has maintained its importance to the sociocultural and livelihood practices of Thái communities in Vietnam, especially at the individual and household levels. The influence of this cosmology on the Thái's past and present lives is well embodied in the ways they interpret "abnormal" occurrences within families and communities. Thái shamans continue to play important roles in resolving most issues in the community including those concerned with health and well-being, natural resources extraction for livelihood, house building, and more recent problems such as debt collection, marital conflicts, and land disputes (see also Đỗ Thị Thu Hà 2019).

This significance of animist cosmology in the Thái's current life can be seen most clearly in how local Thái people in Thanh Hoá resisted the appropriation of their temple dedicated to Po Then Luang to serve Buddhist and Mother Goddess traditions, which they believed would anger their gods. This fear was confirmed when they witnessed and experienced unprecedented and inexplicable tragedies after work began on modifying the temple. A mountain landslide fell on the hut of a group of Thái villagers in Như Hoa commune who had been foraging for bamboo shoots in the forest, resulting in five deaths.[6] A Buddhist priest from another temple in the district was accidently run over

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[6] This tragedy was covered in the press: https://hanoimoi.com.vn/ban-in/Xa-hoi/848212/thanh-hoa-sat-lo-nui-7-nguoi-chet-va-mat-tich.

Figure 7. Ritual dance (*xe*) at *Xen xo Phôn* ceremony (photo by Hoàng Cầm 2023)

Figure 8. Ritual dance (*xe*) of the Tay Khao at Đông Cuông temple (photo by Hoàng Cầm 2023)

by a bulldozer.[7] When the vice president of the provincial Buddhist association, a Việt Buddhist abbot, was conducting the rituals of *hầu* đồng mediumship and enlivening the statues during the temple inauguration ceremony, a storm "unprecedented in magnitude" according to local accounts swept away all the Buddhist offerings and votive papers, as well as the prepared feast tables, and flooded the surrounding area, isolating the commune from the outside so that all the participating district officers were unable to leave until three days later. Even stranger, a local man fell while climbing a very small tree in the temple precinct and broke his leg. Two days before that, two buffaloes that the people bought to offer to Po Then Luang suddenly rammed into each other and died. Locals claimed that such an incident had never happened before in local history.

These events were interpreted as connected to the modification of the temple and its associated rituals. The local Thái believed that inappropriate behavior toward their spiritual tradition had angered their gods, especially Po Then Luang, and had induced the god to punish the villagers. At the beginning, their objections were "hidden transcripts" (Scott 1990). When the first two incidents happened, the villagers discussed and questioned the elders at community gatherings as to whether these tragedies were caused by the gods' wrath. After witnessing the strange phenomena on the day of the temple inauguration, the villagers and some of the Thái and Việt district officers truly feared that Po Then Luang was enraged and would punish them. After these incidents, villagers resisted more vehemently by requesting the Thái commune leaders to organize an offering ritual to ask for the god's pardon and to invite the gods to return to the temple. Three months after the inauguration, this ritual was finally conducted by the villagers and the commune leaders in secret and presided over by the shaman from the Lường family, following traditional protocols. The district officers were not notified of this event.

During my fieldwork in Sơn La in early 2022, I had the opportunity to witness a ritual conducted by Ms Thay, the Thái shaman mentioned earlier, to help Mr Hải's family settle a land conflict with their neighbor. Mr Hải believed that this land dispute, which had been going on for more than three years, had not been resolved because *chạu* đin (land deity/master) was not pleased with his family. He thus invited Ms Thay to perform a ritual to change the position of the altar for land deity worship and offer repentance to appease the deity. Similarly, in Áng village in Mộc Châu District, local people asked a Thái shaman to organize ceremonies to demand the return of the communal forest which had been appropriated by a private company from elsewhere to build an "eco-tourism" complex. During the same fieldwork trip, I observed the healing rituals which a Thái shaman named Lót performed at the large main shrine, built from three connected stilt houses, to heal many Thái patients. Given the significance of animist cosmology, especially the belief in the ultimate power of spirits, most Thái families would have healing rituals done to appease the deities, the superpowers believed to be the cause of human illnesses, in addition to seeking medical care from hospitals. Moreover, all households there perform certain rituals before a cultivation cycle to ask the deities to grant them a successful crop and after the harvest to express their gratitude. Likewise,

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[7] This is the new temple built by the People's Committee of the district, which, together with the Thái temple in Như Hoa, was expected to create an "axis of spiritual tourism".

Thái communities also strictly follow rituals dedicated to land and tree deities when building their houses, whether in modern style or traditional stilt houses.

Conclusion

For those who were born, grow up and live their lives in Thái communities like Ms Thay and thousands of other Thái who participate actively in animist rituals and practices, the world around them is populated by various spirits with person-like features or personhood with full capacity of will, intention and agency. In everyday life, the relationship between human beings and these person-like spirits is divided but intersubjective. So, for Thái communities in Vietnam, even during the period of High Socialism when animist cultural practices were condemned as superstitious and irrational, this animist stance remained a significant framework of values for orienting their actions in the social world.

As in China (Yang 2020), folk religions, especially the practice of Thái communal beliefs such as the ritual praying for rain among the Thái in Mộc Châu, the ritual of worshiping the water god of the Tay Khao people in Yên Bái or the worship of Then by the Thái inThanh Hoa, have been transformed from "superstition" to "worthy tradition" and "beautiful custom" (Endes 2002). The state now invests both human and financial resources in preserving and promoting these practices in contemporary society. The revival of local practices since 1986 shares some of the qualities of heritagization in which there is extensive outside intervention (Salemink 2016; Smith 2006), yet "the state's inscription of religious practices as cultural heritage also, at the same time, offers the local actors new justifications for negotiation and legitimized claims over their religious traditions and cultural identities" (Hoang Cam 2023: 25). Against the backdrop of this shift in the state's attitude towards religious culture and practices, the Thai animistic cosmology has been strongly revived and reinforced.

Bruno Latour and many other postmodernist scholars have argued for the need to pay critical attention to the culture-nature divide in modernist thinking. In his stimulating book *We Have Never Been Modern* (1993), Latour strongly and convincingly claims that human history has never reached a state of modernity where there is a clear and definitive separation between culture and nature. Instead, humans, regardless of historical period, "have actually always been engaged in …. 'hybridization', 'mediation'," or 'translation', the crossing and merging of nature and culture (Yang 2020: 6). Nikolas Århem (2016: 135) argues that this "beyond superstition" ontology "is representative both of a specific cultural ethos, a moral attitude towards 'nature', and a profound practical understanding of the local forest environment." Although the process of modernization and the development of rational scientific thinking has had certain impacts on groups with animistic ontology, the animist which creates a moral connection between human and non-human beings still has a strong influence on the relationship between humans and the natural world, and can therefore become the basis for achieving ecological balance in a radically transformed political economic system.[8]

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[8] Helkkula and Arnould (2022) convincingly show that, in order to achieve the 2030 Sustainable Development

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Goals, it is not enough to develop only a human-centered market eco-system while ignoring the relationships between people, animals and other members of the biological community. The authors propose that it is necessary to use and promote an animistic way of thinking, a way of thinking that rejects the dual distinction between "culture" (people) and nature, in this global and promising agenda. In order to address climate and inequality issues, especially SDG goals 14 and 15, it is necessary to replace "market ontologies" with animist ontology, which emphasizes the interrelationships between humans and the natural world.

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Spiritual Connections to Nature and to Climate Change Action

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ABSTRACT—The Anthropocene world has caused mass extinctions of plant and animal species, polluted the oceans, and altered the atmosphere, among other lasting impacts. Human belief, spirituality, and practice mark the earth. One can hardly think of a natural system that has not been considerably altered, for better or worse, by human culture and spirituality. Buddhism teaches that spiritual connections to nature and climate change action are inextricably linked and organically related. The Buddhist canonical texts describe humanity's relationship with the natural world under five laws (*niyāma*) which correspond to biosphere, biodiversity, will of mind, actions, and natural laws (*dhamma*). The Buddhist spirituality on *anatta* or "non-self" makes it clear that one cannot define "self" without "surrounding", namely ecology. Buddhist spirituality teaches us to look at the planet Earth as the interrelatedness of everything. Everything relies on everything else in the cosmos whether a star, a cloud, a flower, a tree, or you and me. Buddhist spirituality suggests human survival is only possible through sustaining the surrounding, the ecology. If we wish for a sustainable biosphere, we must live by the dharmic principle of self, sustenance, and surroundings with mindfulness.

Introduction

Spiritual connections to nature can play an important role in motivating people to act on climate change. Many spiritual traditions view the natural world as sacred and see human beings as stewards of the earth. By connecting with nature on a spiritual level, individuals may be more likely to develop a deep sense of responsibility for protecting the planet and taking action to address climate change.

The global crisis of climate change and environmental destruction are modern problems. These were unknown at the time of the Buddha; hence it can hardly be expected that the early discourses provide precise advice on how to handle these global crises. Nevertheless, several early discourses provide helpful perspectives and can be relied on in facing the current challenge. According to the Buddhist scholar C. A. F. Rhys Davids,[1] Buddhism explains the natural world as a "cosmodicy" and "anthropodicy" in contrast to the theodicy, or theistic position. What happens in this planet is a natural law that has nothing to do with God. It is partly the consequence of karma or human action,

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[1] C. A. F. Rhys Davids, *Buddhism: A Study of the Buddhist Norm* (London: Williams and Norgate, 1912).

in other words "anthropodicy." The great wheel of cosmic order goes on without maker or without known beginning but continues to exist by virtue of a concatenation of cause and effect. The Buddhist way of looking at global crisis from a perspective of cosmodicy and anthropodicy emphasizes that global problems are partly created by human society.

Therefore, spiritual practices such as mindfulness meditation can help individuals cultivate a greater sense of inner peace and clarity, which may in turn help them make more informed decisions and take more effective action on climate change. Particularly, mindfulness practice cultivates a principle of living in balance between human greed and limited resources.

There are also many spiritual practices that focus specifically on honoring and connecting the natural world, such as nature-based rituals, eco-meditation, tree ordination, and earth-based spirituality. These practices can help individuals feel a deeper sense of connection to the natural world and may inspire them to take action to protect it.

Spiritual communities can be important allies in the fight against climate change. Many faith-based organizations are already working to address climate change, and these communities can provide support, guidance, and inspiration to individuals who are looking to act on this issue. In Thailand, Buddhist monasteries are closely related with protection of forest and nature. By working together, spiritual communities can help to create a more sustainable and just world for all.

A Buddhist perspective on the natural world

Religion distinguishes the human species from all others, just as the human presence on earth distinguishes the spiritual connections of our planet from other places in the known universe. Religious life and the environment, biosphere and biodiversity are inextricably linked in defining who we are and how we live on this planet earth. Human belief and practice mark the earth as we understood from the term "Anthropocene." One can hardly think of a bioethical system that has not been considerably altered, for better or worse, by human culture. Human belief and knowledge about bioethics are the distinctive contribution of our species to the environment, biosphere, and biodiversity itself.

Buddhism explains that everything on this planet consists of the four primary elements: earth, fire, water, and air. Observing the presence of all four of these elements within us, or even just one of them, can be an important way of recognizing how our individual composition is the same as the composition of the rest of the universe. This may be an intellectual understanding at first, but eventually, with practice, it can become a feeling—one of being exactly the same as everything around us.

In the Buddhist Pali Canon, there is a record indicating that in pre-Buddhist society, when people were threatened with danger in the name of religion, they worshiped forests, mountains, parks, gardens, and trees believing that they would be liberated from all ills of life (Dhammapada: 188).[2] In other words, religions, and spiritualities in olden days were directly connected with nature. Nature was considered as a source of life.

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[2] Valerie J. Roebuck, *The Dhammapada* (London: The Penguin Group, 2010), p. 128.

Figure 1. Ordaining trees (picture from: https://www.seub.or.th/bloging/into-the-wild/blessing-trees/)

Moreover, nature was a source of religion and spirituality. Those ancient religions may not be related to the modern concept of protecting nature and climate change action but the outcome of taking refuge in nature had a direct outcome in protecting nature and it leads to climate change action. This concept, of course, is not new. Native Americans have been nature-centric in their religious expression for centuries. Animists in Asian countries consider nature as divine and sacred. Many cultures including Buddhism believe in forest angels and trees as a dwelling place of tree angels. Similarly, there are spirits and local deities in nature everywhere. There are many stories in Buddhism about spirits in the forest. Some stories are about Buddhist monastics being disturbed by spirits in the forest and Buddha teaching those monastics to spread loving-kindness to those spirits—in other words to respect and appreciate nature and live in harmony with nature. Accordingly, there are many rituals connecting people with nature throughout the year. In Thailand, there is a Buddhist ceremony for ordaining trees as a measure for protecting them (Figure 1). People believe that if a tree is wrapped by a saffron robe, the tree is possessed by spirits, and they become scared of cutting down those trees. In the modern context, many misunderstand those rituals as superstition without knowing the true wisdom behind them.

With globalization, many cultures are influenced by world religions and modern development but indigenous belief and wisdom are still practiced in parallel. Contemporary individuals are likely to see nature as an instrument of self-expression, especially since the natural environment is no longer viewed as a threat to survival. Furthermore, people often operate within a moral schema that imagines the environment as sacred, either because it is a divine creation or because it is inherently holy. In Southeast Asia, people believe the forest is a perfect dwelling places for spirits, ghosts and even

Figure 2. The Buddha and nature; illustration in a paper folding book, Part 4 of Mālālaṅkāra vatthu, Burma, 1875. © British Library Board, Or 14405, f38r

deities and angels. In other words, forest and nature are sources of both good and bad; it depends on how each individual treats forest and nature. Forest is the source of life. On the other hand, Buddhism regards nature as the best place for religious practice. Most of the important events in the Buddha's life took place in nature (Figurs 2, 3). Buddha himself was born in the Lumbini garden, got awakened under a Bodhi tree in the park, gave his first sermon in the deer park, spent a total of forty-five years teaching amidst nature and finally died in a grove. Therefore, Buddhism makes a connection with nature either as divine/sacred or as a source for enlightenment.

In Pali, the language of Theravada Buddhism, the term for mountain is *giri*. Surprisingly, *giri* etymologically means "a place that discharges water and medicine." From this linguistic perspective, Buddhism makes a very deep spiritual connection with mountains. The word itself shows how quintessential the mountain is for human sustenance.

Similarly, in Pali, forest is called *vana*, which etymologically means enjoy, associate, or shout. Thus a forest is a place where all beings enjoy happiness, a place where all beings associate, a place where all beings shout freely and a dwelling place for one who is seeking isolation.

In the Thai language, *vana* or forest may have some negative meaning as a dense place, a place of danger from wild animals and a place of fear. In Pali, it has wider meaning: *vana* as wood, a place of pleasure and sport; *vana* as jungle, a place of danger and frightfulness; *vana* as forest, a resort for ascetics, noted for its loneliness.

With these Buddhist vocabularies, it shows that Buddhism has its deep spiritual connections with nature. Each etymological meaning shows how all sentient beings

Figure 3. The Buddha and nature; Buddha receives the understanding from King Bhimisara; *phrabot*, Thailand, Rattanakosin era; from James Bogle, *Thai and Southeast Asian Painting, 18th through 20th centuries* (Schiffer, 2011)

have very close connections with nature. Peter Harvey characterizes Buddhism's ideals of relationship with the natural world as embodying "harmonious cooperation."[3]

Through his ethnographic studies, Chayan Vaddhanaphuti[4] explores the Thai perspective on climate action both from vernacular and indigenous beliefs. In the vernacular Thai language, there are several interchangeable compound words used to talk about the weather: *ākāśa* (air), *din fa ākāśa* (earth-sky-air), *lom fa ākāśa* (wind-sky-air) and *fa fon* or *fon fa* (air-rain/rain-air). On the other hand, the term *bhumi ākāśa* (geo-air) is rather a technical term, and is used to translate the Western term "climate." Interestingly, to maintain and convey an idea of global-scale temperature increase, the Thai media often use the term *lok ron* or global warming, because the Thai translation of climate change is very wordy.

Chayan further analyzes that in northern Thailand, the irregularities of their weather are deemed to be "good" or "bad" according to three related sets of religious belief systems. As the weather carries moral significance, there is always an agent that can be held responsible for the positive or negative changes in the weather. In the animist belief system, the reason for the changing weather is that the deities who reside in the sky are either blessing or punishing people. People have to carry out the Cat Parade or worship

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[3] P. Harvey, "Buddhist Attitudes to and Treatment of Non-Human Nature," *Journal for the Study of Religion, Nature and Culture*, 3, 1 (1998), 35–50; https://doi.org/10.1558/ecotheology.v3i1.35

[4] Chayan Vaddhanaphuti, "Governing climate knowledge: what can Thailand Climate Change Master Plan and climate project managers learn from lay northern Thai villagers?" in *Climate Change Governance in Asia* edited by Kuei-Tien Chou, Koichi Hasegawa, Dowan Kun, and Shu-Fen Kao (London and New York: Routledge Taylor and Francis, 2020).

at spirit houses to appease the deities. In the Buddhist belief system, adverse changes in the weather are something to be accepted as natural, rather than to be fixed. People have to learn to be stoic and to cope through livelihood strategies such as crop diversification. In the third belief system, the deeper moral perspective, the explanation for the changing weather is that it is caused by the erosion of cultural traditions and morality. Only by re-living the golden past, caring for nature like the ancestors used to, will enable the "good" weather to return.

Buddhism and the environment

Buddhism teaches that all beings are part of a larger web of interdependence, and that our actions have a ripple effect on the world around us. This includes our relationship with the natural world, and our impact on the climate. One of the key principles in Buddhism that relates to the environment is the concept of dependent origination. This teaches us that everything in the world is interconnected and that our actions have consequences that affect others including nature and climate. For example, if we pollute the environment, we are not only harming ourselves but also other living beings and the planet as a whole.

Another important principle in Buddhism is the concept of impermanence. This teaches us that everything in the world is constantly changing and in flux, including the natural environment. By recognizing the impermanence of the natural world, we can better appreciate its beauty and value, and take action to protect it for future generations.

Buddhism also emphasizes the importance of compassion and non-harm towards all living beings. This includes animals, plants, and the environment as a whole. The Buddha taught that all beings have the potential for enlightenment and that we should treat them with kindness and respect.

Monastic disciplines in Buddhism are clearly laid out for monks to be an active agent for protecting nature. The first lesson for every newly ordained Theravada Buddhist monk is to live by the four dependencies (*nissaya*). These four Buddhist bioethics are about the foundation of living a life of sufficiency in order to keep a balance between biosphere and biodiversity in this planet. The four foundations of monastic life are:

Living a livelihood of sufficiency (*pindiyalopabhojanam*)
Living by a principle of recycling (*pamsukulacivaram*)
Living in harmony with nature (*rukkhamulasensasanam*)
Living a life of self-sufficiency (*putimuttabhesajjam*)

Among Buddhist monks, the first foundation of monastic life is to live a life by sufficient livelihood. People these days live a life led by consumerism or even immoral consumerism. Immoral consumerism and excess consumption destroy the balance between "need" and "want." As Mahatma Gandhi said: "The world has enough for everyone's need, but not enough for everyone's greed." Therefore, the first monastic discipline laid out by the Buddha for his monks was encouraging them to live a life with

consciousness of truth of dependencies. Accordingly, one should live by the principle of sufficient livelihood. In other words, to consume mindfully.

The second foundation of monastic life is to live a life by the recycling principle. The planet is inundated with waste that humans created as a by-product of human consumption and technologies. Therefore, a sustainable life according to Buddhism is living a life with the principle of recycling (*pamsukulacivaram*). For example, a monk is supposed to wear robes made of rags collected from a dust-heap, preferably from cemeteries. This applies not only to robes but everything that we consume in our lives. In essence, the monastic life is designed around a circular economy.

The third foundation of monastic life is to live in harmony with nature. The Buddha spoke of the "foot of a tree" as the basic shelter for monastics. The first prototypes of Buddhist monasteries were forest and parks. Accordingly, it is a task of Buddhist monks to take care of their abodes, the forest and parks. Also, there are monastic codes that prevent monks from destroying vegetation. The common belief at the time of the Buddha was that plants (and even soil) were "one-faculties life." To destroy any kind of life is fully prohibited for a monastic who is called "a peaceful one" (*samana*). Therefore, destroying a living plant, such as felling a tree, uprooting a flower, picking fruit from a tree, or burning grass, is a Confession offense. It is an offense of wrongdoing (*dukkata*) to damage or destroy fertile seeds or pips, or viable seedlings. Buddhist monastics observe rules of not defecating, urinating, or spitting in water or on living crops. This is to protect water sources from being polluted. At the same time, the Buddha gave emphasis to planting new trees and protecting water sources as a means of making merit. Consequently, in Thailand, forest monks are well known as the best protectors of the forest.

The fourth foundation of monastic life is living a life of sufficiency. To lessen the damage created by humans on the planet, Buddhism encourages people to live by a principle of sufficiency. We can all take steps to reduce our carbon footprint and be more self-sufficient. For some, that might mean heading to the countryside to live off the land. For the rest of us, the reality might involve smaller, but no less important, lifestyle changes: cutting back on plastic or food waste, growing vegetables, preserving meat and fish, preparing jams and chutneys, baking sourdough bread, making your own plant-based milk, or keeping a chicken or two.

The Pali term *gharavāsa* simply means a householder. However, in Pali, *ghara* or house etymologically means a place where you indulge yourself with the five senses (eyes, nose, ear, tongue, and body). Therefore, a householder literally means a person who lives a life of indulgence in the five senses. In essence, a householder means a person who looks at the world from an "egocentric" perspective. Egocentrism leads to exploitation of resources, of nature. It downgrades the importance of other people and of nature. This simply means that humans prioritize humans and tend to exploit nature for humans' sake. This is the main reason why people need to develop consciousness so that people can have a mutual respect between humanity and nature.

In Buddhist practice, when someone is transformed from being a householder to become a "homeless" or monastic person, he must rethink about himself in relation to other humans, the environment, and nature. He should live in balance with humans

and nature. That is the exact meaning of being a "monastic" in a true Buddhist practice. Therefore, in Pali a monastic is called *samana* which means someone who is at peace with humans and nature.

These age-old Buddhist practices are directly related to what we now call bioethics, particularly about the nonhuman biological environment, although there was no such term as bioethics in the time of the Buddha.

Dependent origination means that everything is conditioned by everything else. A flower needs the conditions of sunlight, soil, and water to grow. All things arise dependent on conditions. They do not appear out of nowhere. This is common sense but if we follow this teaching all the way, the view becomes deeply profound and illuminates the importance of bioethics, biosphere, and biodiversity in the planet.

Knowledge of dependent origination is the bedrock of Buddhist wisdom. It enables all of the other teachings to have their effect. This means that humans depend on nature and nature depends on humans. Some may say that nature does not need humans! In that case, humans do not need humans either. Harming one part of this whole is the same as harming all of it. Therefore, if people learn to live simply and in harmony with the world, the whole environment will benefit. Thich Nhat Hanh coined the word "interbeing" meaning to inter-dependently co-exist. The concept of interbeing recognizes the dependence of any one person or thing on all other people and objects.

Environmental ethics is a branch of applied philosophy that studies the conceptual foundations of environmental values as well as more concrete issues surrounding societal attitudes, actions, and policies to protect and sustain biodiversity and ecological systems. There are many different environmental ethics, running the gamut from human-centered (or "anthropocentric") views embedded in traditional Western ethical thinking to more nature-centered (or "ecocentrism") perspectives. Ecocentrics argue for the promotion of nature's intrinsic value rather than its instrumental or use value to humans. For some ethicists and scientists, this attitude of respecting species and ecosystems for their own sakes is a consequence of embracing an ecological worldview; it flows out of an understanding of the structure and function of ecological and evolutionary systems and processes. This view is also shared by Buddhist bioethics.

Biosphere and biodiversity in Buddhism

There is an unique explanation in Buddhism about the nature of this world where Buddha uses similar modern terms like biosphere and biodiversity.

The Buddha says there are five laws at work in the cosmos that cause things to happen. These are called the *Five Niyāma* and they explain how matters are determined by nature. Present circumstances are the result of countless factors that are always in flux. There is no single cause that makes everything to be the way it is. In the canonical text, the Buddha uses the term *niyāma* in describing the inevitable work of dependent origination (Paccaya Sutta, S.II. 25)[5] or to describe the intrinsic nature of things. In

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[5] *Saṃyutta-Nikāya*, vol. II (Oxford: Pali Text Society, 1994), p. 25.

another discourse Buddha uses it in the context of a "causal law of nature" (Uppadaya Sutta, A.I. 285).[6]

This Buddhist perspective sees that everything in this world functions under such an order. However, in later Buddhist commentaries[7] from the 5th to the 13th century CE, *niyāma* is categorized into five distinctive kinds. C. A. F. Rhys Davids was the first Western scholar to draw attention to the list of Five Niyāma in her 1912 book, *Buddhism.*[8] Her reason for mentioning it was to emphasize that we exist in a "moral universe" in which actions lead to just consequences according to a natural moral order, a situation she calls a "cosmodicy" in contrast with the Christian "theodicy".

The *Five Niyāma* or five laws which explain the Anthropocene and natural world are:

biosphere laws (*utu-niyāma*): laws concerning human beings' external environment, such as laws governing temperature, weather, climate and seasons; law of non-living matter;

biodiversity laws (*bīja-niyāma*): laws concerning reproduction, including heredity, laws of seeds or germs, plantation, vegetation;

psychic laws (*citta-niyāma*): laws concerning mental activities, will of mind;

karmic laws (*kamma-niyāma*): laws concerning intention and human behavior, such as the law of actions (kamma) and their results; and

natural laws (*dhamma-niyāma*): general laws of nature, especially those of cause and effect; laws concerning the interrelationship of all things.

This is how Buddhism describes the causes of the global problems. Many global crises are caused by living unethically in contravention of these five laws.

Buddhism and climate change

Climate change is a pressing global issue that has significant implications for both the environment and human well-being. Buddhism and its teachings have a strong connection to environmental ethics and sustainability, making it relevant to the issue of climate change. While Buddhism does not specifically address climate change as a modern phenomenon, its principles and teachings can offer valuable insights and guidance for addressing environmental challenges.

In recent years, there has been a growing movement within Buddhism to address the issue of climate change and to take action to protect the environment. Buddhists around the world are increasingly recognizing the urgent need to address the environmental crisis, and are taking steps to reduce their carbon footprint, promote sustainable living practices, and advocate for policies that protect the natural world.

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[6] *Anguttara-Nikāya*, vol. I (Oxford: Pali Text Society, 1989), p. 285.

[7] Buddhaghosa, *The Expositor (Atthasalini)*, Vol. II, tr. Maung Tin (London: The Oxford University Press, 1921), pp. 360–362; see also in the Sumaṅgalavilāsinī (Dīghanikāya Aṭṭhakathā), DA.II.432.

[8] Rhys Davids, *Buddhism*, pp. 118–9.

Significantly, Buddhism teaches us to cultivate mindfulness, which can help us to become more aware of our impact on the environment. By becoming more mindful of our actions and their consequences, we can make more informed choices that are in line with our values and the greater good.

Based on biosphere laws, Buddhism sees that some climate changes arise naturally as all things are impermanent. These changes are beyond human reach. Humans must gradually evolve and adapt to the changes in nature. However, Buddhism also sees that many outcomes of climate change and natural disasters are man-made and these outcomes can be mitigated through global action.

A Buddhist declaration on Climate Change entitled "The Time to Act is Now: A Buddhist Declaration on Climate Change"[9] was first developed in 2009 and updated in 2015 for presentation to the negotiators at the COP 21 climate summit in a ceremony of all faith-based petitions. In October of the same year, the Global Buddhist Climate Change Collective, including His Holiness the Dalai Lama and Zen Master Thich Nhat Hanh, issued the "Buddhist Climate Change Statement to World Leaders", calling on world leaders to reach "an ambitious and effective climate agreement" at the Paris Climate Change Conference. The statement urges humanity to act on the root causes of climate change, which is driven by fossil fuel use, unsustainable consumption patterns, lack of awareness and lack of concern about the consequences of our actions. The statement is based on the understanding that all things in the universe are interconnected, and the consequences of our actions "are critical steps in reducing our environmental impact".[10]

The statement calls for phasing out fossil fuels, and moving toward 100 percent renewable and clean energy. It describes actions that individuals can take, including protecting forests, moving toward a plant-based diet, reducing consumption, recycling, switching to renewables, flying less and using public transport. One important concept in Buddhism that relates to climate change action is the idea of "sustainable action", meaning taking actions that are aligned with our values and with the greater good of all beings. By integrating Buddhist teachings and values with concrete actions of "sustainable action", individuals and communities can play an active role in mitigating climate change, fostering environmental sustainability, and promoting the well-being of all beings.

Buddhist spiritual connections to nature and to climate change action

Buddhist spirituality can provide valuable guidance and inspiration for spiritual connections to nature and climate change action. One example of this is the concept of the "Three Jewels", which are the Buddha, the Dharma (the teachings of the Buddha), and the Sangha (the community of Buddhist practitioners). In the context of environmental action, we can see the Buddha as a symbol of our inner nature, the Dharma as a guide to ethical living and the Sangha as a means of environmental stewardship.

There are many Buddhist monasteries (*wat*) in Thailand that are actively involved in

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[9] https://oneearthsangha.org/articles/buddhist-declaration-on-climate-change/

[10] http://sdg.iisd.org/news/buddhist-leaders-call-to-scale-up-climate-finance/

Figure 4. Recycling at Wat Chak Daeng; (top) collectopn center; (middle) monks sorting plastic waste; (bottom) sewing a "nano-robe" (photos: top and bottom by Jarunee Khongsawasdi; middle from https://www.khaosodenglish.com/featured/2019/09/18/this-temple-recycles-plastic-bottles-into-monk-robes/)

Figure 5. Solar power at Wat Sisaengtham, Ubon Ratchathani; (top) the "solar monk" and solar panels; (bottom) teaching on energy (photos from https://infocenter.nationalhealth.or.th/node/27686)

zero waste projects. One of the successful models is at Wat Chak Daeng in Samut Prakan province (Figure 4), an eastern suburb of Bangkok. Wat Chak Daeng is considered a community learning center on waste management engaged in study and development of waste recycling processes for all types of waste, and in training on garbage segregation via community leaders to promote waste management behavior at the household level, and to raise awareness and participation among community dwellers regarding environmental issues and waste management. The temple has received cooperation from the private sector, resulting in behavioral change among Bang Kachao community dwellers who became interested in the segregation process. Food waste can be redeemed for consumer products at the temple's zero-waste station, and this waste is converted into organic compost for community use. Wat Chak Daeng also operates a project for recycling plastic bottles into monk's robes. Thes robes, made from a mixture of recycled plastic, cotton and zinc oxide nanoparticles, are called "nano-robes".

Another monastery active on projects related to climate change is Wat Sisaengtham in Khong Chiam District, Ubon Ratchathani province in northeast Thailand (Figure 5).[11] The abbot is popularly known as "the solar monk". The monastery started by founding Sisaengtham School, a private secondary school, which not only uses solar power but also includes teaching on alternative energy design, installation, and maintenance in the school curriculum. The school also has its own organic gardens where students learn to tend crops for their own consumption. Beyond promoting technological progress, academic improvement, and spiritual enlightenment for his students, the solar monk is also active in disseminating these ideas nationwide.

Wat Sisaengtham is now popular with installment of solar cell system in hospitals, schools, wats and public buildings. The project has extended to education on agronomy systems which leads this Buddhist temple to be an unique model of Buddhist action for climate change.

Another important Buddhist principle related to climate change is the idea of impermanence. This teaches us that everything in the world is constantly changing and in flux, including the natural environment. By recognizing the impermanence of the natural world, we can better appreciate its beauty and value, and take action to protect it for future generations.

Conclusion: ecosattva

Overall, Buddhist spiritualities encourage us to be mindful of our relationship with the natural world, and to take responsibility for our actions to protect the environment and promote a more sustainable future. This planet is not only a perfect dwelling places for enlightenment but equally quintessential for survival of sentient beings.

Certainly, at the time of the Buddha, there was no problem with nature and climate change. Therefore, there is no direct discourse on natural protection and climate change

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[11] Phrapanayawachiramoli and Wasana Kaewla, "The Solar Monk in Siseangtham School: Mission Engaged for Society," in *ASEAN Journal of Religious and Cultural Research* (Mahachulalongkorn-rajavidyalaya University), 8, 3 (2019): 1–4, https://so02.tci-thaijo.org/index.php/ajrcr/article/view/249777/168387

action in early Buddhist texts. However, Buddhism promotes concern and caring for nature and the environment and has much to say about human ecology. Buddhist teachings prompt us to realize our interdependence with others, and the inter-relatedness of environment, biosphere, biodiversity and humanity. They aim to ensure the preservation of nature. Buddhism aims to balance sustainable human happiness along with a sustainable environment and ecology. Buddhist spiritualities can be applied as practical spiritual connections to make this planet sustainable both for humanity and nature.

Buddhist spirituality suggests human survival is only possible through sustaining the surrounding ecology. If you wish for a sustainable biosphere you must live by the dharmic principle of self, sustenance, and surroundings with mindfulness.

In other words, Buddhism teaches us to see the self as an "interbeing" who needs to adhere to the universal spiritual connections of "ecodharma" in order to transform the self to be a true ecological spiritual person, an "ecosattva".[12]

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[12] David R. Loy, *Ecodharma: Buddhist Teaching for the Ecological Crisis* (Somerville MA: Wisdom Publications, 2018).

Tri Hita Karana, a Spiritual Connection to Nature in Harmony

Catrini Pratihari Kubontubuh

Indonesian Heritage Trust

ABSTRACT—The Balinese ancestors showed how to live in harmony with their natural environment, and how their traditional wisdom can mitigate the risk of natural disaster and the degradation now known as climate change. Today, the concept of harmony in Balinese Hinduism is not a relic of the past but part of people's daily activities that will be passed on to the next generation. To illustrate the relationship between cultural heritage and climate change, this article discusses the Balinese philosophy of Tri Hita Karana which promotes harmony in multiple ways: harmony among human beings through communal cooperation and friendship; harmony towards God, manifested in numerous rituals and offerings to the creator; and harmony with nature, through efforts to conserve the environment and promote sustainability and balance. Tri Hita Karana guides many aspects of Balinese life, from daily rituals to economic activities. Currently, efforts are needed to harness this philosophy in this era of urban development.

Background

Traditional wisdom created significant values attached to the locations of living and daily life. Tradition is not merely about the past, but also about passing on the current activities of people to the next generation. Each generation has its own dynamics which contribute to changes in tradition over time. We risk losing rich and unique traditions if there is carelessness in passing them from one generation to the next. A tradition should not be regarded as an obligation, but as a wisdom which reflects the daily customs of a community and their religious beliefs. The history behind each tradition helps to maintain community support for its practice, even among people who are migrants into the area where the tradition is upheld.

Balinese Hinduism has a long history. Bali is an island province of Indonesia where at present 86.9 percent adhere to Balinese Hinduism. In the past there were ten kingdoms which originated before the 8th century in different areas of the island. Today these kingdoms are not recognised by the government of Indonesia. The first king known from historical records was Sri Kesari Warmadewa whose capital was at Pejeng or Bedulu, now in the Gianyar regency. In these kingdoms spirit worship and reverence for the ancestors coexisted with Hindu and Buddhist influences from neighboring Java. In the 11th century, Erlangga went from Bali to rule a kingdom at Kahuripan in eastern Java.

During the Majapahit Empire from the 13th to the 15th century, Bali was conquered by Majapahit troops lead by Gajah Mada. When the empire declined in the 15th century and was eventually overrun by Muslim lords, a number of Balinese courtiers, nobles, priests and artisans left the Majapahit court and returned to Bali (Kubontubuh 2021). Bali became the last stronghold of the Hindu-Buddhist culture which had earlier flourished in Java (Rukmi 2015). Balinese kings expanded their influence over neighboring islands. In the late 16th and the early 17th century, the kingdom of Gelgel, for example, extended its influence to Blambangan and other regions in East Java, and the kingdom of Karangasem conquered the island of Lombok in the 17th century.

In the 19th century, the colonial state of the Dutch East Indies took control of Bali and suppressed the Balinese kingdoms. In 1946 Bali became part of the Republic of Indonesia. However, the old traditions derived from Hinduism continued to shape everyday life in Bali. Within those traditions there is cultural wisdom relevant to safeguarding the environment based on an ideal of harmony and balance of life. This experience is similar to other regions of Asia where old religious traditions continue to shape the relationship of humans with the environment. This article traces how one aspect of Balinese cultural wisdom contributes to thinking about the community's role in protecting the environment and cultural heritage in the present day.
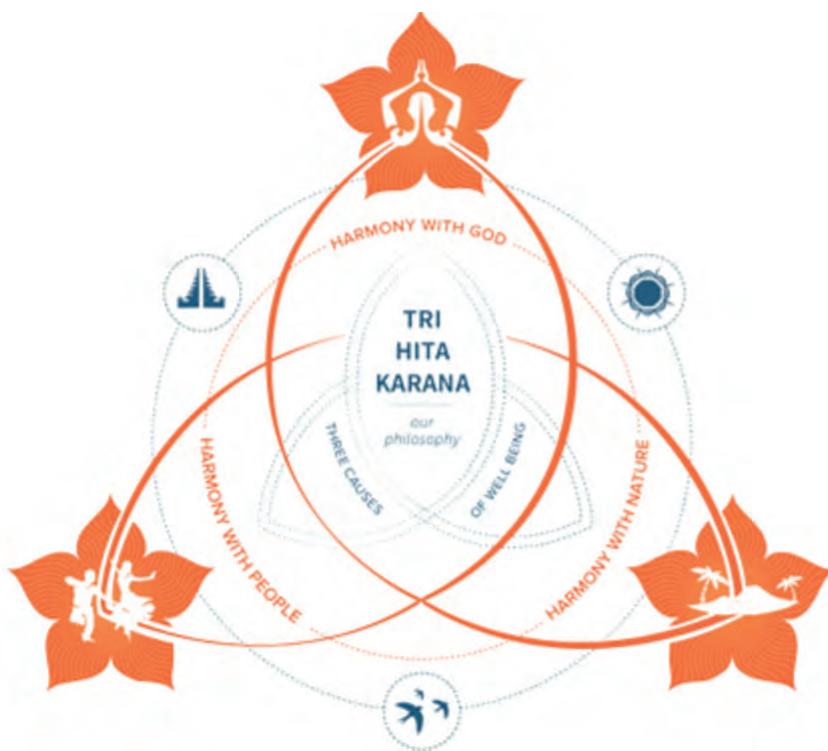

Figure 1. Tri Hita Karana philosophy (BPPI, 2015)

Tri Hita Karana as a concept of harmony

For the Balinese, Tri Hita Karana is a basic tradition about the balance between man and the environment, between man and man, and between man and the creator. Balinese believe that the environment is God's special creation, a rich gift that supports human life, and that needs to be maintained to achieve prosperity in harmony.

Tri Hita Karana can be translated as "the three causes of happiness". The concept has been present in Bali since at least the 8th century. It means that the three relationships — between man and the environment, between man and man, and between man and the creator — must be kept in balance (Figure 1). This concept guides many aspects of Balinese life, from daily rituals, to communal cooperation practices, and to spatial planning in Balinese architecture. The three relations are called Parhyangan, Pawongan, and Palemahan.

Parhyangan is the basis for all the rituals that mark the relationship between man and God. People express their appreciation of divine generosity through various rituals conducted as part of daily life. Drawing on Hindu concepts, people are considered as God's creation (Brahman), and Atman is the spark of the holy light of God's greatness that causes humans to live. Therefore, humans owe their lives to God. Every human being is obliged to be grateful, devoted and submissive to God by worshipping, following religious teachings, and making pilgrimages to holy places.

Pawongan is the harmonious relationship between neighbors that is essential for serenity in life. The spirit of Pawongan is manifested in the ways that people help one another, find solutions through discussion, and formulate plans through village meetings. Palemahan is based on compassion, nurturing, mutual respect and mutual love. Harmonious human relationships create security and inner and outer peace in society.

Palemahan is the relationship of humans and nature, which is a circular relationship of give-and-take. As nature provides for humanity through the necessities of life, humanity must preserve nature in return. This has long been the basis of sustainable development in harmony with the environment. Palemahan includes simple everyday actions such as watering plants and managing garbage, as well as larger-scale activities such as agriculture and forest conservation. People are very dependent on the environment and thus must take care of it. Forests should not be cut down arbitrarily and animals should not be over-hunted because such actions disturb the balance of nature. If the environment is properly maintained, it will create beauty and give humanity a sense of calm and serenity.

Tri Hita Karana states that good relationships between the three components of man, nature, and the creator are the basis of balance and harmony (Figure 2).

Tri Hita Karana and climate action

The degradation of the environment at the global level has caused long-term shifts in temperature and weather patterns. People are experiencing climate change in diverse ways. Some are already vulnerable to climate impacts which affect health, the ability
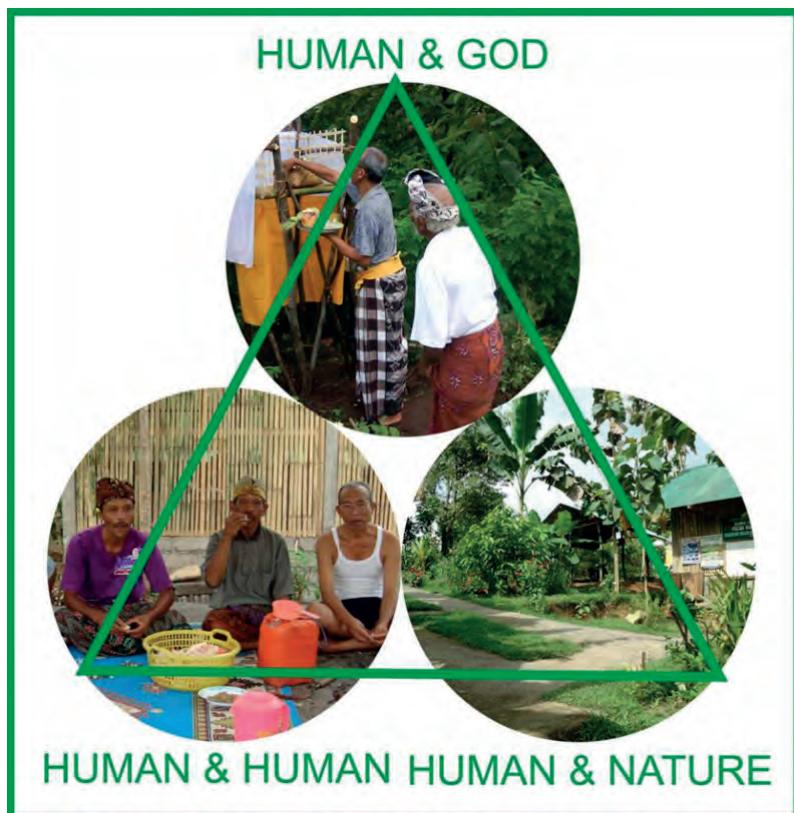
Figure 2. Tri Hita Karana connections (BPPI, 2015)

to grow food, housing, safety, and work (United Nations 2020). These conditions have advanced to the point where whole communities have had to mobilize to tackle the impact of climate change. Cultural heritage is one form of asset that can be a positive factor in designing climate action policies.

The movement to reinvent local tradition led to the formation of the Indonesian Network for Heritage Conservation in 2003 and the Indonesian Heritage Trust (Badan Pelestarian Pusaka Indonesia/BPPI) in 2004. BPPI works together with conservation organizations and individuals from various regions in Indonesia to promote local traditions as part of intangible heritage, to raise understanding and awareness of these traditions, and to preserve heritage nationwide. The Bali Field School for Subak (Subak is the irrigation system of terraced paddy fields) was started in 2015 and continues today. There is a need for a "sense of urgency" about protecting nature through cultural activities. The government has a role in formulating and implementing policies on climate action, but local communities also have a responsibility. Local wisdom and global policies must complement each other. The traditions of Balinese Hinduism can be a source of principles, paradigms, and strategies for effective and locally based climate action.

Figure 3. The Bali Field School for Subak.(BPPI, 2018)

Closing remarks

It is not difficult to integrate local tradition with modern approaches to combating climate change. Locally based climate action requires commitment, broad participation and understanding of the philosophy behind the tradition (Smith and Akagawa 2009). Conservation of the environment is part of Balinese tradition, based on the philosophy of Tri Hita Karana. The local people have a strong attachment to the legacy of their ancestors and a passion for nurturing local traditions (Lowenthal 2009). They understand that modern living poses threats to their environment. They are striving to maintain their own environment at the small scale as a contribution to the larger project of climate action at the national and global levels. They face the limitations inherent in their own capabilities as well as the obstruction inherent in the complexity of modern society. The local wisdom about harmony arising from the three relationships between humanity, nature and the creator can be a powerful basis for action to combat climate change. At present, not enough attention is paid to involving local communities and drawing on cultural heritage in climate campaigns. The context of heritage conservation is constantly changing under the dynamics of socio-economic development. There is a need for flexibility and negotiation among the various stakeholders. Tradition and modernity should not be seen as a dichotomy. The rituals, procession, and ceremonies of Balinese Hinduism are still performed today. Traditions passed down from the anchestors can be adapted by today's communities

to aid the conservation of heritage and the protection of the environment. People can preserve heritage through the practice of their living tradition.

Tri Hita Karana is an example of local wisdom about harmony that retains its relevance today and can help to stimulate thinking and discussion on climate action and community participation.

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How Islamic Tradition Benefits Nature and Climate Change Action

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ABSTRACT—This article explores the contribution of Islamic tradition and teachings in Southeast Asia, particularly in Indonesia, to benefit nature and climate change action. Indonesian Muslims follow the idea of Islamic jurisprudence (*fiqh*) based on the Imam Syafi'i school of thought, whose principles are practiced in daily life and provide many positive teachings on nature as God's creation. Humans are regarded as the *khilafah fil al ard*, stewards of the earth, and the Qur'an teaches that God has created everything in the heavens and on earth as *ayat*, the sign of God. In Indonesia, organizations and scholars have explored the potential of Islamic teachings for climate action in the form of *fatwas* (verdicts) and for awakening the people's awareness of climate change through religious lectures. Government officials and green activists have worked in partnership with the Ulama Council of Indonesia, Muslim leaders, and communities to issue important *fatwas* on certain issues including forest burning and the protection of wildlife. The Islamic principles of charity and finance, such as *zakat, infaq, shadaqah and waqf* as well as green *sukuk* (Islamic bonds), are also beginning to be mobilized for climate change action, including forest conservation. A Sumatra tradition of *lubuk larangan* has been applied to managing river environments. These examples show the potential of Islamic teaching to promote values important for combating the climate crisis.

Introduction

Muslims are the majority in the population of Indonesia. There are more than 700 ethnic communities who inhabit thousands of islands in the archipelago, making Indonesia a very diverse country in terms of culture, tradition and ethnicity. This diversity makes Indonesia a complex country. Before the coming of Muslim traders who spread Islam in the 12th and 13th centuries, the archipelago's major religions were Hinduism and Buddhism.

There was a massive trade and exchange of goods between the many islands, which caused a cultural assimilation among religious communities. Islam spread by absorbing local tradition and culture. Therefore, Indonesia has many traditional legacies, including a religious culture which may not exist in the rest of the Islamic world. Islam allows positive assimilation of local practices as long as they do not conflict with *sharia* and the main teachings of the Qur'an. Islam acknowledges what is known as *al-adat* and *al-urf*, which literally means tradition.

Figure 1. Hindu gateway at Menara Kudus Mosque, Demak (photo: Antara)

The dynamic and harmonious relationship between religion and culture in Indonesia is evident from the presence of Hindu and Buddhist temples and other shrines as part of the cultural legacy that is still well-maintained. History shows that Islam was easily accepted in the archipelago and became the majority religion by assimilating local traditions. For example, the architecture of the mosque as a place of worship reflects local cultural patterns. There are mosques dating from the early 17th to the 19th century, such as the Menara Kudus Mosque in Demak, displaying Joglo architecture which is influenced by Javanese architecture. There is even a gate which is a symbol found in every Hindu religious place of worship.

The assimilation of cultural and religious values is important because it affects the world view which forms the basis for behavior, including treating nature and God's gifts on earth. Likewise, the coming of the modern world has not changed much of the culture of this area. Religious values and local wisdom are passed down and have a role in harmonizing human actions in preserving nature.

Climate change is the central issue of the world today and is already changing both individual and collective behavior. Human management of climate change requires strong moral messages that can be taken from religious teachings. This article examines how Islamic teachings and traditions contribute to actions for combatting the climate crisis. The article builds on earlier work such as Koehrsen (2021) on Muslim movements in Indonesia and the UK, and Khalid (2018) on Islam, modernity and the climate crisis.

Muslims in Indonesia and most of Southeast Asia follow the Syafe'ie school, which was promoted by diaspora scholars during the 18th century (Azra 2001). The *ulema* of the archipelago interacted with their counterparts in the Middle East. They wrote books in Malay but with the Jawi script (Malay Arabic) which developed in the early 15th

century. They were *muftis* and advisors to kings and sultans in the archipelago.

The development of Islam in the archipelago is therefore distinctive and dynamic. *Sharia* in its pure sense is a religious teaching. *Sharia* law thus has the authority of religion, but *sharia* also makes room for customary law, called *adat and urf* (Efendi and Zein 2015).

Environmental *fatwas*

Islam has three sources of teachings: the Koran; the *sunnah* of the Prophet Muhammad; and the *ijma* or agreement of the scholars. Scholars who are recognized as having expertise in these three sources have the authority to issue *fatwa* (verdicts) for people to follow. The environmental crisis is a modern challenge that has emerged in the society of mass production, through events such as the green revolution which improved agricultural product by using pesticides but brought negative impacts to the environment and wildlife (Carson 1969). Islam teaches about responsibility and stewardship (*amanah*), about not being extravagant and about thinking of the generation to come.

In Muslim majority countries, a *fatwa* is usually issued by a particular institution or an *ulema* who is appointed as *mufti* – a position that gives him the authority to give *fatwas* to the public, as well as to the government or royal officials. In the case of Indonesia, this authority is given to the Indonesian Ulema Council (MUI), which has hundreds of branches in the lower administrative levels from province down to sub-district.

These MUI branches serve the village communities. The MUI has issued hundreds of *fatwas*, but began issuing *fatwas* related to the environment only in 2009, in response to new environmental problems. Some environmental conservation NGOs have become aware of the success of this approach and have worked together with religious leaders (Mangunjaya 2011). Some fatwas issued by MUI related to the environment are as follows (Mangunjaya and Praharawati 2018):

- *Fatwa* 30 October 1983, regarding population, health and development
- *Fatwa* 2/2010, about recycling water for ablutions
- *Fatwa* 22/2011, about environmentally friendly mining
- *Fatwa* 4/2014, about protection of wildlife for the balance of the ecosystem (biodiversity fatwa)
- *Fatwa* 47/2014, about waste management
- *Fatwa* 1/MUNAS-IX/MUI/2015, about the utilization of Zakat Infaq Shadaqah and Waqf (ZISWAF), for the construction of community water and sanitation
- *Fatwa* 30/2016, about the law of burning land and forest

Fatwas 4/2014 and 30/2016 are particularly relevant to climate change and the protection of nature: the biodiversity *fatwa* has changed perception particularly among grassroot-level clerics and the *pesantren* (Islamic boarding schools). The UNAS Center for Islamic Studies has worked with MUI and Indonesian NGOs on implementation

(Figures 1, 2). Forest fires have been a main cause of carbon emissions in Indonesia. In 2015, forest fires covered an area four times as large as Bali and were more intense than in the prior eighteen years. According to Terra Modis, the total area burned was 2,089,911 hectares (CNN Indonesia 2015).

In 2016, MUI released *Fatwa* 30/2016 that stated:

- The burning of forests and land that can cause damage, pollution, harm to other persons, adverse health effects, and other harmful effects, is religiously forbidden (*haram*).
- Facilitating, allowing, and/or deriving benefit from the burning of forests and land as referred to in item 1 is religiously forbidden (*haram*).

Figures 1, 2. Training *imam* on the *fatwa* prohibiting burning forest and land; (above) Kalimantan, 2018; (below) Sumatra, 2019 (photos: Fachruddin Mangunjaya)

- Burning forests and land as referred to in item 1 constitute a crime and the offender is punishable based on the extent of the damage and impact rendered.
- The control of forest and land fires as referred to in the general provision is mandatory.
- The utilization of forests and land is in principle allowed, subject to the following conditions:

    a. formal rights for such utilization must be acquired;
    b. license for utilization must be obtained from the appropriate authorities; in accordance with the prevailing regulations;
    c. utilization must be for the positive benefit of the people;
    d. utilization must not cause damage and adverse impact, including damaging the environment; and
    1. utilization of forests and land that is not in line with the requirements set forth in paragraph 5 is religiously forbidden (*haram*).

Did the *fatwa* have any impact? Luck (2019) conducted a study of the impact of this *fatwa* in villages with a Muslim majority and non-Muslim majority population, covering 29,300 villages over the period August 2016 to December 2019. The results showed a decrease of forest fires in the Muslim-majority villages after the *fatwa*. An average of 2.2 forest fires were prevented in each village.

Praharawati *et al* (2021) evaluated the impact of training preachers to publicize the *fatwa* in nine villages in West Kalimantan and Riau Provinces in 2019. The results showed that while the fatwa had no binding legal basis, its existence provided moral motivation that influenced the attitudes and behavior of individuals and Muslim leaders to prevent forest fires. This motivation was even stronger when accompanied by government programs to protect forests and land. As a result, forest burning decreased significantly over the period 2016 to 2021.[1] World Resources Institute (Indonesia) observed:

> After devastating forest and peat fires in 2015, Indonesia's Ministry of Environment and Forestry stepped up its fire monitoring and prevention efforts. The government issued a temporary moratorium on new oil palm plantation licenses and a permanent moratorium on primary forest and peatland conversion.

In 2016, President Jokowi formed the Peatland Restoration Agency (BRG) to intensify efforts to tackle the issue of emissions from burning peatlands through cooperation with various stakeholders concerned. Local administrations were instructed to pursue sustainable land use, avoid burning of the forest, and enforce prior regulations to prevent deforestation and forest fire. With these and other programs on land use, the burning was brought under control.[2]

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[1] https://wri-indonesia.org/en/insights/primary-rainforest-destruction-increased-12-2019-2020

[2] https://en.antaranews.com/news/253157/indonesia-raises-greenhouse-gas-emission-reduction-target

The *waqf* fund and land assets

Islamic finance is currently growing rapidly as an alternative to the conventional financial system. *Waqf* is an Islamic financial instrument that is very flexible in its application. It is an instrument of charity based on *sharia* for Muslims to contribute to give benefit to the people, but the ultimate purpose is to gain God's rewards. According to RI *Waqf* law No 41/2004:

> *Waqf* is a legal act of *waqif* [the giver] to separate and/or hand over some of his property to be used forever or for a certain period of time according to his interests for the purposes of worship and/or general welfare according to sharia.

A *waqf* can be used for the good of nature. It cannot be transferred to other people because it becomes the right of the *waqif* (the *waqf* giver) who hands it over to the *nazir* (administrator). The latter can manage it to generate benefits that in turn are used for charity (*maukuf alaih*).

In Indonesia there has been a forest *waqf* initiative to support climate mitigation and other efforts to restore nature and the environment. The forest *waqf* is practiced in Aceh and Bogor.[3] A group of people in Aceh, Sumatra, secured more than 4.7 ha land. The *waqf* contributors are from Aceh and elsewhere.[4] In Bogor, West Java a forest w*aqf* has been initiated to halt land degradation and conversion, started with 2,700 square meters of land.[5]

Even though such initiatives are rare, this is a stepping stone towards greater usage of Islamic financial facilities to protect the environment. The forest *waqf* may be used by individuals or institutions to protect nature, particularly the forest. The land *waqf* may be used to protect paddy land from illegal acquisition by people or industry. *Waqf* can be implemented in the form of a land trust dedicated to support charitable objectives, such as agricultural research, wildlife protection, or public gardens in perpetuity (Bagader at al. 1994). It can also take the form of a trust fund to finance such projects. Llewellyn (2003) has drawn attention to the numerous private contributions of land and money as conservation instruments worldwide.

The potential monetary value of *waqf* is estimated at around IDR 2,000 trillion per year, but currently this is far from being realized. There are only 52,000 hectares of land involved, located at 390,000 locations (UNDP and BWI 2022: 25).

Green *sukuk*

Islamic teaching prohibits usury and requires transactions to be based on profit (*tijarah*), buying and selling (*murabahah*), benefit sharing (*mudharabah and*

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[3] https://www.hutanwakaf.org/en/

[4] https://www.hutan-tersisa.org/inisiatif-konservasi/

[5] https://www.hutanwakaf.org/en/hutan-wakaf-solusi-melestarikan-rimba/

musyarakah), and giving (*waqf, shadaqah,* grant).[6] To comply with *sharia*, the Indonesian government issues Islamic bonds (*sukuk*), including so-called green *sukuk* for public investment in projects such as renewable energy and green infrastructure (IFC and UNDP 2021). Indonesia and Malaysia have pioneered the issue of such bonds since 2017 (Table 1).

In March 2018, the Indonesian government issued its first green *sukuk* valued at US$ 1.25 billion, followed by issues in 2019 and 2020 reaching a total value of US$ 2.75 billion (Mangunjaya and Ozdemir 2022). Retail *sukuk* have also been issued. One issued in March 2022 raised Rp 18 trillion (US$ 9 billion) and another in 2022 was targeted to raise over Rp 20 trillion (US$ 12.8 billion).[7]

Table 1. *Issuance of green sukuk in the world*

Issuer name	Country	Issue date	Curr -ency	USD million	Usage
Tadao Energy Sdn Bhd	Malaysia	7/2017	MYR	58	energy
Quantum Solar Park (Semenanjung) Sdn Bhd	Malaysia	10/2017	MYR	236	energy
PNB Merdeka Ventures Sdn Bhd	Malaysia	12/2017	MYR	481	buildings
Mudajaya Group Berhad (Sinar Kamiri Sdn Bhd)	Malaysia	1/2018	MYR	63	energy
Indonesia Government	Indonesia	3/2018	USD	1250	green projects
UITM Solar Power Sdn Bhd	Malaysia	4/2018	MYR	57	energy
Indonesia Government	Indonesia	2/2019	USD	750	green projects
Telekosang Hydro One Sdn Bhd	Malaysia	6/2019	MYR	115	renewable energy
Indonesia Government	Indonesia	11/2019	IDR	103	green projects

Source: Fitrah and Sumitra (2022)

Islamic finance has become a driving factor in the Indonesian economy. Since 2014, the United Nations Development Programme (UNDP) has cooperated with the Indonesian Finance Ministry to strengthen public funding for projects on climate change and the green economy in order to help achieve the Sustainable Development Goals (SDGs). According to the UNDP (2021), *sukuk* reaches out to traditional, Islamic and green investors for green projects and spreads awareness of green issues among the Muslim community and the millennial generation:

> Based on the success of reaching out to domestic investors, the government issued
> the first retail green *sukuk* in the world on November 2019, valued at Rp1.46

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[6] https://pkebs.feb.ugm.ac.id/2018/04/03/akadkontraktransaksi-dalam-syariah/

[7] https://www.bareksa.com/berita/sbn/2022-09-06/penjualan-sr017-lampaui-sr016-ayo-pesan-masih-ada-kuota-sukuk-ritel

trillion, attracting more than 7,000 investors who are Indonesian citizens – most of them are millennials. The *sukuk* is sold online and its revenues is used to finance the national climate change adaptation and mitigation projects. (Kementerian Keuangan RI 2020)

The spirit of investing to tackle climate change can go hand in hand with *sharia* teachings on economics, with appeal for the Muslim community in Indonesia.

Islamic scholars

Tradition in Indonesia is a blend of Islam and local values. Islamic rules on female attire can be combined with accessories worn for beauty. Among Muslims in South and Southeast Asia, the dress for *shalat* (prayer) in the *masjid* is different from the style in the Middle East. The crisis over the environment is something new that challenges the Muslim community to develop responses which combine scientific knowledge with local knowledge and values. To achieve such responses, *imams* and Muslim leaders need to understand the science of climate change.

Research on climate change has advanced over the last three decades. Knowledge on the consequence of greenhouses gases in the atmosphere has prompted efforts to change human thinking and behavior. In 2006, Edward O. Wilson recognized the potential of religions to contribute to this process:

I think the usual approach of secular science is to marginalize religion or even disapprove of it publicly and not expect anything from religious believers or at least religious thinkers. But I've taken precisely the opposite approach and that is to recognize that there is a powerful moral energy and purpose among religious believers – well, as there is among dedicated secular humans as well (Wilson 2006).

Islamic scholars must combine scientific knowledge with religious principles to provide simple and motivating explanations about the climate crisis to the public. The UNAS Center for Islamic Studies has worked to achieve this by building bridges between Muslim leaders and environmental scientists and practitioners at the local, national and international levels. The Center has organized training on Islamic ethics for the environment in several places. These courses highlight the Qur'anic verses on the oneness of God (*Tawhid*), the human position in the universe, and the human responsibility for planet Earth, in order to build a sense of mission and responsibility. Understanding the messages of the Qur'an creates a strong spiritual motivation for action, which the *imams* convey to the grassroots through their sermons.

Youth education and the *pesantren*

The *pesantren* or Islamic boarding school is a traditional school for the study of the Qur'an, *hadith*, and Islamic science. The *pesantren* is an important institution that shapes the values, attitudes, and behavior of millions of Muslim youths, many of whom

become leaders of their communities and wider Indonesian society (Mangunjaya and McKay 2012). Indonesia has 26,900 *pesantren* with around five million *santris* (students). Around 70 percent of *pesantren* are located in rural areas and close to forests. Only a few *pesantren* have coursework on Islamic theology, philosophy and practice related to environmental issues such as *al-fiqh al-biah* (Islamic jurisprudence for the environment). Teachers do not have the knowledge or resources to communicate these issues to their students and to build moral values on how to perceive and treat the earth.

In 2008, the Ministry of Environment launched a project of *eco-pesantren* to promote environmental education in the *pesantren*. The Ministry provided a budget.[8] The project started with meetings between academia and NGOs, and the publication of teaching materials. In 2013, The Center for Islamic Studies or Pusat Pengajian Islam Universitas Nasional (PPI-Unas) developed an online learning platform on environmental issues (www.ekopesantren.com) which provided free access to schools on environmental issues. In 2019, PPI-Unas developed and published a teaching module on environmental *fatwas* that is currently distributed to *pesantrens* in West Java and Sumatra. The involvement of *pesantren* in environmental action, however, is not new. There are some *pesantren* which started environmental actions earlier, as follows:

> In 2003, *Pondok Pesantren Al Ittifaq* in Ciwidey, West Java won the Goverment of Indonesia National Environmental Award for its program on organic agriculture, sustainable land use and improving the economy of the surrounding community by empowering 500 vegetable farmers to supply vegetables to supermarkets in Jakarta and West Java.[9]

> *Pondok Pesantren Nurul Haramain* pioneered tree planting on thirty-three hectares of its own land, as well as hundreds of hectares in the surrounding community and neglected areas. The *pesantren* also became a zero-waste school by recycling garbage and teaching the community how to produce organic fertilizer.[10]

> *EcoPesantren Daruttauhid* in Bandung, West Java is built from sustainable bamboo, and teaches students about organic farming. [11]

> *Pesantren Modern Darul Ulum* in West Java protects a small forest on their school grounds and has turned nearby water resources into *harim* zones. The *pesantren* teachers promote environmental awareness and include environmental topics in their curricula. As this *pesantren* is close to Gunung Gede National Park, the students plant trees and participate in the restoration of the national park forest.[12]

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[8] In 2015 the environment and forestry ministries were combined as the Ministry of Environment and Forestry.

[9] https://www.youtube.com/watch?v=dtZse5ahQPs

[10] https://www.youtube.com/watch?v=Ccfe8CfUQHU

[11] https://www.youtube.com/watch?v=TdbeukgjXiE; https://www.youtube.com/watch?v=ORM-K-e4AbA

[12] https://www.youtube.com/watch?v=0-NR8JFvAzo

Jamil (2021) summed up the work of the *eco-pesantren*:

> As such, *eco-pesantrens* have implemented the programmatic ideas of *hima* (environmental management zones) and *harim* (inviolable sanctuaries) and established zones where each student has to take care of his or her own tree. An example that dates back to the 1970s before the introduction of *eco-pesantrens* is the pesantren An-Nuqayah in Madura.

This *pesantren* managed to significantly raise groundwater levels in arid land through tree planting. The driving force behind this was the need for spiritual cleansing before prayer. In order to procure sufficient water for cleansing before each of the five daily prayers, the local *kiai* together with his students continuously planted trees to better absorb rainfall, leading finally to the creation of a creek and small river.
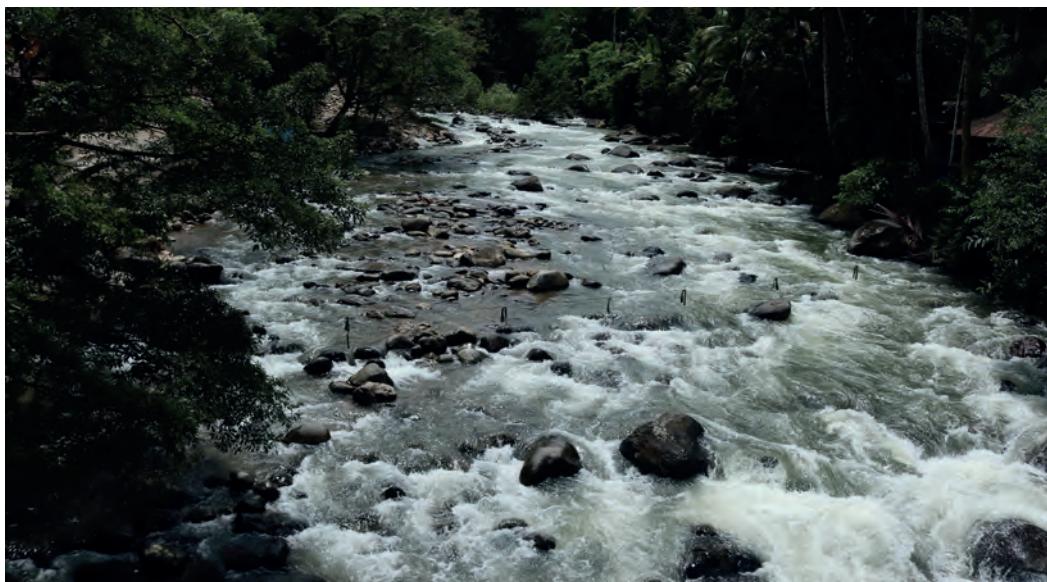
Figure 3. *Lubuk Larangan Bulu Soma,* North Sumatra (photo: Taufik Mulyana)

The *lubuk larangan*

Lubuk larangan are schemes of natural resource conservation, particularly watershed areas, based on local tradition or customary law. Under these schemes, local communities maintain the vegetation along the river-banks and keep the river clean and unpolluted. *Lubuk larangan* are found scattered in the provinces of West Sumatra, North Sumatra, Jambi and Riau (Figure 4). The tradition is derived from the Minangkabau indigenous community of West Sumatra. The *lubuk larangan* has ecological, economic, social and cultural functions. It builds a bond between humans and nature. The local wisdom is associated with Islamic rituals involving the *masjid* and its congregation (*jama'ah*) (Mangunjaya and Dinata 2017).

The opening and closing ceremonies of *lubuk larangan* are held in the *masjid* with a

Qur'an recital. The community members commit to these schemes, and as a result there is no single case of these schemes being violated, as customary law would be invoked for punishment.

The *lubuk larangan* have proved to be effective for nature conservation, particularly for river ecosystems as well as animal habitats. In 2022, there were more than 867 *lubuk larangan* in West Sumatra and more in Muslim-majority areas in North Sumatra, Riau and Jambi (Mangunjaya et al. 2022). They are based on a Minangkabau saying: *adat basandi sara, sara basandi kitabullah* (Custom leans on *sharia*, *sharia* leans on God's scripture). West Sumatra is rich in natural resources, especially along the coastlines, and has a legacy of protecting this heritage.

Conclusion

The management of climate change requires awareness of the need to use natural resources morally and wisely. Islam in Southeast Asia upholds the moral value of moderate usage of natural resources. Teachings on environmental responsibility, derived from Islamic teachings, are authoritative messages conveyed by religious leaders such as Islamic jurists and scholars to the grassroots. In Indonesia, the blend of Islamic teaching and local tradition has resulted in several initiatives to mitigate climate change, including Islamic finance (green *sukuk*), *waqf* for sustainable land use for forest restoration (*hutan wakaf*), *eco-pesantren* for inculcating green values in youth, and *lubuk larangan* for conserving natural resources by the local community.

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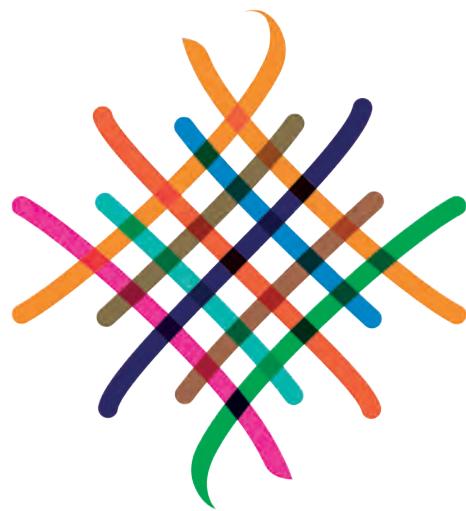
Heritage and Politics, Past and Future

Nusantarazation: Liberating Malaysia and Indonesia through Decolonization and Indigenization of the Societal and Environmental Paradigms

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ABSTRACT—Against the backdrop of the Nusantara Malay Archipelago's history, the colonial legacy and the hegemony of colonial paradigms continue to dominate the present trajectories of social and political-economic realities. If this were to persist, Indonesia and Malaysia as a community of communities will continue being subjugated by these shackles of the colonial masters and can never be truly liberated to re-imagine and to realize their fullest potential based on their own mold. In this article, I examine three societal and environmental paradigms — namely the paradigm of space and property, the paradigm of knowledge, and the paradigm of development — critically examining the colonial legacies in each. I propose Nusantarazation as a discourse of decolonization and indigenization to counter the subjugating constructs by reintegrating solutions and practices from local wisdom and indigenous heritage, especially from socio-environmental ecology. In opposition to the Westphalian world-order, capitalist definitions of property, privatization and exploitation of resources, concentration of wealth, and epistemicide, I call on Nusantara perspectives of stewardship, shared and common spaces, cultural heritage and local wisdom.

Introduction

The Nusantara Malay Archipelago has played a vital role in international trade, cultural interchange, and colonial conquest. Nusantara is a civilizational space with a diverse patchwork of cultures, languages, and ecosystems which historically and geographically extends from what is now Indonesia to the Philippines in the east and parts of Indochina to the north. Malaysia and Indonesia have felt the deep effects of colonialism, which continues to influence their current realities.

The notion of Nusantarazation, which is explored in this article, aims to decolonize these countries by eradicating harmful colonial paradigms and reinstating local knowledge and indigenous traditions. Nusantarazation is a philosophy and a process of unearthing civilizational paradigms that help heal and re-develop society along the values of societal and environmental sustainability. In essence, Nusantarazation is about decolonization and indigenization. This article looks at how Nusantarazation might challenge colonial assumptions that have long dominated knowledge, development, and

space. Specifically in this article, three paradigms are being re-examined: the paradigm of space and property, the paradigm of knowledge, and the paradigm of development.

Paradigm of space and property

In stark contrast to the communal land stewardship practiced in traditional Nusantara, the British and Dutch colonial eras in Malaysia and Indonesia introduced Westernized concepts of private ownership and borders (Hickling 1961; Peluso and Vandergeest 2001). Colonization resulted in the deconstruction of shared spaces and properties. The concentration of land and resources in the hands of a small number of, frequently foreign, companies harmed local communities and their relational and behavioral connections with the environment. For instance, land reclamation in Penang, Malaysia, and Jakarta Bay, Indonesia favored private interests over the needs of the community and the environment (Firman 2016; Yeo 2003). Fishing communities suffered. Food security was lost. Marine ecology was impaired. Space, property, and environment were removed from public or communal stewardship and were privatized or exploited.

By supporting sustainable fishing methods and the preservation of coral reefs and drawing on the traditional knowledge of coastal people, Nusantarazation can help safeguard the rich marine biodiversity of Malaysia and Indonesia (Clifton and Majors 2012; Teh et al. 2015). The Nusantara local wisdom recognizes and protects common or shared spaces and resources through the concept of stewardship of the land and the sea. Nusantarazation can contribute to cultural diversity and food security by preserving and promoting traditional culinary culture and practices in Malaysia and Indonesia (Tan and Khoo 2019; Bellwood 1997).

Nusantarazation promotes a return to traditional indigenous methods of land management in the forests. For instance, the Bidayuh community in Sarawak, Malaysia, and the Baduy community in Banten, Indonesia, both have strong ties to their ancestral lands and use them in environmentally friendly ways (Sujarwo et al. 2016; Cramb 2007). The Bidayuh forbids entering the forest and hunting on certain days. The Dayak communities in Kalimantan have a strong bond with their ancestral lands and engage in environmentally conscious land usage (Dove 1993). These practices prevent or mitigate deforestation.

In Indonesia, the Baduy people have developed a typology of forests as part of their practice of environmental conservation and agricultural cultivation. Some forest is considered sacred and is completely forbidden from entry or exploitation, creating an ecological sanctuary. The colonial paradigm of private ownership can be challenged, and environmental care encouraged by recognizing and honoring these customary land rights from the Nusantara paradigm of space and property. In Wae Rebo Village in Flores, indigenous land rights are recognized in an effort to meld tradition and modernity harmoniously (Maharani and Sulasmi 2019). By encouraging the sustainable use of forest resources and acknowledging the rights of indigenous groups to their ancestral lands, Nusantarazation can help preserve the forests of Malaysia and Indonesia (Lye 2004; Potter 1997).

Figure 1. With posters and banners (below) the fishing community in southern Penang protests against a reclamation project which will destroy the ecosystem underpinning their healthy work-life balance (photos by Internship team at CenPRIS-USM and I-WIN Library https://waqafilmunusantara.com/)

Boundaries drawn by the colonial powers divided people, fragmented identities, and overrode the idea of shared space. In order to overcome this division, Nusantarazation as a philosophy promoting common and shared spaces to embrace inclusivity and cultural interaction, even in urban contexts. The common space of Indonesia's traditional markets (pasar), where people from various backgrounds interact, exchange commodities, and celebrate their cultural heritage, serves as a shining example (Suganda 2018).

The artificial borders drawn by colonialism tore Indonesia's social fabric apart. The Nusantarazation paradigm honors Indonesia's nautical legacy and seeks to build a bridge between the past and the present. The Coral Triangle Initiative aims to safeguard marine biodiversity in the shared waterways between Indonesia, Malaysia, and the Philippines (Horigue et al. 2017).

In essence the Nusantara constructs of stewardship or custodianship of ancestral or sacred spaces can form a shield of environmental conservation.

Paradigm of knowledge

Phaedra Haringsma (2021) describes colonial epistemicide as "the process of killing and erasure of indigenous knowledge." In the Nusantara Malay Archipelago, British and Dutch colonialism brought about colonial epistemicide, or the systematic erasing of indigenous knowledge systems in favor of Western-centric values and schooling. The education systems of Malaysia and Indonesia today have been significantly influenced by British and Dutch educational techniques (Alatas 2006; van Langen 2002). Local and indigenous knowledge is often seen as non-scientific and at best taught in cultural studies, if at all. Mainstream education has generally forgotten indigenous knowledge, or retains only a vague recollection, and does not consider promoting study of these matters as a branch of science and wisdom.

Colonialism imposed an educational system primarily intended to generate submissive subjects. Local knowledge and languages were suppressed, resulting in the loss or deterioration of indigenous wisdom. By combining local knowledge and languages and developing a sense of cultural identity and pride, Nusantarazation aims to reinvigorate traditional educational institutions (Parekh 2006).

Nusantarazation aims to reverse this colonial epistemicide. For instance, the indigenous knowledge of the Orang Asli (indigenous people) in Malaysia on forest management and medicinal plants must be included into formal education. The traditional knowledge of the Javanese in Yogyakarta, Indonesia, on arts and crafts should be similarly recognized and nurtured. Promoting a knowledge paradigm that is anchored in the rich cultural history of both nations of Nusantara will foster a sense of identity and belonging (Alatas 2006; van Langen 2002).

Paradigm of development

The legacy of colonial economic systems, including capitalism, commodification, and wealth concentration, has had a significant impact on the development paradigm of Malaysia and Indonesia, resulting in the rapid industrialization and urbanization

that frequently results in economic inequality and environmental damage (Jomo 2004; Robison and Hadiz 2004).

This development paradigm should be replaced with one that is both egalitarian and sustainable, according to the philosophy of Nusantarazation. The concept of stewardship promotes an economy that values regional resources, a fair distribution of wealth, and a culture of caring for the environment. For example, encouraging community-based tourism in locations such as Sarawak, Malaysia, and Sebatik Island, Indonesia can reverse the monetization of nature and culture in favor of preservation and sustainable use (King 2008; Spencer 2016). By encouraging ideals of community, respect for nature, and cultural diversity while opposing the individualistic and consumerist values pushed by colonialism and capitalism, Nusantarazation can have an impact on social norms and behavior in Malaysia and Indonesia (Amster 2015; Geertz 1960).

Conclusion

Nusantaration is captured in the Malay proverb, *buang yang keruh, ambil yang jernih*, meaning "removing the muddy and saving the clear." It aims to restore indigenous wisdom and traditions while challenging the destructive colonial paradigms of knowledge, development, and ownership in order to promote a more sustainable and just future. The framework provided by Nusantarazation for decolonization in Malaysia and Indonesia is both ethical and crucially urgent. Reimagining a future that is grounded in the rich cultural legacy and wisdom of Nusantara is a key step on the road toward a society where the environment is conserved and the people can live productively and peacefully.

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Elites, Climate Action and the Future:
Reflections on Two Cases from Thailand

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ABSTRACT—Like other Asian megacities, Bangkok is suffering from the "heat island" effect and from deteriorating air quality. While means to counteract these problems are well known, little has been done. The urban elite which dominates policy making has shown little interest in climate change, and seems confident in its ability to protect itself from its effects. By contrast, in the northern city of Chiang Mai, the persistent problem of haze prompted the formation of a broad-based coalition which planned an innovative approach to managing forest to minimize fires. This case shows the importance of democratic process and coalition building for action to combat climate change. The coming generations will need to strengthen and exploit the democratic process in order to supplant the old elite and institute policies to manage the impact of climate change.

Traditional elites are a form of heritage. They are social constructs formed in the past, which have survived into the present with some remaining authority based on their age and their historical role. In some cases, their accumulated knowledge and their attachment to other forms of heritage can serve as a counter to the destructive aspects of modernity. A prime example of relevance to this conference is the 2015 encyclical of Pope Francis known as "Laudato Si'". In this passionate document, the Pope invoked the memory of St Francis to call for "a new dialogue about how we are shaping the future of our planet" (Francis 2015).

In Southeast Asia, the traditional elites have mostly been destroyed or sidelined. Colonialism followed by nationalism largely devastated the old political elites clustered around traditional rulers. With only a few exceptions, landed elites have diminished in importance with the rise of the urban economy. The new secular states have been careful to limit the authority of religious leaders within the religious sphere and prevent their intrusion into politics.

In Thailand, the traditional religious establishment, the Buddhist Sangha, has produced several thinkers who have articulated ideas about the economy and the environment. These thinkers are important as individuals, but the Buddhist Sangha as an institution has been carefully isolated from politics. As detailed elsewhere in this volume by Ajan Chaiwat and Phra Anil, Buddhist monks sometimes play important roles in local campaigns over issues such as protecting the environment or managing waste. But the Sangha has produced nothing with the same force and reach as a papal encyclical.

Across Southeast Asia, the dominant elites today are the new urban elites underpinned by the modern urban economy and the modern political structures of bureaucracy, military, judiciary and parliament. They are sometimes allied with or fused with remnants of traditional power, including old rulers, aristocrats and landed gentry, but their mentality is shaped by the modern urban economy in a globalized world. Any significant action on climate issues requires the support and participation of these elites.

In this article, I examine the role of these urban elites by briefly reviewing two case studies of climate issues in Thailand in the last few years. The first issue is about the implications of global warming and urbanization. The second is about the management of forests. In the conclusion, I reflect on some implications for the politics of climate action in the future.

City, heat, power

The combination of several aspects of climate change – more erratic weather, migration, rising temperature and deteriorating air quality – is creating critical conditions in Asian cities, including Thailand's capital, Bangkok.

Across the world, climate change is undermining old livelihoods and forcing people to move. This "human flow", as the artist Ai Weiwei called it, can be seen at the southern border of the US and the boats crossing the Mediterranean into Europe and the English Channel into Britain. In Asia, it is less obvious but present and increasing.

Recently the UN Intergovernmental Panel on Climate Change (UN-IPCC) confirmed that the Indian monsoon, which affects South and Southeast Asia, is becoming more erratic, bringing more droughts, more heatwaves, and, especially, more local instances of flooding, often of spectacular severity (UN-IPCC 2021: 118–20, 1094–96; Srinivasan

Figure 1. Flooding in Khon Kaen by Storm Podul (photo: Chakkraphan Natanri, Bangkok Post, 1 September 2019)

2019; see Figure 1). This erratic weather means that every year some marginal farmers reach the point where they cannot survive. Their last resort is their feet. They migrate.

In Asia, such migrants mainly move to the cities because land elsewhere is no longer available and the city offers their best chance of finding work. They target the larger cities, the national and regional capitals, because these cities have much better economic opportunities and much better social infrastructure as a result of past development policies. Urban growth in Asia is concentrated in megacities. Of the world's sixty largest cities, forty-two are in Asia.

Thailand fits this pattern. Between the 1997 financial crisis and 2020, some three million people, a quarter of those remaining in agriculture, left the villages. Over these two decades, one-in-five people moved from rural to urban areas, whether because they moved to the city or the city moved to them. By 2020, the urban population had overtaken the rural at 51.4 per cent. Bangkok has long been a "primate city," far larger than its nearest rival. The population of Greater Bangkok grew from ten million in 2000 to eighteen million in 2020.

Megacities have mega-problems – of congestion, traffic, air pollution, water supply, waste disposal, and much else. Global warming compounded by the concentration of population and economic activity creates a micro-climate, a "heat island." Bangkok is now several degrees hotter than the surrounding countryside (Figure 2), and recently the authorities have begun to count "heat deaths" in the mortality statistics. Atmospheric pollution has significantly deteriorated over the past decade. Some is caused by crop
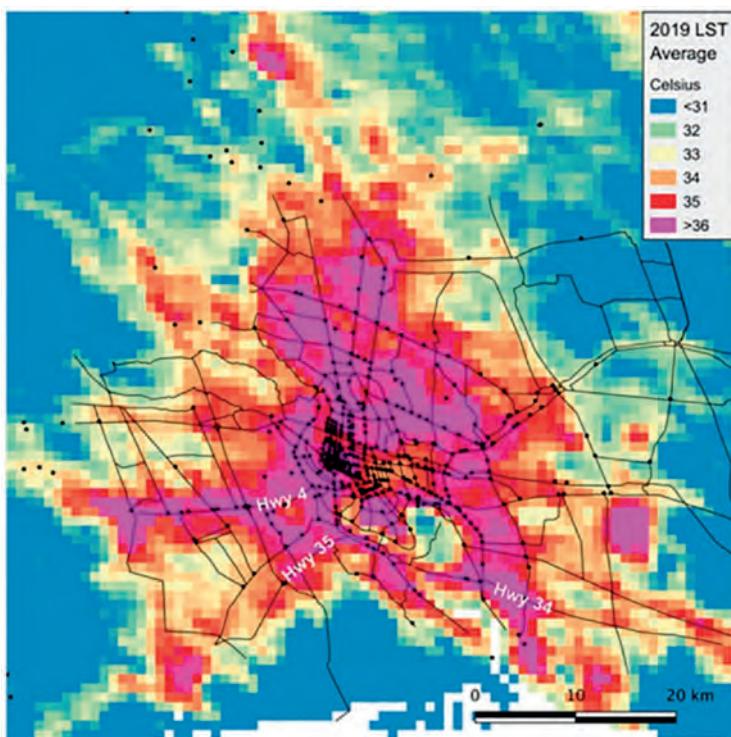
Figure 2. Temperature difference in Bangkok (source: Bentley et al., *Asian Geographer* 2020, via Marks and Connell 2023)

burning and forest fires, but most is locally generated by traffic, construction, and industry (Marks and Connell 2023).

Across the world, urban planners and architects have been creative in proposing solutions including green cities, sponge cities (which can store excess water for use later), 15-minute Cities (where residence, work and shopping are within a journey of that time), and ecologically appropriate buildings. Two decades ago, the Chinese government understood the trend of urban concentration and laid plans for "new-type urbanization" focusing on "equality, happiness, health, the green economy and efficiency" (Yu 2021). Some Chinese cities have adopted such ideas, especially Xixian, and there are showcase projects elsewhere (UN-IPCC 2021: 984).

Figure 3. Benjakitti Park, Bangkok, at its opening in December 2021 (photo: Chris Baker)

Two major problems in Bangkok are traffic and the lack of green space. Bangkok has only 3.3 square metres per person, the lowest for any Asian city, and only one square meter of parks per person. The authorities try to boost these figures by including "golf courses, street medians, underdeveloped land, shrubs, and undeveloped land along the coast" (Marks and Connell 2023: 9). Recently the city acquired a new green space, Benjakitti Park (Figure 3), which is exceptionally beautiful, and urban activists have helped to develop several local "pocket parks," but these are too small to have any impact on the statistics or the micro-climate.

The Bangkok traffic has been a focus of complaint since the epic jams in the boom years of 1986–1997 through the recent years of steadily deteriorating air quality. Yet there have been no policies to restrict the ownership or usage of vehicles. The number of cars in the city grew from 4.2 million to 10.7 million over 1999–2019. Mass transit systems have developed slowly. Any proposals to restrict vehicle access by zoning or by

limiting provisions for parking evoke howls of protest from car owners. Free use of the car has become a symbol of middle-class self-assertion.

The policies needed to combat the heat island effect and deteriorating air quality are quite simple—controls on traffic, better urban architecture, more greenery. There are NGOs, activists and academics who have been pushing for such measures for many years, but without significant result. The urban elite which ultimately dictates policy on such matters has shown little interest in climate change, even though they are subject to its effects. Why is this so?

Thailand's governments have pursued growth while paying only lip-service to equity, resulting in high levels of inequality in income and especially in wealth. This pattern has emerged while hierarchical structures from the ancient regime still linger in language and norms of behaviour. In addition, the weak rule of law means that money, social status, and personal networks can be leveraged to secure privileges as a matter of everyday course.

Against this background, it is not surprising that the social elites focus on protecting *themselves* from the impact of climate change rather than society as a whole or humanity as a whole. The rich and powerful establish preferential claims on resources that are becoming scarcer—on space, nature, clean air, safe water, and tolerable temperature. They establish these claims through market mechanisms, especially the real estate market, but also through their political influence. Luxury real estate projects sell privileged access to urban greenery, cleaner air, and safer streets (Figure 4). They promise to insulate their residents from "urban chaos." Helicopter services promise to save them from "traffic chaos." The well-off invest in systems to heat, cool, and filter air at the expense of everyone else. And they do everything possible to evade paying taxes to fund policies for better infrastructure and more welfare. These trends will intensify

Figure 4. Bangkok condo advertisement, January 2023.

as urban environments deteriorate with more crowding, more heatwaves, more air pollution, more competition over water.

People, forests, haze

The second case offers a partial exception to the general picture outlined above. This case concerns the critical levels of air pollution in northern Thailand, especially in the city of Chiang Mai. This case requires some background on the debate over the protection of forests.

In the mid-20th century, half of Thailand's forest cover was lost, mainly to the expansion of agriculture. In the 1980s, government resolved to protect what remained, ideally by emptying these areas of people. However, several million people were already living inside areas defined as forests; some were long-settled there, and felt they had the right to remain; some were recently imported for political reasons and had often been promised they would be allowed to stay; most wanted to remain; in total they may have been a quarter or more of the rural population; they were denied rights to land, a basic asset of a rural economy and society. This set the scene for debates and disputes over people and forests. As described by Suwichan and Greene elsewhere in this volume, forest communities argued that they should be allowed to remain resident in the forests because they had the expertise to protect them. The authorities, and especially the army, argued that people destroyed forests and had to be removed. This debate raged in policy forums and academic space, while on the ground communities struggled to establish local rights and authorities sometimes used force to evict them.

The context of this debate changed in the early 21st century because of tourism and global warming.

Domestic tourism increased as the urban population became larger and richer, swelling the demand for recreation. International tourism boomed on low-cost air travel and heavy government promotion. Forest resources were targeted by tourism entrepreneurs, ranging from international and local hotel chains down to community homestays. The urban population became more interested in the forests as sites for recreation and entrepreneurial opportunity.

In northern Thailand, seasonal air pollution worsened steadily from the later 2000s. The contributing factors included traffic, industry, construction, and crop burning, but also forest fires, intensified by the warming climate (Marks 2022). The problem was especially acute in Chiang Mai, where it affected the health of large numbers of people, and also had a major impact on tourism because the seasonal spread of the haze overlapped with the peak period for international tourist arrivals in the cool season (Figures 5, 6). In 2019, the air pollution in Thailand was declared the worst in the world. Many people in Chiang Mai became interested in management of the neighboring forests, especially in Mae Chaem district, to the west and upwind of the city.

This district was a microcosm of the history of forests outlined above. Between the 1970s and 2010s, virtually all of the district was declared as national park or reserved forest, yet all these areas had some resident communities. Forest officials claimed that the communities damaged the forest and wanted to remove them. Karen communities

Figure 5, 6. (above) Haze over Chiang Mai (photo: TTRWeekly, 25 March 2019); (below) forest fire on Doi Suthep with lights of Chiang Mai in the background, April 2020 (photo: Chiang Mai Volunteer Drone Teamvia WWF)

responded that the exploitation by external elements (loggers, maize businesses) was the major cause. They made various proposals to show that they could live in and protect the forests sustainably, as well as increasing the forest cover with trees (Nualnoi and Olarn 2023). They joined social movements demanding community rights over land. When the air pollution peaked in the late 2010s, a broad coalition including NGOs, activists, forest villagers, sympathetic forest officials, public health specialists, other government officials, Buddhist monks and business associations (especially those interested in tourism) came together to design new way of managing the forest in order limit the air pollution

The "Mae Chaem Model", which evolved from these discussions, began with arrangements to minimize the haze by developing water resources to moisten the forest

and by deploying villagers as forest guards. The programme was then extended to reviving degraded forests and replacing monocrop farming with agro-forestry in order to limit the pollution caused by the burning of maize waste and the large application of pesticides. Large areas were planted with bamboo, used as raw materials for making furniture which provided a source of secure income for villagers and reduced the dependency on mono-cropping. Other commercial crops include coffee, fruit trees, and vegetables. A report by the Thailand Development Research Institute found that the scheme had multiple benefits:

> The change resulting from switching the farming practices in Mae Chaem to chemical-free sustainable agroforestry comes with many dimensions. The farmers are enjoying better health. Relationships within their families have improved. So has their sense of well-being. The consumers, meanwhile, are safe from foods contaminated by toxic farm chemicals. With better health among the locals, the central government has less of a financial burden in taking care of people suffering from chemical poisoning. The environmental impact is also impressive. The forests are returning, serving as a carbon sink to alleviate climate change. Such local efforts help significantly save the country's resources in tackling environmental problems. (Kannika and Natthaporn 2020)

Villagers cooperated in these schemes in the hope that they would be rewarded with some improvement in their land rights, but became less enthusiastic when some officials continued to arrest villagers for land encroachment. The villagers responded by ceasing to police forest fires. The haze returned with a vengeance in 2019–2020. Somkiat Meetham, a local environmental activists claimed: "If the officials believe they can look after the forests by themselves, let them. This is what the local villagers feel…. Land rights and community-based forest conservation is the answer. Yet, power and prejudice prevail." (Sanitsuda 2020).

Although the scheme temporarily failed, the incident was a turning point in the long-running debate over people and forests. The haze showed that the issue of managing the forests could not be separated from the issue of the forest communities; the issue of forest communities could not be separated from the issue of right to livelihood; and the issue of livelihood could not be separated from the issue of sustainability for both people and trees. The realization that these issues coincided formed the basis for a broad-based coalition including both elite and non-elite interests. The resolution of these issues continues to be a focus of struggle. To put it another way, democratic process matters.

Conclusion

In Thailand and in other countries of Southeast Asia, the modern urban elite aspires to be part of a global elite. It often identifies itself more closely with the global elite than with the rest of its own society. This is a function of the high level of inequalities in these societies—inequalities in income, wealth, access to politics, rights and respect.

The urban elite in Thailand has shown little interest in the issue of climate change.

Many in this elite are investors or entrepreneurs in businesses that are heavy emitters, such as power generation, plastics, automobiles or plantation agriculture. They see no reason to support policies which they perceive as having little impact on them as businessmen or human beings. They argue that economic growth is more of a priority than climate change or social justice. They are confident that they can use the privileges afforded them by their wealth and by the weak rule of law to protect themselves from the impact of climate change. Of course, this trend is not special to Thailand or Southeast Asia, but may be more pronounced because of the exceptional power of these elite coalitions and the weakness of the democratic mechanisms for opposing them.

Popular politics in Southeast Asia are still in their infancy. In several more advanced countries, the development of the mass participation, political parties and civil society seen today took several centuries. In Southeast Asia, the parallel process is only around two generations deep. The pace of economic change over these two generations has been so fast and disorienting that the nascent political systems tend to be unstable and prone to authoritarianism. Of course, politics in advanced countries are often vulnerable to elite capture or swayed by ideology and misinformation, but there is generally more space for debate.

Because the currently dominant elite have this attitude to climate issues, Southeast Asia has had very little presence in the global movement to manage the impact of climate change. This should not be. Those who can make a difference are those in the younger generations who will have to live with the impact. They have a tough task ahead. They will need to strengthen the democratic processes which give a larger portion of the population access to the power needed to bring about change. They will need to ally across national boundaries to maximize their strength.

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In 2019, at a pan-Asian conference on "Heritage Protection: The Asian Experience" held in Bangkok, activists, academics, practitioners and a highly engaged audience explored the experience of protecting cultural heritage within the Asian socio-cultural and political context. This event showed there was a wealth of local wisdom in the region to pursue Asia's own vision of cultural heritage protection, but presently no organization for this role. Several civil society bodies joined together as the Southeast Asian Cultural Heritage Alliance, or SEACHA, to develop indigenous Asian concepts of cultural heritage protection, and to initiate programs of protection in the region. SEACHA was registered as a cultural non-profit association under Thailand's law in 2021.

The founding members are: the Indonesian Heritage Trust; Yangon Heritage Trust; Penang Heritage Trust; The Heritage Conservation Society, Philippines; The Siam Society Under Royal Patronage; Center for Research and Promotion of Cultural Heritage of Vietnam; Mulberries, Lao PDR; and Singapore Heritage Society.

SEACHA aims to promote effective government-community partnership in cultural heritage management, to strengthen the ASEAN socio-cultural community as a people-centered third pillar of ASEAN, to serve as a networking forum between ASEAN member organizations, and to become an entity associated with ASEAN governments and the ASEAN secretariat. Its regular activities include a monthly online talk called "Cha-Time with SEACHA", an annual Cultural Heritage Management Clinic, and biennial conferences. SEACHA focuses on promoting culture as one of the significant tools and solutions for mitigation and adaptation of climate change.

The SEACHA logo, inspired by the basketweaving skills that are part of the cultural heritage found across the region, presents SEACHA as the hub of creative collaboration among partners in safeguarding Southeast Asian cultural heritage.

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