A Political Ecology of 'Adaptation': Critical perspectives on case studies in Taiwan and Vietnam

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Abstract

The current global climate crisis, a result of the Anthropocene, has forced the global community to reconsider current notions of adaptation, vulnerability and resilience. This has especially been true for smallholder local and Indigenous farmers, who on the one hand have proven to be excellent at adapting to changing environmental conditions but on the other hand are also disproportionally affected by the global climate crisis. In this article, I will critically examine the concept of adaptation from a political ecology perspective, both conceptually and using examples from Taiwan and Vietnam. I argue that 'adaptation', as we know it, is often a neoliberal mechanism which puts the responsibility on individual farmers, instead of looking at the many structural barriers and power relations underlying unequal vulnerabilities and resiliencies. Instead of seeing adaptation, resilience and vulnerabilities as linear and causal processes, it would be better to reconsider these definitions from a critical perspective. On the one hand, we do need to prepare for the adverse effects of climate change, but on the other hand we need to be aware of what causes structural inequalities to co-exist. This awareness will then hopefully lead to better bottom-up strategies towards coping with the global climate crisis from smallholders' perspectives, while tackling other inequalities and unequal power structures at the same time.

Keywords: political ecology; adaptation; Taiwan; Vietnam; Indigenous peoples; climate crisis, Anthropocene; smallholder farming; resilience

Introduction

The global climate crisis has severe consequences for the world's Indigenous peoples, as they are often directly dependent on natural resources and subsistence-based livelihoods (**Reyes-García et al., 2024**). Instead of solely portraying them as victims of climate change, an increasing number of studies, international reports, and advocacy groups argue that it is better to study how Indigenous and other subsistence-oriented communities cope with, adapt to, and mitigate the adverse impacts of climate change (**Ford et al., 2020**). Therefore, the concept of Indigenous resilience becomes more widely used in climate change adaptation literature (**Bayrak et al., 2023; Berkes et al., 2021**). Indigenous and other subsistence-oriented communities are able to observe temperature changes that align with scientific climate models and provide essential information on how these climatic shifts affect local ecosystems, agricultural systems, and food security (**Savo et al., 2016**). Various Indigenous communities have demonstrated remarkable proficiency in climate change adaptation through the use of their locally specific Traditional Ecological Knowledge systems (TEK) and their holistic relationship with their land and community (**Berkes, 2018; Gómez-Baggethun et al., 2013; Paneque-Gálvez et al., 2018**). Indigenous communities must therefore be recognized as equal partners in climate change adaptation and mitigation initiatives, across all scales from global to local (**Reyes-García et al., 2024**).

With the advent of the Anthropocene, and given that the climate crisis presents a global threat with very much localized impacts, the call for adaptation at all levels has become the new 'creed' (**Watts, 2015**). The underlying idea in conventional resilience theory is that everyone has a certain level of resilience, and by adopting appropriate adaptation measures in response to certain (climate-related) stressors, this resilience can be enhanced. Resilience theory has faced criticism from scholars for failing to really consider broader social, economic, and environmental processes, political economy, unequal power relations, and discourses on adaptation (**Turner, 2014; Watts, 2015**). Adaptation does not occur in a vacuum; it involves more than just reacting to internal and external stressors, such as climate change, and is influenced by various structural determinants and micro-level factors (**Marks et al., 2022; Taylor, 2013, 2015**). More often than not, it is not even clear what people 'adapt' to: climate change, top-down solutions to climate change, other human-made disasters, market restructuring, or all of these?

In this article, I critically examine the concept of adaptation from a political ecology perspective. By taking three cases of Indigenous and local smallholder communities in Taiwan and Vietnam as examples, I highlight

how dominant scientific discourses on climate adaptation and mitigation are essentially a neoliberal mechanism putting the responsibility upon the individual while proposing market-based solutions as a means to 'stay in place'. This article builds on my previous research, consisting of various surveys and field visits conducted in both countries with local and Indigenous communities, who, on the one hand, face the tangible threat of the climate crisis, and on the other hand, must cope with top-down enforced adaptation solutions.

In the following section I concisely outline how concepts such as adaptation, resilience and vulnerability can be approached from a political ecology perspective. The article then continues to present three case studies: the impact of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) program, a global climate change mitigation program, on the Indigenous M'nam in Vietnam; Indigenous tourism as a proposed post-disaster recovery solution for the Indigenous Tsou in Taiwan; and the Vietnamese government's use of agricultural upscaling as proposed adaptation strategy for local smallholder farmers in the Mekong Delta. While all three case studies describe very diverse situations, I argue that the proposed adaptation solutions are essentially based on very similar presumptions. The final part of this article offers concluding remarks and proposes ways forward.

Political Ecology of Adaptation, Resilience, and Vulnerability

It would be erroneous to assume that this article introduces the political ecology of adaptation, resilience, and vulnerability as a new approach given the extensive body of research already conducted (**Corbera et al., 2017; Eriksen et al., 2015; Eriksen and Lind, 2009; Pelling, 2011; Sovacool, 2018; Sovacool et al., 2015**). It is not my goal here to propose a novel framework nor provide an exhaustive review on the literature on the political ecology of adaptation. What this article, however, proposes is a relatively straightforward hypothesis or proposition: most top-down climate change adaptation solutions are essentially neoliberal. Those who implement adaptation policies (e.g., governments, international organizations, non-governmental organisations, or NGOs) often place sole responsibility—whether intentionally and unintentionally—on individuals to adapt, advocating for market-based solutions without critically incorporating structural determinants, political economy, unequal power relations, pre-existing social and economic inequalities, and the micro-level factors that shape and reshape people's adaptation pathways (**Marks et al., 2022**). If anything, many ill-fitted adaptation and mitigation solutions exacerbate pre-existing inequalities and reshape power dynamics and processes of marginalisation within and among communities (**Corbera et al., 2017; Eriksen et al., 2015**).

Contrarily, adaptation is not merely about reacting to or coping with climate change; it is an inherently socio-political process (**Eriksen et al., 2015**). While the dominant assumption is that individuals need to adapt, the broader processes driving the Anthropocene are largely ignored. Consequently, if individuals fail to adapt, it is often considered their own fault (in technocratic terms, 'maladaptation'), or they are left to bear the brunt of the climate crisis if they choose to remain in place. Conventional studies and international policy reports on climate migration then often imply that failure to adapt will inevitably result in massive out-migration, leading to an urban future for millions of rural poor in the Global South, leaving their lands for large-scale industrial agriculture (**Paprocki, 2020**).

The question then becomes, Who decides which individuals need to 'adapt'? Is it simply determined by the negative impacts of the global climate crisis on the individuals and their households, or are there other factors at play? Here, two concepts play an important role: vulnerability and resilience. The Sixth Assessment Intergovernmental Panel on Climate Change (IPCC) report, which is probably the most influential authority on climate change adaptation, defines resilience as

> *the capacity of social, economic and ecosystems to cope with a hazardous event or trend or disturbance, responding or reorganising in ways that maintain their essential function, identity and structure as well as biodiversity in case of ecosystems while also maintaining the capacity for adaptation, learning and transformation* (**IPCC, 2023: 7**).

The report defines vulnerability as 'the propensity or predisposition to be adversely affected and encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt' (**2023: 5**). What both definitions have in common is that they are apolitical; fail to recognize people as autonomous agents; do not consider the intersectionality of resilience and vulnerability; and do not acknowledge how both resilience and vulnerability are deeply relational—in other words, some people are resilient or vulnerable because others are not (**Taylor, 2013**). Nonetheless, many conventional studies 'measure' one's 'resilience' and 'vulnerability'—with numerous indices created and quantified—to determine how much 'adaptation' is needed.

Instead of questioning the drivers and root causes of the negative consequences of the Anthropocene, which I argue are undeniably linked to global capitalism, solutions are often sought solely within the market system (**Escobar, 1996**). Escobar explains how the sustainable development discourse purports 'to reconcile two old enemies—economic growth and the preservation of the environment—without any significant adjustments in the market system (**1996: 328**). Discourses on adaptation, vulnerability, and resilience should be viewed as a subset

within dominant sustainability discourses abiding the same internal logic: rather than questioning the system that caused the climate crisis in the first place, we seek solutions within that very same system. The dominant logic seems to suggest that, simply put, what we need is not less but *more* capitalism (**Escobar, 1996; Fairhead et al., 2012**).

REDD+ and Indigenous Communities in Vietnam

The Reducing Emissions from Deforestation and Forest Degradation (REDD+) program is a multilateral initiative under the Paris Agreement aimed at mitigating global climate change. It is implemented by various multilateral organizations, including United Nations agencies and the World Bank, as well as by NGOs, governments, and private companies. It was established and further negotiated during the many Conferences of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC). The premise of REDD+ is quite simple: developed countries pay developing countries for conserving carbon in their forests as a means to halt CO_2 emissions. Ever since CO_2 became a commodity, an outcome of the Kyoto Protocol, carbon markets, both global and voluntary, emerged, and REDD+ was developed to achieve a triple-win situation: mitigate climate change, conserve the world's forests, and improve livelihoods of those depending on forests. Activities in REDD+ include not only avoiding deforestation and degradation but also sustainable forest management, enhancement of carbon stocks, and conservation. These activities very often involve and impact local forest-dependent communities. As of today, most countries in the Global South with significant forest covers, as well as a few without, are involved in REDD+ readiness or implementation activities, though the COP meetings and REDD+ negotiations seemed to be on hold for now.

During my PhD research from 2011 to 2015 (**Bayrak, 2015**), I analysed the local impacts of REDD+ on Indigenous communities in Vietnam. Among the communities I researched, the implementation process of REDD+ in the M'nam communities, one of Vietnam's Central Highlands groups, particularly stood out. REDD+ was implemented by an international NGO with the goal of not only conserving carbon to sell in a voluntary carbon credit market but also using REDD+ to transfer forestland from former state forest enterprises back to the communities. The underlying assumption was that if communities owned the forestland, they would have a vested interest in preserving it. Additionally, sustainable forest management was perceived as a good adaptation measure against climate-related stressors. The M'nam communities in this study were highly forest-dependent, conducting swidden agriculture, hunting and collecting non-timber forest products (NTFPs). When the NGO approached them to participate in REDD+, the involved communities voted in

accordance with the principles of Free, Prior, and Informed Consent (FPIC). The main aim of FPIC is that people have a clear understanding of what REDD+ is, and they are able to vote unrestrained in a democratic manner. REDD+ had yet to pay out carbon payments at the time of the research, but the communities were involved in various readiness activities.

My study revealed that the local M'nam communities did not have a clear understanding of what REDD+ entailed, even though they voted to participate in the program. Being forest-dependent, they assumed that they could collect carbon in the forest and sell it on the market like any other NTFP. Additionally, interviewees claimed that REDD+ was something about the air. The reason why they decided to participate in REDD+ was that they wanted to receive formal land titles for forestland. They wanted these forestlands not for preservation but for growing coffee and other commercial crops, the very antithesis of REDD+ (**Nguyen et al., 2022; To et al., 2017**). While REDD+ is primarily a mitigation rather than an adaptation program, its premise is highly problematic: it shifts the responsibility for global climate mitigation onto local and Indigenous communities, who live what conventional scientists describe as 'carbon-negative' lifestyles. These communities are told, often implicitly, that if they do not participate in REDD+, they will have to bear the negative consequences of climate change, whereas participation could potentially provide them with significant financial benefits. International and other powerful actors attempting to impose a highly alien concept of forest management on local and Indigenous communities—who have developed deep and spiritual relationships with their surrounding forests through their TEK systems—may be a key reason why REDD+ has failed to succeed in many pilot projects around the world.

Indigenous and Community-based Tourism in Taiwan

Regarding the second case study, we conducted a research project on post-disaster recovery and Indigenous tourism among the Tsou communities, one of the sixteen officially recognized Indigenous groups in Taiwan, who live in Alishan Township, a mountainous and forested area rich in biodiversity (**Bayrak, 2022**). We were interested in studying the impact of Typhoon Morakot, which swept across Taiwan in 2009, leaving behind a deadly trail of devastation. We analysed the role of Indigenous tourism—defined as a subset of community-based tourism (CBT)—in post-disaster recovery among three communities in South Alishan.

The first community, Shanmei (or *Saviki* in the Tsou language) had developed a very successful CBT model prior to Typhoon Morakot, which focused on community-based river ecosystem and local fish fauna (*Onychostoma alticorpus*) management. The community established the Danaiku Nature Ecological Park (DNEP), which involved most of its

community members working in the park, and it is generally considered to be among the most successful CBT models in Taiwan as well as the world (**Hipwell, 2007**). The second community, Chashan (*Cayamavana*), transformed the village into a cultural eco-village, in which most visitors stayed in home-stays to experience the unique Tsou culture. The third community, Xinmei (*Sinvi*), was situated right between Shanmei and Chashan and faced challenges in developing a tourism niche. When Typhoon Morakot struck the communities, the tourism industries and local economies of all three communities collapsed. The ecological disaster was so severe that the number of visitors to DNEP dropped to zero in 2010.

During the post-disaster recovery efforts, significant attention was given by the government to CBT and Indigenous tourism as means to restore the local economy and ravaged ecosystems. Consequently, the government prioritized communities already engaged in CBT before Typhoon Morakot, such as Shanmei, in receiving the necessary resources for recovery. It took six years following the typhoon to reach the same visitor levels as 2008 (around 110,000 annual visitors) in DNEP. Communities like Xinmei, which were less involved in tourism, felt somewhat neglected; many interviewees from Xinmei, for instance, reported that their hiking trails were still unrepaired as of 2019. Indigenous tourism thus contributed to inequalities between communities in post-disaster recovery settings. We also observed intra-community disparities, such as those between households actively engaged in tourism and those that were not. Those actively involved in tourism prior to Typhoon Morakot in Chashan reported being better financially recovered from the typhoon compared to those with other non-tourism livelihoods.

More problematically, many Indigenous communities in Taiwan are expected to copy other successful models like Shanmei to develop their own CBT initiatives to cope with the negative effects of climate change, but also to find means to remain in the village. Villages in rural Taiwan, including those in our study, not only face the negative consequences of climate change, but also super-aging, economic stagnation, and out-migration. Additionally, there is an underlying assumption that everyone has the potential to be a tourism entrepreneur. This pressure for many individuals and communities to adopt the same CBT model of more successful communities illustrates how responsibilities have shifted to households and communities, while solutions are expected to be found in the market. Although it is not official government policy, few alternatives besides tourism are provided to keep the village economy alive.

Agricultural Upscaling and Climate Change in the Mekong Delta

An official government policy to use market-based solutions as a form of climate change adaptation can be found in the Mekong Delta of Vietnam. Around 75 percent of the people's livelihoods depends on agriculture in the Mekong Delta (**Van Aalst et al., 2023**). It is perhaps one of the most human-modified, politically contested deltas in the world. Since French colonialism prompted massive canalisation projects in the delta, the Mekong Delta has been intrinsically linked to Vietnam's changing political economy and national development plans. After the end of the American war and the reunification of Vietnam, the main purpose of the Mekong Delta was to produce rice for the entire nation, earning the title of 'rice basket of Vietnam' (and later of the entire Asian region). Many rice farmers practiced monocrop single-rice agriculture, growing rice during the dry season and allowing their fields to be flooded during the rainy season. In order to improve efficiency, the Vietnamese government invested heavily in flood infrastructure, such as dike and sluice gate systems, to prevent flooding and enable farmers to not only double but also triple their rice crops annually. As rice farmers traditionally depended on flooding to replenish soil nutrients, the lack of flooding heavily increased the use of chemical fertilizers and pesticides. The Vietnamese government adopted the paradigm that flooding had to be prevented at all costs (**Tran, 2020**). With an increase of intensified flooding events however, the Vietnamese government proposed the idea to 'live with floods' starting from the late 2000s.

The Mekong Delta faces various environmental and non-environmental challenges, which include sea-level rise, increasing salinisation, droughts, intensified flooding events, and changing weather patterns. They also include the negative impacts of upstream hydropower development in upstream Mekong countries such as China and Laos, which remove sediments from the river and exacerbate droughts downstream; coastal and riverbank erosion; illegal sand mining; the negative impacts of (faulty) flood infrastructure; and the lack of flooding, which in many cases is also considered a disaster (**Bayrak et al., 2022**).

It should be noted, though, that the above description of the Mekong Delta is somewhat of a generalisation, considering the diversity of its agricultural systems. In our project, we focused on local smallholder farmers in Kien Giang province, a coastal province in the Mekong Delta. As a means to cope with increasing salinisation, the government started to promote aquaculture to the local farmers, particularly (rotational) rice-shrimp farming. Rice-shrimp farmers raise shrimp during the dry season and grow rice during the rainy season. The general idea is that since shrimp

thrive in a brackish and saline environment, it would be better to let brackish water in (i.e., live with brackish water). The shift to rice-shrimp farming could fulfil three goals: adapt to increased salinisation; increase income as aquaculture is more profitable than rice farming; and upscale agriculture in the delta. This shift was linked to the national government's broader plan to upscale the agricultural value chains and industries in the delta. Aquaculture, as well as fruit tree farming, is currently being actively encouraged and implemented. In its 2017 Resolution 120/NQ-CP, which outlines the Vietnamese government's vision for the Mekong Delta, the government no longer referred to its farmers as smallholder farmers but rather as agri-entrepreneurs (**Bayrak et al., 2022)**. While the shift to rice-shrimp farming provided significant financial benefits to rice-shrimp farmers, not all smallholder farmers had the capacity, start-up capital or land to make this transition (**Poelma et al., 2021**). However, by allowing brackish water in to enable rice-shrimp farming, mono-crop rice farmers have few choices but to either engage in rice-shrimp farming themselves or lease out their farmlands to others due to shared water resources.

While aquaculture and fruit production have been increasing in the Mekong Delta, outmigration rates to urban areas have also reached an all-time high. While I do not argue that there is a causal relationship between these two factors, the government, as well as many other organizations and academics, link these out-migration rates directly to the negative impacts of climate change (**Bayrak et al., 2022**). Climate change, being an external threat, is easier to blame than other political economy factors, such as the government's top-down plan to upgrade agriculture in the delta or the negative impacts of upstream hydropower development, which make it more difficult for farmers to cope with environmental changes.

When we refer to adaptation of farmers in the Mekong Delta, it is equally difficult to pinpoint what it is farmers are actually adapting *to.* To make matters more complicated, both COVID-19 and the war in Ukraine affected farmers in Kien Giang. Urban migrants returned to rural areas due to COVID-19 lockdowns, while the war caused fertilizer prices to significantly increase for local farmers. What the case above has shown is that future studies should no longer ascribe changes in the Mekong Delta solely to climate change, and the effects of broader land-use challenges, government policy, geopolitical relations, power relations and transboundary water governance issues need to be better understood (**Tran, 2020**).

Conclusion

The above cases have shown how powerful stakeholders, such as governments and international organizations, have turned 'environmental subjects' into carbon-, tourism- or agri-entrepreneurs as solutions in order to cope, adapt to, or mitigate the negative impacts of climate change. Indigenous communities in Vietnam were even expected to carry the burden of global climate change through engaging in REDD+. We also found Indigenous tourism in Taiwan and the shift to rice-shrimp farming in Vietnam have caused inequalities within and among communities. Some households were able to successfully transition into rice-shrimp farming or become successful tourism entrepreneurs, but other households were left behind. Whether it was to sell carbon, a unique tourism experience, or shrimp, all proposed solutions were based on market mechanisms while shifting focus onto the individual responsibility of households.

In this article, I do not argue that engaging in tourism, sustainable forest management, or transitioning to rice-shrimp farming are necessarily negative. For many farmers in the Mekong Delta, for instance, rice-shrimp farming was seen as highly profitable, providing local farmers with new opportunities to improve their lives and livelihoods. I argue, however, that adaptation solutions should be (co-)developed by Indigenous and local communities. They need to be bottom-up approaches that also address existing inequalities and power imbalances in addition to other structural problems that communities face, all while considering peoples' aspirations and dreams.

This can be achieved in two ways. First, we need to perceive adaptation as a cultural practice (**Marks et al., 2022**). Adopting a cultural lens allows us to better situate adaptation within a specific socio-cultural and historical context and adopt an intersectional perspective, appreciating the diversity within communities. Instead of viewing adaptation through a checklist of 'adaptation actions', we need a more grounded approach that reflects what adaptation truly encompasses from the perspectives of local and Indigenous peoples. Secondly, we need to adopt a more grounded approach by decolonising research. Decolonising research refers to, according to Datta, 'a continuous process of anti-colonial struggle that honors Indigenous approaches to knowing the world, recognizing Indigenous land, Indigenous peoples, and Indigenous sovereignty—including sovereignty over the decolonization process' (**2018: 2**). This puts Indigenous epistemologies and voices at the center of the research process (**Datta, 2018; Kovach, 2021; Smith, 2012**). While these calls to action are not new, this article hopefully serves as an important reminder.

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References

Bayrak, M. M., 2015. *Rethinking Livelihoods, Forest Governance and Socio-ecological Systems: The State of REDD+ in Vietnam* (PhD thesis). The Chinese University of Hong Kong. Available at: https://www.proquest.com/docview/1774914681/abstract/7BFB08B342754B36PQ/1 (last accessed: 19 February 2026).

Bayrak, M. M., 2022. 'Does Indigenous tourism contribute to Indigenous resilience to disasters? A case study on Taiwan's highlands'. *Progress in Disaster Science,* 14, Available at: https://doi.org/10.1016/j.pdisas.2022.100220 (last accessed: 19 February 2026).

Bayrak, M. M., Hung, L.-S., & Hsu, Y.-Y., 2023. 'Living with typhoons and changing weather patterns: Indigenous resilience and the adaptation pathways of smallholder farmers in Taiwan'. *Sustainability Science,* 18(2), 951–965.

Bayrak, M. M., Marks, D., & Hauser, L. T., 2022. 'Disentangling the concepts of global climate change, adaptation, and human mobility: a political-ecological exploration in Vietnam's Mekong Delta'. *Climate and Development*, 14(10),

935–944. Available at: https://doi.org/10.1080/17565529.2022.2028596 (last accessed: 19 February 2026).

Berkes, F., 2018. *Sacred Ecology* (4th ed.). New York and London: Routledge. Accessed: 25 May 2021.

Berkes, F., Tsai, H.-M., Bayrak, M. M., & Lin, Y.-R., 2021. 'Indigenous Resilience to Disasters in Taiwan and Beyond'. *Sustainability,* 13(5), 2435. Available at: https://doi.org/10.3390/su13052435 (last accessed: 19 February 2026).

Corbera, E., Hunsberger, C., & Vaddhanaphuti, C., 2017. 'Climate change policies, land grabbing and conflict: perspectives from Southeast Asia'. *Canadian Journal of Development Studies / Revue canadienne d'études du développement,* 38(3), 297–304. Available at: https://doi.org/10.1080/02255189.2017.1343413 (last accessed: 19 February 2026).

Datta, R., 2018. 'Decolonizing both researcher and research and its effectiveness in Indigenous research'. *Research Ethics,* 14(2), 1–24. Available at: https://doi.org/10.1177/1747016117733296 (last accessed: 19 February 2026).

Eriksen, S. H., Nightingale, A. J., & Eakin, H., 2015. 'Reframing adaptation: The political nature of climate change adaptation'. *Global Environmental Change,* 35, 523–533. Available at: https://doi.org/10.1016/j.gloenvcha.2015.09.014 (last accessed: 19 February 2026).

Eriksen, S., & Lind, J., 2009. 'Adaptation as a political process: adjusting to drought and conflict in Kenya's drylands'. *Environmental Management*, 43(5), 817–835. Available at: https://doi.org/10.1007/s00267-008-9189-0 (last accessed: 19 February 2026).

Escobar, A., 1996. 'Construction nature: Elements for a post-structuralist political ecology'. *Futures,* 28(4), 325–343. https://doi.org/10.1016/0016-3287(96)00011-0 (last accessed: 19 February 2026).

Fairhead, J., Leach, M., & Scoones, I., 2012. 'Green Grabbing: a new appropriation of nature?' *The Journal of Peasant Studies*, 39(2), 237–261. Available at: https://doi.org/10.1080/03066150.2012.671770 (last accessed: 19 February 2026).

Ford, J. D., King, N., Galappaththi, E. K., Pearce, T., McDowell, G., & Harper, S. L., 2020. 'The Resilience of Indigenous Peoples to Environmental Change'. *One Earth*, 2(6), 532–543. Available at: https://doi.org/10.1016/j.oneear.2020.05.014 (last accessed: 19 February 2026).

Gómez-Baggethun, E., Corbera, E., & Reyes-García, V., 2013. 'Traditional Ecological Knowledge and Global Environmental Change: Research findings and policy implications'. *Ecology and Society,* 18(4). Available at: https://doi.org/10.5751/ES-06288-180472 (last accessed: 19 February 2026).

Hipwell, W. T., 2007. 'Taiwan aboriginal ecotourism: Tanayiku Natural Ecology Park'. *Annals of Tourism Research*, 34(4), 876–897. Available at: https://doi.org/10.1016/j.annals.2007.04.002 (last accessed: 19 February 2026).

Intergovernmental Panel on Climate Change (IPCC) (Ed.), 2023. 'Summary for Policymakers', in *Climate Change 2022 – Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 3–34). Cambridge: Cambridge University Press. Available at: https://doi.org/10.1017/9781009325844.001 (last accessed: 19 February 2026).

Kovach, M., 2021. *Indigenous Methodologies: Characteristics, Conversations, and Contexts*, Second Edition. University of Toronto Press.

Marks, D., Bayrak, M. M., Jahangir, S., Henig, D., & Bailey, A., 2022. 'Towards a cultural lens for adaptation pathways to climate change'. *Regional Environmental Change,* 22(1), 22. Available at: https://doi.org/10.1007/s10113-022-01884-5 (last accessed: 19 February 2026).

Nguyen, V. T. H., McElwee, P., Le, H. T. V., Nghiem, T., & Vu, H. T. D., 2022. 'The challenges of collective PES: Insights from three community-based models in Vietnam'. *Ecosystem Services,* 56, 101438. Available at: https://doi.org/10.1016/j.ecoser.2022.101438 (last accessed: 19 February 2026).

Paneque-Gálvez, J., Pérez-Llorente, I., Luz, A. C., Guèze, M., Mas, J.-F., Macía, M. J., et al., 2018. 'High overlap between traditional ecological knowledge and forest conservation found in the Bolivian Amazon'. *Ambio,* 47(8), 908–923. Available at: https://doi.org/10.1007/s13280-018-1040-0 (last accessed: 19 February 2026).

Paprocki, K., 2020. 'The climate change of your desires: Climate migration and imaginaries of urban and rural climate futures'. *Environment and Planning D: Society and Space, 38*(2), 248–266. Available at: https://doi.org/10.1177/0263775819892600 (last accessed: 19 February 2026).

Pelling, M., 2011. *Adaptation to climate change: from resilience to transformation*. London, New York: Routledge.

Poelma, T., Bayrak, M. M., Van Nha, D., & Tran, T. A., 2021. 'Climate change and livelihood resilience capacities in the Mekong Delta: a case study on the transition to rice–shrimp farming in Vietnam's Kien Giang Province'. *Climatic Change, 1*64(1), 9. Available at: https://doi.org/10.1007/s10584-021-02973-w (last accessed: 19 February 2026).

Reyes-García, V., García-del-Amo, D., Álvarez-Fernández, S., Benyei, P., Calvet-Mir, L., Junqueira, A. B., et al., 2024. 'Indigenous Peoples and local communities report ongoing and widespread climate change impacts on local social-ecological systems'. *Communications Earth & Environment,* 5(1), 1–10. Available at: https://doi.org/10.1038/s43247-023-01164-y (last accessed: 19 February 2026).

Savo, V., Lepofsky, D., Benner, J. P., Kohfeld, K. E., Bailey, J., & Lertzman, K., 2016. 'Observations of climate change among subsistence-oriented communities around the world.' *Nature Climate Change*, 6(5), 462–473. https://doi.org/10.1038/nclimate2958 (last accessed: 19 February 2026).

Smith, L. T., 2012. *Decolonizing Methodologies: Research and Indigenous Peoples* (2nd edition.). London: Zed Books.

Sovacool, B. K., 2018. 'Bamboo Beating Bandits: Conflict, Inequality, and Vulnerability in the Political Ecology of Climate Change Adaptation in Bangladesh'. *World Development*, 102, 183–194. Available at: https://doi.org/10.1016/j.worlddev.2017.10.014 (last accessed: 19 February 2026).

Sovacool, B. K., Linnér, B.-O., & Goodsite, M. E., 2015. 'The political economy of climate adaptation'. *Nature Climate Change*, 5(7), 616–618. Available at: https://doi.org/10.1038/nclimate2665 (last accessed: 19 February 2026).

Taylor, M., 2013. 'Climate change, relational vulnerability and human security: rethinking sustainable adaptation in agrarian environments'. *Climate and Development*, 5(4), 318–327. https://doi.org/10.1080/17565529.2013.830954 (last accessed: 19 February 2026).

Taylor, M., 2015. *The political ecology of climate change adaptation: Livelihoods, agrarian change and the conflicts of development*. Abingdon, Oxfordshire and New York, N.Y: Routledge.

To, P., Dressler, W., & Mahanty, S., 2017. 'REDD+ for Red Books? Negotiating rights to land and livelihoods through carbon governance in the Central Highlands of Vietnam'. *Geoforum,* 81, 163–173. Available at: https://doi.org/10.1016/j.geoforum.2017.03.009 (last accessed: 19 February 2026).

Tran, T. A., 2020. 'From free to forced adaptation: A political ecology of the 'state-society-flood' nexus in the Vietnamese Mekong Delta'. *Asia Pacific Viewpoint,* 61(1), 162–182. Available at: https://doi.org/10.1111/apv.12241 (last accessed: 19 February 2026).

Turner, M. D., 2014. 'Political ecology I: An alliance with resilience?' *Progress in Human Geography,* 38(4), 616–623. Available at: https://doi.org/10.1177/0309132513502770 (last accessed: 19 February 2026).

Van Aalst, M. A., Koomen, E., & de Groot, H. L. F., 2023. 'Vulnerability and Resilience to Drought and Saltwater Intrusion of Rice Farming Households in the Mekong Delta, Vietnam'. *Economics of Disasters and Climate Change*, 7(3), 407–430. Available at: https://doi.org/10.1007/s41885-023-00133-1 (last accessed: 19 February 2026).

Watts, M. J., 2015. 'Now and Then: The origins of political ecology and the rebirth of adaptation as a form of thought', in T. Perreault, G. Bridge, & J. McCarthy (Eds.), *The Routledge Handbook of Political Ecology* (pp. 19–50). New York, NY: Routledge.

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