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Climate change related urban transformation and the role of cultural heritage  
*Matthias Ripp & Christer Gustafsson (Eds.)*

## From Tradition to Resilience: The Value of Balinese Adaptive Culture in Climate Change Adaptation and Heritage Management

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### Abstract

The Subak Landscape of Bali Province was inscribed as a World Heritage Site in 2012 for its exceptional irrigation system that links to the *Tri Hita Karana* philosophy, which emphasises the importance of maintaining a harmonious relationship between humans, the spiritual realm, nature, and fellow human beings. Farmers and local communities have faced a growing challenge in safeguarding their livelihood and ensuring the productivity of rice fields. While tourism has been an integral part of Balinese society for centuries, it is essential to acknowledge that the agricultural sector has encountered difficulties that have driven many individuals away from farming activities and towards the tourism industry. The fact that this agricultural society has been disrupted by the global climate crisis is often overlooked. Extreme drought, heavy rainfall, and flooding have significantly affected rice production and the social and economic sustainability of farmers and urban landscapes.

These changes in livelihood and agricultural practices have transformed Balinese villages and communities, driven by the climate crisis as much as tourism. Such transformations have brought about both negative and positive impacts on the Balinese built heritage. The Balinese's perception of heritage value and change have contributed to the adaptive characteristic of Balinese cultural heritage, causing them to normalize physical transformations. While there are consequences associated with this approach, it has been demonstrated that the shift in livelihoods and land use, which potentially jeopardize the World Heritage Status, is linked to the preservation of the Balinese culture and society that face destruction due to environmental changes. This serves as a compelling illustration of how climate resilience and heritage preservation are interconnected.

Scholars and intergovernmental organizations consistently emphasize the pivotal role of local, indigenous, and traditional knowledge in climate change adaptation, disaster risk reduction, and biodiversity protection (Hulbert *et al.*, 2019; Raygorodetsky, 2011). This paper aims to explore the role of the Balinese culture in climate change adaptation as well as examine the impact of the climate crisis on the Balinese cultural heritage, including traditional knowledge, livelihoods, and urban landscape. It is important to acknowledge that varying interpretations of heritage preservation exist between international and local communities, often resulting in the marginalization of local and indigenous knowledge within heritage management approaches (Rakic & Chambers, 2008; Taylor, 2009; Staiff & Bushell, 2013; Suntikul & Jachna, 2013; Cocks *et al.*, 2018). Using the subak landscape as a case study, this paper also seeks to explore the potential of local and indigenous knowledge as a bridge for integrating climate actions and heritage preservation.

**Keywords:** adaptive culture, agriculture, climate change adaptation, resilience, subak landscape



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**Works cited**

- Al-Harithy, H., 2005, "[Reframing] 'World Heritage'", *Traditional Dwellings and Settlements Review*, 17(1), 7–17.
- Berkes, F., Folke, C., Gadgil, M., 1994, *Traditional ecological knowledge, biodiversity, resilience and sustainability*, Springer, Netherlands, 269-287.
- Berkes, F., Reid, W. V., Wilbanks, T. J., & Capistrano, D., 2006, Bridging scales and knowledge systems. *Bridging scales and knowledge systems: Concepts and applications in ecosystem assessment*, 315.
- Berkes, F., & Armitage, D., 2010, "Co-management institutions, knowledge, and learning: Adapting to change in the Arctic", *Etudes/Inuit/Studies*, 34(1), 109-131.
- Berkes, F., & Ross, H., 2013, "Community resilience: toward an integrated approach", *Society & natural resources*, 26(1), 5-20.
- Berkes, F., Tsai, H. M., Bayrak, M. M., Lin, Y. R., 2021, "Indigenous resilience to disasters in Taiwan and beyond", *Sustainability*, 13(5), 2435.
- Boillat, S., & Berkes, F., 2013, "Perception and interpretation of climate change among Quechua farmers of Bolivia: indigenous knowledge as a resource for adaptive capacity", *Ecology and Society*, 18(4).
- Chapagain, N.K., 2023, "Scope and limitations of heritage-based resilience: some reflections from Nepal", *Built Heritage* 7:12. <https://doi.org/10.1186/s43238-023-00094-0>.
- Chen, Y. Y., 2020, "Decolonizing methodologies, situated resilience, and country: Insights from Tayal Country, Taiwan", *Sustainability*, 12(22), 9751.
- Cocks, M., Vetter, S., Wiersum, K. F., 2018, "From universal to local: perspectives on cultural landscape heritage in South Africa", *International Journal of Heritage Studies*, 24(1), 35–52. doi: 10.1080/13527258.2017.1362573.
- Creswell, J. W., 2013, Five Qualitative Approach to Inquiry. In: *Qualitative inquiry and research design: choosing among five approaches*, (3rd ed.), Thousand Oaks, Calif: SAGE Publications, 53–84.
- David-Chavez, D. M., & Gavin, M. C., 2018, "A global assessment of Indigenous community engagement in climate research", *Environmental Research Letters*, 13(12), 123005.
- Eiseman Jr, F. B., 1990, *Bali: Sekala and Niskala*, Singapore, Periplus.
- Fatorić, S., & Seekamp, E., 2017, "Are cultural heritage and resources threatened by climate change? A systematic literature review", *Climatic change*, 142(1-2), 227-254.



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Ford, J. D., Cameron, L., Rubis, J., Maillet, M., Nakashima, D., Willox, A. C., Pearce, T., 2016, "Including indigenous knowledge and experience in IPCC assessment reports", *Nature Climate Change*, 6(4), 349-353.

Garai, J., Ku, H. B., Zhan, Y., 2022, "Climate change and cultural responses of indigenous people: A case from Bangladesh", *Current Research in Environmental Sustainability*, 4, 100130.

Gonzales, T., 2013, "Sense of place and Indigenous people's biodiversity conservation in the Americas", *Seeds of resistance, seeds of hope: Place and agency in the conservation of biodiversity*, 85-106.

Gunderson, L. H., Holling, C. S. (Eds.), 2002, *Panarchy: understanding transformations in human and natural systems*, Island Press.

Hobart, M., 2016, Talking to God; On Argument, agency and articulation in Bali, In: *How Indonesian Argue*, Oxford. Available at: <http://www.criticalia.org/symposia--panels/hobart---talking-to-god.pdf> (Accessed 24 January 2019).

Hurlbert, M., J. Krishnaswamy, E. Davin, F.X. Johnson, C.F. Mena, J. Morton, S. Myeong, D. Viner, K. Warner, A. Wreford, S. Zakieldein, Z. Zommers., 2019, Risk Management and Decision making in Relation to Sustainable Development. In: P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D.C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.), *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*, Cambridge University Press, <https://doi.org/10.1017/9781009157988.009>.

International Labour Office (ILO), 2017, *Indigenous peoples and climate change: from victims to change agents through decent work*, Geneva, ILO.

Kohler, T. A., & Rockman, M., 2020, "The IPCC: A primer for archaeologists", *American Antiquity*, 85(4), 627-651.

Laduzinsky, P., 2019, *The Disproportionate Impact of Climate Change on Indigenous Communities*, KCET, Retrieved from <https://www.kcet.org/shows/tending-nature/the-disproportionate-impact-of-climate-change-on-indigenous-communities>. (Accessed 1 May 2023).

Lee, S. H., & Chen, Y. J., 2021, "Indigenous knowledge and endogenous actions for building tribal resilience after typhoon soudelor in northern Taiwan", *Sustainability*, 13(2), 506.

Lin, Y. R., Tomi, P., Huang, H., Lin, C. H., Chen, Y., 2020, "Situating indigenous resilience: Climate change and Tayal's "Millet Ark" action in Taiwan", *Sustainability*, 12(24), 10676.

Maikhuri, R. K. *et al.*, 2001, "Conservation policy–people conflicts: a case study from Nanda Devi Biosphere Reserve (a World Heritage Site), India", *Forest Policy and Economics*, 2(3–4), 355–365. doi: 10.1016/S1389-9341(01)00037-5.



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- Mansourian, S., Belokurov, A., & Stephenson, P. J., 2009, "The role of forest protected areas in adaptation to climate change", *Unasylva*, 60(231-232), 63-69.
- Maruyama, N. U., Woosnam, K. M. and Boley, B. B., 2016, "Comparing levels of resident empowerment among two culturally diverse resident populations in Oizumi, Gunma, Japan", *Journal of Sustainable Tourism*, 24(10), 1442–1460. doi: 10.1080/09669582.2015.1122015.
- McDowell, G., Ford, J., & Jones, J., 2016, "Community-level climate change vulnerability research: trends, progress, and future directions", *Environmental Research Letters*, 11(3), 033001.
- Meskel, L., 2002, "Negative heritage and past mastering in archaeology", *Anthropological Quarterly*, 75(3), 557–574.
- Pearce, T. D., Ford, J. D., Laidler, G. J., Smit, B., Duerden, F., Allarut, M., ... & Wandel, J., 2009, "Community collaboration and climate change research in the Canadian Arctic", *Polar Research*, 28(1), 10-27.
- Picard, M., 1996, *Bali Cultural Tourism and Touristic Culture*, Singapore: Archipelago Press.
- Rahman, D. F., 2021, *Re-Evaluating Socio-Cultural Change in World Heritage Sites: A Case Study of the Cultural Landscape of Bali Province*, Doctoral dissertation, University College London.
- Rahman, D., & Fouseki, K., 2022, Evaluating the management plan of Bali Cultural Landscape from the local community's perspective. In Fouseki, K., Cassar, M., Dreyfuss, G., Ang Kah Eng, K., 2022, *Routledge Handbook of Sustainable Heritage*, 72-84, London, Routledge.
- Rakic, T., & Chambers, D., 2008, "World Heritage: Exploring the tension between the national and the 'universal'", *Journal of Heritage Tourism*, 2(3), 145-155.
- Raygorodetsky, G., 2011, *Why traditional knowledge holds the key to climate change*, United Nations University, 13.
- 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.
- Scheuren, J. M., De Waroux, O., Below, R., Guha-Sapir, D., Ponserre, S., 2007, Annual disaster statistical review: The numbers and trends, Brussels, CRED
- Sesana, E., Gagnon, A. S., Bertolin, C., Hughes, J., 2018, "Adapting cultural heritage to climate change risks: perspectives of cultural heritage experts in Europe", *Geosciences*, 8(8), 305.
- Dastgerdi, A. S., Sargolini, M., and Pierantoni, I., 2019, "Climate change challenges to existing cultural heritage policy", *Sustainability*, 11(19), 5227.
- Simpson, N. P., Orr, S. A., Sabour, S., Clarke, J., Ishizawa, M., Feener, R. M., ... & Zvobogo, L., 2022, ICSM CHC White Paper II: Impacts, vulnerability, and understanding risks of climate change for culture and heritage: Contribution of Impacts Group II to the International Co-Sponsored Meeting



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on Culture, Heritage and Climate Change, Discussion Paper, Paris ICOMOS, available at: <https://openarchive.icomos.org/id/eprint/2718/>.

Staiff, R., & Bushell, R., 2013, “Mobility and modernity in Luang Prabang, Laos: Re-thinking heritage and tourism”, *International Journal of Heritage Studies*, 19(1), 98-113.

Suntikul, W. and Jachna, T., 2013, “Contestation and negotiation of heritage conservation in Luang Prabang, Laos”, *Tourism Management*, 38, 57–68. doi: 10.1016/j.tourman.2013.02.005.

Taylor, K., 2009, “Cultural Landscapes and Asia: Reconciling International and Southeast Asian Regional Values”, *Landscape Research*, 34(1), 7–31. doi: 10.1080/01426390802387513.

Tengö, M., Brondizio, E. S., Elmqvist, T., Malmer, P., & Spierenburg, M., 2014, “Connecting diverse knowledge systems for enhanced ecosystem governance: the multiple evidence base approach”, *Ambio*, 43, 579-591.

Todd, Z., 2015, “Indigenizing the Anthropocene”, In Davis, H., & Turpin, E., 2015, *Art in the Anthropocene: Encounters among aesthetics, politics, environments and epistemologies*, Open Humanity Press, 241-254.

UN Department of Economic and Social Affairs, 2019, *On the Frontlines of Climate Change*, Retrieved from <https://www.un.org/sustainabledevelopment/blog/2019/07/on-the-frontlines-of-climate-change/>, (Accessed 15 May 2023).

UNDRR, 2023, *The Report of the Midterm Review of the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030*, UNDRR, Geneva, Switzerland.

UNESCO, 2020, *Climate change now top threat to natural World Heritage – IUCN report*, Retrieved from <https://whc.unesco.org/en/news/2219>, (Accessed 15 May 2023).

Vickers, A., 2012, *Bali A Paradise Created*, 2nd edition, Singapore, Tuttle Publishing.

Wardekker, A., Nath, Sanchayan., Handayaningsih, T., 2023, The interaction between cultural heritage and community resilience in disaster-affected volcanic regions, *Environmental Science & Policy*, Volume 145, 2023, 116-128.

Winter, T., 2014, “Heritage studies and the privileging of theory”, *International Journal of Heritage Studies*, 20(5), 556–572. doi: 10.1080/13527258.2013.798671.

Yeh, J. H. Y., Lin, S. C., Lai, S. C., Huang, Y. H., Yi-fong, C., Lee, Y. T., & Berkes, F., 2021, Taiwanese indigenous cultural heritage and revitalization: Community practices and local development, *Sustainability*, 13(4), 1799.