



The impact of conservation and land use transitions on the livelihoods of indigenous peoples: A narrative review of the northern Thai highlands

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ABSTRACT

Ecosystem conservation has moved to the centre of global development agendas in light of an unprecedented acceleration of environmental degradation, species extinction, and catastrophic weather events. Global and national conservation policies with seemingly laudable aspirations, however, have been widely instrumentalised and distorted – leading researchers to argue that the very tools to safeguard natural spaces feed consistently into a market-oriented agricultural production and modernisation agenda. Indigenous peoples who continue to inhabit protected spaces as their ancestral lands have systematically suffered in this process. We conducted a place-based narrative literature review to formulate a consistent agenda for the next generation of conservation research and policy to help overcome this persistent challenge, drawing on the extensive and interdisciplinary research literature of the northern Thai highlands published until 2021.

The place-based narrative review traced gradual contextual change, inconsistent policy directions, and perverse incentives that have created a systemic challenge to ecosystem conservation. Key research gaps are the under-appreciated symbolic and affective dimensions of evolving tropical landscapes at the interface of Indigeneity, conservation, and development. Our proposed research agenda involves the synergistic combination of tools of human security, everyday environmental heritage, activity spaces, and behavioural design to understand these experiential dimensions of conservation from the perspective of Indigenous peoples, their active role as security contributors, pathways to impact, and new models of policy making. Suggested policy responses revolve around comprehensive domains of action (instead of isolated interventions) to overcome the systemic and contextual challenges affecting Indigenous livelihoods.

1. Introduction

Catastrophic forecasts of biodiversity loss have pressured world leaders at COP26 (Glasgow) and COP15 (Montreal) to combat the large-scale loss of biodiversity in an effort to retain the viability of environmental and societal functioning globally. The renewed commitments are encouraging, and the global conservation policy discourse has gradually become more diversified as it increasingly recognises not only vulnerability but also the central role of Indigenous peoples in ecosystem conservation (United Nations, 2021a, 2021b).

However, laudable aspirations underlying the conservation agenda have been widely instrumentalised and distorted by political action.

Indigenous peoples who inhabit protected spaces as their ancestral lands have systematically suffered in this process, being often criminalised and “at highest risk of dispossession, displacement, resettlement, or even forced eviction” (Erni, 2015; Linh et al., 2021:25; Locke et al., 2021; Nellemann et al., 2016; Yasmi et al., 2017). A recent report by the United Nations Environment Programme and Interpol considered for instance that “poverty” caused by land insecurity and lack of livelihood options drives “crimes” such as bushmeat poaching – which in turn necessitates “coordination, enforcement and prosecution in the sector of environmental crimes” (Nellemann et al., 2016:75). Even where Indigenous communities are considered conducive to environmental protection, international agencies frame them patronisingly as needing to be

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“encourage[d]” and requiring “incentive mechanism[s]” to protect natural resources and to actively “involve” them in resource governance (Yasmi et al., 2017:xi-xii,54).

We therefore confront a global challenge in which persistent omissions and contradictions in ecosystem conservation threaten to undermine Indigenous lives and conservation progress itself. Research activity on this topic has been lively and extensive (Apostolopoulou et al., 2021; Dawson et al., 2021; Fa et al., 2020; Garnett et al., 2018; Hayward et al., 2021; Linh et al., 2021; Muthee et al., 2022), but an integrative agenda for the next generation of conservation research policy still requires a place-based review that can understand *interlinked* systemic and distributional issues of conservation policy within one specific context. Our review of the conservation and land use literature from northern Thailand responds to this need.

We build on opportunities afforded by the rich research landscape of the Greater Mekong Subregion (Evrard and Leepreecha, 2013; Hayward et al., 2021; Linh et al., 2021). Indigenous peoples in Thailand have received particular attention in this literature owing to perceptions of their “vulnerability and disadvantage to environmental changes” (Leepreecha, 2019; Linh et al., 2021:22). Across Thailand, 18.6% of lands with a total area exceeding 100,000 km² areas are now officially “protected” (UNEP-WCMC, 2021) – an area that is in absolute terms several orders of magnitude larger than that of any other country in the Greater Mekong Subregion (Yasmi et al., 2017). At the same time, ethnic struggle and tensions between conservation and development have been salient issues for decades, peaking since the 2014 military coup (Hirsch, 2020). In this conflict-prone conservation environment, the guiding question for our review was, *What have been the experiences of forest conservation policy and other land use changes for Indigenous communities in the northern Thai highlands?*

Our literature review sourced material from the Mekong Land Research Forum bibliography (Mekong Land Research Forum, 2022), local research partners and Chiang Mai University library (a regional research hub), and scholarly database searches with broad geographical search terms (e.g. “North[ern] Thailand” and “Chiang Mai,” filtered

subsequently by conservation, land-related, or Indigenous livelihood subjects). Following the review of titles, abstracts, and full-texts, 141 sources until 2021 were included, spanning policy documents, statistical sources, reports, peer-reviewed publications, edited volumes, monographs, and dissertations. The selection criteria were irrespective of the research methods employed in the publications and included (a) relevance to northern Thailand and (b) relevance to any of the three topics of Indigenous livelihood, highland land use, or forest conservation (i.e. also publications solely focused on land use or conservation were included to contextualise the study broadly). A thematic synthesis led by MJH (with MS, PL, and TWC, and reviewed by IV and EA) identified and linked key themes with a bearing on the lived experiences, land use, and livelihoods of Indigenous peoples in northern Thailand who have been exposed to conservation policy and other contextual changes (Wong et al., 2013) – illustrated in Fig. 1. To strengthen the emerging thematic framework, we actively challenged our interpretations through counterexamples with view towards the disciplinary diversity of the literature (e.g. interpretations of livelihood strategies, or tensions between Western scientific positions on forest conservation versus Indigenous people's realities versus unorthodox analyses of agroecological practice; see Wong et al., 2013, on methodological aspects of counter-examples in reviews). The ensuing “narrative” guided our formulation of future research directions, which we trialled through pilot research (reported elsewhere as empirical studies) in northern Thailand with subject experts in the domains of human security (TWC), cultural studies (EA), behavioural science (IV), and development studies (MJH/PL/MS).

2. Stages of land use transition in northern Thailand

2.1. Pre-1980s: Self-sufficiency

The scholarship from northern Thailand covers three broad periods in living memory, starting with the post-WWII period, when the main economic forms of land use in the northern highlands involved subsistence rice, maize for animal fodder, and opium as cash crop. Rotational

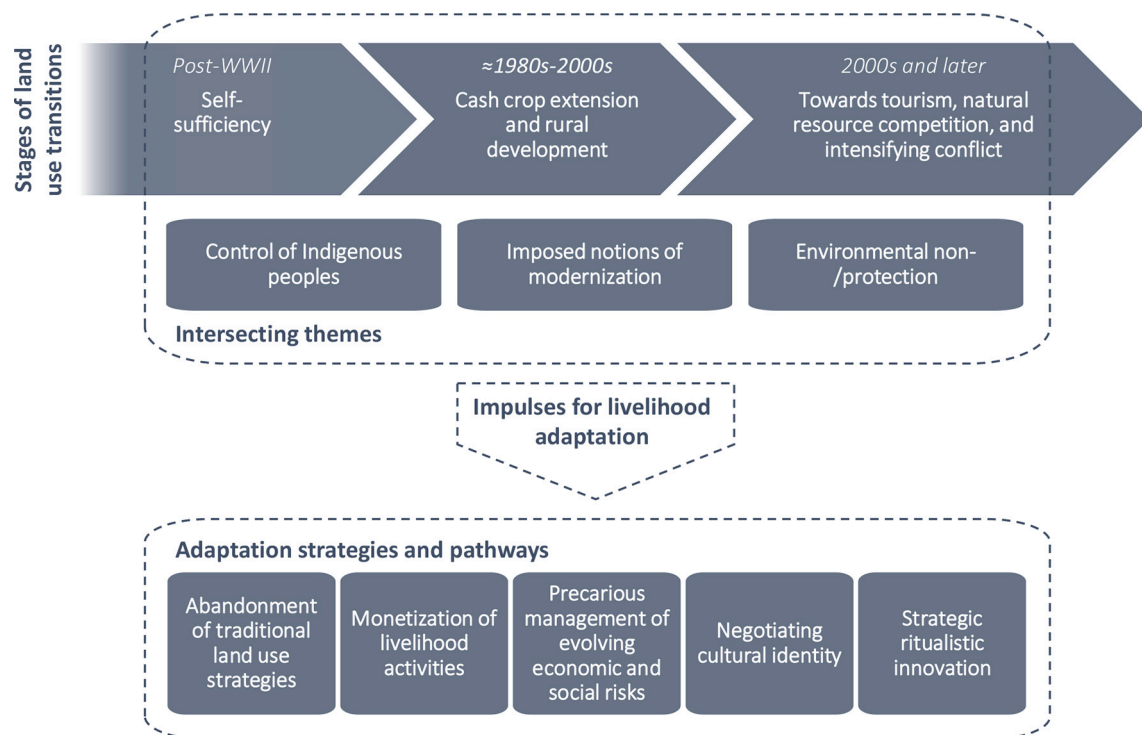


Fig. 1. Overview of key themes in the narrative review.
Source: Authors.

agriculture (i.e. the cyclically shifting cultivation of several plots of land with fallow periods of several years in between) dominated this cultivation with low-input production that, however, waned in the transition towards rural modernisation and intensive cash cropping in the 1970s (Vaddhanaphuti, 2005). The agricultural production systems also depended largely on family labour and labour exchange with relatives, and livelihoods across community members were highly interdependent (Kunstadter and Chapman, 1978; Sato, 2000).

The changing local and geopolitical environment drove this transition, and with it the face of the northern Thai highlands (Sturgeon et al., 2013). Pressure from United Nations agencies and Western governments for instance led the Thai government to officially ban opium trading and smoking in 1958 (Renard, 2001). Parallel state-led persecution of alleged Communism sympathisers during the Vietnam War and Cold War – who were suspected to comprise members of Indigenous communities in the highlands – then entailed uncompensated displacement from, securitisation of, and land use shifts within highland areas (Ghimire, 1994; Hearn, 1974).

These conditions coincided with a policy shift from ensuring national security to the transformation and modernisation of rural areas. This policy paradigm did not only promote infrastructure investments and agricultural intensification with the support from international development organisations such as UNDP or the locally important Royal Development Project founded in 1969 (Harada, 2018; Renard, 2001). A key feature of the modernisation discourse was also the state's portrayal of highland Indigenous peoples as “destroyers of the rich natural resources of the country, opium cultivators, and recent migrants lacking consciousness as Thai citizens” to assert control over highland areas (Hayami, 1997:563), which reflected on a fundamental government stance to assimilate highland dwellers (Renard, 2001; Vaddhanaphuti, 2005).

The early stages of forest management during this period therefore saw land inhabited by highland Indigenous groups as being declared as off limits; Previous residents were now considered encroachers and enforcement of this stance gradually became stricter towards the 1970s and 1980s. Initially, the focus on national security and nation building as well as resource shortages and overlapping mandates of government agencies for forest conservation meant that control of the forests and the regulation of villagers' land and environment were enforced only weakly (Vaddhanaphuti, 2005). However, widespread relocation of highland groups to lowland areas proceeded often with little or no adequate compensation for the productive lands from which they were removed (Ghimire, 1994). The relocation and concentration of villagers in response to national security concerns combined with restrictive land use regulations artificially accentuated population pressure on available land even further (Erni, 2015; Phongchiewboon et al., 2020).

2.2. 1980s–2000s: cash crop extension and “development”

A neoliberal and market-oriented development period ensued that emulated the global development *Zeitgeist*: an expansion of access to debt for agricultural investment through state agencies and commercial banks, cash crop production for export (e.g. soybeans), a shift towards off-farm wage employment, and accentuated labour migration (Erni and Nikornuaychai, 2015; Johnson and Forsyth, 2002; Stiglitz, 1996; Sturgeon et al., 2013). Environmental legislation and the expansion of forest conservation, national park, and wildlife sanctuary areas during this period resonated strongly with this development discourse while blaming the so-called “hill tribe problem” for mounting environmental disaster (FAO, 2009; Ingalls et al., 2018; Roth, 2004; Virapongse, 2017).

The subsequent cultivation restrictions – facilitated by large-scale state efforts to survey, map, and classify forest areas – meant that remaining land had to be used more intensively (machinised cash and mono cropping with chemical and fertiliser use and other debt-financed working capital requirements, Kanazawa et al., 2006; Siriphon, 2006; Walker, 2003), and permanent cultivation was required to prevent forest

protection authorities from re-claiming community lands (Delang, 2002; Phongchiewboon et al., 2020). Cash crop production involving especially maize, cabbage, soybeans, and fruit orchards accelerated in response (Samata, 2003; Vanwambeke et al., 2007). Yet, the shift from rotational agriculture to land-intensive cultivation also required the increased use of machinery, chemicals, and water as production inputs (Riwthong et al., 2015; Siriphon, 2006; Walker, 2003).¹ The socio-economic upshot of the expanding cash crop production were new divisions between “rich” and “poor,” new livelihood risks caused by indebtedness, and unprecedented exposure to agricultural product and input markets (Hayami, 1997; Phomma et al., 2019; Riwthong et al., 2017; Vanwambeke et al., 2007).² But also the ideological struggle became more salient: While villagers continued to apply beliefs and rituals to preserve the forest, fluid claims over land nevertheless produced conflicts between highland farmers and foresters (Delang, 2002; Sato, 2000).

Perhaps not surprisingly, the intensification of conservation efforts led to visible community resistance through local and regional protest movements, which was enabled by a global context in which non-governmental organisations (NGOs) proliferated in the 1980s (Hayami, 1997; Sturgeon et al., 2013; Tomforde, 2003). The shifting landscape of global and local development actors would also gradually provide a platform for Indigenous peoples to assert their rights and identities (Leepreecha, 2019). One example of the change in discourse was a shift away from fundamental debates of whether or not highland Indigenous peoples could legitimately inhabit forest areas, towards more technical questions of how this habitation ought to be managed (Isager and Ivarsson, 2002).

2.3. 2000s onwards: tourism, natural resource scarcity and competition

The 2000s witnessed continued agricultural intensification especially for field and permanent crops, para rubber, and vegetables, but also an expansion into coffee and flowers as a growing urban demand met highland Indigenous entrepreneurship (NSO, 2019; Phongchiewboon et al., 2020; Riwthong et al., 2015). Ironically, however, the very state-led measures leading to the adoption of cash cropping as economic survival strategy in the 1980s were now being framed as environmentally detrimental and created impulses for mixed-crop cultivation and rapid uptake of organic production methods (Sapkota et al., 2021; Sitthisuntikul et al., 2018). Another vent for the concerns around agricultural sustainability was tourism (e.g. villagers converting agricultural plots into resorts; Evrard and Leepreecha, 2009; Leepreecha, 2016), which, too, reproduced contradictions between protecting the environment and catering to markets, and fuelled tensions between highland communities and state authorities who started threatening to demolish resorts and relocate villages in the name of forest conservation (Yodelis, 2013).

New constellations of civil society advocates, rural-urban linkages, and interdependencies with private businesses also created a more pluralistic and contested political space (Ingalls et al., 2018; Wittayapak and Baird, 2018). Especially Thailand's civil society movements have evolved as a strong force in conservation, in the more general protection of land security and Indigenous rights, and in countering assimilation trends by helping assert Indigenous peoples' cultural uniqueness

¹ The 2013 Agricultural Census reported 1.7 m tonnes of inorganic fertiliser use across 28.7 m rai (4.6 m ha) of farmland in the Northern region, which corresponds to 59.5 kg/rai or 372.1 kg/ha of inorganic fertiliser use and constitutes an increase of 88.3% since 1993 (NSO, 2004, 2014). Latest available data from 2018 suggests that 47.1% of all crop-cultivating holdings in the North used only inorganic fertiliser and 84.5% use it at least partly; and 77.8% used chemical pesticides (NSO, 2019).

² Household debt stood at 60% of annual income at the end of this period (2002 – earliest available data from NSO, 2021).

(Wittayapak, 2008). However, recent changes in the political climate have revived the state's militaristic stance and now threaten livelihood security as they criminalise agricultural as well as non-agricultural land uses in the highlands. Under the guise of conservation, renewed repression of minority groups ensued, coarsened the discourse and state attitude towards the lands of Indigenous peoples, and a new programme to “reclaim the forest” has provoked expropriation and violence towards forest dwellers across Thailand (Ayuttacorn, 2019; Hirsch, 2020; Pawakapan, 2017).

An important parallel development to the state-centred restrictions of forest use had been a countermovement towards community-led forest management so as to assert more local control over the governance of land. A community forestry bill proposed to this end in the 1990s had, after a long development process that reached into the 2010s, eventually dissipated (Wittayapak and Baird, 2018). Although the proposal evolved into a movement for community land tenure, the lengthy and draining process met increasing consternation among the people lobbying for it (Virapongse, 2017; Wittayapak and Baird, 2018). In the so far latest iteration of communal land rights, the government has again pushed back against recognising community land use that predated the national parks, offering highland ethnic groups instead official yet temporary use rights for 30 years against a nominal tax (Wittayapak and Baird, 2018). The number of community forests in Thailand has meanwhile informally grown to 11,866 nationwide in 2019, but only 1533 were officially recognised by the *Community Forest Act* and therefore only offer a nominal mechanism to involve communities (RFD, 2021).

3. Intersecting themes in highland land use transitions

3.1. Control of indigenous peoples

The literature recognises population control as a central problem in the Thai conservation policy discourse, wherein the state asserts for instance control over people and their land in the context of nation building (Ghimire, 1994; Isager and Ivarsson, 2002; Leblond, 2010). In the particularly diverse Thai highlands (Table 1), some Indigenous groups (often comprising several sub-groups) such as the Karen, Lua, H'tin, and Mlabri had often lived in their contemporary places for many generations, while others such as the Hmong, Yao, Lisu, Lahu, and Akha had just migrated from Southwestern China and neighbouring countries of Laos, Vietnam, and Burma during the past few generations spanning one to two centuries. In addition, mobility and migration patterns also changed during the review period. Prior to the cold war and the associated state-led relocation and displacement, movements across porous borders were common and highland Indigenous communities often were mobile within the highlands – moving villages in conjunction with agricultural practices, population growth, and changes in the natural environment. Land use regulation and forest conservation limited this degree of community mobility in the highlands and transformed it to individual patterns of migration (partly along family and clan lines) from rural to urban areas (Ayuttacorn, 2019). In addition, also cross-border mobility did not cease and a continuing influx of economic migrants as well as refugees (esp. from conflict-prone Myanmar) from Indigenous groups has characterised the post-Cold-War period with only a momentary freeze during the COVID-19 pandemic responses (Nillsuwan, 2023).

Indigenous peoples in Thailand had long been subject to discrimination that had depicted them as underdeveloped and stylised them as “others” (Leepreecha, 2019). According to the Thai national government, the so-called “hill tribe problems” that were portrayed especially since the 1960s included 1) a threat to national security due to Communist insurgency in the jungle, 2) opium cultivation among highland farmers, 3) deforestation due to shifting cultivation, and 4) poverty (Buruspat, 1985; Morton and Baird, 2019; Sakboon, 2007; Virapongse, 2017).

The Thai state had been capitalising on the discriminatory discourse to legitimate its control over highland populations via internal displacement, military intervention, and bureaucratic processes. Militarised forest management aided by national security offices and the 3rd Army Area involved crop destruction and substitution as well as community relocation to remove suspected Communist activists from highland forest areas into lowland areas that were easier for the state to monitor (Tungittiplakorn, 1998). When highland farmers had largely stopped growing opium in the mid-1980s, the state declared forest reserves, national parks, and wildlife sanctuaries over residential and cultivation areas (Ingalls et al., 2018; Wittayapak, 2008). Forest conservation in Thailand therefore fulfilled the same purpose as “green agendas that provide pretexts for eviction” (Hirsch, 2020:365).

The 2014 coup d'état has yet again brought military dominance to the fore. Only a few months after seizing power, the military government released a new forest policy through the *Master Plan for Solutions to Forest Resource Destruction, Invasion Into State Land and Sustainable Management of Natural Resources* (ISOC, 2014; Pawakapan, 2017). A hardened discourse towards highland forest dwellers, continued confrontational action, and the ongoing threat of evicting highlanders from their lands have become the hallmarks of the new conservational policy under military rule (Hirsch, 2020:374). At the same time, young leaders of these communities have been attempting to recast themselves as “Indigenous peoples,” and their rights and access to services had also been increasingly recognised internationally as well as nationally especially from the 2000s onwards (Baird et al., 2017; Hayami, 2006; Leepreecha, 2019; Morton and Baird, 2019).³

Note, however, that the state is not a unified and homogenous entity. While a discriminatory discourse towards Indigenous peoples has been pervasive, instances of inter-institutional disagreements abound as well. For example, Vandergeest and Peluso (1995) argued that the Ministry of Interior effectively legitimised the allegedly “illegal” forest residence of highland ethnic groups in the 1980s when it readily taxed their land, and Wataru (2020) recounted misalignment across various state agencies and local government administrations when it came to environmental protection versus the expansion of rubber plantations in northeast Thailand during the 2000s. Disagreements and conflicting interests were at times so far-ranging that they effectively stalled the implementation of the state's conservation agenda. The diverging interests and agendas of actors, organisations, or governmental branches therefore add further layers of complexity on the exposure of Indigenous peoples to state policies.

3.2. Imposed modernism

Although Thailand held a unique position as it has never been colonised, it still aligned with Western paradigms through geopolitical, regional, and national developments that distinctly shaped the local coevolution of rural development, Indigenous rights, and forest conservation. Western knowledge gained primacy in this process, the roots of which can be found in the late 19th Century: The Kingdom of Siam (which would in 1932 become Thailand) interacted closely with neighbouring colonial administrations, among others through King

³ While “Indigenous peoples” are still not fully formally recognised by the Thai state, the *The Indigenous World 2023* report summarises the progress as follows, Thailand is a signatory to the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on the Rights of the Child (CRC), the International Covenant on Civil and Political Rights (ICCPR), the International Convention on the Elimination of All Forms of Racial Discrimination (ICERD) and the Universal Declaration of Human Rights. It voted in support of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) but does not officially recognize the existence of Indigenous Peoples in the country. The Constitution 2016 section 70 refers to ‘Ethnic groups’. (IWGIA, 2023:291)

Table 1
Official highland population of Thailand in 2016.

Ethnic groups	Communities	Households	Persons		
			Male	Female	Total
1. Karen	1927	125,653	278,300	269,895	548,195
2. Lowlanders	662	61,839	110,617	106,790	217,407
3. Hmong	269	29,515	102,067	105,084	217,407
4. Lahu	452	23,167	57,941	58,185	116,126
5. Others	369	19,908	53,107	53,952	107,059
6. Akha	301	15,463	43,161	44,268	87,429
7. Lua	182	13,905	29,475	29,328	58,803
8. Mien	143	9256	24,605	24,277	48,882
9. Lisu	142	7961	17,639	17,983	35,622
10. Khamu	37	3224	6655	6439	13,094
11. H'tin	3	138	528	482	1010
12. Mlabri	2	50	162	195	357
Total	4489	310,079	724,257	716,878	1,441,135

Source: Department of Social Development and Welfare (2016:8).

Mongkut (Rama IV, 1851–1868), who was “greatly influenced by Western scientific knowledge” as he promoted the secularisation of politics, education, and everyday life (Tanabe and Keyes, 2002:8). His successor King Chulalongkorn (Rama V, 1868–1910) continued the pursuit of the modern nation state and acquired a reputation as reformer and moderniser (Ferrara, 2015). Geopolitical developments during the 20th Century, military alliances (e.g. during the Cold War), and economic integration into world markets led Thailand to continue absorbing Western knowledge and paradigms into its politics, society, and economy (Sopranzetti, 2017; Tanabe and Keyes, 2002).

Thailand's rural development agenda made Western influences particularly visible as it foregrounded the idea of (monetary) poverty eradication by integrating rural areas into markets and capitalising on their assets for production. However, this approach followed notions of “development” that were primarily held by Thai urban and political elites (Erni and Nikornuaychai, 2015; Harada, 2018; Tanabe and Keyes, 2002). Modernism and scientific knowledge also shaped Thailand's forest conservation policy from the outset: Britons held the position of director-general of the 1896 established Royal Forestry Department for the first 27 years of its operation, as a result of which “British India and Burma became the model for forestry in Thailand” (Vandergeest and Peluso, 1995:408). Inputs from Western experts then continued to shape national park regulations emerging in the 1960s (Roth, 2004), and the World Bank had a key influence on the 1993 *Thai Forestry Sector Master Plan* (Tomforde, 2003).

Rural development and Western scientific conservation approaches thus conspired to re-create distinctly Western conceptualisations that demark “civilised” human presence versus “wild” yet pristine natural spaces (Fletcher et al., 2021) – and that therefore at best look down upon and at worst criminalise non-mainstream livelihoods such as those led by highland Indigenous peoples (Hayami, 2006; Roth, 2004; Tungittiaplakorn, 1998; Wittayapak and Baird, 2018). For example, while rotational agriculture was being banned as environmentally destructive, the state permitted land- and input-intensive agriculture that was commonly practised in the lowlands, and it kept comparatively relaxed terms with private-sector companies engaging in agriculture and timber production at industrial scales (Ghimire, 1994; Johnson and Forsyth, 2002). In short, Western scientific knowledge and the modernisation paradigm created systematic forces towards – and became a conduit for – ethnic assimilation, neoliberal conservation, and market-based production.

3.3. Environmental non-/protection

A third theme in the land use transition of the northern Thai highlands is the emergence of counteracting forces that simultaneously protect and undermine the natural environment – which leave conservation policy in Thailand somewhat (1) misdirected, (2) unreliable, and

(3) contradictory (Luangaramsri, 2002).

A key event in this context was the establishment of the Royal Forestry Department in the late 19th Century (in what was then the Kingdom of Siam) to claim and manage lands in response to pressures from other colonial forces in the Greater Mekong Subregion (Hirsch, 1996; Vaddhanaphuti, 2005; Vandergeest and Peluso, 1995). Forests were subsequently claimed as property of the state through the 1913 *Forest Protection Act* (Lakanavichian, 2006), but the enforcement of this claim had been variable and fluid throughout subsequent history. Targets and their enforcement only gradually tightened as the conservation policies more acutely recognised issues of logging and forest deterioration.⁴ Concerns around logging sparked for instance formal numerical forest conservation targets of 15% of the total Thai land area under the 1985 *National Forest Policy*, which were expanded shortly thereafter to 25% and indeed exceeded as early as 1991 due to the rapid expansion of conservation areas (Lakanavichian, 2006). This expansion period was accompanied by enforcement through fines, arrests, and land expropriation (as opposed to the opium crop destruction that was commonly practised in the self-sufficiency period).

Firstly, these top-down conservation policy targets have focused on restoring forest cover at the expense of highlanders' livelihood priorities (Virapongse, 2017). Declaring nominal targets, realising them through the designation of protected areas, and validating success through seemingly scientific aerial and satellite imagery has exposed villagers to land grabs for areas that contain any kind of canopy that could be construed as “forest” – such as mixed crop plots or fallow fields (Lakanavichian, 2006; Roth, 2007; Virapongse, 2017). At the same time, the target-driven approach legitimated the creation of monoculture eucalyptus and pine plantations, which deprived villagers of customary building materials, food sources (nuts, animals), medicinal plants, grazing grounds for their cattle, and spiritual engagement with their accustomed ecosystem (Delang, 2002; Trakansuphakorn, 2008).⁵

Secondly, collusion has rendered state-led conservation efforts unreliable (Roth, 2004; Sato, 2000; Trakansuphakorn, 2008; Wittayapak, 2008). In a broader study of northern Thailand, Tungittiaplakorn (1998:78) argued for instance that, “well-connected commercial developers are usually given special treatments by the authorities” and

⁴ Key policy developments in the meantime were the *Forest Act*, B.E. 2484 (1941) to regulate forest extraction and clearing, the *National Park Act*, B.E. 2504 (1961) to govern the establishment of national parks, and the *National Forest Reserve Act*, B.E. 2507 (1964) focusing specifically on the National Reserved Forest (RFD, 2009:39).

⁵ According to official statistics from NSO, 2019, land use in the Northern region of Thailand in 2019 was structured as follows: 53% forest land, 31% agricultural land (incl. 4% of total land use attributable to fruit trees and perennial trees), and 16% non-agricultural (e.g. residential and industrial) land.

that, “being the group with the least power to circumvent the law, highlanders are often more affected by law enforcement than other groups.” Even seemingly well-intentioned environmental policies can under such circumstances undermine faith in authorities and the very objective of protecting natural resources, while also leaving affected communities confused and alienated.

Thirdly, contradictions in the conservation approach have created perverse incentives that could entail natural resource degradation and forest loss. The most visible instances relate to the replacement of Indigenous forest management techniques in pursuit of conservation, modernisation, and development, but at the expense of environmental and human wellbeing. Authors argue that this shift from traditional towards formal and state-sanctioned approaches has entailed the intensification of land use, reduced soil quality, accelerated the use of chemical production inputs, and undermined villagers' health (Bruun et al., 2017; Jiang et al., 2007; Kanazawa et al., 2006; Kunststadter et al., 2001; Riwthong et al., 2015). The impacts of the national conservation efforts are accordingly rather limited. Among others, Thailand has performed poorly on the Red List Index (which estimates the risk of mammals, birds, amphibians, corals, and cycads becoming extinct) – ranking 178 out of 244 countries in 2021, down from rank 169 in 2000 (United Nations Statistics Division, 2021).

4. Livelihood adaptation strategies

4.1. Responding to the land use transition

Considering the long-standing ethnic struggle and the co-evolution of conservation and development agendas in the northern Thai highlands, an immediate reaction to the wide-ranging declarations of protected areas in northern Thailand was that Indigenous residents often abandoned their homes and economic livelihood strategies (Phongchiewboon et al., 2020).⁶ Ayuttacorn (2019) reported for example how members of a Dara-ang community lost almost all their land and were effectively prevented from foraging in the forest as any such activity now required “report[ing] their activities to the village headman before entering the forest area since the [forest authorities] visit the village almost every day” (Ayuttacorn, 2019:32). The land use restrictions simultaneously offered a few new economic livelihood opportunities, for instance gatekeeping to retain some control of agricultural production and foraging (e.g. mushrooms) for local markets (Hirai, 2002; Roth, 2008; Virapongse, 2017). Supported by contextual developments such as mandatory formal (mainstream Thai) education, also outmigration has enabled younger generations to explore new livelihood opportunities that the evolving village economies could not provide in the short run (Erni and Nikornuaychai, 2015; Phongchiewboon, 2016).

The longer-term economic trend of livelihood adaptation involved income source expansion and diversification and labour outmigration. This has broadened and deepened the spectrum of economic activities across and within highland communities towards a mix of subsistence and input-intensive cash crop production, wage and white-collar employment, retail and trade, and tourism and hospitality business, and associated business services like marketing (Phongchiewboon, 2016; Riwthong et al., 2015; Trébuil et al., 2006; Virapongse, 2017). Such agricultural transitions have been covered extensively in the development literature, but they mask nuanced adaptations to land use change that a multidimensional examination of livelihoods (as described

in the following sections) helps reveal.

4.2. Coping in the capitalist rural economy

The transition of economic livelihoods has entailed a closer integration of villagers into formal markets and the monetisation of productive activities (Erni and Nikornuaychai, 2015; Phongchiewboon et al., 2020; Vanwambeke et al., 2007). However, what is described sometimes in an off-hand manner as “money-making strategies” (Dressler and Roth, 2011:858) has emerged as a prerequisite to the non-negotiable participation in the broader capitalist economy.

The growing cash income became necessary to support productive activities by purchasing fuel, fertiliser, and seeds, renting machinery, or hiring transportation and seasonal labour, but also to partake in the “modern” Thai society (Hirai, 2002) – affording for example the direct and indirect costs of education or healthcare that were hitherto provided on the community level, or being able to pay official fees and bribes to access government services such as birth certificates and identification documents that have become essential to obtain rights to the now privatised lands (Ayuttacorn, 2019; Phongchiewboon, 2016; Sakboon, 2007; Seo, 2020). Non-monetised activities such as foraging for food, firewood, or plants have simultaneously become either risky or altogether impractical in the increasingly regulated environment, requiring villagers to depend on markets or use agricultural land even for previously available natural goods (Phongchiewboon, 2016; Turner et al., 2013).

The process of adapting to these new livelihood strategies has been riddled with a complex and often inequitable interplay of experimentation and risk management – but not necessarily with antagonism by villagers. Some accounts highlighted for instance how Hmong communities enthusiastically explored production techniques like mixed cropping, readily expanded into tourism businesses, and pursued wage labour and urban employment without much hesitation (Delang, 2002; Siriphon, 2006; Tomforde, 2003). But experimentation with modern lifestyles and production techniques as an economic livelihood activity could over time crowd out and create an irreversible loss of local knowledge of sustainable cultivation techniques (Bruun et al., 2017; Samata, 2003; Trakansuphakorn, 2021; Tungtittiplakorn, 1998; Wityayapak, 2008). For example, Bruun et al. (2017:92) documented how the (politically and contextually driven) transition from traditional rotational agriculture to intensive maize cultivation in a northern Thai village entailed a “consistent negative trend in almost all of the investigated soil quality indicators as a result of continuous cultivation of maize.” A yet more immediate problem was that the ability to experiment, and to reap the fruits of experimentation, have been distributed unequally: While successful community members would gain ever more freedom to experiment with new production techniques while insulating themselves from market risks by diversifying their economic activity, “unsuccessful” experimentation would create an emerging class of landless and indebted villagers at the same time (Riwthong et al., 2017; Siriphon, 2006; Tungtittiplakorn, 1998; Youdelis, 2013). This could in turn undermine community cohesion, contribute to precarious livelihoods, and weaken villagers' ability to cope with economic risks.

4.3. Facing and managing risk

Risk and risk management practices in the cash economy are another major topic in the northern Thai literature, but the issue extends beyond simplistic economic notions of communities being more or less “comfortable with risk and change” (Dressler and Roth, 2011:858). Highland communities have had long histories of struggle with state authorities, lowland populations, and with production techniques that left them exposed to environmental forces – and have therefore been well acquainted with “risk” and “change” (Leblond, 2010; Linh et al., 2021; Trakansuphakorn, 2008; Tungtittiplakorn, 1998). Rather, villagers now needed to manage new economic and financial risks that they were

⁶ Although this is the consensus in the critical social science literature and is repeatedly demonstrated in individual case studies, comprehensive and dependable statistics on this point are notoriously elusive (see e.g. Leblond, 2019, who cites cases of land confiscation in northern Petchabun province from 1980 to 2010 totalling 18,651 ha). For illustration, in one community in our pilot research areas in Chiang Mai province, the government gradually seized the farming area over the past 40 years, reducing it thus from 640 ha to 448 ha.

not previously exposed to, and this has become ever more difficult due to the ageing of farm households and a widespread loss of land and livestock (Attavanich et al., 2019; Jiang et al., 2007; Phromma et al., 2019; Samata, 2003; Trébuil et al., 2006). Even successful cash crop producers have not been insulated from these issues as monocropping, monopoly power of agricultural buyers, and tectonic shifts of urban consumer demand for highland produce perpetuated their susceptibility to indebtedness and “poverty traps” (Attavanich et al., 2019:17; Delang, 2002; Dressler and Roth, 2011; Riwthong et al., 2017).

These risks also have important gender, cultural, and social dimensions. The intensification of cash crop cultivation and off-farm income generation had entailed a greater inclusion of women into formal economic activities, but the resources to experiment are unevenly distributed across women and men (Tungtittiplakorn, 1998; Youdelis, 2013). Likewise, the disappearance of livestock such as chicken, buffalo, and pigs may not only undermine ways of storing wealth and responding to crisis, but their important role in ritualistic activities (e.g. as sacrifices) also reduced communities' ability of meaning-making (e.g. making sense of identity, life, and the world) in times of transition and hardship (Evrard and Leepreecha, 2013; Huang and Sumrongthong, 2004; Phongchiewboon, 2016).

From a social perspective, risk management has become more individualised and household focused. In Nan province, Wittayapak and Baird (2018:325) described for example how the acceptance of the state's land tenure scheme left some villagers with the right to cultivate their existing lands legally and others without, which “created a rift within the community” and consequently undermined social cohesion.⁷ At the same time, rural-urban migration commonly described as “rural exodus” has led highland Indigenous peoples (especially the youth) to seek their future in cities, which has exposed them to sex work, violence, occupational hazards in factories, labour exploitation, or fundamental anxiety about their future outlook (Phongchiewboon, 2016; Podhisita, 2017:255; Theobald, 1996; Vaddhanaphuti, 2005). With waning solidarity networks across community members and the social obligation to support upland families with cash remittances, opportunities to actively manage (as opposed to “making do”) in these environments have been especially limited.

4.4. Negotiating identities with the state, with the public, and within

Despite such livelihood pressures, highland Indigenous peoples in Thailand have not been passive victims of external forces. Adaptability to and negotiation of external threats have underscored their agency and challenged the essentialising and primordial ethnic stereotypes that had been fabricated for decades. Highland communities have repeatedly formed networks, joined regional movements, and sought alliances to boost their bargaining power vis-à-vis the state. Villagers were also able to forge connections with officers who were supportive of their cause – for example, Royal Forestry Department officers who supported Indigenous education made informal concessions to local communities and actively limited the enforcement of official policies to grant villagers economic breathing space (Roth, 2007; Samata, 2003; Trakansuphakorn, 2008; Virapongse, 2017). The development and expansion of tourism has generated additional economic gravity and bargaining power for communities to withstand relocation pressure,⁸ and provided them with a platform to demonstrate the environmental dimensions of

Indigenous identity in negotiation with state agents (Evrard and Leepreecha, 2009; Youdelis, 2013).

Evolving Indigenous identities have been a central theme in this process – within their communities and in relation to the state and the broader public (Evrard and Leepreecha, 2009; Hayami, 2006; Youdelis, 2013). Communities catering to the tourist demand would thereby commonly experience pressure to conform with ethnic stereotyping, such as Karen communities presenting themselves in a nature-loving and conservationist “rice over money”-way even if they extensively engage in capitalist production (Evrard and Leepreecha, 2009; Youdelis, 2013:169). In other cases (within and beyond tourism), interactions with the state also prompted the negotiation of communities' identities among themselves (Isager and Ivarsson, 2002; Morton and Baird, 2019). In Karen villages studied by Hayami (2006) and Youdelis (2013), national parks would neglect cultural knowledge or impose stereotypes during eco-tourism campaigns, as a result of which “Karen knowledge is overwritten and loses its voice” (Hayami, 2006:405) and villagers even started internalising the criminalising state narratives such as that “rotational shifting [...] destroys nature and is no longer desirable” (Youdelis, 2013:166). Yet, in both these cases, villagers also strategically mobilised their identity to challenge the state and critique external representations of Indigenous peoples (Hayami, 1997, 2006).

4.5. Relating to land and natural space

A final key theme is communities' altered relationship to their environment. Forests served many purposes in the past, such as shifting cultivation, hunting, and residing, while also having ceremonial and spiritual importance for local communities. Evrard and Leepreecha (2013:26) described that “hunting or trapping an animal is therefore engaging in a relationship of exchange with these spirits [in the forest], which are considered literally as ‘owners’ of the game.” This complex character of forests has gradually changed with conservation policies. On the one hand, the administrative gaze of the government machinery and the private property regime of the modern capitalist economy have transformed forests into “national assets” and the surrounding land into commoditised and clearly demarked space for economic extraction (Hayami, 1997; Hirsch, 2020; Tomforde, 2003:356). This new definition of land makes traditional cultivation and spiritual engagement with protected spaces difficult or impossible (Roth, 2007). On the other hand, previously common livelihood activities are now deemed “illegal” (Ayuttacorn, 2019:32), fears of arrests and sanctions abound (Hayami, 1997; Phongchiewboon et al., 2020), and “one has to take too much risk just to be able to get in the forest,” as one of the research participants in Ghimire (1994:208) described. Forests have become a space associated with risk to physical safety.

These developments have provoked counter-reactions. Communities have asserted their relationship to the environment through established, revived, and new rituals that serve important social and strategic functions (Isager and Ivarsson, 2002; Morris, 2002). One example is the Hmong new year celebration, which Huang and Sumrongthong (2004:33) described as a “[site] of contestation over what should be preserved and what must be rejected in Hmong culture” while also enabling the community to display its interest in preserving the forest – which can serve a strategic function in negotiations over land claims with state actors (Hayami, 1997; Siriphon, 2006). The evolution of religious and symbolic practices to preserve the forest has also supported inter-ethnic relationships while ironically corresponding in parts to the historical Thai assimilation agenda (Isager and Ivarsson, 2002): as Morrow (2011:58) highlighted, the ordination (i.e. religious sanctification) of 50 million trees in celebration of the Golden Jubilee of the late King Rama IX was an “invented tradition” that built on Buddhist symbols and that was joined by Karen as well as Hmong highland communities. The cross-religious practice (where animist and Christian believers adopt Buddhist symbols) thereby did not only lead to the further evolution of this ritual (e.g. substituting Buddhist with Karen deities) but it

⁷ The scheme is referred to as KTC, the Romanised version of คทช and acronym of the 2019 *National Land Policy Board Act* that governs the land right scheme (original Thai name: พระราชบัญญัติคณะกรรมการนโยบายที่ดินแห่งชาติ พ.ศ. ๒๕๖๒). See Ministry of Natural Resources and Environment (2019) for details.

⁸ The slump in tourism during the pandemic had temporarily exposed the highland communities to higher vulnerability, but tourist inflows have rebounded strongly and to the communities' advantage.

also “allowed groups whose Thainess had fallen into question to perform tree ordinations in order to reassert their citizenship as Thais” (Morrow, 2011:58). Ritualistic practices such as tree ordination or the revival of Hmong new year celebrations have helped the villagers assert claims over space, redefine it from the bottom up, and draw a “symbolic” or “invisible” fence around a territory to shield it from external and internal threats – while maintaining continued spiritual links to their natural environment (Isager and Ivarsson, 2002:406; Phongchiewboon, 2016:121; Roth, 2007).

5. Discussion

5.1. Research directions for inclusive conservation policy

The gaps and questions in the literature can offer practical pointers for future research at the interface of Indigeneity, conservation, and development. We propose directions for tackling four of these open questions through effective yet under-utilised interdisciplinary analytical frameworks that open a consistent agenda for inclusive conservation research and policy:

1. **Human security:** How can we capture multi-dimensional threats to Indigenous people's lives comprehensively – without denying them agency and with acknowledgement of their affective dimensions?
2. **Ordinary (everyday) environmental heritage:** How can we integrate the pervasive non-economic and symbolic practices into analyses of livelihood adaptation in the context of conservation policy?
3. **Activity spaces:** How can we capture systemically the evolving relationships between Indigenous peoples, the state, and the natural space surrounding them?
4. **Behavioural design:** If past policies and interventions have reached their potential, can we use new mechanisms to devise effective and inclusive conservation policy?

5.1.1. Human security: reframing threats to lives and livelihood

The notion of “livelihood” has featured extensively in the land use and conservation literature in northern Thailand. The concept had gained popularity during the 1980s and 1990s (Bernstein et al., 1992; Hart, 1986) and culminated in the formulation of the Sustainable Livelihoods Framework (Bebbington, 1999; DFID, 1999; Scoones, 1998). This framing offers an open-ended and bottom-up analytical approach, multi-dimensional considerations of people's circumstances and life choices, context sensitivity, the potential to capture a range of practices that fall outside of “making money” – and it has been mobilised in studies of land use change and ecosystem conservation around the world (Fahad et al., 2022; Nasrnia and Ashktorab, 2021; Woyesa and Kumar, 2020). However, its usefulness to guide land use and conservation research has plateaued, partly owing to a disproportionate emphasis on “vulnerability,” lacking clarity about the nature and drivers of people's coping strategies, a focus on individuals and households, and an open-endedness that invites analysts to default into economic and income-based livelihood strategies (Jiang et al., 2007; Nguyen et al., 2017; Vanwambeke et al., 2007). The persistent focus on “making a living” and economic survival renders livelihood analyses prone to neglecting important aspects that our review highlighted: cultural survival, threats to dignity, symbolic practices, or personal experiences in the process of livelihood adaptation.

A promising analytical starting point that can incorporate these elements more effectively is the concept of human security. It arose in the mid-1990s through the United Nations Development Programme (UNDP, 1994) and has been mobilised as guideline and classification tool for international policy (Axworthy, 2001; Gjörv, 2018; Howe and Jang, 2013), as basis for normative evaluation (Alkire, 2003; Tadjbakhsh, 2014), as framework for situation assessments (Human Security Unit, 2009; Owen, 2014), and to guide open-ended analysis (Martin and

Kostovicova, 2014; Newman, 2001). Much value for studies of conservation impacts on Indigenous peoples resides in using human security as an analytical framework with a fundamental “anthropological concern for understanding how individual persons live” and, owing to variation across contexts and individuals, the opportunity to “listen to people's ‘voices’, their fears and perceptions” (Clover and Eriksen, 2009; Gasper, 2014:24). Such a bottom-up enquiry would in turn enable the analyst to⁹:

- Consider “human security” as a form of welfare that comprises the multidimensional concepts of dignity, livelihood, and survival.
- Problematised the short- and long-term forces (“threats”) that are militating against the attainment of human security.
- Be conscious of local contextual factors shaping the experience of “security” as well as international forces such as neoliberalism and human rights discourses.
- Respect human agency through a bottom-up approach that lets affected populations define the nature of threats, human security, and associated emotional and behavioural responses.

Conceptually, the notion of human security thereby links directly to research involving Indigenous peoples and their experiences of land use change and conservation: The looming and at times active conflict between Indigenous peoples and the state touches on typical human security topics of land grabs and land insecurity (Clover and Eriksen, 2009; Locke et al., 2021; Ogata and Cels, 2003), environmental threats and ecosystem management in shaping the “security” of people (Andersen-Rodgers and Crawford, 2018; Dalby, 2018), and ethnic conflict (Kaufman, 2018) – all of which open space for and legitimise a human security approach to studying the sources, experiences, and remedies of such tensions (Andersen-Rodgers and Crawford, 2018; Leaning and Arie, 2000).

Applied to this literature review, such a human security study in northern Thailand would potentially reveal richly contextualised information on the threats from the Thai conservation agenda and gradual land use changes, and their manifestation in deteriorating physical and environmental health from intensive agricultural chemical use, risks to personal safety from arrests, animals at risk of being killed for grazing in off-limits forest areas, forced exposure to volatile markets in the cash economy, but also the persistent anti-Indigenous bias in the fickle policies of divided state actors that penalise highlanders for practices they had previously encouraged. The intersecting themes of institutionalised discrimination against Indigenous peoples and rural areas, technological change that empowers the state as top-down actor, and the social and economic development along ideals of Westernised modernisation thereby act as enablers for the human security threats. Given the gaps in the literature, further ethnographic study would help reveal how Indigenous villagers themselves experience these problematic developments, both in terms of their affective dimensions as well as their active contributions to restore and contribute to their own human security.

5.1.2. Everyday environmental heritage: operationalising “culture” in conservation

Open-ended analytical approaches remain prone to anchoring the understanding of (and assumptions surrounding) mechanisms of impact on prevailing discourses and paradigms such as neoliberalism and the capitalist organisation of our societies – which, incidentally, have been responsible for persistent omissions and contradictions in ecosystem conservation and which threaten Indigenous lives as well as conservation progress itself. Everyday environmental heritage is a grounded

⁹ These key characteristics build on Alkire (2003); Commission on Human Security (2003); Gasper (2014); Green (2010); Human Security Unit (2009); Martin and Kostovicova (2014); Newman (2001); Ogata and Cels (2003).

pathway to exploring what cultural and environmental practices in the context of conservation-induced conflict mean concretely and practically (Acabado and Kuan, 2023; Auclair, 2018; Auclair and Garcia, 2021; Azzopardi et al., 2022; Smith, 2006).

Heritage as a concept has evolved from a narrow notion of historical sites and objects as cultural markers towards an inherently intangible and unstable process of producing and transmitting culture through artefacts, spaces, and practices – “whether physically significant or emotionally and symbolically important” (Auclair and Fairclough, 2015:3; Smith, 2006) – and thus linking the past, present, and future. The “everyday” perspective thereby moves away from spectacular representations that abide by externally imposed historical and aesthetic criteria, towards ordinary yet locally valued and meaningful practices and processes that reproduce a community’s sense of belonging (Hall and Holmes, 2020). This process evokes associations, individual and collective memories, and narratives, which open a new angle in the conservation literature to capture values and relationships between Indigenous peoples and nature in politically conflicted spaces.

Applying this concept of heritage (which, in practice is often done in a transformational action research design) enables the analyst to identify key elements of the otherwise elusive notion of “culture” that have a practical significance for the human security threats experienced by Indigenous peoples. The research would begin with a comprehensive stocktaking of practices, objects, and spaces that create a sense of belonging or attachment, that have an element of inter-generational transmission (typically spanning 30 years or more), and that are collectively valued as worth preserving. The focus on process and dialogue avoids romanticization of heritage (as it may rather uncover disagreements and ongoing negotiations of identity) and considers its dynamic manifestations as places, practices, and objects (Bonnin and Moore-Cherry, 2023). Heritage instances with environmental significance are those that link people to nature and would for example include activities and objects that transport environmental values, connect people to spiritual entities related to nature, involve natural materials and landscapes or natural space, or otherwise create a “sense of belonging and attachment” towards the natural environment (Azzopardi et al., 2022). In all cases, heritage is considered intrinsically valuable, but it can fulfil additional functions that relate usefully to how communities respond to environment-related threats to their survival, livelihood, and dignity.

The fundamental existence of everyday environmental heritage as a cultural marker is thereby not specific to the Indigenous peoples in the northern Thai highlands – any community or society could in principle engage in such intrinsically valued cultural practices that relate them to the natural space around them, including in urban and non-Indigenous settings as well as in contexts of sheer modernisation (see e.g. Coles et al., 2013; Olwig, 2001). However, many instances demonstrate how highland Indigenous peoples’ culture is being transported concretely through these practices in everyday environmental heritage – albeit the documented cases have mainly focused on spectacular and salient aspects of highland culture. One example is the Karen *htar*, which often takes the form of poems and songs that have been passed down from ancestral generations, but which also constantly evolve in response to local development. An instance of such a case is a Karen community where villagers had described themselves as being “deceived” by the promises made around reforestation in the 1980s (Trakansuphakorn, 2008:592); the caution towards deceit consequently transported into *htar* verses such as, “*Klei mux naj yaz s’kiz hti, klei mux naj y’naj paz htiv*” (which the author interpreted broadly as, “The seductive song of the cricket is but an attempt to fool you. Be advised that sweet words are always filled with poison. This is what your children must beware of.”). Other spectacular examples of such heritage practices that we outlined in Section 4.5 include tree ordination (i.e. the sanctification of trees through a Buddhist ritual akin to ordaining a monk) or the Hmong new year celebrations around the *ntoo xeeb* (or *tong seng* in Thai) – the sacred tree in which a local deity/spirit settles down and protects the forest

(Huang and Sumrongthong, 2004; Morrow, 2011). Much less scholarly work has focused on ordinary and evolving forms of environmental heritage, which would help us move away from romantic stereotypes of Indigenous culture in the highlands and more carefully tease out their social and political role (after all, everyday environmental heritage is not only defined by its links to the past but also to the future, Auclair, 2018; Bonnin and Moore-Cherry, 2023) – for example evolving environmental knowledge in light of changing ecosystems (Georgiadis, 2022), the marketing of natural products, or the changing meaning of landscapes under tourism and market-based production and their representation in mass and social media (Leepreecha, 2016; Youdelis, 2013).¹⁰

As a process of cultural reproduction, heritage helps negotiate identity and belonging while also forging connections between communities and their environment (Azzopardi et al., 2022; Coggins et al., 2022). Especially the outward-oriented political permeation of everyday heritage becomes abundantly clear in contexts where Indigenous communities experience tensions with forestry officials and state developers (e.g. the cases of tree ordination and Hmong new year). For example, Siriphon (2006) documented how the local significance of *ntoo xeeb* in Hmong communities had been waning as cash crop production and market integration expanded, but villagers strategically restored the celebrations and ceremonies surrounding the sacred tree, asserted the need to preserve and restore the forest, and also imbued a wider set of expanding community forests with new rituals and symbolic import. The deeper study of such instances can offer scope for discussing the concrete policy implications of cultural practices (Acabado and Kuan, 2023). Future work can thus engage meaningfully in grounded research to understand not only the diversity of communities’ everyday heritage and its links to the environment, but also the cultural, psychological, social, and especially political purposes it fulfils against the backdrop of human security.

5.1.3. Activity spaces: mapping pathways of impact

The literature review repeatedly highlighted the plurality and systemic character of responses to conservation and development processes that shape the evolving relationships between Indigenous peoples, the state, and the natural space surrounding them. A third major component of our proposed research agenda is to capture pathways of impact in this system (e.g. from land use change, conservation policy, and the ensuing human security response from communities), which the activity space framework helps to map out. Fig. 2 exemplifies a generic version of such an application of activity spaces to land use regulation, showing – as analytical objects – three key domains (local populations, human services incl. The state, and nature), relationships across and within them (arrows), and possible forms of interactions (arrow descriptors, e.g. “re-configure”).

Initial work on activity spaces involved sociological mobility studies that later broadened to movement in physical environments and socially constructed spaces, and how individuals encounter barriers and facilitators when navigating these social and physical spaces (Haenssger et al., 2018; Kwan, 2013; Schroeder, 2002; Zenk et al., 2011). This

¹⁰ The Mon Chaem tourism area in Chiang Mai province is a case in point: A viewpoint with a coffee shop was featured in popular Thai TV drama scenes including *Majurat See Nam Pueng* (มัจจุราชสีน้ำผึ้ง), Khun Samee Karmalor Tee Ruk (คุณสามี(ท่ามะลอร)ที่รัก; Episode available at 3Plus Channel 3 web site: <https://ch3plus.com/v/118771>), and Thoranee Nee Ni Krai Krong (ธรรณี นี้นี้ใครครอง; making-of scenes available on YouTube: <https://youtu.be/67Sk8RFDmIA>), after which waves of Thai tourists started visiting the place. Despite the actual names of local communities, the destination became to be known across the nation as “Mon Chaem,” and the face of the landscape fundamentally reformed with dome-tents and scenic spots. As landscapes are a prime example of environmental heritage and associated meaning- and identity-making process, questions abound as to what this transformation entailed culturally.

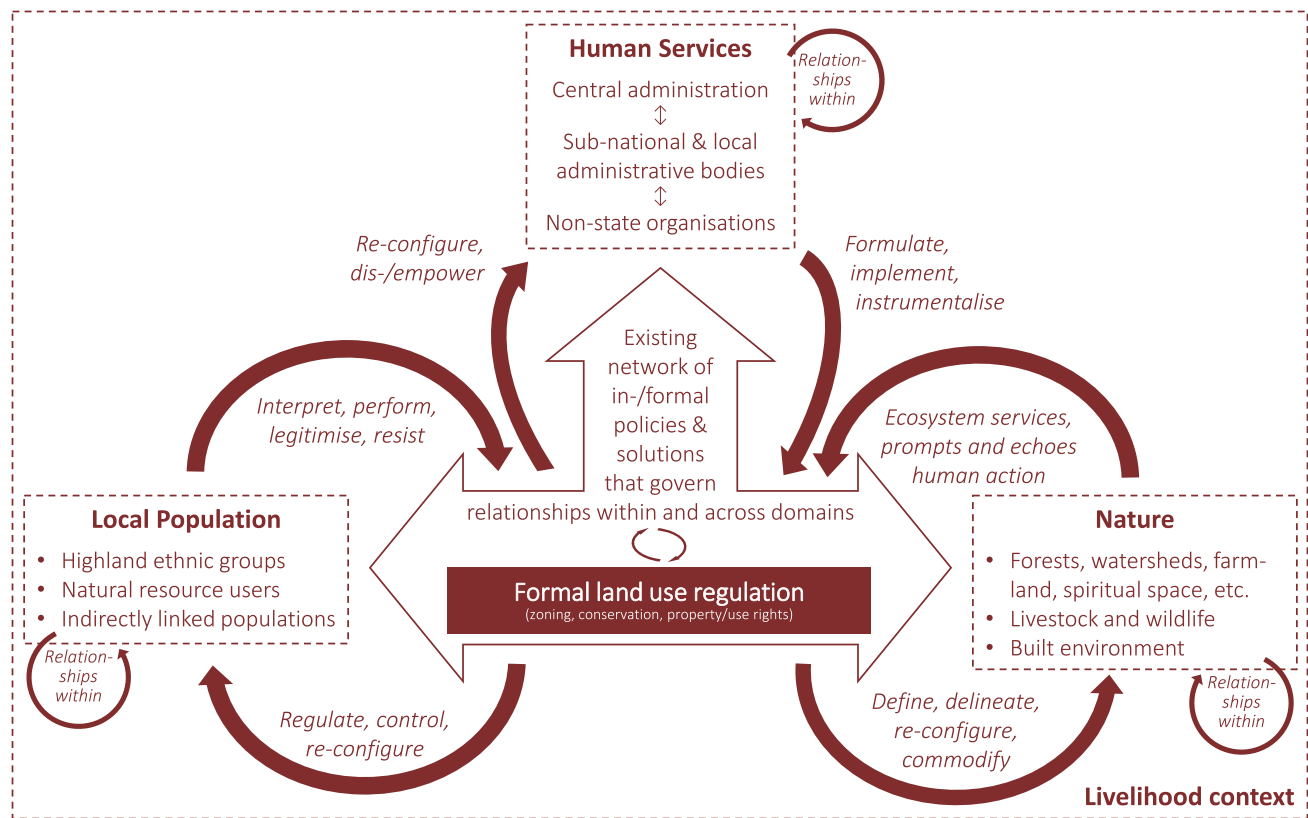


Fig. 2. Activity space framework to map impact pathways.

Source: Authors, adapted from Haenssger et al. (2021:3).

Notes. Arrows indicate relationships between domains, mediated by the network of solutions linking them. Abstract categories for illustration only.

fundamental work relates well to critical social science research on the governance of land and water (e.g. Ghimire, 1994; West et al., 2006) and sociological and political sciences literature on material practice and policy implementation processes (Coupaye, 2009; Fairhead and Leach, 2005; Ferguson, 1994; Miller, 2010; Scott, 1998). Accordingly, policies emerge and are implemented in a confluence of policy makers' attention (and biases), windows of opportunity, and power struggles among stakeholders, while contextual change continuously reconfigures how current in-/formal arrangements of natural resource use materialise into practice (Cairney and Jones, 2016; Lipsky, 2010; Mosse, 2004).

Taken together, this literature helps map pathways of impacts. For example, "local population" impacts of forest conservation typically include conflict, identity negotiation, and changing gender relationships (Tungittiaplakorn, 1998; West et al., 2006). Impacts on the relationships between communities and human service organisations could materialise through the instrumentalization of land regulation to criminalise Indigenous peoples or to attain "elite control" over lands (Linh et al., 2021; Nellemann et al., 2016; Yasmi et al., 2017). Changes in land use regulation would also shape how humans and non-human actors navigate natural space – both as a physical and "socially constructed" space (West et al., 2006:252). As our literature review had illustrated, impacts on this relationship could include the creation of new and artificial divisions between natural "forest" and human-managed "agricultural" land (Morrow, 2011), restrictions of Indigenous rotational farming methods and buffalo grazing (Trakansuphakorn, 2008), common patterns of commodification (Hirsch, 2020), or the changing ceremonial and spiritual importance of community lands (Evrard and Leepreecha, 2013). Observations such as "resistance" to or "non-compliance" with governmental land use policy can therefore represent a sometimes subtle response to reconfiguration, interferences, and incompatibility between new and existing connections in the activity space (Holmes, 2007; Scott, 1985). Examples like Delang (2002) in which reforestation

initiatives actually led to forest loss should therefore not surprise us: Forest reclamation and reforestation policies targeting lands used by a highland Hmong community in Chiang Mai province provided perverse incentives for villagers to uproot trees growing on fallow lands and to clear forest areas, just to mitigate the threat of losing their land to the state.

5.1.4. Behavioural sciences: formulating innovative and inclusive policy responses

While recognising the importance for Indigenous peoples to regain control over the protection of their land (Garnett et al., 2018), researchers have also called for a greater involvement of behavioural science tools to make the formulation and implementation of conservation policy more effective (Balmford et al., 2021; Toomey, 2023; Williamson and Thulin, 2022). Recent progress in this direction has been made (McDonald et al., 2020; Nielsen et al., 2021; Nisa et al., 2019), but current approaches focus on the behaviour of producers, extractors, conservation managers, consumers, and populations affected by negative outcomes. Groups with a potentially significant yet indirect impact on conservation outcomes often remain neglected, such as manufacturers, sellers, investors, policymakers, voters, communicators, and lobbyists. This omission is reinforced by a knowledge gap on influencing decision-makers' behaviour in the policy process (DeCaro et al., 2017; Hallsworth et al., 2018).

Our research agenda therefore calls for empirical knowledge generation on the effectiveness of new conservation policy options and for conceptual development to enable inclusive and equitable behavioural policy design. Two related approaches are a suitable starting point: Firstly, the Capability-Opportunity-Motivation-Behaviour (COM-B) framework emerged from a comprehensive synthesis of behavioural sciences frameworks, which yielded a systematic classification of barriers and enablers of human behaviour (Michie et al., 2013). These

barriers and enablers include factors relating to individuals' mental and physical ability (i.e. physical and psychological capability, in the language of the framework), their conscious and sub-conscious thought processes (i.e. reflective and automatic motivation), and the broader environment in which they act (i.e. social and physical opportunity to perform a behaviour). Secondly, the MINDSPACE framework (an acronym comprising common mechanisms of automatic motivation: Messenger, Incentives, Norms, Defaults, Salience, Priming, Affect, Commitment, and Ego) is based on the psychological dual-process models of decision-making, according to which System 2 is precise and controlled but cognitively costly and therefore involved in the minority of every decision, whereas System 1 is often dominant and based on "heuristics" that serve as effective yet bias-prone cognitive shortcuts (Dolan et al., 2012; Vlaev et al., 2016). The dual-process model lets us distinguish two main types of policy/intervention approaches: "Governing" as the traditional behaviour change approach is based on a rational choice model which would lead policy action to rebalance the relative utility of options through regulation, incentives, and information. "Nudging" complements the Governing approach by utilising any aspect of the choice environment that alters behaviour in a predictable way and without forbidding any actions or significantly changing their economic incentives.

Behavioural interventions of this kind could for instance involve removing barriers to cultural expressions of everyday environmental heritage; highlighting (and reinforcing through social media influencers or "messengers") reputational benefits for urban consumers when buying sustainable and organic produce from the highlands; or nudging policy makers into considering Indigenous peoples' realities more actively. The latter could use tools like checklists or decision trees to guide decisions about legal cases of forest and land use, or digital platforms for open sharing of evidence of the social, psychological, and economic impact of conservation (including stories about victims of conservation policies) – and thereby legitimise and institutionalise forest conservation actions that safeguard Indigenous peoples' livelihoods. To address the systemic causes of environmental degradation, such as harmful subsidy programs or inadequate governance, it is also necessary to scale interventions at the population level.

The behavioural sciences approach in the field of climate action in general and forest conservation in particular remains in its infancy. However, first behavioural science and "green nudge" applications hold promise for future research albeit their evidence is concentrated in high-income consumer contexts (Howlett and Rawat, 2019; Schubert, 2017). Examples from various domains of pro-environmental behaviour include Griskevicius et al. (2010), who documented experimentally with US students how ecologically friendly consumer products can appeal to individuals' "Ego" (in the MINDSPACE terminology) as they see themselves acting "pro-socially" towards their peers. Byerly et al. (2021) demonstrated how US farmers' land conservation decisions were influenced by exposure to other farmers' surrounding them (e.g. by being conscious of their own reputation but also farmer community norms) – which policymakers can reinforce through targeted communication that highlights responsible behaviour in a relevant peer group. In the context of woodland management in the UK, Valatin et al. (2016) further highlighted how a wide spectrum of nudges (in combination) could be mobilised to influence automatic motivation in woodland creation behaviour, including, among others, public commitments towards woodland planting. Lastly, in a rare middle-income country example, Zoratto et al. (2015) demonstrated that behavioural design considerations in communication with households in Costa Rica can reduce their water consumption – in this case, through stickers comparing their water usage in the neighbourhood and worksheets to encourage them to make water consumption goals.

However, an effective expansion of this knowledge base towards the livelihood struggles of Indigenous peoples at the interface of conservation and land use transitions also requires active engagement with the limitations of existing behavioural science approaches. Behaviourally

informed interventions have for instance faced criticism for their narrow focus on individual end-users ("victim blaming"), the possibility of being seen as manipulative, and a common lack of contextual, historical, and political grounding that can accentuate equity concerns in behavioural conservation policy (Crosman et al., 2022; Ewert, 2019; Pendleton et al., 2019; Valatin et al., 2016). As a bulk of the underlying psychological evidence is historically biased towards Western and privileged population groups ("WEIRD" populations, meaning empirical evidence has been based on Western, Educated, Industrialized, Rich, and Democratic study participants, see Henrich et al., 2010), these criticisms become especially relevant when transferring behavioural science tools to contexts less characterised by privilege (for a useful discussion of privilege and intersectionality, see Nixon, 2019), such as Indigenous livelihood struggles.

Halting the decline of ecosystems will necessitate sustained modifications to human behaviour across all levels and actors. Important conceptual work to improve conservation policy therefore involves the formulation of process models that are more faithful to the realities of affected Indigenous communities (ideally supported by decolonial and participatory methodologies), and that help infuse conservation policy more effectively with these perspectives. Empirical work would in parallel help generate a policy-relevant and non-Western knowledge base from which interventions and policies can draw.

5.2. Reflections for policy and practice

The review has demonstrated problematic trends affecting the livelihoods of highland Indigenous communities in northern Thailand. Left unchecked, the trajectory cast by the historical review is worrying: a vicious cycle of intensifying state-led forest monitoring (aggravated by the inevitable impact of climate change) and intensive land use is likely to worsen livelihood experiences alongside continual outmigration and social isolation, which can only be partially offset by re-assertions of agency and Indigenous innovation. Policy responses are needed, and many proposals are already circulating from settings facing a confluence of Indigenous livelihood struggle, oppressive conservation policy, and gradual contextual change. Researchers have for instance suggested to establish collaborative training and research centres for land use in Myanmar to explore opportunities "to better integrate customary and communal laws and practices, to avoid further ethnic conflicts" (McCarthy, 2016:7), to disentangle community income from local agricultural market pressure in Lao PDR through trading carbon emission certificates from communal forest land (Elliott et al., 2019), or, where such is not possible, to direct highland agricultural production towards organic agriculture and sufficiency principles to counteract the environmental and social impact of input-intensive agricultural production (Sitthisuntikul et al., 2018). Key responses from reviews and studies from elsewhere around the globe also commonly include securing Indigenous land tenure rights and cultural freedom as well as more decentralised and participatory forms of forest governance (Dawson et al., 2021; Fa et al., 2020; Muthee et al., 2022; Rakotonarivo et al., 2023; Tseng et al., 2021).

While we agree with the intentions of such suggestions, the complex entanglements of land use change, conservation policy, and development processes encapsulated in our review also hint at challenges and potential unintended consequences of existing proposals to resolving Indigenous livelihood struggles. For example, with the pressure on livelihoods through external forces of rural development, authors in the context of our review have cautioned that simply re-allocating land rights to highland communities could expand permanent and capital-intensive agriculture in forest areas, which would be environmentally counter-productive and still leaves highland communities exposed to instrumentalization by state authorities (Beaulieu et al., 2023; Phromma et al., 2019). Even market-based instruments to foster sustainable production are susceptible to such unintended consequences as the case of recent food label interventions in Thailand shows: agricultural

producers were categorised unwittingly into mountainous crop burners and encroachers versus those who employ “sustainable” production methods (Bangkok Post, 2023; Greenpeace Thailand, 2020), thus potentially reinforcing rather than overcoming problematic stereotypes that pervade public and policy discourses.

Although there is clearly no universal solution, in light of the multi-faceted impacts of the gradual land use and contextual change in the northern Thai highlands, our review suggests going beyond discrete interventions while acknowledging the deep-rooted biases and mutual suspicions among a wide range of stakeholders. A starting point for integrative policy responses would consist of grounded research to map key outcomes and the surrounding behavioural system, and creating sustainable and inclusive domains of change through dialogue and collaboration between Indigenous communities, conservation scientists, policymakers, and other stakeholders such as urban consumers, civil society organisations, or the media.

In the domain of zoning, forest management, and national park regulations, this could for instance involve change led by the Thai Royal Forestry Department, the Ministry of Interior, the Ministry of Social Development and Human Security, and the Ministry of Culture to create “safe” cultural spaces (i.e. reducing cognitive load from anxiety, see e.g. Biddle, 2017) for communities to cultivate their environmental heritage and thus re-assert their social and cultural stake in the local environment – and thus also their ability to monitor and manage forest fires more effectively (e.g. through culturally infused fire break activities in which communities clear long passages of forests from fire-prone dry leaves). The practical focus on heritage thereby has advantages over the often politically sensitive notion of “religion” or the broader and elusive notion of “culture.” Behavioural tools such as public commitments and community showcases can support this re-assertion on the community level, while scientifically framed information and appeals to the responsible state agencies’ self-perception as supporters of effective practices can provide impulses to help overcome deep-rooted biases at key stages of the policy process.

Mitigating contextual pressures in the related domain of social and economic security is similarly important to enable the change that Indigenous communities may envision (note that this would have to be established in respectful consultations with a diverse range of community members and through a neutral mediator). Social insurance schemes and mechanisms to compensate forest protection activities can support this process, and also the aforementioned food origin label initiatives can play a constructive role for a shift to less input-intensive agricultural practices – as long as they are co-developed with Indigenous communities and conscious to not re-create divisions between “deserving” and “irresponsible” groups. Behavioural design could again intersect such measures and target downstream consumers of Indigenous products (e.g. handicrafts, artisanal coffee) and produce (e.g. organic lettuce): endorsement from the Thai Food and Drug Administration and compliance with Good Manufacturing Practices can reinforce trust while design optimisation through eye tracking research and visual appeals to automatic motivation can help nudge consumers during the purchasing decision (Antúnez et al., 2013; Ares et al., 2013; Vandenbroele et al., 2020).

While significant elements of Indigenous peoples’ livelihood struggles in Thailand are shared around the world – discrimination of Indigenous peoples, patterns of oppressive as well as market-driven conservation, lack of secure land tenure, perverse incentives in forest protection policies, and neoliberal rural development processes (Apostolopoulou et al., 2021; Fa et al., 2020; Hayward et al., 2021; Linh et al., 2021; Muthee et al., 2022) – the specific context of Thailand still requires attention. On the one hand, Thailand has been found to have a high “synergy potential due to its national-level committees and a ministry that addresses all three measures” of climate change mitigation, adaptation, and biodiversity/ecosystem conservation through forest conservation (Morita and Matsumoto, 2018:66), and its conditions for social mobilisation of Indigenous peoples are comparatively favourable

in the region (Ingalls et al., 2018; Isager and Ivarsson, 2002; Leepreecha, 2019). Also the policy primacy of forest protection (whatever its manifestation in practice) is not universally shared across tropical countries as the case of Brazil under President Jair Bolsonaro reminds us. On the other hand, and despite the *potential* synergies outlined in Morita and Matsumoto (2018), Gritten et al. (2019:5) highlighted that regional stakeholders deem Thailand’s institutional framework for forest protection as “weak” compared to its mainland Southeast Asian peers – especially as far as collaboration across different government sectors is concerned. Yet more problematic is that Thailand recognises only a small group of “hill tribes” but not generally the Indigenous peoples who live within its borders (Leepreecha, 2019), which contrasts with other Southeast Asian countries. In comparison, Cambodia’s 2008 *Protected Area Law* emphasises the rights of Indigenous peoples who inhabit protected areas (although impending revisions threaten to dilute this protection), Lao PDR refrains from using the term “Indigenous” but asserts that all ethnic groups are to be treated equally, and the 1997 *Indigenous Peoples Rights Act* in the Philippines ensures that Indigenous communities are consulted before resource permits (IWGIA, 2023). While these differences are partly confined to paper as Indigenous groups remain vulnerable and exposed to widespread human rights violations, the varying institutional contexts underline that policy responses in Thailand face a different set of systemic constraints and enablers than in other countries.

6. Conclusion

Driven by the need for more inclusive conservation approaches to retain the viability of the planet, we conducted a review of the rich research landscape of conservation and land use change in the northern Thai tropics to inspire a new research agenda. Across three distinct periods, the review painted a picture of gradual contextual change, inconsistent policy directions, and perverse incentives that have created a systemic challenge to ecosystem conservation. The place-based consideration of this interdisciplinary and longitudinal body of research has enabled us to draw connections that would otherwise remain dormant. On the one hand, it became visible how intersecting forces had over time shaped multi-faceted livelihood struggles for Indigenous peoples, namely top-down political control, neoliberal modernisation pressure, and misdirected, unreliable, and contradictory environmental protection approaches. On the other hand, the systemic impact of these developments on the lives and livelihoods of highland Indigenous peoples in northern Thailand materialised along a wide range of pathways spanning conventional notions of agricultural transitions, involuntary exposure to new social as well as economic risks, or changing cultural production that modifies communities’ relationship to the natural space surrounding them.

The literature itself oscillated as scholars responded to growing and ebbing interests in militarised state action and social counter-movements, and to periodic debates around the green revolution or critiques of development. Current interests in sustainable development and planetary health have now been increasingly highlighting the historically unaccounted costs of capitalist modes of production and the difficult trade-offs involved in multi-dimensional conceptions of development. Among the most noticeable long-term transformations was a growing voice of Thai and Indigenous scholars, which has been offering new and grounded perspectives on livelihood change and which provides a much-needed counterweight to the historical dominance of White Western male scholars diagnosing Indigenous peoples’ lives. The diversification of voices coincided with a broader pluralisation of intellectual spaces from the 1980s onwards, which entailed clearer differentiation and more authentic representations of highland Indigenous identities. A practical consequence of this long-term trend has been a recognition of broader structural factors militating against highlanders’ livelihoods and facets of livelihood that involve non-monetary and indeed non-material practices.

The collective consideration of a voluminous and place-based body of literature also helped reveal critical gaps in our current approach to biodiversity conservation. How can we capture multi-dimensional threats to Indigenous people's lives comprehensively without denying them agency and with acknowledgement of their affective dimensions? How can we integrate the pervasive non-economic and symbolic practices into analyses of livelihood adaptation in the context of conservation policy? How can we capture systemically the evolving relationships between Indigenous peoples, the state, and the natural space surrounding them? And if past policies and interventions have reached their potential, can we use new mechanisms to devise effective and inclusive conservation policy? Thus far, however, our review underlines that there is no blueprint for effective policy action, given the variability of behavioural systems and the problematic politics of forest conservation. The configuration and viability of each package of action will depend crucially on local contexts as well as the relationship between the different stakeholders therein (systematic stakeholder analyses can support this process, see e.g. [Varvasovszky and Brugha, 2000](#)).

Our proposed research agenda for the next generation of ecosystem conservation research and policy responds to these challenges, proposing tools of human security, everyday environmental heritage, activity spaces, and behavioural design to understand the experiential dimensions of conservation from the perspective of Indigenous peoples, their active role as security contributors, pathways to impact, and new models of policy making. The resulting interdisciplinary research and policy agenda offers a platform for much-needed collaboration between ecologists, political scientists, cultural scholars, anthropologists, and behavioural researchers to achieve more inclusive and sustainable natural resource conservation.

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Declaration of Competing Interest

The authors declare that there are no conflicts of interest.

Data availability

No data was used for the research described in the article.

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References

- Acabado, S., Kuan, D.-W. (Eds.), 2023. *Indigenous Peoples, Heritage and Landscape in the Asia Pacific: Knowledge Co-Production and Empowerment*. Routledge, London.
- Alkire, S., 2003. *A Conceptual Framework for Human Security* [CRISE Working Paper no. 2]. Centre for Research on Inequality, Human Security and Ethnicity, Oxford.
- Andersen-Rodgers, D., Crawford, K.F., 2018. *Human Security: Theory and Action*. Rowman & Littlefield, Lanham, MD.
- Antúnez, L., Vidal, L., Sapolski, A., Giménez, A., Maiche, A., Ares, G., 2013. How do design features influence consumer attention when looking for nutritional information on food labels? Results from an eye-tracking study on pan bread labels. *Int. J. Food Sci. Nutr.* 64 (5), 515–527. <https://doi.org/10.3109/09637486.2012.759187>.
- Apostolopoulou, E., Chatzimentor, A., Maestre-Andrés, S., Requena-I-Mora, M., Pizarro, A., Bormpoudakis, D., 2021. Reviewing 15 years of research on neoliberal conservation: towards a decolonial, interdisciplinary, intersectional and community-engaged research agenda. *Geoforum* 124, 236–256. <https://doi.org/10.1016/j.geoforum.2021.05.006>.
- Ares, G., Giménez, A., Bruzzone, F., Vidal, L., Antúnez, L., Maiche, A., 2013. Consumer visual processing of food labels: results from an eye-tracking study. *J. Sens. Stud.* 28 (2), 138–153. <https://doi.org/10.1111/joss.12031>.
- Attavanich, W., Chantararat, S., Chenphuengpaw, J., Mahasuweerachai, P., Thampanishvong, K., 2019. *Farms, Farmers and Farming: A Perspective through Data and Behavioral Insights* [PIER Discussion Paper no. 122]. Puey Ungphakorn Institute for Economic Research, Bangkok.
- Auclair, E., 2018. *Heritage and sustainability*. In: López Varela, S.L. (Ed.), *The Encyclopedia of Archaeological Sciences*. Wiley, New York, NY.
- Auclair, E., Fairclough, G., 2015. Living between past and future: An introduction to heritage and cultural sustainability. In: Auclair, E., Fairclough, G. (Eds.), *Theory and Practice in Heritage and Sustainability: Between Past and Future*. Routledge, London, pp. 1–22.
- Auclair, E., Garcia, E., 2021. Making visible attachments: Artists as a lever for highlighting a sense of place and emotional attachments to heritage: Articulating public art and urban renewal in Porto-Novo (Benin). In: Lesh, J., Madgin, R. (Eds.), *People-Centred Methodologies for Heritage Conservation: Exploring Emotional Attachments to Historic Urban Places*. Routledge, London, pp. 212–227.
- Axworthy, L., 2001. Human security and global governance: putting people first. *Glob. Gov.* 7 (1), 19–23.
- Ayuttacorn, A., 2019. Social networks and the resilient livelihood strategies of Dara-ang women in Chiang Mai, Thailand. *Geoforum* 101, 28–37. <https://doi.org/10.1016/j.geoforum.2019.02.022>.
- Azzopardi, E., Kenter, J.O., Young, J., Leakey, C., O'Connor, S., Martino, S., et al., 2022. What are heritage values? Integrating natural and cultural heritage into environmental valuation. *People Nat.* <https://doi.org/10.1002/pan3.10386>.
- Baird, I.G., Leepreecha, P., Yangcheepsutjarit, U., 2017. Who should be considered 'indigenous'? A survey of ethnic groups in northern Thailand. *Asian Ethnicity* 18 (4), 543–562. <https://doi.org/10.1080/14631369.2016.1268044>.
- Balmford, A., Bradbury, R.B., Bauer, J.M., Broad, S., Burgess, G., Burgman, M., et al., 2021. Making more effective use of human behavioural science in conservation interventions. *Biol. Conserv.* 261, 109256. <https://doi.org/10.1016/j.biocon.2021.109256>.
- Bangkok Post, 2023. CP Foods takes steps to ensure sustainable corn sourcing. Retrieved 29 August 2023, from. <https://www.bangkokpost.com/thailand/pr/2529321>.
- Beaulieu, A., Leblond, J.-P., Dery, S., Cao, H., 2023. Urban air pollution anxieties, forest conservation, and farmland expropriation: state territorialization in the uplands and highlands of northern Thailand. *Land Use Policy* 131, 106687. <https://doi.org/10.1016/j.landusepol.2023.106687>.
- Bebbington, A., 1999. Capitals and capabilities: a framework for analyzing peasant viability, rural livelihoods and poverty. *World Dev.* 27 (12), 2021–2044. [https://doi.org/10.1016/S0305-750X\(99\)00104-7](https://doi.org/10.1016/S0305-750X(99)00104-7).
- Bernstein, H., Crow, B., Johnson, H., 1992. *Rural Livelihoods: Crises and Responses*. Oxford University Press, Oxford.
- Biddle, N., 2017. Insights for indigenous policy from the applied behavioural sciences. *Asia & the Pacific Policy Studies* 4 (1), 129–140. <https://doi.org/10.1002/app5.158>.
- Bonnin, C., Moore-Cherry, N., 2023. Livelihoods as everyday heritage: urban redevelopment, heritage discourses and marketplace trade in Moore street, Dublin. *Int. J. Herit. Stud.* 29 (7), 678–694. <https://doi.org/10.1080/13527258.2023.2211996>.
- Bruun, T.B., Neergaard, A., Burup, M.L., Hepp, C.M., Larsen, M.N., Abel, C., et al., 2017. Intensification of upland agriculture in Thailand: development or degradation? *Land Degrad. Dev.* 28 (1), 83–94. <https://doi.org/10.1002/ldr.2596>.
- Buruspat, K., 1985. *ฮิลล์ทริบ์ส* [Hill Tribes]. Prae Phittaya, Bangkok.
- Byerly, H., Kross, S.M., Niles, M.T., Fisher, B., 2021. Applications of behavioral science to biodiversity management in agricultural landscapes: conceptual mapping and a California case study. *Environ. Monit. Assess.* 193 (S1) <https://doi.org/10.1007/s10661-020-08815-z>.

- Cairney, P., Jones, M.D., 2016. Kingdon's multiple streams approach: What is the empirical impact of this universal theory? *Policy Stud. J.* 44 (1), 37–58. <https://doi.org/10.1111/psj.12111>.
- Clover, J., Eriksen, S., 2009. The effects of land tenure change on sustainability: human security and environmental change in southern African savannas. *Environ. Sci. Pol.* 12 (1), 53–70. <https://doi.org/10.1016/j.envsci.2008.10.012>.
- Coggins, C., Århem, N., Boedihartono, A.K., Phan, H., Le, H., Wardani, E.M., 2022. Southeast Asia—Sacred forests and human-environment relations. In: Coggins, C., Chen, B. (Eds.), *Sacred Forests of Asia: Spiritual Ecology and the Politics of Nature Conservation*. Routledge, London, pp. 189–202.
- Coles, R., Millman, Z., Flannigan, J., 2013. Urban landscapes - everyday environmental encounters, their meaning and importance for the individual. *Urban Ecosyst.* 16 (4), 819–839. <https://doi.org/10.1007/s11252-013-0327-y>.
- Commission on Human Security, 2003. *Human Security Now*. Commission on Human Security, New York, NY.
- Coupage, L., 2009. Ways of enchanting: chaînes opératoires and yam cultivation in Niamikum village, Maprik, Papua New Guinea. *J. Mater. Cult.* 14 (4), 433–458. <https://doi.org/10.1177/1359183509345945>.
- Crosman, K.M., Jurcevic, I., Van Holmes, C., Hall, C.C., Allison, E.H., 2022. An equity lens on behavioral science for conservation. *Conserv. Lett.* 15 (5) <https://doi.org/10.1111/conl.12885>.
- Dalby, S., 2018. Environmental change. In: Paul, D.W., Matt, M. (Eds.), *Security Studies: An Introduction*, 3rd ed. Routledge, Abingdon, pp. 526–540.
- Dawson, N.M., Coolsaet, B., Sterling, E.J., Loveridge, R., Gross-Camp, N.D., Wongbusarakum, S., et al., 2021. The role of indigenous peoples and local communities in effective and equitable conservation. *Ecol. Soc.* 26 (3) <https://doi.org/10.5751/es-12625-260319>.
- DeCaro, D.A., Arnol, C.A.T., Boama, E.F., Garmestani, A.S., 2017. Understanding and applying principles of social cognition and decision making in adaptive environmental governance. *Ecol. Soc.* 22 (1), 33. <https://doi.org/10.5751/ES-09154-220133>.
- Delang, C.O., 2002. Deforestation in northern Thailand: the result of Hmong farming practices or Thai development strategies? *Soc. Nat. Resour.* 15 (6), 483–501. <https://doi.org/10.1080/08941920290069137>.
- Department of Social Development and Welfare, 2016. *ทำเนียบชุมชนบนพื้นที่สูง ครอบคลุมพื้นที่ 20 จังหวัดของประเทศไทย ประจำปี พ.ศ. 2559* [Directory of highland communities, covering 20 provinces of Thailand in 2016]. Department of Social Development and Welfare, Bangkok.
- DFID, 1999. *Sustainable Livelihoods Guidance Sheets*. UK Department for International Development, London.
- Dolan, P., Hallsworth, M., Halpern, D., King, D., Metcalfe, R., Vlaev, I., 2012. Influencing behaviour: the mindspace way. *J. Econ. Psychol.* 33 (1), 264–277. <https://doi.org/10.1016/j.joep.2011.10.009>.
- Dressler, W., Roth, R., 2011. The good, the bad, and the contradictory: neoliberal conservation governance in rural Southeast Asia. *World Dev.* 39 (5), 851–862. <https://doi.org/10.1016/j.worlddev.2010.08.016>.
- Elliott, S., Chairuangsi, S., Kuarsaka, C., Sangkum, S., Sinhaseni, K., Shannon, D., et al., 2019. Collaboration and conflict—developing forest restoration techniques for northern Thailand's upper watersheds whilst meeting the needs of science and communities. *Forests* 10 (9), 732. <https://doi.org/10.3390/f10090732>.
- Erni, C., 2015. Introduction. In: Erni, C. (Ed.), *Shifting Cultivation, Livelihood and Food Security: New and Old Challenges for Indigenous Peoples in Asia*. Food and Agriculture Organization of the United Nations, International Work Group For Indigenous Affairs, Asia Indigenous Peoples Pact, Bangkok, pp. 3–37.
- Erni, C., Nikornuaychai, P., 2015. The lizard on the tree and the tailor bird village: 21st century livelihood challenges among Karen swidden farmers in Thailand. In: Erni, C. (Ed.), *Shifting Cultivation, Livelihood and Food Security: New and Old Challenges for Indigenous Peoples in Asia*. Food and Agriculture Organization of the United Nations, International Work Group For Indigenous Affairs, Asia Indigenous Peoples Pact, Bangkok, pp. 327–415.
- Evrard, O., Leepreecha, P., 2009. Monks, monarchs and mountain folks. *Crit. Anthropol.* 29 (3), 300–323. <https://doi.org/10.1177/0308275x09104657>.
- Evrard, O., Leepreecha, P., 2013. *Picturing Highlanders: A Half-Century of Photography in Northern Thailand*. Center for Ethnic Studies and Development, Chiang Mai.
- Ewert, B., 2019. Moving beyond the obsession with nudging individual behaviour: towards a broader understanding of behavioural public policy. *Publ. Pol. Administr.* 35 (3), 337–360. <https://doi.org/10.1177/0952076719889090>.
- Fa, J.E., Watson, J.E., Leiper, I., Potapov, P., Evans, T.D., Burgess, N.D., et al., 2020. Importance of indigenous Peoples' lands for the conservation of intact forest landscapes. *Front. Ecol. Environ.* 18 (3), 135–140. <https://doi.org/10.1002/fee.2148>.
- Fahad, S., Nguyen-Thi-Lan, H., Nguyen-Manh, D., Tran-Duc, H., To-The, N., 2022. Analyzing the status of multidimensional poverty of rural households by using sustainable livelihood framework: policy implications for economic growth. *Environ. Sci. Pollut. Res. Int.* 1–14 <https://doi.org/10.1007/s11356-022-23143-0>.
- Fairhead, J., Leach, M., 2005. Misreading Africa's forest history. In: Edelman, M., Haugerud, A. (Eds.), *The Anthropology of Development and Globalization: From Classical Political Economy to Contemporary Neoliberalism*. Blackwell, Malden, pp. 282–291.
- FAO, 2009. *Thailand Forestry Outlook Study* [Asia-Pacific Forestry Sector Outlook Study II Working Paper no. APFOS II/WP/2009/22]. Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific, Bangkok.
- Ferguson, J., 1994. The anti-politics machine: “development” and bureaucratic power in Lesotho. *Ecologist* 24 (5), 176–181.
- Ferrara, F., 2015. *The Political Development of Modern Thailand*. Cambridge University Press, Cambridge.
- Fletcher, M.-S., Hamilton, R., Dressler, W., Palmer, L., 2021. Indigenous knowledge and the shackles of wilderness. *Proc. Natl. Acad. Sci.* 118 (40), e2022218118 <https://doi.org/10.1073/pnas.2022218118>.
- Garnett, S.T., Burgess, N.D., Fa, J.E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C. J., et al., 2018. A spatial overview of the global importance of indigenous lands for conservation. *Nat. Sustain.* 1 (7), 369–374. <https://doi.org/10.1038/s41893-018-0100-6>.
- Gasper, D., 2014. Human security: From definitions to investigating a discourse. In: Martin, M., Owen, T. (Eds.), *Routledge Handbook of Human Security*. Routledge, Abingdon, pp. 28–42.
- Georgiadis, P., 2022. Ethnobotanical knowledge against the combined biodiversity, poverty and climate crisis: a case study from a Karen community in northern Thailand. *Plants, People, Planet* 4 (4), 382–391. <https://doi.org/10.1002/ppp3.10259>.
- Ghimire, K.B., 1994. Parks and people: livelihood issues in national parks management in Thailand and Madagascar. *Dev. Chang.* 25 (1), 195–229. <https://doi.org/10.1111/j.1467-7660.1994.tb00514.x>.
- Gjorv, G.H., 2018. Human security. In: Paul, D.W., Matt, M. (Eds.), *Security Studies: An Introduction*, 3rd ed. Routledge, Abingdon, pp. 221–234.
- Green, M., 2010. Neurons and nations: Attachment and human security. In: McIntosh, M., Hunter, A. (Eds.), *New Perspectives on Human Security*. Routledge, Abingdon, pp. 176–187.
- Greenpeace Thailand, 2020. *ข้าวโพด: การเปลี่ยนแปลงการใช้ที่ดินและมลพิษทางอากาศข้ามพรมแดน* [Maize, Land Use Change, and Transboundary Haze Pollution]. Greenpeace Thailand, Bangkok.
- Griskevicius, V., Tybur, J.M., Van den Bergh, B., 2010. Going green to be seen: status, reputation, and conspicuous conservation. *J. Pers. Soc. Psychol.* 98 (3), 392–404. <https://doi.org/10.1037/a0017346>.
- Gritten, D., Lewis, S., Breukink, G., Mo, K., Thuy, D., Delattre, E., 2019. Assessing forest governance in the countries of the greater Mekong subregion. *Forests* 10 (1), 47. <https://doi.org/10.3390/f10010047>.
- Haenssger, M.J., Charoenboon, N., Zanello, G., Mayxay, M., Reed-Tsochas, F., Jones, C. O.H., et al., 2018. Antibiotics and activity spaces: protocol of an exploratory study of behaviour, marginalisation, and knowledge diffusion. *BMJ Glob. Health* 3 (e000621). <https://doi.org/10.1136/bmjgh-2017-000621>.
- Haenssger, M.J., Savage, J., Yeboah, G., Charoenboon, N., Srenth, S., 2021. In a network of lines that intersect: the socio-economic development impact of marine resource management and conservation in Southeast Asia. *World Dev.* 146, 105576 <https://doi.org/10.1016/j.worlddev.2021.105576>.
- Hall, S.M., Holmes, H., 2020. Introduction: Mundane methods and the extra-ordinary everyday. In: Holmes, H., Hall, S.M. (Eds.), *Mundane Methods: Innovative Ways to Research the Everyday*. Manchester University Press, Manchester, pp. 1–14.
- Hallsworth, M., Egan, M., Rutter, J., McCrae, J., 2018. *Behavioural Government: Using Behavioural Science to Improve how Governments Make Decisions*. Behavioural Insights Ltd, London.
- Harada, K., 2018. *The Village in Transition: Development and Socio-Economic and Cultural Change in Mae Kampong Village, Chiang Mai*. Chiang Mai University Press, Chiang Mai.
- Hart, G., 1986. *Power, Labor, and Livelihood: Processes of Change in Rural Java*. University of California Press, Berkeley, CA.
- Hayami, Y., 1997. Internal and external discourse of communality, tradition and environment: minority claims on forest in the northern hills of Thailand. *Southeast Asian Stud.* 35 (3), 558–579.
- Hayami, Y., 2006. Negotiating ethnic representation between self and other: the case of Karen and eco-tourism in Thailand. *Southeast Asian Stud.* 44 (3), 385–409. <https://doi.org/10.20495/tak.44.3.385>.
- Hayward, D., Hirsch, P., Scurrah, N., 2021. Key Themes in Land Governance: Synopses of Research, Policy and Action in the Mekong Region. Regional Centre for Social Science and Sustainable Development, Chiang Mai.
- Hearn, R.M., 1974. *Thai Government Programs in Refugee Relocation and Resettlement in Northern Thailand*. Thailand Books, Auburn, NY.
- Henrich, J., Heine, S.J., Norenzayan, A., 2010. The weirdest people in the world? *Behav. Brain Sci.* 33 (2–3), 61–83. <https://doi.org/10.1017/S0140525X0999152X>.
- Hirai, K., 2002. Exhibition of power: Factory women's use of the housewarming ceremony in a northern Thai village. In: Tanabe, S., Keyes, C.R. (Eds.), *Cultural Crisis and Social Memory: Modernity and Identity in Thailand and Laos*. Routledge, London, pp. 185–201.
- Hirsch, P., 1996. Introduction: Seeing forests for trees. In: Hirsch, P. (Ed.), *Seeing Forests for Trees: Environment and Environmentalism in Thailand*. Silkwood Books, Chiang Mai, pp. 1–14.
- Hirsch, P., 2020. Limits to neoliberal authoritarianism in the politics of land capitalisation in Thailand: beyond the paradox. *Canad. J. Develop. Stud. / Revue canadienne d'études du développement* 41 (3), 363–380. <https://doi.org/10.1080/02255189.2019.1666705>.
- Holmes, G., 2007. Politics and protest: understanding resistance to conservation. *Conserv. Soc.* 5, 184–201. <https://doi.org/10.2307/26392880>.
- Howe, B.M., Jang, S., 2013. Human security and development: divergent approaches to Burma/Myanmar. *Pac. Focus* 28 (1), 120–143. <https://doi.org/10.1111/paf.12001>.
- Howlett, M., Rawat, S., 2019. Behavioral science and climate policy. *Oxford Res. Encyclop. Clim. Sci.* <https://doi.org/10.1093/acrefore/9780190228620.013.624>.
- Huang, H., Sumrongthong, B., 2004. Speaking with spirits: the Hmong ntou xeeb new year ceremony. *Asian Folklore Stud.* 63 (1), 31–55.
- Human Security Unit, 2009. *Human Security in Theory and Practice: Application of the Human Security Concept and the United Nations Trust Fund for Human Security*. Office for the Coordination of Humanitarian Affairs, New York, NY.

- Ingalls, M.L., Diepart, J.-C., Truong, N., Hayward, D., Neil, T., Phomphakdy, C., et al., 2018. State of Land in the Mekong Region. Centre for Development and Environment, Mekong Region Land Governance, Bern.
- Isager, L., Ivarsson, S., 2002. Contesting landscapes in Thailand: tree ordination as counter-territorialization. *Crit. Asian Stud.* 34 (3), 395–417. <https://doi.org/10.1080/146727102200008947>.
- ISOC, 2014. แผนแม่บท แก้ไขปัญหาการทำลายทรัพยากรป่าไม้ การบุกรุกที่ดินของรัฐ และการบริหารจัดการทรัพยากรธรรมชาติอย่างยั่งยืน [Master Plan for Solutions to Forest Resource Destruction, Invasion Into State's Land and Sustainable Management of Natural Resources]. Internal Security Operations Command, Bangkok.
- IWGIA, 2023. The Indigenous World 2023. International Work Group for Indigenous Affairs, Copenhagen.
- Jiang, Y., Kang, M., Schmidt-Vogt, D., Schrestha, R.P., 2007. Identification of agricultural factors for improving sustainable land resource management in northern Thailand: a case study in Chiang Mai Province. *Int. J. Sustain. Developm. World Ecol.* 14 (4), 382–390. <https://doi.org/10.1080/13504500709469738>.
- Johnson, C., Forsyth, T., 2002. In the eyes of the state: negotiating a "rights-based approach" to forest conservation in Thailand. *World Dev.* 30 (9), 1591–1605. [https://doi.org/10.1016/S0305-750X\(02\)00057-8](https://doi.org/10.1016/S0305-750X(02)00057-8).
- Kanazawa, H., Hoshikawa, K., Nawata, E., 2006. The changes in land use and agricultural systems of Karen people in North Thailand - a case study of Sam Sop Bon Village. *Japan. J. Trop. Agric.* 50 (3), 133–141. <https://doi.org/10.11248/jsta1957.50.133>.
- Kaufman, S.J., 2018. Ethnic conflict. In: Paul, D.W., Matt, M. (Eds.), *Security Studies: An Introduction*, 3rd ed. Routledge, Abingdon, pp. 380–394.
- Kunstadter, P., Chapman, E.C., 1978. Problems of shifting cultivation and economic development in northern Thailand. In: Kunstadter, P., Chapman, E.C., Sabhasri, S. (Eds.), *Farmers in the Forest: Economic Development and Marginal Agriculture in Northern Thailand*. University of Hawai'i Press, Honolulu, HI, pp. 12–42.
- Kunstadter, P., Prapamontol, T., Siriroyin, B.-O., Sontirat, A., Tansuhaj, A., Khamboonruang, C., 2001. Pesticide exposures among Hmong farmers in Thailand. *Int. J. Occup. Environ. Health* 7 (4), 313–325. <https://doi.org/10.1179/107735201800339227>.
- Kwan, M.-P., 2013. Beyond space (as we knew it): toward temporally integrated geographies of segregation, health, and accessibility. *Ann. Assoc. Am. Geogr.* 103 (5), 1078–1086. <https://doi.org/10.1080/00045608.2013.792177>.
- Lakanavichian, S., 2006. Trends in forest ownership, forest resources tenure and institutional arrangements: Are they contributing to better forest management and poverty reduction? In: Reeb, D., Romano, F. (Eds.), *Understanding Forest Tenure in South and Southeast Asia*. Food and Agriculture Organization of the United Nations, Rome, pp. 325–354.
- Leaning, J., Arie, S., 2000. *Human Security: A Framework for Assessment in Conflict and Transition*. USAID, Washington, DC.
- Leblond, J.P., 2010. Population Displacement and Forest Management in Thailand [Challenges of the Agrarian Transition in Southeast Asia Project Working Paper no. 8]. Université de Montréal, Montreal.
- Leblond, J.-P., 2019. Revisiting forest transition explanations: the role of "push" factors and adaptation strategies in forest expansion in northern Phetchabun, Thailand. *Land Use Policy* 83, 195–214. <https://doi.org/10.1016/j.landusepol.2019.01.035>.
- Leepreecha, P., 2016. Commoditizing his Majesty's footprints: Tourism in highland ethnic communities in northern Thailand. In: Porananond, P., King, V.T. (Eds.), *Tourism and Monarchy in Southeast Asia*. Cambridge Scholars Publishing, Newcastle upon Tyne, pp. 69–88.
- Leepreecha, P., 2019. Becoming indigenous peoples in Thailand. *J. Southeast Asian Stud.* 50 (1), 32–50. <https://doi.org/10.1017/S0022463419000183>.
- Linh, H.T.P., Espagne, E., Lagrèe, S., Drogoul, A., 2021. Inequalities and Environmental Changes in the Mekong Region: A Systematic Mapping. Agence Française de Développement, Paris.
- Lipsky, M., 2010. *Street-Level Bureaucracy: Dilemmas of the Individual in Public Services*, Updated ed. Russell Sage Foundation, New York.
- Locke, A., Langdown, I., Domingo, P., 2021. Perceived Tenure Security as a Tool for Understanding the Conflict Context and Predicting Violent Conflict. Overseas Development Institute, London.
- Luangaramsri, P., 2002. Redefining Nature: Karen Ecological Knowledge and the Challenge to the Modern Conservation Paradigm. Earthworm Books, Chennai.
- Martin, M., Kostovicova, D., 2014. From concept to method: The challenge of a human security methodology. In: Martin, M., Owen, T. (Eds.), *Routledge Handbook of Human Security*. Routledge, Abingdon, pp. 297–307.
- McCarthy, S., 2016. *Land Tenure Security and Policy Tensions in Myanmar (Burma)* [AsiaPacific Issues Series no. 127]. East-West Center, Honolulu, HI.
- McDonald, G., Wilson, M., Verissimo, D., Twohey, R., Clemence, M., Apistar, D., et al., 2020. Catalyzing sustainable fisheries management through behavior change interventions. *Conserv. Biol.* 34 (5), 1176–1189. <https://doi.org/10.1111/cobi.13475>.
- Mekong Land Research Forum, 2022. Mekong Land Research Forum. Retrieved 17 November 2022, from <http://www.mekonglandforum.org/>.
- Michie, S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., et al., 2013. The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: building an international consensus for the reporting of behavior change interventions. *Ann. Behav. Med.* 46 (1), 81–95. <https://doi.org/10.1007/s12160-013-9486-6>.
- Miller, D., 2010. *Stuff. Polity*, Cambridge.
- Ministry of Natural Resources and Environment, 2019. คู่มือปฏิบัติงานการจัดที่ดินทำกินให้ชุมชน ภายใต้คณะกรรมการนโยบายที่ดินแห่งชาติ (คทช.) [Handbook for Arranging Land for the Community under the National Land Policy Committee (NTC)]. Ministry of Natural Resources and Environment, Bangkok.
- Morita, K., Matsumoto, K.I., 2018. Synergies among climate change and biodiversity conservation measures and policies in the forest sector: a case study of southeast Asian countries. *Forest Policy Econ.* 87, 59–69. <https://doi.org/10.1016/j.forpol.2017.10.013>.
- Morris, R.C., 2002. Crises of the modern in northern Thailand: Ritual, tradition, and the new value of pastness. In: Tanabe, S., Keyes, C.R. (Eds.), *Cultural Crisis and Social Memory: Modernity and Identity in Thailand and Laos*. Routledge, London, pp. 68–94.
- Morrow, A., 2011. Tree ordination as invented tradition. *ASIA Network Exchange* 19 (1), 53–60. <https://doi.org/10.16995/ane.11>.
- Morton, M.F., Baird, I.G., 2019. From hill tribes to indigenous peoples: the localisation of a global movement in Thailand. *J. Southeast Asian Stud.* 50 (1), 7–31. <https://doi.org/10.1017/S0022463419000031>.
- Mosse, D., 2004. Is good policy unimplementable? Reflections on the ethnography of aid policy and practice. *Dev. Chang.* 35 (4), 639–671. <https://doi.org/10.1111/j.0012-155X.2004.00374.x>.
- Muthee, K., Duguma, L., Wainaina, P., Minang, P., Nzyoka, J., 2022. A review of global policy mechanisms designed for tropical forests conservation and climate risks management. *Front. For. Glob. Change* 4, 748170. <https://doi.org/10.3389/ffgc.2021.748170>.
- Nasrnia, F., Ashktorab, N., 2021. Sustainable livelihood framework-based assessment of drought resilience patterns of rural households of Bakhtegan basin, Iran. *Ecol. Indic.* 128. <https://doi.org/10.1016/j.ecolind.2021.107817>.
- Nellemann, C., Henriksen, R., Kreilhuber, A., Stewart, D., Kotsovou, M., Raxter, P., et al., 2016. The Rise of Environmental Crime – A Growing Threat to Natural Resources, Peace, Development and Security: A UNEP-INTERPOL Rapid Response Assessment. United Nations Environment Programme and RHIPTO Rapid Response-Norwegian Center for Global Analyses, Nairobi.
- Newman, E., 2001. Human security and constructivism. *Int. Stud. Perspect.* 2, 239–251.
- Nguyen, T.T., Nguyen, L.D., Lippe, R.S., Grote, U., 2017. Determinants of farmers' land use decision-making: comparative evidence from Thailand and Vietnam. *World Dev.* 89, 199–213. <https://doi.org/10.1016/j.worlddev.2016.08.010>.
- Nielsen, K.S., Marteau, T.M., Bauer, J.M., Bradbury, R.B., Broad, S., Burgess, G., et al., 2021. Biodiversity conservation as a promising frontier for behavioural science. *Nat. Hum. Behav.* 5 (5), 550–556. <https://doi.org/10.1038/s41562-021-01109-5>.
- Nillsuwan, B., 2023. Interacting with global refugee complexity and wrestling control: Shan refugees and migrants in Thailand. *Asian Pol. Pol.* 15 (2), 226–248. <https://doi.org/10.1111/aspp.12694>.
- Nisa, C.F., Belanger, J.J., Schumpe, B.M., Faller, D.G., 2019. Meta-analysis of randomised controlled trials testing behavioural interventions to promote household action on climate change. *Nat. Commun.* 10 (1), 4545. <https://doi.org/10.1038/s41467-019-12457-2>.
- Nixon, S.A., 2019. The coin model of privilege and critical allyship: implications for health. *BMC Public Health* 19 (1637). <https://doi.org/10.1186/s12889-019-7884-9>.
- NSO, 2004. 2003 Agricultural Census: Northern Region. National Statistical Office, Bangkok.
- NSO, 2014. 2013 Agricultural Census: Northern Region. National Statistical Office, Bangkok.
- NSO, 2019. 2018 Intercensal Survey of Agriculture. Retrieved 21 August 2021, from. National Statistical Office Data Warehouse. http://customerportal.nso.go.th/imin_dwebportal/sso/SsoDatawarehouse.aspx.
- NSO, 2021. Key Statistical Data. Retrieved 17 July 2021, from. National Statistical Office of Thailand. Web page. <http://statbbi.nso.go.th/staticreport/page/sector/en/index.aspx>.
- Ogata, S., Cels, J., 2003. Human security—protecting and empowering the people. *Glob. Gov.* 9 (3), 273–282.
- Olwig, K.R., 2001. 'Time out of Mind'—'Mind out of Time': custom versus tradition in environmental heritage research and interpretation. *Int. J. Herit. Stud.* 7 (4), 339–354. <https://doi.org/10.1080/13581650120105543>.
- Owen, T., 2014. Human security mapping. In: Martin, M., Owen, T. (Eds.), *Routledge Handbook of Human Security*. Routledge, Abingdon, pp. 308–318.
- Pawakapan, P., 2017. The Central Role of Thailand's Internal Security Operations Command in the Post-Counter-Insurgency Period. ISEAS Publishing, Singapore.
- Pendleton, A., Lupton, B., Rowe, A., Whittle, R., 2019. Back to the shop floor: behavioural insights from workplace sociology. *Work Employ. Soc.* 33 (6), 1039–1057. <https://doi.org/10.1177/0950017019847940>.
- Phongchiewboon, A., 2016. *Livelihood Strategies and Environmental Management Practices in Northern Thailand National Park Communities* (unpublished PhD thesis). Massey University, Palmerston North.
- Phongchiewboon, A., Holland, J., Hytten, K., Farrelly, T., 2020. Political ecology, privation and sustainable livelihoods in northern Thailand's national parks. *J. Pol. Ecol.* 27 (1), 360–377. <https://doi.org/10.2458/v27i1.23753>.
- Phomma, I., Pagdee, A., Popradit, A., Ishida, A., Uttaranakorn, S., 2019. Protected area co-management and land use conflicts adjacent to Phu Kao – Phu Phan Kham National Park, Thailand. *J. Sustain. For.* 38 (5), 486–507. <https://doi.org/10.1080/10549811.2019.1573689>.
- Podhisita, C., 2017. Household dynamics, the capitalist economy, and agricultural change in rural Thailand. *Southeast Asian Stud.* 6 (2), 247–273. <https://doi.org/10.20495/seas.6.2.247>.
- Rakotonarivo, O.S., Rakotoarisoa, M., Rajaonarivelo, H.M., Raharijaona, S., Jones, J.P.G., Hockley, N., 2023. Resolving land tenure security is essential to deliver forest restoration. *Commun. Earth Environ.* 4 (1) <https://doi.org/10.1038/s43247-023-00847-w>.
- Renard, R.D., 2001. *Opium Reduction in Thailand 1970–2000: A Thirty-Year Journey*. United Nations Drug Control Programme, Bangkok.

- RFD, 2009. Forestry in Thailand. Ministry of Natural Resources and Environment, Bangkok.
- RFD, 2021. สถิติป่าไม้ [Forest statistics]. Retrieved 22 August 2021, from. Royal Forestry Department. web page. <http://forestinfo.forest.go.th>.
- Riwthong, S., Schreinemachers, P., Grovermann, C., Berger, T., 2015. Land use intensification, commercialization and changes in pest management of smallholder upland agriculture in Thailand. *Environ. Sci. Pol.* 45, 11–19. <https://doi.org/10.1016/j.envsci.2014.09.003>.
- Riwthong, S., Schreinemachers, P., Grovermann, C., Berger, T., 2017. Agricultural commercialization: risk perceptions, risk management and the role of pesticides in Thailand. *Kasetsart J. Soc. Sci.* 38 (3), 264–272. <https://doi.org/10.1016/j.kjss.2016.11.001>.
- Roth, R., 2004. On the colonial margins and in the global hotspot: park–people conflicts in highland Thailand. *Asia Pac. Viewp.* 45 (1), 13–32. <https://doi.org/10.1111/j.1467-8376.2004.00225.x>.
- Roth, R., 2007. Two-dimensional maps in multi-dimensional worlds: a case of community-based mapping in northern Thailand. *Geoforum* 38 (1), 49–59. <https://doi.org/10.1016/j.geoforum.2006.05.005>.
- Roth, R.J., 2008. “Fixing” the forest: the spatiality of conservation conflict in Thailand. *Ann. Assoc. Am. Geogr.* 98 (2), 373–391. <https://doi.org/10.1080/00045600801925557>.
- Sakboon, M., 2007. The borders within: The Akha at the frontiers of national integration. In: Paper Presented at the Critical Transitions in the Mekong Region Conference, 29–31 January 2007, Chiang Mai.
- Samata, R., 2003. Agricultural transformation and highlander choice: A case study of a Pwo Karen community in northwestern Thailand. In: Paper Presented at the Politics of the Commons: Articulating Development and Strengthening Local Practices, 11–14 July 2003, Chiang Mai, Thailand.
- Sapkota, L.M., Jihadah, L., Sato, M., Greijmans, M., Wiset, K., Aektaeng, N., et al., 2021. Translating global commitments into action for successful forest landscape restoration: lessons from Ing watershed in northern Thailand. *Land Use Policy* 104, 104063. <https://doi.org/10.1016/j.landusepol.2019.104063>.
- Sato, J., 2000. People in between: conversion and conservation of forest lands in Thailand. *Dev. Chang.* 31 (1), 155–177. <https://doi.org/10.1111/1467-7660.00150>.
- Schroeder, R., 2002. The consumption of technology in everyday life: car, telephone, and television in Sweden and America in comparative-historical perspective. *Sociol. Res. Online* 7 (4).
- Schubert, C., 2017. Green nudges: do they work? Are they ethical? *Ecol. Econ.* 132, 329–342. <https://doi.org/10.1016/j.ecolecon.2016.11.009>.
- Scoones, I., 1998. Sustainable Rural Livelihoods: a Framework for Analysis [IDS Working Paper no. 72]. Institute for Development Studies, Sussex.
- Scott, J.C., 1985. *Weapons of the Weak: Everyday Forms of Peasant Resistance*. Yale University Press, New Haven, CT.
- Scott, J.C., 1998. *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press, New Haven, CT.
- Seo, B.K., 2020. *Eliciting Care: Health and Power in Northern Thailand*. University of Wisconsin Press, Madison, WI.
- Siriphon, A., 2006. Local knowledge, dynamism and the politics of struggle: a case study of the Hmong in northern Thailand. *J. Southeast Asian Stud.* 37 (1), 65–81. <https://doi.org/10.1017/S002246340500041X>.
- Sitthisutikul, K., Yossuck, P., Limnirankul, B., 2018. How does organic agriculture contribute to food security of small land holders?: a case study in the north of Thailand. *Cogent Food Agric.* 4 (1), 1429698. <https://doi.org/10.1080/23311932.2018.1429698>.
- Smith, L., 2006. *Uses of Heritage*. Routledge, London.
- Sopranzetti, C., 2017. Framed by freedom: emancipation and oppression in post-Fordist Thailand. *Cultural Anthropology* 32 (1). <https://doi.org/10.14506/ca32.1.07>.
- Stiglitz, J.E., 1996. Some lessons from the east Asian miracle. *World Bank Res. Obs.* 11 (2), 151–177.
- Sturgeon, J.C., Menzies, N.K., Fujita Lagerqvist, Y., Thomas, D., Ekasingh, B., Lebel, L., et al., 2013. Enclosing ethnic minorities and forests in the Golden economic quadrangle. *Dev. Chang.* 44 (1), 53–79. <https://doi.org/10.1111/dech.12006>.
- Tadjibakhsh, S., 2014. In defense of the broad view of human security. In: Martin, M., Owen, T. (Eds.), *Routledge Handbook of Human Security*. Routledge, Abingdon, pp. 43–57.
- Tanabe, S., Keyes, C.R., 2002. Introduction. In: Tanabe, S., Keyes, C.R. (Eds.), *Cultural Crisis and Social Memory: Modernity and Identity in Thailand and Laos*. Routledge, London, pp. 1–39.
- Theobald, S., 1996. Employment and environmental hazard: women workers and strategies of resistance in northern Thailand. *Gend. Dev.* 4 (3), 16–21. <https://doi.org/10.1080/741922174>.
- Tomforde, M., 2003. The global in the local: contested resource-use systems of the Karen and Hmong in northern Thailand. *J. Southeast Asian Stud.* 34 (2), 347–360.
- Toomey, A.H., 2023. Why facts don't change minds: Insights from cognitive science for the improved communication of conservation research. *Biol. Conserv.* 278. <https://doi.org/10.1016/j.biocon.2022.109886>.
- Trakansuphakorn, P., 2021. Rotational agriculture from agroecological perspective: The case of Pgae K' Nyau community in northern Thailand. In: Paper Presented at the Shifting Cultivation from an Agroecological Perspective Conference, 24 March 2021, Chiang Mai.
- Trakansuphakorn, P., 2008. Space of resistance and place of local knowledge in Karen ecological movement of northern Thailand: the case of Pgae K' Nyau villages in Mae Lan Kham River Basin. *Southeast Asian Stud.* 45 (4), 586–614. https://doi.org/10.20495/tak.45.4_586.
- Trébuil, G., Ekasingh, B., M. E., 2006. Agricultural commercialisation, diversification, and conservation of renewable resources in northern Thailand highlands. *Moussons* 9–10, 131–155. <https://doi.org/10.4000/moussons.2005>.
- Tseng, T.-W.J., Robinson, B.E., Bellemare, M.F., Benyishay, A., Blackman, A., Boucher, T., et al., 2021. Influence of land tenure interventions on human well-being and environmental outcomes. *Nat. Sustain.* 4 (3), 242–251. <https://doi.org/10.1038/s41893-020-00648-5>.
- Tungtittiplakorn, W., 1998. *Highland Cash Crop Development and Biodiversity Conservation: The Hmong in Northern Thailand* (unpublished PhD thesis). University of Victoria, Victoria.
- Turner, N.J., Plotkin, M., Kuhnlein, H.V., 2013. Global environmental challenges to the integrity of indigenous peoples' food systems. In: Kuhnlein, H.V., Erasmus, B., Spigelski, D., Burlingame, B. (Eds.), *Indigenous peoples' Food Systems & Well-Being: Interventions & Policies for Healthy Communities*. Food and Agriculture Organization of the United Nations, Rome, pp. 23–38.
- UNDP, 1994. *Human development report 1994*. United Nations Development Programme, New York, NY.
- UNEP-WCMC, 2021. Protected Area Profile for Thailand from the World Database of Protected Areas, August 2021. Retrieved 21 August 2021, from. United Nations Environment Programme World Conservation Monitoring Centre. web page. www.protectedplanet.net.
- United Nations, 2021a. COP26 IPLC Forest Tenure Joint Donor Statement. Retrieved 7 Nov 2021, from. 26th UN Climate Change Conference of the Parties (COP26). web page. <https://ukcop26.org/cop26-iplc-forest-tenure-joint-donor-statement/>.
- United Nations, 2021b. Glasgow Leaders' Declaration on Forests and Land Use. Retrieved 7 Nov 2021, from. 26th UN Climate Change Conference of the Parties (COP26). web page. <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>.
- United Nations Statistics Division, 2021. Global SDG indicators database. Retrieved 22 August 2021, from. <https://unstats.un.org/sdgs/indicators/database/>.
- Vaddhanaphuti, C., 2005. The Thai state and ethnic minorities: From assimilation to selective integration. In: Snitwongse, K., Thompson, W.S. (Eds.), *Ethnic Conflicts in Southeast Asia*. Institute of Security and International Studies, Bangkok, pp. 151–166.
- Valatin, G., Moseley, D., Dandy, N., 2016. Insights from behavioural economics for forest economics and environmental policy: potential nudges to encourage woodland creation for climate change mitigation and adaptation? *Forest Policy Econ.* 72, 27–36. <https://doi.org/10.1016/j.forpol.2016.06.012>.
- Vandenbroele, J., Vermeir, I., Geuens, M., Slabbinck, H., Van Kerckhove, A., 2020. Nudging to get our food choices on a sustainable track. *Proc. Nutr. Soc.* 79 (1), 133–146. <https://doi.org/10.1017/s0029665119000971>.
- Vandergeest, P., Peluso, N.L., 1995. Territorialization and state power in Thailand. *Theory Soc.* 24 (3), 385–426. <https://doi.org/10.1007/bf00993352>.
- Vanwambeke, S.O., Somboon, P., Lambin, E.F., 2007. Rural transformation and land use change in northern Thailand. *J. Land Use Sci.* 2 (1), 1–29. <https://doi.org/10.1080/17474230601145943>.
- Varvasovszky, Z., Brugha, R., 2000. How to do (or not to do) . . . a stakeholder analysis. *Health Policy Plan.* 15 (3), 338–345. <https://doi.org/10.1093/heapol/15.3.338>.
- Virapongse, A., 2017. Smallholders and forest landscape restoration in upland northern Thailand. *Int. For. Rev.* 19 (4), 102–119. <https://doi.org/10.1505/146554817822330533>.
- Vlaev, I., King, D., Dolan, P., Darzi, A., 2016. The theory and practice of “nudging”: changing health behaviors. *Public Adm. Rev.* 76 (4), 550–561. <https://doi.org/10.1111/puar.12564>.
- Walker, A., 2003. Agricultural transformation and the politics of hydrology in northern Thailand. *Dev. Chang.* 34 (5), 941–964. <https://doi.org/10.1111/j.1467-7660.2003.00335.x>.
- Wataru, F., 2020. The rubber boom assemblage and internalized friction: attitudes of the government, NGOs, and farmers in northeast Thailand. *Southeast Asian Stud.* 9, 381–411. <https://doi.org/10.20495/seas.9.3.381>.
- West, P., Igoe, J., Brockington, D., 2006. Parks and peoples: the social impact of protected areas. *Annu. Rev. Anthropol.* 35 (1), 251–277. <https://doi.org/10.1146/annurev.anthro.35.081705.123308>.
- Williamson, K.A., Thulin, E., 2022. Leveraging emotion-behavior pathways to support environmental behavior change. *Ecol. Soc.* 27 (3). <https://doi.org/10.5751/es-13363-270327>.
- Wittayapak, C., 2008. History and geography of identifications related to resource conflicts and ethnic violence in northern Thailand. *Asia Pac. Viewp.* 49 (1), 111–127. <https://doi.org/10.1111/j.1467-8373.2008.00364.x>.
- Wittayapak, C., Baird, I.G., 2018. Communal land titling dilemmas in northern Thailand: from community forestry to beneficial yet risky and uncertain options. *Land Use Policy* 71, 320–328. <https://doi.org/10.1016/j.landusepol.2017.12.019>.
- Wong, G., Greenhalgh, T., Westhorp, G., Buckingham, J., Pawson, R., 2013. RAMESES publication standards: realist syntheses. *BMC Med.* 11 (21). <https://doi.org/10.1186/1741-7015-11-21>.
- Woyesa, T., Kumar, S., 2020. Potential of coffee tourism for rural development in Ethiopia: a sustainable livelihood approach. *Environ. Dev. Sustain.* 23 (1), 815–832. <https://doi.org/10.1007/s10668-020-00610-7>.
- Yasmi, Y., Durst, P., Ul Haq, R., Broadhead, J., 2017. Forest Change in the Greater Mekong Subregion (GMS): An Overview of Negative and Positive Drivers. Food and Agriculture Organization of the United Nations, Bangkok.

- Youdelis, M., 2013. The competitive (dis)advantages of ecotourism in northern Thailand. *Geoforum* 50, 161–171. <https://doi.org/10.1016/j.geoforum.2013.09.007>.
- Zenk, S.N., Schulz, A.J., Matthews, S.A., Odoms-Young, A., Wilbur, J., Wegrzyn, L., et al., 2011. Activity space environment and dietary and physical activity behaviors: a pilot study. *Health Place* 17 (5), 1150–1161. <https://doi.org/10.1016/j.healthplace.2011.05.001>.
- Zoratto, L., Datta, S., Miranda, J.J., Gonzales, O., 2015. A Behavioral Approach to Water Conservation: Evidence from Costa Rica [World Bank Policy Research Working Paper Series no. 7283]. World Bank, Washington, DC.