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Beyond Harmony: Climate Adaptation, Gender Inequality, and Symbolic Governance in Bali

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Abstract

This study critically examines the celebrated Balinese *subak* irrigation system. The *subak* is an irrigation group for water control and allocation over a regional area, traditionally guided by the *Tri Hita Karana* (THK) philosophy of harmony. We argue that this idealised narrative obscures structural inequalities and gendered exclusion embedded within *subak* governance, particularly as communities face intensifying climate stressors. Investigating two sites—Jatiluwih (rural, high tourism) and Margaya (peri-urban)—through intersectional analysis, utilising Participatory Focus Group Discussions and interviews we explore how women's labour and agency are shaped by spatial governance and symbolic discourses. Women's exclusion from decision-making stems from a systemic rationalisation of hierarchy as essential for morality order. This creates a governance blind spot: climate adaptation interventions, designed as gender-neutral, yield profoundly biased outcomes, reinforcing existing inequalities and hindering equitable adaptation for smallholder farmers.

Keywords*: subak,* governance, gender exclusion, intersectionality, *Tri Hita Karana,* climate change, adaptation, resilience

Introduction

Subak is a socio-religious system and irrigation collective that coordinates water distribution, cropping schedules, and collective labour.[1] Hildred and Clifford Geertz situate *subak* within a broader cultural landscape where ritual authority, social organisation, and resource management are interdependent rather than separate domains.[2]

Tri Hita Karana (THK; 'the three causes of well-being') provide the cultural and normative framework for the *subak* system and Balinese life—a tripartite harmony necessary for collective prosperity.[3] THK's three dimensions: *parhyangan* (relations with the divine,

[1] Clifford Geertz, *Agricultural Involution: The Process of Ecological Change in Indonesia* (University of California Press, 1963); Clifford Geertz, 'Form and variation in Balinese village structure,' *American Anthropologist* 61, no. 6 (1959).

[2] Hildred Geertz and Clifford Geertz, *Kinship in Bali* (University of Chicago Press, 1975).

[3] Dik Roth and Gede Sedana, 'Reframing *Tri Hita Karana*: From "Balinese Culture" to Politics,' *The Asia Pacific Journal of Anthropology* 16, no. 2 (2015), https://doi.org/10.1080/14442213.2014.994674.

enacted through temple), *pawongan* (relations among humans, expressed through collective governance), and *palemahan* (relations with the environment, maintained through agricultural practice) are reflected in the structure and function of the *subak*.[4]

These ethical principles have historically guided Balinese agrarian life; however, recent scholarship situates *subak* within contemporary political and economic processes as well. *Subak* is being reshaped by land markets, tourism development, state regulations, and situations where control over land and water becomes contested.[5] Further, Dik Roth and Gede Sedana argue that THK is increasingly mobilised within policy and heritage discourse.[6] Against this background, we argue that structural inequalities and gendered exclusions, embedded within the system's daily operations and formal governance, are often obscured.

With the focus on communal harmony, critical questions of power, labour, and authority are overlooked or even ignored. Formal leadership, land ownership, and ritual power are largely male domains, and the contributions by women, youth, and non-landowning labourers are neither considered nor included in decision-making.[7] Policy approaches that adopt this uncritical narrative risk overlooking the various vulnerabilities of different social groups. They do not consider the knowledge and adaptive strategies of women and landless workers whose agency is institutionally constrained. This paper moves beyond what we see as the idealisation of the THK role in agricultural management and examines how the cultural ideals that prioritise harmony sustain unequal governance and influence approaches to climate adaptation within the *subak* groups.

We employ a comparative empirical focus on two distinct *subak* sites in Bali. Jatiluwih, in rural Tabanan, is part of a UNESCO World Heritage Cultural Landscape site and a major tourism zone. Green zoning policies nominally protect farmland yet prioritise tourism investment, which restructures labour toward service work and weakens collective farming. In contrast, Margaya, on the peri-urban fringes of Denpasar, faces rapid land conversion, flooding, and ageing irrigation infrastructure. These dynamics unfold amid intensifying climate variability and socio-economic change: unpredictable rainfall disrupts planting cycles, declining water flow in Jatiluwih forces crop substitution, and land conversion in Margaya heightens tenure insecurity and exclusion. Tourism and urbanisation reconfigure livelihoods, creating unstable service work that falls disproportionately on women.

Drawing on fieldwork that included interviews and participatory focus group discussions (pFGDs) in which farmers collectively produced spatial maps and seasonal calendars of farming activities, this paper addresses the following key research questions: 1) How do symbolic discourses structure governance under climate stress?; 2) How do gender relations and intersecting identities come into view in *subak* governance and adaptation to climate and livelihood change in rice farming?; 3) What contrasts emerge between rural-tourism and peri-urban *subak*?

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[4] John Stephen Lansing, *Perfect Order: Recognizing Complexity in Bali* (Princeton University Press, 2006), 67-87; John Stephen Lansing, *Priests and Programmers: Technologies of Power in the Engineered Landscape of Bali* (Princeton University Press, 2007); Geertz, *Agricultural Involution*.

[5] Agung Wardana, *Contemporary Bali: Contested Space and Governance* (Springer, 2019); Agung Wardana, 'Neoliberalizing Cultural Landscapes: Bali's Agrarian Heritage,' *Critical Asian Studies* 52, no. 2 (2020), https://doi.org/10.1080/14672715.2020.1714459.

[6] Roth and Sedana, 'Reframing *Tri Hita Karana*,' 163–66.

[7] Roth and Sedana, 'Reframing *Tri Hita Karana*,' 163.

The paper proceeds as follows: we review the literature on symbolic governance, climate adaptation, gender, and intersectionality, after which we outline our methodology and field sites. Analysis of *subak* governance and the symbolic orders followed by an examination of women's labour and authority.We highlight how vulnerability emerges at the intersection of gender, land ownership, kinship status, and migration in the context of climate variability and tourism-driven economic change. The final section argues for a more critical engagement with cultural discourse in climate and resource governance.

Conceptual framework

Symbolic governance and Tri Hita Karana

Bali's agricultural policy increasingly turns to culturalisation,[8] reframing *subak* and rice as markers of Balinese identity rather than as part of everyday livelihoods. Instruments such as *Kawasan Pertanian Pangan Berkelanjutan* (KP2B) zoning and the Organic Farming Regulation (Perda No. 8/2018) embed narratives of cultural safeguarding and what Agung Wardana mentioned as 'branding for tourism.'[9] This alignment with heritage and tourism markets depoliticises agrarian issues, including land conversion, declining incentives, and inheritance-related fragmentation.[10] At the same time, expectations of visibility, performance, and compliance are introduced, as cultural values become embedded in tourist-oriented development and branding.[11] These strategies prioritise economic returns while obscuring inequalities of distribution.[12]

[8] The concept of culturalisation emerged from the 'cultural turn' in the social sciences, where scholars highlighted the increasing centrality of culture as the idiom through which politics, identity, and economy were mediated. See Stuart Hall, 'The Question of Cultural Identity,' in *Modernity and Its Futures*, ed. Stuart Hall, David Held, and Tony McGrew (Polity Press, 1992); Ulf Hannerz, *Cultural Complexity: Studies in the Social Organization of Meaning* (Columbia University Press, 1992); and Angela McRobbie, *Postmodernism and Popular Culture* (Routledge, 1994). Subsequent works extended this analysis into migration and citizenship studies, showing how governance increasingly relied on cultural framings of difference, gender, and sexuality. See, for example, Paul Mepschen, Jan Willem Duyvendak, and Evelien Tonkens, 'Sexual Politics, Orientalism, and Multicultural Citizenship in the Netherlands,' *Sociology* 44, no. 5 (2010), https://doi.org/10.1177/0038038510375740; and Sara Farris, *In the Name of Women's Rights: The Rise of Femonationalism* (Duke University Press, 2017). More recently, the concept has been applied beyond migration to heritage and agrarian contexts. In Bali, for instance, UNESCO's inscription of the *subak* has been critiqued as a form of neoliberal culturalisation that turns agrarian systems into symbolic heritage capital; see Wardana, 'Neoliberalizing cultural landscapes.' This analysis echoes earlier insights on the commodification of Balinese culture for tourism and policy branding found in Michel Picard, *Bali: Cultural Tourism and Touristic Culture* (Archipelago Press, 1996), and Adrian Vickers, *Bali: A Paradise Created* (Penguin Books, 2020).

[9] Wardana, *Contemporary Bali*, 47.

[10] Zheng, Tongyue. 'Negotiating Conflicts Between Cultural Values and Economic Interests in The Development of Cultural Heritage Tourism Projects.' *Highlight and Business, Economics and Management* 60 (2025), https://doi.org/10.54097/rr0pyg11.

[11] Agung Wardana and Venasius Haryanto, 'Development for Whom? The Politics of Heritage Conservation-cum-Tourism in Indonesia,' *Journal of Contemporary Asia* 56, no. 3 (2026), https://doi.org/10.1080/00472336.2025.2561810.

[12] Ida Bagus Putu Suamba, 'Materiality and Spirituality in Tourism of Bali: An Ethical Reflection on the *Tri-Hita-Karana*,' *International Journal of Applied Sciences in Tourism and Events* 1 (2017), https://repository.pnb.ac.id/id/eprint/5144.

THK discourse legitimises this shift, portraying *desa adat* (customary villages)*, desa dinas* (administrative villages), and *subak* (irrigation collectives)[13]*,* as naturally cooperative.[14] At the same time, it masks gendered exclusions and power asymmetries, naturalising the state's interventions in the name of cultural balance.[15] This occurs where competition over economic, cultural, and symbolic capital continues to influence access to leadership positions and decision-making authority within Balinese social fields.[16] Wardana and Venansius Haryanto argue that this shapes rationales of governance by re-casting political contestation as moral obligation and cultural balance.[17] This process constrains dissent, obscures power and gender inequalities, legitimises state and elite authority, and shifts risks downwards to farmers and marginal groups. The inscription of the *subak* on the UNESCO World Heritage list as a Cultural Landscape in 2012 intensified this logic, linking tourism, conservation, and international recognition, recasting *subak* as timeless while obscuring land loss and livelihood precarity.[18] This orientation is reinforced through *awig-awig* (form of customary law regulating *desa adat*)*, perarem* (complementary regulations of the *awig-awig*), and other institutional mechanisms that embed moral authority in everyday decision-making.[19]

Climate adaptation and agrarian change

In Indonesia, climate vulnerability is commonly analysed using the framework of the Intergovernmental Panel on Climate Change (IPCC, an intergovernmental body of the United Nations) which conceptualises vulnerability as the degree to which a system is susceptible to, and unable to cope with, the adverse effects of climate change. In this framework, used

[13] Bali's governance is organised through overlapping institutional fields: *desa adat* (customary villages), *desa dinas* (administrative villages), and *subak* (irrigation collectives). *Desa adat* regulates ritual life, customary law (*awig-awig*), and cultural identity, with authority vested in community councils; see Clifford Geertz, 'Form and Variation in Balinese Village Structure,' *American Anthropologist* 61, no. 6 (1959); Carol Warren, *Adat and Dinas: Balinese Communities in the Indonesian State* (Oxford University Press, 1993). *Desa dinas*, formalised under colonial and later Indonesian state law, manages administrative tasks such as public services, education, and infrastructure; see Carol Warren, '*Adat* in Balinese Discourse and Practice: Locating Citizenship and the Commonweal,' in *The Revival of Tradition in Indonesian Politics,* ed. Jamie S. Davidson and David Henley (Routledge, 2007). The *subak*, recognised by UNESCO in 2012, is a semi-autonomous irrigation system that integrates water management with temple rituals dedicated to the god Danu and Sri, the goddess of fertility; see Lansing, *Priests and Programmers*. While often depicted as harmonious, these spheres overlap, compete, and negotiate authority depending on context; see Wardana, *Contemporary Bali*. Such interpenetration reveals what Moore terms 'semi-autonomous social fields,' where rules are internally generated yet shaped by wider political and economic forces; see Sally Falk Moore, 'Law and Social Change: The Semi-Autonomous Social Field as an Appropriate Subject of Study,' *Law & Society Review* 7, no. 4 (1973).

[14] Geertz, 'Form and variation,' 991–1012; Warren, *Adat and Dinas*, 7-35, 99–134; Wardana, *Contemporary Bali*, 129–61.

[15] Pamela Herd and Donald Moynihan, 'Gender administrative burden: regulating gendered bodies, labor and identity,' *Journal of Public Administration Research and Theory* 35, no. 1 (2024), https://doi.org/10.1093/jopart/muae021.

[16] I Nyoman Sudama, 'Conflict within *Tri Hita Karana's* fields: A conceptual review,' *International Journal of Linguistics, Literature and Culture* 6, no. 6 (2020), https://doi.org/10.21744/ijllc.v6n6.992.

[17] Wardana and Haryanto, 'Development for Whom?'

[18] Roth and Sedana, 'Reframing Tri Hita Karana,' 168; Wardana, *Contemporary Bali*, 138–45.

[19] I. Nyoman Norken et al., 'Institutional and Regulatory Roles in Maintaining Sustainability of *Subak* as a World Cultural Heritage in Bali,' *Asian Agri-History* 21, no. 4 (2017).

globally in climate research and policy analysis, vulnerability is understood as a function of three core components: exposure to climate hazards, system sensitivity, and adaptive capacity, which is the system's ability to adjust or manage the consequences.[20]

Southeast Asia is heavily reliant on farming and mainly smallholder farmers, who are highly susceptible to climate stressors, particularly unpredictable rainfall that leads to ENSO-related drought and shifting biotic threats such as La Niña-linked Brown Planthopper (Nilaparvata lugens) outbreaks that affect rice crops.[21] This unpredictability has forced farmers to adjust their practices constantly. In Bali, the farmers plan agricultural tasks using a traditional agronomy calendar and *subak*.[22] Integrating these ecological and social values into strategies addressing climate change is essential for robust and inclusive strategies.

The success of adaptation is influenced by a gendered division of labour in farming and households and the distribution of authority over irrigation and land management, which together shape different vulnerabilities to climate change. Vulnerability is not only environmental but also social and political.[23] Adaptation carries political implications where the reliance on narratives of *subak* harmony often masks structural inequalities.[24] Where inequalities in land ownership, authority and participation in decision-making persist, technical adaptation measures may reinforce existing hierarchies or be appropriated by local elites. It is necessary to recognise these systemic struggles to ensure adaptation benefits those most affected.

Gender, power, and agency in agrarian institutions

The Feminist political ecology (FPE)[25] approach highlights that women's exclusion from resource governance is rarely incidental but produced through the intersection of a gendered

[20] Arief Anshory Yusuf and Herminia A. Francisco, *Climate Change Vulnerability Mapping for Southeast Asia* (Economy and Environment Program for Southeast Asia, 2009), 10–14, https://idl-bnc-idrc.dspacedirect.org/server/api/core/bitstreams/4863e9aa-1bef-47ae-86d4-82d81e2a3b6e/content; Thomas Fellmann, 'The assessment of climate change-related vulnerability in the agricultural sector: reviewing conceptual frameworks,' in *FAO/OECD Workshop on Building Resilience for Adaptation to Climate Change in the Agriculture Sector* (Food and Agriculture Organization of the United Nations, 2012).

[21] Alwin Keil et al., 'Vulnerability of Smallholder Farmers to ENSO-related Drought in Indonesia,' *Climate Research* 38 (2009), https://10.3354/cr00778; Elza Surmaini et al., 'Climate Change and the Future Distribution of Brown Planthopper in Indonesia: A Projection Study.' *Journal of the Saudi Society of Agricultural Sciences* 23, no. 2 (2024), https://doi.org/10.1016/j.jssas.2023.10.002.

[22] Tyas Mutiara Basuki et al., 'Improvement of Integrated Watershed Management in Indonesia for Mitigation and Adaptation to Climate Change: A Review,' *Sustainability* 14, no. 16 (2022), https://doi.org/10.3390/su14169997.

[23] Jesse Ribot, 'Cause and response: Vulnerability and climate in the Anthropocene,' in *New Directions in Agrarian Political Economy,* ed. Ryan Isakson (Routledge, 2017).

[24] Edward R. Carr and Mary C. Thompson, *Gender and Climate Change Adaptation in the Agrarian Settings* (Engility-IRG, 2013), 47, https://www.edwardrcarr.com/downloads/Carr,%20Thompson%20-%202013%20-%20Gender%20and%20Climate%20Change%20Adaptation%20in%20Agrarian%20Settings.pdf; Laura Zanotti et al., 'Sustainability, Resilience, Adaptation, and Transformation: Tensions and Plural Approaches,' *Ecology and Society* 25, no.3 (2020), https://doi.org/10.5751/ES-11642-250304.

[25] Feminist political ecology (FPE) combines political ecology with feminist and intersectional perspectives to examine how natural resources are embedded in power relations and social hierarchies; see Dianne Rocheleau, Barbara Thomas-Slayter, and Esther Wangari, 'Gender and Environment: A Feminist Political Ecology Perspective,' in *Feminist Political Ecology: Global Issues and Local Experiences*, edited by Dianne Rocheleau, Barbara Thomas-Slayter and Esther Wangari (Routledge, 1996). It conceptualises resources such as

division of labour, property regimes, and institutional authority.[26] In Bali, *subak* governance operates within a predominantly patrilineal agrarian structure in which landholding households—typically represented by men—participate in irrigation decision-making and leadership roles such as *pekaseh* (head of *subak*).[27] Women nevertheless contribute extensively to cultivation, ritual preparation, and household provisioning. These divisions of labour frequently normalise women's contributions as part of routine social reproduction rather than recognising them as forms of expertise or authority.[28] Consequently, women's work becomes institutionally undervalued even though it sustains agricultural production, farming households and community life.[29]

Kinship and inheritance reinforce these dynamics. Kathryn Robinson shows that New Order gender regimes institutionalised male authority in formal decision-making.[30] In Bali, these norms intersect with *purusa* (patrilineal inheritance), where land and ritual responsibilities pass to male heirs. As *subak* membership and leadership are contingent upon landholding, this system inherently restricts irrigation governance to men. Recent institutional reforms have introduced limited adjustments to these norms. The 2010 Decree of the *Majelis Utama Desa Pakraman* (MUDP or Pakraman Primary Village Main Assembly) introduced limited inheritance rights for daughters,[31] granting them claims equivalent to half a *purusa* share, although these rights remain conditional and can be revoked under religious or social conditions.[32] Although village land (*druwen desa* or *pekarangan desa*) is formally distributed to descendants of the village founding lineages, inheritance disputes adjudicated through customary law continue to prioritise male successors.[33]

Legal pluralism and institutional change further complicate these dynamics. Ingrid Westendorp argues that Indonesia's laws governing marriage and inheritance undermine women's equality, while customary norms that privilege male heirs conflict with

land and water as politically contested, shaped by struggles over access, control, and the distribution of benefits; see Sharlene Mollett and Caroline Faria, 'Messing with gender in feminist political ecology,' *Geoforum* 45 (2013), https://doi.org/10.1016/j.geoforum.2012.10.009. The gender dimension of FPE examines how intersecting factors—gender, class, land tenure status, ethnicity, and kinship—shape differentiated access to resources, labour responsibilities, decision-making power, and the recognition of environmental knowledge; see Rebecca Elmhirst, 'Feminist Political Ecology,' in *The Routledge Handbook of Political Ecology*, edited by Tom Perreault, Gavin Bridge and James McCarthy, (Routledge, 2015). It also draws attention to invisible labour, informal authority, social norms, and religious or customary roles, often associated with women, and how these interact with formal governance systems.

[26] Rocheleau, Thomas-Slayter and Wangari, 'Gender and Environment'; Elmhirst, 'Feminist Political Ecology.'

[27] Geertz and Geertz, *Kinship in Bali, 76.*

[28] Kumala Lahiri-Dutt and Kathryn Robinson, 'Bodies in Contest: Gender Difference and Equity in a Coal Mine,' in *Women and Work in Indonesia*, ed. Lyn Parker and Michele Ford (Routledge, 2008).

[29] Dan Nightingale et al., 'Introduction: Patriarchies in Practice,' in *Patriarchy in Practice: Ethnographies of Everyday Masculinities*, ed. Nikki Van der Gaag, Amir Massoumian and Dan Nightingale (Bloomsbury Academic, 2023).

[30] Kathryn Robinson, *Gender, Islam and Democracy in Indonesia* (Routledge, 2009), 68.

[31] Decree number 1/Kep./Psm-3/MDP.Bali/X/2010.

[32] I Ketut Sukadana, 'The Dynamics of Women's Position in Bali Customary Inheritance Law,' in *2nd International Conference on Business Law and Local Wisdom in Tourism (ICBLT 2021)* (Atlantis Press, 2021).

[33] I Ketut Artadi, *Balinese Customary Law and Its Various Problems* (Pustaka Bali Post), 2003.

constitutional and international commitments to non-discrimination.[34] In practice, this means that although Indonesian law formally recognises gender equality, inheritance disputes in Bali are commonly resolved through customary institutions that prioritise male heirs. Thus, Balinese women must navigate between formal legal rights and obligations to family, religion, and community. The coexistence of state law and customary authority sustains a gap between equality in law and equality in practice.

Women exercise significant, under-recognised authority through ritual management and transmission of agro-spiritual knowledge. Linda Connor identifies healing and spiritual mediation as central domains of female agency conferring moral and cosmological authority, yet these remain undervalued within patriarchal hierarchies.[35] Such agency is intersectional: younger, educated women in tourism areas gain visibility, while others remain constrained by land access and kinship.[36] Furthermore, the policies and institutional structure of the New Order[37] were hindering women's formal participation in *subak* governance.[38] Consequently, women's engagement with agrarian institutions represents a political negotiation of hierarchical everyday relations not just symbolic inclusion.[39]

Intersectionality as analytical tool

Intersectionality is a framework used to understand how overlapping systems of power shape marginalisation, especially when law and policy recognise only one axis of identity at a time.[40]

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[34] Ingrid Westendorp, 'Personal Status Law and Women's Right to Equality in Law and in Practice: The Case of Land Rights of Balinese Hindu Women,' *Journal of Human Rights Practice* 7, no. 3 (2015), https://doi.org/10.1093/jhuman/huv013.

[35] Linda H. Connor, 'Healing as Women's Work in Bali,' in *Women's Work and Women's Roles: Economics and Everyday Life in Indonesia, Malaysia, and Singapore*, ed. Lenore Manderson (The Australian National University, 1983).

[36] H. Lorraine Radtke and Hendrikus J. Stam, 'Feminist Theorizing of Power and Gender,' in *Power/Gender: Social Relations in Theory and Practice*, ed. H. Lorraine Radtke and Hendrikus J. Stam (Sage Publishing, 1995); Kathryn Robinson and Zazie Bowen, 'Gender Relations and Women's Agency: Indonesia–India Comparison,' *Intersections: Gender and Sexuality in Asia and the Pacific* 43 (2019), http://intersections.anu.edu.au/issue43/robinson-bowen_intro.pdf.

[37] The New Order (1967–1998), under the authoritarian regime of President Suharto, centralised governance and state-led social control, which included the promotion of women's roles as wives and mothers through institutions such as *Pembinaan Kesejahteraan Keluarga* (PKK) (Guidance for Family Welfare) a nationwide state-sponsored women's organisation focused on family welfare and community service) and *Dharma Wanita* (for wives of civil servants that reinforces women's supportive roles within the state apparatus while supporting the institutionalisation of male leadership). These institutions reinforce gendered divisions of labour and limit women's participation in public and local governance.

[38] Muhammad Syukri, 'Gender Policies of the New Developmental State: The Case of Indonesian New Participatory Village Governance,' *Journal of Current Southeast Asian Affairs* 42, no.1 (2023), https://doi.org/10.1177/18681034221149750.

[39] Haslanger critiques this subordination as a structural issue, arguing that women's participation must be recognised as a 'political stance' that resists institutional hierarchies rather than merely symbolic inclusion; see Sally Haslanger, 'Gender, Power, and Agency: Empowerment Under Conditions of Structural Injustice,' in *Themes from the Philosophy of Sally Haslanger: Gender – Race – Ideology*, ed. Sally Haslanger (Springer, 2024).

[40] Kimberlé Crenshaw, 'Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics,' *University of Chicago Legal Forum* (Taylor & Francis, 1989); Kimberlé Crenshaw, 'Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color,' *Stanford Law Review* 43, no.6 (1991).

Rooted in Black feminist thought that challenges universalising white middle-class notions of 'womanhood,' intersectionality was developed as a framework to analyse how supposedly neutral systems reproduce structural exclusion.[41] Intersectionality later expanded into a broader framework to examine how overlapping hierarchies shape access to resources and recognition.[42] In development and environmental research, it aligns with feminist political ecology, in treating power as embedded in lived identities and material relations.[43] These feminist approaches critique technocratic gender mainstreaming that recognises difference without politicising it.[44]

In agrarian and environmental contexts, an intersectionality approach shows how class, tenure, kinship, and migration status intersect with gender, to shape access to land, credit, and decision-making.[45] 'Women farmers' are highly differentiated, but rights and authority are most often mediated by male kin, or local elites, across Southeast Asia.[46] Exclusion is predominantly rooted in property regimes, inheritance norms, and bureaucratic classifications, rather than in gaps in participation. In Bali, agrarian law defines farmers as male household heads and women as dependents.[47] Viewing this through an intersectiona lens exposes the institutionalisation of gender hierarchies and reveals class and tenure distinctions among women.

Methodology

This study used a comparative ethnographic case study to examine how gender, disability, and social inclusion shaped participation in Bali's traditional agricultural system, the *subak*, using combined participatory focus group discussions (pFGDs), in-depth interviews, and document analysis. Each pFGD involved sixteen to twenty participants representing landowners, labourers, and ritual actors, with separate sessions for men and women to facilitate and encourage open discussion. Exercises such as spatial mapping, seasonal calendars, and ritual flow diagrams helped capture agricultural routines and everyday governance practices. Follow-up interviews were held with women farmers, *pekaseh*, and

[41] Patricia Hill Collins, *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment* (Routledge, 1990); The Combahee River Collective, 'The Combahee River Collective Statement,' in *How We Get Free: Black Feminism and the Combahee River Collective*, ed. Keeanga-Yamahtta Taylor (Haymarket Books, 2017).

[42] Sumi Cho et al., 'Toward a Field of Intersectionality Studies: Theory, Applications, and Praxis,' *Signs: Journal of Women in Culture and Society* 38, no. 4 (2013), https://doi.org/10.1086/669608.

[43] Rebecca Elmhirst, 'Introducing New Feminist Political Ecologies,' *Geoforum* 42, no. 2 (2011), https://doi.org/10.1016/j.geoforum.2011.01.006; Andrea J. Nightingale, 'Bounding Difference: Intersectionality and the Material Production of Gender, Caste, Class and Environment in Nepal,' *Geoforum* 42, no.2 (2011), https://doi.org/10.1016/j.geoforum.2010.03.004.

[44] Andrea Cornwall and Althea-Maria Rivas, 'From "Gender Equality" and "Women's Empowerment" to Global Justice: Reclaiming a Transformative Agenda for Gender and Development,' *Third World Quarterly* 36, no. 2 (2015), https://doi.org/10.1080/01436597.2015.1013341.

[45] Bina Agarwal, *A Field of One's Own: Gender and Land Rights in South Asia* (Cambridge University Press, 1994); Shahra Razavi, 'Engendering the Political Economy of Agrarian Change,' *Journal of Peasant Studies* 36, no. 1 (2009), https://doi.org/10.1080/03066150902820412.

[46] Bernadette P. Resurrección, 'Persistent Women and Environmental Linkages in Climate and Development Agendas,' *Wiley Interdisciplinary Reviews: Climate Change* 4, no. 5 (2013), https://doi.org/10.1016/j.wsif.2013.03.011 ; Elmhirst, 'New Feminist Political Ideologies.'

[47] Wardana, *Contemporary Bali.*

landless labourers (both male and female). In these interviews we examined gender roles, access to land and water, decision-making in *subak* meetings, and the use of digital agricultural tools. Document analysis contextualised these insights through an analysis of local zoning regulations, *subak* management policies, and heritage or tourism development plans.

Analysis followed an interpretive, context-based approach rather than formal coding. Visual and narrative materials from the pFGDs and interviews were analysed together, treating maps and drawings as expressions of lived experience. A male Balinese member of our research team provided clarification of cultural nuances during and after fieldwork. Reflexivity guided the research, as the team, mostly non-Balinese and institutionally affiliated, occupied different social positions from participants. To mitigate researcher-participant power imbalances, discussions of research findings were conducted in small, gender-separated groups with informal facilitation and local support. Power differences were acknowledged in both data collection and interpretation, with continuous consent and transparency maintained.

FGDs were conducted in Indonesian to include participants from diverse backgrounds; complex Balinese terms were explained through stories and discussion, making language differences part of the shared meaning-making process.

Findings from Jatiluwih and Margaya cannot be applied to all *subak*, and the gender focus limited exploration of other hierarchies such as caste or age. Uneven field schedules and language choice may also have influenced responses: complex Balinese terms were often clarified through a collaborative process. Nonetheless, the participatory and interpretive approach provided a grounded understanding of how gender, inclusion, and tradition interact within Bali's changing agrarian systems.

Subak governance under symbolic planning

Symbolic governance in Bali works through the culturalisation of agrarian policy, where heritage and moral discourse reorganise governance rather than redistribution.[48] Cultural branding and tourism-oriented development have a growing influence in agrarian policy, reframing *subak* organisation and rice cultivation as heritage and as moral identity.[49] Fieldwork in both *subak* revealed the gap that exists between the ideals of harmony and lived realities: THK is used as a foundational philosophy, yet participation, labour, and authority remain unevenly distributed along gendered and tenure-based lines.

In Jatiluwih, the green zoning of farmland under the KP2B and UNESCO's World Heritage inscription has turned the rice terraces into an emblem of sustainable development and cultural protection, reflecting the regulatory alignment of conservation, tourism, and agrarian governance.[50] Protection of *subak* is mediated through heritage regulation rather than farmer empowerment, leaving critical socio-economic challenges such as unstable agricultural input prices, declining youth participation in farming, and intensifying labour burdens on *subak* members insufficiently addressed. Rather than supporting farming, tourism revenue circulates among cooperatives and destination management bodies led by *subak* elites. One *subak* leader mentioned that only 'around 5 per cent of tourism income reaches

[48] Wardana, *Contemporary Bali;* Wardana, 'Neoliberalizing cultural landscapes'; Sudama, 'Conflict.'

[49] Suamba, 'Materiality and Spirituality.'

[50] Wardana and Haryanto, 'Development for Whom?'

farmers, and that this small share must be divided between *subak* and the village cooperatives' (IWM, Subak Jatiluwih, 23 February 2025). THK has become a tourism brand that sustains cultural visibility while reproducing socio-economic gaps.[51] This exemplifies that the landscape is preserved for others to see, yet it is sustained by the labour of those who are least rewarded.

Struggles within Balinese institutions increasingly revolve around symbolic, cultural, and reputational capital rather than material resources.[52] The rice brand *Beras Jatiluwih* illustrates this: sold in Denpasar supermarkets, it draws meaning from the landscape, yet Jatiluwih farmers note that a neighbouring *subak* produces the rice while it is their own labour that maintains its ritual and visual authenticity. This is a diffusion of ownership. The *Jatiluwih* brand continues to signify locality, yet its value now lies equally in the intangible capital embedded in its name. Competition which once focused on land and irrigation now unfolds within this terrain of symbolic branding and representation, where cultural meaning itself becomes an economic resource.

The politics of naming and visibility reveal the ways in which authority operates in the heritage landscape. The *pekaseh*, the elected leader of the *Subak Jatiluwih,* who also chairs the *Kertha Agroekowisata Jatiluwih* Cooperative, mediates between farmers, government offices, and tourism actors. His overlapping roles link ritual legitimacy with bureaucratic administration, illustrating the fusion of moral and managerial authority.

Figure 1. The results of social mapping, conducted during pFGDs, on living space from female farmers' point of view (left)
Source. WRI Indonesia. Subak Jatiluwih, 23 February 2025.

The participatory mapping exercises exposed how visibility operates as a form of governance. Male participants drew mountains, lakes, water temples, and irrigation networks

[51] Suamba, 'Materiality and Spirituality.'

[52] Sudama, 'Conflict.'

that structure the heritage narrative, as shown in Figure 1. Stephen Lansing's study of water temple networks found *subak* meetings and decision-making were dominated by male landowners.[53]

The female participants drew domestic and proximate sites such as houses, paths, temples, market activities, and weeding activities that sustain daily production but fall outside recognition. This contrast highlights a methodological insight: even in separate FGDs, male farmers tended to minimise women's roles, while women's maps demonstrated the breadth of their involvement in agricultural and ritual work. Gendered power shapes not only participation but also influences which forms of knowledge are recognised as legitimate. Women participants emphasised their own expertise in ritual preparation, crop care, and everyday field management as essential to sustaining agricultural production, yet the *subak* authority requires that they are excluded from participating in decision-making. The harmony that is promoted through planning and heritage discourse depends on separating the visible from the necessary.

Figure 2. The results of social mapping, conducted during pFGDs, on living space from male farmers' point of view (right)
Source. WRI Indonesia. Subak Jatiluwih, 23 February 2025

Subak governance sustains itself by aligning moral legitimacy with administrative authority, producing a hierarchy that appears collective while concentrating control. Decisions on water, cropping, and land are framed as consensus rather than command, a managed equilibrium, where the language of harmony conceals asymmetry and limits contestation.

In Margaya, where land conversion and urban encroachment have eroded collective farming, the institutional form changes, but the logic endures. The *pekaseh* manages both

[53] Lansing, *Perfect Order*, 209–10.

agricultural coordination and urban water distribution, with authority that circulates through the *pekaseh*'s household rather than through the collective institutional structures of the *subak*, producing a domestic extension of governance. That is, the *pekaseh's* wife occupies a central position in this arrangement. She coordinates equipment, organises women farmers, and manages ritual preparation. She noted that women hold specialised knowledge of ritual flowers and their placement, aligning offerings with temple hierarchy and agricultural cycles. Although central to ritual legitimacy and continuity, this expertise remains unrecognised as governance. Her role shows how gendered authority adapts under institutional weakening: coordination and care are absorbed into the language of cooperation, allowing hierarchy to persist under the guise of flexibility.

THK, thus, operates less as a moral philosophy and more as a flexible political instrument. It legitimises heritage protection in rural contexts and compensates for institutional fragility in urban ones. Its durability lies in its capacity to absorb contradiction and present inequality as equilibrium—hierarchy is reframed as coordination and exclusion as order.

Gender, labour, and authority in *subak*

Subak authority operates through a symbolic system that equates maintenance with morality and hierarchy with order. Within this framework, women's labour, while essential to agricultural production, remains institutionally unrecognised by the *subak* authority. A practice in Jatiluwih illustrates this dynamic: during harvesting, landowners often outsource labour to cheaper collective labour groups known as *seka* (Figure 2). *Seka*, typically coordinated by women, perform care and maintenance works in all phases of rice farming. There are *seka manyi* (harvesting), *seka nandur* (transplanting seedlings), and the *seka majukut* (weeding). These arrangements separate labour from ownership, reinforcing a structural distinction between those who perform agricultural work and those who hold authority over irrigation and land management.

The importance of women in successful farming processes is often overlooked in the division of labour. One landowner in Jatiluwih framed cultivation as inherited obligation, a duty rooted less in ownership than in ancestral continuity, saying,

> If we don't continue farming, then who will? For me, the rice fields we manage are not only about obligation or the need to claim ownership and recognition, but also because they were prepared by our parents before us. It has already been envisioned and passed on to us, whether we choose to manage the fields or simply abandon them (IWS, Subak Jatiluwih, 27 April 2025).[54]

Such narratives position land stewardship as a moral duty tied to lineage continuity. Inheritance and ancestral responsibility often function as ethical frameworks that legitimise authority over land and agricultural decision-making.[55] At the same time, formal lineage

[54] Excerpt from a conversation with a male farmer in Jatiluwih, discussing the regeneration of agricultural land inheritance among the Balinese community in Jatiluwih, Tabanan (in Indonesian); *'Kalau bukan kami yang melanjutkan pertanian, terus mau siapa lagi? Mungkin, kalau untukku, sawah yang dikelola bukan hanya paksaan untuk memiliki dan mengakui, melainkan karena telah dipersiapkan oleh orangtua sebelumnya. Dan hal itu sudah jadi gambaran atau persiapan untuk kita, agar dapat mengelola pertanian sawah atau ditinggal begitu saja.'* IWS, Subak Jatiluwih, 27 April 2025.

[55] Geertz and Geertz, *Kinship in Bali*; Ida Ayu Grhamtika Saitya, 'Gender and the Intergenerational Transmission of Property in Rural Bali' (Master's thesis, International Institute of Social Study, 2021), 44–45, https://thesis.eur.nl/pub/61031/Ida-Ayu-Grhamtika-Saitya-Gender-and-the-Intergenerational-Transmission-

ownership does not always correspond to effective control of land, which may be mediated through arrangements such as pawning, tenancy, or other informal transfers. These dynamics highlight how moral claims to authority coexist with more complex patterns of land use and labour organisation.

Table 1. First planting seasonality calendar combining pFGDs from Subak Jatiluwih (J) and Subak Margaya (Mg). Sessions with female (♀) and male (♂) farmers were conducted separately.

	First Planting Season *Bold indicates knowledge conveyed by female farmers in the pFGDs; the process is not necessarily conducted by them.*						
	January	February	March	April	May	June	July
Farming Process	**Fertilizing** (♀ Mg, ♂ J) **Planting** (All) **Ploughing** (♀ J, Mg) **Seeding** (♀ J, ♀ Mg) **Start first season** (♂ Mg) **Weeding** (♀ J, ♂ J)	**Fertilizing** (♀ Mg, ♂ J) **Planting** (♀ Mg, ♂ J) **Ploughing** (♀ Mg) **Seeding** (♀ Mg) **Weeding** (♀ J, ♂ J)	**Fertilizing** (♀ Mg, ♂ J) **Planting** (♀ Mg, ♂ J) **Ploughing** (♀ Mg) **Seeding** (♀ Mg) Weeding (♂ J)	**Harvesting** (♀ Mg) **Weeding** (♀ J)	**Harvesting** (♀ Mg)	**Fertilizing** (♀ Mg) **Harvesting** (♀ J, ♂ J) **Planting** (♀ Mg) **Ploughing** (♀ Mg) **Seeding** (♀ Mg)	**Fertilizing** (♀ Mg) **Planting** (♀ Mg) **Ploughing** (♀ Mg) Preparing second season (♂ J) **Seeding** (♀ Mg)
Subak Ritual	**Mapag Toya** (♀ J) **Ngrastiti** (♀ J) **Ngerasakin** (♀ J, ♂ J) **Nuasen** (♀ J, ♂ J, ♂ Mg) Pengawitan Nandhur (♂ J)	**Nangluk Merana** (♀ Mg) Ngerasakin (♂ J) **Ngrastiti Permulaen** (♀ J) **Ngisehin** (♀ Mg) **Nuasen** (♀ Mg, ♂ J, ♂ Mg) Pengawitan Nandhur (♂ J)	**Nangluk Merana** (♀ Mg, ♂ J) **Ngisehin** (♀ Mg) Ngrastiti Permulaen (♂ J) **Nuasen** (♀ Mg)	Mesaba (♂ J, ♂ Mg) Nganggih (♂ Mg) **Ngrastiti** (♀ J) **Nyepi** (♀ J)	Mantenan (♂ Mg) Mesaba (♂ J, ♂ Mg) **Nyepi** (♀ J)	**Mesaba** (♀ J) **Ngisehin** (♀ Mg) **Nuasen** (♀ Mg)	**Manten** (♀ J)
Other Ritual		**Tumpek Landep** (♀ J)	**Galungan & Kuningan** (♂ J) **Nyepi** (♀ J, ♀ Mg, ♂ J) Tumpek Kandang (♂ J) Tumpek Wariga (♂ J)	**Galungan & Kuningan** (♀ J, ♀ Mg) Piodalan (♂ Mg) **Sugihan Jawa & Bali** (♀ J)	**Kuningan** (♀ J, ♂ Mg) Piodalan (♂ Mg)		**Tumpek Kandang** (♀ J)
Pest & Disease	Brown Planthopper (♂ Mg) **Freshwater Crab** (♀ Mg) **Golden Apple Snail** (♀ Mg, ♂ Mg) **Plastic Residue** (♀ Mg) Rice Bug (♂ Mg)	**Brown Planthopper** (♀ Mg, ♂ J, ♂ Mg) **Caterpillar** (♀ J) **Golden Apple Snail** (♀ J, ♀ Mg, ♂ Mg) **Freshwater Crab** (♀ Mg) **Rice Leafroller** (♀ J) **Plastic Residue** (♀ Mg) **Rats** (♀ J, ♂ J) **Stemborer** (♀ J) Rice Bug (♂ Mg)	**Brown Planthopper** (♀ Mg) **Freshwater Crab** (♀ Mg) **Golden Apple Snail** (♀ Mg) Sparrows (♂ Mg) **Plastic Residue** (♀ Mg) Rats (♂ Mg)	Sparrows (♂ Mg) Rats (♂ Mg)	Sparrows (♂ Mg) Rats (♂ Mg)	**Birds** (♀ J) **Brown Planthopper** (♀ Mg) **Freshwater Crab** (♀ Mg) **Golden Apple Snail** (♀ Mg) **Plastic Residue** (♀ Mg) **Rice Bug** (♀ J) **Rats** (♀ J)	**Brown Planthopper** (♀ Mg) **Freshwater Crab** (♀ Mg) **Golden Apple Snail** (♀ Mg) **Plastic Residue** (♀ Mg)
Water	**Overflowing** (♀ Mg, ♂ Mg) **Sufficient** (♀ J, ♂ J)	Insufficient (♂ J) **Overflowing** (♀ M) **Sufficient** (♀ J, ♂ Mg)	**Insufficient** (♀ Mg, ♂ J) **Sufficient** (♀ J, ♂ Mg)	**Insufficient** (♀ Mg, ♂ J) **Sufficient** (♀ J, ♂ Mg)	**Insufficient** (♀ Mg, ♂ J) **Sufficient** (♀ J, ♂ Mg)	**Insufficient** (♀ Mg, ♂ J, ♂ Mg) **Sufficient** (♀ J)	**Insufficient** (♀ Mg, ♂ Mg) Sufficient (♂ J)
Weather	**Rainy** (All) **Windy** (♀ J, ♀ Mg, ♂ J)	Rainy (♂ J, ♂ Mg) **Sunny** (♀ Mg)	**Sunny** (♀ Mg, ♂ J, ♂ Mg)	**Sunny** (♀ Mg, ♂ J, ♂ Mg)	**Sunny** (♀ Mg, ♂ J, ♂ Mg)	**Sunny** (♀ Mg, ♂ J, ♂ Mg) **Unpredictable** (♀ J)	Rainy (♂ J) **Sunny** (♀ Mg, ♂ Mg) **Unpredictable** (♀ J) Windy (♂ J)

Source. The authors' compilation of Planting Season FGD from Subak Jatiluwih (23 February 2025) and Subak Margaya (22 March 2025).

Despite limited land ownership, female farmers possess extensive agricultural and ecological knowledge across the planting cycle (Tables 1 and 2). However, this expertise does not translate into authority within *subak* governance, revealing a fundamental epistemic hierarchy where gender is the decisive factor. Because this hierarchy denies women formal authority, it also recasts the meaning of their participation. Women's engagement in cultivation and ritual is treated as a matter of willingness rather than as the obligation and entitlement that, for men, accompanies farming the land and transmitting its heritage. Women's labour is thereby rendered voluntary rather than constitutive, which is precisely why recognition and authority are withheld from women. The strength of female farmers is evident in their involvement in all stages of agricultural production, from land preparation to post-harvest. Their expertise is systematically framed as 'supportive' or 'intuitive' rather than 'technical' or 'authoritative.' As Geertz suggests, such differentiated contributions are embedded within systems that segment rights, roles, and recognition, particularly in relation to inheritance and authority.[56]

of-Property-in-Rural-Bali.pdf; Wardana, *Contemporary Bali,* 2–6; Wardana and Haryanto, 'Development for Whom?'

[56] Geertz, *Agricultural Involution*.

In the *subak,* authority derives less from competence than from land ownership, ritual status, and patrilineal descent. Feminist political Eeology emphasises that gendered property regimes shape access to governance and resource management.[57] Women's partnership with male *subak* members reflects cooperation but not equality. Women often speak through male relatives. Widows, acting as household heads, however, represent a special case where women can participate directly in decision-making, but through their custody of the deceased husband's land and *subak* membership, not in their own right. This reflects the patrilineal order working through a female stand-in rather than an exception to it.

This division reveals a paradox of power, the decoupling of material responsibility from political authority. Women dominate market exchange and manage the flow of agricultural goods and ritual offerings, while water access that is essential for those goods, is regulated by a male-only *subak.*[58] Women thus sustain the economic and ritual circulation of rice cultivation while authority over irrigation and land management remains concentrated in male-led *subak* meetings. This gendered division of labour is culturally legitimised by *rwa bhineda,*[59] the Balinese principle of complementary opposites which frames these distinct roles as a harmonious balance rather than a hierarchy. While this principle frames male and female roles as mutually necessary, it can also obscure structural inequalities. Climate change intensifies this dynamic; when ritual ingredients become more expensive or scarce due to environmental stress, women absorb the additional economic cost and labour required to maintain ceremonial obligations.[60]

[57] Lahiri-Dutt and Robinson, *Bodies in Contest*, 9–16; Nightingale, Van der Gaag and Massoumian, 'Introduction'; Saitya, 'Gender,' 44–45.

[58] Lansing, *Perfect Order*, 209–10.

[59] *Rwa bhineda* is a foundational Balinese Hindu principle of dualism that emphasises balance between complementary opposites, such as masculine and feminine or spiritual and material. Harmony is understood as the maintenance of this balance. Although Balinese society is structurally patrilineal, *rwa bhineda* cosmologically frames masculine and feminine principles as non-hierarchical. In social practice, this often translates into a gendered division of labour where the husband's role as breadwinner and the wife's role managing domestic and ritual life are articulated as balancing forces essential for the integrity of the household and community; see Anette Fagertun, 'Labour in Paradise: Gender, Class and Social Mobility in the Informal Tourism Economy of Urban Bali, Indonesia,' *The Journal of Development Studies* 53, no. 3 (2017), https://doi.org/10.1080/00220388.2016.1184248; Nazrina Zuryani and Tedi Erviantono, 'Gender Dualism as Degendering Cosmic Multicultural Tolerance of Wargas: Community Security Practices in North Bali,' in *Security, Democracy, and Society in Bali: Trouble with Protection*, ed. Andrew Vandenberg and Nazrina Zuryani, trans. Hannah Mansfield (Springer Singapore, 2020).

[60] Fagertun, 'Labour in Paradise.'

Table 2. Second planting seasonality calendar combining pFGDs from Subak Jatiluwih (J) and Subak Margaya (Mg). Sessions with female (♀) and male (♂) farmers were conducted separately.

	Second Planting Season *Bold indicates knowledge conveyed by female farmers in the pFGDs; the process is not necessarily conducted by them.*				
	August	September	October	November	December
Farming Process	**Harvesting non-rice** (♀ Mg) **Planting** (♀ J) **Ploughing** (♀ J) Start second season (♂ Mg) **Weeding** (♀ Mg)	**Harvesting non-rice** (♀ Mg) **Weeding** (♀ J)		**Fertilizing** (♀ Mg) Harvesting (♂ J) **Planting** (♀ Mg) **Ploughing** (♀ Mg) **Seeding** (♀ Mg) **Weeding** (♀ J)	**Harvesting** (♀ J) **Harvesting non-rice** (♀ Mg) Preparation first season (♂ J)
Subak Ritual	**Mapag Toya** (♀ J) **Ngerasakin** (♀ J) **Ngrastiti** (♀ J, ♂ J) **Nuasen** (♀ J)	**Nyepi** (♀ J)		**Mesaba** (♀ J, ♂ J) Piodalan (♂ Mg)	**Mantenin** (♀ J) **Ngisehin** (♀ Mg) **Nuasen** (♀ Mg)
Other Ritual	**Piodalan** (♀ J)		Tumpek Kandang (♂ J) Tumpek Wariga (♂ J)	Galungan & Kuningan (♀ J, ♂ J)	Nangluk Merana (♂ Mg)
Pest & Disease	**Brown Planthopper** (♀ Mg, ♂ Mg) **Freshwater Crab** (♀ Mg) **Golden Apple Snail** (♀ Mg, ♂ Mg) **Plastic Residue** (♀ Mg) Rice Bug (♂ Mg)	Brown Planthopper (♂ Mg) Golden Apple Snail (♂ Mg) Rats (♂ J) Rice Bug (♂ J, ♂ Mg)	**Caterpillar** (♀ J) **Golden Apple Snail** (♀ J) Sparrows (♂ Mg) **Rats** (♀ J, ♂ Mg) **Stemborer** (♀ J)	**Brown Planthopper** (♀ Mg) Sparrows (♂ Mg) **Freshwater Crab** (♀ Mg) **Golden Apple Snail** (♀ Mg) **Plastic Residue** (♀ Mg) Rats (♂ Mg)	**Brown Planthopper** (♀ Mg) **Freshwater Crab** (♀ Mg) **Golden Apple Snail** (♀ Mg) **Plastic Residue** (♀ Mg)
Water	**Insufficient** (♀ J, ♀ Mg, ♂ Mg) Sufficient (♂ J)	**Drought** (♀ J) **Insufficient** (♀ Mg) Sufficient (♂ J, ♂ Mg)	**Insufficient** (♀ Mg) Sufficient (♂ J, ♂ Mg)	**Sufficient** (♀ Mg, ♂ J, ♂ Mg)	**Sufficient** (♀ J, ♀ Mg, ♂ J, ♂ Mg)
Weather	Rainy (♂ J) **Sunny** (♀ Mg, ♂ Mg) Windy (♂ J)	**Rainy** (♀ Mg, ♂ J, ♂ Mg) **Sunny** (♀ J) **Windy** (♀ Mg, ♂ J)	**Rainy** (♀ Mg, ♂ J, ♂ Mg) **Windy** (♀ Mg, ♂ J)	**Rainy** (♀ Mg, ♂ J, ♂ Mg) **Windy** (♀ Mg, ♂ J)	**Rainy** (♀ J, ♀ Mg, ♂ J, ♂ Mg) **Windy** (♀ Mg, ♂ J)

Source. The authors' compilation of Planting Season FGD from Subak Jatiluwih (23 February 2025) and Subak Margaya (22 March 2025)

Climate stressors and adaptive practices

The climate and adaptive practices vary according to each *subak*. *Subak* Jatiluwih conducts more ritual activities than *Subak* Margaya, as shown in Tables 1 and 2, a pattern consistent with its positioning as a heritage-designated agro-ecotourism landscape. Farmers and *subak* leaders value preserving agriculture, but rapid tourism makes it hard. Ritual keeps rice cultivation visible while there is increasing pressure to maintain production amid climate and market uncertainty. Rather than easing these burdens, heritage and tourism often intensify them, reinforcing hierarchies and enabling the status quo using THK as a tool.[61]

Being a water management institution, the *subak* uses THK as a guiding framework in achieving equilibrium for fair water distribution. Lansing explained how networks of *subak* have interconnected water temples, whose operation resembles game theory in resource management.[62] Within this network, ritual coordination regulates water use among the temples or within one temple. Coordination is especially intense among *subak* sharing the same water temple, where upstream and downstream *subak* must collaborate to control pests and manage yield. However, climate stressors can disrupt this ritual coordination when the hydrological cycle no longer follows the *subak's* agronomic calendar.[63] Under these conditions, the harmony produced through ritual coordination risks becoming symbolic, as it can no longer effectively manage the material scarcity.[64]

Indonesia's Integrated Watershed Management program aims to build resilience, yet its top-down application rarely aligns with local knowledge such as the *subak*'s agronomic

[61] Zanotti et al., 'Sustainability, Resilience,' 4.

[62] Lansing, *Perfect Order*, 71–86.

[63] In Bali the *subak* agronomic calendar is called *Kerta Masa* where planting cycles are determined using environmental observation.

[64] Lansing, *Perfect Order*, 191–195; Basuki et al., 'Integrated Watershed Management,' 1–41.

calendar, which adapts planting cycles according to environmental observation.[65] These conditions produce a different kind of adaptation that is more pragmatic than ritualised but equally constrained by the absence of institutional support. For example, *Subak* Margaya sits within Denpasar's expanding urban core, where land conversion has accelerated livelihood shifts away from agriculture.

Balinese women generally lack primary decision-making authority over land usage, a marginalisation reinforced by the revitalisation of village customary law following the 1998 decentralisation era. This structural exclusion is rooted in the foundational patrilineal principle, which historically limits inheritance to male heirs.[66] While contemporary legal instruments, such as *sentana rajeg* status or the 2010 MUDP Decree,[67] provide normative pathways for female inheritance, many village leaders continue to prioritise the customary norm that ties land rights to male-coded *swadharma* (ritual and social obligations).[68] Consequently, the social cost of contesting these deep-seated expectations remains high, as women who invoke formal inheritance rights are often perceived as undermining communal harmony, rendering formal legal protections effectively inaccessible.[69] The concentration of land in male hands means that under climate stress women are unable to participate in *subak* decisions over climate-affected resources.

According to Ana Amorim-Maia and Marta Olazabal, sustainability depends on a gendered adaptation strategy, which is rooted in power dynamics and the integration of diverse knowledge systems.[70] Across both *subak* sites, adaptation unfolds through differentiated labour rather than collective planning, with women prioritising subsistence production and household food security in their labour inputs. This 'naturalised' resilience often masks the reality that climate vulnerability is produced by social and political factors, rather than environmental exposure.[71] Consequently, women must navigate rising economic and ritual demands while managing household survival without formal institutional support.

Intersectionality

Field data reveal that belonging is structured through the intersection of kinship, ritual authority, gender, and class—not as layered identities but as processes that assign value to particular forms of labour and participation.

In Jatiluwih, kin-based landholding defines participation. Families with inherited land are positioned as the primary rights-bearing members of the *subak*. Women's agricultural and ritual work is framed as duty rather than authority, and environmental labour is recorded as

[65] Basuki et al., 'Integrated Watershed Management.'

[66] Geertz and Geertz, *Kinship in Bali.*

[67] *Sentana rajeg* is a given legal status for a daughter to allow her the rights and duty equal to a son; see Sukadana, 'The Dynamics of Women's Position,' 163–66. *Sentana* is a type of marriage where the husband joins the wife's family.

[68] Westendorp, 'Personal status'; Sukadana, 'Dynamics,' 163–66.

[69] Sukadana, 'Dynamics,' 163–66.

[70] Ana Terra Amorim-Maia and Marta Olazabal, 'Beyond Adjustment: A New Paradigm for Climate Change Adaptation in a Complex World,' *Global Environmental Change* 93 (2025), https://doi.org/10.1016/j.gloenvcha.2025.103027.

[71] Ribot, 'Cause and Response.'

moral service.[72] Women disengage from *subak* meetings and WhatsApp group communications, saying: 'the men do that,' which reflects an active negotiation of their position within existing gender norms, rather than passivity.[73] Norms of speech, ritual seniority, and property ownership determine whose voices matter.[74] In a WhatsApp group, men dominate the discussion. In tourist site Jatiluwih, women labour on villa construction sites, clean guesthouses, and maintain village roads—'busy but replaceable'—sustaining the tourism landscape while distancing from farming. Feminised tourism labour reconfigures dependency rather than empowerment: women sustain their households' livelihoods through low-paid service work that remains marginal to the moral economy of the *subak*.[75] In Margaya, as land conversion accelerates, women manage small vegetable plots or home-based trading. Their flexibility is celebrated locally as resilience but can be interpreted as survival under structural neglect.[76] Both *subak* sites depend on women's multi-skilled labour and their ability to share labour and responsibilities across multiple roles. This dependence is sustained by institutions including the *subak* itself, that draw on women's skills without providing necessary material or institutional support.

These findings of intersectional relations provide a processual lens. Women's disengagement, the selective authority of the *pekaseh's* wife, and feminised labour of tourism all reveal that inequality is reproduced in the course of everyday negotiations of time, care, legitimacy and the continuous reorganisation of difference.[77] Belonging is negotiated through proximity to authority and moral worth within kin-based relations, rather than right, and vulnerability emerges due to overlapping exclusions.

Discussion

The *subak* in these case studies illustrates that resilience is a political accomplishment sustained by the redistribution of vulnerability. Through the discourse of THK, hierarchy is legitimised as moral balance. This asymmetry is gendered—women's labour and care maintain harmony, while authority remains tied to male lineages. Under climate stress, these inequalities intensify rather than transform.

Symbolic governance recasts agrarian management as heritage custodianship, replacing political negotiation with ritual consensus.[78] *Subak* members internalise responsibility for ecological and social balance, producing the 'masculinisation of authority

[72] Agarwal, *A Field of One's Own*; Elmhirst, 'New Feminist Political Ideologies,' 129–32.

[73] Saba Mahmood, *Politics of Piety: The Islamic Revival and the Feminist Subject* (Princeton University Press, 2005); Farhana Sultana, 'Gendering Climate Change: Geographical Insights,' *The Professional Geographer* 66, no.3 (2014), https://doi.org/10.1080/00330124.2013.821730.

[74] Michel Foucault, 'Governmentality,' in *The Foucault Effect: Studies in Governmentality*, ed. Graham Burchell, Colin Gordon and Peter Miller (University of Chicago Press, 1991); Tania Murray Li, *The Will to Improve: Governmentality, Development, and the Practice of Politics (*Duke University Press, 2007).

[75] Regina Scheyvens and Janet H. Momsen, 'Tourism and Poverty Reduction: Issues for Small Island States,' in *Tourism and Sustainable Development Goals*, ed. Jarkko Saarinen (Routledge, 2020).

[76] Sultana, 'Gendering Climate Change'; Stephen J. Collier et al., 'Revisiting 'Resilience': Politic and State Practices in a New Conjuncture' *Geoforum* 166 (2025), https://doi.org/10.1016/j.geoforum.2025.104377.

[77] Leslie McCall, 'The Complexity of Intersectionality,' *Signs: Journal of Women in Culture and Society* 30, no. 3 (2005), https://doi.org/10.1086/426800; Elmhirst, 'Feminist Political Ecology.'

[78] Wardana, *Contemporary Bali*.

and feminisation of responsibility.'[79] Consequently, women's essential contributions to cultivation and ritual are sidelined as care, while male authority is reinforced by the moral language of *rwa bhineda*.[80]

Climate stress is absorbed into these moral frameworks through 'adaptive labour'—flexibility that mitigates crisis without redistributing power.[81] Whether through women adopting short-cycle crops, engaging in small-scale trading, or using *nyentana* to secure land continuity in the absence of male heirs, adaptation operates within patriarchal structures.[82] Ultimately, while women's agency secures household and ritual survival, it simultaneously reinforces the gendered foundations of *subak* authority.

In both sites, resilience is relational, shaped by proximity to land, ritual authority, and institutional networks.[83] Consequently, climate adaptation redistributes burdens unevenly across social positions, maintaining established hierarchies under the guise of collective resilience. Women are integrated into these systems through uneven visibility and selective inclusion.[84] While some benefit from tourism or NGO programs, others remain peripheral, with proximity to authority often a substitute for actual redistribution. In this context, agency is conditional, contingent on kinship, and institutional recognition rather than formal rights. Under climate stress, these distinctions harden, making adaptation capacity itself a measure of inequality.

Shifting labour profiles further illustrate this divergence. As climate stressors make rice farming uncertain, men increasingly migrate to urban or tourism sectors, leaving women to manage stressed farms alongside small-scale kiosks or homestays. These roles are extensions of domestic labour, increasing women's workload without a corresponding increase in authority.[85] As climate change increases economic pressures, women perform the additional labour necessary to stabilise the household economy, intensifying longstanding patterns of gendered responsibility.

Authority must evolve to recognise the role of women: their labour and their expertise. Currently, women's expanding roles uphold stability while power remains unchanged. Although the *subak* embodies deep ecological knowledge, its institutional form privileges masculine authority over care and maintenance. A gender-inclusive model would better reflect the link between ritual, labour, and authority, making equity essential for long-term resilience.

A political ecology of endurance emerges through symbolic governance, gendered labour, and intersectional adaptation where responses are differentiated by gender, class, and tenure rather than by adaptation as a uniform community process. While symbolic governance normalises hierarchy, feminist political ecology reveals how women's work sustains legitimacy despite being unequally valued. Vulnerability emerges when risk is shifted

[79] Lahiri-Dutt and Robinson, 'Bodies in Contest.'

[80] Fagertun, 'Labour in Paradise.'

[81] Carr and Thompson, *Gender and Climate Change,* 47.

[82] Franklin Obeng-Odoom, 'Reproductive Justice in the Hindu Balinese Compound: Community, Property and Development,' *Journal of Developing Societies* 40, no. 1 (2024), https://doi.org/10.1177/0169796X231223817.

[83] Elmhirst, 'New Feminist Political Ideologies'; Sultana, 'Gendering Climate Change.'

[84] Tacconi, et al.,' Livelihood Impacts.'

[85] Fagertun, 'Labour in Paradise.'

downward.[86] In Bali, this displacement is rendered as harmony. The resilience of the *subak* rests on its ability to turn instability into legitimacy. It endures through inequality, not against it. Gendered labour and authority are central to this endurance, as institutional stability depends on the continuous reorganisation of women's work without corresponding shifts in power. Climate change amplifies this process by shifting risks onto women, making adaptive inequality central to institutional survival.

Conclusion

This study of *Subak* Jatiluwih and *Subak* Margaya challenges romanticised notions of Balinese socio-ecological unity. Rather than functioning as an inclusive and collectively resilient system, *subak* governance is shaped by gendered, class- and nativist-based exclusions. Migrant and landless workers remain outside formal membership, despite their labour being critical to the system's functioning. This shows that the reality is far from the idealised model of *subak* as a harmonious, inclusive, and collectively governed socio-ecological system.

Dominant discourses of symbolic harmony obscure uneven adaptation to climate change, economic shifts, and tourism expansion. Policies prioritising heritage designation tourism and land conservation overlook structural inequalities that shape participation and the distribution of benefits. Adaptation to climate change and tourism is achieved through differentiated labour, where women and marginal groups absorb increasing responsibilities while institutional authority remains unchanged. Harmony is not the absence of conflict; it legitimises hierarchy and unequal outcomes as pressures from climate change and tourism intensify.

We call for climate adaptation approaches that explicitly recognise the structural inequalities within the *subak* system. Women's extensive knowledge of food security and community-level resource management must be acknowledged. Ideally this knowledge should be integrated into formal *subak* governance that is crucial for inclusive adaptation. Ultimately, resilience in Bali is not only ecological or cultural but political. The endurance of *subak* depends on the ongoing reorganisation of gendered labour and authority, not merely its continued reproduction.

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[86] Ribot, 'Cause and Response.'

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