Landscape Architecture without Landscape Architects: Exploring CHANS in the Sacred Shadow Conservation Network

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In millennia to come, the present paleontological period of the Anthropocene will be remembered as the time when man's vast influence triggered the sixth great extinction.[1] Almost twenty years has passed since Richard Leakey published his controversial claims on conservation and species loss,[2] disproving Darwin's belief that extinction only happened slowly.[3]

In that time we have witnessed the global expansion of the American Conservation model, now practiced worldwide as the International Protected Area Movement, which is proving inadequate to stem these losses.[4] Indeed it has led to the displacement of millions of conservation refugees, most of whom are indigenous peoples removed from their traditional homelands.

But there is an alternative approach, which is the topic explored in this chapter. A global complex of largely unrecognized sacred natural sites forms a shadow conservation network of the world's oldest conserved lands[5]. In these shadows, sacred cosmological diagrams sanctified by taboo, protect the lands that produce the richest ecological services. Magic rites, rituals and ceremonies, such as the recent wrapping of the Mount Batur volcano in Bali, are ancient repetitive practices carried out by shamans to revise accumulated ecological knowledge and revalue natural environs. The shaman's role is essentially as ecosystem manager for eco-dwellers who are solely dependent upon increasingly biological diversity for survival. The overlap of sacred indigenous territories and the world's biodiversity hotspots was discovered in mappings that emerged after the Millennium Ecosystem Assessment[6]. This discovery changed the field of Conservation Biology, acknowledging indigenous peoples as critical inhabitants of the ecosystems that conservationists were so anxious to protect[7].

Our discordant engagement with the natural world harks back to the period of Enlightenment, when a certain view of the Western world was formulated.

1

Figure 1: In October of 2012, a white cloth was wrapped 17 kilometres around the circumference of the sacred Mt Batur volcano in a sacred rite called peng-ider-an, in fulfillment of an ancient vow. According to anthropologist Steve Lansing (personal communication), the ceremony was performed by fueding royal descendants of a famous 18th century Balinese king, Gusti Panji Sakti, whose unfulfilled promise to the Goddess of the Lake was recalled by a royal priest in a trance. The quarrelling families joined accompanied by thousands of supporters who helped encircle the volcano with white cloth. Later, newspapers reported that the political strife among his descendants appeared to have ended. Photo credit: Steve Lansing

Its exclusivity over a great diversity of worldviews and their traditional knowledge and innovations, has left Western civilization with its present predicament of limited innovative prescriptions[8].

Akin to the western ecosystem approach, ancient conservation models, which are most commonly watershed-based units, have existed in several Indigenous Amerindian, European, and Asian cultures for millennia. The Hawaiian ahupua'a is a typically wedge-shaped watershed-based conservation unit composed of functionally integrated zones.[9] Encompassing entire valleys and stretching from mountain peaks to coastal waters, ahupua'a include forested watershed conservation uplands, integrated upland farming and coastal aquacultures, which are fringed by vegetated wind and storm surge barriers. These sacred watersheds were protected by generations of kings and shamans through knowledge passed on as ancient cosmological guidelines.[10] Here, the practice of habitat protection is intrinsically linked to the spiritual realm and unique worldviews, shaping attitudes towards environmental ethics and ecological engagement.[11]

In the mid-twentieth century, Bernard Rudofsky recognized these as the 'unfamiliar non-pedigreed world of architecture' and warned that our contemporary discourse had overlooked the vernacular and the breadth of indigenous infrastructures that in isolation remained unexplored.[12] In ancient landscapes, indigenous peoples have proven to be the catalyst for maintaining ecological richness. Through a multi-various range of subtle practices resulting from continuous human interactions with natural systems, unique and inseparable organizational, spatial and temporal couplings have emerged. This variety of complex self-organizing systems and the indigenous infrastructures they constructed are documented in a sub-field of human ecology called Traditional Ecological Knowledge (TEK)[13] and are coupled with human-nature systems or CHANS.[14] From the less explored sacred territories described by Margaret Mead as the anthropological 'other', these indigenous infrastructures offer living examples of innovation for ecological co-existence.[15] Since the cultural argument for the design of biodiverse landscapes is still emerging in an era dominated by the ecosystem approach to design, untangling the complexities of these CHANS reveals much.[16]

As the father of Biodiversity Edward O. Wilson suggests, the only case for human survival and the most important challenge for the twenty-first century, will be to drag through this bottleneck period the greatest diversity of species possible.[17] As designers, our role in this is three-fold: firstly, to preserve and restore the functionality of our remaining intact ecosystems; secondly, to protect species trait diversity and thirdly, to design replicable models for contemporary coupled human-nature systems. In light of Wilson's proclamation, the importance of protecting our biologically rich cultural landscapes through the translation of TEK into contemporary practice becomes paramount.

Hollings' (1973) concept of ecological resilience largely depends on species trait diversity for continued adaptation in response to cycles of change, cyclical seasonal fluctuations and unexpected extraordinary events.[18] All forms of life, whether animal or human, cause disturbance to an ecosystem. In the savannah, a night time foraging parade of elephants

will leave a signature path of fallen trees, maintaining the vast grasslands. In search of the most succulent leaves, elephants use their immense strength to overturn mature specimens, snapping even the thickest trunks in half. Without this natural reversal of forest succession the savannah would quickly transform to forest and the critical herbivore habitat would be lost. The role of the elephant in maintaining the grassland ecosystem and the dependence of so many other species upon their nightly foraging activity signifies them as the savannahs '*biological keystone species*'. Thus, the effect on their environment that is disproportionately larger than their relative abundance has clear translations to the role humans play as ecosystem managers.

INDIGENOUS INFRASTRUCTURES: APPROPRIATING TEK AND CHANS

Like the forestry techniques of elephants, native peoples have been maintaining grassland ecosystems using fire for millennia. The Mardu people of Western Australia continue to hunt, gather and manage their landscape with fire as their 'keystone disturbance agent', cultivating a mode of life that began in the Pleistocene.[19] Throughout the Americas, pyro-technology in combination with shifting cultivation is still practiced by the Bora of the Amazon, the Ralamuli of New Mexico and many First Nation peoples of British Columbia, Alberta and Ontario.[20] To the Anishnaabe people from the shores of Shoal Lake in North-western Ontario, Ishkote or the ritualized 'action of burning' by both man or lightning refers to certain spatial and temporal dimensions of knowledge related to the use of fire and are overseen by the sacred Thunderbird. *Beenesay Eshkotay* and *Pishashkooseewuhseekaag* are the marsh fires lit over a few short weeks in early Spring. They are signalled by the ice on the lakes beginning to break while the ground remains frozen or by a change in the color of the ice from cloudy to clear.[21] The burning clears old grasses, stimulates the growth of blackberry patches and encourages new growth along with the movement of wind, reducing mosquito infestation while also providing habitat and building materials.

With the topic of innovation in material technologies at the forefront of design discourse for the last decade, this discovery places distinct importance upon sacred lands and the TEK therein of our ecosystem dwellers.[22] The innovations emerging from the study of CHANS are, in Le Corbusier's terms, primitive infrastructures that use local materials and maintain local techniques.[23] Their survival is dependent upon syncing with natural cycles and biophysical processes. This has involved our ecosystem dwellers accumulating knowledge to choreograph multiple species symbiosis and adaptive management techniques in response to complex ecosystem dynamics in non-equilibrium systems. The suggested migration of these systems and the knowledge they have accumulated to similar global biomes emerges from Berkes's (2012) research that evidences the similarity of eco-adaptations shared by distant cultures that inhabit comparably similar ecosystems. And while basic designs are similar the modes of operation are remarkably diverse, based on endemism and exploitation-control mechanisms that are fine-tuned to local environments. For example in the semi-arid herding areas of the Turkana as compared to the Gabra, the mechanisms of rotation and migration are unique, and in reef and lagoon environs, like the artificial reefs of the Tofinu, the mix of exploitation-control mechanisms are fine-tuned to the local environment.[24]

2

Figure 2: The Subak is one of the oldest known and most biodiverse agrarian systems in existence. When they are flooded in moonlight, the reflecting planes of the rice terraces resemble a multi-faceted diamond. Photo credit: Steve Lansing

ENDNOTES

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Being primarily an agricultural civilization, the Tofinu adapted terrestrial practices to their new lacustrine environment and developed the acadja fish farming paddocks. Ganvie is a now a completely sustainable community organized by a canal system for dugout canoe transportation and small-scale fish farming. The acadja is a highly controlled artificial reef forming plots that radiate from village. The reefs are constructed by embedding branches and saplings cut from the coastal mangrove forests into the shallow, muddy floor of the lagoon. A large net creates a perimeter around the artificial mangrove island trapping large fish within the farm while the rotting wood acts as a catalyst for algae growth, insect aggregation, avian feeding, and fish breeding, attracting mangrove ecology to the highly controlled island condition. The morphology of the pens responds to the flow of water with spiral pens located in turbid waters at the river mouth and square pens in the lake's central calmer waters.[25] The opportunistic migration of the artificial reefs innovation of the Tofinu located in the Tropical and Subtropical Grasslands and Shrublands biomes is explored in the Subak Cultural Landscapes of Bali.

SUBAK LANDSCAPES OF BALI

On a mountainous island of the Indonesian archipelago, the combined forces of tourism and globalization are threatening one of the world's oldest CHANS. An opportunity exists to test the migration hypothesis of indigenous infrastructures and explore an alternative conservation model informed by TEK and sacred cosmology. A replicable prototype for robust world heritage conservation will emerge through the coupled re-activation of cultural and biological diversity. The conservation model for the Tri Kita Kirana Cultural Landscape of Subaks and Water Temples of Bali UNESCO World Heritage, which includes 19,500 ha of sacred rice terraces is a launching point for clarifying the cultural argument for ecological design.

Traditional rice paddies like Bali's subaks are the most biodiverse and productive agrarian systems in the world, requiring no pesticides or fertilizers.[26] The local cycles of nutrient dispersal and seasonal precipitation are cleverly adapted into the subak system. The Balinese Subaks are self-governing associations of farmers who share irrigation water originates from a common source, such as a weir, spring or irrigation canal, and coordinates their planting schedules by means of calendrical rites in water temples.

In the 1980s, the introduction of massive quantities of pesticide wrought havoc on the ecology of the rice paddies, and subsequently the expansion of the tourist industry triggered uncontrollable commercial development, aquifer privatization, water shortages and pollution resulting from sewerage and illegal solid waste disposal. Previously, the nutrient-rich volcanic soils combined with microbial nitrogen fixation and traditional harvest methods meant that farmers growing traditional slow-maturing rice varieties could escape the need to fertilize their rice paddies. In addition, the synchronization of irrigation was used to reduce losses caused by rice pests like rats, insects and insect-borne diseases. [Lansing 2001: 383-390] In response, the Balinese requested World Heritage status for the cultural landscape of subaks and water temples, which was granted by UNESCO in June 2012. However, with over a million foreign visitors each year, Bali is in danger of being loved to death.

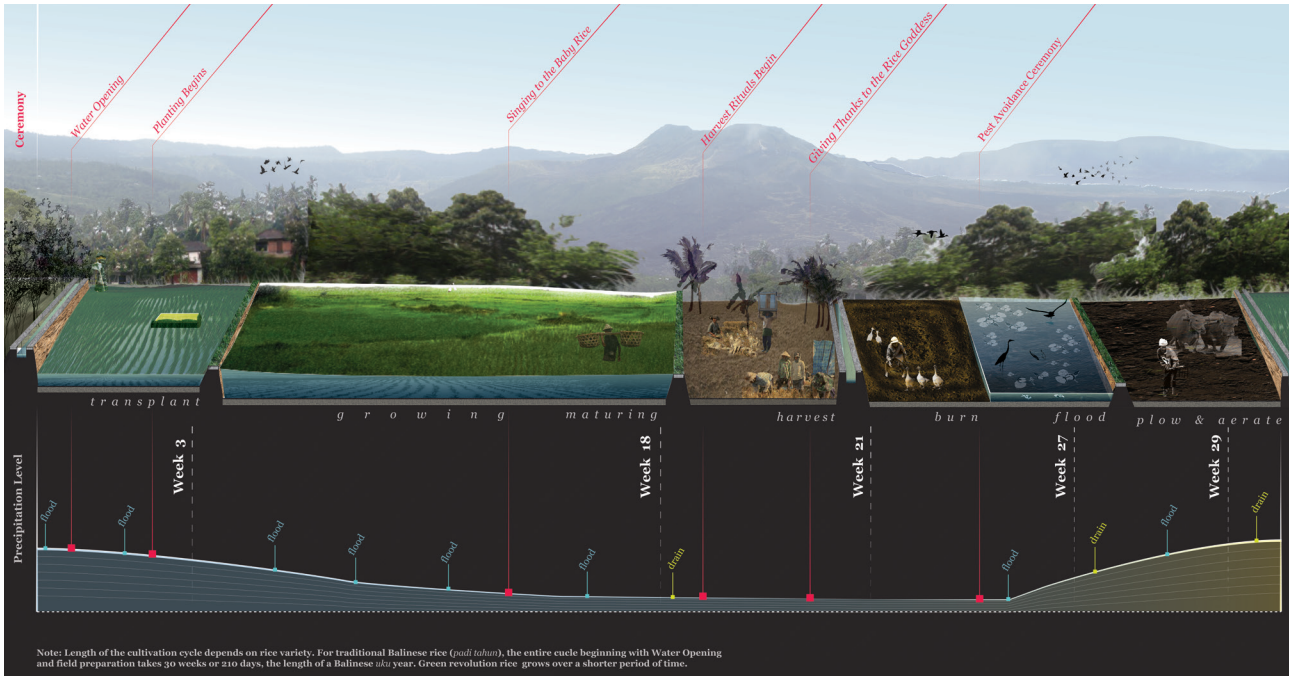

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Figure 3: The 180 day rice growing cycle has been adapted over millennia. Balinese life is completely intertwined with the growing of rice and its seasonal cycles. Illustration credit: Christianna Bennett

The new bio-cultural model for world heritage conservation proposes regional retrofitting of existing socio-ecological systems and tourist infrastructures. Through the migration of eco-innovations will utilise local skills and materials and improve various environmental conditions within the subaks. Over approximately the past five years fish farms have been spreading rapidly in the lakes. Water quality improvements to the sacred volcanic lakes that have fertilized the terraced subak landscapes for thousands of years are proposed through the adaptation of the acadja fish paddocks of the Tofinu. New Balinese hybrids will be sited in three crater lakes contained within the borders of the World Heritage: Batur, Buyan and Tamblingan.[27]

COINCIDING COSMOLOGY AND ECOLOGY

Throughout the world, this interconnectedness of cosmology and ecology reverberates in many ancient landscapes as a continuous cycle maintaining sustainable co-existence. Here, the role of a designer is cultural and ecological adviser, similar to that of the shaman acting as an ecosystem manager. Unravelling the complexities of our CHANS, still shrouded in mystery and bound by taboo, hidden in the shadow conservation network of sacred natural sites, will reform our engagement with the world and re-determine the level of creative co-existence. The language of ecology pervasive across many disciplines, has yet to spatialize, so the consequences of contemporary theories and practices it inspires, remains unknown. For designers, the environmental impact of this rhetoric can be observed in the lands of our ecological dwellers. Its exhibition lies in the shadows of the anthropological landscapes of the 'other', and consequently in the sacred indigenous lands we have afforded our least priority to protect.

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