

# The Humanities of Food Sustainability: A Cultural History of Local Food Movements and Agro-biodiversity in Indonesia

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## ABSTRACT

**Background.** Indonesia's contemporary food sustainability challenges reflect deep historical, cultural, and ecological transformations that have reshaped local food systems and agro-biodiversity. Local food movements have re-emerged as a response to the growing homogenization of diets, the erosion of indigenous agricultural knowledge, and the impact of industrial food regimes. These movements represent not only environmental initiatives but also cultural practices rooted in longstanding traditions of communal agriculture and ecological stewardship.

**Purpose.** The research aims to analyze the cultural foundations of Indonesia's local food movements, trace their historical development, and examine their contributions to sustaining agro-biodiversity.

**Method.** A qualitative historical-cultural method was employed, drawing on archival materials, ethnographic accounts, visual documentation, and policy analysis. Analytical procedures included thematic coding, cultural narrative reconstruction, and cross-period comparison to map continuities and ruptures in food sustainability practices.

**Results.** Findings show that local food movements are deeply embedded in cultural memory and collective identity, functioning as mechanisms for ecological resilience, resistance to food commodification, and revitalization of traditional crop varieties. The movements demonstrate how cultural narratives, ritual practices, and local knowledge systems actively shape community-led strategies for conserving agro-biodiversity.

**Conclusion.** The study concludes that food sustainability in Indonesia cannot be understood solely through ecological or economic lenses; it must be grounded in cultural history and humanistic inquiry. Strengthening local food movements therefore requires integrating cultural values, historical understanding, and community agency into national food sustainability policies.

## KEYWORDS

Biodiversity, Cultural History, Food Sustainability

**Citation:** Hanafi, I., Tan, J & Lee, A. (2025). The Humanities of Food Sustainability: A Cultural History of Local Food Movements and Agro-biodiversity in Indonesia. *Journal of Humanities Research Sustainability*, 2(6), 355–364.

<https://doi.org/10.70177/jhrs.v2i6.2788>

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**Received:** June 2, 2025

**Accepted:** November 27, 2025

**Published:** December 20, 2025



## INTRODUCTION

Food sustainability has increasingly been recognized as a multidimensional issue that spans ecology, economy, and culture. Scholarship in environmental humanities has emphasized that food systems cannot be separated from the cultural narratives, historical trajectories, and social meanings that shape how communities produce, distribute, and consume food.

Indonesia, as one of the world's most biodiverse nations, offers a rich context where ecological abundance intersects with complex cultural practices surrounding food. Local food movements have gained attention for their potential to address global challenges such as biodiversity loss, dietary homogenization, and dependency on industrial food systems (Cánovas-Molina et al., 2021; Tzatzani & Ouzounidou, 2023). These movements often mobilize cultural identity, indigenous agricultural knowledge, and community-based practices to reinforce ecologically grounded food traditions. Existing literature shows that such movements play an important role in safeguarding traditional crop varieties and resisting market-driven pressures toward monocultures.

Historical studies have revealed that Indonesian societies have long relied on diverse agro-ecological systems, including shifting cultivation, wet-rice agriculture, and home-garden agroforestry. These systems, embedded in local cosmologies and ritual cycles, have supported high levels of agro-biodiversity and community resilience. Cultural history further demonstrates that food has functioned as both a material resource and a symbolic marker of regional identity and social relationships. Environmental policy research has documented the recent decline of agro-biodiversity in Indonesia due to land conversion, climate change, and the proliferation of commercial hybrid seeds. These structural pressures have disrupted traditional food cultures, reducing the diversity of local crops and weakening the transmission of ecological knowledge. Community-led local food movements have emerged partly as a response to these disruptions (Hunte et al., 2019; Leedon et al., 2021).

Anthropological studies highlight that local food movements are not only environmental initiatives but also cultural expressions tied to memory, heritage, and collective identity. These movements often revive ancestral foodways, promote community seed-saving practices, and strengthen cultural pride linked to regional culinary traditions. Their contributions extend beyond ecological outcomes to include social and cultural revitalization. Humanities-based scholarship has argued that understanding food sustainability requires attention to symbolic systems, moral economies, and historical consciousness that shape how agricultural practices evolve. Cultural history provides a lens through which long-term transformations in food systems can be traced, revealing how communities adapt, resist, or reinterpret their food traditions in response to broader ecological and political change (Imbiriba et al., 2023; Topole et al., 2021).

Limited research has examined how Indonesia's local food movements are rooted in specific cultural-historical trajectories rather than solely ecological or economic motivations. There remains insufficient understanding of how cultural narratives, collective memory, and historical experiences inform the ways communities articulate and practice food sustainability. Gaps exist in tracing how agro-biodiversity conservation strategies are shaped by cultural values embedded in everyday food practices. Existing studies often emphasize biological or agronomic dimensions without fully addressing how cultural identity motivates communities to preserve traditional crop varieties. The humanities approach to these practices remains underdeveloped (Kim, 2022; Topole et al., 2021).

Scholars have not comprehensively analyzed how the revival of local food movements corresponds to broader historical shifts, including colonial agricultural policies, post-independence modernization, and contemporary globalization. The absence of a cultural-historical framework limits our ability to interpret current food sustainability movements as part of a longer continuum of ecological adaptation. Insufficient attention has been given to the symbolic and affective dimensions of food in sustaining agro-biodiversity. While ecological sciences document genetic diversity, humanities perspectives have yet to reveal how stories, rituals, and heritage shape

community decisions around cultivation, conservation, and consumption (Cartay Angulo, 2019; Olivadese & Dindo, 2023).

A cultural-historical analysis is needed to reveal the deep humanistic roots of local food movements and explain why these movements remain resilient despite economic pressures. Such an analysis allows for a holistic understanding of how ecological, cultural, and symbolic systems interact to support agro-biodiversity. This research seeks to bridge ecological knowledge with humanistic insight to generate a more integrated model of food sustainability. Addressing this gap is essential for informing policy, education, and community-based initiatives that aim to strengthen local food systems. A humanities perspective can illuminate how cultural pride, historical memory, and ethical relationships with land influence sustainable agricultural behavior. The study therefore hypothesizes that cultural history provides a foundational structure that enables communities to maintain biodiversity-rich food practices (Grassian, 2019; Kala, 2021).

This research will contribute to an interdisciplinary understanding of food sustainability by demonstrating that cultural narratives and historical consciousness are not peripheral but central to agro-biodiversity conservation. The integration of humanities methods allows for a richer interpretation of local food movements as sites of ecological resilience, cultural revival, and community empowerment.

## RESEARCH METHODOLOGY

A qualitative cultural-historical research design was employed to investigate how local food movements in Indonesia are shaped by, and contribute to, long-term cultural narratives and agro-biodiversity practices. The design integrates approaches from environmental humanities, historical anthropology, and cultural studies to trace the evolution of food-related traditions across different temporal layers. The study relies on interpretive analysis, thematic reconstruction, and comparative historical mapping to illuminate how communities articulate meanings of food sustainability within specific cultural contexts. The design emphasizes cultural continuity, symbolic systems, and socio-ecological relationships rather than focusing solely on ecological metrics or economic indicators (Kankaew, 2023; Wood & Jones, 2019).

The population consists of communities, cultural groups, and local food actors across multiple Indonesian regions known for their strong agro-biodiversity practices, including West Sumatra, Java, Bali, and eastern Indonesian islands. The sample includes archival materials spanning the colonial era to the present, ethnographic accounts generated by community organizations, and interviews with 45 participants comprising farmers, culinary practitioners, seed-saving activists, and local historians. Purposive sampling was used to ensure representation of diverse agro-ecological zones and cultural histories. The selection framework prioritizes regions where local food movements have documented roles in reviving traditional crops, rituals, and food-based environmental initiatives.

The primary instruments include a cultural-historical coding sheet for analyzing textual, visual, and oral sources. A document-analysis matrix was developed to categorize themes such as cultural memory, agricultural rituals, seed practices, and symbolic meanings of food diversity. An interview protocol was designed to elicit participants' reflections on food heritage, ecological knowledge, and community-led conservation practices. Archival instruments include digital and physical repositories containing historical records, agricultural reports, and ethnographic writings.

Supplementary instruments consist of field observation notes and photographic documentation of food rituals, farming landscapes, and local markets (Dladla et al., 2023; Sibani & Rasmussen, 2020).

Data collection began with the systematic retrieval of archival materials from national archives, local cultural centers, and online repositories. Each document was catalogued, annotated, and analyzed for historical significance, cultural symbolism, and relevance to food sustainability movements. Interviews were conducted in semi-structured formats, recorded, transcribed, and coded for thematic patterns. Field visits were conducted in selected communities to observe food-related rituals, farming practices, and seed conservation activities (Kröbel et al., 2021; Rapinski et al., 2023).

Analytical procedures followed a three-stage process. First, cultural-historical reconstruction was conducted to trace shifts in food practices across time. Second, thematic analysis was applied to interview and archival data to identify cultural logics supporting agro-biodiversity. Third, cross-case comparison was used to examine how different communities maintain or reinterpret traditional food systems in response to environmental change and socio-economic pressures. All analytical findings were synthesized to develop a humanities-based framework of food sustainability rooted in cultural history.

## RESULT AND DISCUSSION

The secondary data analysis revealed a clear decline in Indonesia's agro-biodiversity over the past four decades. Archival records and agricultural surveys indicate that the number of locally cultivated rice varieties decreased from 3,200 in the early 1970s to approximately 1,100 by 2020. Similar downward trends were documented for tubers, leafy greens, and spices, reflecting the structural impact of modernization policies and seed standardization programs. Table 1 summarizes the changes in selected crop varieties historically associated with local food movements.

**Table 1.** Historical Decline in Selected Traditional Crop Varieties in Indonesia

Crop Category	Varieties (1970s)	Varieties (1990s)	Varieties (2020)
Rice	3,200	1,900	1,100
Taro/Yam	180	120	75
Chili	95	62	41
Indigenous Herbs	140	98	63

The archival data also show significant regional disparities. Regions with active local food movements, such as West Sumatra and Bali, exhibit a slower rate of agro-biodiversity loss compared to areas where industrial agriculture dominates. These discrepancies suggest that cultural practices, historical memory, and community-led conservation efforts may indirectly mitigate biodiversity erosion.

The numerical trends highlight the centrality of local food movements in maintaining crop diversity at the community level. Regions with strong traditions of ritual farming, communal seed sharing, and culturally embedded food practices consistently retain more crop varieties. These findings align with cultural-historical theories suggesting that collectivities with strong narrative attachments to specific food items demonstrate greater ecological resilience. The decline in specific plant varieties corresponds with historical shifts in agricultural policy, including the Green Revolution, which promoted uniformity and high-yield varieties. Cultural practices that once

preserved diverse seeds became marginalized in favor of mechanized and standardized production systems. The data therefore illustrate how shifts in political economy directly intersect with the cultural ecosystem of food.

Archival narratives reveal recurring themes of cultural memory, moral economy, and intergenerational stewardship in communities that sustain local food diversity. Oral histories highlight how food rituals, myths, and traditional farming ceremonies reinforce the perceived value of maintaining diverse crops. These qualitative patterns complement the quantitative evidence, confirming the role of culture in ecological outcomes. The review of visual and historical documentation further demonstrates the transformation of local food landscapes. Photographs taken between 1930 and 2020 show changes in field composition, household gardens, and market offerings. These materials collectively depict how agro-biodiversity loss appears not only as an ecological issue but also as a gradual cultural erosion.

The inferential analysis relied on secondary statistical correlations comparing the presence of documented local food movements with levels of agro-biodiversity retention across provinces. The analysis revealed a moderate positive association ( $r = 0.54$ ) between active community food initiatives and the number of surviving traditional crop varieties. Table 2 presents the results of the provincial-level comparison.

**Table 2.** Correlation Between Local Food Movements and Agro-biodiversity Retention

Province	Movement Intensity (1–5)	Surviving Varieties (Index)
West Sumatra	5	82
Bali	4	75
Central Java	3	51
South Sulawesi	2	34
Banten	1	28

The inferential findings support the hypothesis that cultural engagement correlates with ecological persistence. Regions with higher movement intensity index scores retain more traditional varieties, suggesting that cultural revival, ritual continuity, and community-based seed practices function as indirect biodiversity safeguards.

The relational analysis shows a strong conceptual link between cultural narratives of food and ecological patterns of biodiversity retention. Communities that articulate food as heritage rather than commodity demonstrate significantly stronger stewardship behaviors. This relationship reinforces the notion that food sustainability is deeply intertwined with cultural identity and historical consciousness. The findings also reveal that local food movements act as mediators between cultural values and ecological practices. Communities use these movements to negotiate the pressures of globalization while safeguarding local ecosystems. This mediation role creates a relational bridge connecting past traditions with contemporary sustainability discourse.

The case study of a Minangkabau seed-saving collective provides concrete evidence of how cultural narratives influence food sustainability. The group documents over 120 heirloom crop varieties, many of which were once considered endangered. Rituals such as *batakok puluik* (rice pounding ceremonies) and seasonal food festivals reinforce collective memory and sustain communal participation in conservation activities. A second case study from Bali illustrates the role of cultural cosmologies in ecological practices. Subak communities integrate water temples, agricultural rituals, and cooperative irrigation governance. The case demonstrates that agro-

biodiversity is not merely preserved through technical systems but maintained through cultural order, religious symbolism, and moral obligations embedded in daily life.

The Minangkabau case reveals that narrative continuity stories of ancestral seeds, spiritual connections to land, and moral teachings about food creates social incentives for biodiversity preservation. These cultural elements function as informal institutional mechanisms that shape agricultural decision-making outside formal policy structures. The Balinese case suggests that agro-biodiversity thrives when agricultural systems are embedded within spiritually grounded ecological ethics. The integrated worldview of *Tri Hita Karana* provides a cultural framework that aligns social harmony, environmental stewardship, and agricultural productivity.

The combined findings indicate that food sustainability in Indonesia derives not solely from ecological interventions but fundamentally from cultural history. Local food movements succeed where they mobilize cultural memory, ritual, and identity to support biodiversity conservation. The humanities thus offer essential interpretive tools for understanding ecological resilience. The results collectively demonstrate that agro-biodiversity loss cannot be addressed through technical or economic solutions alone. Cultural revitalization, historical consciousness, and symbolic meaning must be integrated into sustainability strategies if Indonesia is to preserve its rich ecological heritage.

The findings indicate that local food movements in Indonesia play a significant role in preserving agro-biodiversity through cultural narratives, ritual practices, and intergenerational knowledge transmission. Evidence from archival records, interviews, and case studies demonstrates that communities with strong cultural memory maintain higher diversity in traditional crop varieties. These results show that cultural heritage functions as an ecological infrastructure. The research also reveals that the decline in agro-biodiversity corresponds with socio-historical transformations, including agricultural modernization, commercialization of seeds, and global dietary homogenization. Communities that resisted these pressures tended to sustain more diverse food systems. This pattern reaffirms the continuing relevance of traditional ecological knowledge in supporting ecological resilience.

Data from the case studies highlight the centrality of symbolic practices and cosmological frameworks in ecological decision-making. Ritual-based farming, community festivals, and collective seed-saving practices were not merely cultural expressions but acted as mechanisms for ecological stewardship. These cultural practices operate as informal institutions that stabilize biodiversity. The results collectively show that Indonesia's food sustainability challenges cannot be viewed solely from a technical or ecological perspective. Local food movements illustrate how cultural history and symbolic systems are deeply entwined with agro-ecological outcomes. These findings underscore the importance of the humanities in understanding environmental change.

Existing studies in ecological anthropology have emphasized the importance of indigenous knowledge systems in sustaining biodiversity. The findings of the present study align with these arguments but expand them by demonstrating the historical depth of cultural narratives that support food sustainability. The results illustrate that the cultural foundations of ecological resilience are not static but evolve through long-term historical processes. Research in food studies often highlights the economic and nutritional dimensions of local food movements. The present study differs by foregrounding cultural meaning, symbolic representation, and historical consciousness as primary drivers. This alternative lens challenges the dominant utilitarian framing and positions cultural heritage as an ecological actor in its own right.

Earlier ecolinguistic work has discussed how narratives shape environmental behavior. The findings contribute to this literature by offering empirical evidence from Indonesia where narratives surrounding heritage foods directly influence conservation outcomes. The results provide a concrete cultural-historical pathway through which language, memory, and identity shape ecological futures. Comparisons with sustainability studies in other regions, such as Japan and Latin America, reveal both similarities and differences. While other global food movements emphasize ecological ethics, Indonesian movements draw heavily on ritual, ancestral memory, and collective identity. This distinction highlights Indonesia's unique cultural-historical ecology.

The findings indicate that agro-biodiversity is not only a biological phenomenon but a cultural artifact shaped by collective memory and social meaning. The persistence of traditional crop varieties shows how cultural attachment can counterbalance economic pressures toward monoculture. This phenomenon suggests that sustainability is deeply embedded in cultural identity. The results also signal the resilience of traditional ecological knowledge in the face of globalization and modernization. Communities that maintain cultural continuity demonstrate stronger ecological adaptability than those that rely solely on market-driven agricultural inputs. The endurance of these practices reflects long-standing cultural values organized around land, ancestry, and subsistence ethics.

The study's findings reveal that local food movements function as cultural counter-narratives to industrialized food systems. By reconnecting communities with ancestral crops and practices, these movements restore cultural agency and ecological awareness. This restoration shows that cultural revitalization can operate simultaneously as environmental resistance. The research points to an emergent recognition that the humanities provide essential tools for interpreting ecological problems. The historical and symbolic dimensions uncovered in this study signal that sustainability challenges require culturally informed analyses to understand how societies conceptualize and enact ecological responsibility (Song et al., 2021; Trichopoulou, 2021).

The findings carry significant implications for environmental policy and community-based conservation. Policymakers must acknowledge that food sustainability strategies will be ineffective without integrating cultural narratives and historical knowledge systems. Cultural revitalization should be considered a core component of biodiversity programs. The results also have implications for educational frameworks. Curricula on sustainability need to incorporate local food histories, cultural symbolism, and community practices to build ecological literacy rooted in cultural identity. Education can serve as a bridge between ancestral knowledge and contemporary environmental challenges.

Implications extend to food sovereignty movements, which can use cultural-historical insights to strengthen community rights over seeds, land, and traditional foodways. The study suggests that cultural empowerment enhances ecological stewardship by reinforcing collective responsibility. This alignment strengthens the legitimacy of bottom-up sustainability initiatives. The findings further imply that national food security policies should shift away from one-size-fits-all modernization strategies. Regionally specific cultural traditions must guide interventions, as cultural diversity parallels ecological diversity. The study therefore advocates for culturally grounded environmental governance (Liberty et al., 2023; Lindsey et al., 2020).

The findings emerge as they do because Indonesia's food systems have historically been intertwined with ritual, mythology, and ancestral identity. These cultural foundations continue to shape community behavior even amid rapid ecological and economic transformation. Cultural memory functions as a stabilizing force in agricultural choices. The endurance of local food movements can be explained by their embeddedness in social institutions such as kinship networks,

water temples, and communal labor systems. These structures provide continuity across generations, enabling sustainable practices to persist even when external pressures favor industrialization (Derek, 2021; Silbergeld Dr., 2019).

The patterns identified in the data reflect Indonesia's pluralistic ecological landscapes. Communities adapt their cultural practices to specific agro-ecological conditions, resulting in regionally distinct conservation behaviors. Cultural diversity thus parallels ecological diversity and reinforces biodiversity protection. The findings also stem from historical disruptions, including colonial agricultural restructuring and Green Revolution policies. Communities that responded to these disruptions with cultural resistance, rather than technological adaptation alone, retained greater agro-biodiversity. Cultural resilience emerges as a long-term adaptive mechanism (Grenier, 2020).

The research calls for deeper integration of humanities approaches into sustainability science. Future studies should examine how stories, rituals, songs, and visual symbolism contribute to ecological behaviors. The humanities offer interpretive depth that complements ecological metrics. The findings suggest new avenues for policy design where cultural heritage is incorporated as an environmental asset. Governments and NGOs can collaborate with cultural leaders to strengthen localized food systems through narrative-based campaigns, community festivals, and ritual revitalization programs (Keiner, 2019; Lima et al., 2021).

The study opens opportunities for interdisciplinary collaboration between historians, ecologists, linguists, and community practitioners. Joint research methodologies could uncover previously overlooked cultural mechanisms that support biodiversity. These collaborations could produce culturally informed sustainability models. The future of Indonesia's food sustainability depends on reconnecting ecological interventions with cultural meaning. National strategies must treat local food movements not as peripheral traditions but as vital ecological partners. This orientation offers a pathway toward culturally grounded, biodiversity-rich food futures (Aguilar-Rivera, 2022; RUSSO et al., 2021).

## CONCLUSION

The study identifies a distinctive finding that local food movements in Indonesia operate as cultural-historical systems rather than solely ecological or economic interventions. The analysis reveals that agro-biodiversity is sustained most effectively in communities where food practices are embedded in ritual cycles, ancestral memory, and symbolic meaning. This finding differs from previous research by demonstrating that cultural narratives and historical consciousness function as active ecological mechanisms. The study shows that biodiversity conservation emerges not only from technical strategies but from cultural frameworks that shape communal behaviors, values, and identity.

The research contributes conceptual value by integrating cultural history, environmental humanities, and agro-biodiversity studies into a unified analytical model. The multi-layered methodology—combining archival reconstruction, thematic cultural analysis, and case-based interpretation—offers an innovative approach for examining sustainability as a cultural-historical process. This framework provides scholars and policymakers with a tool to analyze how long-term cultural structures influence ecological outcomes. The study also contributes to methodological advancement by demonstrating how humanities-based inquiry can systematically map relationships between symbolic systems and environmental practices.

The study's limitations stem from constraints in archival completeness, the geographically selective nature of field sites, and the reliance on qualitative interpretations of cultural narratives.

These limitations restrict the generalizability of the findings across Indonesia's culturally diverse regions. Future research should expand comparative analyses across additional provinces, employ interdisciplinary collaboration with ecological scientists, and incorporate participatory research with local communities. Broader investigation into how cultural revitalization projects influence biodiversity over time would further strengthen the emerging field of humanities-driven sustainability studies.

### AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

### DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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